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Evidence to Guide Action:

Comprehensive tobacco control in Ontario (2016)

Smoke-Free Ontario Scientific Advisory Committee

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Evidence to Guide Action:

Comprehensive tobacco control in Ontario (2016)

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List of Abbreviations

CAMH - Centre for Addiction and Mental Health

CASP - Critical Appraisal Skills Program

CBT - Cognitive Behavioural Therapy

CDC - Centers for Disease Control and Prevention

CI - Confidence Interval

CINAHL - Cumulative Index to Nursing and Allied Health Literature

COPD - Chronic Obstructive Pulmonary Disease

CPHA - Canadian Public Health Association

CTUMS - Canadian Tobacco Use Monitoring Survey

E-cigarettes - Electronic Cigarettes

EMR - Electronic Medical Records

EPHPP - Effective Public Health Practice Project

FCTC - Framework Convention on Tobacco Control

HR - Hazard Ratio

HWL - Health Warning Labels

IARC - International Agency for Research on Cancer

IQR - Inter Quartile Range

LGBT - Lesbian, Gay, Bisexual, and Transgender

MEDLINE - Medical Literature Analysis and Retrieval System Online

MetaQAT - Meta Quality Appraisal Tool

MMCs - Mass Media Campaigns

MOHLTC - Ministry of Health and Long-Term Care

MPOWER - **M**onitor tobacco use and prevention policies, **P**rotect people from tobacco smoke, **O**ffer help to quit tobacco use, **W**arn about the dangers of tobacco, **E**nforce bans on tobacco advertising, promotion and sponsorship, **R**aise taxes on tobacco, Reduce the size of cigarette

MUH - Multi-Unit Housing

NRT - Nicotine Replacement Therapy

NSRA - Non-Smokers' Rights Association

OMSC - Ottawa Model for Smoking Cessation

OR - Odds Ratio

OTRU - Ontario Tobacco Research Unit

PHO - Public Health Ontario

PICO - Population, Intervention, Comparison, Outcomes

PM - Particulate Matter

POS - Point-of-Sale

RCTs - Randomized Control Trials

RR - Relative Risk

SES - Socioeconomic Status

SFO – Smoke-Free Ontario

SFOA – Smoke-Free Ontario Act

SFO-SAC 2010 - Smoke Free Ontario - Scientific Advisory Committee 2010 (report)

SHS - Secondhand Smoke

SOR - Statutory Orders and Regulations

TCAN - Tobacco Control Area Network

TEACH - Training Enhancement in Applied Cessation Counselling and Health Project

THS - Thirdhand smoke

TSAG - Tobacco Strategy Advisory Group

U.K. - United Kingdom

U.S. - United States

USD - United States Dollar

WHO - World Health Organization

Executive Summary

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The purpose of this Report is to provide a comprehensive assessment of the tobacco control interventions that would have the greatest impact on reducing tobacco use and its associated burden in Ontario. This Report is a rigorous synthesis of tobacco control research that builds on the *Smoke-Free Ontario Scientific Advisory Committee (SFO-SAC) 2010 Report*.

The *SFO-SAC 2016 Report* provides evidence on the effectiveness of interventions to reduce the use of, and exposure to, tobacco products and an assessment that seeks to identify the scientific consensus on the most impactful interventions for tobacco control in Ontario. The Report includes interventions that target relatively new products, such as e-cigarettes and other non-combustibles.

To achieve the desired substantial reductions in tobacco use requires ongoing, collective and coordinated efforts. The greatest impact is still through a comprehensive tobacco control strategy that produces synergies by leveraging the combined contributions of many interventions.

Background

Despite the established body of evidence on the harms caused by tobacco and the sustained efforts to get tobacco use under control, there is still a far-too-high burden of tobacco-related illness and death in Canada.[1] With approximately two million individuals currently smoking in Ontario, tobacco use is responsible for over 13,000 deaths per year in Ontario, the equivalent of 36 deaths per day.[2] Some groups continue to be particularly vulnerable, including people who identify as Indigenous, the LGBTQ community and people with low socio-economic status.

Ontario has taken the tobacco epidemic seriously and has been a leader in tobacco control for many years, as evidenced by the *Smoke-Free Ontario Act (SFOA)* and its enabling infrastructure of funded tobacco control programs, area networks, resource centres and the Ontario Tobacco Research Unit (OTRU). Since the *SFO-SAC 2010 Report*, there have been advances in tobacco control at the provincial, municipal and federal government levels. For example, Ontario has broadened smoke free-environments through amendments to the *SFOA*,[3] banned the sale of flavoured tobacco, including menthol,[4] and undertaken partial implementation of the *Electronic Cigarettes Act*.[5] Progress on local level policies includes bans on indoor and outdoor waterpipe use.[6]

At the federal level, recent and upcoming developments include regulatory proposals for plain packaging under the *Tobacco Act*[7] and regulatory frameworks focused on the legalization of marijuana, which will likely intersect with tobacco control policy via common approaches to reduce secondhand smoke exposure.[8]

To continue to move forward effectively, the Ontario government identified the need for a comprehensive report to support ongoing developments of the provincial tobacco control strategy and to address the changing tobacco landscape. In 2015, the Ministry of Health and Long-Term Care asked Public Health Ontario to reconvene a SFO-SAC committee and update the evidence in the *SFO-SAC 2010 Report*. The request was framed as a specific question: “Which interventions or set of interventions will have the greatest impact on reducing tobacco use in Ontario?” Importantly, the Ministry requested that equity and implementation considerations be addressed (i.e., embedded) throughout the report.

Methods

The Report is organized according to the four pillars of tobacco control; industry, prevention, protection and cessation, consistent with the *SFO-SAC 2010 Report*.

Key interventions are described within each of the four pillars. Each intervention description includes: background information; relevant Canadian and Ontario contextual data; a summary of the evidence sources*, with a synthesis of evidence of effectiveness; any intervention characteristics; and considerations regarding implementation, specific populations and/or equity issues.

A three-part Intervention Summary concludes each description, with a précis of evidence regarding the effectiveness of the intervention, a scientific consensus statement including a categorization of the intervention's potential contribution for Ontario, and a succinct key message recap on potential impact.

To determine the most impactful tobacco control interventions for Ontario, SFO-SAC 2016 engaged in a categorization process to assess the potential contribution of each intervention. Potential contribution was determined by consensus, considering the evidence of effectiveness, the Ontario context and opportunity gap. The 10 categories ranged from 'high' to 'harmful', and included a designation of 'innovative' for emerging evidence or a promising direction. The other categories were 'moderate', 'uncertain at this time' and 'unsupported at this time'. See Figure 1.

*The key tobacco control interventions described in each pillar comprise three types of evidence: best available research evidence from published literature via pre-appraised databases and PHO library searches; contextual evidence from the OTRU Annual Smoke-Free Ontario Monitoring Report, an Internet-based environmental scan and a survey of Ontario's tobacco control stakeholders; and experiential evidence from SFO-SAC 2016 members.

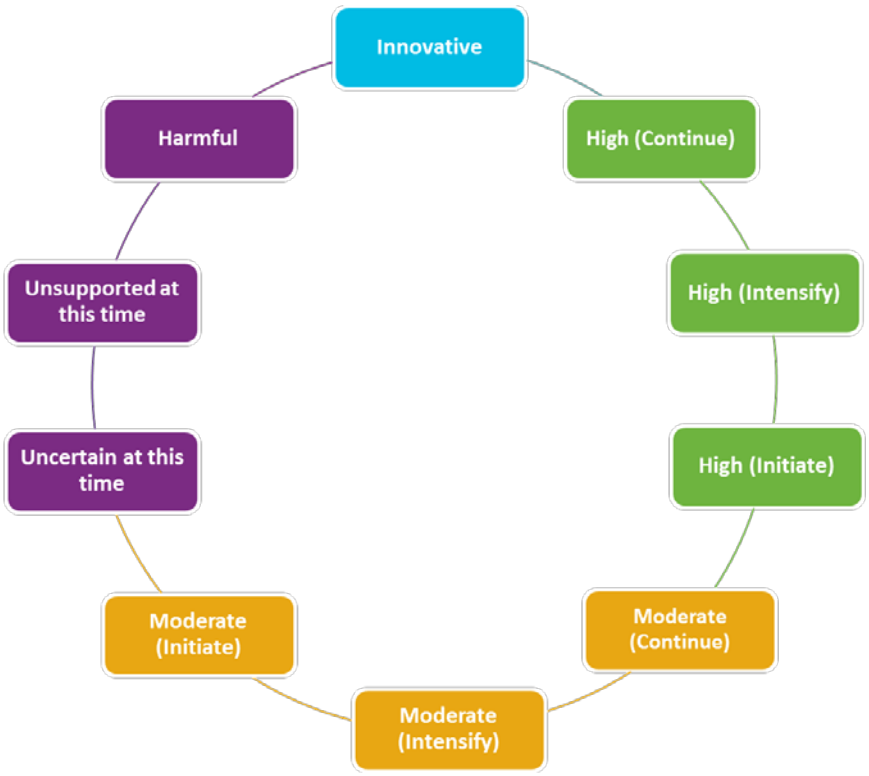

Figure 1: Categorization of Potential Contribution for Tobacco Control in Ontario

Results: Potential Contribution of Key Interventions

To answer the overall question, "Which interventions or set of interventions will have the greatest impact on reducing tobacco use in Ontario?, SFO-SAC 2016 reviewed, assessed and categorized a total of 56 interventions over the four pillar topics of industry, prevention, protection and cessation.

The findings included in this Executive Summary are the interventions that SFO-SAC 2016 categorized as 'high', 'moderate' or 'innovative' in each pillar, and together, present the scientific consensus on interventions with the greatest potential to reduce the use of and exposure to tobacco products.

The 'high' and 'moderate' category has three qualifiers– 'intensify' where the effectiveness of an implemented intervention could have greater impact if its scope, reach and implementation were increased; 'continue' for implemented interventions that evidence supports as effective, but where additional intensity would not increase impact; and 'initiate' for interventions not yet implemented in Ontario that could make a substantial contribution.

For the 'innovative' category the body of evidence is emerging or a promising direction. The intervention is not currently implemented in Ontario. However, if well-implemented, the potential contribution may shift the landscape of tobacco control for Ontario (potential contribution may be transformational).

Detailed descriptions of all the interventions pertaining to each pillar are provided in the relevant chapter.

The titles in Table 1 (below) reflect the intervention titles from the specific chapters. Links to these sections are in the table.

Table 1: Potential Contribution of Interventions by Pillar Chapter

Potential contribution	Industry	Prevention	Protection	Cessation
High (Intensify)	• Price and Taxation (+) • Tobacco Advertising Promotion and Sponsorship Bans • Anti-Contraband Measures • Banning Flavours in Tobacco Products (+)	• Price and Taxation (+) • Mass Media - Prevention (+)	• Mass Media - Protection • Protection from Tobacco Smoke Exposure in Outdoor Public Spaces • Protection from Tobacco Smoke Exposure in Home Environments (+)(T) • Protection from Tobacco Smoke Exposure in Workplaces (+)(T)	• Price and Taxation (+) • Smoke-Free Policies • Mass Media - Cessation • Technology-Based Interventions: Internet /Computer and Text Messaging • Hospital-Based Cessation Interventions • Other Health Care Setting Cessation Interventions • Pharmacotherapy • Behavioural Interventions
High (Initiate)	• Plain and Standardized Packaging	• N/A	• N/A	• N/A
High (Continue)	• N/A	• Bans on Point-of-Sale Displays	• N/A	• N/A
Innovative	• Zoning Restrictions to Create Tobacco Retail-free Areas • Retail Licenses • Government-Controlled Outlets • Imposing a Quota on Tobacco Product Availability (Sinking Lid) (+) • Regulated Market Model • Non-Profit Enterprise with a Public Health Mandate • Performance-Based Regulation	• Reducing the Availability of Tobacco Products (+) • Raising the Minimum Purchase Age • Social Marketing (T) • Onscreen Tobacco Use and Product Placement • Tobacco-Free Generation	• Integrating Electronic Cigarettes into Smoke-Free Policies	• Cessation Maintenance

Potential contribution	Industry	Prevention	Protection	Cessation
Moderate (Intensify)	• Health Warning Labels	• Elementary and Secondary School Tobacco Policies • Campus-Based Tobacco Policies	• Protection from Tobacco Smoke Exposure in Institutional Settings (+) • Protection from Tobacco Smoke Exposure Hospitality Settings (+) • Protection from Tobacco Smoke Exposure in Vehicles • Protection from Waterpipe Smoke	• Workplace-Based Interventions • Campus-Based Interventions • Quitlines with Cessation Telephone Support • Financial Incentives (+) (T)
Moderate (Initiate)	• N/A	• N/A	• N/A	• N/A
Moderate (Continue)	• N/A	• Elementary and Secondary School Prevention Programs	• N/A	• Self-Help Interventions
Uncertain at this time	• Regulation to Favour Electronic Cigarettes over Cigarettes • Litigation • Reducing Product Toxicity • Reduction of Nicotine Content in Cigarettes to Reduce Addictiveness	• Prevention in the Family Setting • Prevention in the Primary Care Setting	• Impacts of Post-Consumption Cigarette Waste	• Electronic Cigarettes • Enhancing Partner Support (+) (T) • Biomedical Risk Assessment • Acupuncture and Related Interventions • Combustible Products – Waterpipes • Smokeless Tobacco
Unsupported at this time	• N/A	• N/A	• N/A	• Hypnotherapy
Harmful	• N/A	• N/A	• N/A	• N/A

(+) = Demonstrated or potential positive equity (T) = Targeted

Industry

The Industry chapter examines actions and interventions that could most effectively counter the tobacco industry's efforts to promote and sell their products.

The term 'industry' refers to entities that produce, supply, market and promote commercial tobacco to current and potential users. This group includes tobacco growers and importers, manufacturers, companies involved in producing tobacco product inputs (e.g., cigarette paper), wholesalers and the retailer network, including tobacconists. Additional networks that take part in illicit contraband tobacco trade outside the regulatory framework are also deemed part of industry.[9]

SFO-SAC 2016 assessed a total of 17 interventions pertaining specifically to the tobacco industry. The interventions were grouped as retail-based, market-based or product-based, and included relatively new products such as e-cigarettes and other non-combustibles .

Four Interventions Categorized as 'High (Intensify)'

SFO-SAC 2016 categorized four interventions that are already implemented in Ontario as 'high (intensify)' for greater impact. These include: increasing price and taxation; banning tobacco advertising, promotion and sponsorship (TAPS); banning flavours in tobacco products; and both continuing and strengthening anti-contraband measures already in place. For example, Ontario has one of the lowest tobacco tax rates in Canada and substantial tax increases, in conjunction with addressing pricing strategies, would contribute significantly to decrease tobacco use in Ontario.

One intervention was categorized as 'high initiate'. Evidence from Australia showed that plain and standardized packaging is an effective public health intervention to reduce smoking prevalence. Based on the Australian experience, the implementation of plain and standardized packaging could help reduce tobacco use in Ontario.

Seven Interventions Categorized as 'Innovative'

SFO-SAC 2016 categorized seven interventions as 'innovative'. They include: zoning restrictions to create tobacco retail-free areas; retail licenses; government-controlled outlets; reducing the quota on tobacco product availability ('sinking lid'); regulated market model; non-profit enterprise with a public health mandate, and performance-based regulation. For example, in Ontario, there are no zoning restrictions and, while evidence about the effects of zoning is sparse, theory and experience from other areas suggest that zoning restrictions that reduce tobacco retailer density, tobacco product availability and environmental cues for smoking could contribute substantially to decreased initiation and more successful cessation.

One Intervention Categorized as 'Moderate (Intensify)'

SFO-SAC 2016 categorized health warning labels as 'moderate (intensify)'. In Canada, health warning labels currently cover 75% of the package, with toxic emission statements on the sides, interior health information and a toll-free quitline number. Health warning labels can be further improved by increasing their periodic rotation of images and/or messaging which on its own would have a moderate contribution to decreasing tobacco use in Ontario.

Find all interventions described in Chapter 3: Industry of the full Report.

Prevention

The Prevention chapter focuses on the effectiveness of various primary and secondary tobacco prevention interventions that target tobacco use among youth and young adults. Primary prevention aims to prevent tobacco use initiation, while secondary prevention aims to detect and prevent the progression of further tobacco use.

Youth and young adults are susceptible to smoking, and once individuals start smoking, they are at greater risk of progressing to increased tobacco use. The transition period from youth to young adulthood increases the risk of initiation.

SFO-SAC 2016 identified a total of 14 interventions pertaining specifically to the prevention of tobacco use by youth and young adults. The interventions were primarily grouped into retail-based, marketing, school and campus-based interventions, but also included others, such as on-screen tobacco use and product placement, and 'tobacco-free generation'.

Two Interventions Categorized as 'High (Intensify)'

SFO-SAC 2016 categorized two interventions, price and taxation as well as mass media, as 'high intensify' for greater impact. Evidence supports the effectiveness of both these interventions, and while both have been implemented in Ontario to some degree, intensifying them could contribute to reducing initiation and use of tobacco by youth and young adults in Ontario. For example, with the second lowest provincial/territorial excise tax and the second lowest retail price for cigarettes in Canada, Ontario could raise the prices of all tobacco products to maximize deterrence of tobacco use.

One intervention was categorized as **'**high continue'. Banning point-of-sale (POS) tobacco promotions removes sensory cues to purchase and use tobacco, and helps to denormalize its use. The *Smoke-free Ontario Act* has prohibited retail tobacco product displays since 2008; tobacco products must be hidden from sight and customers are not permitted to handle tobacco products prior to purchase. Continued monitoring and enforcement of existing bans on POS displays can further reduce smoking prevalence in Ontario.

Five Interventions Categorized as 'Innovative'

SFO-SAC 2016 categorized five interventions as 'innovative'. The evidence for these interventions is still in development or non-existent, and they have not been implemented in Ontario, they have the potential to significantly affect initiation rates, and therefore, the prevalence of tobacco use in Ontario. These interventions are: raising the minimum purchase age; reducing the availabilty of tobacco products; social marketing; tobacco-free generation; and removing onscreen tobacco use and product placement. For example, while there is no direct evidence to date regarding the effectiveness and feasibility of implementing a tobacco-free generation, that is, banning tobacco sales to Ontarians born after a certain date, conceptually this makes a lot of sense and some countries, including Singapore, Australia, New Zealand and the U.K., view it as a promising strategy to reduce smoking prevalence. Similarly, given there is strong evidence of a positive association between onscreen tobacco exposure

and increased risk of smoking initiation among young people, it is likely that restricting movies with tobacco imagery to adults in Ontario would substantially decrease smoking initiation among youth.

Two Interventions Categorized as 'Moderate (Intensify)'

SFO-SAC 2016 categorized two interventions as 'moderate (intensify)'. Tobacco policies in elementary and secondary schools have the potential for greater impact if combined with other strategies such as prevention and education components with strict monitoring and enforcement. Tobacco-free policies on campuses (e.g., colleges, universities and trades schools) are more effective when comprehensive (e.g., prohibit the advertising, promotion and sale of all tobacco products on campuses).

Find all interventions described in Chapter 4: Prevention of the full Report.

Protection

The Protection chapter focuses on interventions in numerous settings that would enhance protection for all Ontarians from physical exposure to secondhand smoke (SHS) and thirdhand smoke (THS) and from social exposure to smoking, vaping and using other tobacco products, particularly where there are protection gaps and opportunities. Interventions include reducing exposure to emissions from newer products such as e-cigarettes and waterpipes. Physical exposure occurs when people who are not actively engaged in smoking are involuntarily exposed to pollutants from tobacco, e-cigarettes or other related products, such as waterpipes.[10] Social exposure includes visual and sensory cues associated with the use of tobacco, e-cigarettes or related products.

SFO-SAC 2016 identified a total of 10 interventions pertaining specifically to protection from SHS and THS including restricting smoking in different settings, mass media campaigns and addressing the impacts of post-consumption product waste, primarily in the form of cigarette butts.

Four Interventions Categorized as 'High (Intensify)'

SFO-SAC 2016 categorized four interventions as 'high (intensify)' for greater impact. These include: increasing smoke-free outdoor public spaces in settings that are not covered, or are covered insufficiently, by *SFOA* (e.g., buffer zones around bar and restaurant patios, and entrances to buildings); smoke-free home environments; outdoor workplace settings; and mass media and social media campaigns with a focus on protection outcomes.

These interventions, which are already implemented in Ontario at the local level, would benefit from intensification at the provincial level. For example, some municipalities in Ontario have implemented smoke-free policies in community housing; implementing similar policies at the provincial level would contribute substantially to protect people from tobacco smoke exposure and to decrease tobacco use.

Another example of intensifying an existing initiative would be a new province-wide mass media campaign on the recently-expanded *SFOA* restrictions on smoking in outdoor spaces. The new campaign would reinforce previous campaign messages and increase awareness about the dangers of secondhand and thirdhand smoke.

Four Interventions Categorized as 'Moderate (Intensify)'

SFO-SAC 2016 categorized four interventions as 'moderate (intensify)'. These include: eliminating designated smoking rooms (e.g., guest rooms) in hospitality settings; continued enforcement and expansion of smoking bans in all indoor and surrounding outdoor areas of institutional settings; continued enforcement of existing legislation banning smoking in vehicles with children and increasing the age of coverage in Ontario; and prohibiting non-tobacco waterpipe use in indoor and outdoor public spaces. Intensification of these interventions within these settings would have a moderate contribution to decreasing use and exposure of tobacco in Ontario.

One Intervention Categorized as 'Innovative'

SFO-SAC 2016 categorized one intervention as 'innovative'. This intervention was integrating e-cigarettes into smoke-free policies. Although still emerging, the evidence suggests that policies prohibiting the use of e-cigarettes in public places are likely to be effective to reduce physical and social exposure to e-cigarette use.

Find all interventions described in Chapter 5: Protection of the full Report.

Cessation

The Cessation chapter focuses on interventions that motivate, encourage and support efforts to quit smoking, at both the population and individual levels. It includes interventions related to other tobacco products such as waterpipes and smokeless tobacco.

SFO-SAC 2016 identified a total of 15 different types of interventions, targeted to populations and individuals, and in specific settings that included a range of health care settings, workplaces and campuses.

Eight Interventions Categorized as 'High (Intensify)'

SFO-SAC 2016 categorized six interventions as 'high (intensify)' for greater impact. These include: price and taxation; smoke-free policies; mass media (cessation related); technology-based interventions (Internet/computer and text messaging); hospital-based cessation interventions; other healthcare setting cessation interventions; pharmacotherapy; and behavioural interventions.

SFO-SAC 2016 emphasized that although these interventions are already in place in Ontario, increasing the intensity of any or all of them would increase their impact on smoking cessation. For example, pharmacotherapy treatments are effective at increasing smoking cessation and the Ontario Drug Benefit Program covers a number of effective smoking cessation drugs such as NRT, varenicline and bupropion. However, vulnerable populations, such as youth and young adults, have less access to smoking cessation medication. Extending coverage to these populations would likely increase cessation.

One Intervention Categorized as 'Innovative'

SFO-SAC 2016 categorized cessation maintenance as 'innovative'. Cessation maintenance includes behavioural, psycho-educational skills training, pharmacotherapy and text messaging interventions, all

of which have been implemented at varying intensities across the province. Further, the evidence suggests that cessation maintenance can sustain long-term quitting.

Four Interventions Categorized as 'Moderate (Intensify)'

SFO-SAC 2016 categorized four interventions as 'moderate (intensify)'. These include: workplace-based interventions, campus-based interventions, quitlines with cessation telephone support and financial incentives. Increasing impact could be achieved by providing support at the health unit level for workplace interventions and implementing 100% smoke-free policies on campuses in Ontario. In addition, promotion of quitlines (e.g., mass media) and other financial incentives (e.g., direct payment using cash).

Find all interventions described in Chapter 6: Cessation of the full Report.

Final Considerations

It is essential to build on Ontario's current comprehensive tobacco control strategy to save lives and improve health in the province. This Report provides strong evidence for a number of high-impact interventions and identifies several innovative interventions that have potential to substantially reduce tobacco use and its associated burden and to transform the tobacco control landscape in Ontario.

Coordinated and Comprehensive Strategy

To optimize the impact of interventions requires a coordinated and comprehensive strategy that leverages the synergy of multiple interventions across the four tobacco control pillars of industry, prevention, protection and cessation. A number of interventions categorized by SFO-SAC 2016 as having the greatest potential to reduce tobacco use in Ontario are considered impactful in a cross-cutting way across multiple pillar chapters. For example, price and taxation was determined to be a 'high (intensify)' intervention in the Industry, Prevention and Cessation chapters, based on evidence that showed its effectiveness to: (1) reduce the demand for tobacco products, (2) reduce the prevalence, initiation and uptake of tobacco use among young people and (3) increase smoking cessation. Mass media campaigns are another example of a cross-cutting intervention, particularly when implemented as part of a comprehensive strategy.

The importance of a coordinated and comprehensive approach was also observed in specific intervention settings. When interventions are integrated and policy coverage is optimized (more blanket than partial), greater impact is observed. For example, this can include coordinated smoke-free policies in outdoor public places, workplaces, elementary schools, post-secondary campuses, hospitals and home environments.

Addressing equity within a coordinated and comprehensive strategy is critical to provide a combination of population-wide interventions and more targeted interventions that can reduce smoking prevalence in specific vulnerable groups. The SFO-SAC 2016 scientific consensus process specifically considered the equity impacts of each intervention in terms of demonstrated or potential positive equity (indicated by a + in Table 1) and targeting (indicated by a T in Table 1). Interventions with a demonstrated or potential positive equity impact included taxation, banning flavours in tobacco products, prevention-focussed

mass media and interventions that protect individuals from tobacco smoke exposure. Interventions targeted to specific populations included protection interventions in home environments and workplaces, and prevention interventions that use social marketing.

Coordinating implementation is a key factor to optimize impact; for example, Australia introduced plain packaging regulations along with a national mass media public awareness campaign, and implementation is more effective with a multi-component approach such as combining technology-based and behavioural interventions. Active enforcement is another important component of coordinated and comprehensive implementation, required for policy interventions such as raising the minimum purchase age.

System Enablers Support

System enablers, which are interrelated functions within and between organizations and institutions, support effective comprehensive tobacco control. The *SFO-SAC 2010 Report* identified five system enablers that were endorsed by SFO-SAC 2016. System enablers include: 1) leadership, including at all levels of government, and partnership to develop multi-sector measures, strategic plans and coordinated responses; 2) capacity to develop and implement policies, programs and mass and social marketing that deliver information and services to the population as a whole, and to specific groups, such as potential smokers; 3) funding to achieve the high levels of population reach and intervention intensity required to effect changes in tobacco use; 4) capacity-building infrastructure, surveillance, evaluation and research to provide continued support to Ontario's comprehensive tobacco control learning system; 5) coordination to sustain and enhance Ontario's substantial contributions to global understanding of what works to eliminate tobacco use and exposure through its role in the global tobacco control framework, contributing to Canada's obligations under the WHO Framework Convention on Tobacco Control. Investment in key system enablers is critical for the effective management and implementation of a comprehensive tobacco control strategy.

Endgame Framing

The *SFO-SAC 2016 Report* frames the opportunities to reduce tobacco use in Ontario beyond a five-year tobacco control strategy, incorporating the concept of tobacco 'endgame', a vision of a tobacco-free future. Importantly, there is a commitment that the evidence and potential contribution be updated annually. Annual updating will provide tobacco control decision-makers and implementers access to best available research evidence and scientific consensus to progress towards an endgame goal.

SFO-SAC 2016 categorized a number of interventions as 'innovative' that could be considered endgame measures, including tobacco-free generation, zoning restrictions to create tobacco retail-free areas and imposing a quota on tobacco availability ('sinking lid').

The *SFO-SAC 2016 Report* is intended for a range of audiences, including government, non-government organizations, program developers, policy-makers and service providers. All audiences can contribute to reducing tobacco use and its associated burden in Ontario.

References

1. Rehm J, Adlaf E, Recel M, Single E. The costs of substance abuse in Canada 2002: highlights. Ottawa, ON: Canadian Centre on Substance Abuse; 2006. Available from: http://www.ccsa.ca/Resource%20Library/ccsa-011332-2006.pdf

2. Smoke-free Ontario: information on places where you can't smoke, the rules on selling tobacco and how Ontario is working to reduce tobacco use [Internet]. Ottawa, ON: Queen's Printer for Ontario; 2016 [updated 2016 Aug 16; cited 2016 Nov 25]. Available from: https://www.ontario.ca/page/smoke-free-ontario?_ga=1.221771800.1898918448.1475585651

3. *Smoke-Free Ontario Act,* S.O. 1994, c.10. Available from: https://www.ontario.ca/laws/statute/94t10/v4

4. Bill 45*, Making Healthier Choices Act, ,* 1st Sess, 41st Leg, Ontario, 2015 (assented to 28 May 2015), SO 2015, c 7. Available from: http://www.ontla.on.ca/web/bills/bills_detail.do?BillID=3080

5. *Electronic Cigarettes Act, 2015,* S.O. 2015, c. 7, Sched. 3. Available from: https://www.ontario.ca/laws/statute/15e07

6. Ontario Tobacco Research Unit. Smoke-free Ontario strategy monitoring report [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2016 [cited 2016 Dec 12]. Available from: http://otru.org/wp-content/uploads/2016/02/OTRU_2015_SMR_Full.pdf

7. Health Canada. Consultation on "plain and standardized packaging" for tobacco products: potential measures for regulating the appearance, shape and size of tobacco packages and of tobacco products [Internet]. Ottawa, ON: Health Canada; 2016 [cited 2016 Nov 25]. Available from: http://healthycanadians.gc.ca/health-system-systeme-sante/consultations/tobacco-packages-emballages-produits-tabac/alt/tobacco-packages-emballages-produits-tabac-eng.pdf

8. Changing marijuana laws [Internet]. Ottawa, ON: Government of Canada, Department of Justice; 2016 [updated 2016 June 30; cited 2016 Nov 25]. Available from: http://www.justice.gc.ca/eng/cj-jp/marijuana/lawc-loic.html

9. Smoke-Free Ontario, Scientific Advisory Committee. Evidence to guide action: Comprehensive tobacco control in Ontario [Internet]. Toronto, ON: Ontario Agency for Health Protection and Promotion; 2010 [cited 2015 Jul 29]. Available from: http://www.publichealthontario.ca/en/eRepository/Evidence%20to%20Guide%20Action%20-%20CTC%20in%20Ontario%20SFO-SAC%202010E.PDF

10. U.S. Department of Health and Human Services. The health consequences of involuntary tobacco smoke: a report of the Surgeon General [Internet]. Atlanta, GA: U.S. Department of Health and Human Services, Office of the Surgeon General; 2006 [cited 2016 April 11]. Available from: http://www.ncbi.nlm.nih.gov/books/n/rptsmokeexp/pdf/

Chapter 1: Introduction

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Global Tobacco Epidemic

The tobacco epidemic kills approximately six million people every year across the globe.[1] In response to the globalization of the tobacco epidemic, the World Health Organization (WHO) *Framework Convention on Tobacco Control* (FCTC) was adopted in 2003.[2] The WHO FCTC is an evidence-based treaty that reaffirms the right of all people to the highest standard of health. Importantly, the FCTC acknowledges that the tobacco epidemic is man-made and preventable, providing numerous opportunities for prevention, control and elimination.[1]

Ontario Tobacco Burden and Control

Each day in Canada, nearly 100 people die because of a smoking-caused illness.[3] In Ontario, approximately two million people still smoke, with more at risk for initiation and uptake.[4] Tobacco use is responsible for over 13,000 deaths per year in Ontario, the equivalent of 36 deaths per day.[5] Disease attributable to tobacco use is estimated to cost $2.2 billion in direct health care costs and $5.3 billion in indirect costs (e.g., lost productivity) for a total of $7.5 billion each year.[5]

Since the *Tobacco Control Act* was passed in 1994 (changed to the *Smoke-Free Ontario Act* in May, 2006) (2005, c. 18, ss. 1, 19 (2)),[6] there have been many efforts to address the burden of tobacco use. The *Smoke-Free Ontario Strategy* is a comprehensive tobacco control program that involves a coalition of provincial and local governments, boards of health, voluntary health organizations, hospitals and universities.[7] The Strategy includes education, programs and policies to help smokers quit, protect non-smokers from exposure to secondhand smoke and encourage young people to never start smoking.[8] The funding comes from the Ontario government, which committed $50 million in 2005-06 for the *Smoke-Free Ontario Strategy*.[9] Varying levels of ongoing funding have been provided since that time.

Smoke-Free Ontario Scientific Advisory Committee 2010 Report

In 2009, the Ontario Ministry of Health Promotion and Sport (MHPS) requested that Public Health Ontario (PHO) convene the Smoke-Free Ontario Scientific Advisory Committee (SFO-SAC) to provide guidance and recommendations to inform the renewal of Ontario's tobacco control strategy for 2010 to 2015. A committee of leading tobacco control scientists was convened by PHO, and a Report entitled *Evidence to Guide Action: Comprehensive tobacco control in Ontario, 2010,*[10] herein called the *SFO-SAC 2010 Report*, was produced. The *SFO-SAC 2010 Report* summarized the evidence of intervention effectiveness and provided 55 recommendations. It was organized according to four key tobacco control pillars: 'confronting the disease vector' (i.e., industry, including contraband), prevention of tobacco use among youth and young adults, protection from tobacco smoke and social exposure to tobacco use and tobacco cessation. The Report recommended a comprehensive approach, i.e., a "fully integrated, multi-level, comprehensive, coordinated and intense strategy that will greatly reduce use of and exposure to tobacco products and the illnesses and deaths they cause" (SFO-SAC 2010, p.1). The *SFO-SAC 2010 Report* also included a summary of the evidence and recommendations specific to reducing tobacco-

related disparities; a separate chapter focused on key system enablers; logic models, indicators and targets. The *SFO-SAC 2010 Report* was reviewed by an international expert committee, and then conveyed to government and disseminated widely through webinars, online publication and a two-day in person training event, held in March 2011.

Ontario Context since 2010

The Ontario government is committed to ensuring that Ontario has the lowest smoking rates in Canada. Since the release of the *SFO-SAC 2010 Report*, overall smoking prevalence has declined in Ontario from 19.3% (CI: 18.4 - 20.3) in 2010 to 17.4% (CI: 16.5 - 18.3) by 2014, although a plateau is discernible from 2009-12. As of 2014, Ontario has the third lowest smoking prevalence (17.4%) in Canada, behind British Columbia (14.3%) and Manitoba (16.3%).[4] However, some groups continue to have higher prevalence and burden. In 2014, the smoking prevalence was 34.0% among individuals who identify as Indigenous and 27.0% among adults who identify as homosexual or bisexual.[11] Other Ontario data have also shown socio-economic disparities in smoking prevalence: smoking prevalence among adults with a household income of less than $30,000 was 32% compared with 14.8% among adults with a household income of more than $80,000.[12] These data suggest additional interventions are needed to accelerate smoking rate reductions among population sub-groups with high smoking prevalence and related burden. For more information on trends in tobacco use and related statistics, please refer to the the 2016 *Smoke-Free Ontario Strategy Monitoring Report*,[13] and Tobacco Informatics Monitoring System available at http://tims.otru.org/.

Many of the *SFO-SAC 2010 Report* recommendations have been implemented at the provincial as well as municipal and federal levels. A detailed inventory of these initiatives is presented in the 2016 *Smoke-Free Ontario Strategy Monitoring Report*,[13] and *Ontario tobacco control efforts between January 2010 and July 2015: A Jurisdictional Scan*.[14]

Since 2010, changes to the policy and program landscape in Ontario include broadening smoke free-environments through the *Smoke-free Ontario Act* (*SFOA*), banning the sale of flavoured tobacco including menthol, and enacting local-level policies on indoor and outdoor waterpipe use and on outdoor smoking. At the federal level, plain packaging was identified as a top priority in the Prime Minister's November 2015 mandate letter to the Minister of Health.[15] Regulatory proposals under the *Tobacco Act* are being developed.[16] Ontario has also moved forward with the development and partial implementation of the *Electronic Cigarettes Act*, which currently prohibits the sale and supply of electronic cigarettes to persons under 19. Future restrictions under the *Act* to be implemented at a later date are: placing restrictions on the display, sale and promotion of electronic cigarettes and restricting the use of electronic cigarettes in enclosed workplaces, enclosed public places and certain other places (e.g., hospitals, psychiatric facilities and long-term care homes).[17]

SFO-SAC 2016 Request

In 2015, the Ministry of Health and Long Term Care (MOHLTC) asked Public Health Ontario to reconvene the SFO-SAC committee and update the evidence in the *SFO-SAC 2010 Report*. The request was framed as a specific question: ***"Which interventions or set of interventions will have the greatest impact on reducing tobacco use in Ontario?"*** Importantly, the Ministry requested that equity and implementation considerations be addressed (i.e., embedded) throughout the Report.

The *SFO-SAC 2016 Report* is intended for a range of audiences, including government, non-government organizations, program developers, policy-makers and service providers.

Approach to SFO-SAC 2016

To develop the *SFO-SAC 2016 Report*, we (i.e., SFO-SAC members and the PHO secretariat) undertook a series of syntheses of the latest evidence on key tobacco control interventions, as identified by SFO-SAC 2016 members. To be consistent with the four key pillar chapters of the *SFO-SAC 2010 Report,* we grouped the interventions into four chapters: Industry, Prevention, Protection and Cessation. Building on the *SFO-SAC 2010 Report,* we included several relatively new topic areas, such as interventions to address waterpipe, smokeless tobacco and thirdhand smoke. Another important new topic examined is e-cigarettes. Within each intervention, emphasis was also placed on identifying considerations to reduce tobacco-related inequities and implementation characteristics that optimize impact.

We have framed and discussed impact throughout this Report in terms of the potential contribution of interventions to reduce tobacco use or its associated burden in Ontario. At the same time, our approach recognizes that greater impacts will be achieved with a coordinated and comprehensive approach that produces synergies by leveraging the combined contributions of many interventions.[18]

Approach to Evidence

To describe and organize the evidence for this Report, we adapted the Centers for Disease Control and Prevention (CDC) framework for understanding evidence.[19]

Broadly, the sources to inform the three types of evidence were:

- Best available research evidence identified from the published literature, focusing primarily on review-level evidence from pre-appraised sources to determine intervention effectiveness. Along with effectiveness, standards of rigour (e.g., rigour of design, implementation fidelity and replication in different settings) were used to determine our level of confidence with the best available research evidence was.

- Contextual evidence was informed by the OTRU Annual Smoke-Free Ontario Monitoring Report, a separate internet-based environmental scan, a survey of Ontario's tobacco control stakeholders and SFO-SAC members' expert knowledge to identify policies and programs implemented in Ontario since 2010.

- Collective scientific expertise was based on the SFO-SAC 2016 members' expert knowledge about tobacco control and the Ontario context (adapted from the CDC experiential evidence term).

Integrating evidence from these sources, our scientific consensus process identified the potential contribution of each intervention to reduce tobacco use or associated burden in Ontario. Detailed methods are provided in the Report.

Identifying Equity Considerations

We highlight evidence regarding equity effects on specific populations for each intervention when it is available. Populations were identified within the literature based on their higher prevalence of smoking (e.g., youth and young adults, specific occupations), lack of access to cessation services (e.g., unemployed people, northern and Indigenous populations) and/or higher risk for adverse outcomes (e.g., cancer in heavy smokers). As well as higher exposure to tobacco smoke, such as residents in community multi-unit housing, hotel staff and outdoor workers. Our scientific consensus process facilitated an assessment of the potential equity impacts of each intervention (whether targeted or universal).

Identifying Implementation Considerations

A wide range of factors influence the effectiveness of an intervention. This includes the extent to which the intervention is implemented as planned and multi-level barriers and facilitators to implementation. We continue to acknowledge key system-level factors that were detailed in the 'system enablers' chapter in the *SFO-SAC 2010 Report*. Specifically: leadership and partnership, support for policy and program development, funding, understanding Ontario's role within a regional and global tobacco control framework, and establishing a strong Ontario Tobacco Control Learning System that includes surveillance, evaluation, research, and capacity building. These key system enablers support a comprehensive tobacco control strategy, making investment in these areas a priority. In the *SFO-SAC 2016 Report*, we also examined implementation considerations at other levels for individual interventions when these were identified in the literature. For example, we assessed characteristics of the intervention itself that may influence implementation and intervention effectiveness. We have included this material throughout the pillar chapters and in the conclusion.

Endgame Framing

The *SFO-SAC 2016 Report* has been developed to be amenable to annual or periodic updating. In this way, the present Report frames the opportunities to reduce tobacco use in Ontario beyond a five-year tobacco control strategy horizon. The horizon and impetus for tobacco control efforts in this Report include a relatively new framing called 'endgame'.

A tobacco endgame strategy is defined as "Initiatives designed to change/eliminate permanently the structural, political and social dynamics that sustain the tobacco epidemic, in order to achieve within a specific time an endpoint for the tobacco epidemic."[20] Such a strategy is consistent with the Canadian

Public Health Association's call in 2011 for a pan-Canadian smoking prevalence rate of less than 1% by the year 2035.[21] A recent Endgame Summit set a goal for Canada of less than 5% by 2035.[22]

An endgame strategy for tobacco applies to all four pillar chapters in this Report, and is introduced in the Industry chapter. There are endgame interventions within prevention and protection, and an understanding that cessation has a role to play in the endgame. Overall, the goal is to reduce tobacco use so that it is no longer a public health problem.

Report Planning and Organization

Scientific Advisory Committee

Like SFO-SAC 2010, this Report was prepared with a scientific advisory committee. PHO invited experts in tobacco control and the Ontario tobacco control context to participate on the Smoke-Free Ontario Scientific Advisory Committee 2016 (SFO-SAC 2016). The SFO-SAC 2016 included the overall chair, four working group chairs, SFO-SAC members from universities, and public health organizations, the project lead for the PHO secretariat, and representatives from the provincial government (*ex-officio*) (See Acknowledgement Section for list).

We established four individual working groups with chairs from the full SFO-SAC membership along with additional content experts to lead the pillar chapters' extensive series of evidence searches, reviews, appraisals and syntheses, and to develop consensus on each tobacco control intervention in their chapters. We established a fifth working group to identify a common approach to assess the potential contribution of each intervention to reduce tobacco use in Ontario across all pillar chapters.

The full SFO-SAC membership and the separate working groups met face-to-face or via teleconference on a regular basis to discuss and reach consensus on methods, approaches, chapter development, progress updates and completion of the final Report.

A PHO secretariat and research team within the Health Promotion, Chronic Disease and Injury Prevention (HPCDIP) Department supported SFO-SAC 2016. In addition to providing logistical and secretariat support, the team undertook all literature searches, data extraction, synthesis and summarizing activities, working closely with the SFO-SAC chair, working group chairs and members.

Future updates to this Report will be provided by the Ontario Tobacco Research Unit (OTRU), building on the current Report framework and methods.

Report Organization

In addition to the chapters on the four pillars of tobacco control, we include an Introduction, Methods, Conclusion and Glossary.

Chapter 1 – Introduction

The introduction summarizes the background of the *SFO-SAC 2010 Report* and this Report, outlines the request guiding the content and development of this Report and introduces the approaches used.

Chapter 2 – Methods

The methodological approach comprised four main processes used in a consistent manner across the four pillar chapters. We introduce each intervention, then the gathering of available evidence is described and the evidence is assessed. As part of the synthesis process, there is a summary of the available evidence, a narrative synthesis of the evidence of effectiveness, a summary of any intervention characteristics and implementation considerations, as well as specific population and equity considerations found in the literature. We also describe the relevant Ontario context. We used a further process to weigh each body of evidence and categorize each intervention in terms of its potential contribution to reduce tobacco use in Ontario. The Methods chapter summarizes our rationale for the series of processes used, including the categorization of interventions.

Chapter 3 – Industry

The Industry chapter examines actions and interventions that are most effective to decrease, and eventually eliminate, the burden of disease caused by tobacco industry products. Consistent with the *SFO-SAC 2010 Report*, we used the agent-host-environment-vector framework to conceptualize the role of industry.[23] The idea of a tobacco endgame and its relevance to comprehensive tobacco control is re-emphasized. The interventions are grouped as: retail-based, market-based or product-based. This chapter includes interventions for relatively new products such as e-cigarettes and other non-combustibles.

Chapter 4 – Prevention

The Prevention chapter describes the effectiveness of interventions that target tobacco use among youth and young adults. We grouped the interventions into four sections: retail-based, marketing interventions, school and campus-based interventions and other interventions.

Chapter 5 – Protection

The Protection chapter reiterates the importance of protection for all Ontarians from physical and social exposure to tobacco smoke, and we examine and discuss exposure to newer products such as e-cigarettes and waterpipes. The protection interventions are grouped into sections on restricting smoking in different settings, mass media campaigns for protection and addressing the impacts of post-consumption product waste.

Chapter 6 – Cessation

The Cessation chapter reviews cessation interventions that target the population as whole, specific populations and individuals. We have included interventions in specific settings and interventions for products such as waterpipes and smokeless tobacco.

Chapter 7 – Conclusion

The Conclusion chapter provides a brief summary of all interventions and how they were categorized in terms of potential contribution to reduce tobacco use or associated burden in the Ontario context. The conclusion discusses equity and implementation considerations and highlights how intervention impact can be optimized. For example, we reinforce the recommendation of the *SFO-SAC 2010 Report* on the value of a comprehensive tobacco control strategy, where ongoing and coordinated efforts are required to achieve desired substantial reductions in tobacco use or associated burden.

The importance of an endgame strategy is discussed, with specific examples of interventions within the Report that could be considered endgame interventions. Final comments complete the conclusion.

References

1. World Health Organization. WHO report on the global tobacco epidemic, 2015: raising taxes on tobacco. Geneva, SZ: World Health Organization; 2015. Available from: http://apps.who.int/iris/bitstream/10665/178574/1/9789240694606_eng.pdf?ua=1&ua=1

2. World Health Organization. WHO framework convention on tobacco control [Internet]. Geneva, SZ: World Health Organization; 2005 [cited 2016 Apr 15]. Available from: http://www.who.int/tobacco/framework/WHO_FCTC_english.pdf

3. Rehm J, Adlaf E, Recel M, Single E. The costs of substance abuse in Canada 2002: highlights [Internet]. Ottawa, ON: Canadian Centre on Substance Abuse; 2006 [cited 2016 Mar 4]. Available from: http://www.ccsa.ca/Resource%20Library/ccsa-011332-2006.pdf

4. Statistics Canada. Health indicator profile, annual estimates, by age group and sex, Canada, provinces, territories, health regions (2013 boundaries) and peer groups, occasional [Internet]. Ottawa, ON: CANSIM; 2016 [updated 2016 Apr 21; cited 2015 July 31]. [Figure] Table 105-0501. Available from: http://www5.statcan.gc.ca/cansim/a26?lang=eng&id=1050501

5. Smoke-free Ontario: information on places where you can't smoke, the rules on selling tobacco and how Ontario is working to reduce tobacco use [Internet]. Ottawa, ON: Queen's Printer for Ontario; 2016 [updated 2016 Aug 16; cited 2016 Nov 25]. Available from: https://www.ontario.ca/page/smoke-free-ontario?_ga=1.221771800.1898918448.1475585651

6. *Smoke-Free Ontario Act,* S.O. 1994, c.10. Available from: https://www.ontario.ca/laws/statute/94t10/v4

7. Ontario Tobacco Research Unit. Smoke-free Ontario strategy monitoring report [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2015 [cited 2015 Aug 12]. Available from: http://otru.org/wp-content/uploads/2015/04/MR-2014-Final.pdf

8. Smoke-free Ontario: about us [Internet]. Ontario, CA: Smoke-free Ontario; 2014 [cited 2016 Dec 3]. Available from: http://www.sfoa-training.com/about-us/

9. Ontario Tobacco Research Unit. Toward a smoke-free Ontario: progress and implications for future developments (2005–2006): special reports: monitoring and evaluation series (Volume 12, No. 3) [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2007 [cited 2016 Feb 3]. Available from: http://otru.org/wp-content/uploads/2012/06/12mr_no3_final.pdf

10. Smoke-Free Ontario - Scientific Advisory Committee. Evidence to guide action: Comprehensive tobacco control in Ontario [Internet]. Toronto, ON: Ontario Agency for Health Protection and Promotion; 2010 [cited 2015 Jul 29]. Available from: http://www.publichealthontario.ca/en/eRepository/Evidence%20to%20Guide%20Action%20-%20CTC%20in%20Ontario%20SFO-SAC%202010E.PDF

11. Canadian Community Health Survey Master File 2013, Statistics Canada, provided by the Ontario Tobacco Research Unit (OTRU).

12. Ialomiteanu AR, Hamilton HA, Adlaf EM, Mann RE. CAMH monitor ereport: substance use, mental health and well-being among Ontario adults, 1977–2013 [Internet]. CAMH Research Document Series No. 40 ed. Toronto, ON: Centre for Addiction and Mental; 2014 [cited 2016 Dec 3]. Available from: http://www.camh.ca/en/research/news_and_publications/CAMH%20Monitor/CAMH-Monitor-2015-eReport-Final-Web.pdf

13. Ontario Tobacco Research Unit. Smoke-free Ontario strategy monitoring report, special report [Internet].]Toronto, ON: Ontario Tobacco Research Unit; 2016 [cited 2016 Dec 12]. Available from: http://otru.org/wp-content/uploads/2016/02/OTRU_2015_SMR_Full.pdf

14. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Ontario tobacco control efforts between January 2010 and July 2015: a jurisdictional scan.. Toronto, ON: Queen's Printer for Ontario; [draft].

15. Canadian Cancer Society. Cigarette package health warnings: international status report, fifth edition [Internet]. Toronto, ON: Canadian Cancer Society; 2016 [cited 2016 Nov 25]. Available from: http://www.cancer.ca/~/media/cancer.ca/CW/for%20media/Media%20releases/2016/CCS-international-cigarette-packaging-report-2016-English.pdf?la=en

16. Health Canada. Consultation on "plain and standardized packaging" for tobacco products: potential measures for regulating the appearance, shape and size of tobacco packages and of tobacco products [Internet]. Ottawa, ON: Health Canada; 2016 [cited 2016 Nov 25]. Available from: http://healthycanadians.gc.ca/health-system-systeme-sante/consultations/tobacco-packages-emballages-produits-tabac/alt/tobacco-packages-emballages-produits-tabac-eng.pdf

17. *Electronic Cigarettes Act, 2015,* S.O. 2015, c. 7, Sched. 3 . Available from: https://www.ontario.ca/laws/statute/15e07

18. Kania J, Kramer M. Collective impact [Internet]. Stanford, CA: Stanford Social Innovation Review; 2011 [cited 2016 Dec 28]. Available from: http://c.ymcdn.com/sites/www.lano.org/resource/dynamic/blogs/20131007_093137_25993.pdf

19. Puddy RW, Wilkins N. Understanding evidence part 1: best available research evidence. A guide to the continuum of evidence of effectiveness. [Internet]. Atlanta, GA: Center for Disease Control and Prevention; 2011 [cited 2016 Dec 3]. Available from: https://www.cdc.gov/violenceprevention/pdf/understanding_evidence-a.pdf

20. Malone R, McDaniel P, Smith E. Tobacco control endgames: global initiatives and implications for the UK, a report commissioned by Cancer Research UK [Internet]. London, UK: Cancer Research UK; 2014 [cited 2016 Mar 15]. Available from: http://www.cancerresearchuk.org/sites/default/files/policy_july2014_fullendgame_report.pdf

21. Canadian Public Health Association. The winnable battle: ending tobacco use in Canada [Internet]. Ottawa, ON: Canadian Public Health Association; 2011 [cited 2016 Sep 9]. Available from: http://www.phans.ca/cmsAdmin/uploads/position-paper-tobacco_e_001.pdf

22. A tobacco endgame for Canada: 2016 summit summary report [Internet]. Kingston, ON: Queen's University; 2017 [cited 2017 Feb 22]. Available from: http://oncology.queensu.ca/assets/TOBACCO_ENDGAME/Tobacco_Endgame_Summit_Summary_Report.pdf

23. Orleans CT, Slade J. Preface. In: Nicotine addiction: principles and management. New York, NY: Oxford University Press; 1993.

Chapter 2: Methods

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Methods Overview

To assess the potential contribution of each key intervention to reduce tobacco use or associated burden in Ontario, consistent methods were applied across all interventions in each pillar chapter. The methodological approach included four processes performed for each intervention:

1. There was a structured process to systematically identify and appraise the best available research evidence, primarily from pre-appraised literature sources and PHO library searches.

2. There was a process to identify the Ontario context, based on a jurisdictional scan, a survey and expert insight.

3. There was a process to incorporate the SFO-SAC members' collective scientific expertise. SFO-SAC members assessed the body of synthesized evidence for each intervention and its applicability to Ontario. Evidence summaries and scientific consensus statements were developed by PHO secretariat and SFO-SAC members.

4. SFO-SAC members engaged in a process to reach final agreement about the potential contribution for each intervention in the Report to reduce tobacco use in Ontario. To discuss the potential impact of an intervention, important implementation elements and equity concerns were considered and discussed when that information was available.

For all processes, SFO-SAC members attended face-to-face meetings and/or participated in teleconference discussions to agree on priorities and the approaches most appropriate at this time.

Identifying Best Available Research Evidence

To identify the best available research evidence for each intervention topic area within each pillar chapter, a specific research question, a PICO (Population, Intervention, Comparison, Outcomes) search strategy, and specific inclusion and exclusion criteria were developed. A systematic approach was used to retrieve studies relevant to the intervention topic area, as described below.

From Pre-Appraised Literature

Pre-appraised sources were considered for review-level evidence first, before additional searches were undertaken for other reviews or primary literature. Pre-appraised sources such as the Cochrane Database of Systematic Reviews use an explicit process to both identify evidence and have the evidence reviewed for methodological rigour; in some instances, the evidence is synthesized, and in other instances, it is both synthesized and summarized.[1] The process is ideally carried out by experts and is reproducible. Selected databases were systematically searched and/or screened to find pre-appraised reviews that met inclusion criteria and had been published from 2009 to September/October 2015. The rationale for selecting 2009 as a starting point was to identify best available evidence since the searches undertaken for the SFO-SAC 2010 Report. Databases searched up to September 2015 were: the Cochrane Database of Systematic Reviews, The Campbell Collaboration and the Database of Abstracts of Reviews of Effects (DARE). Due to the timing of database updates, a search of reviews published from

the Health Evidence.org database (McMaster University) was completed up to October 2015. The database search terms included, but were not limited to, nicotine OR tobacco OR smok* OR cigarette*. Two PHO staff screened all the pre-appraised reviews for relevance and categorization to the specific pillar chapters.

From PHO Library Searches

Based on the reviews identified from the pre-appraised literature, Working Group members for each chapter decided whether more detailed searches of larger databases on a particular intervention were necessary. This decision was based on the initial number of reviews identified, how recently the reviews had been published, and on the Working Group's expert opinion of the relevance of the identified reviews to the specific intervention area and the Ontario context. If a librarian-assisted search was undertaken, the search was guided by a predetermined research question, PICO variables and inclusion/exclusion criteria. The search terms used were necessarily more detailed than the terms that were used for the pre-appraised database searches. The librarian-assisted searches used one or more electronic databases (e.g., Embase and MEDLINE) (see Appendix 1 for full search details). The search outputs were filtered to identify review-level articles first. Single studies were included in a search output if a Working Group requested searching at that level. Once duplicates were removed, two PHO staff independently screened the titles and abstracts of the search results, first to determine their relevance and eligibility. Two PHO staff then independently screened the full text of all potentially relevant articles for inclusion/exclusion. Instances of disagreement were resolved through discussion.

The Ontario Context: PHO Jurisdictional Scan

PHO concurrently conducted a jurisdictional scan for Ontario that included a targeted grey literature search to identify government and publicly accessible literature (e.g., media updates, organizational reports, other provincial and municipal reports) to answer the research question: What comprehensive tobacco control program and policy initiatives have been implemented in Ontario at municipal, provincial and federal levels since January 2010?

The scan was limited to programs, policies and other related comprehensive tobacco control initiatives (e.g., formation of the Ontario Coalition for Smoke-Free Movies, 2010) that were implemented in Ontario at municipal, provincial and federal levels from January 2010 to mid-June 2015. The search was conducted using four sources: 1) tobacco-related policy directories (e.g., Canadian Partnership Against Cancer Prevention Policies Directory and Non-Smokers' Rights Association Smoke-free Law Database); 2) individual websites for the 36 Health Units in Ontario (e.g. Toronto Public Health; www1.toronto.ca); 3) pre-selected organizational sources (e.g., Ontario Tobacco Research Unit (OTRU) Monitoring Reports and OTRU website, (www.otru.org), governmental and public health websites (e.g., Ontario Public Health Association); 4) Google search engine. Each source required a unique search protocol, which was developed in collaboration with PHO Library Services and other PHO staff members.

Results from the scan were validated through discussions with Ontario tobacco control stakeholders including: Tobacco Control System Committee (TCSC) members, Tobacco Control Area Network (TCAN) coordinators, Tobacco Control Managers at their respective public health units and Cessation Task Force

(CTF) committee members. Their feedback was used to identify policy or program interventions that were not captured by the scan and to verify the intervention information that was identified (e.g., program descriptions, target population, status). Results are summarized narratively for each pillar chapter.

The findings from the scan are used throughout each pillar chapter to augment evidence within the section titled "The Ontario/Canadian Context". The findings are published in a separate document called *Ontario tobacco control efforts between January 2010 and July 2015: A Jurisdictional Scan*.

From Experts

To supplement the pre-appraised, librarian-assisted searches and jurisdictional scan, SFO-SAC members were invited to provide: milestone review articles (including those that may have been published before 2009); Ontario studies; newly released documents; and, grey literature (e.g., OTRU reports; WHO reports)[2] for consideration to include in the relevant intervention sections. This input was particularly important for emerging tobacco control topics where there are no reviews yet available (e.g., tobacco-free generation). The papers from experts were also provided to use as background information and/or examples for the Ontario context sections.

PHO staff reviewed these evidence sources to assess adherence to inclusion and exclusion criteria.

Outcomes

To answer the Ministry of Health and Long Term Care's (MOHLTC) question about impact for Ontario, the primary outcome of interest was the effect of interventions on the prevalence of tobacco use. However, it is acknowledged that different outcomes related to associated burden are also important for specific pillar chapters, for example, the protection interventions are primarily adopted to protect vulnerable populations and non-smokers from exposure. Impact on equity was considered wherever possible.

A Glossary of tobacco control terms was developed to ensure consistency in searches and reporting.

Limitations

Given the magnitude and range of available literature, this Report does not examine an exhaustive list of interventions and strategies. The scope of each chapter was limited to the topics identified by the SFO-SAC 2016 experts as those that address the risks of tobacco, either indirectly or directly. However, due to capacity constraints, not all identified interventions were included in each chapter. Likewise, the Report prioritizes pre-appraised, review-level evidence first, and may not include the most recent studies. It draws heavily on the expertise of the SFO-SAC 2016 members' knowledge of the tobacco control literature. In addition, given the varied outcome measures, forms of evidence and issues facing different population groups that were synthesized in this Report, the SFO-SAC 2016 members and PHO secretariat decided to synthesize evidence in turn, rather than attempting to standardize effects across interventions and outcome measures. Finally, cost effectiveness was not taken into account.

Inclusion/Exclusion of Literature

To be eligible for inclusion, all potential sources of pre-appraised, primary and grey literature had to meet the following criteria:

- Published in English
- Tobacco control focus and relevant to the specific intervention area
- Relevant to the Ontario context
- Reviews from the pre-appraised databases or librarian-assisted searches from 2009 onwards, or milestone reviews and articles outside the dates of the search strategy when provided by SFO-SAC 2016 members, or grey literature provided by SFO-SAC members or Ontario-specific studies to inform the Ontario context when provided by SFO-SAC members
- Outcomes relevant to tobacco use prevalence (e.g., smoking prevalence, quit attempts, abstinence) and/or exposure

Note: Quality appraisal was undertaken; however, articles that met inclusion criteria were included irrespective of quality rating.

The main criteria for excluding sources were:

- Not specific to tobacco control and/or to the specific intervention areas
- Protocol paper

PRISMA flow diagrams to present the flow of sources are provided in each chapter.

Quality Appraisal of Best Available Research Evidence

The PHO MetaQAT provides a four-step critical appraisal framework and guidance to assess 'relevancy', 'validity', 'reliability' and 'applicability' for different types of evidence.[3] The PHO MetaQAT tool also contains a list of companion appraisal tools (CATs) for assessing the methodological quality of specific research designs as part of the validity and reliability steps.[3]

The PHO MetaQAT permits flexibility in terms of application. Therefore, in terms of the four domains of MetaQAT, PHO secretariat assessed 'relevancy' through its formal screening and selection criteria. The inclusion criteria specified that all sources needed to be relevant to tobacco control, the specific pillar/chapter subject and the Ontario context. Together, they constituted a basic 'relevance' threshold of the PHO MetaQAT. Aligning further with the PHO MetaQAT framework, the 'validity' and 'reliability' domains were assessed within the thresholds of each companion appraisal tool that was used. Given the breadth of the volume of literature and time constraints, for the review-level literature, PHO secretariat used the quality ratings assigned by HealthEvidence.org (a two-rater system). The Health Evidence scores can range from 0 to 10. For this Report, the following category labels were used: four or less was categorized as 'Level III', five to seven as 'Level II' and eight to 10 as 'Level I'. For consistency, two PHO staff independently applied the HealthEvidence.org Quality Assessment Tool to complete the appraisal of all included quantitative and qualitative review articles that had not been pre-appraised by HealthEvidence.org.[4] Instances of disagreement were resolved through discussion.

Quality appraisal (QA) was also performed on single studies identified through the literature retrieval strategy. For example, the CASP suite of tools for qualitative studies was used based on the PHO MetaQAT. The CASP qualitative checklist is based on 10 items of equal weight, which is consistent with HealthEvidence.org tool.[5] The CASP economic evaluation checklist is based on 11 scoring items of equal weight.[6] Where the PHO MetaQAT did not designate a specific rating tool to match the design of an included paper, additional quality appraisal tools were located and applied to generate a quality assessment for those papers. These included the 'Newcastle-Ottawa Scale' (NOS) for observational (e.g., cross-sectional) designs and the 'Effective Public Health Practice Project' (EPHPP) Quality Assessment Tool for Quantitative Studies for other quantitative designs such as interrupted time series and cohort studies.[7,8] Therefore, for consistency with the review-level evidence QA, the CASP scores were categorized and labeled in the same way with four or less as 'Level III', five to seven as 'Level II' and eight or higher as 'Level I'. Grey literature reports were not quality appraised (e.g., U.S. Surgeon General Reports and OTRU reports) nor were animal or experimental studies (i.e., testing on cigarette butts) because no appraisal tools exist for these types of studies at this time.

The MetaQAT domain of 'applicability' was assessed by SFO-SAC 2016 members based on their knowledge of the Ontario context, augmented by the results of the jurisdictional scan performed by PHO staff. 'Applicability' to the Ontario context was a core consideration in the final stages of "weighing the evidence".

Data Extraction and Synthesis

A data extraction template form was developed for the SFO-SAC Report, based on a modified Population Intervention Comparison Outcome (PICO) framework.[9]

The following information was extracted from the included reviews and single studies by one primary reviewer, and checked by at least one secondary reviewer according to the template: target population, intervention, the comparison group(s) and the outcome(s). Other information concerning the study was also extracted: publication year, lead author, title, study type, objective, number and jurisdiction(s) of included studies, database quality appraisal rating (if reported), equity considerations (e.g., noting the effects of an intervention on specific groups), implementation considerations (if reported), main results, reported main conclusions and limitations. (*Data extraction tables are available upon request*).

Relevant information from literature characterized as commentaries, discussion papers, and presentations as provided by SFO-SAC 2016 (only source), was extracted in bullet form and is available on request.

For each topic area, PHO staff synthesized included research evidence to generate a first draft. Each resulting synthesis was further reviewed and refined by SFO-SAC 2016 members. Because this Report is an update of the *SFO-SAC 2010 Report*, the 2010 Report is cited throughout. For example, citations may occur to emphasize when the tobacco control landscape has not changed significantly and / or when the relevant 2010 recommendation is supported by the updated evidence.

Developing the SFO-SAC 2016 Intervention Summaries

The purpose of the *SFO-SAC 2016 Report* is to answer the question: "What intervention, or set of interventions, will have the greatest impact on reducing tobacco use in Ontario?" To achieve this purpose, an integral task for this Report was to assess the body of evidence for each intervention and its applicability to Ontario. The informed opinion of tobacco control experts was crucial to guide this 'weighing the evidence' process and to develop overall messages for each intervention. To summarize the body of evidence and the scientific consensus about the application of evidence in Ontario, each intervention has an intervention summary comprised of: (1) an evidence summary; (2) a scientific consensus statement; and (3) a key message. The 'weighing the evidence' step comes after data extraction and synthesis of the included sources of evidence, and is described in the following sub-sections.

One challenge when attempting to weigh the bodies of evidence, is that the types and the amount of evidence can vary substantially from one intervention to the next. In December 2015, the SFO-SAC 2016 members reviewed and discussed existing approaches to weigh a body of evidence; for example, the approach used by the National Institute for Health and Care Excellence (NICE) and the Scottish Intercollegiate Guidelines Network (SIGN).[10,11] NICE and SIGN appraise and categorize the quality of the evidence using a GRADE approach (GRADE, Grading of Recommendations, Assessment, Development and Evaluation) that considers elements such as consistency of findings, study design, precision of results and avoidance of bias.[12] The CDC's 'Continuum of Evidence of Effectiveness' (*www.cdc.gov*) and the Agency for Healthcare Research and Quality (AHRQ)'s 'Grading the strength of the body of evidence when comparing medical interventions' were also considered (*www.ahrq.gov*).[13,14] The AHRQ examines a broad range of study designs and uses a structured (modified GRADE) strength of evidence process with clear definitions. The CDC continuum provides a useful and inclusive way to describe evidence of effectiveness. For instance, while recognizing the highest level of empirical evidence, it also recognizes emerging and promising practices and distinguishes between no effect and harmful effects. The CDC continuum therefore was used in this Report to broadly address research design considerations and context in terms of applied settings, and is intended to complement collective scientific expertise and specific contextual considerations.

Weighing the Evidence and Developing the Evidence Summaries

To weigh each body of evidence in the *SFO-SAC 2016 Report*, standard questions were asked about: *quality* of the included reviews and/ or single studies; the *size of the body of evidence*; reported intervention *effectiveness*; and *consistency* of findings within the body of evidence. Table 2.1 describes the 'weighing the evidence' domains.

Table 2.1: Weighing the evidence domain and general descriptions

Domain	General description
Quality	An overall assessment of (technical) quality of reviews and/or single studies in a body of evidence. Individual ratings based on either the Health Evidence.org tool (for review-level); or appropriate tools for single study designs. Score categories (Level III, level II, Level I) were developed to align with Health Evidence.org. (*see the quality appraisal section for details*)
Quantity of evidence (size)	A judgment about the volume of research on a specific topic, aligned with CDC criteria and 'Evidence-Informed Decision-Making' (EIDM) hierarchy of research evidence (e.g., review level; compared to no review, but some primary research; compared to no studies identified).
Effectiveness	According to CDC, effect based on the extent to which the intervention is producing desired outcomes. Deemed more effective when a strategy demonstrates effects in the short term, long term or both, rather than short term only. Effect size reported when available (e.g., level of significance, relevant relative risks (RR) and odds ratios (OR)). Evidence of no effect (unproven benefits associated with the intervention) or any harm (undesired outcomes) was also reported in 'weigh the evidence' tables.
Consistency	The degree to which a pattern of similar findings is identified across the body of evidence for the respective intervention being considered. More weight given to consistency (AHRQ). CDC refers to independent replication.

Once 'weighing the evidence' was completed for each intervention, a brief summation which covered these domains was developed and refined to become the Evidence Summary portion of the intervention summary. When no information was available to populate a domain (e.g., no information reported about effectiveness), this was stated. In addition, SFO-SAC 2016 members used the CDC continuum and the language of the CDC to provide an interpretation of effectiveness for each body of evidence. Each body of evidence was therefore assigned one of seven CDC 'evidence of effectiveness' categories: well supported, supported, promising direction, emerging, undetermined, unsupported or harmful.[13]

Two PHO staff initially undertook the categorization according to the six criteria outlined by the CDC: effect, internal validity, type of evidence/research design, independent replication, presence of implementation guidance, and if there are real world informed/applied studies (see Table 2.2). All proposed categories for the intervention areas were discussed by the respective working groups and refined until agreement was reached. Subsequent discussion of the categorization was undertaken by the full SFO-SAC and is described below.

Table 2.2: CDC Continuum of Evidence of Effectiveness

	Well Supported	Supported	Promising Direction	Emerging	Undetermined	Unsupported	Harmful
Effect	Found to be effective	Found to be effective	Some evidence of effectiveness	Expected preventive effect	Effect is undetermined	Ineffective	Practice constitutes risk or harm
Internal Validity	True experimental design	Quasi-experimental design	Non-experimental design	Sound theory only	No research No sound theory	True or quasi experimental design	Any design with any results indicating negative effect
Type of evidence/ research design	Randomized control trials and meta-analysis/ systematic review	Quasi-experimental design	Single group design	Exploratory study	Anecdotal/ Needs assessment	Randomized control trials or quasi experimental designs	Any design with results indicating negative effect
Independent Replication	Program replication with evaluation replication	Program replication with evaluation replication	Program replication without evaluation replication	Partial program replication without evaluation replication	Partial program replication without evaluation replication	Program replication without evaluation replication	Possible program replication without evaluation replication
Implementation Guidance	Comprehensive	Comprehensive	Partial	None	None	Comprehensive	Partial/ Comprehensive
Extended and ecological validity	Applied studies – different settings (2+)	Applied studies – similar settings (2+)	Real-world informed	Somewhat real-world informed	Not real-world informed	Applied studies – same/ different settings	Possible applied studies – similar/ different settings

Source: Adapted from Continuum of Evidence of Effectiveness in Puddy, R.W., & Wilkins, N. (2011). *Understanding Evidence Part 1: Best Available Research Evidence. A Guide to the Continuum of Evidence of Effectiveness.* Atlanta, GA: Centers for Disease Control and Prevention.[13]

Developing the Scientific Consensus Statements

The Scientific Consensus Statements are the second portion of the intervention summaries. They are expert-informed conclusions based on a balance of the body of evidence and the collective opinions of the experts about the potential contribution of each intervention in the context of "What intervention, or set of interventions, will have the greatest impact on reducing tobacco use in Ontario?" As noted earlier, this Report privileges the prevalence and distribution of tobacco use at the provincial level, taking current patterns of tobacco use into account. However, it is acknowledged that different outcomes are also important for specific pillar chapters.

The Scientific Consensus Statement Approach

Implicit in each Scientific Consensus Statement is a critical analysis of the body of evidence plus expert opinion on applicability to the Ontario context (including knowledge of gaps) and expert opinion of other domains when applicable, such as potential reach, equity and implementation considerations to optimize impact for Ontario. To present the Scientific Consensus Statements in a consistent manner, SFO-SAC 2016 agreed to include five essential elements for every intervention: a comment on the body of evidence (i.e., CDC continuum from well supported to harmful), Ontario context, opportunity gap(s) for Ontario, intervention potential reach and equity considerations when applicable. The wording of each consensus statement was decided by the relevant working group members, but common terms were used when possible for all consensus statements. Once the working groups had refined their consensus statements, the statements were circulated to the wider SFO-SAC 2016 for feedback and revisions. Using an iterative process, the consensus statements were discussed and refined further until the entire SFO-SAC 2016 reached consensus.

Common terms used in the consensus statements are:

Ontario context: Applicable to the Ontario context means that SFO-SAC 2016 agrees that the evidence maps to the populations, settings, interventions and outcomes most relevant to reducing tobacco use in Ontario.

Opportunity gap: Collective SFO-SAC 2016 opinion that a discrepancy exists between the current status of the intervention in Ontario and approaches that optimize impact. For example, specific actions may be necessary to reinstate, expand or initiate a strategy and/or bolster an existing intervention that is currently not producing outcomes that optimize impact for Ontario. Important implementation considerations may therefore also be addressed.

Reach: It is assumed that for an intervention to optimize impact, the level of participation or exposure necessary must be considered, matched to the appropriate target audiences. The SFO-SAC 2016 comments on reach are generally framed in terms of intended reach. Nuanced terms are used to define the intended target audience such as 'high reach - for the general population', 'high reach for a sub-population group' or 'high reach in a specific setting'.

Equity considerations: SFO-SAC 2016 agreed that equity considerations are addressed when an intervention, implemented appropriately, demonstrates or has the potential to reduce differences in burden associated with tobacco use between different population sub-groups, including the most vulnerable. In these instances, the intervention was described as having a 'positive equity impact'.[15] Interventions targeted to reach higher risk populations via specific settings were also considered for their potential positive equity impacts. Assigning positive equity impacts is by its nature a simplification of a complex process. Readers are encouraged to consider deeper issues of intersectionality and unintended impacts in developing any tobacco control intervention.

Categorizing Potential Contribution for Impact on Reducing Tobacco use in Ontario

In addition to the descriptions of the five common elements in each consensus statement, SFO-SAC 2016 members assigned a category to each intervention. The goal was to indicate an overall conclusion based on the original question about reducing tobacco use in Ontario. The agreed approach was to be explicit, informative, easy to understand and reproducible to facilitate updates and/or adding new topic areas in the future. PHO notes that when the evidence focused on a specific population rather than on an intervention (e.g., individuals with heart disease in the cessation pillar chapter), a potential contribution was not assigned at this time. However, the topic areas that focus on specific populations (e.g., non-exhaustive list of specific medical conditions and demographic populations) may change in the future.

The categories in the scientific consensus statements are predicated upon the assumption that interventions currently implemented in Ontario continue unless otherwise stipulated. The categorization presented here, is therefore not intended to supplant current initiatives, but to focus on strengthening and/or initiating efforts to reduce the opportunity gaps identified by SFO-SAC 2016 members. Of note, SFO-SAC 2016 also considered and documented along-side the categories of potential contribution whether the design of the intervention was targeted (i.e., focused on a specific population) and/or if it had a positive equity impact (see equity considerations described above) as indicated by the literature and confirmed by SFO-SAC 2016 members.

The categories are not mutually exclusive, but are designed to overlap as they are inter-related. PHO also acknowledges that the overall potential contribution is optimized with multiple complementary strategies (e.g., a comprehensive approach) including interventions from all pillar chapters and categories (e.g., concurrent mass media prevention campaigns plus outdoor by-laws and ongoing cessation support services) as discussed further in the conclusion chapter.

Category determination was decided within each working group for its respective interventions. Each categorization was discussed within the working group, refined if necessary, and then shared with the wider SFO-SAC 2016 for discussion and revisions until the entire SFO-SAC 2016 reached consensus.

Ten categories of (non-hierarchical) potential contribution were used: innovative, high (continue), high (intensify), high (initiate), moderate (continue), moderate (intensify), moderate (initiate), uncertain at this time, unsupported at this time and harmful (see Figure 1.1). "Targeted" and/or "Positive Equity"

were also used as descriptors for relevant interventions. A table was used to guide each determination; the table included the CDC category from the evidence summary plus the common elements reported in the scientific consensus statement: knowledge and collective opinion about the Ontario context, the opportunity gap, equity considerations and potential contribution for Ontario.

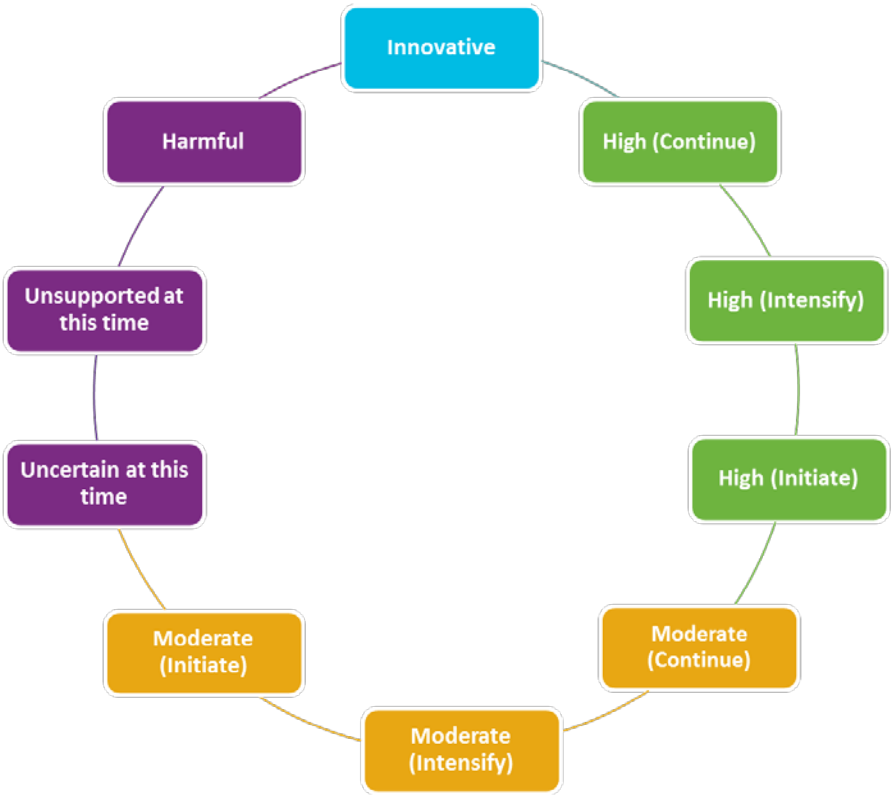

Figure 1.1: Categories of potential contribution for tobacco use and related burden Ontario

The categories of potential contribution for tobacco use and related burden in Ontario were:

- **High (continue).** The body of evidence is primarily well supported or supported. The intervention is currently implemented in Ontario. The opportunity gap is not considered large enough to suggest more intervention intensity will increase its contribution. (Intensity may include reach). Therefore, potential contribution for reducing tobacco use in Ontario is high if continued.

- **High (intensify)**. The body of evidence is primarily well supported or supported. The intervention is currently implemented in Ontario. However, there is an opportunity gap because the intervention has the potential for greater (substantial or transformational) contribution if the intensity of the intervention was greater than what is currently being done. The term 'intensify' refers to both intensifying the scope/breadth of the intervention as well as to the degree to which the intervention is implemented (intensity may include reach). Therefore, potential contribution for reducing tobacco use in Ontario is high if intensified.

- **High (initiate).** The body of evidence is primarily well supported or supported. The intervention is not currently implemented in Ontario. The intervention has the potential for substantial contribution if it was initiated in Ontario. Therefore, potential contribution for reducing tobacco use in Ontario is high if initiated.

- **Innovative.** The body of evidence is emerging or a promising direction. The intervention is not currently implemented in Ontario. However, if well-implemented, the potential contribution may shift the landscape of tobacco control for Ontario (potential contribution may be transformational).

- **Moderate (continue).** The body of evidence ranges from promising to well supported. The intervention is currently implemented in Ontario. The potential contribution for reducing tobacco use in Ontario is modest rather than transformational if continued.

- **Moderate (intensify)**. The body of evidence ranges from promising to well supported. The intervention is currently implemented in Ontario. However, there is an opportunity gap because the intervention has the potential for greater contribution if the intensity of the intervention was greater than what is currently being done. The term 'intensify' refers to both intensifying the scope/breadth of the intervention as well as to the degree to which the intervention is implemented (intensity may include reach). Therefore, potential contribution for reducing tobacco use in Ontario is modest rather than transformational if intensified.

- **Moderate (initiate).** The body of evidence ranges from promising to well supported. The intervention is not currently implemented in Ontario. The intervention has potential contribution if it was initiated in Ontario. Therefore, potential contribution for reducing tobacco use in Ontario is modest rather than transformational if initiated.

- **Uncertain at this time.** There is not enough information from the body of evidence at this time to discern which category the intervention best fits. Therefore, potential contribution for reducing tobacco use in Ontario is uncertain if initiated.

- **Unsupported at this time.** The body of evidence is unsupported at this time. The intervention may or may not be currently implemented in Ontario. If continued, or if the intervention were intensified or initiated to address any opportunity gap, the potential contribution for reducing tobacco use in Ontario is unsupported because the evidence shows this intervention to be ineffective.

- **Harmful.** The body of evidence indicates that the intervention constitutes risk or harm physically (on the body) or is ineffective and preventing the implementation of other efficacious treatments (i.e., using homeopathy instead of pharmacotherapy). Therefore, any contribution of the intervention for reducing tobacco use in Ontario constitutes risk or harm.

Key Messages

The final portion of the intervention summary is a key message. The key messages were developed to provide many audiences with a succinct summary of each intervention, based on its scientific consensus statement. The key messages are a means of communication and not intended as a methodological assessment or prioritization tool.

Review and Validation

Draft versions of the 'weighing the evidence' tables, evidence summaries and draft scientific consensus statements were reviewed by the working group members to ensure the statements were accurate. In-person meetings were also held for SFO-SAC 2016 members to review all 'weighing the evidence' tables and evidence summaries for accuracy, and to verify the draft scientific consensus statements. Small group discussions among the experts refined the statements until l consensus among the SFO-SAC 2016 members was reached. Inconsistencies were resolved through discussion.

Based on feedback from these meetings, modifications were made to specific criteria, evidence summaries and scientific consensus statements.

The scientific consensus statements were further refined as part of working group reviews, and the complete Report was reviewed before being finalized with sign-off by all SFO-SAC 2016 members.

References

1. Robeson P, Dobbins M, DeCorby K, Tirilis D. Facilitating access to pre-processed research evidence in public health. BMC Public Health. 2010;10:95. Available from: https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-10-95

2. Proceedings of the Sixth International Conference on Grey Literature. Presented at: Sixth International Conference on Grey Literature (GL6). 2004 Dec 6-7;New York, NY.

3. Rosella L, Bowman C, Pach B, Morgan S, Fitzpatrick T, Goel V. The development and validation of a meta-tool for quality appraisal of public health evidence: Meta Quality Appraisal Tool (MetaQAT). Public Health. 2016;136:57-65. Available from: http://www.sciencedirect.com/science/article/pii/S0033350615004370

4. Health Evidence. Quality assessment tool - review articles [Internet]. Hamilton, ON: Health Evidence; 2016 [cited 2016 Aug 15]. Available from: http://www.healthevidence.org/documents/our-appraisal-tools/QATool&Dictionary_01Jun16.pdf

5. 10 questions to make sense of qualitative research [Internet]. Oxford, UK: Critical Appraisal Skills Programme (CASP); 2013 [cited 2016 Dec 3]. Available from: http://media.wix.com/ugd/dded87_29c5b002d99342f788c6ac670e49f274.pdf

6. 12 questions to help you make sense of economic evaluations [Internet]. Oxford, UK: Critical Appraisal Skills Programme (CASP): 2013 [cited 2016 Dec 3]. Available from: http://media.wix.com/ugd/dded87_3b2bd5743feb4b1aaac6ebdd68771d3f.pdf

7. Wells GA, Shea B, O'Connell D, Peterson J, Welch V, Tugwell P. The Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomised studies in meta-analyses [Internet]. Ottawa, ON: The Ottawa Hospital Research Unit; 2013 [cited 2016 Dec 3]. Available from: http://www.ohri.ca/programs/clinical_epidemiology/oxford.asp

8. Effective Public Health Practice Project. Quality assessment tool for quantitative studies [Internet]. Hamilton, ON: Effective Public Health Practice Project; 2009 [cited 2016 Nov 23]. Available from: http://www.ephpp.ca/PDF/Quality%20Assessment%20Tool_2010_2.pdf

9. Schardt C, Adams MB, Owens T, Keitz S, Fontelo P. Utilization of the PICO framework to improve searching PubMed for clinical questions. BMC Med Inform Desic Mak. 2007;7(16):1-6. Available from: https://bmcmedinformdecismak.biomedcentral.com/articles/10.1186/1472-6947-7-16

10. Weightman A, Ellis S, Cullum A, Sander L, Turley R. Grading evidence and recommendations for public health interventions: developing and piloting a framework [Internet]. London, UK: Health Development Agency; 2005 [cited 2016 Mar 17]. Available from: http://orca.cf.ac.uk/69810/1/grading_evidence.pdf

11. Scottish Intercollegiate Guidelines Network (SIGN). SIGN 50: a guideline developer's handbook. Edinburgh, UK: Scottish Intercollegiate Guidelines Network; 2014. Available from: http://sign.ac.uk/pdf/SIGN50_2014.pdf

12. Guyatt GH, Oxman AD, Vist GE, Kunz R, Falck-Ytter Y, Alonso-Coello P, et al. GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. BMJ. 2008;336(7650):924-6.

13. Puddy RW, Wilkins N. Understanding evidence part 1: best available research evidence. A guide to the continuum of evidence of effectiveness. [Internet]. Atlanta, GA: Center for Disease Control and Prevention; 2011 [cited 2016 Dec 3]. Available from: https://www.cdc.gov/violenceprevention/pdf/understanding_evidence-a.pdf

14. Agency for Healthcare Research and Quality [Internet]. Grading the strength of the body of evidence when comparing medical interventions. Rockville, MD: Agency for Healthcare Research and Quality; 2016 [updated 2016 Nov; cited 2016 Nov 23]. Available from: http://www.ahrq.gov/

15. Brown T, Platt S, Amos A. Equity impact of population-level interventions and policies to reduce smoking in adults: a systematic review. Drug Alcohol Depend. 2014;138:7-16.

Chapter 3: Industry

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Background

Despite the established body of evidence about the harms caused by tobacco and concentrated efforts to get tobacco use under control, the tobacco industry has adapted and continues to profit from the manufacturing and marketing of addictive products that are lethal when used as intended.[1] Key policies in recent years include increasing price control through taxation, advertising restrictions and health warning label.[2] These successful policies are primarily focused on protecting children, youth and others from the means the tobacco industry uses to market its products. Recognizing this, it is necessary to add new strategies to existing initiatives, to reduce the number of new and current tobacco users, and to confront the disease vector – the tobacco industry.

This 'pillar chapter', *Industry*, updates and expands on the pillar chapter in the SFO-SAC 2010 Report,[3] titled *Confronting the Disease Vector*. The focus of this chapter is similar — to examine which actions and interventions confront the tobacco industry most effectively to decrease, and eventually eliminate, the burden of disease caused by the products that it produces and sells.

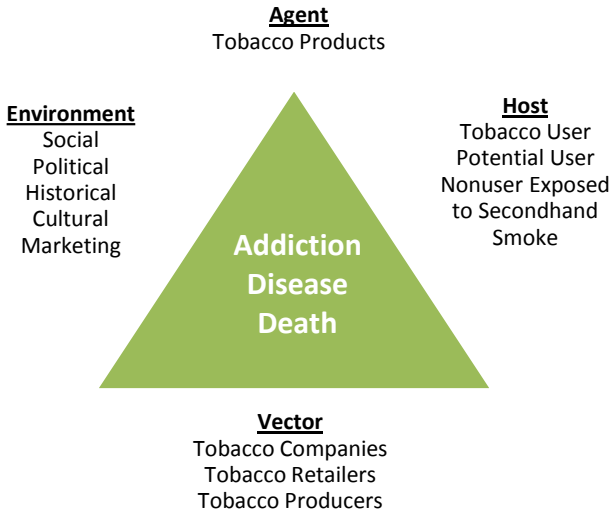

Figure 3.1: The Disease Vector

Source: Adapted from One Million Fewer Smokers by 2010: Shaping a Tobacco-Free Society for All New Yorkers, 2008-1010, 2010 (23, p.5) via SFO-SAC 2010.[3]

The SFO-SAC 2010 Report discussed the tobacco industry as the 'disease vector' for nicotine addiction (see Figure 3.1),[3] one of four components in the comprehensive disease model of nicotine addiction and tobacco-caused disease and death. The model includes the host (anyone coming in contact with tobacco or tobacco smoke), the agent (the tobacco product itself) and the environment (social, political, historical, cultural and marketing).[4] The disease vector refers to the tobacco industry's role in producing, marketing and delivering tobacco products to consumers in Ontario.[3]

For this Report, the term "industry" aligns with the definition used in the SFO-SAC 2010 Disease Vector chapter. Industry refers to entities responsible for producing, supplying, marketing and promoting commercial tobacco to current and potential users. This group includes tobacco growers and importers, manufacturers, companies involved in producing tobacco product materials (e.g., cigarette paper), wholesalers and the retailer network, including tobacconists. Additional networks that take part in illicit contraband tobacco trade outside the regulatory framework are also deemed part of industry.[3]

In 2015, the major tobacco manufacturers in Canada were Imperial Tobacco Canada Limited with 49% market share, Rothmans, Benson & Hedges (owned by Philip Morris International) with 37.3% market share, and JTI-Macdonald with 13.1% market share.[5] Other major tobacco entities include Grand River Enterprises (Canada's largest on-reserve tobacco manufacturer), Casa Cubana Spike Marks Inc. (a major distributer of pipe tobacco, cigars, cigarillos) and National Smokeless Tobacco Company Ltd. (Canada's largest smokeless tobacco product distributor, owned by Altria).[5]

The issue of e-cigarettes has emerged since the publication of SFO-SAC 2010. For more information on e-cigarettes, refer below to Regulation to Favour Electronic Cigarettes over Cigarettes in the Product section of this chapter.

Industry Accountability

The World Health Organization Framework Convention on Tobacco Control (WHO FCTC) states that, "There is a fundamental and irreconcilable conflict between the tobacco industry's interests and public health policy interests".[6] Historically, this "fundamental and irreconcilable conflict" has resulted in tobacco industry financial gains at the expense of public health; the premise of industry accountability is reversing this imbalance, changing the perception that public health outcomes are "externalities" to the free market in which the tobacco industry exists.[7]

The tobacco industry has a history of denying the negative health effects and addictive nature of its products, targeting marketing at youth and young adults to recruit more smokers, manipulating scientific research and undermining research with findings against its products, and employing these strategies in the pursuit of profits, while aware of their impacts on public health.[3] Industry accountability is a key tobacco control measure, to make public health aware of the industry's efforts to undermine public health strategies and gains, and so that the industry will have to take responsibility for the harms caused by its actions.[3]

To achieve industry accountability, the Tobacco Strategy Advisory Group (TSAG) and SFO-SAC 2010 recommended interventions that focus on active monitoring of the industry: "Implement the provisions under the [WHO's FCTC] Article 5.3 guidelines to prevent tobacco industry interference in the setting and implementing of tobacco control policies":[8] "[4.12] Legislate tobacco manufacturer reporting requirements that match or exceed what is currently required by the Federal government; [4.13] Implement tobacco-industry surveillance, monitoring and intervention development functions to address and plan for mitigation of tobacco industry activities"(SFO-SAC 2010).[3] Both TSAG and the SFO-SAC 2010 Report also recommended making tobacco manufacturers accountable for the number of

under-aged users in Ontario, with severe financial penalties for failing to do so (TSAG 2010, SFO-SAC 2010).[3,8]

Tobacco Endgame and Comprehensive Tobacco Control

To further reduce the prevalence of tobacco use, the idea of a tobacco 'endgame' has gained attention and momentum over recent years.[9,10] A tobacco endgame strategy is defined as "initiatives designed to change/eliminate permanently the structural, political and social dynamics that sustain the tobacco epidemic, in order to achieve within a specific time an endpoint for the tobacco epidemic."[9] As such, endgame initiatives are generally concerned with confronting the tobacco industry.

The rationale for an endgame is that while overall tobacco use in countries like Canada has declined over the past years, further marked decreases in tobacco use are not likely to occur with the current policy and tobacco control measures.[10] More innovative strategies must be considered to continue to produce marked decreases in tobacco use. Endgame strategies are multi-faceted, and as part of a comprehensive tobacco control policy, can have synergistic effects on public health and policy efforts to address patterns of use, new products and users, the changing populations of users and industry efforts to expand the market.[9]

Some countries have already established endgame targets:

- The governments of Ireland and the New Zealand have committed to reduce their smoking populations to under 5% by 2025.[9]
- Finland has committed to become smoke-free by 2040.[9]
- Scotland has committed to less than 5% prevalence by 2034.[9]

A Canada-wide tobacco endgame initiative is now underway and is calling for a reduction in the prevalence of smoking to less than 5% by 2035.[11] The Canadian Public Health Association (CPHA) defines a desired 'tobacco-free' target as less than 1% prevalence by 2035.[10] In 2013, the Association of Local Public Health Agencies (alPHa) board of directors announced that they support the vision of a tobacco-free Ontario.[12]

Various strategies have been proposed to achieve an endgame target. Actions include establishing tobacco-free generations by prohibiting tobacco sales to all individuals born in the year 2000 or later, gradually reducing quotas on tobacco industry production and sales (also known as 'sinking lid') and reducing the level of nicotine in all tobacco products.[9] Health warning label regulations have been implemented in over 100 countries worldwide.[9,13] In addition, standardized or 'plain' packaging has been implemented to date by Australia, France and the United Kingdom.[14,15]

Methods

Best Available Research Evidence

This chapter primarily focuses on comprehensive coverage of interventions related to the tobacco industry. Two reviewers screened all the pre-appraised reviews for relevance to this chapter. Additional library searches were conducted for taxation, retail, and product. Please see Appendix 1: Summary Tables of Library Searches for the list of research questions for the intervention topics.

Broad inclusions of industry outcomes were used in the report; for example, prevalence and consumption. Please refer to the Glossary for definitions. For a full description of the methods see Chapter 2: Methods.

Results

The pre-appraised literature search yielded nine relevant review-level articles. PHO Library searches for articles related to taxation, retail and product yielded 19 additional review articles. SFO-SAC members contributed 56 articles that met inclusion criteria (Figure 3.2).

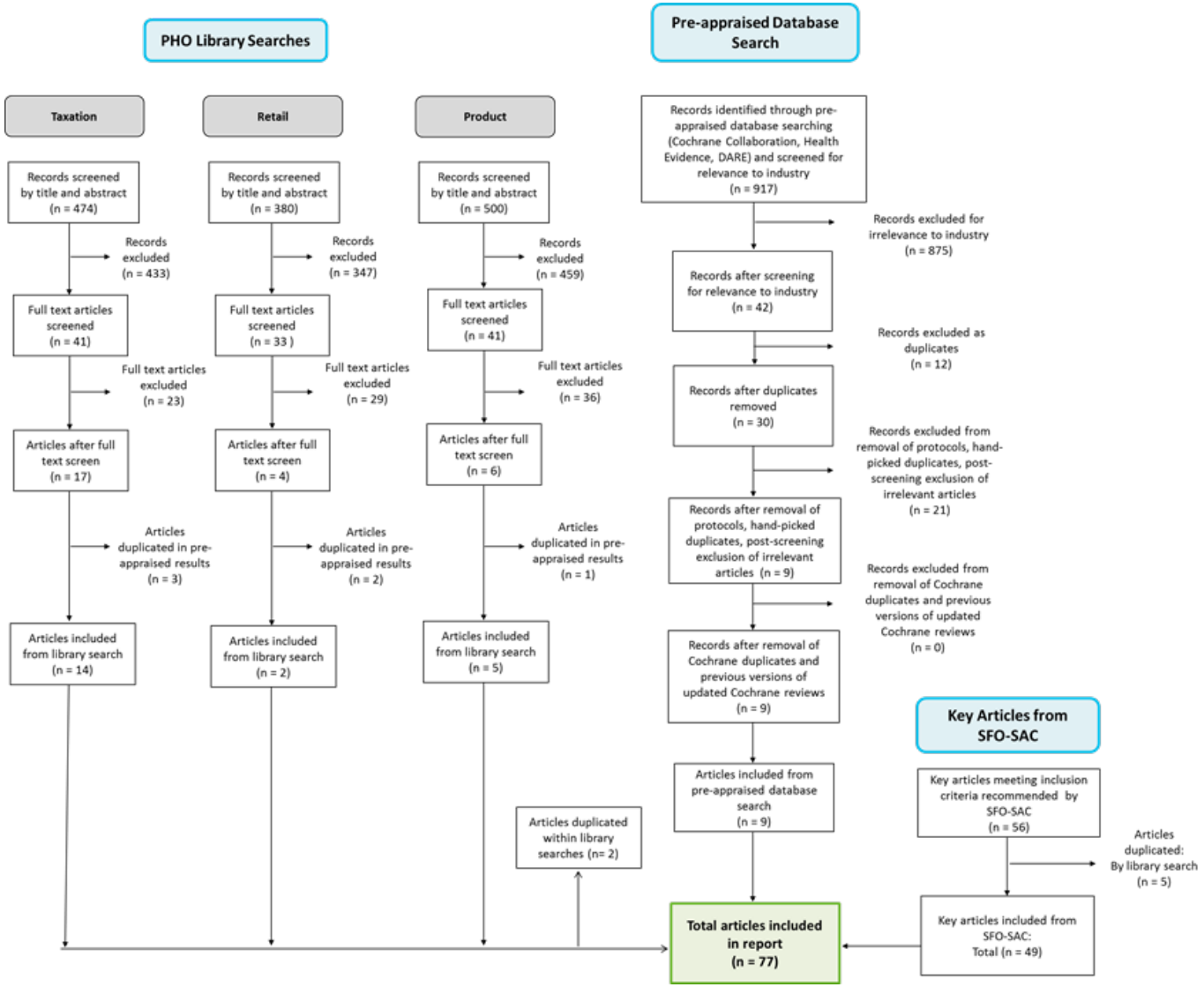

Figure 3.2: Search and Screening Flow Diagram

Organization of Interventions

Select industry interventions may be discussed more than once as they relate to other topic areas throughout the Report. Where repetition occurs, hyperlinks have been provided. Within each topic, best available evidence with intervention effectiveness is discussed. It is important to note that, where evidence is considered insufficient to conclude effectiveness does not necessarily indicate evidence of no effect. Each topic includes specific intervention characteristics and implementation considerations, specific populations and equity considerations related to the Ontario context, and any limitations.

Interventions and Innovations

Retail

Price and Taxation

> *Taxation is one of the most proven effective tobacco control interventions; however, Ontario has the second lowest tobacco tax rate in Canada at 15.475 cents per cigarette. This rate is lower than the minimum rate recommended by WHO MPOWER, and Ontario has not had substantial tax increases for many years. Substantial tax increases would contribute significantly to decreasing tobacco use in Ontario. While evidence on non-tax price measures (i.e., minimum price policies, maximum price or 'price cap' policies, bans on tobacco discounts, and non-tax fees) is sparse, experience of their use in other areas (e.g., alcohol) suggests that they have the potential to decrease tobacco use.*
>
> *SFO-SAC 2016 Scientific Consensus Statement*

Background

Taxation policies are intended to raise the price of tobacco products for the smoker or potential smoker, thereby reducing product desirability and consumer demand.[16] Taxes also provide revenue for the government that can be used to fund other tobacco control efforts.[16] Article Six of the WHO's *Framework Convention on Tobacco Control* (FCTC) recommends "price and tax measures to reduce the demand for tobacco," given that, "the Parties [of the treaty] recognize price and tax measures are an important and effective means of reducing tobacco consumption by various segments of the population, in particular young persons".[6]

There are also non-tax price policies including minimum price policies, bans on tobacco discounts and offers, price caps and non-tax fees.[16,17] A minimum price policy determines the lowest price that industry can set for a tobacco product; the intention is to reduce the potential for industry to under-shift the tax in an attempt to lessen the financial impact of the tax.[18] This policy is recommended by Ontario's Tobacco Strategy Advisory Group (2010) and the WHO (2015).[2,8]

Maximum price policies are recommended by Henriksen et al. (2012) and Malone et al. (2013) to lessen the industry's ability to over-shift a tax.[19,20] A maximum price policy, which takes production and labour costs into account,[19,20] imposes an upper threshold, thereby limiting the potential for tobacco companies to use the higher-priced brands for revenue and forcing them to raise prices on lower-priced brands as well to maintain revenue or limit losses. This approach ultimately reduces revenue potential for the industry.[19]

The Ontario/Canadian Context

The WHO introduced the MPOWER measures (Monitor tobacco use and prevention policies, Protect people from tobacco smoke, Offer help to quit tobacco use, Warn about the dangers of tobacco, Enforce bans on tobacco advertising, promotion, and sponsorship, and Raise taxes on tobacco) to provide a foundation for country-level implementation and management of effective tobacco control interventions.[2] One of the MPOWER recommendations is for countries to raise taxes on tobacco, with some researchers positing that one of the most effective tobacco control interventions would be to raise tobacco taxes to greater than 75% of the final retail price.[2]

Currently, Ontario tax rates fall under the recommended rate of 70% in the WHO technical manual.[2] Further, in relation to other provinces and territories in Canada, Ontario has the second lowest provincial/territorial tobacco tax, and the second lowest retail price for cigarettes in Canada.[21,22] Until 2016, Ontario had the lowest tobacco tax rate and second lowest retail price. Manitoba has the highest retail price of cigarettes, with a cost of $133.25 for 200 cigarettes, compared to $97.12 in Ontario.[21,22]

As of February 26, 2016, amendments to Ontario's *Tobacco Tax Act O.Reg. 40/16 S.1*, included an increase in tobacco tax rates for individual cigarettes and per gram of tobacco, from 13.975 cents to 15.475 cents per cigarette and per gram or part gram of other tobacco product, respectively.[23] This increase translates into an additional $3 of tobacco tax per carton of 200 cigarettes, and an increased retail price from $93.66 to $97.12 .[21,22] To further contribute to the Smoke-Free Ontario Strategy, Ontario has committed to use $5 million of increased revenue from tobacco tax rates (the projected tobacco tax revenue increase in 2016-2017 is $100 million, for a total annual revenue of $1.221 billion) to support improved access to smoking cessation services for priority populations across Ontario.[24] Additionally, the amendment outlines an annual increase in the tobacco tax rate of 2% per year over five years, starting in 2017, to accommodate the rate of inflation. The last increase in tobacco tax rates in Ontario was in 2014, which accounted for inflation since the previous targeted tobacco tax increase in 2006.[21-23] The price of tobacco also increased between 2006 and 2014, when the harmonized sales tax (HST) came into effect in Ontario in 2010; this resulted in an increase of $5.10 on a carton of 200 cigarettes in the retail price of cigarettes.[25]

There is currently no minimum retail market price for tobacco products in Ontario. Further, there is no regulatory action to address price segmentation of tobacco products in Canada, which allows tobacco companies to offer premium and discount versions of their products.[26]

With regard to contraband, a 2015 OTRU report concluded that there was no correlation between increasing tobacco taxes and contraband use in Ontario or Canada.[27]

Evidence

The best available research evidence for this topic comprised an overview of systematic reviews, systematic reviews with meta-analysis, systematic reviews, narrative reviews and grey literature reports. One overview of systematic reviews[28] and four systematic reviews[29-32] were retrieved from the pre-appraised literature. A PHO Library search obtained additional reviews, including one systematic review and meta-analysis,[33] four systematic reviews,[34-37] and nine narrative reviews.[18,19,38-44] In addition, one systematic review,[17] eight grey literature reports, [2,7-9,16,45-47] an editorial[48] and a commentary[49] were provided by SFO-SAC. Overall, three reviews were appraised as Level I,[28,30,34] four as Level II,[29,32,33,37] and 13 as Level III. [17-19,31,35,36,38-44] Jurisdictions of included studies were not consistently reported by reviews, but included the U.S., the U.K., Australia, and countries in Latin America and the Caribbean.

Evidence of Effectiveness

Within the studies examined, the effectiveness of increased taxation and price is primarily evaluated with the outcome of price elasticity of a smoking outcome (i.e., prevalence, participation, demand/total consumption, individual consumption, cessation, initiation). The price elasticity of a smoking outcome is the percentage change in smoking outcome resulting from a percentage change in price; for example, a price elasticity of consumption of -0.1 means that a 10% increase in price results in a 1% decrease in consumption. This section focuses on the outcomes of price elasticity of prevalence and of total consumption of cigarettes (i.e., demand). Prevalence of commercial cigarette smoking is impacted by non-smokers not initiating, and smokers quitting. Demand is likewise impacted, but is also affected by smokers reducing their consumption. Impacts of taxation and price on outcomes of cessation and individual levels of cigarette consumption are examined in Chapter 6: Cessation and the outcome of initiation is examined in Chapter 4: Prevention.

Evidence consistently shows that taxation is an effective strategy to decrease smoking prevalence[28,31,43] and demand.[18,32-34,39,41,44] This same finding was reported in the SFO-SAC 2010 Report.[3] Taxation is considered by scientific consensus to be the most effective tobacco control measure available to impact smoking prevalence. While the reviews note that the direction of the effect is clear and consistent, they also note that the magnitude of the effect varies, as well as the degree of tax increases in different jurisdictions. In terms of prevalence, a review included in Hoffman et al. (2015) that combined seven studies found a price elasticity of prevalence of -0.37, meaning a 10% increase in price is associated with a 3.7% decrease in smoking prevalence. Chaloupka et al. (2012), Jha et al. (2014), and Guindon et al. (2015) found price elasticities of demand to fall in the range of -0.3 to -0.5.[33,39,44] Throughout reviews that examined the effectiveness of multiple interventions for tobacco control, higher price through taxation was consistently reported as having the strongest and most consistent evidence of effectiveness.[28,31]

The positive impact of increased taxation that raises price was also found in reviews conducted by IARC (2011), in terms of declines in overall tobacco use and declines in adult tobacco use prevalence.[16] This positive impact is also asserted by reports by Navarro et al. (2014),[7] Malone et al. (2014),[20] the *U.S. Surgeon General Report* (2014),[47] the *WHO Report on the Global Tobacco Epidemic (*2015),[2] the *Tobacco Strategy Advisory Group Report* (2010),[8] and OTRU's *Smoke-free Ontario Strategy Evaluation Report* (2012).[50] Those that cite the magnitude of effect, all agree that a 10% increase in tobacco price would

result in an approximate 4% reduction in total cigarette demand.[7,8,16,45,47] The above outcomes were primarily found for examinations of price increases through taxation.

To mitigate the effects of taxation on the market, the tobacco industry often uses price discrimination strategies to not lose the most price-sensitive populations of tobacco-users.[17] These strategies include promotions and price tiers, which shift the burden accrued by taxation to the industry's premium market, keeping prices low on discount products.[17] As such, other non-tax price policies have been considered.[17] One systematic review, by Golden et al. (2015), examined non-tax price policies that included minimum price, price promotion restrictions and bans, non-tax fees and maximum price, examining how the literature describes, recommends and evaluates these policies (Golden 2015).[17] Limited evaluation has been undertaken.[17] The review found two studies that evaluated the impact of minimum price policies on the retail price of cigarettes in the United States, and neither study found prices to be higher in states with such a policy.[17] One of the studies did find prices to be higher in New York, where both a minimum price policy and a special price promotion ban exist.[17] The review states that the empirical evidence found is limited and that more is needed to understand the impact of non-tax price policies on tobacco prices, including non-cigarette tobacco products.[17] The review by van Walbeek et al. (2013) found that there is minimal literature that examines the effects of minimum price policies.[41]

Intervention Characteristics/Implementation Considerations

There are both barriers and facilitators to increased tobacco taxation and price that may affect outcomes. Potential barriers to the effectiveness of increased prices and taxation include individual smoker's price minimization strategies, industry pricing strategies and contraband tobacco products. A review by Calo et al. (2013) that investigated individual smoker's price minimization strategies found that smokers use price-related promotions, multi-pack discounts and switching to lower-cost generic brands to minimize the financial impact of increased prices and tax.[18]

The tobacco industry can influence the effectiveness of increased price and taxation in a variety of ways. Industry pricing strategies include price-related promotions, multi-pack discounts and lower-cost generic brand cigarettes.[32] Calo et al. (2013) recommend a ban on price-related promotions to address this barrier.[18] Four reviews discuss industry pricing strategies to lessen the financial impact of increased prices and tax,[19,32,41,42] including the under-shifting and over-shifting of a tax. By under-shifting the tax, the industry lowers its price so that the final retail price is not as impacted by an increased tax.[41] The industry may also over-shift a tax: two reviews[41,42] show evidence from the U.K. that, in response to raising taxes, tobacco companies increased the prices on originally higher-priced cigarette brands more than on the lowest-priced brands. In this way, tobacco companies can keep the lowest-priced brands as low as possible, while still increasing their revenues.[41,42]

Additionally, tobacco companies offer incentive programs to retailers that are associated with decreased prices.[51] These include "buy downs" where a tobacco company specifies a sale (e.g., "cents off" on each pack in the store's inventory) for a defined period of time.[52] Following the buy down, the retailer is reimbursed the difference between the inventory price and the reduced price.[52]

Other price strategies used by tobacco companies include the use of 1) *prestige pricing* (i.e., where higher prices and premium monikers are used to convey superior product quality), 2) *odd-even pricing* (i.e., where prices are set just below even-dollar value to convey value and affordability (e.g., $9.99 vs $10)), 3) *leader pricing* (i.e., where the retailer sets a promotional price below their usual listed price to gain attention or draw consumers to their retail location, and 4) *discount pricing* (e.g., buy two packs, get one free).[48]

The tobacco industry cites contraband tobacco sales as a negative outcome of increasing tobacco tax as a strategy to persuade governments not to increase the tax; however, the notion that increasing tobacco taxes necessarily leads to increasing use of contraband tobacco is false.[49] Multiple reviews also note contraband tobacco as an area of concern, but consistently conclude that increased prices of legal tobacco products are effective strategies to reduce smoking prevalence and increase government revenue regardless,[16,30,33,39] and recommend stricter enforcement of anti-contraband efforts rather than withholding tax increases.[39] Tax increases also generate more revenue for the government despite use of contraband, and a smoker's switch to contraband may only last up to 12 months.[49] (Find out more about Anti-Contraband Measures). Guindon et al. (2015) note that, while smokers switching to contraband may bias negative impacts on demand of commercial cigarettes further downward, if tax increases are accompanied by an increase in enforcement, the bias may be in the other direction.[33] In terms of cross-border shopping as an avenue for product switching, the systematic review by Rice et al. (2010) included studies from the U.S. that controlled their price elasticity outcomes for cross-border shopping and still found that increased taxes reduced prevalence and demand.[30]

Facilitators to increase price through taxation include specific tax characteristics and non-tax price policies. Tobacco taxes may be specific excise taxes, which are fixed dollar amounts added onto a price, or *ad valorem* taxes, which are proportionate to the original price.[39] Specific excise taxes allow lower-priced cigarettes to be taxed as much as higher-priced cigarettes, lessening the gap between them.[39,44] Chaloupka et al. (2012) also state that specific excise taxes "[sends] the message that all brands are equally harmful",[39] and Jha et al. (2014) note that specific excise taxes are less susceptible to industry manipulation because they are a set, rather than relative, price.[44] Additionally, IARC found sufficient evidence that "higher and more uniform specific excise taxes result in higher tobacco prices and increase the effectiveness of taxation policies in reducing tobacco use".[16] Supporting this finding, cigarette consumption was halved in under 15 years in both France and South Africa after each country increased inflation-adjusted cigarette prices through tax.[44] The history of tobacco taxation in Canada has also shown evidence in the reverse. Following health-motivated tobacco taxes implemented to raise prices in 1989 and 1991, cigarette consumption in Canada decreased from 3,000 to 2,000 cigarettes per adult from 1986 to 1991, and smoking prevalence among young people decreased; however, in 1994 the tobacco industry succeeded in lobbying the federal government to lower tobacco taxes.[46] Tobacco consumption increased and young person smoking prevalence began to increase.[46] Chaloupka et al. (2012) discuss other facilitators for an effective tax, such as automatic adjustment for inflation and eliminating opportunities for smokers to buy cigarettes duty-free.[39]

Specific Populations/Equity Considerations

Nine reviews[18,28,30,32,34,36,39-41] and one grey literature report of reviews[16] consistently found that increased price through taxation has a beneficial impact on reducing youth smoking prevalence, and a stronger impact on youth than on adults. Bader et al. (2011) concluded from the included studies that youth are two to three times more price responsive than adults.[36] Bader et al. (2011) also found that older youth are more price responsive than younger youth;[36] Rice et al. (2010) found that male youth may be more price responsive than female youth;[30] and Brown et al. (2014) found that youth with low SES are more price responsive than youth with high SES.[37] Two reviews found that increased price through taxation reduces young adult smoking prevalence, and that young adults are more price responsive than adults.[30,36]

Seven reviews[18,28,29,35,36,39,40] and one grey literature report of reviews[16] found strong and consistent evidence that increased price through taxation is an effective strategy to reduce smoking prevalence among smokers with low SES, and that this population is more price responsive than the general population. Reviews that evaluated the equity impact of multiple interventions found increased price through taxation provided the most consistently positive evidence of reducing tobacco-related inequities due to SES.[29,37,40] Multiple reviews note that increased tobacco taxes should be accompanied by increased targeted cessation efforts for smokers with low SES, and that tobacco taxes may create a disproportionate financial burden for smokers with low SES who are unsuccessful at quitting or choose not to quit.[36,39,40] IARC (2011) suggests that further research be done to determine the existence and nature of unintentional effects on smokers with low SES.[16]

Reviews noted that there is limited evidence available on smokers with mental illness,[36,38] heavy and/or long-term smokers[36] and Indigenous persons[36] and the impact of increased price and taxation on non-traditional tobacco usage.[36] More evidence is needed on effectiveness in these populations, especially as people who identify as having mood disorders and those who identify as Indigenous have higher smoking prevalence rates than the general population.[53]

Intervention Summary

Evidence Summary - Price and Taxation - Well supported

The body of evidence regarding the effectiveness of taxation is substantial and comprised one review of reviews, 10 systematic reviews, one with a meta-analysis, nine narrative reviews, a commentary, an editorial and numerous grey literature reports including those from the World Health Organization (WHO) and the U.S. Surgeon General. The evidence reports a consistent and significant relationship between increased price through taxation and reduced smoking prevalence and demand for tobacco products. While there is limited evidence regarding the effectiveness of non-tax price measures (e.g., minimum price policy) on tobacco use, evidence from other areas suggests that they have the potential to decrease tobacco use. The potential reach of taxation and price measures is high, for the general population and certain priority populations.

SFO-SAC 2016 Scientific Consensus Statement - High (Intensify), Positive Equity

Taxation is one of the most proven effective tobacco control interventions; however, Ontario has the second lowest tobacco tax rate in Canada at 15.475 cents per cigarette. This rate is lower than the minimum rate recommended by WHO MPOWER, and Ontario has not had substantial tax increases for many years. Substantial tax increases would contribute significantly to decreasing tobacco use in Ontario. While evidence on non-tax price measures (i.e., minimum price policies, maximum price or 'price cap' policies, bans on tobacco discounts, and non-tax fees) is sparse, experience of their use in other areas (e.g., alcohol) suggests that they have the potential to decrease tobacco use.

The scientific consensus regarding the potential contribution for Ontario is: High (Intensify). This intervention has a positive equity impact.

Key Message

Increased price of tobacco through taxation is a highly-impactful method to reduce the prevalence of smoking and the overall consumption of tobacco. Other price measures also have the potential to reduce smoking prevalence and tobacco consumption by further increasing prices, limiting tobacco industry revenues while increasing prices, and supporting taxation

Tobacco Advertising Promotion and Sponsorship Bans

Comprehensive advertising bans are effective to reduce tobacco consumption. Both the federal and provincial governments have introduced a number of tobacco advertising, promotion and sponsorship (TAPS) bans that will continue to have a high contribution if continued; however, there are gaps in these restrictions, such as movies and video games. Closing these gaps would increase effectiveness.

SFO-SAC 2016 Scientific Consensus Statement

Background

Tobacco companies make substantial expenditures each year on tobacco advertising, promotion and sponsorship (TAPS) with the aims to increase tobacco sales, encourage current smokers to continue smoking and get non-smokers to start.[2] For example, in 2006 in the United States, the tobacco industry spent $13.5 billion USD on cigarette advertising and promotion; an average of $37 million per day.[54] Advertising and promotional activities have been shown to increase users' positive images of tobacco, convey distorted messages about the utility of tobacco use and increase curiosity about tobacco use.[31] These activities are augmented by other industry tactics, such as corporate social responsibility, which seek to improve public image and legitimize the tobacco industry through the implementation of philanthropic programs and initiatives.[55]

Evidence indicates a causal relationship between tobacco advertising and increased levels of tobacco initiation and continued consumption.[54,56] For example, exposure to tobacco marketing is associated with doubling the chances of smoking initiation among youth.[31] The WHO suggests that complete bans on all TAPS activities are needed as a key tobacco control strategy because comprehensive TAPS bans hinder the industry's ability to promote and sell its products.[2] Additionally, the National Cancer Institute (NCI) reports that there is strong evidence that national and state-level media campaigns reduce tobacco use. [54]

According to Article 13 of the WHO *Framework Convention on Tobacco Control*, "... a comprehensive ban on advertising, promotion and sponsorship would reduce the consumption of tobacco products. Each Party shall ... undertake a comprehensive ban of all tobacco advertising, promotion and sponsorship". In 2014, reportedly only 29 countries (12% of the world's population) had passed a comprehensive ban.[2] Canada does not have a comprehensive advertising ban and has not yet met all of its FCTC recommendations with respect to Article 13 (e.g., promotion of tobacco products through films and other entertainment media has not been banned; however, traditional tobacco advertising has been significantly reduced.[57]

The Ontario/Canadian Context

A number of laws have been introduced in Canada banning TAPS, including a ban on tobacco advertising on television and radio, but not on other forms of direct and/or indirect (i.e., movies, internet) advertising. See Chapter 5: Protection for more information on Smoking in Movies. In 1972, the tobacco industry withdrew direct tobacco advertising from radio and television in Canada, based on a *Tobacco*

Industry Voluntary Packaging and Advertising Code developed by the Tobacco Manufacturer's Council.[9,58]

The *Tobacco Products Control Act*, which came into effect January 1, 1989, provided the federal government with the authority to ban all tobacco advertising, impose restrictions on promotional activities and tobacco sponsorship and demand stronger health warning labels on packaging.[59,60] This act was successfully challenged in the case of *RJR-MacDonald Inc. v Canada (AG)*, which led to the introduction of the *Tobacco Act* (effective 1997) that permitted "the promotion of a tobacco product by means of information advertising or brand-preference advertising in publications that have an adult readership of not less than 85%".[59] This means that bars (which require patrons to be 19+ years of age) and some music festivals (with age restrictions) can still be sponsored by tobacco companies and that these facilities/events can present tobacco advertising. In 1998, the *Tobacco Act* was amended to prohibit tobacco sponsorships, which came into effect in 2003, and further amendments in 2009 later banned print advertising (effective 2010).[9] This amendment includes banning tobacco advertising in domestic print media such as newspapers, magazines, pamphlets, leaflets, flyers, posters and signs (Section 22 under the *Act*).[61] However, there are limited exemptions for other forms of print media including direct mail to an identified adult and signage in places when young people are not permitted (e.g., bars) (Section 22 Exemption a, b, c, under the *Act*).[61]

The restrictions on advertising and sponsorship are not comprehensive and have loopholes that allow tobacco companies options to promote their products.[8] For example, tobacco companies can promote their products in movies and video games, and depictions of the act of smoking itself can be used to promote tobacco products.[8] Further legislation to address these loopholes has been recommended to restrict tobacco-related accessories in movies and other forms of media, further decrease the visibility of public smoking (e.g., on patios or outdoor sport and recreation spaces), require adult ratings for movies (e.g., 18A)and videogames (e.g., mature) with any tobacco imagery.[8] Another suggestion is to end existing exemptions on tobacco product advertising and promotion (e.g., advertising on posters and leaflets, in bars and at music festivals which have a primarily adult audience);[8] According to the recommendations from the FCTC, these should be banned.[2]

Under the SFOA, section 3.2 prohibits places of entertainment from employing or authorizing anyone to promote the sale of tobacco of tobacco.[62]

Evidence

The best available research evidence for this topic comprised of an overview of reviews, systematic reviews, and grey literature reports. One overview of reviews,[28] and two systematic reviews[29,31] were retrieved from the pre-appraised literature. One review was appraised as Level I,[28] one as Level II[29] and one as Level III[31] The majority of the included studies within these reviews took place in developed countries such as the U.S., the U.K. and Australia. Three grey literature reports from the WHO(WHO 2015),[2] the U.S. Department of Health and Human Services[47] and Cancer Research U.K.[9] that reported on TAPS bans were provided by SFO-SAC.

Evidence of Effectiveness

There is evidence on the harmful consequences of unregulated advertising on smoking behaviour (e.g., advertising is associated with smoking initiation among youth).[28,31,47]

Comprehensive advertising bans have been shown to be effective to reduce tobacco use and initiation,[2] whereas partial or voluntary bans have had little or no effect;[2,28] The overview of reviews by Hoffman (2015), which included studies of more and less comprehensive TAPS bans, found no consistent findings regarding the effectiveness of TAPS bans on cigarette consumption (with one included review reporting inconsistent effects and one review reporting no reduction in cigarette consumption).[28] The remaining included review did not measure any direct effects, but hypothesized that a TAPS ban should decrease smoking behaviour, given the evidence on a strong positive association between tobacco advertising and increased smoking.[28] Hoffman et al. suggested that the scope and comprehensiveness of TAPS bans influence their effectiveness to change cigarette consumption, which may explain the varied results across reviews. The systematic review by Wilson (2012) concluded that due to methodological limitations of the included studies, there was insufficient evidence to quantify the impact of advertising bans or restrictions on smoking behaviour; however, they suggested that comprehensive bans are the only effective way to eliminate tobacco marketing exposure.[31] Additionally, WHO reports that TAPS bans are effective to reduce tobacco use and initiation.[2]

Intervention Characteristics/Implementation Considerations

The comprehensiveness of a TAPS ban,[28] the level of enforcement and the industry response to bans (e.g., shifting to indirect means of marketing) influence effectiveness.[28,31] Partial restrictions or non-comprehensive bans allow the tobacco industry to subvert restrictions by substituting marketing channels not covered by existing laws.[31,47] WHO suggests that legislation banning TAPS "should be written in uncomplicated language, with clear definitions, strong monitoring and enforcement mechanisms and high financial penalties".[2]

Specific Populations/Equity Considerations

One systematic review by Brown (2014) examined the equity impact of controlling TAPS.[29] Researchers concluded that placing controls on advertising, marketing and promotion of cigarettes had mostly neutral equity effects (7/9 studies), meaning that there was no difference in effects based on socio-economic (SES) status.[29] WHO also reported that comprehensive TAPS bans reduce tobacco consumption in all countries regardless of income level.[2]

Intervention Summary

Evidence Summary - Tobacco Advertising Promotion and Sponsorship Bans - Well supported

The body of evidence regarding the effectiveness of advertising bans included one overview of reviews, two systematic reviews and several grey literature reports from the World Health Organization (WHO), U.S. Surgeon General and Cancer Research U.K. There is consistent evidence on the harmful consequences of advertising on smoking behaviour (e.g., advertising is associated with smoking initiation among youth). There is evidence that comprehensive advertising bans are highly effective to reduce tobacco consumption; partial or voluntary bans have less or no impact. Advertising bans have been shown to have neutral equity impacts, meaning that they impact tobacco use outcomes similarly across individuals from different socio-economic (SES) status and/or income levels.

SFO-SAC 2016 Scientific Consensus Statement - High (Intensify)

Comprehensive advertising bans are effective to reduce tobacco consumption. Both the federal and provincial governments have introduced a number of tobacco advertising, promotion and sponsorship (TAPS) bans that will continue to have a high contribution if continued; however, there are gaps in these restrictions, such as movies and video games. Closing these gaps would increase effectiveness.

The scientific consensus regarding the potential contribution for Ontario is: High (Intensify).

Key Message

Comprehensive advertising bans are effective to reduce tobacco consumption. Both the federal and provincial governments have introduced bans on many forms of TAPS; however, there are gaps in these restrictions, which, if addressed would increase effectiveness.

Packaging and Labelling Regulation

Packaging is a key component of tobacco marketing because it: 1) is present during the purchase of tobacco products, 2) has extensive reach to all purchasers and most users, 3) is a source of information and 4) consumers are intimately involved with the package, including its public display, which implicitly endorses the product (especially for children).[63]

Plain packaging of tobacco products refers to "measures that restrict or prohibit the use of logos, colours, brand images or promotional information on packaging other than brand names and product names displayed in a standard colour and font style", including the inside packaging, foil wrap and the cigarette stick itself.[15] The purpose of plain and standardized packaging is to reduce the attractiveness of tobacco products, restrict the ability of the pack to act as a form of advertising and promotion and limit misleading packaging and labelling.

Health warning labels on tobacco product packages are designed to increase awareness of the health hazards and health effects caused by tobacco use.[64] In Canada, most tobacco packages contain graphic health warnings that cover 75% of the front and back of packages and include a pan-Canadian quitline number and web address (see Quitlines with Cessation Telephone Support in the Chapter 6: Cessation).[64] The primary focus of the graphic health warnings are the health hazards posed by tobacco use.[64] There are also health information messages inside tobacco packages that focus on the benefits of quitting and provide tips to help smokers quit.[64] Additionally, short statements on toxic emissions/constituents information are displayed on the side of most tobacco packages, where they primarily focus on the health impacts of specific toxic chemicals found in tobacco smoke .[64]

Plain packaging and health warning labels aim both to prevent smoking initiation and promote smoking cessation. They are two separate interventions that can be applied on their own or together. The evidence describes the effects of plain packaging and health warning labels when they are applied on their own and when they are applied together.

Plain and Standardized Packaging

> *In Canada, plain and standardized packaging is currently being examined through a consultation process, and the Prime Minister's mandate letter to the Minister of Health in November, 2015 included plain packaging as a top priority. The evidence from both experimental and real world studies indicates that plain packaging reduces the appeal of tobacco products as well as the prevalence of smoking, and will have larger reach if implemented alongside comprehensive tobacco advertising, promotion, and sponsorship bans. Implementation of plain and standardized packaging in Ontario would likely result in meaningful impact, based on the Australian experience.*
>
> *SFO-SAC 2016 Scientific Consensus Statement*

Background

According to the SFO-SAC 2010 Report, plain and standardized packaging means the use of a standard size, shape and material, with no logos, colours, or advertising inside or attached to the package (e.g., inserts and onserts). The guidelines for implementing Article 13 of the WHO *Framework Convention on Tobacco Control* (FCTC) suggest that plain and standardized packaging should be "black and white or two other contrasting colours, as prescribed by national authorities; nothing other than a brand name, a product name and/or manufacturer's name, contact details and the quantity of product in the packaging, without any logos or other features apart from health warnings, tax stamps and other government-mandated information or markings; prescribed font style and size; and standardized shape, size and materials. There should be no advertising or promotion inside or attached to the package or on individual cigarettes or other tobacco products.".[15]

Plain and standardized packaging was recommended to be mandated as a tobacco control intervention, in the SFO-SAC 2010 Report .[3] In the literature, plain and standardized packaging is referred to as "plain packaging", and will be referred to that way for the remainder of this section.

Plain packaging of cigarettes was implemented in Australia as of December 1, 2012, and in the U.K. and France in 2016. The plain packs, under the legislation in Australia, are olive green, devoid of brand design and prominently feature the telephone number of the national smoking cessation helpline (Quitline).[65] The U.K. and France introduced plain packaging on all cigarettes manufactured from May 20, 2016 .[14,15] Additionally, countries such as Norway, Hungary, Sweden, Finland, New Zealand, Singapore, Turkey and South Africa have had plain packaging under formal consideration since November 2015.[2]

The Ontario/Canadian Context

The concept of plain packaging to reduce the appeal of tobacco products was first suggested in 1986 by Dr. Gerry Karr, a Canadian physician, at the annual meeting of the Canadian Medical Association.[66] In 1994, plain packaging was recommended by the House of Commons Standing Committee on Health.[14] The current federal government committed to implement plain packaging in its electoral platform .[14] On November 13, 2015, the Prime Minister's mandate letter to the Minister of Health included plain packaging as a "top priority".[14] On March 11, 2016, the federal government issued a tender notice for a cost-benefit analysis for tobacco plain packaging, which is currently being examined through a consultation process.[67] As of December 13, 2016, Bill S-5 (a proposal in front of the Senate that would amend the *Tobacco Act*, extending the ban on promotion to include promotion on packaging), had moved on to its second reading.[68]

The Ontario Tobacco Research Unit considers plain packaging to be an evolutionary intervention (similar to what is currently being done in Ontario, but may go beyond WHO recommendations) , as it represents an important shift from existing regulations in most countries.[7] Plain packaging has also been recommended by the Canadian Public Health Association, Canadian Cancer Society and the Tobacco Strategy Advisory Group as an important tobacco control intervention.[7] Ontario has the ability to regulate tobacco packaging, provided that the provincial regulations are more restrictive than any federal legislation.[69]

Evidence

The best available research evidence for this topic comprised systematic reviews, grey literature reports, and primary studies. Three systematic reviews were identified from the pre-appraised literature.[32,66,70] All primary studies included in these three reviews were conducted before actual implementation of plain packaging intervention in any jurisdiction, and therefore their results are based on simulated plain packaging studies. Five grey literature reviews[7,15,56,71,72] were provided by SFO-SAC, which also provided four grey literature reports from WHO,[2] Canadian Cancer Society,[14] Australian Government,[72] and Cancer Research U.K.[9]

One review was appraised as Level I,[66] and two reviews were appraised as Level II.[32,70] The majority of the reports and primary studies in the identified reviews were conducted in high-income regions of Australia, North America and Western Europe.

Evidence of Effectiveness

Overall, there is a strong body of empirical evidence from both pre-implementation (experimental) and post-implementation (real world) studies that supports the introduction of plain packaging; they conclude that plain packaging is an effective public health intervention.[15] There is evidence to suggest that plain packaging reduces the attractiveness of tobacco products, restricts use of the pack as a form of advertising and promotion, limits misleading packaging and increases the effectiveness of health warnings.[15]

Pre-Implementation (Experimental Studies)

The review-level evidence, based on experimental studies that took place prior to the implementation of plain packaging in Australia, show that plain packaging reduces the appeal of tobacco products and makes them less attention-grabbing by reducing the perceived attractiveness of the package and alleviating positive associations between specific brands and a smoker's identity.[2,56,71] Also, smokers consider cigarettes in plain packaging to have poorer taste and be of lower quality in comparison to the branded packs.[66,70,71] Plain packaging improves the recall and perceived seriousness of health warnings.[56,66,70,71] Additionally, plain packaging reduces false beliefs about the risks of smoking and is more effective at conveying information about the health effects of smoking.[56,66,70,71]

Post-implementation (Real-World Studies)

Evidence from post-implementation studies in Australia suggests that plain packaging reduces the attractiveness and appeal of tobacco products and reduces the prevalence of active smoking.[15] It also reduces the display of tobacco packs in outdoor settings.[15] This suggests that in addition to smokers treating tobacco products as less attractive, plain packaging also reduces the public's exposure to tobacco products packaging as a form of marketing.[15] Additionally, there is evidence to suggest that plain packaging encourages quitting; plain packaging has been shown to increase the salience of health warning labels on packages, increase the urgency to quit among smokers, increase calls to quitlines (see Quitlines with Cessation Telephone Support for more information) and increase rates of quitting cognitions and quit attempts among adult smokers.[15]

Evidence also suggests that plain packaging reduced consumer misperceptions of harm.[15] Misleading descriptors on packages allowed consumers to have incorrect views about the risks associated with tobacco products (e.g., the 'light' in Marlboro Ultra Lights suggests that these are better for you).[15] Tobacco companies used brand variants, which enabled retailers to assist consumers to identify those variants after misleading descriptors were banned from packaging (e.g., Marlboro Lights became Marlboro Gold and Marlboro Ultra Lights became Marlboro Silver).[15] Despite attempts by tobacco companies to ensure that their brand variants are identified, evidence from a national survey in Australia found a statistically significant increase in the proportion of adult smokers who believed that brands do not differ in harmfulness (69.8%) during the first year of implementation as compared with the period before implementation (65.7%).[15]

Plain packaging is also associated with reductions in smoking prevalence. The *Single Source Survey Data* conducted by Roy Morgan (an Australian market research company) found that the implementation of plain packaging (combined with enhanced graphic health warnings) resulted in a significant decline (0.55 percentage points) in smoking prevalence among Australians ages 14 and older post-implementation, compared to the anticipated prevalence without the implementation of plain packaging.[72] This decrease accounted for one-quarter of the total decline in the average prevalence rates observed between 34 months pre- and 34 months post-implementation.[72] Since the introduction of plain packaging, the Australian government has observed declining total expenditures on tobacco products and declining customs and excise clearances on tobacco products.[15]

Intervention Characteristics/Implementation Considerations

Plain packaging is a key part of strengthening tobacco control measures that are already in place.[15] It has been recommended that plain packaging be implemented as part of a comprehensive set of tobacco control measures.[15] For example, in Australia, when plain packaging legislation came into force, other interventions were also implemented simultaneously to create synergistic effects. Along with plain packaging, a set of 14 new pictorial health warning labels, enlarged from 30% to 75% of the front of tobacco packs, were mandated at the same time, while maintaining 90% of the back. A quitline number was featured prominently on the cigarette package. Also, a national mass media campaign was aired to increase public awareness about this new intervention.[7,73]

When implementing plain packaging legislation, considering legal issues is important. The tobacco industry has issued multiple legal challenges in response to plain packaging legislation, and has lost all cases to date. [71,74,75]

It is important to consider how tobacco companies respond to plain packaging legislation. Some companies have used the variant descriptors (e.g., 'Smooth', 'Rich', 'Fine') in addition to brand names on plain packages to further enhance perceptions and differentiate their brand.[15,76] These variant descriptors on plain packages have been shown to affect smokers' perceptions of cigarettes contained within the packages.[15,76]

Specific Populations/Equity Considerations

Some primary studies (based on simulated plain packaging) from the included reviews reported demographic differences regarding the impact of plain packaging on tobacco use. For example, according to an Australian study, non-smokers and younger respondents were significantly more likely to rate plain packaging as unattractive when compared to their branded counterparts.[66,70] A Canadian study of young women reported that plain packs were rated as less appealing than branded female-oriented packs.[66] A French study also showed that women found plain packaging less appealing than men.[70]

Intervention Summary

Evidence Summary - Plain and Standardized Packaging - Supported

The body of evidence regarding the effectiveness of plain packaging comprised three systematic reviews, four grey literature reviews and five grey literature reports from the World Health Organization, The Australian Government, U.S. Surgeon General, among others. Overall, there is empirical evidence from both pre-implementation (experimental) studies and post-implementation (real world) studies concluding that plain packaging is an effective public health intervention. There is evidence to suggest that plain packaging reduces the attractiveness of tobacco products, restricts use of the pack as a form of advertising and promotion, limits misleading packaging and increases the effectiveness of health warnings. Additionally, evidence from Australia (where plain packaging has been implemented) suggests plain packaging reduces smoking prevalence.

SFO-SAC 2016 Scientific Consensus Statement - High (Initiate)

In Canada, plain and standardized packaging is currently being examined through a consultation process, and the Prime Minister's mandate letter to the Minister of Health in November, 2015 included plain packaging as a top priority. The evidence from both experimental and real world studies indicates that plain packaging reduces the appeal of tobacco products as well as the prevalence of smoking, and will have larger reach if implemented alongside comprehensive tobacco advertising, promotion, and sponsorship bans. Implementation of plain and standardized packaging in Ontario would likely result in meaningful impact, based on the Australian experience.

The scientific consensus regarding the potential contribution for Ontario is: High (Initiate).

Key Message

Plain packaging has been shown to be an effective public health intervention. Evidence from Australia suggests that implementation in Ontario and Canada could help to reduce smoking prevalence.

Health Warning Labels

Evidence indicates that health warning labels are effective to educate about the health risks of smoking and motivate smokers to quit. Health warning labels also increase the use of helplines/quitlines. As of 2012, Canada's pictorial health warnings cover 75% of the package, with toxic emission statements on the sides, interior health information and a toll-free quitline number. Health warning labels make a high contribution to reducing prevalence and can be improved in Canada by increasing periodic rotation. This intensification would make an additional moderate contribution to reducing prevalence.

SFO-SAC 2016 Scientific Consensus Statement

Background

Health warning labels are an important medium to communicate the health risks of tobacco use. Tobacco packages can deliver messages to smokers with high reach and frequency (especially among heavy smokers) during the act of smoking.[77] Tobacco packaging can also advertise the risks of smoking to non-smokers, since packages are often in public view when smokers use a tobacco product.[77]

Health warning labels on tobacco packaging have been shown to increase awareness of health risks and reduce tobacco use.[2] Article 11 of the WHO *Framework Convention on Tobacco Control* states: "… each unit packet and package of tobacco products and any outside packaging and labelling of such products and [shall] also carry health warnings describing the harmful effects of tobacco use …".[2] Canada was the first country to implement pictorial warnings of a larger size (which covered 50% of the principle display areas).[77] Many laws initially required warning labels to occupy 50% of the front and back of packages; however, over time, many jurisdictions have implemented even larger labels;[47] Uruguay has a law that requires that 80% of the front and back of packs to have warning labels; Australia's law requires that 75% of the front of the pack and 100% of the back be devoted to warning labels.[47] As of May 4th 2016, the European Court of Justice upheld the new *Tobacco Products Directive* which mandated that health warning labels must cover the the top 65% of the front and back of packages.[78]

The Ontario/Canadian Context

Health warning labels are regulated under federal and provincial jurisdiction in Ontario. As part of the *Smoke-Free Ontario Act 1994*, Ontario has regulated that tobacco be packaged in accordance with the

requirements under the federal *Tobacco Act*. Canada was the first country to require picture-based health warnings on cigarette packages in 2000.[9] In 2012, the federal *Tobacco Products Labeling Regulations (SOR/2011-177)* came into effect.[79] The regulation required new graphic health warning messages to cover 75% of the front and back of cigarette and little cigar packages; labels must include easy-to-understand toxic emissions statements and interior health information messages; and cigarette packages must include a phone number to a toll-free quitline (e.g., Smokers' Helpline).[79] A recent study evaluated the new pictorial health warning labels on tobacco packaging introduced by Health Canada in 2012, which prominently displayed a toll-free number for a quit-smoking line.[80] Results found a significant relative increase of 160% (870 calls/month before, to 1,391 calls/month after the policy change) in the monthly overall call volume, and 174% (153 calls/month before to 267 calls/month after the policy change) in the number of new callers receiving treatment, which have been adjusted for the *Driven to Quit Challenge* and the January effect as confounders.[80]

Evidence

The best available research evidence for this topic comprised an overview of systematic reviews, systematic reviews, a narrative review and grey literature reports. Four systematic reviews,[31,66,70,81] one narrative review,[77] and one overview of systematic reviews[28] were retrieved from the pre-appraised literature search. Additionally, two grey literature reports[2,9] a systematic review[82] and a meta-analysis[83] were provided by SFO-SAC. Three of the reviews were appraised as Level I,[28,66,82] four as Level II,[70,77,81,83] and one as Level III.[31] The majority of the studies took place in Canada, USA, Australia, New Zealand, and Europe; a few were in developing countries such as Mexico, Brazil, Malaysia, China, and Iran.

Evidence of Effectiveness

Health warning labels on cigarette packaging have been shown to increase awareness of the risks of smoking in both smokers and non-smokers across age groups.[66,70,77] In 2001, Canada was the first country to implement pictorial health warnings; a series of population-based surveys found pictorial warnings were more noticeable, were associated with stronger beliefs about health risks and increased motivation to quit smoking compared to text-only health warnings.[77]

Although the effect of health warning labels on cessation behaviour is more difficult to determine, large text and pictorial warnings have been shown to reduce consumption levels and increase the likelihood of quitting and remaining abstinent. In Canada, more than 40% of smokers reported that pictorial warnings have motivated them to quit smoking, and other surveys found they reduced daily cigarette consumption and helped former smokers to remain abstinent.[77] Health warning labels were also found to increase the use of cessation services such as helplines.[28,77] For example, in The Netherlands, calls to the smoking cessation helpline increased more than 3.5 times in the 12 months after the helpline number was printed on the back of one of 14 package warnings.[77] However, these results may not be solely attributed to health warning labels, which are typically introduced along with other tobacco control measures such as changes in price/taxation, mass media campaigns and smoke-free legislation.[77]

Two recent reviews found some evidence of effectiveness for strengthened cigarette pack warnings (featuring pictorial warnings).[82,83] One review examined longitudinal studies that observed changes following the implementation of strengthened cigarette pack warnings (e.g., from text to pictorial, text

to strengthened text and pictorial to strengthened pictorial), and found that six out of nine studies found decreases in smoking prevalence, three out of eight studies found a decrease in cigarette consumption and four out of seven studies found an increase in quit attempts.[82] One review also found that calls to quitlines increased in four out of six studies.[82] The other review conducted a meta-analysis on the effects of pictorial warnings when compared with text warnings.[83] Results found statistically significant effects in favour of pictorial warnings in 12 of 17 effectiveness outcomes, including attractiveness (d=0.79), ability to hold attention (d=1.74), eliciting stronger cognitive (d=1.70) and emotional reactions (d=0.54), eliciting negative attitudes towards smoking (d=0.55), increasing intentions to not initiate smoking (d=1.82), and increasing intentions to quit smoking (d=0.54).[83]

In addition, plain packaging on cigarette packages has been shown to increase the noticeability, recall and perceived credibility of health warnings.[66,70,77]

In contrast, two reviews on pictorial warnings found mixed effects on cessation behaviour (i.e., fourth quartile score: 1.7, 95% CI: 0.37-5.3);[81] reduction in cigarette consumption (i.e., OR: 2.68, 95% CI: 1.21-5.9;[81] and quit attempts (i.e., Prevalence range in Canada: 19.84% to 21.34% without direct comparison).[31] Among the included studies, the authors found high heterogeneity in definition of outcomes and general low methodological quality, along with a greater emphasis on experimental studies rather than 'real world' implementation.[31,81] Health warning labels can appear in many different forms, therefore the impact of health warning labels was found to be dependent on their size, position, design and type.[66,77]

Intervention Characteristics/Implementation Considerations

Larger warning size was associated with greater perceived recall, greater health risk, increased promotion of cessation behaviour and decreased prevalence of smoking, and potentially undermining brand appeal.[77] Moodie et al. (2012) noted that warnings that are positioned prominently on the front of the pack with a design of bold, contrasting lettering and the use of a box perimeter increased consumer comprehension of health warning labels.[66] Text-only warnings with more obscure design type showed lower impact compared to pictorial health warnings.[77] Impact also increased when the content of the labels was periodically updated, even when their size and position did not change. In addition, health warnings that elicit negative emotional reactions were associated with increased contemplation of health risks and cessation behaviour. These included fear-arousing health warnings, shocking images, personal testimonials and depictions of human suffering or negative aesthetic effects.[77]

Additionally, health warning labels have been found to affect social norms regarding tobacco use, which reduced tobacco use and increased support for tobacco control measures.[2]

Periodic rotation of health warning labels has been shown to improve and maintain the impact of messages,[2] to prevent 'over-exposure' or 'wear-out', in which smokers can become desensitized to the same health warning labels over time.[77] In Canada, health warning labels did not change until 11 years after implementation, which was substantially longer than when other countries changed their pictorial health warning labels.[77]

Specific Populations/Equity Considerations

According to a European Union (EU) survey, younger respondents, less educated respondents and 'manual' workers were slightly more likely to perceive health warnings as effective.[77] In addition, labels that depicted negative aesthetics were found to be particularly effective among young people.[77] Text-only health warnings varied in their effects by socio-economic status, likely due to varying literacy levels.[77]

Intervention Summary

Evidence Summary - Health Warning Labels - Supported

The body of evidence regarding the effectiveness of health warning labels comprised one overview of reviews, five systematic reviews, one meta-analysis, one narrative review and two grey literature reports. Health warning labels that are large, prominently positioned, contain a graphic pictorial that elicits negative emotions, use bold contrasting lettering and are periodically updated are more effective (compared to text-only health warning labels) at being noticeable, promoting stronger beliefs about health risks and motivating smokers to quit.

SFO-SAC 2016 Scientific Consensus Statement - Moderate (Intensify)

Evidence indicates that health warning labels are effective to educate about the health risks of smoking and motivate smokers to quit. Health warning labels also increase the use of helplines/quitlines. As of 2012, Canada's pictorial health warnings cover 75% of the package, with toxic emission statements on the sides, interior health information and a toll-free quitline number. Health warning labels make a high contribution to reducing prevalence and can be improved in Canada by increasing periodic rotation. This intensification would make an additional moderate contribution to reducing prevalence.

The scientific consensus regarding the potential contribution for Ontario is: Moderate (Intensify).

Key Message

Health warning labels have shown to be effective in Canada and can be further improved by increasing their periodic rotation (e.g., bi-yearly).

Addressing the Retail Environment (Decreasing Availability)

Background

The tobacco retail environment has been identified as an important area for tobacco control.[8,47] In a 2010 report, TSAG made the following recommendations regarding the tobacco retail environment: 1) "Move toward a system of designated sales outlets, by employing methods such as licensing strategies and zoning by-laws, to continuously reduce the number of tobacco retailers and locations permitted to sell tobacco products; 2) Increase the number of specific places that are prohibited from selling tobacco products to match or exceed bans in leading Canadian provinces; and 3) Develop and implement tobacco vendor compliance strategies that continue to reduce availability of cigarettes to underage youth".[8]

The tobacco retail environment is considered to be an important area to control and reduce tobacco product availability.[8] Reducing exposure to and the physical accessibility of tobacco products at the retail level could help to denormalize tobacco products and to decrease environmental cues to smoke or purchase tobacco.[19,84,85] Various types of interventions or policy options that target the retail environment have been examined and/or discussed in the literature, including minimum age restrictions, point of sale tobacco display bans, zoning tobacco retail-free areas and retailer licenses.

There is a well-established body of evidence that demonstrates a positive association between alcohol outlet density and excessive alcohol consumption and its related harms.[86] Limiting alcohol outlet density through the use of regulatory authority (e.g., licensing and zoning) is widely accepted as a means to reduce or control excessive alcohol consumption and related harms.[86,87] Moreover, governments have a history of applying licensing and zoning to businesses that sell alcohol.[87] These regulatory systems may provide a framework that could be adapted to tobacco control in Ontario.[88]

Zoning Restrictions to Create Tobacco Retail-free Areas

> *Zoning restrictions can reduce tobacco retailer density, tobacco product availability and environmental cues for smoking. In Ontario, there are no zoning restrictions per se. Ontario could decrease smoking initiation and facilitate quitting by doing one or more of: capping the number of retailers in a certain geographical area, prohibiting retailers within certain distances of schools or other youth-oriented facilities, prohibiting retailers along access routes to schools, establishing minimum distances between tobacco retailers, and restricting the location of tobacco retailers to certain areas. Intensive zoning restrictions have the potential to transform the tobacco market.*
>
> *SFO-SAC 2016 Scientific Consensus Statement*

The Ontario/Canadian Context

There is one tobacco retail outlet for every 1,000 people aged 15 or older in Ontario.[89] This Report has not identified any zoning restrictions to specifically reduce the number of tobacco retail outlets in Ontario (which a 2013 report has been estimated to be approximately 12,000).[89] There are restrictions on where tobacco can be sold in Ontario. Under the Ontario's *Smoke-Free Ontario Act*, it is illegal to sell tobacco products via vending machines, and at pharmacies, long-term care homes, hospitals, psychiatric facilities and other specified places.[90] Under the *Smoke-Free Ontario Act*, it is also illegal to sell tobacco products on university and college campuses, on property that is owned or leased by post-secondary institutions or student unions, and in schools, child care centres and places where home child care is provided (effective January 1, 2015).[90]

Evidence

Zoning restrictions can be used to create tobacco retail-free areas and reduce the availability of tobacco products.[91] This was discussed in one narrative review[19] retrieved from a PHO Library search and four grey literature reports[7-9,91] provided by SFO-SAC. The narrative review was appraised as Level III.[19]

Recommended zoning restrictions to reduce tobacco retail availability include the following: capping the number of retailers in a certain geographical area, prohibiting retailers within certain distances of schools or other youth-oriented facilities, prohibiting retailers along access routes to schools, minimizing the distances between tobacco retailers and restricting the location of tobacco retailers to certain areas.[7,9,19,91]

Zoning restrictions could reduce tobacco retailer density, and thus accessibility to tobacco products and environmental cues for smoking.[7,9,19] This in turn could promote cessation behaviour and attitudes, since higher tobacco retailer density has been shown to be associated with greater smoking rates and tobacco sales among youth, and greater relapse rates during quit attempts.[19,91] It has specifically been shown that increased tobacco retail density was associated with greater smoking prevalence within a public health unit in Ontario. [89] Similar impact has been seen with reducing alcohol outlet density. Population-level studies have shown that decreased alcohol outlet density is associated with decreased alcohol consumption over time.[91]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Specific Populations/Equity Considerations

There is evidence that tobacco retailer density tends to be higher closer to schools and in more vulnerable neighbourhoods (e.g. lower SES neighbourhoods).[89] One Ontario study found that tobacco retail outlets tend to be found in urban and rural neighbourhoods with higher deprivation (assessed based on the following: percentage of individuals aged 25+ without high school graduation, percentage of lone-parent families, percentage of families receiving government assistance, percentage of individuals aged 15+ unemployed, percentage of families living under the low-income cut off, and percentage of homes needing major repair).[89] For example, the study found that compared to urban

neighbourhoods with the least deprivation, urban neighbourhoods with the highest deprivation were approximately three times more likely to have a tobacco retail outlet in their neighbourhood (OR: 3.4, p<0.0001).[89] Similar results were found for urban neighbourhoods with the second (OR: 2.04, p<0.0001) and third highest deprivation levels (OR: 1.58, p<0.0001), and in rural neighbourhoods. The study also found that 65% of tobacco retail outlets were located within 500 metres of schools in urban areas and that schools in lower SES areas were more likely to have a tobacco retailer within walking distance (p<0.0001).[89] Zoning restrictions to limit the number of retailers overall, or within certain areas, could therefore help to address this disparity in tobacco retailer density.

Intervention Summary

Evidence Summary - Zoning Restrictions to Create Tobacco-Free Retail Areas - Emerging

The body of evidence regarding zoning restrictions on retail outlets to create tobacco retail-free areas comprised a narrative review and four grey literature reports. Studies have shown that high tobacco retailer density (which has shown to be more prevalent closer to schools and in low SES areas) is associated with higher smoking rates, tobacco sales to youth and relapse during quit attempts. While evidence about the effects of zoning is sparse, theory suggests that zoning restrictions that reduce tobacco retailer density, tobacco product availability and environmental cues for smoking would contribute to decreased initiation and more successful cessation.

SFO-SAC 2016 Scientific Consensus Statement - Innovative

Zoning restrictions can reduce tobacco retailer density, tobacco product availability and environmental cues for smoking. In Ontario, there are no zoning restrictions per se. Ontario could decrease smoking initiation and facilitate quitting by doing one or more of: capping the number of retailers in a certain geographical area, prohibiting retailers within certain distances of schools or other youth-oriented facilities, prohibiting retailers along access routes to schools, establishing minimum distances between tobacco retailers, and restricting the location of tobacco retailers to certain areas. Intensive zoning restrictions have the potential to transform the tobacco market.

The scientific consensus regarding the potential contribution for Ontario is: Innovative.

Key Message

Ontario could decrease initiation and facilitate quitting by adopting zoning restrictions that reduce tobacco retailer density, tobacco product availability and environmental cues for smoking.

Retail Licenses

There is promising evidence that retailer licenses and retail license fees can increase compliance with in-store tobacco retail restrictions and reduce the number of licensed retailers. In Ontario, there are currently no license fees for tobacco retailers; however, the development of retail licenses is in progress. Few municipalities have established permit fees at fairly low levels. Establishing substantial license fees with restrictive conditions for retail outlets in Ontario could transform the retail tobacco landscape, substantially decrease initiation and facilitate quitting, as well as cover the cost of enforcement.

SFO-SAC 2016 Scientific Consensus Statement

The Ontario/Canadian Context

Under the *Tobacco Tax Act*, tobacco retailers in Ontario are required to possess a no-cost permit to sell tobacco products. Although there are no costs for the permits issued by the province, some Ontario cities (e.g., Hamilton, Ottawa and Kingston) require payment of an annual fee for tobacco licenses.[7] In 2014, the fees for these municipal-level retail licenses were between $50 to more than $400.[7]

Evidence

Retailer licensing programs require all retailers to possess a government-issued license to sell tobacco products.[92] Governments have a history of applying licensing to businesses selling alcohol,[87] and these regulatory systems may provide a framework that could be adapted to tobacco control in Ontario.[88] One rapid review[40] (retrieved from a PHO Library search), four grey literature reports[7-9,91] and two primary studies provided by SFO-SAC focused on retailer licenses.[93,94] The review was appraised as Level III,[40] and the two primary studies were appraised as Level II[93] and Level III, respectively.[94]

As a condition of holding the license, tobacco retailers must comply with all pertinent tobacco control legislation.[91,92] Violating these requirements (e.g., evading taxes, selling tobacco products to minors) may result in the license being revoked or other lesser consequences, such as fines and suspensions.[92] Retail licensing has a number of other purposes including to aid with collecting taxes and to track and identify tobacco retail outlets.[91,92]

Licencing-associated strategies could be used to control and reduce the retail availability of tobacco products, as well as to cover any costs associated with the administration, implementation and enforcement of the retail license (e.g. compliance checks).[92] These strategies include the following: limiting the number of licenses that can be issued (and perhaps reducing this limit over time), increasing the licensing fee, not renewing licenses to existing license holders, not granting licenses to particular retailers and holding an auction or lottery for a limited number of available licenses.[9,91] In addition, certain conditions of the license, such as limiting the hours and/or days during which tobacco can be sold, could also aid in reducing tobacco retail availability.[91]

Two primary studies of observational design have examined the impact of retailer licenses and retail license fees.[93,94] One Australian primary study demonstrated that being registered as required by a no-cost government licensing scheme was positively associated with compliance with in-store retail requirements (such as point-of-sale display bans, posting notices that it is illegal to sell tobacco products to individuals younger than 18).[93] The study specifically showed that non-registered retailers were more likely to violate one or more in-store retail restrictions than stores that were registered (adjusted OR: 2.42, 95% CI: 1.62-3.61, p<0.001).[93] Based on these findings, enforcement mechanisms for searching and responding to unlicensed retailers were recommended.[93] Another Australian primary study showed that a 15-fold increase in retail license fees (from $12.90 AUD to $200 AUD per annum) could be an effective method to reduce the number of active tobacco licenses (purchased or renewed).[94] Researchers found that the total number of tobacco licenses significantly decreased by 23.7% from one year to two years, after the first of four fee increases.[94]

Intervention Characteristics/Implementation Considerations

It has been shown that the impact of an increase in retail license fees appears to vary by outlets' tobacco sales volume.[94] For instance, it has been shown that tobacco license fees that are not high enough may not deter retailers with higher sales volume from purchasing and renewing licenses.[94] Another implementation barrier are promotional allowances at both a retail and wholesale level, which involve tobacco industry payments or incentives to tobacco retailers and wholesalers for facilitating and promoting the sales of tobacco products (i.e. price discounts, retail value-added or bonuses).[54]

Specific Populations/Equity Considerations

There is evidence indicating that tobacco retailer density is greater in lower SES areas.[7,91] A rapid review also found evidence that disadvantaged areas with a high density of tobacco retailers contributes to smoking-relating disparities.[40] It has been suggested that policies that cap the number of retailer licenses issued within a disadvantaged area can reduce these disparities;[40] however, evidence on the equity impact of this strategy has not yet been identified.

One Australian primary study did not find any significant associations between the probability of being registered or listed as part of a government licensing scheme and the SES of the retailers' postal area;[93] however, the study did find that retailers in lower SES areas were significantly more likely to breach in-store regulations than retailers in higher SES areas (p-trend=0.02, z= 02.33).[93]

Intervention Summary

Evidence Summary - Retail Licenses - Promising Direction

The body of evidence for retailer licences comprised one rapid review and several grey literature reports and primary studies. There is promising evidence that retailer licenses and retail license fees can increase compliance with in-store tobacco retail restrictions and reduce the number of licensed retailers, respectively. Experts have proposed other retail licensing strategies and conditions to reduce the availability of tobacco products, such as capping the number of retail licenses, not granting licenses to certain retailers and restricting when tobacco can be sold.

SFO-SAC 2016 Scientific Consensus Statement - Innovative

There is promising evidence that retailer licenses and retail license fees can increase compliance with in-store tobacco retail restrictions and reduce the number of licensed retailers. In Ontario, there are currently no license fees for tobacco retailers; however, the development of retail licenses is in progress. Few municipalities have established permit fees at fairly low levels. Establishing substantial license fees with restrictive conditions for retail outlets in Ontario could transform the retail tobacco landscape, substantially decrease initiation and facilitate quitting, as well as cover the cost of enforcement.

The scientific consensus regarding the potential contribution for Ontario is: Innovative.

Key Message

Establishing substantial licensing fees for retail outlets in Ontario has the potential to reduce smoking initiation and encourage cessation through reduced retail outlet density.

Government-Controlled Outlets

Emerging evidence, from tobacco and other areas, suggests that if properly implemented, government-controlled retail outlets have the potential to transform the tobacco market and decrease the availability of tobacco products, with associated decreases in initiation and increases in quits.

SFO-SAC 2016 Scientific Consensus Statement

The Ontario/Canadian Context

No information related to the Ontario or Canadian context was identified from the included literature of this report.

Evidence

Government-controlled outlets have been discussed in two of the identified grey literature reports provided by SFO-SAC.[7,91]

Government-controlled outlets would allow only designated retail outlets to sell or distribute tobacco products.[7] These outlets could be owned by private organizations (but regulated by the government), or by only non-profit organizations or governments, or they could be licensed by a central public authority.[7] While no evidence evaluating this intervention was identified from the literature searches, there is potential that if properly implemented, government-controlled outlets would, by design, decrease the availability of tobacco products with associated decreases in initiation and increases in quits.[91]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Government-Controlled Outlets - Emerging

The body of evidence on government-controlled outlets comprised of two grey literature reports. This intervention would allow only designated retail outlets to sell or distribute tobacco products. No evidence evaluating government-controlled tobacco outlets was identified from the literature searches.

SFO-SAC 2016 Scientific Consensus Statement - Innovative

Emerging evidence, from tobacco and other areas, suggests that if properly implemented, government-controlled retail outlets have the potential to transform the tobacco market and decrease the availability of tobacco products, with associated decreases in initiation and increases in quits.

The scientific consensus regarding the potential contribution for Ontario is: Innovative

Key Message

While there is limited evidence regarding the effectiveness of government-controlled outlets, there is potential that if properly implemented, they would, by design, decrease the availability of tobacco products with associated decreases in initiation and increases in quits.

Market

Anti-Contraband Measures

Ontario has introduced a number of anti-contraband measures including new tobacco stamps and strengthened enforcement and penalties for selling contraband. These will continue to have a high contribution in Ontario. However, Ontario has not implemented sufficiently strong measures to identify and cut-off supplies of contraband tobacco. When implementing anti-contraband measures in Ontario, it is important to collaborate with First Nations Communities on the development policies which potentially impact them. The implementation of stronger measures, in concert with First Nations communities, would further decrease the use of cheap contraband tobacco which will contribute to decreasing the prevalence of tobacco use.

SFO-SAC 2016 Scientific Consensus Statement

Background

According to the RCMP, contraband tobacco is defined as: "…any tobacco product that does not comply with the provisions of all applicable federal and provincial statutes. This includes importation, stamping, marking, manufacturing, distributing and payment of duties and taxes."[95] Contraband tobacco can take the form of organized international smuggling, illicit manufacturing, tax-avoidance from duty-free sources and/or counterfeit cigarettes.[96] Article 15 of the WHO *Framework Convention on Tobacco Control* (WHO FCTC) suggests "the elimination of all forms of illicit trade in tobacco products, including smuggling, illicit manufacturing and counterfeiting, and the development and implementation of related national law, in addition to sub-regional, regional and global agreements, are essential components of tobacco control".[6]

In Ontario, more than 252 million contraband cigarettes, 4.3 million untaxed cigars and 169 million grams of untaxed fine-cut tobacco or other tobacco products were reported to have been seized since 2008.[97] For example, in 2014, the RCMP seized $4 million worth of contraband tobacco across Canada.[98]

Anti-contraband measures are enacted to reduce the availability and sales of contraband tobacco, as it undermines tobacco control efforts (e.g., offering cheaper prices following increased price through

taxation, making government reluctant to adopt policies out of fear that smokers will turn to the contraband market).[8,45] Sales of contraband tobacco reduce government revenues accumulated through legal cigarette sales[47] and can involve organized crime.[96] The availability of contraband cigarettes can also reduce smokers' motivation to quit smoking or reduce their cigarette use.[99]

The Ontario/Canadian Context

The prevalence estimates of contraband tobacco in Ontario are varied due to differences in survey methodology and definitions of contraband tobacco, and it is likely that many smokers underreport their contraband tobacco use due to its illegal nature.[8] It has been estimated that 14% to 42% of all cigarettes bought by adult smokers in Ontario may be contraband.[8] The most reliable source of data on contraband in Ontario indicates that prevalence of contraband has been quite low for some time.[49]

TSAG suggests using a 'whole of government' approach to tobacco control, which may require coordination of various ministries to contribute more to the Ontario government's effort to reduce the burden of tobacco on families, communities, healthcare and the economy, including Finance, Agriculture, Food and Rural Affairs, Health and Long-Term Care, and Municipal Affairs and Housing.[8] Additionally, a coordinated set of interventions that includes international collaboration, strengthened tax administration, increased enforcement and swift, severe penalties is needed to reduce illicit trade in tobacco products.[16]

The following anti-contrabands measures have been implemented in Canada: 1) licencing, 2) marking/labeling, 3) record-keeping/control measures, 4) enforcement, 5) export taxation, 6) tax harmonization, 7) Indigenous tax agreements/compacts and 8) MOUs/legal agreements.[96]

A number of anti-contraband measures have also been implemented in Ontario. In January 2014, new tobacco stamps were implemented on packages of cigarettes and fine cut tobacco (requiring consumers to pay tobacco tax), which help to distinguish between legal and illegal tobacco products.[97] In January 2016, the Ontario Provincial Police (OPP) created the Contraband Tobacco Enforcement Team within the OPP's Organized Crime Enforcement Bureau, responsible for investigating smuggling and trafficking of contraband tobacco.[100]

The Ontario Ministry of Finance has also signed an information-sharing agreement with the Alcohol and Gaming Commission of Ontario so that retailers who illegally sell tobacco (under the *Tobacco Tax Act*) can have their lottery licenses suspended or revoked.[97] In January 2015, the Ontario government strengthened the oversight of raw leaf tobacco to provide more opportunities to disrupt the diversion of raw leaf tobacco to contraband manufacturers.[97] Additionally, the Ontario government introduced legislation that amended the *Tobacco Tax Act* to increase fines for offences related to the marking of tobacco products and to allow vehicles that transport contraband tobacco to be impounded.[97]

Prior to January 1st 2015, the Ontario Flue-Cured Tobacco Growers' Marketing Board oversaw the growing and buying of flue-cured raw leaf tobacco in Ontario.[101] In the past, the Board also was involved in determining the amount of flue-cured tobacco that can be grown through a quota system.[102]

In January 2015, the Ontario Ministry of Finance replaced the Board and now regulates the oversight of all raw leaf tobacco grown in Ontario and raw leaf tobacco imported into Ontario through the *Raw Leaf Tobacco Program*.[101] Under *the Tobacco Tax Act*, the program requires all bodies involved in producing (e.g., planting, growing and harvesting), processing, transporting, selling/buying, or importing/exporting raw leaf tobacco to hold registration certificates issued by the Ministry of Finance.[101] In addition to overseeing a registration and reporting system for these bodies, the program includes baling or packaging, labelling, transportation, record-keeping and reporting requirements and exemptions for raw leaf tobacco registrants.[103]

The *Raw Leaf Tobacco Program* also conducts inspections and audits, seizes raw leaf tobacco and places civil penalties and offences, if necessary.[101] According to the *Tobacco Tax Act*, tobacco retailers who sell contraband tobacco can be subject to fines, penalties and imprisonment.[104]

Evidence

The best available research evidence for this topic comprised six grey literature reports provided by SFO-SAC. [2,8,27,45,47,96] No reviews related to anti-contraband measures were identified from the pre-appraised literature. Sweeting et al. (2009) is a comprehensive report describing different forms of contraband tobacco and anti-contraband policy measures.[96] Table 3.1 describes anti-contraband measures that have been proposed.

Table 3.1: Proposed Anti-Contraband Measures

Anti-Contraband Measure	Description
Licensing[6,96]	Licensing involves permission from a competent authority to do business.[96] Governments can require manufacturers/retailers do business with only other licensed bodies, thereby creating a greater chain of accountability.[96]
Tax-markings/stamping[3,6,8,96]	Applying provincial tax-paid marking to every cigarette sold in Ontario can help to distinguish tax-paid, legally tax-exempt products from contraband products.[8] This helps officials and consumers determine whether a product has ended up in a jurisdiction it was not intended to be in.[96]
Tracking and tracing[3,6,8,47,96]	Tracking and tracing systems can enhance enforcement (border controls, investigations, intelligence, inspections and seizures) for tobacco products.[8] This includes marking tobacco products with a unique, secure and non-removable identifier.[2] This helps to maintain supply chain integrity by strengthening authorities' ability to identify illicit products and determine at what point products are diverted from legal supply chains into illicit markets, and allows them to identify who was in control of the products at that point.[2]

Anti-Contraband Measure	Description
Record-keeping/control measures[96]	Record-keeping involves documenting information from all members of the tobacco supply chain, from raw material producers to manufactures to retailers.[96] This might include recording when shipments are made/received and to/from who.[96]
Enhanced enforcement[3,8,96]	Enforcement involves mobilizing municipal police and other enforcement personnel to assist in enforcing contraband controls.[8] This might include empowerment of municipal police, establishing joint operation groups and educating and empowering non-police officials.[8]
Export taxation[96]	Increasing tax on exported goods can decrease smuggling, particularly in areas where tobacco was exported tax-free to jurisdictions with lower sales tax.[96] This tax can also be refunded if proof is provided that indicates that cigarettes were sent to a legitimate body.[96]
Tax harmonization[96]	Tax harmonization occurs when jurisdictions agree to cooperate on issues of taxation, implementing tax at the same rate across jurisdictions, thereby reducing the economic incentives of cross-border shopping.[96]
Tax agreements with the First Nations[96]	Tax agreements with First Nations allow them to tax certain goods at the State rate and keep the proceeds.[96] This undermines the economic incentive to purchase tobacco on reserves. Tax could be collected from all tobacco customers or just non-Indigenous persons.[96]
Legally binding agreements with the tobacco industry and memoranda of understanding[96]	Legal agreements with the tobacco industry outline the obligations and regulations on those within the tobacco market.[96] They include legislated enforcement mechanisms, and therefore provide incentives for the tobacco industry to ensure adequate control of their supply chains.[96] "A Memorandum of Understanding (MOU) is a non-binding agreement of cooperation between parties. In theory, MOUs should encourage voluntary industry cooperation to limit their brand presence in smuggling operations, instead of creating stricter government regulations. Nonetheless because MOUs are not legally binding, unenforceable, and hinge on the willingness of industry to comply with their terms, they are not particularly useful in practice".[96]

Anti-Contraband Measure	Description
Public awareness campaigns[8,96]	Public awareness campaigns that emphasize the negative impacts of contraband (e.g., lost government revenue, increased smoking rates and increased youth smoking) highlight that contraband tobacco is not a 'victimless crime'(which is often assumed) and may also discourage the sale and distribution of contraband tobacco products.[96]
Engage in dialogue with First Nations leadership and communities[3,8]	Engaging with First Nations leaders and community members can achieve a mutually-satisfactory approach to stop the sale of tax exempt tobacco to ineligible individuals, and implement strategies to address the production, distribution and sale of contraband tobacco communities.[3,8]

Evidence of Effectiveness

It is not easy to study the effectiveness of anti-contraband policy measures because the level of contraband use is difficult to obtain.[45,96] For example, Canada does not provide official estimates of the size of the illicit market or comprehensive data on contraband tobacco seizures made by federal and provincial agencies.[96] As a result, few reports regarding effectiveness of anti-contraband measures were identified.

However, evidence from Quebec has shown that anti-contraband efforts can succeed.[27] In 2008-09, the Quebec government increased efforts to control contraband tobacco through the Actions Concertées pour Contrer les Économies Souterraines (ACCES) tobacco committee, which aimed to dismantle smuggling networks and to recover tax losses linked to illicit trade in tobacco.[27] The actions taken since 2008 have led to a reduction in illegal tobacco trade and smuggling as well as to increased revenue from taxes on tobacco products (from $654 million in 2008-2009 to $1,026 million in 2013-2014 without an appreciable increase in smoking rates in Quebec).[27] Following the decreases in contraband rates, the Quebec government raised its tobacco taxes and has continued to increase its tax revenue and maintain stable rates of contraband tobacco.[27]

Intervention Characteristics/Implementation Considerations

A number of factors may influence the impacts of anti-contraband measures. For instance, policies which target legally-manufactured tobacco that is smuggled across borders will have no impact on illegally-manufactured tobacco and counterfeit cigarettes that are produced within the country.[96]

Additionally, contraband activities change over time (often in response to anti-contraband measures) (Sweeting 2009).[96] Policies must be able to adapt to these changes, while taking into account feasibility of different policies and long-term impacts.[96]

Anti-contraband measures also require cooperation among various groups (e.g., governments, organizations and agencies),[2,96] and they must be comprehensive and multi-faceted.[96] For example, measures might require a combination of regulations, policies, enforcement and awareness campaigns.[96]

Specific Populations/Equity Considerations

It is important to consider the potential implications to First Nations communities when implementing anti-contraband measures since tobacco trade is considered to be a First Nations right.[96] Tobacco may be a major funding source for community initiatives (e.g., daycares, libraries) and controlling contraband tobacco might not be financially feasible.[96] Implementing anti-contraband measures may negatively impact the autonomy of First Nations and it has been suggested that any new policies should be endorsed, executed and enforced by the communities.[96] Additionally, governments should collaborate with First Nations when they develop policies that may affect their communities.[96]

Intervention Summary

Evidence Summary - Anti-Contraband Measures - Promising direction

The evidence related to anti-contraband measures comprised several grey literature reports from the U.S. Surgeon General, World Health Organization, Ontario Tobacco Research Unit, among others. The effectiveness of anti-contraband policy measures cannot be easily studied as the level of contraband use is difficult to measure; however, anti-contraband efforts in Quebec have been effective to reduce illegal tobacco trade and increase revenue from taxes on tobacco products.

SFO-SAC 2016 Scientific Consensus Statement - High (Intensify)

Ontario has introduced a number of anti-contraband measures including new tobacco stamps and strengthened enforcement and penalties for selling contraband. These will continue to have a high contribution in Ontario. However, Ontario has not implemented sufficiently strong measures to identify and cut-off supplies of contraband tobacco. When implementing anti-contraband measures in Ontario, it is important to collaborate with First Nations Communities on the development of policies which potentially impact them. The implementation of stronger measures, in concert with First Nations communities, would further decrease the use of cheap contraband tobacco which will contribute to decreasing the prevalence of tobacco use.

The scientific consensus regarding the potential contribution for Ontario is: High (Intensify).

Key Message

Anti-contraband measures have been shown to be successful in Canadian jurisdictions such as Quebec. A number of anti-contraband measures have been implemented in Ontario, and they can be further strengthened.

Litigation

Both civil and criminal legal claims against the tobacco industry have been filed in the past on the grounds of ill-health, health care costs, smuggling, hiding of scientific evidence, failure to warn consumers adequately about ill-effects of tobacco products and exposing the public to unreasonable danger.

Litigation resulting in large financial settlements has the potential to provide justice and compensation for victims, deal financial blows to tobacco companies (including bankruptcy), provide funding that can be used for tobacco control programs and portray the wrongdoings of the tobacco industry. Tobacco litigation can also provide an opportunity to further shed light on the practices of tobacco manufacturers by making industry documents available for public consumption and scientific analysis. Litigation by the Government of Ontario holds promise to yield several of these desired outcomes. It is not clear at this point what the contribution of such litigation would make to reduce the prevalence of tobacco use.

SFO-SAC 2016 Scientific Consensus Statement

Background

Litigation involving against tobacco companies attempts to challenge them through judicial processes. Litigation can be civil action and/or criminal charges. Claimants can be individuals, groups suffering a common harm (class action) or third parties (e.g., governments, non-governmental organizations or insurance companies).[105]

Litigation against tobacco companies offers various potential social benefits. Tobacco litigation has provided an opportunity to shed light on the practices of tobacco manufacturers by making industry documents available for public consumption and scientific analysis.[47,105,106] Successful litigation can: 1) provide funding that can be used for tobacco control programs;[106] 2) serve to recover health care costs for smokers incurred due to smoking-related illnesses;[107] 3) lead to tobacco product price increases;[47,105,106] 4) create a situation in which the tobacco industry could become bankrupt if the number of cases and/or awards/settlements were large enough;[106] and 5) ensure that companies are compliant with future regulations.

Moreover, punitive damages can potentially encourage manufacturers to examine their practices and prevent industry misconduct in future.[106] For example, litigation settlements may include provisions that encourage manufacturers to change their products or marketing practices to reduce associated risks.[47] Lastly, publicity associated with lawsuits, and the information they generate, may help to further denormalize smoking and reduce the perceived legitimacy of the tobacco industry.[108]

The Ontario/Canadian Context

In 2009, the *Ontario Tobacco Damages and Health Care Costs Recovery Act* was passed, which enabled the province to sue tobacco companies directly for alleged wrongdoing and to recover health care costs incurred due to smoking, going back several decades.[105] The Ontario legislation created a method to determine the cost of damages associated with tobacco use and the allocation of liability based on the market share. However, despite the number of past lawsuits in Canada and Ontario, these suits have not included criminal charges.[106]

Across Canada, other provinces have also filed health care cost recovery lawsuits against the tobacco industry since British Columbia first filed in 2001. Since then, New Brunswick (2008), Newfoundland and Labrador (2011), Alberta (2012), Saskatchewan (2012), Manitoba (2012), Quebec (2012) and Prince Edward Island (2012) have followed with health care cost recovery lawsuits, with Nova Scotia and Nunavut also announcing their intention to file.[105]

Evidence

The best available research evidence for this topic comprised two commentaries,[107,108] one primary study (appraised to be Level II)[109] and six grey literature reports from the U.S. Surgeon General,[47] Physicians for a Smoke-Free Canada,[110] Global Tobacco Control Forum ,[57] Ontario Tobacco Research Unit,[105] Smoking and Heath Action Foundation[106] and Widener Law Review,[111] all provided by SFO-SAC. All commentaries and the primary study were from the United States. No pre-appraised reviews were identified for this topic.

Impacts of Litigation

Litigation in the news can impact smokers' beliefs about tobacco products. The news media coverage of tobacco litigation regarding the tobacco industry's failure to disclose health risks concerning 'light' cigarettes, for example, served to reduce inaccurate beliefs and reinforce messaging about the health risks associated with the use of tobacco products.[109] Smokers with inaccurate beliefs were less likely to have strong quitting intentions (OR: 0.52, 95% CI: 0.28-0.96).[109]

Legal Claims and Criminal Charges

Numerous legal claims (civil and criminal) against the tobacco industry have been filed, based on ill-health, health care costs, smuggling, hiding of scientific evidence, failure to warn consumers adequately about ill-effects of tobacco products and exposing the public to unreasonable danger.[105]

In the United States, in 1998, the Attorneys General of 46 states and six other U.S. jurisdictions collectively commenced a civil class action lawsuit against the four of the largest tobacco manufacturers to recover the health care costs for smokers incurred due to smoking-related illnesses.[107] It was

considered the largest civil lawsuit in U.S. history, and resulted in a settlement known as the Master Settlement Agreement (MSA).[107] States were awarded billions of dollars over a 25-year period, and the tobacco companies agreed to curtail how cigarettes could be advertised and targeted to minors .[107] Four states that had settled with the tobacco industry before the MSA were given an additional $40 billion collectively, to be paid out over the same 25-year period. Those funds were used to form a non-profit national organization, the American Legacy Foundation, to support tobacco control initiatives and associated research. However, the public health benefits of the MSA have been a matter of some controversy, as most states have performed poorly in directing their settlement funds to reduce tobacco consumption.[107] Between 2002 and 2006, states that were part of the MSA, allocated on average between three to five per cent of their MSA funds to tobacco control programs.[111] Following the MSA, tobacco companies increased the retail price of cigarettes to help cover the costs of the settlement, and the sales of cigarettes decreased by 6.5% the year following the MSA.[111]

The parties agreed to settle in order "to avoid the further expense, delay, inconvenience, burden and uncertainty of continued litigation (including appeals from any verdicts)",[112] which meant that local and state governments could not sue tobacco companies in the future. Tobacco companies were not protected from future lawsuits by individuals, class-action lawsuits, private healthcare insurance companies, or labour unions.[113]

Tobacco companies have also faced criminal charges. In 2003, the RCMP laid criminal charges against JTI-Macdonald and related companies, claiming that between 1991 and 1996, Canada, Ontario and Quebec had been defrauded of $1.2 billion in tobacco tax revenue. In 2008, settlements were reached with British American Tobacco and Philip Morris International; each company pleaded guilty to the charge of selling smuggled cigarettes and agreed to pay $1.15 billion to federal and provincial governments. In 2010, settlements were reached with JTI-Macdonald and its former owner, RJ Reynolds Tobacco Co., with total fines and civil payments of $550 million.[57] Observers noted that "both sets of settlements were severely criticized for the secrecy in which they were negotiated, for the absence of measures to address health outcomes and the lack of sanctions against individuals for their wrongdoing."[57]

Excluding the U.S., more than half of the world's tobacco lawsuits are in Canada. Physicians for Smoke-free Canada maintains an online library of documents and key events related to tobacco litigation in Canada. Currently, 10 class actions (three certified and seven dormant) and 10 health care cost recovery lawsuits by all provincial governments are ongoing.[110]

In 1998, in Quebec, Jean-Yves Blais and the Conseil québecois sue le tabac et la santé and Cécelia Létourneau filed class action lawsuits against Imperial Tobacco Canada LTD., Rothmans, Benson & Hedges, and JTI-MacDonald. After 251 days of hearings, from March 2012 to December 2014, Justice Brian J. Riordan[106,114] ruled that the tobacco companies were guilty of violating four laws ("a general duty not to cause harm to another; the manufacturers' duty to inform their clients of the risks and dangers of their products; the right to life, personal security, personal inviolability and dignity protected by the *Quebec Charter of Human Rights and Freedoms*; the manufacturers' obligation not to hide the truth from or mislead their clients concerning their products under the *Quebec Consumer Protection*

Act"). The judge awarded $15.5 billion in moral and punitive damages to smokers in the Blais file and $1.31 billion in the Létourneau file,[115] that included 99,957 injured Quebecers who could claim payments from the settlement. The implications of this ruling were the need for: (1) clearer rules regarding a duty to warn consumers and to not cause harm and (2) better standards for misleading advertising of harmful products.[114]

Intervention Characteristics/Implementation Considerations

As litigation against tobacco companies has helped advance the public health goal of tobacco control, (which is reducing the morbidity and mortality caused by tobacco products)[47] it is important to identify public health provisions that should be included in a judgment or settlement resulting from tobacco-industry litigation.[3]

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Litigation - Supported

The evidence evaluating the effectiveness of litigation efforts comprised several grey literature reports (including reports from the U.S. Surgeon General and the Global Tobacco Control Forum), commentaries and a primary study. Evidence from one primary study showed that media coverage of litigation can reduce inaccurate beliefs that act as a barrier to quitting. To date there have been a number of civil and criminal law suits filed against large tobacco companies in the U.S. and Canada. Results of these lawsuits have allowed claimants to recover some health care costs through settlements; however, as with the Master Settlement Agreement in 1998, in some cases settlement funds intended to increase tobacco control have been redirected to other areas of need. Despite the number of past lawsuits in Canada and Ontario, these suits have not included criminal charges.

SFO-SAC 2016 Scientific Consensus Statement - Uncertain at this time

Both civil and criminal legal claims against the tobacco industry have been filed in the past on the grounds of ill-health, health care costs, smuggling, hiding of scientific evidence, failure to warn consumers adequately about ill-effects of tobacco products and exposing the public to unreasonable danger.

Litigation resulting in large financial settlements has the potential to provide justice and compensation for victims, deal financial blows to tobacco companies (including bankruptcy), provide funding that can be used for tobacco control programs and portray the wrongdoings

of the tobacco industry. Tobacco litigation can also provide an opportunity to further shed light on the practices of tobacco manufacturers by making industry documents available for public consumption and scientific analysis. Litigation by the Government of Ontario holds promise to yield several of these desired outcomes. It is not clear at this point what the contribution of such litigation would make to reduce the prevalence of tobacco use.

The scientific consensus regarding the potential contribution for Ontario is: Uncertain at this time.

Key Message

Litigation by the Government of Ontario holds promise to yield several desired outcomes, including the potential to portray the wrongdoings of the tobacco industry, provide justice and compensation for victims, deal financial blows to tobacco companies (including bankruptcy) and provide funding that can be used for tobacco control programs.

Non-Price Controls

Imposing a Quota on Tobacco Product Availability (Sinking Lid)

There is currently no evidence available evaluating the effectiveness of sinking lid interventions, but theory suggests that implementing a sinking lid intervention could transform the tobacco market, cause tobacco product prices to increase, and thus reduce the demand for tobacco products.

SFO-SAC 2016 Scientific Consensus Statement

Background

'Sinking lid' is an endgame strategy that involves regularly reducing the quota on tobacco production and imports.[116] Reducing quotas would cause tobacco product prices to increase and thus reduce the demand for tobacco products.[116] In addition, manufacturers and importers of tobacco products would have to bid for shares at government-run auctions to sell their products.[117] The revenue that the government would gain from the auctions would be used to help fund tobacco control programmes.[9]

The development of quota management systems originates principally from a need to manage environmental and natural resource allocation problems.[116] Quota systems that have been applied internationally, often with large corporate companies (e.g., 'cap and trade' for fossil fuel emissions, 'catch share' for fishing, import quotas on Hydrochlorofluorocarbons (HFCs)), may provide some evidence to support a sinking lid strategy as an impactful tobacco control initiative for Canada.[116,118]

Although there has been success with these strategies internationally, critical aspects for a sinking lid of quotas on tobacco differ from these other domains. For tobacco, the goal is to reduce supply to a low level or with a complete sales end-date, where all current quota management systems aim to sustain the resource by reducing "detrimental component characteristics with the least distortionary effect possible on the overall market".[118] For example, setting quotas for the amount of fish that can be caught in a fishery allows the industry to continue while attempting to prevent collapses and restore declining fisheries. Specific implementation considerations for sinking lid for tobacco must therefore be considered separately, including the Canadian market context for tobacco.[118]

The Ontario/Canadian Context

No information related to the Ontario or Canadian context was identified from the included literature of this report.

Evidence

The best available research evidence comprised one grey literature report provided by SFO-SAC that discussed various strategies including 'sinking lid';[9] however no reviews related to sinking lid were identified from the pre-appraised literature.

Intervention Characteristics/Implementation Considerations

Researchers suggest that a sinking lid strategy would be more successful if it were accompanied by other comprehensive tobacco control measures such as mass media campaigns.[116] This type of intervention requires strong political will and high public support and may be more feasible to implement in jurisdictions with low (<%15) adult smoking prevalence.[116] Additionally, those trying to implement sinking lid may face legal challenges from the tobacco industry (e.g. may trigger tobacco company litigation against the government).[116]

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Imposing a Quota on Tobacco Product Availability (Sinking Lid) - Emerging

The body of evidence related to sinking lid interventions comprised one grey literature report. Sinking lid involves regularly reducing the quota on tobacco production and imports. Reducing quotas would cause tobacco product prices to increase and thus reduce the demand for tobacco products. In addition, manufacturers and importers of tobacco products would also have to bid for shares at government-run auctions to sell their products. The revenue that the government would gain from the auctions would be used to help fund

tobacco control programmes. There is currently no evidence available evaluating the effectiveness of sinking lid interventions.

SFO-SAC 2016 Scientific Consensus Statement - Innovative, Positive Equity

There is currently no evidence available evaluating the effectiveness of sinking lid interventions, but theory suggests that implementing a sinking lid intervention could transform the tobacco market, cause tobacco product prices to increase, and thus reduce the demand for tobacco products.

The scientific consensus regarding the potential contribution for Ontario is: Innovative. This intervention has a potential positive equity impact.

Key Message

Theory suggests that implementing a sinking lid intervention could cause tobacco product prices to increase and thus reduce the demand for tobacco products.

Regulatory Institutions

Regulated Market Model

The regulated market model could transform the tobacco market landscape and has the potential to be an effective tobacco control strategy to reduce harms associated with tobacco use.

SFO-SAC 2016 Scientific Consensus Statement

Background

The regulated market model is proposed as an intervention to reduce tobacco consumption and harm by regulating the tobacco market through the creation of a Tobacco Products Agency.[7] This agency would act as the sole purchaser and supplier of tobacco products.[7]

Attributes of a regulatory market for tobacco in Ontario can be compared to the current approach used for alcohol sales in Ontario.[119] The Alcohol and Gaming Commission of Ontario (AGCO) is responsible to oversee the Liquor Licence Act (LLA).[120] These laws have authority over regulation and licensing of the following: liquor sales licences, ferment on premise facility licences, liquor delivery services, manufacturer's licences and manufacturer's representative licences. The current system offers a mix of private and publicly owned off-premise retail outlets.[120] Alcohol is primarily sold through three main channels, including The Liquor Control Board of Ontario (LCBO), The Beer Store network, and Ontario

winery stores.[120] This system has been found to reduce alcohol consumption and related harms through regulating access to alcohol through outlet locations, hours of operation, minimum pricing, taxes and social responsibility promotion (e.g., recommended standard drink, drinking and driving campaigns).[121] Similar models for alcohol regulation that resemble Ontario's approach exist across North America.[120] The AGCO can offer a framework for which tobacco may be regulated and sold in Ontario.

The Ontario/Canadian Context

No information related to the Ontario or Canadian context was identified from the included literature of this report.

Evidence

The best available research evidence for this topic comprised two grey literature reports provided by SFO-SAC.[7,9] Both grey literature reports cited one special communication article.[119] No review articles on regulated market model were identified from the pre-appraised literature.

The regulated market model is viewed as a compromise between free enterprise and government takeover, as the growing, manufacturing and sale of tobacco products to consumers would continue to be run privately.[119] However, as the sole purchaser from manufacturers and the sole supplier to retailers, the Tobacco Products Agency would be able to shape the tobacco market, with the goal of reducing harm to the consumer.[119]

With control over the marketing of tobacco products, the Tobacco Products Agency would be able to apply and enforce other tobacco control strategies aimed at reducing the demand for cigarettes, such as mandating plain packaging, reducing retail outlet density, increasing point-of-sale cessation support and increasing taxes.[9] The regulated market model could encourage the innovation of less harmful products (e.g., reduced product toxicity, progressive reduction of nicotine content) by granting larger market share to manufacturers that create safer products.[7] The Tobacco Products Agency would also be better equipped to enforce compliance with regulations among retailers, as they would need to compete with each other to obtain their supply.[7]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Regulated Market Model - Emerging

The body of evidence for the regulated market model consists of two grey literature reports. Under the regulated market model, a Tobacco Products Agency would become the sole purchaser and supplier of tobacco products, giving it the power to set prices, regulate tobacco products and make them less harmful to consumers. There is currently no evaluative evidence on this topic.

SFO-SAC 2016 Scientific Consensus Statement - Innovative

The regulated market model could transform the tobacco market landscape and has the potential to be an effective tobacco control strategy to reduce harms associated with tobacco use.

The scientific consensus regarding the potential contribution for Ontario is: Innovative.

Key Message

The regulated market model has the potential to reduce the harms of tobacco products to consumers through the regulation of tobacco products.

Non-Profit Enterprise with a Public Health Mandate

The acquisition of tobacco corporations by a non-profit enterprise with a public health mandate has the potential to transform tobacco control and be an effective tobacco control strategy to reduce tobacco use over time. While no examples of this intervention have been reported, there is potential that a non-profit enterprise takeover of the tobacco industry could be used to bring an end to the tobacco epidemic.

SFO-SAC 2016 Scientific Consensus Statement

Background

The creation of a non-profit enterprise with a public health mandate is proposed as an intervention to eliminate tobacco use through the acquisition of tobacco companies.

The Ontario/Canadian Context

No information related to the Ontario or Canadian context was identified from the included literature of this report.

Evidence

The best available research evidence for this topic comprised of three grey literature reports provided by SFO-SAC.[7,9,47] The three grey literature reports all cited one special communication article.[122] No review articles on non-profit enterprises with public health mandates were identified from the pre-appraised literature.

While the regulated market model has the potential to reduce the harm of tobacco, some researchers have argued that regulation does not address the fundamental issue with the tobacco industry: that the mandate of privately-owned corporations is to act in the best interest of their shareholders.[122] Given this mandate, corporations will try to find ways to circumvent tobacco control strategies. A potential solution would be to purchase (voluntarily or legislated) tobacco corporations from shareholders, transferring the manufacturing and supply of tobacco from for-profit corporations to a non-profit enterprise with a public health mandate.[122] Compared to the Regulated Market Model that would focus on harm reduction and reduction of demand, a non-profit enterprise with a public health mandate would strive to eliminate tobacco use over time by slowly reducing the supply of tobacco products.[122] Tobacco products would be increasingly designed to enable smokers to quit and to prevent initiation.[7]

While no examples of this intervention have been reported, there is potential that a non-profit enterprise takeover of the tobacco industry could be used to bring an end to the tobacco epidemic.

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Non-Profit Enterprise with a Public Health Mandate - Emerging

The body of evidence for non-profit enterprise with a public health mandate consists of three grey literature reports. For this intervention, tobacco corporations would be purchased from shareholders, transferring the manufacturing and supply of tobacco from for-profit corporations to a non-profit enterprise with a public health mandate. This enterprise would be responsible for eliminating tobacco use over time by slowly reducing supply and designing tobacco products to promote cessation and prevent initiation. There is currently no evaluative evidence on this topic.

SFO-SAC 2016 Scientific Consensus Statement - Innovative

The acquisition of tobacco corporations by a non-profit enterprise with a public health mandate has the potential to transform tobacco control and be an effective tobacco control strategy to reduce tobacco use over time. While no examples of this intervention have been reported, there is potential that a non-profit enterprise takeover of the tobacco industry could be used to bring an end to the tobacco epidemic.

The scientific consensus regarding the potential contribution for Ontario is: Innovative.

Key Message

A non-profit enterprise with a public health mandate has the potential to reduce tobacco-related harm and eliminate tobacco use over time.

Performance-Based Regulation

The implementation of performance-based regulation for the tobacco industry could improve public health outcomes related to tobacco because the industry would be legally responsible to improve these outcomes as a condition to do business. There is potential that well-implemented performance-based regulation holds promise to substantially reduce tobacco use. Canada has effectively used performance-based regulation with tobacco to reduce cigarette ignition propensity.

SFO-SAC 2016 Scientific Consensus Statement

Background

Performance-based regulation is a method, proposed by Stephen Sugarman, Professor of Law at the University of California at Berkeley, and elaborated upon for the Canadian context by Physicians for a Smoke-Free Canada (PSC), that recommends assigning legal responsibility to the tobacco industry to address the public health consequences of its business.[123,124]

The Ontario/Canadian Context

In Canada, in 2007, the federal government made a commitment to shift the focus of all regulation from design to objective-focused, which is a shift to performance-based regulation.[124] For example, performance-based regulation has been used effectively with tobacco in Canada for reduced cigarette ignition propensity: tobacco companies must meet "a closely specified standard of reduced ignition propensity", but the methods by which they can do that are not regulated and are at the discretion of the individual companies.[124] Health Canada monitors the tobacco companies on this regulation, and the

large companies are reported to be compliant.[124] PSC states that Health Canada is in a position to act as an overseeing body to evaluate success in achieving performance measures, as it administers existing tobacco regulations and successfully monitors the industry's reduced ignition propensity requirements described above.[124]

Evidence

The best available evidence for this topic comprised a published expository article,[123] a book section,[125] and two grey literature reports,[7,124] provided by SFO-SAC. No review articles on performance-based regulation of the industry were identified from the pre-appraised literature.

Performance-based regulation is proposed as an outcomes-based measure: the regulator would decide on an outcome the industry needs to meet based on the harm it does, but it would be the industry's responsibility to decide and implement how to meet that outcome.[123] For example, a performance outcome might be a 5% reduction in youth smoking initiation over a period of time, with an increasing reduction over successive periods. Dictating the outcome would make the industry accountable to ameliorate harm, rather than having responsibility only to the point of implementing a program without it needing to ensure it has public health success. Ideally, this would ensure outcomes are actually substantively changed.

Sugarman proposes two options to ensure compliance in a performance-based regulation tobacco policy intervention. The first is a penalty-only scheme, in which a severe financial penalty would be applied to the industry for not meeting the performance goal; the second is a dual penalty and reward system, supported by PSC, which would add a financial reward if the industry were to exceed the performance goal.[123,124] The penalty is recommended to be profit-minimizing and greater than the cost of working toward the performance goal, with the reward recommended to exceed profits.[123,124] In this way, the industry could meet its responsibility to its shareholders without ignoring its public health impacts.[124] As the intention is for the responsibility to be applied at an industry-wide level, a "cap and trade" system is proposed, whereby a company that exceeded its allotted goal could sell their overage to a company that was not meeting its goal.[123] Sugarman suggests that within the industry, shares of the responsibility could be assigned to different companies, for example, according to market share or by geography.[123] PSC highlights that without severe penalties, and potentially, without significant rewards, it would be very difficult to successfully implement an intervention that requires the tobacco industry to begin discouraging use of its products.[124]

An agency to oversee the initiatives, evaluate their success, and apply penalties as necessary is key to this strategy.[123] Sugarman additionally suggests that this agency should have veto power over industry initiatives that work toward the outcome but at the expense of public health as a whole (e.g., convincing youth to take up smokeless tobacco to bring down cigarette smoking initiation rates).[123]

Sugarman notes the importance of continual re-evaluation in performance-based regulation.[123] The outcomes must be ambitious but also not unrealistic, and the regulation must be flexible to make changes to ensure the system is working as intended.[123] The outcomes must also be easily measured and unambiguous to all parties involved to avoid confusion and industry manipulation.[123,124] The

financial penalties and rewards, if used, must also be continually evaluated to ensure they are enough to keep incentivizing the industry.[124] Performance-based regulation for tobacco would allow for easily and already measured outcomes such as smoking prevalence.[124]

PSC's report highlights that performance-based regulation as a strategy is an evolutionary way forward in tobacco control, as it could be worked into existing structures and would not require a full regulatory overhaul.[124] PSC describes that, in the Canadian context, performance-based regulation could be integrated into the federal *Tobacco Act* and would not require anything be removed from the Act.[124] The report also recommends that litigation be used to support legislative initiatives that will be fought by the tobacco industry, noting that while litigation has historically sought and currently seeks financial retribution, there is latitude for litigation to seek regulatory change to reduce prevalence as well or instead.[124] As the tobacco industry would likely strongly oppose a performance-based regulation scheme,[124,125] it is important that an implementation strategy involve the use of multiple processes that can support each other.[124]

PSC and Sugarman both discuss the reduction of prevalence as the primary outcome measure for performance-based regulation,[123,124] and TSAG and SFO-SAC 2010 recommended the industry take responsibility for reducing youth and young adult initiation as a measure of industry accountability.[3,8] Ultimately, since the aim is for the tobacco industry to take responsibility for the harms that are inherent in its business, the industry would gradually diminish its opportunity to operate as a profitable business.[124] PSC states that with a gradual use of performance-based regulation over the course of approximately 25 years, tobacco companies ultimately would be able to shift their business to other, more profitable endeavours.[124] In addition, PSC acknowledges the concern of contraband tobacco use as an alternative if the commercial industry was declining in line with performance goals, and notes that since contraband minimization is in line with reducing smoking prevalence overall, it could be a component of the performance goals.[124]

Performance-based regulation for reducing smoking prevalence or related outcomes has not been undertaken by any country,[125] and so this intervention's effectiveness has not been evaluated. There is potential that well implemented performance-based regulation hold promise to substantially reduce tobacco use.

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary – Performance-Based Regulation - Emerging

The body of evidence for performance-based regulation consists of one published expository article, two grey literature reports and a book section. Performance-based regulation is proposed as an outcomes-based measure where a regulator would decide on an outcome the industry needs to meet, based on the harm it does. It would be the responsibility of the industry to decide and implement how to meet that outcome. This intervention has been used only narrowly to reduce cigarette ignition propensity, and there is currently no evaluative evidence for more intensive performance-based regulation.

SFO-SAC 2016 Scientific Consensus Statement - Innovative

The implementation of performance-based regulation for the tobacco industry could improve public health outcomes related to tobacco because the industry would be legally responsible to improve these outcomes as a condition to do business. There is potential that well-implemented performance-based regulation holds promise to substantially reduce tobacco use. Canada has effectively used performance-based regulation with tobacco to reduce cigarette ignition propensity.

The scientific consensus regarding the potential contribution for Ontario is: Innovative.

Key Message

Performance-based regulation has the potential to improve public health outcomes related to tobacco by assigning legal responsibility to the tobacco industry to improve the public health consequences of its operations.

Product

Background

The content and design of tobacco products have implications for addictiveness, toxicity and consumer appeal. Thus the regulation of tobacco products has been identified as an important area for tobacco control.[2,126] The WHO has made a number of tobacco control recommendations in relation to tobacco products, including Article 9 (regulation of the contents of tobacco product) and Article 10 (regulation of tobacco product disclosures) of the WHO *Framework Convention on Tobacco Control*.[2,126] Article 9 (regulation of the contents of tobacco product) states that all parties "propose guidelines for testing and measuring the contents of emissions of tobacco products and for the regulation of these contents and

emissions."[6] Article 10 states that each party shall "adopt and implement effective legislative, executive, administrative or other measures requiring manufacturers and importers of tobacco products to disclose to governmental authorities information about the contents and emissions of tobacco products."[6]

Reducing Product Toxicity

> *There is limited or no evidence of effectiveness from regulations to reduce toxicity of conventional cigarettes. The potential benefit of regulations to reduce product toxicity remains unclear, and may, in fact, be harmful because it provides the tobacco industry with the opportunity to market its products as less harmful. In Canada, it is mandatory to disclose the toxic emissions and ingredients of tobacco products and any research activity regarding them, and to have a toxic emission statement on tobacco products.*
>
> *SFO-SAC 2016 Scientific Consensus Statement*

Background

The rationale behind reducing tobacco product toxicity is to reduce harm.[127] It is widely established that carcinogens and toxins found in tobacco products and the products' emission (defined as *"*substances released from the product when it is used as intended*")*[128] can result in many negative health consequences.[47,129] While reducing toxicity of selected toxicants is an intuitive strategy, there is considerable uncertainty about the potential health impact based on the amount and type of toxicants. There are serious limitations on the extent to which tobacco products can be made less harmful, particularly in the case of cigarettes, given the magnitude of toxic chemicals in cigarette smoke and the levels of exposure among regular users. Even where the levels of toxic chemicals can be reduced, there is considerable scepticism in the scientific community as to whether these reductions would be sufficient to reduce health risks.

The Ontario/Canadian Context

There is no current Ontario or federal legislations on reducing tobacco toxicity, such as placing limits on harmful substances. However, under the federal *Tobacco Reporting Regulations (SOR/2000-273*), tobacco manufacturers and importers must provide annual reports regarding tobacco product ingredients (including toxic constituents) and toxic emissions, and any research activity on the toxicity and health effects of tobacco products.[130,131] Manufacturers must also provide disclosure on the level of over 20 chemical constituents and 40 smoke emissions.[131] In addition, manufacturers must perform toxicity testing using standard methods, including those set by the International Organization for Standardization.[131] Under *the Tobacco Products Labelling Regulations (SOR/2011-177),* cigarettes and cigar packages must also have a toxic emission statement indicating that the product contains toxic constituents that can result in health consequences (e.g., cancer or damage to the respiratory system).[132]

Regulating toxic emissions has the potential to undermine consumer perceptions of risk by promoting the belief that tobacco products are becoming less harmful, much in the same way that 'lower tar' cigarettes have been perceived by consumers.[133] The tobacco industry has identified emission limits as

an effective marketing platform, where manufacturing 'conventional' cigarettes with lower emission profiles are among the industry's primary product development strategies.[56] In short, the potential benefits of regulating toxic emissions of cigarettes to reduce the harm from smoking are highly uncertain and carry known risks. In addition, there is currently no known country experience of toxic emission limits that provides evidence of effectiveness of decreased health risks from 'less harmful' tobacco products.

Evidence

The best available research evidence came from three grey literature reports that discuss reducing the toxicity of tobacco products through regulation and/or disclosure.[47,126,129] One report was retrieved through a PHO Library search,[129] while the other two were provided by SFO-SAC.[47,126]

An important part of reducing product toxicity is to implement regulatory standards that mandate the manufacture and/or import of tobacco products of lower toxicity, as well as the disclosure of the harmful substances (carcinogens and other toxicants) found in tobacco products and the products' emission.[47,126,129] It has been recommended to establish limits for harmful substances.[126,129] The WHO Study Group on Tobacco Product Regulation (WHO TobReg) has developed a list of known carcinogens and other toxicants for mandatory lowering.[126,129] The list includes carcinogenic nitrosamines such as 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK) and N'-nitrosonornicotine (NNN), acetaldehyde, acrolein, benzene, 1,3-butadiene, benzo[a]pyrene, carbon monoxide, and formaldehyde.[126,129]

There are currently no epidemiological data that suggest any one combustible tobacco product is less harmful than any other, including products that currently have notably lower emission profiles for toxic emissions, such as tobacco-specific nitrosamines.[129] As a result, considerable debate continues about the merits of a strategy to reduce selective toxicants from tobacco or smoke.

Intervention Characteristics/Implementation Considerations

WHO TobReg has recommended that the regulatory strategy of lowering toxicants should be implemented in phases.[126] The first phase would require tobacco product (e.g., cigarettes) manufacturers to annually report toxicant levels to a regulatory authority. The second phase would involve "the promulgation of levels for toxicants above which brands cannot be offered for sale" and the final phase would enforce the mandated levels of toxicant.[126] Overall, the purpose of this strategy is to reduce levels of toxic constituents in cigarette smoke, as well as to prevent tobacco products with higher levels of smoke toxicants onto the market; not to promote these products as less harmful to health.[126]

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Reducing Product Toxicity - Undetermined

The body of evidence for reducing product toxicity through regulation and disclosure consists of three grey literature reports, including from the U.S. Surgeon General and the WHO. Whether reducing product toxicity through regulation and disclosure can reduce the harmful consequences of tobacco products is not known.

SFO-SAC 2016 Scientific Consensus Statement - Uncertain at this time

There is limited or no evidence of effectiveness from regulations to reduce toxicity of conventional cigarettes. The potential benefit of regulations to reduce product toxicity remains unclear, and may, in fact, be harmful because it provides the tobacco industry with the opportunity to market its products as less harmful. In Canada, it is mandatory to disclose the toxic emissions and ingredients of tobacco products and any research activity regarding them, and to have a toxic emission statement on tobacco products.

The scientific consensus regarding the potential contribution for Ontario is: Uncertain at this time.

Key Message

Tobacco manufacturers in Canada are required to disclose tobacco product ingredients and smoke emissions. Reducing product toxicity through regulation and disclosure has unclear effects on reducing the harmful consequences from the use of tobacco products.

Reduction of Nicotine Content in Cigarettes to Reduce Addictiveness

The clinical evidence indicates some promise for the reduction of nicotine content in cigarettes; however, it is currently unknown how this might be done at the population level, and with what effect. There is currently much scholarly debate on this topic.

SFO-SAC 2016 Scientific Consensus Statement

Background

One proposed intervention to reduce the consumption of tobacco is to lower the nicotine content of cigarettes to a level that minimizes its addictiveness.[9] In Canada, the average nicotine content of a cigarette is 12.6 mg of total nicotine.[134] Approximately 10% of this nicotine is absorbed by the smoker (referred to as the nicotine yield).[135]

It is important not to confuse very low nicotine content (VLNC) cigarettes with what the industry markets as "light" cigarettes. Nicotine levels are measured in two distinct ways in combustible tobacco: nicotine content, which refers to the total amount of nicotine included in the cigarette, and nicotine emissions, which refers to the amount yielded in smoke generated by machine-tests.[136] Cigarettes that are marketed as "light" by the tobacco industry generate lower nicotine yields when machine-tested due to filter ventilation that dilutes the smoke; however, the nicotine content remains the same.[136,137] This leaves "light" cigarettes vulnerable to manipulation by smokers to generate regular nicotine yields by circumventing the design features.[137] In contrast, VLNC cigarettes contain 5-10% of the nicotine content seen in standard cigarettes.[138] Compensatory smoking with VLNC is much more difficult than with "light" cigarettes, as the amount of nicotine contained within the tobacco in VLNC cigarettes is much lower than in standard cigarettes.[9,137,139]

The Ontario/Canadian Context

Cigarettes in Canada and Ontario currently have enough nicotine content to promote and sustain addiction, with few differences between cigarettes.[136] As noted above, the average nicotine content of a cigarette in Canada is 12.6 mg of total nicotine.[134]

Evidence

The best available research evidence for this topic comprised of four narrative reviews[135,137-139] (from a PHO Library search), three grey literature reports,[7,9,47] and one primary study (Hammond 2014)[136] provided by SFO-SAC. The four narrative reviews were appraised as Level III[135,137-139] and the primary study was appraised as Level III.[136]

Evidence of Effectiveness

Observers posit that reducing the amount of nicotine contained within a cigarette would make cigarettes less addictive, increasing the likelihood that smokers would be able to make successful quit attempts, and possibly reducing smoking initiation among youth.[7]

Reviews of lab studies with varying doses of nicotine have examined the effect among smokers who were motivated to quit of immediately switching to VLNC cigarettes for a six-week period.[137,138] Results showed that seven-day point prevalence abstinence was highest in groups that received 0.05 mg nicotine emission cigarettes, with a reduced number of cigarettes smoked per day, lowered cotinine levels and lowered carbon monoxide levels.[137,138]

These reviews also looked at lab studies that examined the effect of gradually switching to VLNC cigarettes among smokers who were not motivated to quit. Results showed that progressively reducing nicotine content resulted in decreased intake of nicotine, with minimal increases in compensatory

behaviour, which eventually subsided as the nicotine content dropped below 1 mg (0.1 mg nicotine emission).[135] These findings indicate that cigarettes may need to have nicotine content below 1 mg (or 0.1 mg nicotine emission) to prevent any compensatory behaviour.[135,137]

The strongest results were seen when the nicotine content was below 1 mg per cigarette (or 0.1 mg nicotine emission). There is no established level of nicotine that would make cigarettes non-addictive, or prevent initiation across the whole population; however, existing evidence would suggest that reducing the nicotine content to 0.5 mg per cigarette (or 0.05 mg nicotine emission) might be a good starting point.[7,135] These findings support the results of an Ontario-based study that found the most significant reductions in nicotine intake were observed with 0.05 mg nicotine emission cigarettes.[136]

Intervention Characteristics/Implementation Considerations

While the current evidence shows that reducing nicotine levels in cigarettes has the potential to be an effective intervention, the literature cautions that, like most tobacco control interventions, the reduction of nicotine content within cigarettes must be incorporated into a comprehensive tobacco control programme.[47,135] Increased education and increased access to treatment would be necessary to help smokers through the transition period and prevent demand for contraband cigarettes, especially in specific populations that might require tailored services (see below for further discussion).[135]

Specific Populations/Equity Considerations

The evidence on the effect that the reduction of nicotine content in cigarettes would have on youth is currently very limited. The results of one study found that adolescents who switch to VLNC cigarettes do engage in compensatory smoking behaviour, such as an increased number of puffs when compared to standard cigarettes.[137] However, given that nicotine is the primary constituent responsible for promoting and sustaining smoking, it is plausible to infer that VLNC would reduce smoking initiation among youth.

Smokers with psychiatric conditions such as schizophrenia, mood disorders and anxiety disorders may be at higher risk to engage in compensatory behaviour when switched to VLNC cigarettes.[137] Individuals with schizophrenia who smoke tend to absorb higher yields of nicotine due to increased puffs while smoking, making nicotine withdrawal symptoms more severe in this population.[137] The existing evidence shows that VLNC cigarettes are just as effective as standard nicotine cigarettes to reduce cravings in individuals with schizophrenia,[137] although switching this population to VLNC cigarettes may result in compensatory smoking behaviour.[137] Similarly, individuals with mood disorders or anxiety disorders experience more severe withdrawal symptoms than the general population.[137] To mitigate this reaction, smokers with psychiatric conditions may benefit from more gradual reductions in nicotine content, as opposed to immediate reductions, and they may benefit from the provision of nicotine replacement therapy during the transition period.[137]

Intervention Summary

Evidence Summary - Reduction of Nicotine Content in Cigarettes - Emerging

The body of evidence for the reduction of nicotine content in cigarettes comprised four narrative reviews, three grey literature reports, and one primary study. There are no 'real world' studies, and the sparse clinical evidence suggests that for individuals, switching to very low nicotine content cigarettes with 5-10% of the nicotine content contained in standard cigarettes, resulted in a reduction in cigarette consumption, without triggering compensatory smoking behaviour.

SFO-SAC 2016 Scientific Consensus Statement - Uncertain at this time

The clinical evidence indicates some promise for the reduction of nicotine content in cigarettes; however, it is currently unknown how this might be done at the population level, and with what effect. There is currently much scholarly debate on this topic.

The scientific consensus regarding the potential contribution for Ontario is: Uncertain at this time.

Key Message

The clinical evidence indicates some promise for the reduction of nicotine content in cigarettes; however, it is currently unknown how this might be done at the population level, and with what effect. There is currently much scholarly debate on this topic.

Banning Flavours in Tobacco Products

Flavoured tobacco products are currently banned in Ontario (with the exception of flavoured cigars over six grams, flavoured pipe tobacco, and wine, port, whiskey and rum flavoured cigars weighing between 1.4 to 5.9 grams); provincial legislation has been passed to ban menthol-flavoured tobacco products and clove-flavoured cigarettes, and enforcement of this legislation came into effect January 2017. Well-designed flavour and menthol policies, accompanied by strong enforcement, could have substantial effects on reducing tobacco use in Ontario, particularly among youth and young adults.

SFO-SAC 2016 Scientific Consensus Statement

Background

One of the main strategies used by the tobacco industry to stimulate use is the addition of flavouring agents.[140] These flavouring agents (e.g., fruit, candy or menthol flavourings) are added to tobacco products by tobacco companies to help conceal the coarse tastes and inferred toxicity of the tobacco product (e.g., cigarettes) making them more appealing and tolerable for new users.[140] The tobacco industry uses flavouring to attract and retain customers, for example, using candy-flavoured tobacco products to appeal to youth.[8]

One common flavouring agent used is menthol. Menthol cigarettes are disproportionately used by certain population groups, including African Americans and youth, and are associated with smoking initiation and difficulty quitting.[141]

In recent years, flavour capsules embedded within cigarette filters have gained popularity among smokers, as they release flavours when crushed by the user. This product innovation has the potential to increase the appeal of cigarettes and may require regulatory action.[142]

The Ontario/Canadian Context

In May 2015, Ontario passed the *Making Healthier Choices Act* which banned the sale of flavoured tobacco products under the *Smoke-Free Ontario Act* (effective January 1st 2016).[143] An exemption was provided for certain types of tobacco products (e.g., flavoured cigars over six grams, flavoured pipe tobacco, and wine, port, whiskey and rum flavoured cigars between 1.4 and 5.9 grams), and a temporary exception was provided until January 1st, 2017 for menthol-flavoured tobacco products and clove-flavoured cigarettes.[144,145] Four other provinces in Canada have also banned the sale of flavoured tobacco products (Alberta, Quebec, New Brunswick, and Nova Scotia).[146]

In April 2016, the federal government announced that it would be moving forward with a proposal to ban menthol in most tobacco products.[147] This ban will extend the previous changes which took place in 2009 and 2015 and banned certain flavours (e.g., fruit and candy flavoured additives)[3] in cigarettes, blunt wraps and most cigars.[147] However, the newly proposed ban has some gaps (e.g., the ban on menthol would not apply to roll-your-own tobacco, cigarette papers, many cigars weighing more than 6g, smokeless tobacco, (traditional) pipe tobacco, or any other tobacco product).[148] In addition, the menthol ban would apply only to menthol and not to other flavours, such as vanilla, peach, cherry, or mint).[148] Given these gaps, enhancement of provincial level legislation is considered to be essential.[148]

In Canada, there has been a recent increase in the sale of menthol cigarettes. Beginning in 2009, menthol cigarette sales increased for five consecutive years and sales in 2014 were 14% higher than they were in 2008.[147] According to most recent Ontario data, menthol cigarettes and cigars represented 4.3% of cigarette wholesale sales and 3.2% of cigar sales in 2014.[21]

Evidence

The best available research evidence came from one primary study which examined the effectiveness of a flavouring ban in New York City,[149] two additional primary studies which examined the potential impacts of a proposed ban on menthol cigarettes (Pearson 2012, Wackowski 2014) and one grey

literature report from the United States Food and Drug Administration provided by SFO-SAC.[141,150] One primary study was appraised as Level II,[149] and two as Level III.[141,150]

Evidence of Effectiveness

Bans on Non-Menthol Flavouring Agents

One population-level primary study by Farley et al. (2016) evaluated the effectiveness of banning the sale of all 'other flavoured tobacco' products (including cigars, cigarillos, little cigars, chew, snuff, snus, tobacco, pipe tobacco, roll-your-own tobacco and dissolvables) in New York City,[140] with the exception of menthol flavour.[149] This ban does not include flavoured cigarettes which are already banned under federal law – with the exception of menthol.[149] The researchers examined overall tobacco sales and changes in teens' (ages 13-17) tobacco use and smoking prevalence prior to (2010) and following (2013) the ban ,which came into effect October 2009.[140]

The ban was associated with a significant decline (mean decline 87%) in overall sales for flavoured tobacco products (β = -20247.00, $p<0.001$); the decline was particularly strong for cigars (86%) and pipe and roll-your-own tobacco (91%).[140] In comparison, non-flavoured tobacco products had a small, but non-significant increase in sales following enforcement of the ban (mean increase 18%, $p = 0.066$).[140]

Additionally, the proportion of teens who reported ever using a flavoured tobacco product decreased from 19.6% (95% CI: 16.5% to 23.2%) in 2010 to 15.6% (95% CI: 13.7% to 17.8%) in 2013 ($p = 0.054$) following enforcement of the ban.[140] Teens in 2013 had lower odds of ever using a flavoured tobacco product (OR = 0.63, 95% CI: 0.52 to 0.77) or any tobacco product (OR = 0.72, 95% CI: 0.62 to 0.85) compared to teens in 2010.[140] However, there was no significant change in the odds of teens smoking between 2010 and 2013 (OR = 1.31, 95% CI: 0.94 to 1.84).[140]

Bans on Menthol Flavouring

Menthol is a widely-used consumer product that is often used in cigarettes as a flavouring agent.[151] The use of menthol in cigarettes is problematic. Menthol has cooling, desensitizing, and proanalgesic effects, and is associated with altered physiological responses to tobacco smoke.[151] This altered response may make cigarettes more appealing and tolerable for new users.[140] Menthol cigarettes are likely associated with increased smoking initiation (by youth and young adults) and progression to regular cigarette smoking.[151] Additionally, menthol cigarettes are associated with increased dependence and reduced success in smoking cessation.[151] For these reasons, bans on menthol cigarettes have been proposed in various jurisdictions.[141,150]

Two studies examined behavioural intentions (i.e., how individuals intend to change their behaviour) among adult menthol cigarette smokers in response to a menthol ban.[141,150] In both studies, the majority of participants indicated that they would quit tobacco use if menthol cigarettes were no longer sold.[141,150] Wackowski found that 65.7% of menthol smokers reported that they would quit tobacco use, 18.4% would switch to a non-menthol brand, and 16.0 % would switch to some other tobacco product.[141] Similarly, Pearson (2012) found that 40% of menthol smokers would quit, 12.5% would switch to a non-menthol brand and 25.2% would both switch to a non-menthol brand and try to quit.[150]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Specific Populations/Equity Considerations

Behavioural intentions were also associated with race and ethnicity; intentions to quit tobacco use in the event of a menthol ban were most prevalent among African American menthol smokers (79.3%), while the majority of Asian respondents indicated that they would switch to non-menthol cigarettes (62.0%).[141] Intentions to switch to another type of tobacco product were most commonly reported among Hispanics (34.6%).[141] These results have implications for how a menthol ban might differentially affect individuals from different ethnic groups.

Intervention Summary

Evidence Summary - Banning Flavours in Tobacco Products - Promising direction

The body of evidence examining banning flavours in tobacco products consisted of three primary studies, as there was no review level evidence on this topic. There is strong evidence supporting the effects of flavours, in particular menthol, on initiating and sustaining smoking. Some population-level evidence suggests that bans on flavoured tobacco products (not including menthol) are effective to reduce overall sales of tobacco products, as well as to reduce flavoured tobacco use among teens. Experimental evidence suggests that bans on menthol cigarettes result in greater quit intentions among smokers.

SFO-SAC 2016 Scientific Consensus Statement - High (Intensify), Positive Equity

Flavoured tobacco products are currently banned in Ontario (with the exception of flavoured cigars over six grams, flavoured pipe tobacco, and wine, port, whiskey and rum flavoured cigars weighing between 1.4 to 5.9 grams); provincial legislation has been passed to ban menthol-flavoured tobacco products and clove-flavoured cigarettes, and enforcement of this legislation came into effect January 2017. Well-designed flavour and menthol policies, accompanied by strong enforcement, could have substantial effects on reducing tobacco use in Ontario, particularly among youth and young adults.

The scientific consensus regarding the potential contribution for Ontario is: High (Intensify). This intervention has a potential positive equity impact.

Key Message

Well-designed flavour and menthol policies could have substantial effects on reducing tobacco use in Ontario.

Electronic Cigarettes and Non-Combustibles

Regulation to Favour Electronic Cigarettes over Cigarettes

> *The public health impact of e-cigarettes may be determined by how they are regulated; regulation influences who uses these products and for what purpose. Current regulation in Ontario makes it illegal to sell or supply e-cigarettes and component parts to anyone less than 19 years of age. On a day to be proclaimed, the law will also prohibit use of e-cigarettes in public places and ban point-of-sale display and promotion. The prevalence of tobacco use may be reduced if e-cigarettes are regulated to make them highly preferable to combustible cigarettes and to encourage smokers, who would otherwise not quit altogether, to switch completely to e-cigarettes. At the same time, regulation would have to prevent non- or never-smokers (particularly youth and young adults) from initiating e-cigarette use.*
>
> *SFO-SAC 2016 Scientific Consensus Statement*

Background

Non-combustible Tobacco Products

Many, but not all of the harms of tobacco use, are attributable to combustion.[47] Inhaling combustion compounds in tobacco smoke causes a number of adverse health outcomes, such as cancer, cardiovascular and pulmonary diseases and fetal growth restrictions.[47]

Non-combustible tobacco in the form of snuff and chew has been marketed for many years. Studies have demonstrated that these products have serious health effects.[152] Smokeless tobacco causes cancers of the oral cavity, esophagus and pancreas.[152]

Since the 1960s, Swedish snus (a moist, finely-ground product made with pasteurized air-cured or sun-cured tobacco) has been marketed as a non-combustible tobacco product that is less harmful than smoking tobacco.[153,154] Various smokeless tobaccos have been shown to increase the risk of oral cancer; however, this has not been confirmed for Swedish moist snuff (*snus*).[152,155] While snus has captured a large portion of the tobacco market in Sweden (and Norway),[156] attempts at marketing snus in other jurisdictions have largely failed, possibly because tobacco users do not find it appealing.

The tobacco industry has been working on non-combustible products for many decades. There have been several attempts to create heat-not-burn (HNB) products (e.g., heating rather than burning

tobacco).[157] In 1997, Philip Morris introduced the Accord smoking system.[157] The Accord system was a hand-held device to heat tobacco electronically, and was marketed as a way to reduce secondhand smoke.[158] Other cigarette companies have marketed unsuccessful HNB products,[157] notably RJR with Premier and Eclipse cigarettes. Independent scientific studies of previous generation HNB found, counter to tobacco industry research, that emissions were highly toxic.[155,159]

The Accord was not successful as a commercial product, because it was not as satisfying as conventional cigarettes.[158] Smokers would smoke cigarettes more often, or smoke more intensely, to compensate for decreased withdrawal suppression and/or nicotine delivery.[158] Accord remained on the market from 1998 to 2006 when it was removed for poor sales.[160]

Since 2014, a new generation of HNB has reportedly been relatively successful in Japan, capturing some 5% of the tobacco market over the course of one year.[161] There is not yet a body of independent research about the emissions and health effects of new generation HNB products. The new generation, "I Quit Ordinary Smoking" (IQOS) product is part of Philip Morris International's heat-not-burn technology, heating tobacco to less than 250°C, to reduce the amount of smoke produced.[162] It uses a specially-designed cigarette inserted into a hand held heater. The IQOS is the third commercial generation of this device and may include additional product improvements in either providing satisfaction or in the ease of use of the electronic system.[160] Smokers accustomed to e-cigarettes may now find the electronic heating device more acceptable.[160] New generation HNB products have not yet been introduced in Ontario and their effects are unknown.

Electronic Cigarettes (E-cigarettes)

Electronic cigarettes, also known as e-cigarettes, are the most prominent non-combustible to be marketed in recent history. E-cigarettes have become increasingly popular among Canadians.[163] In 2013, 9% of Canadians 15 years of age and older have ever tried an e-cigarette (approximately 2.5 million Canadians).[163]

E-cigarettes are battery-operated devices that electronically heat a solution to create an inhalable aerosol.[164] This solution is commonly made up of propylene glycol or glycerine water, flavour and nicotine. However, some solutions, also known as 'e-liquid' or 'e-juice', are sold without nicotine.[164] E-cigarettes can take the form of: 'cigalikes' that look like typical cigarettes and can be disposable or reusable with disposable solution cartridges; 'tank systems' that are refillable with solution and do not resemble a typical cigarette; and 'variable power e-cigarettes', systems of variable appearance on which the user can control and change the electronic output.[164] E-cigarettes are also commonly referred to as 'vape pens', 'hookah pens' or 'e-hookah' among youth.[165,166]

Widespread use of e-cigarettes poses a new public health problem. It is important to note that the safety of e-cigarettes is still unknown, as the evidence base on overall and relative risks of e-cigarettes in comparison with smoking is still developing. Given the lack of data concerning the safety of e-cigarettes and their effectiveness as a smoking cessation aid (see E-cigarettes section in the Chapter 6: Cessation), it is unclear how e-cigarettes should be regulated and to what extent.[167] The public health impact of e-cigarettes will be determined by their effect on smoking prevalence, their effect on the initiation of

vaping by non-smokers, particularly youth, and also, by the extent to which smokers who switch to e-cigarettes eventually quit vaping as well.

The Ontario/Canadian Context

In Canada, e-cigarettes that contain nicotine fall within the scope of the *Food and Drugs Act*, and because they have not been granted a market authorization, e-cigarettes with nicotine cannot be imported, advertised or sold.[168] E-cigarettes without nicotine are permitted.

In Ontario, as of January 1, 2016, it is illegal to sell or supply e-cigarettes and component parts (e.g., battery, atomizer) in Ontario to anyone less than 19 years of age, under the *Electronic Cigarettes Act*.[169] Stores or vape shops that sell e-cigarettes are required to post signs about the new rules.[169] The same law also bans the use of e-cigarettes in any enclosed public place or enclosed workplace and also bans point-of-sale display and promotion; however, these amendments have not yet been put in place.[170] Currently there are no regulations regarding the price and/or marketing of e-cigarettes within Ontario.

Legislation regarding manufacturer sale and use is currently under review by the federal government. In November 2016, the federal government introduced Bill S-5, which, if passed, will amend the *Tobacco Act* and the *Non-smokers' Health Act* and make consequential amendments to other *Acts* such as the *Tobacco and Vaping Products Act.* This amendment would also include new provisions to protect non-users from using vaping products, and allow access to vaping products as a potentially less harmful alternative to cigarette use.[68]

Evidence

The best available research evidence for this topic included two systematic review and meta-analyses,[171,172] (from the pre-appraised literature and PHO library search from the Cessation Chapter, respectively) as well as one systematic review,[173] one presentation (based on the findings of an unpublished review)[174] and four grey literature reports provided by SFO-SAC.[47,166,175,176] Overall, one review was appraised as Level I,[171] one appraised as Level II[172] and one appraised as Level III.[173]

Evidence of Effectiveness

A recent systematic review on the health effects of e-cigarettes concluded that there is sufficient evidence to suggest that anybody who is not a current smoker of tobacco cigarettes should not use e-cigarettes.[174] Moreover, the health effects of long-term regular use of e-cigarettes have not yet been studied. The review found that carbonyls, tobacco-specific nitrosamines (TSNAs), and impurities were frequently detected in e-liquids at low levels.[174] Additionally, low levels of carbonyls, VOCs, TSNAs, metals, impurities and particulate matter have been found in e-cigarette aerosol.[174]

E-cigarette use may result in low levels of passive exposure to nicotine, organic compounds, metals, and particulate matter.[174] Air quality measurements have found high levels of particulate matter when used by a large number of people indoors.[174] In addition, the strengthening of evidence about the effects of nicotine on brain development suggests that people should not use nicotine e-cigarettes until they are in their 20s.[174] The 2014 Surgeon General's report concludes that there is sufficient evidence about the effects of nicotine on the development of the fetus,[47] therefore suggesting that pregnant women should not be exposed to nicotine e-cigarette aerosol.

While in absolute terms, e-cigarettes pose health risks, there is widespread consensus that they are less harmful than smoking tobacco cigarettes. For example, the Royal College of Physicians suggests that although it is difficult to quantify the long-term health risks associated with e-cigarettes, the available data suggest that these risks are "unlikely to exceed 5% of those associated with smoked tobacco products, and may well be substantially lower than this figure".[175]

Increasing the number of smokers who quit smoking (and then subsequently quit using e-cigarettes), or even increasing the number of smokers who switch solely to e-cigarettes may help reduce the prevalence of tobacco use. However, while systematic reviews that examine e-cigarettes as a cessation aid indicate that some smokers successfully quit smoking by using e-cigarettes,[171,172] they make up only a small proportion of smokers who have tried e-cigarettes[177] (see Chapter 6: Cessation for more information on the effectiveness of e-cigarettes as a cessation aid).

It has been proposed that making e-cigarettes less expensive and more accessible than regular cigarettes through regulation (while still protecting non-smoking youth from accessing them) could decrease the prevalence of tobacco smoking, when combined with smoking cessation services.[176] According to this approach, tobacco smokers who switch to e-cigarettes and stop smoking tobacco cigarettes would benefit, as they are reported to be safer than smoking traditional cigarettes.[176] Ultimately, the price and availability differentials might lead to the demise or near-demise of tobacco smoking.

Other scientists suggest that e-cigarettes are not critical to achieve a tobacco-free generation; instead they are perceived as a potential threat to achieving this goal.[166] These researchers are concerned that youth, who would not otherwise have become smokers, will initiate e-cigarette use, and that smokers, who otherwise would have quit altogether, will become long-term e-cigarette users.[166] There is some, preliminary review-level evidence suggesting that e-cigarettes are associated with higher rates of smoking initiation among adolescents.[173] These observers note that the known harms of e-cigarette emissions are sufficient to invoke the precautionary principle,[166] and discourage use of e-cigarettes among those who do not smoke. Moreover, they note that the science about the effects of e-cigarettes, in particular, the long-term effects of routine use, are not known.[166]

Intervention Characteristics/Implementation Considerations

There is not yet a scientific basis to determine intervention characteristics and implementation considerations.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Regulation to Favour Electronic Cigarettes over Cigarettes (E-Cigarettes) - Emerging

The body of evidence regarding e-cigarettes included three reviews and five grey literature documents. E-cigarette use may result in exposure to nicotine, organic compounds, metals and particulate matter. The long-term effects of exposure to these components at the levels found in e-cigarette aerosol are unknown. While e-cigarettes do pose health risks, there is widespread consensus that they are likely less harmful than smoking tobacco cigarettes. While e-cigarettes may help some smokers quit tobacco cigarettes, there is also some evidence to suggest that nicotine e-cigarettes are harmful to youth and young adults and may act as a gateway to nicotine addiction and possibly to cigarette use among adolescents.

SFO-SAC 2016 Scientific Consensus Statement - Uncertain at this time

The public health impact of e-cigarettes may be determined by how they are regulated; regulation influences who uses these products and for what purpose. Current regulation in Ontario makes it illegal to sell or supply e-cigarettes and component parts to anyone less than 19 years of age. On a day to be proclaimed, the law will also prohibit use of e-cigarettes in public places and ban point-of-sale display and promotion. The prevalence of tobacco use may be reduced if e-cigarettes are regulated to make them highly preferable to combustible cigarettes and to encourage smokers, who would otherwise not quit altogether, to switch completely to e-cigarettes. At the same time, regulation would have to prevent non- or never-smokers (particularly youth and young adults) from initiating e-cigarette use.

The scientific consensus regarding the potential contribution for Ontario is: Uncertain at this time.

Key Message

Regulating e-cigarettes to make them preferable to cigarettes and to prevent non- or never-smokers from initiating e-cigarette use may reduce the prevalence of tobacco use in Ontario.

References

1. World Lung Foundation. New Tobacco Atlas estimates U.S. $35 billion tobacco industry profits and almost 6 million annual deaths. American Cancer Society [Internet], 21 March 2012[cited 2016 Sep 21]; Press Releases. Available from: http://pressroom.cancer.org/releases?item=356

2. World Health Organization (WHO). WHO report on the global tobacco epidemic, 2015. Raising taxes on tobacco: executive summary [Internet]. Geneva, SZ: World Health Organization; 2015 [cited 2015 Aug 24]. Available from: http://apps.who.int/iris/bitstream/10665/178577/1/WHO_NMH_PND_15.5_eng.pdf?ua=1

3. Smoke-Free Ontario - Scientific Advisory Committee. Evidence to guide action: Comprehensive tobacco control in Ontario [Internet]. Toronto, ON: Ontario Agency for Health Protection and Promotion; 2010 [cited 2015 Jul 29]. Available from: http://www.publichealthontario.ca/en/eRepository/Evidence%20to%20Guide%20Action%20-%20CTC%20in%20Ontario%20SFO-SAC%202010E.PDF

4. Orleans CT, Slade J. Preface. In: Nicotine addiction: principles and management. New York, US: Oxford University Press; 1993.

5. Smoking and Health Action Foundation and Non-Smokers' Rights Association. Eye on the industry [Internet]. Spring 2016 ed. Toronto, ON: Smoking and Health Action Foundation/Non-Smokers' Rights Association; 2016 [cited 2016 Oct 6]. Available from: http://www.nsra-adnf.ca/cms/file/files/Eye_on_the_Industry_2016-FINAL2.pdf

6. World Health Organization. WHO framework convention on tobacco control. Geneva: World Health Organization; 2005. Available from: http://www.who.int/tobacco/framework/WHO_FCTC_english.pdf

7. Navarro C, Schwartz R. Evidence to support tobacco endgame policy measures. Toronto, ON: Ontario Tobacco Research Unit; 2014.

8. Tobacco Strategy Advisory Group (TSAG). Building on our gains, taking action now: Ontario's tobacco control strategy for 2011 - 2016 [Internet]. Toronto, ON: The Ontario Tobacco Research Unit; 2010 [cited 2016 Jan 4]. Available from: http://otru.org/wp-content/uploads/2012/06/TSAGReport.pdf

9. Malone RE, McDaniel PA, Smith EA. Tobacco control endgames: global initiatives and implications for the UK [Internet]. London, UK: Cancer Research UK; 2014 [cited 2016 Mar 15]. Available from: http://www.cancerresearchuk.org/sites/default/files/policy_july2014_fullendgame_report.pdf

10. Canadian Public Health Association. The winnable battle: ending tobacco use in Canada [Internet]. Ottawa, ON: Canadian Public Health Association; 2011 [cited 2016 Sep 9]. Available from: http://www.phans.ca/cmsAdmin/uploads/position-paper-tobacco_e_001.pdf

11. Armes C. News release - Queen's-led summit concludes with a call to bring tobacco prevalence rate to "less than 5 by '35'" [Internet]. Kingston, ON: Queen's University; 2016 [cited 2016 Nov 4]. Available

from: http://www.queensu.ca/gazette/media/news-release-queen-s-led-summit-concludes-call-bring-tobacco-prevalence-rate-less-5-35

12. Association of Local Public Health Agencies. alPHa Resolutions - tobacco [Internet]. Toronto, ON: Association of Local Public Health Agencies; 2016 [cited 2016 Oct 14]. Available from: http://www.alphaweb.org/page/Resolutions_tobacco

13. Canadian Cancer Society. Cigarette package health warnings: international status report [Internet]. 5th ed.Canadian Cancer Society; 2016 [cited 2016 Nov 25]. Available from: http://www.cancer.ca/~/media/cancer.ca/CW/for%20media/Media%20releases/2016/CCS-international-cigarette-packaging-report-2016-English.pdf?la=en

14. Canadian Cancer Society. Plain packaging – international overview [Internet]. Toronto, ON: Canadian Cancer Society; 2015 [cited 2015 Nov 23]. Available from: https://www.smokershelp.net/wp-content/uploads/2016/07/Canadian-Cancer-Society-International-Overview.pdf

15. World Health Organization (WHO). Plain packaging of tobacco products: evidence, design and implementation. Geneva, SZ: World Health Organization; 2016. Available from: http://apps.who.int/iris/bitstream/10665/207478/1/9789241565226_eng.pdf?ua=1

16. IARC handbooks of cancer prevention, tobacco control, effectiveness of tax and price policies for tobacco control. Volume 14. Lyon, FR: International Agency for Research on Cancer (IARC); 2011. Available from: http://www.iarc.fr/en/publications/pdfs-online/prev/handbook14/handbook14.pdf

17. Golden SD, Smith MH, Feighery EC, Roeseler A, Rogers T, Ribisl KM. Beyond excise taxes: a systematic review of literature on non-tax policy approaches to raising tobacco product prices. Tob Control. 2016;25(4):377-85. Available from: http://tobaccocontrol.bmj.com/content/tobaccocontrol/25/4/377.full.pdf

18. Calo WA, Krasny SE. Environmental determinants of smoking behaviors: the role of policy and environmental interventions in preventing smoking initiation and supporting cessation. Curr Cardiovasc Risk Rep. 2013;7(6):446-52. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3947572/pdf/nihms533679.pdf

19. Henriksen L. Comprehensive tobacco marketing restrictions: promotion, packaging, price and place. Tob Control. 2012;21(2):147-53. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4256379/

20. Malone RE. Tobacco endgames: what they are and are not, issues for tobacco control strategic planning and a possible US scenario. Tob Control. 2013;22 Suppl 1:i42-4. Available from: http://tobaccocontrol.bmj.com/content/tobaccocontrol/22/suppl_1/i42.full.pdf

21. Ontario Tobacco Research Unit. Smoke-free Ontario strategy monitoring report [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2016 [cited 2016 Dec 12]. Available from: http://otru.org/wp-content/uploads/2016/02/OTRU_2015_SMR_Full.pdf

22. Sousa C. Jobs for today and tomorrow: 2016 Ontario budget. Toronto, ON: Queen's Printer for Ontario; 2016. Available from: http://www.fin.gov.on.ca/en/budget/ontariobudgets/2016/papers_all.pdf

23. *Tobacco Tax Rates*. O. Reg. 5/05: Available from: https://www.ontario.ca/laws/regulation/050005

24. Ontario Ministry of Finance. Tobacco tax rate increases [Internet]. Toronto, ON: Queen's Printer for Ontario; 2016 [cited 2016 Mar 7]. Available from: http://www.fin.gov.on.ca/publication/tobacco-tax-rate-increases-en.pdf

25. Ontario Tobacco Research Unit (OTRU). Tobacco taxes: monitoring update [Internet]. Toronto, ON: Ontario Tobacco Research Unit ; 2012 [cited 2016 Mar 21]. Available from: http://otru.org/wp-content/uploads/2012/10/taxes2012.pdf

26. Smoking and Health Action Foundation and Non-Smokers' Rights Association. Prohibitive pricing of tobacco products. Part 1: understanding the challenges of the Canadian market [Internet]. Toronto, ON: Smoking and Health Action Foundation and Non-Smokers' Rights Association; 2015 [cited 2016 Apr 10]. Available from: https://www.nsra-adnf.ca/cms/file/files/SHAF_Prohibitive_pricing_fact_sheet_March_2015(1).pdf

27. Zhang B, Schwartz R. What effect does tobacco taxation have on contraband? Debunking the taxation - contraband tobacco myth [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2015 [cited 2016 May 24]. Available from: http://otru.org/wp-content/uploads/2015/02/special_tax_contraband_final.pdf

28. Hoffman SJ, Tan C. Overview of systematic reviews on the health-related effects of government tobacco control policies. BMC Public Health. 2015;15:744. Available from: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-015-2041-6

29. Brown T, Platt S, Amos A. Equity impact of population-level interventions and policies to reduce smoking in adults: a systematic review. Drug Alcohol Depend. 2014;138:7-16.

30. Rice N, Godfrey C, Slack R, Sowden A, Worthy G. A systematic review of the effects of price on the smoking behaviour of young people [Internet]. York, UK: Public Health Research Consortium; 2010 [cited 2016 Dec 3]. Available from: http://phrc.lshtm.ac.uk/papers/PHRC_A2-06_Final_Report.pdf

31. Wilson LM, Avila Tang E, Chander G, Hutton HE, Odelola OA, Elf JL, et al. Impact of tobacco control interventions on smoking initiation, cessation, and prevalence: a systematic review. J Environ Public Health. 2012;1-36. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/pmid/22719777/

32. Mozaffarian D, Afshin A, Benowitz NL, Bittner V, Daniels SR, Franch HA, et al. Population approaches to improve diet, physical activity, and smoking habits: a scientific statement from the American Heart Association. Circulation. 2012;126(12):1514-63. Available from: http://circ.ahajournals.org/content/126/12/1514.long

33. Guindon GE, Paraje GR, Chaloupka FJ. The impact of prices and taxes on the use of tobacco products in Latin America and the Caribbean. Am J Public Health. 2015;105(3):e9-19. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4330839/pdf/AJPH.2014.302396.pdf

34. Ekpu VU, Brown AK. The economic impact of smoking and of reducing smoking prevalence: review of evidence. Tob Use Insights. 2015;8:1-35. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4502793/pdf/tui-8-2015-001.pdf

35. Hill S, Amos A, Clifford D, Platt S. Impact of tobacco control interventions on socioeconomic inequalities in smoking: review of the evidence. Tob Control. 2014;23(e2):e89-97.

36. Bader P, Boisclair D, Ferrence R. Effects of tobacco taxation and pricing on smoking behavior in high risk populations: a knowledge synthesis. Int J Environ Res Public Health. 2011;8(11):4118-39. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3228562/

37. Brown T, Platt S, Amos A. Equity impact of interventions and policies to reduce smoking in youth: systematic review. Tob Control. 2014;23(e2):e98-105.

38. Ashton M, Rigby A, Galletly C. Do population-wide tobacco control approaches help smokers with mental illness? Aust N Z J Psychiatry. 2014;48(2):121-3.

39. Chaloupka FJ, Yurekli A, Fong GT. Tobacco taxes as a tobacco control strategy. Tob Control. 2012;21(2):172-80.

40. Purcell KR, O'Rourke K, Rivis M. Tobacco control approaches and inequity--how far have we come and where are we going? Health Promot Int. 2015;30 Suppl 2:ii89-101.

41. van Walbeek C, Blecher E, Gilmore A, Ross H. Price and tax measures and illicit trade in the framework convention on tobacco control: what we know and what research is required. Nicotine Tob Res. 2013;15(4):767-76. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3693499/pdf/nts170.pdf

42. Gilmore AB, Tavakoly B, Taylor G, Reed H. Understanding tobacco industry pricing strategy and whether it undermines tobacco tax policy: the example of the UK cigarette market. Addiction. 2013;108(7):1317-26. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3746125/pdf/add0108-1317.pdf

43. Hackbarth DP. Preventing adolescent tobacco use and assisting young people to quit: population-, community-, and individually focused evidence-based interventions. Nurs Clin North Am. 2012;47(1):119-40.

44. Jha P, Peto R. Global effects of smoking, of quitting, and of taxing tobacco. N Engl J Med. 2014;370(1):60-8.

45. Ontario Tobacco Research Unit (OTRU). Smoke-free Ontario strategy evaluation report [Internet]. Toronto, ON: Ontario Tobacco Research Unit (OTRU); 2012 [cited 2016 Dec 3]. Available from: http://otru.org/wp-content/uploads/2012/12/OTRU_SER_2012.pdf

46. Collishaw N. History of tobacco control in Canada [Internet]. Ottawa, ON: Physicians for a Smoke-Free Canada; 2009 Available from: http://www.smoke-free.ca/pdf_1/2009/history%20of%20tobacco%20control%20in%20canada.pdf

47. U.S. Department of Health and Human Services. The health consequences of smoking: 50 years of progress [Internet]. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2014 [cited 2015 Dec 31]. Available from: https://www.surgeongeneral.gov/library/reports/50-years-of-progress/full-report.pdf

48. Dewhirst T. Price and tobacco marketing strategy: lessons from 'dark' markets and implications for the WHO Framework Convention on Tobacco Control. Tob Control. 2012;21(6):519-23.

49. Schwartz R, Zhang B. Debunking the taxation-contraband tobacco myth. CMAJ. 2016;188(6):401-2.

50. Ontario Tobacco Research Unit. Smoke-free Ontario strategy monitoring report [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2015 [cited 2015 Aug 12]. Available from: http://otru.org/wp-content/uploads/2015/04/MR-2014-Final.pdf

51. Feighery EC, Ribisl KM, Schleicher NC, Clark PI. Retailer participation in cigarette company incentive programs is related to increased levels of cigarette advertising and cheaper cigarette prices in stores. Prev Med. 2004;38(6):876-84.

52. Feighery EC, Ribisl KM, Clark PI, Haladjian HH. How tobacco companies ensure prime placement of their advertising and products in stores: interviews with retailers about tobacco company incentive programmes. Tob Control. 2003;12(2):184-8.

53. Canadian Community Health Survey Master File 2013, Statistics Canada, Provided by the Ontario Tobacco Research Unit (OTRU).

54. National Cancer Institute. The role of the media in promoting and reducing tobacco use. Tobacco Control Monograph No. 19 [Internet]. Bethesda, MD: U.S. Department of Health and Human Services; 2008 [cited 2016 Jun 10]. Available from: http://cancercontrol.cancer.gov/brp/tcrb/monographs/19/m19_complete.pdf

55. Weishaar H, Collin J, Smith K, Gruning T, Mandal S, Gilmore A. Global health governance and the commercial sector: a documentary analysis of tobacco company strategies to influence the WHO framework convention on tobacco control. PLoS Med. 2012;9(6):e1001249. Available from: http://journals.plos.org/plosmedicine/article/file?id=10.1371/journal.pmed.1001249&type=printable

56. U.S. Department of Health and Human Services. Preventing tobacco use among youth and young adults: a report of the surgeon general [Internet]. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2012 [cited 2016 Dec 3]. Available from: https://www.surgeongeneral.gov/library/reports/preventing-youth-tobacco-use/prevent_youth_by_section.html

57. Global Tobacco Control Forum. Canada's implementation of the Framework Convention on Tobacco Control: a civil society 'shadow report' [Internet]. Ottawa, ON: Global Tobacco Control Forum; 2010 [cited 2016 Apr 19]. Available from: http://www.smoke-free.ca/pdf_1/FCTC-Shadow-2010-Canada.pdf

58. Voluntary codes guide – what is a voluntary code? [Internet]. Ottawa, ON: Government of Canada; 2010 [updated 2010 Sep 3; cited 2017 Jan 13]. Available from: https://www.ic.gc.ca/eic/site/oca-bc.nsf/eng/ca00963.html

59. *Bill C-32: An act to amend the Tobacco Act*, 2nd Sess, 40th Parl, 2010. Available from: http://www.lop.parl.gc.ca/About/Parliament/LegislativeSummaries/Bills_ls.asp?lang=E&ls=c32&Parl=40&Ses=2&source=library_prb#tpcata

60. Dunsmuir M. Federal legislation and regulatory action [Internet]. Ottawa, ON: Law and Government Division, Government of Canada; 1998 [cited 2017 Jan 13]. Available from: http://publications.gc.ca/Collection-R/LoPBdP/modules/prb98-8-tobacco/legislation.htm

61. *Tobacco Act*, S.C. 1997 , c. 13. Available from: http://laws-lois.justice.gc.ca/eng/acts/T-11.5/FullText.html

62. *Smoke-Free Ontario Act,* S.O. 1994, c.10. Available from: https://www.ontario.ca/laws/statute/94t10/v4

63. Non-Smokers' Rights Association, The Smoking and Health Action Foundation. The case for plain and standardized tobacco packaging [Internet]. Ottawa, ON: Non-Smokers' Rights Association and the Smoking and Health Action Foundation; 2012 [cited 2016 May 13]. Available from: http://www.nsra-adnf.ca/cms/file/files/Plain_Pkg_Brochure_FINAL(2).pdf

64. Tobacco product labelling [Internet]. Ottawa, ON: Health Canada; 2011 [cited 2016 May 13]. Available from: http://www.hc-sc.gc.ca/hc-ps/tobac-tabac/legislation/label-etiquette/index-eng.php

65. Young JM, Stacey I, Dobbins TA, Dunlop S, Dessaix AL, Currow DC. Association between tobacco plain packaging and quitline calls: a population-based, interrupted time-series analysis. Med J Aust. 2014;200(1):29-32. Available from: https://www.mja.com.au/system/files/issues/you11070_fm.pdf

66. Moodie C, Stead M, Bauld L, McNeill A, Angus K, Hinds K, et al. Plain tobacco packaging: a systematic review [Internet]. Nottingham, UK: UK Centre for Tobacco Control Studies; 2012 [cited 2016 May 4]. Available from: http://phrc.lshtm.ac.uk/papers/PHRC_006_Final_Report.pdf

67. Health Canada. Consultation on "Plain and Standardized Packaging" for tobacco products [Internet]. Ottawa, ON: Health Canada; 2016 [cited 2016 May 31]. Available from: http://healthycanadians.gc.ca/health-system-systeme-sante/consultations/tobacco-packages-emballages-produits-tabac/document-eng.php

68. Bill S-5 - *An Act to amend the Tobacco Act and the Non-smokers' Health Act* and to make consequential amendments to other *Acts*, Senate of Canada, 1st Sess, 42nd Parl, 2015 (first reading 22 November 2016).

69. Cunningham R. A province can regulate tobacco packaging [Internet].Toronto, ON: Canadian Cancer Society; 2015 [cited 2016 Dec 3]. Available from: http://cqct.qc.ca/Documents_docs/DOCU_2015/MEMO_15_02_17_SCC_Cunningham_TobaccoPackaging_ProvincialAction.pdf

70. Stead M, Moodie C, Angus K, Bauld L, McNeill A, Thomas J, et al. Is consumer response to plain/standardised tobacco packaging consistent with framework convention on tobacco control guidelines? A systematic review of quantitative studies. PLoS One. 2013;8(10):e75919. Available from: http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0075919&type=printable

71. Hammond D. Standardized packaging of tobacco products: evidence review [Internet]. Waterloo, ON: University of Waterloo; 2014 [cited 2015 Nov 23]. Available from: http://www.drugsandalcohol.ie/22106/1/Standardized-Packaging-of-Tobacco-Products-Evidence-Review.pdf

72. Australian Government, Department of Health. Post-implementation review: tobacco plain packaging [Internet]. Australia: Department of Health; 2016 [cited 2016 May 10]. Available from: http://ris.pmc.gov.au/sites/default/files/posts/2016/02/Tobacco-Plain-Packaging-PIR.pdf

73. Wakefield MA, Hayes L, Durkin S, Borland R. Introduction effects of the Australian plain packaging policy on adult smokers: a cross-sectional study. BMJ Open. 2013;3(7). Available from: http://bmjopen.bmj.com/content/bmjopen/3/7/e003175.full.pdf

74. *British American Tobacco & others v Department of Health* (2016) EWHC 1169. Available from: http://www.bailii.org/ew/cases/EWHC/Admin/2016/1169.pdf

75. *Philip Morris Asia Limited v Commonwealth* (2015) PCA 2012-12. Available from: http://www.italaw.com/sites/default/files/case-documents/italaw7303_0.pdf

76. Borland R, Savvas S. The effects of variant descriptors on the potential effectiveness of plain packaging. Tob Control. 2014;23(1):58-63. Available from: http://tobaccocontrol.bmj.com/content/tobaccocontrol/early/2013/02/21/tobaccocontrol-2012-050736.full.pdf

77. Hammond D. Health warning messages on tobacco products: a review. Tob Control. 2011;20(5):327-37.

78. Judgement of the Court (Second Chamber) of 4 May 2016, *Philip Morris Brands and Others*, 2015, C-547/14, EU:C:2016:325. Available from: http://curia.europa.eu/juris/document/document.jsf?text=&docid=177724&pageIndex=0&doclang=en&mode=req&dir=&occ=first&part=1&cid=567975

79. Tobacco products labelling regulations (cigarettes and little cigars) [Internet]. Ottawa, ON: Health Canada; 2012 [cited 2015 Aug 12]. Available from: http://www.hc-sc.gc.ca/hc-ps/tobac-tabac/legislation/reg/label-etiquette/index-eng.php

80. Baskerville N, Brown KS, Nguyen NC, Hayward L, Kennedy RD, Hammond D, et al. Impact of Canadian tobacco packaging policy on use of a toll-free quit-smoking line: an interrupted time-series analysis. CMAJ Open. 2016;4(1):E59-65.

81. Monarrez-Espino J, Liu B, Greiner F, Bremberg S, Galanti R. Systematic review of the effect of pictorial warnings on cigarette packages in smoking behavior. Am J Public Health. 2014;104(10):e11-30. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4167086/pdf/AJPH.2014.302129.pdf

82. Noar SM, Francis DB, Bridges C, Sontag JM, Ribisl KM, Brewer NT. The impact of strengthening cigarette pack warnings: systematic review of longitudinal observational studies. Soc Sci Med. 2016;164:118-29.

83. Noar SM, Hall MG, Francis DB, Ribisl KM, Pepper JK, Brewer NT. Pictorial cigarette pack warnings: a meta-analysis of experimental studies. Tob Control. 2016;25(3):341-54. Available from: http://tobaccocontrol.bmj.com/content/tobaccocontrol/early/2015/05/03/tobaccocontrol-2014-051978.full.pdf

84. Burton S, Hoek J, Nesbit P, Khan A. "Smoking is bad, it's not cool…yet I'm still doing it": cues for tobacco consumption in a 'dark' market. J Bus Res. 2015;68(10):2067-74.

85. Wakefield M, Germain D, Henriksen L. The effect of retail cigarette pack displays on impulse purchase. Addiction. 2008;103(2):322-8.

86. Campbell CA, Hahn RA, Elder R, Brewer R, Chattopadhyay S, Fielding J, et al. The effectiveness of limiting alcohol outlet density as a means of reducing excessive alcohol consumption and alcohol-related harms. Am J Prev Med. 2009;37(6):556-69.

87. Task Force on Community Preventive Services. Recommendations for reducing excessive alcohol consumption and alcohol-related harms by limiting alcohol outlet density. Am J Prev Med. 2009;37(6):570-1.

88. Tobacco Control Legal Consortium. Using licensing and zoning to regulate tobacco retailers [Internet]. Saint Paul, MN: Tobacco Control Legal Consortium ; 2016 [cited 2016 Oct 25]. Available from: http://publichealthlawcenter.org/sites/default/files/resources/tclc-guide-licensing-and-zoning-2016.pdf

89. Chaiton MO, Mecredy GC, Cohen JE, Tilson ML. Tobacco retail outlets and vulnerable populations in Ontario, Canada. Int J Environ Res Public Health. 2013;10(12):7299-309. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3881168/pdf/ijerph-10-07299.pdf

90. Smoke-Free Ontario [Internet]. Toronto, Ontario: Queen's Printer for Ontario; 2015 [cited 16 May 2016]. Available from: https://www.ontario.ca/page/smoke-free-ontario

91. Tilson M. Reducing the availability of tobacco products at retail: policy analysis [Internet]. Toronto, ON: Non-Smokers' Rights Association; 2011 [cited 2016 May 10]. Available from: https://www.nsra-adnf.ca/cms/file/files/Reducing_Retail_Availabilty_policy_analysis_final_2011.pdf

92. McLaughlin I. License to kill?: tobacco retailer licensing as an effective enforcement tool [Internet]. Saint Paul, MN: Tobacco Control Legal Consortium; 2010 [cited 2016 Apr 5]. Available from: http://www.publichealthlawcenter.org/sites/default/files/resources/tclc-syn-retailer-2010.pdf

93. Fry R, Burton S, Williams K, Walsberger S, Tang A, Chapman K, et al. Retailer licensing and tobacco display compliance: are some retailers more likely to flout regulations? Tob Control. 2016 April 8 [Epub ahead of print] Available from: http://tobaccocontrol.bmj.com/content/tobaccocontrol/early/2016/04/08/tobaccocontrol-2015-052767.full.pdf

94. Bowden JA, Dono J, John DL, Miller CL. What happens when the price of a tobacco retailer licence increases? Tob Control. 2014;23(2):178-80.

95. Royal Canadian Mounted Police. Contraband tobacco enforcement strategy. Ottawa, ON: Royal Canadian Mounted Police; 2008. Available from: https://assets.documentcloud.org/documents/413164/royal-canadian-mounted-police-contraband-tobacco.pdf

96. Sweeting J, Johnson T, Schwartz R. Anti-contraband policy measures: evidence for better practice - summary report [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2009 [cited 2016 Apr 21]. Available from: http://otru.org/wp-content/uploads/2012/06/special_anti_contraband_measures_summary.pdf

97. Contraband tobacco [Internet]. Toronto, ON: Ontario Ministry of Finance; 2016 [updated 2016 Mar 2; cited 2016 Apr 25]. Available from: http://www.fin.gov.on.ca/en/tax/tt/illegal.html

98. Quigley J. Ontario bill could reward police forces for seizing property in illicit tobacco busts. Toronto Star [Internet],2016 Apr 9[cited 2016 Apr 25]; Canada. Available from: http://www.cbc.ca/news/canada/civil-forfeiture-contraband-tobacco-1.3453200

99. Luk R, Cohen JE, Ferrence R. Contraband cigarettes in Ontario [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2007 [cited 2016 Aug 3]. Available from: http://otru.org/wp-content/uploads/2012/06/special_nov_2007.pdf

100. Ontario creating new enforcement team to combat contraband tobacco province strengthening enforcement and collaboration [Internet]. Toronto, ON: Ontario Ministry of Community Safety and Correctional Services; 2016 [cited 2017 Jan 13]. Available from: https://news.ontario.ca/mcscs/en/2016/1/ontario-creating-new-enforcement-team-to-combat-contraband-tobacco.html

101. About raw leaf tobacco [Internet]. Toronto, ON: Ontario Ministry of Finance; 2016 [cited 2016 Apr 27]. Available from: http://www.fin.gov.on.ca/en/tax/tt/rawleaf.html

102. Office of the Auditor General of Canada. Report of the Auditor General of Canada to the House of Commons. Ottawa, ON: Her Majesty the Queen in Right of Canada; 2011. Chapter 3: payments to producers- agriculture and agri-food Canada ; p. 1-35. Available from: http://www.oag-bvg.gc.ca/internet/docs/parl_oag_201111_03_e.pdf

103. Ministry of Finance. Changes to the raw leaf tobacco program [Internet]. Oshawa, ON: Queen's Printer for Ontario; 2016 [cited 2017 Jan 3]. Available from: http://www.fin.gov.on.ca/en/tax/tt/rltprogram.html

104. Basic rules for tobacco retail dealers [Internet]. Oshawa, ON: Queen's Printer for Ontario; 2014 [cited 2016 Apr 25]. Available from: http://www.fin.gov.on.ca/en/tax/tt/basicrules.html

105. Ontario Tobacco Research Unit. Litigation against the tobacco industry: monitoring update [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2013 [cited 2015 Dec 31]. Available from: http://otru.org/wp-content/uploads/2013/10/litigation2013.pdf

106. Smoking and Health Action Foundation (SHAF) and Non-Smokers' Rights Association (NSRA). Tobacco-related litigation in Canada [Internet]. Toronto, ON: Smoking and Health Action Foundation (SHAF) and Non-Smokers' Rights Association (NSRA); 2016 [cited 2016 May 11]. Available from: https://www.nsra-adnf.ca/cms/file/files/Tobacco-related_Litigation_in_Canada_2016.pdf

107. Jones WJ, Silvestri GA. The Master Settlement Agreement and its impact on tobacco use 10 years later: lessons for physicians about health policy making. Chest. 2010;137(3):692-700. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3021365/pdf/chest.09-0982.pdf

108. Vernick JS, Rutkow L, Teret SP. Public health benefits of recent litigation against the tobacco industry. JAMA. 2007;298(1):86-9.

109. Dunlop SM, Romer D. Relation between newspaper coverage of 'light' cigarette litigation and beliefs about 'lights' among American adolescents and young adults: the impact on risk perceptions and quitting intentions. Tob Control. 2010;19(4):267-73.

110. Physicians for a Smoke-Free Canada. A global snapshot: tobacco lawsuits outside of the USA [Internet]. Ottawa, ON: Physicians for a Smoke-Free Canada; 2015 [cited 2015 Dec 31]. Available from: http://www.smoke-free.ca/Eyeonthetrial/2015-litigationsnapshot.pdf

111. Sloan F, Chepke L. Litigation, settlement and the public welfare: lessons from the Master Settlement Agreement. Widener Law Review. 2011;17(159):159-226. Available from: http://widenerlawreview.org/files/2011/03/Sloan.pdf

112. Master Settlement Agreement [Internet]. Washington, DC: National Association of Attorneys General; 1998 [cited 2016 Mar 7]. Available from: http://www.naag.org/assets/redesign/files/msa-tobacco/MSA.pdf

113. Tobacco Control Legal Consortium. The Master Settlement Agreement: an overview [Internet]. St. Paul, MN: Tobacco Control Legal Consortium; 2015 [cited 2016 Apr 6]. Available from: http://publichealthlawcenter.org/sites/default/files/resources/tclc-fs-msa-overview-2015.pdf

114. Callard C. The Montreal Tobacco Class Actions: implications for public health [conference abstract]. National Conference on Tobacco or Health; 2016 Mar 1; Ottawa, ON.

115. Létourneau v JIT-MacDonald Corp, Imperial Tobacco Canada Limited, Rothmans, Benson& Hedges Inc, 2011 QCCS s 500-06-000070-983.

116. Wilson N, Thomson GW, Edwards R, Blakely T. Potential advantages and disadvantages of an endgame strategy: a 'sinking lid' on tobacco supply. Tob Control. 2013;22 Suppl 1:i18-21.

117. Thomson G, Wilson N, Blakely T, Edwards R. Ending appreciable tobacco use in a nation: using a sinking lid on supply. Tob Control. 2010;19(5):431-5.

118. Tait P, Saunders C, Rutherford P. Quota management policy for New Zealand tobacco supply [Internet]. Aukland, NZ: Health Improvement and Innovation Resource Centre; 2013 [cited 2016 Oct 25]. Available from: http://www.hiirc.org.nz/page/38226/quota-management-policy-for-new-zealand-tobacco/;jsessionid=4604E833713620AADE620BF95A883505?tag=policy&tab=4202&contentType=167&section=10541

119. Borland R. A strategy for controlling the marketing of tobacco products: a regulated market model. Tob Control. 2003;12(4):374-82.

120. Alcohol and Gaming Commission of Ontario. Overview: alcohol licensing [Internet]. Toronto, ON: Queen's Printer for Ontario; 2017 [cited 2016 Oct 25]. Available from: http://www.agco.on.ca/en/whatwedo/index.aspx

121. MADD Canada. Provincial liquor boards: meeting the best interests of Canadians [Internet]. Oakville, ON: MADD Canada; 2014 [cited 2015 Oct 25]. Available from: http://www.madd.ca/media/docs/MADD_Canada_Provincial_Liquor_Boards.pdf

122. Callard C, Thompson D, Collishaw N. Transforming the tobacco market: why the supply of cigarettes should be transferred from for-profit corporations to non-profit enterprises with a public health mandate. Tob Control. 2005;14:278-83.

123. Sugarman SD. Performance-based regulation: enterprise responsibility for reducing death, injury, and disease caused by consumer products. J Health Polit Policy Law. 2009;34(6):1035-77.

124. Physicians for a Smoke-Free Canada. Future options for tobacco control: performance-based regulation of tobacco [Internet]. Ottawa, ON: Physicians for a Smoke-Free Canada; 2010 [cited 2016 May 13]. Available from: http://www.smoke-free.ca/pdf_1/2010/Performance-based%20regulation%20of%20tobacco.pdf

125. Miller AB. Epidemiologic studies in cancer prevention and screening. 1st ed. New York, NY: Springer New York; 2012.

126. World Health Organization. WHO Study Group on tobacco product regulation: report on the scientific basis of tobacco product regulation [Internet]. WHO Technical Report Series, n. 989 ed. Geneva, SZ: World Health Organization; 2015 [cited 2016 May 17]. Available from: http://apps.who.int/iris/bitstream/10665/161512/1/9789241209892.pdf?ua=1

127. Hatsukami DK, Henningfield JE, Kotlyar M. Harm reduction approaches to reducing tobacco-related mortality. Annu Rev Public Health. 2004;25:377-95.

128. World Health Organization. WHO technical report series: the scientific basis of tobacco product regulation [Internet]. Geneva, SZ: World Health Organization; 2007 [cited 2016 May 20]. Available from: http://www.who.int/tobacco/global_interaction/tobreg/who_tsr.pdf

129. Gray N, Borland R. Research required for the effective implementation of the framework convention on tobacco control, articles 9 and 10. Nicotine Tob Res. 2013;15(4):777-88. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3693498/pdf/nts175.pdf

130. Tobacco reporting regulations [Internet]. Ottawa, ON: Health Canada; 2012 [cited 2016 May 16]. Available from: http://www.hc-sc.gc.ca/hc-ps/tobac-tabac/legislation/reg/indust/index-eng.php

131. *Tobacco Reporting Regulations*, SOR/2000-273. Available from: http://laws-lois.justice.gc.ca/PDF/SOR-2000-273.pdf

132. *Tobacco Products Labelling Regulations (Cigarettes and Little Cigars)*, SOR/2011-177. Available from: http://www.tobaccocontrollaws.org/files/live/Canada/Canada%20-%20Cigarette%20and%20Little%20Cigar%20Regs%20-%20national.pdf

133. Hammond D, Wiebel F, Kozlowski LT, Borland R, Cummings KM, O'Connor RJ, et al. Revising the machine smoking regime for cigarette emissions: implications for tobacco control policy. Tob Control. 2007;16(1):8-14.

134. Hammond D, O'Connor RJ. Constituents in tobacco and smoke emissions from Canadian cigarettes. Tob Control. 2008;17:i24-31.

135. Benowitz NL, Henningfield JE. Reducing the nicotine content to make cigarettes less addictive. Tob Control. 2013;22 Suppl 1:i14-7.

136. Hammond D, O'Connor RJ. Reduced nicotine cigarettes: smoking behavior and biomarkers of exposure among smokers not intending to quit. Cancer Epidemiol Biomarkers Prev. 2014;23(10):1-9. Available from: http://cebp.aacrjournals.org/content/cebp/early/2014/08/15/1055-9965.EPI-13-0957.full.pdf

137. Donny EC, Hatsukami DK, Benowitz NL, Sved AF, Tidey JW, Cassidy RN. Reduced nicotine product standards for combustible tobacco: building an empirical basis for effective regulation. Prev Med. 2014;68:17-22.

138. Hatsukami DK, Perkins KA, Lesage MG, Ashley DL, Henningfield JE, Benowitz NL, et al. Nicotine reduction revisited: science and future directions. Tob Control. 2010;19(5):e1-10.

139. Dermody SS, Donny EC. The predicted impact of reducing the nicotine content in cigarettes on alcohol use. Nicotine Tob Res. 2014;16(8):1033-44.

140. Farley SM, Johns M. New York City flavoured tobacco product sales ban evaluation. Tob Control. 2016 Feb 2 [Epub ahead of print].

141. Wackowski OA, Manderski MT, Delnevo CD. Young adults' behavioral intentions surrounding a potential menthol cigarette ban. Nicotine Tob Res. 2014;16(6):876-80.

142. Thrasher JF, Abad-Vivero EN, Moodie C, O'Connor RJ, Hammond D, Cummings KM, et al. Cigarette brands with flavour capsules in the filter: trends in use and brand perceptions among smokers in the USA, Mexico and Australia, 2012-2014. Tob Control. 2016;25(3):275-83.

143. Bill 45, *Making Healthier Choices Act,* S.O. 2015, c. 7. Available from: http://www.ontla.on.ca/web/bills/bills_detail.do?BillID=3080

144. New legislation passes to help reduce smoking and obesity rates: Ontario takes action to help families make healthier choices [Internet]. Toronto, ON: Queen's Printer for Ontario; 2015 [cited 2015 May 17]. Available from: https://news.ontario.ca/mohltc/en/2015/05/new-legislation-passes-to-help-reduce-smoking-and-obesity-rates.html

145. Society applauds national ban on menthol cigarettes [Internet]. Toronto, ON: Canadian Cancer Society; 2016 [cited 2016 May 24]. Available from: https://www.cancer.ca/en/about-us/for-media/media-releases/national/2016/national-menthol-ban/?region=nu

146. Canadian provinces first in world to ban menthol flavouring [Internet]. Ottawa, ON: Framework Convention Alliance; 2015 [cited 2016 Nov 02]. Available from: http://www.fctc.org/fca-news/opinion-pieces/1328-canadian-provinces-first-to-ban-menthol-flavouring

147. Government of Canada moving forward with proposal to ban menthol in most tobacco products [Internet]. Ottawa, ON: Health Canada; 2016 [cited 2016 May 26]. Available from: http://news.gc.ca/web/article-en.do?nid=1059269

148. Ontario Tobacco Research Unit. Why provincial legislation on flavours remains essential. In: OTRU Listserve Email Update [discussion list on the Internet]. Toronto, ON: Ontario: Ontario Tobacco Research Unit; 2016 May 3.

149. Flavored tobacco product sale [Internet]. New York, US: City of New York; cited 2016 May 17]. Available from: http://www1.nyc.gov/nyc-resources/service/2919/flavored-tobacco-product-sale

150. Pearson JL, Abrams DB, Niaura RS, Richardson A, Vallone DM. A ban on menthol cigarettes: impact on public opinion and smokers' intention to quit. Am J Public Health. 2012;102(11):e107-14. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3474368/pdf/AJPH.2012.300804.pdf

151. Food and Drug Administration (FDA). Preliminary scientific evaluation of the possible public health effects of menthol versus nonmenthol cigarettes [Internet]. Silver Spring, MD: Food and Drug Administration; 2013 [cited 2016 May 24]. Available from: http://www.fda.gov/downloads/UCM361598.pdf

152. International Agency for Research on Cancer (IARC). A review of human carcinogens. Part E: personal habits and indoor combustions. IARC monograph volume 100E ed. Lyon, France: International Agency for Research on Cancer; 2012. Available from: http://monographs.iarc.fr/ENG/Monographs/vol100E/mono100E.pdf

153. Rutqvist LE, Curvall M, Hassler T, Ringberger T, Wahlberg I. Swedish snus and the GothiaTek(R) standard. Harm Reduct J. 2011;8:11,7517-8-11. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3119032/pdf/1477-7517-8-11.pdf

154. Stepanov I, Gupta PC, Dhumal G, Yershova K, Toscano W, Hatsukami D, et al. High levels of tobacco-specific N-nitrosamines and nicotine in Chaini Khaini, a product marketed as snus. Tob Control. 2015;24(e4):e271-4. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4929854/pdf/nihms719319.pdf

155. O'Connor RJ. Non-cigarette tobacco products: what have we learnt and where are we headed? Tob Control. 2012;21(2):181-90.

156. Ebbert JO, Fagerstrom K. Pharmacological interventions for the treatment of smokeless tobacco use. Cns Drugs. 2012;26(1):2012.

157. Wayne GF. Potential reduced exposure products (PREPs) in industry trial testimony. Tob Control. 2006;15 Suppl 4:iv90-7. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2563586/pdf/iv90.pdf

158. Buchhalter AR, Eissenberg T. Preliminary evaluation of a novel smoking system: effects on subjective and physiological measures and on smoking behavior. Nicotine Tob Res. 2000;2(1):39-43.

159. Forster M, Liu C, Duke MG, McAdam KG, Proctor CJ. An experimental method to study emissions from heated tobacco between 100-200 degrees C. Chem Cent J. 2015;9:20. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4418098/pdf/13065_2015_Article_96.pdf

160. Chaiton M, Schwartz R. Heat-not-burn tobacco products: claims and science [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2016 [cited 2017 Jan 5]. Available from: http://otru.org/wp-content/uploads/2016/11/update_nov2016.pdf

161. Tabuchi T, Kiyohara K, Hoshino T, Bekki K, Inaba Y, Kunugita N. Awareness and use of electronic cigarettes and heat-not-burn tobacco products in Japan. Addiction. 2016;111(4):706-13.

162. Caputi TL. Heat-not-burn tobacco products are about to reach their boiling point. Tob Control. 2016 Aug 24 [Epub ahead of print].

163. Czoli CD, Reid JL, Rynard VL, Hammond D. Tobacco use in Canada: patterns and trends [Internet]. Special supplement: e-cigarettes in Canada. 2015 ed. Waterloo, ON: Propel Centre for Population Health Impact, University of Waterloo; 2015 [cited 2016 Dec 3]. Available from: https://uwaterloo.ca/tobacco-use-canada/sites/ca.tobacco-use-canada/files/uploads/files/tobacco_use_in_canada_2015_accessibleecig_supplement_final_final-s.pdf

164. McNeill A, Brose L, Calder R, Hitchman S, Hajek P, McRobbie H. E-cigarettes: an evidence update. A report commissioned by Public Health England [Internet]. London, UK: Public Health England; 2015 [cited 2016 Dec 3]. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/457102/Ecigarettes_an_evidence_update_A_report_commissioned_by_Public_Health_England_FINAL.pdf

165. Richtell M. E-cigarettes, by other names, lure young and worry experts The New York Times [Internet],2014 Mar 4[cited 2016 Nov 2]; Business. Available from: http://www.nytimes.com/2014/03/05/business/e-cigarettes-under-aliases-elude-the-authorities.html?ref=health&_r=2

166. Centers for Disease Control and Prevention (CDC). CDC's Public Health Grand Rounds: e-cigarettes: the cutting edge of tobacco control [Internet]. Atlanta, GA: US Department for Health and Human Services; 2015 [cited 2016 Aug 26]. Available from: https://www.cdc.gov/cdcgrandrounds/pdf/archives/2015/october2015.pdf

167. Tremblay MC, Pluye P, Gore G, Granikov V, Filion KB, Eisenberg MJ. Regulation profiles of e-cigarettes in the United States: a critical review with qualitative synthesis. BMC Med. 2015;13:130. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4480885/pdf/12916_2015_Article_370.pdf

168. Health and safety report [Internet]. Hamilton, ON: Canadian Centre for Occupational Health and Safety; 2016 [cited 2016 Mar 3]. Available from: http://www.ccohs.ca/newsletters/hsreport/issues/2014/08/ezine.html

169. Electronic cigarette (vape) rules [Internet]. Toronto, ON: Queen's Printer for Ontario; 2015 [updated 2015 Nov 12; cited 2016 Mar 3]. Available from: https://www.ontario.ca/page/electronic-cigarette-vape-rules

170. *Electronic Cigarettes Act,* 2015, S.O. 2015, c. 7, Sched. 3 . Available from: https://www.ontario.ca/laws/statute/15e07

171. McRobbie H., Bullen C., Hartmann-Boyce J., Hajek P. Electronic cigarettes for smoking cessation and reduction. Cochrane Database Syst Rev. 2014;12:CD010216. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD010216.pub2/epdf

172. Rahman MA, Hann N, Wilson A, Mnatzaganian G, Worrall-Carter L. E-cigarettes and smoking cessation: evidence from a systematic review and meta-analysis. PLoS One. 2015;10(3):e0122544. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4378973/pdf/pone.0122544.pdf

Chapter 4: Prevention

Table of Contents

Background

What is Prevention?

Tobacco use prevention can take two forms: primary prevention and secondary prevention.

Primary prevention aims to prevent the onset of specific behaviours such as smoking.[1] For example, to prevent individuals from starting to smoke, tobacco primary prevention efforts might involve implementing minimum age restrictions to prevent youth and young adults from accessing tobacco products.

Secondary prevention aims to detect and prevent the progression of further tobacco use.[1] For example, secondary prevention interventions may aim to prevent youth who have tried the occasional cigarette from becoming daily (and nicotine dependent) smokers. These interventions might involve mass media campaigns or school education programs that inform youth about the dangers of continued smoking to discourage more frequent use.

Why Address Prevention in Youth and Young Adults?

It is widely accepted that prevention is an important aspect of tobacco control. There are also a variety of reasons to address prevention during adolescence and young adulthood:

- Youth and young adults are susceptible to initiating tobacco use
- The transition period to young adulthood increases risk of initiation
- Once individuals start smoking, they are at greater risk of progressing to increased tobacco use
- New products (e.g., e-cigarettes) may increase tobacco use among youth and young adults

Susceptible to Initiating Tobacco Use

Youth and young adults are susceptible to smoking and are at risk of future smoking initiation. Susceptibility to smoking is defined as "the absence of a firm decision not to smoke," and can predict future smoking experimentation by young people.[2] Within Canada, in 2012-13, it was estimated that almost one-third of never-smoking students in grades 6 to 9 were classified as susceptible to smoking, with similar rates between males (30.5%) and females (30.6%).[3]

Transition Period between Adolescence and Young Adulthood

The transition out of adolescence and into young adulthood is associated with increased prevalence of cigarette smoking,[4] which may be a result of numerous factors. To date, prevention efforts (especially those employed at the school level) have focused on youth and have neglected young adults; however, evidence suggests that young adults are also susceptible to smoking uptake.[5,6] The transition to young adulthood is marked by greater access to tobacco products, most notably through legal purchase beginning at age 19 in Ontario.

Young adulthood often includes changes to social networks and living arrangements as well as new school or work settings that may increase exposure to cigarette smoking and the risk of initiation.[5] For

example, the transition period to young adulthood often occurs during a time when young adults begin post-secondary education or enter the workforce; many may leave home for the first time and become more independent.

Tobacco companies may take advantage of the increased susceptibility of young adults during their transition period. For example, tobacco companies develop marketing strategies aimed directly at young adults and intentionally integrate tobacco advertising into the work and social settings of young adults.[5]

Progress to Increased tobacco Use

Adolescence and young adulthood are critical periods for the development of tobacco dependence because once individuals start smoking, they are at increased risk of progressing to greater tobacco use. An early model by Flay (1993) suggests that stages of tobacco use initiation may include some, but not necessarily all of the following: 1) the preparatory stage (where knowledge, beliefs and expectations about tobacco use are formed); 2) the initial trying stage (characterized by the first two or three 'tries' – usually occurring in the presence of friends or alone at home); 3) the experimentation stage (involving repeated but irregular use over an extended period of time); 4) the regular use stage (characterized by using tobacco on a regular basis such as everyday); and 5) the nicotine dependence or addiction stage (characterized by an internal regulated need for nicotine including withdrawal symptoms in the absence of nicotine).[7]

More recent evidence, however, suggests that symptoms of nicotine dependence develop much earlier and may occur soon after the first puff and can precede monthly, weekly and daily smoking.[8] For example, Gervais et al. (2006) examined the temporal sequence of smoking initiation among Canadian students in grades 10 to 12.[8] They found that following the first puff, inhalation (i.e., taking cigarette smoke into the lungs for more than one puff) and smoking a whole cigarette occurred rapidly within a few months of initiation; monthly smoking occurred within approximately nine months, weekly smoking occurred within about 20 months and daily smoking occurred within approximately 24 months of initiation.[8] Additionally, milestones related to nicotine dependence, mental addiction, cravings and physical addiction appeared between two to five months after initiation, while withdrawal symptoms and tolerance developed around 11 to 41 months after initiation.[8]

It is therefore critical that tobacco-related prevention interventions intervene at any of these stages to prevent the initiation of tobacco use (i.e., primary prevention) or the progression to more regular use of tobacco products (i.e., secondary prevention).

Enticing New Products

Since 1999, the prevalence of cigarette smoking has decreased both among youth (15-19 years) and young adults (20-24 years),[3] suggesting that prevention efforts have had some positive impact. However, the focus on cigarette smoking within tobacco control has allowed for growth in the use of other tobacco products, flavoured tobacco products and electronic cigarettes.

Other Tobacco Products

The use of other tobacco products (e.g., cigars, cigarillos, pipes, smokeless (chewing) tobacco and/or waterpipes using tobacco) is a more recent concern. Some products (e.g., cigarillos/little cigars) may be more affordable for young people because they are taxed at lower rates, can be sold individually (rather than in packs) and can include flavours (e.g., candy flavour) that are banned from cigarettes.[9] Additionally, despite the risks associated with these other tobacco products, many young people perceive these products (e.g., waterpipes) to be less harmful than cigarettes .[10,11] In 2013, youth (15-19 years) and young adults (20-24 years) in Canada reported the highest prevalence of use of other tobacco products, compared to older individuals.[3] Although typically used less frequently than cigarettes, other tobacco products may be gateways to cigarette smoking [12] and therefore are an important public health issue.

Flavoured Tobacco Products

The tobacco industry uses flavouring agents (e.g., candy and menthol) in tobacco products to attract and retain consumers .[13] Menthol is a flavouring agent that has cooling, desensitizing and proanalgesic effects, and is associated with altered physiological responses to tobacco smoke.[14] This altered response may make cigarettes more appealing and tolerable for new users.[15] Menthol cigarettes are likely associated with increased smoking initiation by youth and young adults and progression to regular cigarette smoking.[14] In Canada, in 2013, 31% of students in grades 6 to 9 who are current cigarette smokers (i.e., had smoked a cigarette in the last 30 days) reported using menthol cigarettes.[3]

Use of flavouring is also highly popular in other tobacco products; in 2014-15, 70% of Canadian students in grades 6 to 12 who used any tobacco product in the past 30 days used a flavoured product.[16]

For more information on flavoured tobacco products, see Chapter 3: Industry.

Electronic cigarettes

Electronic cigarettes, also known as e-cigarettes, are battery-operated devices that electronically heat a solution to create an inhalable aerosol.[17] There is concern that e-cigarettes may undermine policies and interventions that aim to denormalize tobacco use,[18] and may act as a gateway product to nicotine dependency and tobacco use.[19] Consistent with other markets, e-cigarettes sold in Canada are available in a variety of flavours (e.g., cotton candy, peach, mint).[20] These flavours are often marketed to youth and are used to elicit greater appeal and interest in trying e-cigarettes.[21]

Similar to the use of other tobacco products, in 2013, Canadian youth (15-19 years) and young adults (20-24 years) had the highest prevalence of e-cigarette use.[20] In 2015, 26% of Canadian youth aged 15 to 19, and 31% of young adults aged 20 to 24 reported having ever tried an e-cigarette.[22] Six percent of these youth and six percent of young adults had used an e-cigarette in the past 30 days, an increase in each of the age categories compared to 2013.[22] Concurrent use of e-cigarettes and other tobacco products is also a concern; among a sample of Canadian youth (grades 9-12) (2013-14), 75.5% of e-cigarette users reported also using another tobacco or waterpipe product in the past 30 days.[23]

Methods

Best Available Research Evidence

This chapter is primarily focused on interventions directed at youth and young adult populations to prevent the initiation and progression of tobacco product use.

Two reviewers screened all the pre-appraised reviews for relevance to this chapter. An additional PHO library search was conducted for the Tailoring Interventions to Specific Populations section. Please see the Appendix 1: Summary Tables of Library Searches for the research question used for this intervention topic.

Broad inclusions of prevention outcomes were used in the report; for example, smoking susceptibility, smoking initiation/uptake, smoking progression/escalation, smoking prevalence. Please refer to the Glossary for definitions.

Results

The pre-appraised literature search for the Prevention chapter yielded 22 relevant review-level articles. A PHO Library search for articles related to Specific Populations relevant to prevention yielded one additional review article. SFO-SAC members contributed 31 articles that met prevention inclusion criteria (See Figure 4.1).

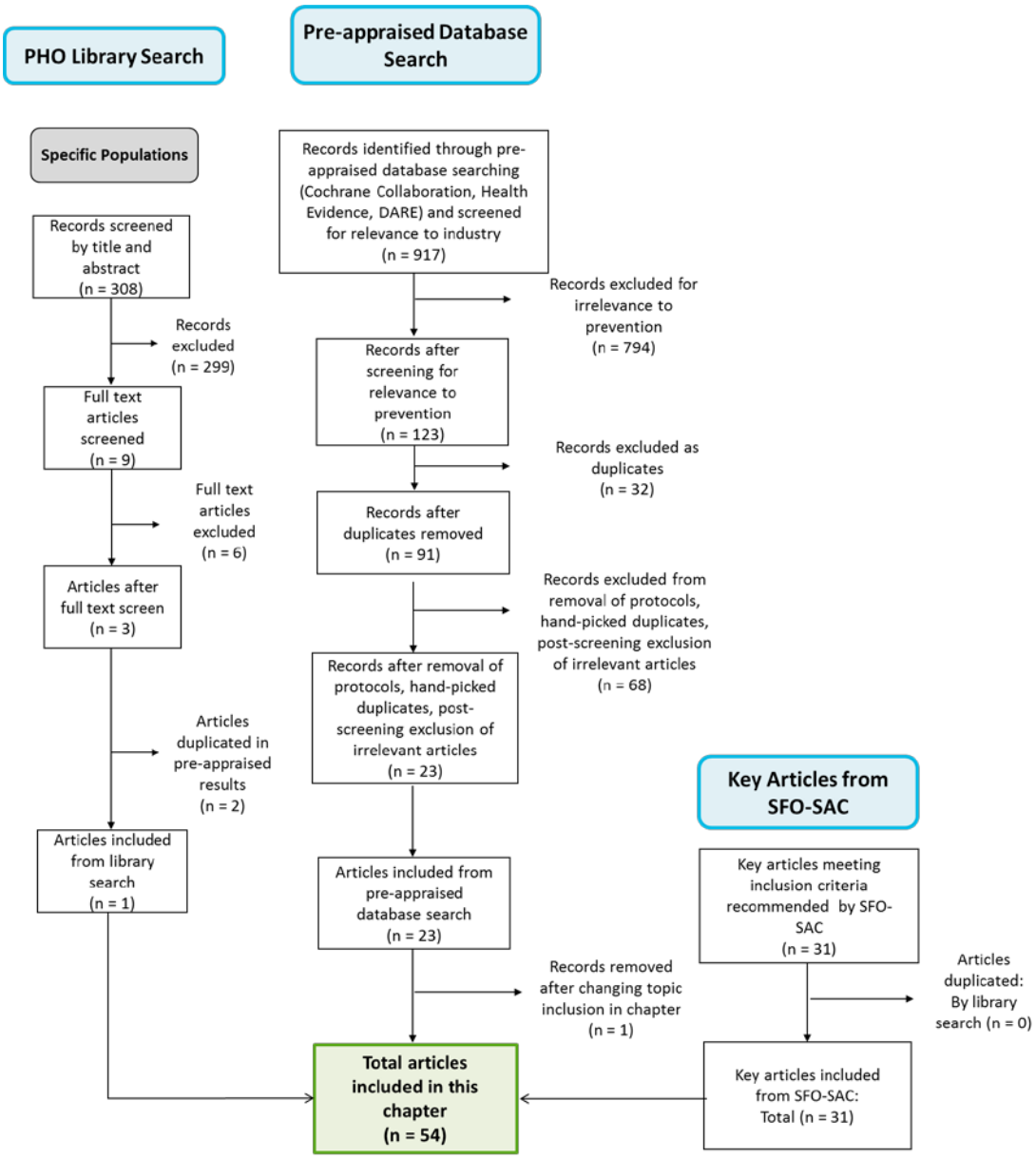

Figure 4.1: Search and Screening Flow Diagram

Organization of Interventions and Innovations

The following section describes the effectiveness of various primary and secondary tobacco prevention interventions and innovations that target tobacco use among youth and young adults. Some interventions are designed to address primary prevention (e.g., a tobacco-free generation aims to prohibit tobacco use among an entire generation), while others are designed to address both primary and secondary prevention (e.g., higher taxes on tobacco products may stop young people from trying cigarettes and also may discourage them from escalating their use of tobacco products).

Details of each intervention are described below in the Interventions and Innovations section.

Interventions and innovations have been categorized in four sub-sections:

1. Retail interventions
2. Marketing interventions
3. School- and campus-based interventions
4. Other interventions

Within each topic area, the best available evidence of effectiveness for each intervention/innovation related to preventing smoking initiation and/or escalation is presented. It is important to note that where evidence is considered insufficient to conclude effectiveness does not necessarily indicate evidence of no effect; rather, it can point to areas for future research. Each topic includes relevant intervention characteristics and implementation considerations, specific populations and equity considerations, and information related to the Ontario and/or Canadian context.

Interventions and Innovations

Retail Interventions

Raising the Minimum Purchase Age

> *In Ontario, the minimum legal age to purchase tobacco products and e-cigarettes is 19, and retailers who violate this restriction can be fined. Raising the minimum legal age to purchase tobacco products would likely reduce tobacco use among youth and young adults. Continued monitoring of the tobacco retail environment and proactive enforcement can further enhance the effectiveness of age restrictions.*
>
> *SFO-SAC 2016 Scientific Consensus Statement*

Background

Prohibiting tobacco product sales to youth and young adults is a policy option recommended in the *World Health Organization Framework Convention on Tobacco Control* (WHO FCTC).[24] Article 16 recommends prohibiting, "…the sales of tobacco products to persons under the age set by domestic law,

national law or eighteen. These measures may include: (a) requiring that all sellers of tobacco products place a clear and prominent indicator inside their point-of-sale about the prohibition of tobacco sales to minors and, in case of doubt, request that each tobacco purchaser provide appropriate evidence of having reached full legal age".[24] Selling tobacco products to underage youth and young adults can be prevented through strong, well-defined policies. Well-enforced tobacco sale policies can help to prevent purchases by underage youth in tobacco retail outlets.[25]

Minimum age restrictions involve prohibiting the sale of tobacco products to individuals who are under a pre-defined age. Currently, in Ontario, retailers are prohibited from selling and supplying tobacco products to anyone under the age of 19 (Section 3 under the *Act*).[26] While minimum age restrictions are effective in decreasing the availability of retail tobacco products to underage youth, it is difficult to determine their effects on tobacco use by these individuals due to their reliance on social and other non-retail sources (e.g., older friends and family members).[27]

The Ontario/Canadian Context

The *Smoke-free Ontario Act* (*SFOA*) (as of May 31, 2006) prohibits retailers from selling and supplying tobacco products to anyone under the age of 19 (Section 3 under the *Act*).[26] In addition, displays of health warnings and government identification signs at point-of-sale must be present; the *Act* also requires retailers to request personal identification from individuals buying tobacco products who appear to be less than 25 years old.[26] Retail owners can face financial penalties or conviction if their employees violate any of these prohibitions, unless it is proven that the owners were diligent in avoiding violations, such as by providing training to employees on the *Act*.[28,29] Enforcement (e.g., conducting inspections and addressing complaints) of minimum age restrictions and other *SFOA* restrictions is done by local public health units.[28]

Despite these policies, many youth continue to access tobacco products through retail sources: 18.2% of Ontario students (grades 7-12) reported obtaining cigarettes from a store, gas station or bar.[25] However, many more youth report accessing tobacco products through alternative social sources; 62.1% of Ontario students reported obtaining cigarettes from a friend or relative.[25] Additionally, half of Ontario students (53.3%) perceived that it would be 'fairly easy' or 'very easy' to obtain cigarettes.[25] It is evident that additional efforts are needed to control youth access to tobacco products.

As of January 1, 2016, it has been illegal to sell or supply e-cigarettes and components (e.g., battery, atomizer) to anyone less than 19 years old.[30] Stores or 'vape' shops that sell e-cigarettes are required to post signs about the new rules.[30] However, there is no evaluative evidence of these regulations at this time.

Evidence

The best available research evidence for minimum age restrictions comprised an overview of systematic reviews,[31] a systematic review,[32] a narrative review [33] from the pre-appraised literature, and a systematic review[34] and a narrative review[35] from a PHO library search (from the Retail section in the Industry Chapter). Additionally, six grey literature reports[4,27,36-39] were provided by SFO-SAC (one of which was a rapid review of review-level literature).[4] One overview of reviews was rated Level I

quality,[31] three reviews were rated Level II quality[32-34] and one was rated Level III quality.[35] The majority of included studies from within reviews were from the U.S., the U.K., Canada, Sweden and Australia.

Evidence of Effectiveness

There has been interest in increasing the minimum legal age to purchase tobacco products.[4] In 2013, the Institute of Medicine (IOM) (in the U.S.) convened a committee at the request of the Food and Drug Administration FDA to study the public health implications of raising the minimum age to purchase tobacco products.[27] The IOM found that a substantial reduction in smoking prevalence in the U.S. would likely occur if the minimum age of legal access was raised, particularly to ages 21 and 25.[27] For example, modelling predictions showed a 12% decrease in prevalence of tobacco use among youth and young adults if the minimum age was raised to 21, and a 16% decrease if it was raised to 25.[27]

Further restrictions proposed by researchers in Singapore include restricting tobacco sales to citizens born in, or after, a certain year (i.e., year 2000), to create 'tobacco-free generations'. This restriction would legally ban these individuals from purchasing tobacco at any age (See the Tobacco-Free Generation section for more information).[37] Other strategies include requiring smokers' licences and tobacco prescriptions for purchasing tobacco products; however, these strategies could cause financial burden on smokers (e.g., renewal fees), lead to illegal sales of tobacco, and normalize smoking as a prescription medication.[37]

Intervention Characteristics/Implementation Considerations

Implementation considerations, including strategies to promote compliance with minimum age restrictions (e.g., active enforcement, requesting ages and personal identification), are described below, as well as barriers to effective implementation.

Strategies to Promote Compliance

One factor that has led to greater effectiveness of minimum age restrictions is requesting age and personal identification. A systematic review examining studies in the U.S. found that requesting age (verbally) (OR: 0.030, 95% CI: 0.002 to 0.426) and personal identification (OR: 0.001, 95% CI: 0.001 to 0.020) reduced illegal sales of tobacco to youth, but greater effects were seen on sales reduction when requesting identification rather than requesting age alone.[32]

Additionally, merchants and vendors need to have a clear understanding of the law, have the knowledge and skills to identify and refuse sales to minors, and have the motivation to comply.[39] However, studies have shown that while educating retailers is necessary, enforcement is also needed to improve compliance and reduce the prevalence of youth smoking .[33,39]

Active enforcement (i.e., conducting regular compliance checks with tobacco vendors) promotes retailer compliance, while passive enforcement (i.e., only responding to complaints) or self-enforcement are not effective.[39] Active enforcement can include revoking store licenses and issuing fines to non-compliant retailers following random compliance checks; of importance in this system is a legal framework and coordinated funding for these activities.[36,39] Enforcement that disrupts the commercial distribution of tobacco products results in fewer purchases made by youth, fewer youth reporting that commercial

sources were their main source of tobacco products, and more youth reporting that it was difficult to purchase cigarettes.[31,33,39] Adopting a law prohibiting the sale of tobacco products to minors with weak enforcement that does not disrupt sales of tobacco products to minors does not show any effect on youth smoking rates.[33,39]

Other effective enforcement strategies include reward and reminders (e.g., social and material reinforcement for retailers to not sell tobacco to young people), feedback or warning letters to retailers, and using the media to publicize names of violators and stores.[39] Case examples in the U.S. and Australia have shown success with these strategies; however, warnings without fines, or issuing warnings for the first offence have not been associated with high compliance rates.[39]

Implementation Barriers

Barriers for effective implementation of minimum age restriction laws include resource capacity (e.g., limited capacity for enforcement) and social sources of tobacco products (i.e., obtaining tobacco products from family members, friends, and strangers).[32,35] For example, over half (58%) of Ontario students who smoked at least one cigarette in the previous year (2009) reported getting their cigarette from a friend or family member.[38]

Specific Populations/Equity Considerations

A single review examined the differential impact of minimum age restriction policies (e.g., laws prohibiting sales to minors and electronic locking devices on vending machines) on youth and young adults at various socio-economic status (SES) levels and found mixed evidence.[34] Two of the five studies showed a positive equity impact (reduced inequity: lower SES groups were relatively more responsive to the intervention or policy).[34] For example, a U.S. study found that more comprehensive and enforced state-level tobacco policies on age-of-sales were associated with lower smoking initiation and reduced transition to heavier tobacco use among low SES adolescent girls.[34] In contrast, two studies showed neutral equity impact (no difference by SES), and the last study showed a negative equity impact (increased inequity: higher SES groups were relatively more responsive to the intervention or policy).[34]

Intervention Summary

Evidence Summary - Raising the Minimum Purchase Age - Promising direction

The body of evidence regarding minimum age restrictions included an overview of reviews (Level I quality), three narrative reviews (two Level II quality, one Level III), one systematic review (Level II quality) and six grey literature reports (e.g., the Institute of Medicine Report (2015); U.S. Surgeon General Report (2014)). Evidence from modelling studies in the United States suggests that raising the minimum legal age to purchase cigarettes (to ages 21 and/or 25) can substantially reduce smoking prevalence among youth and young adults; however, similar evidence for Canada is lacking.

SFO-SAC 2016 Scientific Consensus Statement - Innovative

In Ontario, the minimum legal age to purchase tobacco products and e-cigarettes is 19, and retailers who violate this restriction can be fined. Raising the minimum legal age to purchase tobacco products would likely reduce tobacco use among youth and young adults. Continued monitoring of the tobacco retail environment and proactive enforcement can further enhance the effectiveness of age restrictions.

The scientific consensus regarding the potential contribution for Ontario is: Innovative.

Key Message

Raising the minimum age for purchasing tobacco, and actively enforcing the age restrictions, may substantially reduce the smoking prevalence among Ontario youth and young adults.

Price and Taxation

Given that Ontario has the second lowest provincial excise tax, there is opportunity for a substantial increase in tobacco prices. Increasing the excise tax would meaningfully reduce initiation and escalation of tobacco use among youth and young adults in the province. Because economically-disadvantaged youth and young adults are more responsive to price increases, strategies that increase the price of cigarettes are especially effective for preventing tobacco use among low socio-economic status (SES) groups.

SFO-SAC 2016 Scientific Consensus Statement

Background

Increasing prices through taxation has been shown to be an effective strategy to encourage smoking cessation (see Price and Taxation - Cessation), to reduce the prevalence of cigarette smoking, and to reduce the total consumption of cigarettes (see Price and Taxation - Industry). Taxation is also a core strategy to prevent smoking initiation, especially among youth and young adults, who are more sensitive to price increases.[40] According to the World Health Organization (WHO), "higher taxes and prices prevent young people from initiating tobacco use, and keep them from moving beyond experimentation into daily use".[41]

Price increases primarily occur through taxation, and increased excise taxes discourage cigarette smoking;[42] however other price-related policies exist. The focus of this section will be on price increases through taxation; non-tax price policies are addressed in Chapter 3: Industry.

Ontario/Canadian Context

As discussed in other chapters, amendments to *Ontario's Tobacco Tax Act O. Reg. 40/16 S.1* on February 26th 2016 resulted in a tax increase from 13.975 cents to 15.475 cents per cigarette, and per gram or part gram of other tobacco products.[43] This increase translated into an additional $3 of tobacco excise tax per carton of 200 cigarettes, and increased the retail price from $93.66 to $97.04.[40,44] The amendment also included an annual increase of 2% in the tobacco tax rate over five years in order to account for inflation.

Despite the most recent tax increase, Ontario has the second lowest provincial/territorial tobacco taxes, and the second lowest retail price for cigarettes in Canada.[40,44] For more information on tobacco taxes in Ontario, please refer to Price and Taxation -Cessation.

Evidence

The best available research evidence for this topic comprised three systematic reviews identified from the pre-appraised literature,[45-47] and one systematic review[48] and two grey literature reports provided by SFO-SAC.[49,50] One review was appraised as Level I quality,[47] one was appraised as Level II quality,[48] and two were appraised as Level III quality.[45,46] The majority of included studies within reviews were from the U.S., Canada, Australia, France, Ireland, and Spain.

Evidence of Effectiveness

Within the included reviews, the effectiveness of increased price through taxation was primarily evaluated using price elasticity of smoking initiation. The price elasticity of smoking initiation (or the price elasticity of deciding to start smoking) refers to "the extent to which changes in price impact on smoking initiation".[47] Price elasticity is the percentage change in a smoking outcome resulting from a percentage change in price; for example, a price elasticity of smoking initiation of -0.1 means a 10% change in price would result in a 1% decrease in smoking initiation.

Rice et al. (2010) concluded that price is an effective intervention to prevent smoking initiation in young people, based on several longitudinal studies. Results from these studies found a price elasticity of smoking initiation ranging from -0.91 to -0.65.[47] These numbers imply that a 10% increase in price could result in a 6.5% to 9.1% decrease in smoking initiation.[47] Another review found some evidence of effectiveness, but with a lower price elasticity range of -0.65 to -0.09.[45] Together, these findings are consistent with those reported in the SF0-SAC 2010 Report, which noted that increases in the price of cigarettes result in decreased demand/consumption and that youth are particularly sensitive to higher tobacco prices for uptake and consumption.[6]

The International Agency for Research on Cancer (IARC) (2011) report concluded that there is sufficient evidence that "increases in tobacco excise taxes that increase prices reduce the prevalence of tobacco use among young persons" and that "increases in tobacco excise taxes that increase prices reduce the initiation and uptake of tobacco use among young people, with a greater impact on the transition to regular use".[50] Additionally, the 2012 U.S. Surgeon General's report concluded that the majority of the existing evidence showed that price increases can result in a decrease in smoking initiation among youth.[49]

Other evidence indicates that increases in cigarette price can reduce smoking escalation: the mean price elasticity for any smoking initiation was -0.27, -0.81 for initiating smoking one to five cigarettes per day, and -0.96 for initiating smoking at least half a pack a day.[49] Price increases can also prevent various smoking transitions, such as transitioning from a non-daily smoker to a daily smoker (mean price elasticity=-0.65), transitioning from a light smoker to a moderate smoker (mean price elasticity=-0.58), and transitioning from a moderate smoker to a heavy smoker (mean price elasticity=-0.41).[49] This implies that a 10% increase in price could result in a 6.5% reduction in individuals transitioning from a non-daily smoker to a daily smoker, a 5.8% reduction in individuals transitioning from a light smoker to a moderate smoker, and a 4.1% reduction in individuals transitioning from a moderate smoker to a heavy smoker.[49]

One included review found contrasting results, concluding that the evidence on price increases and their effect on smoking initiation were mixed;[46] however, the authors note that the majority of the included studies were cross-sectional studies, and did not have the same methodological rigour as the longitudinal studies.[46]

Similarly, Guindon (2014) reported that the evidence is not sufficient to conclude that prices (or taxes) affect smoking onset, suggesting that the evidence is too limited to make any conclusive statements about the impact of tobacco prices or taxes on smoking onset (rather than concluding that there is no evidence of effect) due to methodological limitations with the included studies. For example, the author notes that many of the included studies were limited by recall bias, used varied definitions of smoking onset, used blurred definitions of smoking initiation versus smoking participation and uptake, and made conclusions about outcomes that they did not appropriately measure (e.g., smoking onset).[48] The review notes that this conclusion differs from other reviews such as Rice (2010)) and IARC (2011), which had fewer studies and involved expert opinion respectively, (which may have accounted for these differences).[48]

Intervention Characteristics/Implementation Considerations

Intervention and implementation considerations related to tobacco taxation, including contraband tobacco, industry pricing strategies, and individual price minimization strategies, are explored in Price and Taxation (Industry).

Specific Populations/Equity Considerations

One review that examined the equity impact of various tobacco control interventions for youth found that price and taxation had the most consistent positive equity impact (i.e., reducing tobacco-related inequities due to SES), and also reported that low SES youth were more responsive to tax increases compared to the high SES youth.[34] However, as discussed in Price and Taxation (Industry), reviews noted that there was limited evidence for the impact of increased price and taxation on non-traditional tobacco use by Indigenous persons (of all ages).[46]

Intervention Summary

Evidence Summary - Price and Taxation - Supported

The best available research evidence comprised four systematic reviews (one Level I quality, one Level II quality, and two Level III quality) and two grey literature reports. From this evidence, it can be concluded that increases in tobacco excise taxes (that raise cigarette retail prices) reduce the prevalence, initiation and uptake of tobacco use among young people. Price increases effectively deter the transition from infrequent to regular use.

SFO-SAC 2016 Scientific Consensus Statement - High (Intensify), Positive Equity

Given that Ontario has the second lowest provincial excise tax, there is opportunity for a substantial increase in tobacco prices. Increasing the excise tax would meaningfully reduce initiation and escalation of tobacco use among youth and young adults in the province. Because economically-disadvantaged youth and young adults are more responsive to price increases, strategies that increase the price of cigarettes are especially effective for preventing tobacco use among low SES groups.

The scientific consensus regarding the potential contribution for Ontario is: High (Intensify). This intervention has a positive equity impact.

Key Message

Higher pricing through taxation is an effective strategy to reduce smoking initiation and escalation among young people –especially those who are economically-disadvantaged and at greater risk of tobacco use. With the second lowest provincial/territorial excise tax and the second lowest retail price for cigarettes in Canada, Ontario could raise prices of all tobacco products and e-cigarettes to maximize deterrence of tobacco use.

Bans on Point-of-Sale Displays

The Smoke-free Ontario Act has prohibited retail tobacco product displays since May 31, 2008. Tobacco products must be hidden from sight and customers are not permitted to handle tobacco products prior to purchase. Continued monitoring and enforcement of bans on point-of-sale (POS) displays can further reduce the smoking prevalence in Ontario.

SFO-SAC 2016 Scientific Consensus Statement

Background

Tobacco companies use point-of-sale (POS) displays to promote their products to increase tobacco consumption among consumers.[51] Companies may use product advertising, signage and 'slotting' (preferred positions in displays) to attract consumers to particular products. Evidence suggests that there is a positive association between exposure to POS tobacco promotion and increased smoking .[51] For example, in the U.S., POS displays have been demonstrated to increase sales by 12 to 28%.[51]

Article 16 of the World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) recommends "banning the sale of tobacco products in any manner by which they are directly accessible, such as store shelves".[24] Within stores, requirements can mandate that tobacco products be located behind the counter to limit advertising and access to youth and young adults.[36]

The Ontario/Canadian Context

The *Smoke-free Ontario Act* has prohibited the display of tobacco products at the retail level since May 31, 2008.[28,52] Tobacco products must be hidden from sight, and customers are not permitted to handle the tobacco products prior to purchasing them.[28] Retail owners are also not allowed to reveal tobacco products to customers while restocking inventory, carrying out inventory checks, or opening storage units.[28]

Evidence

The best available research evidence on banning POS displays comprised one Level II quality systematic review[51] and one Level I quality systematic review and meta-analysis[53] provided by SFO-SAC. The majority of included studies from this review were from the U.S., the U.K., Canada, Ireland, Norway, and Australia.

Evidence of Effectiveness

Exposure to POS tobacco promotion (e.g., advertisements, pack displays, signage and other marketing forms) was significantly associated with increased smoking prevalence, smoking susceptibility, cigarette consumption, impulse tobacco purchases and urgency to purchase cigarettes.[51] A recent systematic review and meta-analysis by Robertson (2016) found that among young people under 18 years of age, never-smokers who were more frequently exposed to POS tobacco promotions were more likely to have tried smoking (OR: 1.61, 95% CI =1.33 to 1.96) and were more likely to be susceptible to future smoking (OR: 1.32, 95% CI = 1.09 to 1.61) compared to those less frequently exposed.[53] These results suggest that legislation banning tobacco POS promotion could effectively reduce smoking among young people.[53]

While no studies have measured the impact of banning POS displays on smoking behaviour, there were greater odds of impulse purchases in countries with POS displays (e.g., U.S.) compared to those where POS are banned (e.g., Canada) (OR: 3.26, 95% CI = 2.13–4.99). POS display bans were also associated with lower temptation to purchase tobacco products (AOR ranged from 1.15 to 1.45). Bans on POS displays also contribute to the denormalization of tobacco products, especially among youth, and a decrease in environmental smoking cues.[51] Please refer to Tobacco Advertising Promotion and Sponsorship Bans in the Industry Chapter for more information.

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Bans on Point of Sale Displays - Emerging

The body of evidence regarding the effectiveness of bans on point-of-sale (POS) displays comprised one Level II quality systematic review and one Level I quality systematic review and meta-analysis. While studies have not directly examined whether banning POS displays prevents tobacco use, there is evidence that exposure to POS tobacco promotion (e.g., advertisements, pack displays, signage and other marketing forms) is associated with higher smoking prevalence and greater susceptibility to smoking uptake. Conversely, bans on POS displays are associated with lower temptation to purchase tobacco products and fewer impulse purchases. Bans also reduce environmental cues to smoke and contribute to the denormalization of tobacco products, especially among youth.

SFO-SAC 2016 Scientific Consensus Statement - High (Continue)

The *Smoke-free Ontario Act* has prohibited retail tobacco product displays since May 31, 2008. Tobacco products must be hidden from sight and customers are not permitted to handle tobacco products prior to purchase. Continued monitoring and enforcement of bans on POS displays can further reduce the smoking prevalence in Ontario.

The scientific consensus regarding the potential contribution for Ontario is: High (Continue).

Key Message

Banning point-of-sale (POS) tobacco promotions removes sensory cues to purchase and use tobacco, and helps to denormalize use. Continued monitoring and enforcement of existing bans on POS displays can further reduce the smoking prevalence in Ontario.

Reducing the Availability of Tobacco Products

Reducing the density of tobacco retail outlets in certain locations can decrease the prevalence of smoking among youth and young adults. Banning tobacco product sales near schools and campuses can reduce tobacco supply more markedly in disadvantaged neighbourhoods, making this an effective strategy for reducing smoking initiation among lower-income youth. In Ontario, the sale of tobacco products is banned in pharmacies, establishments containing a pharmacy, public and private hospitals, psychiatric facilities, residential care facilities, stores on college/university property, and vending machines. All other retailers (e.g., theatres, bars, casinos, stores and gas stations) can sell tobacco. While evidence is limited, it appears that strengthening zoning restrictions on the sale of tobacco products holds promise to further reduce smoking prevalence in Ontario.

SFO-SAC 2016 Scientific Consensus Statement

Background

Studies have shown an association between greater tobacco outlet density and higher likelihood of youth smoking and smoking prevalence.[54] Tobacco retailer density policies (i.e., zoning restrictions) aim to reduce access to and supply of tobacco by limiting density of and/or proximity to locations where there are higher numbers of youth and young adults (e.g., schools).[42]

Reducing the number of tobacco outlets has been recommended as a way of reducing smoking.[54] *The Tobacco Strategy Advisory Report* (TSAG) (2010) recommends that: "Ontario should move towards a system of designated sales outlets, by employing methods such as licensing strategies and zoning laws to reduce the number of tobacco retailers and locations permitted to sell tobacco products; and that Ontario should increase the number of specific places that are prohibited from selling tobacco products to match or exceed similar bans in leading Canadian provinces".[13] Additionally, the Institute of Medicine (IOM) (2007) recommended that tobacco outlets be licensed, monitored and restricted as part of the blueprint for ending the tobacco epidemic.[55]

The Ontario/Canadian Context

Within Ontario, tobacco products sales are banned in pharmacies (and establishments containing a pharmacy), public and private hospitals, psychiatric facilities (except parts of facilities under the Mental Hospitals Act), residential care facilities, and vending machines.[54] Tobacco sales are permitted in theatres, bars and casinos, as well as in convenience stores, grocery stores and gas stations.[54] Since January 1, 2015, the sale of tobacco on all college and university campuses has been prohibited.[56]

Evidence

The best available research evidence on zoning restrictions comprised two grey literature reports[4,37] (one of which was a rapid review of review-level literature)[4] and one primary study[57] provided by SFO-SAC.

Evidence of Effectiveness

According to Malone (2014) and Andrews (2015), limits to the retail environment can include restrictions on the number, location, density and opening hours of retailers.[4,37] Restrictions can include prohibiting new outlets from opening and barring outlets near schools, campuses and workplaces where youth and young adults are prominent. Additionally, restrictions can include limiting tobacco sales to non-school hours, increasing the licencing fee for selling tobacco products, banning duty-free sales, or restricting sales to government-controlled outlets.[4,37] For more information on Zoning Restrictions to Create Tobacco Retail-free Areas see the Industry Chapter.

Research suggests that reducing the density of tobacco retail outlets has promise to decrease the prevalence of smoking by youth and young adults; but there is not enough evidence for conclusive results.[4,37]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Specific Populations/Equity Considerations

One recent (2016) U.S. study found that a ban on tobacco product sales near schools would either reduce or eliminate existing disparities in tobacco retailer density by income level and by proportion of racially-diverse residents.[57] The study estimated that if a ban on tobacco product sales within 1,000 feet of schools was implemented in New York, the number of tobacco retailers per 1,000 people would go from 1.28 to 0.36 in the lowest income quintile, and from 0.84 to 0.45 in the highest income quintile.[57] This estimate suggests that banning tobacco product sales near schools may be more effective in reducing retailer density in lower-income and racially-diverse neighborhoods compared to higher-income and caucasian neighborhoods, and may be a promising strategy for reducing tobacco-related disparities.[57]

Intervention Summary

Evidence Summary - Reducing the Availability of Tobacco Products - Emerging

Zoning restrictions can include limits on the types of retailers that can sell tobacco, as well as limits on the density of retailers or their proximity to institutions and establishments that young people frequently attend (e.g., schools, campuses, recreational centres). The body of evidence regarding zoning restrictions comprised two grey literature reports and one primary study. This evidence showed that reducing the density of tobacco retailers reduces access and social exposure to tobacco, and can decrease the prevalence of smoking among youth and young adults. Banning tobacco product sales near schools can reduce density more markedly in disadvantaged neighbourhoods.

SFO-SAC 2016 Scientific Consensus Statement - Innovative, Positive Equity

Reducing the density of tobacco retail outlets in certain locations can decrease the prevalence of smoking among youth and young adults. Banning tobacco product sales near schools and campuses can reduce tobacco supply more markedly in disadvantaged neighbourhoods, making this an effective strategy for reducing smoking initiation among lower-income youth. In Ontario, the sale of tobacco products is banned in pharmacies, establishments containing a pharmacy, public and private hospitals, psychiatric facilities, residential care facilities, stores on college/university property, and vending machines. All other retailers (e.g., theatres, bars, casinos, stores and gas stations) can sell tobacco. While evidence is limited, it appears that strengthening zoning restrictions on the sale of tobacco products holds promise to further reduce smoking prevalence in Ontario.

The scientific consensus regarding the potential contribution for Ontario is: Innovative. This intervention has a potential positive equity impact.

Key Message

There is evidence that reducing the density of tobacco retail outlets can decrease the prevalence of smoking among youth and young adults, and banning tobacco product sales near schools can reduce tobacco supply particularly among low-income populations. In Ontario, there is opportunity to restrict tobacco sales in theatres, bars, casinos, convenience stores, grocery stores and gas stations, and to ban the sale of tobacco products and e-cigarettes by all retailers with a certain proximity to institutions and establishments attended by youth and young adults (e.g., schools, campuses, recreational centres).

Marketing Interventions

Mass Media - Prevention

When well-designed and implemented, mass media campaign (MMCs) of sufficient duration and frequency are effective to prevent smoking among youth and young adults, and to produce positive changes in attitudes, beliefs and intentions. In Ontario, mass media campaigns to date have been insufficient in intensity and duration. Opportunity exists to implement MMCs that effectively address stages of smoking initiation and escalation, and the use of other tobacco products to prevent the initiation and escalation of tobacco use among Ontario youth and young adults.

SFO-SAC 2016 Scientific Consensus Statement

Background

Mass media campaigns (MMCs) are a common vehicle to institute broad-based public awareness and education initiatives through a variety of traditional media (e.g., television, radio, print and billboards).[49] Tobacco control MMCs use these channels of communication as well as newspaper ads,, posters, leaflets, booklets and the internet[45] to educate youth and young adults about tobacco use and prevent initiation.[42] MMCs are often implemented for an extended duration and provide brief recurring information and motivational messages at varying frequencies.[42] Tobacco control MMCs have the potential to reach a large proportion of the population and can modify the knowledge, attitudes and behaviour of individuals.[58] Additionally, they are frequently employed to challenge pro-tobacco norms.[59] For the remainder of this section, 'tobacco control mass media campaigns' will be referred to as 'mass media campaigns' (MMCs).

The Ontario/Canadian Context

A number of MMCs targeting youth and young adults have been implemented in Ontario. Many of them focused primarily on encouraging smoking cessation (see Mass Media - Cessation for more information) and took place many years ago. One older multi-media campaign (prior to 2005) that focused primarily on prevention was a provincial wide campaign called *stupid*.ca.[60] Developed by the Ministry of Health and Long-term Care, and released as part of a comprehensive tobacco strategy, *stupid.ca* aimed to inform youth (12-15 years) about the negative realities of smoking cigarettes.[60] All ads directed viewers to an interactive website that provided youth with information about the dangers of smoking to encourage them to resist the temptation to start smoking.[60] No evaluation data are available at this time.

Since 2011, no intensive and sustained (i.e., longer than three weeks) prevention campaign has been conducted in Ontario.[40] In March 2013, the Ontario government introduced a campaign called *Quit the Denial* targeting young adults 18 to 29 years old who were social smokers but didn't view themselves as smokers.[40] By pointing out that social smoking is smoking, and indirectly implying that all smokers should quit, this campaign potentially addressed secondary prevention (i.e., escalation) of smoking.

Overall, while mass media campaigns in Ontario have improved, the intensity and duration of these campaigns is still inadequate.[40]

Evidence

The best available research evidence for MMCs comprised three systematic reviews from the pre-appraised literature,[45,58,61] a recent overview of reviews[62] provided from SFO-SAC, and four grey literature reports also provided by SFO-SAC[4,40,49,63](one of which was a rapid review of review-level literature).[4] One review was appraised as Level I quality,[58] two as Level II quality,[61,62] and one as Level III quality.[45] The majority of the included studies within reviews took place in developed countries including the U.S., the U.K., Australia, Norway, Finland, Greece, Germany, Canada, South Korea and South Africa.

Evidence of Effectiveness

A Cochrane review by Brinn (2010) (also cited by two overviews of reviews[4,62]) found that although there is some evidence that MMCs prevent the uptake of smoking in those under 25 years old, the overall findings are mixed.[58] Of the seven included primary studies, three demonstrated statistically and clinically significant reductions of smoking behaviour (including number of cigarettes smoked, initiation rates and prevalence of daily/ weekly/ monthly smoking) in young people following introduction of the campaign, while four studies found no effect.[58] However, results should be interpreted with caution as the included evidence was not strong, contained a number of methodological flaws and focused on different campaign components.[58] There were also inconsistent results regarding intermediate outcomes (knowledge, attitudes, intentions to smoke, self-efficacy and smoking perceptions) across studies.[58]

The U.S. Surgeon General's report (2014) (also cited by Andrews (2015))[4]concluded that MMCs can be one of the most effective strategies to change social norms and prevent youth smoking.[64] It suggested that anti-smoking messages (particularly MMCs) can change attitudes, beliefs and intentions related to smoking, which in turn, can change smoking behaviour.[64] Additionally, the U.S. Surgeon General's report (2012) stated that the evidence is sufficient to conclude that MMCs can prevent the initiation of tobacco use and reduce its prevalence among youth.[49] These findings are consistent with the SFO-SAC (2010) report which concluded that "Media campaigns can be an effective strategy to prevent tobacco use in youth and young adults".[6]

A systematic review by Wilson (2012) (which cited different studies than Brinn (2010)) found mixed evidence for the effectiveness of MMCs in reducing smoking initiation rates among youth.[45] Of the five included primary studies, one cluster randomized controlled trial demonstrated no effectiveness, while four longitudinal studies indicated a reduced smoking initiation rate over time (odds of initiating smoking ranged from OR: 0.67 to 0.80).[45]

Intervention Characteristics/Implementation Considerations

Effectiveness of MMCs to prevent tobacco use among youth and young adults is influenced by intervention characteristics such as development processes, mode of delivery, intensity, duration, message tone, message content, context and source of funding.[4,36,45,49,58,61]

It has been suggested that MMCs be well-researched and involve *developmental work* with their target audiences.[4,58] Additionally, MMCs are more effective when they are adequately funded;[49] however, the source of funding is also important, as industry-funded MMCs are associated with stronger intentions to smoke among younger survey participants.[49] When MMCs are combined with other strategies within a multi-component tobacco control program, the likelihood of effectiveness increases.[49] A solid theoretical foundation also increases effectiveness.[49]

The *content* of the MMC may influence its effectiveness. For instance, studies suggest that youth respond to messages about tobacco industry deception and manipulation;[49] however, while campaign messages that highlight industry manipulation and offer messages about health consequences are

effective at reducing youth smoking, the evidence regarding messages about health consequences or industry manipulation alone is unclear.[61]

MMCs that include personal testimonials, a surprising narrative, and intense images, sound and editing (e.g., loud fast music, surprise twist, discrete camera shots) are more likely to be recalled by youth.[49] However, evidence from a Canadian case study of college and university students found that young adults do not respond well to shock value or information-based advertising; and although they liked advertising that used humour, it was not effective in changing their behavior.[4] For more information on mass media campaigns related to cessation outcomes, see Mass Media - Cessation)

The *tone* of MMCs is also important. Campaign messages with a negative tone (e.g., generate emotions of sadness or fright) have shown greater influence on youth compared to those with positive or neutral tones (e.g., generate emotions of humour and happiness); however, behavioural outcomes have not been examined.[49]

On a related note, an important predictor of behaviour change for MMCs is their ability to *generate discussion* with peers among those who view the campaign.[49]

The *delivery medium* and *context* of the MMC appear to influence its effectiveness. For example, television ads are generally associated with greater recall compared to other formats such as radio messages.[49] Older youth preferred radio over television,[58] and the internet has increasingly become a vehicle for MMCs targeting youth and young adults.[49] Online MMCs have potential to improve reach and persuasive impact through interactive websites and social networking sites such as Facebook.[49] Text messaging is another possible delivery medium; however, more research is needed to determine effectiveness among these other technologies. See Technology-Based Interventions: Internet /Computer and Text Messaging in the Cessation Chapter for more information.

The *context* of delivering MMCs can also influence their effectiveness, where messages may be processed less effectively when aired during programs that transport viewers into the story (e.g., drama and soap operas) rather than during lighter entertainment (e.g., comedy).[49]

With respect to *intensity and duration*, MMCs that are at least three years long, are more intense (e.g., in terms of frequency of message delivery), and produce repeated exposure were found to be more effective than less intense campaigns of shorter duration.[49,58] This evidence suggests a dose-response relationship between exposure to anti-smoking messages and reduced smoking behaviour among youth.[49,64]

The *context* of delivering MMCs can also influence their effectiveness, where messages may be processed less effectively when aired during programs that transport viewers into the story (e.g., drama and soap operas) rather than during lighter entertainment (e.g., comedy).[49]

Finally, the *characteristics of the message recipients* seem to influence the effectiveness of the campaigns. Youth and young adults with high knowledge of (or belief in) the health consequences of smoking, a firm commitment not to smoke, high self-efficacy to refuse smoking (i.e., refusal efficacy)

and strong beliefs that parents and peers disapprove of smoking (social norms) may be more receptive to MMC messaging.[63] In this regard, it is important to note that according to the U.S. Surgeon General's report (2012), advertisement characteristics are more important than the characteristics of the audience.[49]

Specific Populations/Equity Considerations

Evidence suggests that MMCs are effective at preventing smoking among youth (under 18 years old) across racial and ethnic populations, although effect sizes may differ.[61]

Campaigns designed to target all (at-risk) youth were shown to have similar effectiveness for both males and females; campaigns specifically targeting females were found to be effective as well.[61] There was insufficient evidence to determine if MMC outcomes differed by SES or population density.[61] According to the U.S. Surgeon General's Report (2012) when MMCs are inconsistently implemented (i.e., sparse or sporadic campaigns), smoking prevalence among 12 to 15 year-olds increased, with the greatest increases among those from lower socioeconomic groups.[49]

Intervention Summary

Evidence Summary - Mass Media - Prevention - Supported

The body of evidence for mass media campaigns (MMCs) comprised one Level II quality overview of review, one Level I, three Level II, and two Level III systematic reviews and four grey literature reports. The evidence suggests that MMCs can influence attitudes, beliefs and intentions related to smoking, prevent the initiation of tobacco use and reduce prevalence among youth and young adults. Intervention characteristics (including development processes, mode of delivery, intensity, duration, message tone, message content, context and source of funding) impact the effectiveness of these campaigns. Generally, MMCs are more effective when they: 1) are well-researched and involve the target audience during development, 2) include messages about tobacco industry deception and manipulation (combined with messages about health consequences), 3) have sufficient duration (i.e., three years) and repeated exposure, and 4) generate discussion among viewers.

SFO-SAC 2016 Scientific Consensus Statement - High (Intensify), Positive Equity

When well-designed and implemented, MMCs of sufficient duration and frequency are effective to prevent smoking among youth and young adults, and to produce positive changes in attitudes, beliefs and intentions. In Ontario, mass media campaigns to date have been insufficient in intensity and duration. Opportunity exists to implement MMCs that effectively address stages of smoking initiation and escalation, and the use of other tobacco products to prevent the initiation and escalation of tobacco use among Ontario youth and young adults.

The scientific consensus regarding the potential contribution for Ontario is: High (Intensify). This intervention has a potential positive equity impact.

Key Message

Well-designed and implemented MMCs are an effective means to prevent smoking initiation among youth and young adults. Future MMCs that optimize these characteristics have the potential to prevent the initiation and escalation of tobacco use among Ontario youth and young adults.

Social Marketing

Social marketing is recognized as an effective public health intervention. Although limited, the evidence regarding social marketing for reducing tobacco use shows that tobacco-related campaigns can reduce the initiation of cigarette smoking as well as the escalation of conventional and/or alternative tobacco/nicotine product use among young adult post-secondary students. A number of social marketing campaigns to prevent tobacco use among youth and young adults are under way in Ontario and require evaluation. More extensive use of tobacco-targeted social marketing campaigns would support efforts to prevent tobacco use.

SFO-SAC 2016 Scientific Consensus Statement

Background

Social marketing is defined as the systematic application of marketing concepts, alongside other concepts and techniques, to achieve specific behavioural goals for a social good.[65] Social marketing is not about telling people what to do or coercing them into doing it, but rather, is the art of understanding what will help people make the choices and take the actions that will lead them to live better lives.[66] Using this framework, it is apparent that social marketing goes beyond distributing posters and brochures. Furthermore, social marketing is clearly more than social media, which can be classified as a set of tools and technologies that allow different communication pathways.[66] Social marketing includes multi-component interventions that aim to change particular behaviours and specific health outcomes.[66] Social marketing differs from mass media because it involves interactive two-way communication pathways, rather than the delivery of messages to a passive audience.

Conceptually, and based on effects seen in other domains, social marketing interventions are effective to improve health behaviours (e.g., diet, physical activity and substance abuse. These interventions are effective for a range of target groups in varied settings.

The Ontario/Canadian Context

There have been a number of social marketing campaigns in Ontario (e.g., *Party Without the Smoke*, *#91 Reasons*, *Bad Ways to Be Nice*, *Freeze the Industry*). For full descriptions of these campaigns, see the Jurisdiction Scan.[67] Some campaigns were targeted towards specific audiences like post-secondary students,[68-70] while others were regional campaigns[73] or province-wide.[71,72]

The campaigns targeted youth and young adults and aimed to prevent tobacco use by: providing messages related to reducing the 'social supply' of cigarettes to teens under 19,[73] exposing the strategies and tactics that the tobacco industry uses to make their products appealing to young people,[69,72] increasing awareness among youth and young adults about the dangers of tobacco,[71] or empowering and engaging youth and young adults in tobacco prevention through positive self-expression.[70]

Many of the campaigns used interactive activities such as face-to-face outreach,[68] social media (e.g., Twitter, Facebook and Instagram),[74] webpages,[68,71,73] and posters, displays and videos.[73]

Evidence

The best available research evidence for social marketing comprised a grey literature evaluation report provided by SFO-SAC.[68] This study was conducted in Ontario.

Evidence of Effectiveness

One recent grey literature evaluation report by Kirkwood (2016) evaluated a recently-implemented social marketing campaign called *Party Without the Smoke*, targeting young adults on Ontario post-secondary education campuses.[68] The campaign involved face-to-face outreach activities in campus bars and residences (typical party locations for young adult students), staffed displays in hallways, print and electronic posters and *Leave the Pack Behind* (LTPB) website (www.leavethepackbehind.org) and Facebook page.[68]

Among students surveyed six weeks after the campaign, those who were aware of the campaign (66.4%) self-reported the effects of the campaign on their smoking-related beliefs, knowledge, intentions and behaviours, and their use of alternative tobacco/nicotine products. Participants reported that, as a result of the campaign, they were: 1) less likely to initiate cigarette smoking (but not alternative tobacco/nicotine products), 2) less likely to escalate their cigarette smoking and/or use of alternative tobacco/nicotine products, and 3) more likely to stop/reduce cigarette smoking and/or use of alternative tobacco/nicotine products.[68]

Intervention Characteristics/Implementation Considerations

Evaluation results indicated that message recall was similar among those who were reached through social media and those who were reached through the face-to-face outreach activities. Use of dynamic digital marketing strategies, persistent social media messaging and recurrent, imaginative interpersonal outreach are all recommended to optimize reach to this audience.[68]

Specific Populations/Equity Considerations

Campaign awareness was highest among certain priority populations in the sample (e.g., newcomers, francophones, LGBTQ). Awareness was lowest (but still above 50%) for individuals self-identifying as Black.[68]

Intervention Summary

Evidence Summary - Social Marketing - Promising direction

The body of evidence for social marketing campaigns was limited to one grey literature evaluation report, which found that tobacco-related social marketing campaigns can reduce self-reported initiation of cigarette smoking and escalation of cigarette and/or alternative tobacco/nicotine product use among young adult college and university students.

SFO-SAC 2016 Scientific Consensus Statement - Innovative, Targeted

Social marketing is recognized as an effective public health intervention. Although limited, the evidence regarding social marketing for reducing tobacco use shows that tobacco-related campaigns can reduce the initiation of cigarette smoking as well as the escalation of conventional and/or alternative tobacco/nicotine product use among young adult post-secondary students. A number of social marketing campaigns to prevent tobacco use among youth and young adults are under way in Ontario and require evaluation. More extensive use of tobacco-targeted social marketing campaigns would support efforts to prevent tobacco use.

The scientific consensus regarding the potential contribution for Ontario is: Innovative. This is a targeted intervention.

Key Message

Social marketing campaigns have the potential to reduce initiation of smoking and inhibit escalation of conventional and alternative tobacco/nicotine product use among young adult post-secondary students, and likely among youth. Evaluation of tobacco-related social marketing campaigns under way in Ontario would inform refinements and modifications to further enhance reach and effectiveness.

School- and Campus-Based Interventions

Elementary and Secondary School Prevention Programs

School-based programs that address social skills, social influences to smoke, and problem-solving across multiple sessions in the school year can prevent initiation of tobacco use and reduce smoking prevalence and behaviour. Peer education, and the involvement of parents and health educators or trained community members are beneficial components. In Ontario's current Health and Physical Education curriculum, students learn about tobacco use in grades 4 to 7. Whether the effectiveness-enhancing characteristics noted above are incorporated into the curriculum is unknown and requires evaluation. If Ontario were to implement school-based tobacco prevention programs with these characteristics the smoking prevalence would significantly decrease. School-based tobacco prevention programs could be more effective by including education about all tobacco and related products (i.e., hookah, e-cigarettes).

SFO-SAC 2016 Scientific Consensus Statement

Background

School-based tobacco use prevention programs use various techniques such as instruction, role playing, videos, games, small group discussions and individual 'seat work'. They may also include educational curricula that address the consequences of substance use, the social pressures to use substances and strategies to resist these pressures.[42]

The Ontario/Canadian Context

As part of the Ontario Ministry of Education's 2014 revised Health and Physical Education curriculum for grade 1 to 8 students, students learn about the negative health effects of tobacco use during grades 4 to 7.[40,75] The tobacco curriculum includes learning about what tobacco is, as well as the influences on tobacco uptake (e.g., peer pressure and industry marketing, effects of tobacco use). The curriculum focuses on engaging students, developing school and classroom leadership and helping students to develop the necessary skills to make healthy life choices.[40,75] Evaluation of this curriculum is needed.

Additionally, the Ontario Public Health Standards (OPHS) recommend that the Board of Health develop a written agreement with every school board, covering all local schools and outlining the roles and responsibilities of the Board of Health and school officials, and the procedures related to the *Smoke-Free Ontario Act*".[76]

In 2013, the MOHLTC funded the *Ontario Physical and Health Education Association* (*OPHEA*)'s *Smoke-Free Ontario Pilot Program*, which is a tobacco prevention pilot program that was implemented in eight elementary and 16 secondary schools.[77] The program was implemented with various regional and provincial organizations, including the Youth Advocacy Training Institute, the Centre of Excellence for Youth Engagement, and local public health units.[77] To address tobacco prevention, the program used a *Healthy School Approach* with a focus to engage youth and provide them with leadership

opportunities.[77] Program activities included developing poems, songs, videos and posters, and participating in an interactive youth forum that was led by older students.[78] Preliminary evaluation at one year using student surveys suggested that among schools with the OPHEA program, there was lower likelihood of tobacco use compared to schools without the program, as well as higher participation rates in anti-tobacco activities and greater frequency of in-class discussion about tobacco.[79] Further evaluations of the program are pending.[79]

Evidence

The best available research evidence for school-based prevention programs came from five systematic reviews and meta-analyses[80-84] and two systematic reviews from the pre-appraised literature.[85,86] Two of the reviews specifically focused on smoking prevention curricula,[82,83] and one focused on smoke-free class competitions. [84,86] One systematic review and meta-analysis, and a systematic review were provided by SFO-SAC.[34,87] Four reviews were appraised as Level I quality,[80-83] four were appraised as Level II quality[34,84,85,87] and one was appraised as Level III quality.[86] The majority of included studies from within these reviews were from the U.S., Canada, the U.K., Australia, Spain and Italy.

Evidence of Effectiveness

The most recent review examining school-based prevention programs was a systematic review and meta-regression analysis conducted by Onrust et al.[87] The review evaluated the effects of 228 school-based prevention programs (e.g., including health education, refusal skills, peer education, parental involvement and behavioural management) on smoking behaviour (e.g., varied outcomes ranging from the number or percentage of participants using substances to the number of cigarettes smoked). With prevention programs that were targeted to all students (universal programs), a small but significant effect on smoking behaviour was found for elementary school children (effect size d=−0.15; moderate heterogeneity I^2=57%), early adolescents (grade 6 and 7 students) (d=−0.14; high heterogeneity I^2=81%), and middle adolescents (grade 8 and 9 students) (d=−0.09; low heterogeneity I^2=38%); however, no effects were found for late adolescents (grade 10-12 students).[87]

Another systematic review and meta-analysis of 64 trials compared the effects of school-based prevention programs (including school curricula) with control conditions.[80] Meta-analysis of 27 of the randomized controlled trials demonstrated that smoking prevalence among children was significantly lower with school-based prevention programs than usual education or no intervention (OR: 0.83, 95% CI: 0.76-0.91, moderate heterogeneity I^2=35.9%).[80]

Smoking Prevention Curricula

Smoking prevention curricula for children and youth less than 19 years old were examined in three systematic reviews and meta-analyses.[80,82,83] The curricula included: (1) information-only curricula (curricula that only provide information to oppose tobacco use); (2) social competence curricula (curricula that aim to assist adolescents with refusing offers to smoke by improving their general social competence); (3) social influence curricula (curricula that aim to provide adolescents with skills to overcome social influences that promote tobacco use); (4) combined social competence and social influence curricula (combined aspects of the two curricula approaches); and (5) multi-modal

interventions (curricula approaches combined with other initiatives implemented within or beyond schools, such as programs for parents and communities).[82,83]

Two systematic reviews and meta-analyses by Thomas et al. compared smoking prevention curricula for children and youth (5-18 years) with a control (i.e., no curricula or usual practice).[82,83] Both reviews found that at one year follow-up or less, there was no statistically significant effect with school-based curricula of all types to prevent smoking onset among youth (i.e., keeping youth as never-smokers) compared to the control. The pooled odds ratio for this association was 0.91 (95% CI: 0.82-1.01) according to the more recent review[83] and 0.94 (95% CI: 0.85 to 1.05) for the older review.[82] However, when analyzing the results based on the curricula type, both reviews found the combined social competence and social influences curricula to be effective at preventing smoking initiation at one year follow-up or less (OR: 0.49, 95% CI: 0.28-0.87[82] and OR: 0.59, 95% CI: 0.41-0.85).[83] No statistically significant effects were demonstrated for curricula involving information only, social influences only or multimodal interventions.[82,83]

Additionally, both reviews found statistically significant effects in preventing smoking onset with all types of school-based curricula compared to controls at the longest study follow-up (>1 year) (OR: 0.88, 95% CI: 0.82-0.96[82] and OR: 0.88, 95% CI: 0.82-0.95).[83] At the longest follow-up, there were also statistically significant effects in preventing smoking onset for social competence curricula and combined social competence and social influence curricula.[82,83] No significant effects for the other types of curricula were demonstrated.[82,83]

Among studies examining change in smoking behaviour over time, the pooled results from the review by Thomas et al. (2013) indicated a small, statistically significant effect favouring the control at follow-up of one year or less (standardized mean difference (SMD) 0.04, 95% CI: 0.02-0.06).[82] However, no significant difference in effects between curricula of all types and the control were found at follow-up longer than one year (SMD 0.02, 95% CI: 0.00-0.02). Lastly, among the studies examining point prevalence of smoking, the results favoured the control at one year or less and at the longest follow-up.[82]

An older systematic review and meta-analysis published in 2009 that pooled results of 15 RCTs found lower smoking prevalence with social influence curricula compared to controls (OR: 0.91, 95% CI: 0.84-0.98, I^2= 0%).[80]

Smoke-Free Class Competitions

Smoke-free class competitions are school-based prevention programs that require students to commit to be smoke-free during the competition period (e.g., up to 6 months) and regularly report on their smoking status.[84] If classes remain smoke-free at the end of the competition, the class can win prizes in a lottery.[84] One meta-analysis examined the effect of smoke-free class competitions in Europe (Finland, Germany and Netherlands) on current smoking (at the longest follow-up) in youth between 11 and 14 years old.[84] A pooled analysis of five controlled trials found that current smoking prevalence was lower with smoke-free class competitions compared to control conditions (RR: 0.86, 95% CI: 0.79-0.94). Moderate heterogeneity between the included studies was identified (I^2=31.2%).[84]

Intervention Characteristics/Implementation Considerations

There are several types of school-based programs that are effective for preventing smoking behaviour among elementary school children.[87] These include generic programmes (*B*=−0.23; p=0.01), and programs with social skills training (*B*= −0.13; p=0.04), self-control training (*B*=−0.23; p=0.01), problem-solving skills training (*B*=−0.10; p=0.06), and programs focusing on healthy alternatives to substance use (B=−0.15; p=0.05).[87] For early adolescents (grade 6 and 7 students), programs that include self-control training (*B*=−0.12; p=0.02), problem-solving or decision-making skills training (*B*=−0.13; p=0.01), adjustment of the social norm (*B*=−0.08; p=0.03), focusing on healthy alternatives (*B*=−0.25; p=0.01), peer education (*B*=−0.09; p=0.08), and the involvement of parents in the program (*B*=−0.10; p=0.02) are most effective. For late adolescents (grade 10-12 students), programs that include self-control training (*B*=−0.23; p=0.09), adjustment of the social norm (*B*=−0.23; p=0.02), and peer education (*B*=−0.74; p=0.01) are most effective.[87] No effective program characteristics were identified for middle adolescents (grade 8 and 9 students).[87]

One systematic review identified the characteristics of five short-term smoking prevention programs that were deemed to be successful by the U.S. National Cancer Institute.[86] Successful programs were brief (i.e., initial program lasted no longer than one year), were aimed at a certain demographic, were conducted in schools and used professional health educators and/or trained community members.

The effectiveness of the intervention can also depend on a number of factors, including who is delivering the intervention and how it is delivered to students.[80,81] One review found that using trusted external professionals (e.g., doctors), non-smoking teachers, or teachers with higher self-efficacy to deliver the intervention can facilitate effectively delivering the intervention.[81] Additionally, program contents can also affect how successfully programs are delivered.[80,81] Facilitators of effective delivery include content that is innovative and interactive, ethnically and culturally sensitive, and non-judgemental.[81] Content that includes: role-playing, correcting misconceptions of high smoking prevalence, denormalization approaches such as exposing the activities of the tobacco industry, and the addition of booster sessions (e.g., between three to 10 booster sessions) can also facilitate the effective delivery of prevention programs.[80,81] Other important factors for the effective delivery of school-based programs are timing that aligns with school assessment schedules, including multiple sessions over the school year, reinforcing smoking prevention messages in school curricula, involving other organizations in the intervention, and delivering the intervention as part of a large tobacco control strategy.[81]

Implementation Considerations

Implementation barriers include those related to the intervention itself and those related to the setting in which the program is implemented.[81,85] Program-related barriers include teachers who are reluctant to discuss parental smoking, using outdated methods to communicate prevention messages, and using content that is too complex or includes fear-based tactics.[81,85] Setting-related barriers include schools where staff members smoke, schools and communities where smoking prevalence is high, the presence of occasional or experimental young smokers, the presence of young people who come from households with one or more smokers, and the age of young people (older youth can be more critical of prevention messages).[81]

Specific Populations/Equity Considerations

With prevention programs that selectively target students who are considered high-risk (i.e., students from low SES backgrounds or students with behavioural problems), a small significant effect on smoking behaviour was found for high-risk early adolescents (grades 6-7) (d=−0.12; low heterogeneity I^2=39%), and a medium significant effect was found for high-risk late adolescents (grades 10-12) (d=−0.35; high heterogeneity I^2=75%).[87] No significant effects on smoking behaviour with targeted programs were seen for high-risk elementary school children and middle adolescents (grades 8-9).[87]

The characteristics of school-based programs that predicted effectiveness for smoking behaviour in high-risk elementary school children include: teaching students to cope with stress and anxiety (*B*=0.31; p=0.07), health education (*B*=0.25; p=0.06) and applying a social influence approach (*B*=0.27; p=0.03).[87] For high-risk early adolescents (grade 6 and 7 students), effectiveness was predicted only by social skills training (*B*=0.20; p=0.04). For high-risk middle adolescents (grade 8 and 9 students), effectiveness for smoking behaviour was predicted by generic programs (*B*=0.29; p=0.07), teaching students how to cope with stress and anxiety (*B*=−0.58; p=0.01), and applying techniques from cognitive behavioural therapy (*B*=−0.36; p=0.04). Lastly, for high-risk late adolescents (grade 10-12 students), effectiveness for smoking behaviour was predicted by self-control training (*B*=−0.35; p=0.01), teaching students how to cope with stress and anxiety (*B*=−0.19; p=0.01), altering the social norms regarding substance use (*B*=−0.30; p=0.02), and peer education (*B*=−0.73; p=0.04).[87]

Additionally, Uthman (2009) found no conclusive evidence about the variability of program effectiveness among high-risk individuals (e.g., students from single-parent families), and no association between a student's SES and program effect.[80] However, the study did find evidence suggesting that race is an important predictor of smoking behaviour, with caucasian students less likely to be smokers, compared to Hispanic student, although the association between ethnicity and smoking behaviour is dependent on the outcome measured.[80]

Lastly, one systematic review examined the equity impact (in terms of SES) of interventions or policies on smoking among youth.[34] School-based prevention interventions had mixed equity effects; among the five included studies, two had neutral equity impact and the remaining three had negative, mixed or unclear equity impacts.[34]

Intervention Summary

Evidence Summary - Elementary and Secondary School Prevention Programs - Supported

The best available research evidence for school-based programs to prevent tobacco use came from nine systematic reviews (six of which had meta-analyses). Four reviews were appraised as Level I quality, four were appraised as Level II quality, and one was appraised as Level III quality.

Effective school-based programs (e.g., those that prevent uptake of smoking and reduce smoking prevalence and behaviour): 1)address social influences (i.e., provide adolescents with skills to overcome social influences that promote tobacco use, 2) address social competence jointly with social influences and self-control (i.e., enhance adolescents' tobacco refusal skills by improving their general social competence, and their specific skills for overcoming social influences that promote tobacco use), 3) include problem-solving training, 4) focus on healthy alternatives to substance use, 5) include peer education, and 6) involve parents.

Successful programs are often brief (i.e., no longer than one year), include multiple sessions over the school year, and are delivered by health educators and/or trained community members. Competitions, such as programs that require students to commit to regularly reporting their smoke-free status for a given interval, are effective for preventing initiation among elementary and secondary school students.

SFO-SAC 2016 Scientific Consensus Statement - Moderate (Continue)

School-based programs that address social skills, social influences to smoke, and problem-solving across multiple sessions in the school year can prevent initiation of tobacco use and reduce smoking prevalence and behaviour. Peer education, and the involvement of parents and health educators or trained community members are beneficial components. In Ontario's current Health and Physical Education curriculum, students learn about tobacco use in grades four to seven. Whether the effectiveness-enhancing characteristics noted above are incorporated into the curriculum is unknown and requires evaluation. If Ontario were to implement school-based tobacco prevention programs with these characteristics the smoking prevalence would significantly decrease. School-based tobacco prevention programs could be more effective by including education about all tobacco and related products (i.e., hookah, e-cigarettes).

The scientific consensus regarding the potential contribution for Ontario is: Moderate (Continue).

Key Message

School-based programs effectively prevent tobacco use when they: 1) include multiple sessions over the school year, 2) are delivered by health professionals or trained community members, 3) address social influences to smoke, and build social skills and problem-solving abilities, 4) involve peer education and parents, and 5) suit students' ages. To the extent that Ontario's current Health and Physical Education curriculum includes these characteristics, it can be expected to prevent initiation of tobacco use and reduce smoking prevalence among Ontario youth. Monitoring and evaluation of this potential is required. Inclusion of all tobacco/nicotine products may be a valuable extension of the curriculum.

Elementary and Secondary School Tobacco Policies

Currently the Smoke-Free Ontario Act (SFOA) prohibits smoking (holding a lighted cigarette) on public and private elementary and secondary school property. Smokeless tobacco and e-cigarettes are not included in the SFOA. Day-to-day enforcement of the policy falls to school officials. Local public health units also support enforcement by conducting intermittent inspections of compliance and investigations of violations. There is potential to improve consistency in enforcement of school-based tobacco control policies, to align policies with education aimed at preventing smoking and promoting non-smoking norms, and to extend the scope of school policies to other tobacco/nicotine products. These actions would likely further decrease the smoking prevalence among elementary and secondary school students.

SFO-SAC 2016 Scientific Consensus Statement

Background

School tobacco policies aim to prevent youth tobacco use and to reduce secondhand smoke exposure of employees and students.[88] School tobacco policies outline whether students can smoke or use tobacco on school property, where individuals can smoke and the penalties for violating these smoking restrictions.[88]

The Ontario/Canadian Context

Under *the Smoke-Free Ontario Act* (*SFOA*), smoking (e.g., lighted cigarettes, not including smokeless tobacco or e-cigarettes) is prohibited in both public and private elementary and secondary schools. Smoking is also prohibited anywhere on the property of both public and private elementary and

secondary schools (e.g., school yards).[89] Schools are required to have "No Smoking" signs at all school entrances, exits and other locations such as washrooms. School officials are responsible to ensure that staff, students and visitors know about the smoking prohibitions and do not smoke on school property. The policy is further enforced by local public health units, which conduct inspections in schools and investigate complaints.[89]

One primary study examined the impacts of changes in school tobacco policies in post-secondary schools in Ontario and Alberta. They found that there was a significant reduction in current smoking by students between 2012-13 and 2013-14 among five schools that implemented new policies to increase the punishment for students caught smoking on school property.[90] Additionally, three of these five policy changes were associated with a reduction in the school-level prevalence of smoking susceptibility among students.[90]

Evidence

The best available research evidence for elementary and secondary school tobacco policies comes from three systematic reviews from the pre-appraised literature (Coppo 2014, Galanti 2014; Bauld 2009),[81,88,91] with two appraised as Level I quality[81,88] and one appraised as Level II quality (Galanti).[91] Additionally, one Level II quality primary study was provided by SFO-SAC .[90] The majority of included studies from within reviews were from Canada, the U.S., Australia and New Zealand.

Evidence of Effectiveness

Two systematic reviews examined the effects of school tobacco policies in elementary and secondary schools on smoking behaviour outcomes among youth (ranging from 10 to 21 years old).[88,91] Similar to the findings of the SFO-SAC 2010 Report, which reported that "school policies alone are not sufficient to prevent initiation of tobacco use",[6] both reviews found that evidence on the effects of school tobacco policies to prevent smoking was limited and inconclusive. For instance, a recent systematic review concluded that there is no evidence to support school tobacco policies as a prevention intervention; in this review, only one RCT (appraised to have high risk of bias) met inclusion criteria and found no differences in smoking prevalence between schools with school tobacco policies and control schools at one year follow-up.[88] The review also found that most of the identified observational studies reported no differences in smoking prevalence between schools with formal school tobacco policies and schools without school tobacco policies.[88]

The second systematic review found five studies that suggested that schools with strict smoking bans decreased the probability of tobacco use among students by 20-60%, but also found four studies that failed to detect an association between smoking bans and students' behaviour.[91] This discrepancy was likely due to the heterogeneity of studies and methodological limitations.[91] However, the authors suggest that some components of the investigated policies may be more promising than others, as they showed more consistent associations with the expected outcomes; comprehensive tobacco bans or restrictions, clear rules about tobacco use and consistent enforcement were most often associated with decreased likelihood of smoking and reduced smoking prevalence at the school level.[91]

Intervention Characteristics/Implementation Considerations

Comprehensiveness

Five studies from one review indicated that school tobacco policies with prevention and education components were associated with lower smoking prevalence.[91] There is mixed evidence regarding the effectiveness of school tobacco policies that extend to the whole school population (e.g., staff and students) rather than only students.[88,91] One recent systematic review found that most of the included observational studies reported no statistically significant effects on smoking prevalence with school tobacco policies that included bans extended to outdoor properties, bans extended to teachers, sanctions for transgressors, and cessation assistance to smokers (compared to no or weak school tobacco policies).[88]

In contrast, an older, systematic review of qualitative studies identified that the comprehensiveness of school tobacco policies was important for their effectiveness of.[81] Bauld et al. noted that school tobacco policies that developed and maintained non-smoking norms, including bans for all internal areas and school grounds, and having policies that applied to both staff and students were essential for the effectiveness of school tobacco policies to prevent the uptake of smoking in young people. It was also noted that existing designated smoking areas are a barrier to the effective delivery of school tobacco policies because they may send mixed messages to students.[81]

Enforcement

Combining enforcement of school tobacco policies with prevention and educational components is effective to prevent smoking among youth.[91] Eight studies from one review showed that school tobacco policies with strict enforcement (i.e., implementing systems to monitor students' behavior and compliance with school tobacco policies) were significantly associated with lower smoking rates overall and on school premises. The reported odds ratios for the association of smoking (overall and on school premises) with enforcement ranged from OR: 0.39 (95% CI: 0.34-0.43) to OR: 0.89 (95% CI: 0.85-0.99).[91]

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Elementary and Secondary School Tobacco Policies - Promising direction

The best available research evidence for policies that restrict or ban smoking on elementary and secondary school property comprised three reviews from the pre-appraised literature (two appraised as Level I quality and the third as Level II quality), and one Level II quality primary study from SFO-SAC. From the evidence, it can be concluded that policies alone may not prevent smoking initiation. However, combining policies with prevention and education components is associated with lower smoking prevalence. Strict monitoring and

enforcement of school tobacco policies are associated with lower smoking rates overall and on school premises, as well as with reduced susceptibility to smoking.

Policies most likely to prevent uptake and reduce prevalence of smoking are those that: 1) apply to staff and students in all areas of school property, 2) have clear rules that are strictly and consistently enforced (through systems to monitor compliance), 3) generate and reinforce non-smoking norms, and 4) are combined with education to prevent smoking.

SFO-SAC 2016 Scientific Consensus Statement - Moderate (Intensify)

Currently the *Smoke-Free Ontario Act* (*SFOA*) prohibits smoking (holding a lighted cigarette) on public and private elementary and secondary school property. Smokeless tobacco and e-cigarettes are not included in the *SFOA*. Day-to-day enforcement of the policy falls to school officials. Local public health units also support enforcement by conducting intermittent inspections of compliance and investigations of violations. There is potential to improve consistency in enforcement of school-based tobacco control policies, to align policies with education aimed at preventing smoking and promoting non-smoking norms, and to extend the scope of school policies to other tobacco/nicotine products. These actions would likely further decrease the smoking prevalence among elementary and secondary school students.

The scientific consensus regarding the potential contribution for Ontario is: Moderate (Intensify).

Key Message

School tobacco policies that are comprehensively applied, consistently enforced and combined with educational components can contribute to the prevention of smoking among elementary and secondary school students. Effective, consistent enforcement of the *Smoke-Free Ontario Act*, with extension to other tobacco/nicotine products (e.g., smokeless tobacco, e-cigarettes), would help prevent tobacco/nicotine use by Ontario's students.

Campus-Based Tobacco Policies

Comprehensive tobacco-free policies that prohibit tobacco advertising, promotion and sales, and bar tobacco industry funding, investments and representation can reduce smoking uptake among young adults attending colleges, universities and trades schools. Currently, the Smoke-Free Ontario Act (SFOA) does not prohibit tobacco use on post-secondary campuses, and no Ontario post-secondary institution has implemented its own ban on smoking and/or tobacco use on all campus property. Opportunity exists not only for more extensive bans of tobacco use, but also for more comprehensive treatment of tobacco promotions and industry involvement on Ontario's post-secondary campuses.

SFO-SAC 2016 Scientific Consensus Statement

Background

Campus smoke-free policies (that ban the use of cigarettes), and campus tobacco-free policies (that ban the use of all tobacco products) on campuses (i.e., colleges, universities and trade schools) protect against social exposure to tobacco products.[92] Removing social exposure (and thus tobacco visual and sensory cues) is considered essential to prevent smoking initiation among post-secondary students.[6,92]

Comprehensive campus smoke-free policies have a broad scope in that they ban tobacco advertising, promotions and sales on campus as well as tobacco industry funding for research projects, grants and student scholarships.[92] Comprehensive campus tobacco-free policies often call for the provision of prevention and cessation resources and services for all students, faculty and campus staff.[92,93] It is important to note that campus-based policies do not address young adults who choose not to attend a post-secondary institution and instead choose to enter the workforce directly after high school. Because policies are not universal across Ontario, students can choose to attend institutions with weaker policies.

The Ontario/Canadian Context

In the absence of provincial legislation that addresses tobacco use on post-secondary campuses, universities and colleges in Ontario have implemented their own smoking policies.[94,95] These policies include partial smoking bans that restrict outdoor smoking to designated areas, or prohibit smoking in school-owned facilities, vehicles, or within certain distances of building entrances.[94,95] No Ontario post-secondary institution has completely banned smoking and other tobacco use on all campus properties (both indoor and outdoor). However, there are post-secondary institutions in other parts of Canada, such Holland College in Prince Edward Island, which report having 100% smoke-free campuses.[92] Please see Campus-Based Interventions and Smoke-Free Policies in the Cessation Chapter for more information.

Some university campuses have begun to ban e-cigarettes in places where cigarette smoking is banned.[96-98]

Evidence

The best available research evidence for campus-based smoke-free and tobacco-free policies comes from one systematic review and meta-analysis from the pre-appraised literature,[99] supplemented by several recent reports/studies provided by SFO-SAC including: one primary study,[100] one report of a policy implementation experience,[101] one grey literature rapid review of review-level literature,[4] and one grey literature report.[92] One review was appraised as Level I quality,[99] and the primary study was appraised as Level II quality.[100] The majority of the included studies within reviews were from the U.S., the U.K. and Canada.

Evidence of Effectiveness

There is evidence indicating that campus-wide smoke- and tobacco-free policies (which ban smoking or all tobacco use, respectively, on all campus properties) are effective to reduce smoking prevalence and intention to smoke.[92,100] It has also been noted that these policies show promise in preventing tobacco use among young adults – especially when they are part of a comprehensive intervention approach.[4] These findings are similar to those reported by SFO-SAC 2010, which stated that smoke-free policies and restrictions on campuses may play a significant role to prevent the initiation and progression of tobacco use among university and college students.[6]

The effectiveness of campus-wide smoke-free policies was demonstrated in one systematic review and meta-analysis of 19 studies by Lupton et al.[99] The review found consistent evidence from primary studies showing that campus-wide smoke-free policies were associated with a significant decrease in smoking prevalence.[99] For example, one of the reviewed studies found that the smoking prevalence at a university with a campus-wide smoke-free policy significantly decreased from before implementation to one year after implementation (from 16.7% to 12.8%; $p<0.001$);[99,102] whereas, at a university with a policy only banning outdoor smoking within certain distances of doorways, there was a non-significant increase in smoking prevalence (from 9.5% to 10.1%).[99,102] They also found that students at the university with the campus-wide smoke-free policy significantly reduced their daily consumption of cigarettes (from 8.9 to 3.6 cigarettes per day; $p<0.05$).[99,102]

A recent primary study provided by SFO-SAC found that the number of young adults (18-24 years) reporting an intention to smoke in the next six months was significantly lower for post-secondary schools with policies that banned all tobacco use on the entire campus (campus-wide tobacco-free policies) (3%) compared with campuses with partial policies (9% to 12%; $p=0.02$).[100] Partial policies included those that restrict smoking to designated smoking areas, restrict only cigarette smoking on the entire campus, or restrict smoking indoors and within certain distances of entrances or smoking indoors.[100] Similarly, past 30-day smoking was lowest for the campus-wide tobacco-free policies (10%), and higher for the partial policies (11% to 19%; $p=0.002$).[100] It is important to note that the lower smoking prevalence may be due to students quitting smoking (cessation) in addition to prevention of new smokers.

Campus-wide tobacco-free policies are also associated with reduced social exposure to smoking.[100] With increased coverage of policies (i.e., from one with partial outdoor smoking bans to campus-wide

tobacco use bans), social exposure to smoking on campuses significantly decreased from 95% to 55% ($p<0.01$).[100] For more information on social exposure see Chapter 5: Protection.

Intervention Characteristics/Implementation Considerations

Comprehensive policies

The most effective policies were campus-wide tobacco-free policies and/or policies that were implemented alongside cessation services and other tobacco control interventions.[99-101] Policies could also further prohibit advertising, promotion and sales of all tobacco products, any tobacco industry funding (i.e., grants, student scholarships, or sponsorships), tobacco industry participation in campus career fairs or recruitment activities, and/or investment in tobacco industry stock by the educational institution.[92]

A comprehensive tobacco-free policy, which was associated with a significant decrease in smoking prevalence, was examined in the review by Lupton et al.[99] The policy specifically included bans on the use, sales, marketing and advertising of tobacco products on campus properties.[99] The policy was also accompanied by smoking cessation support and an anti-tobacco media campaign that was led by the university.[99] Another comprehensive policy that was considered to be successful and well-enforced was a campus-wide tobacco-free policy implemented by the largest urban university system in the U.S., City University of New York (CUNY).[101] The policy restricted the use of tobacco products (i.e., cigarettes, smokeless tobacco and e-cigarettes) on all indoor and outdoor properties (e.g., parking lots, playing fields and building entrances/exits). The policy also prohibited tobacco industry marketing/advertising on campus properties and tobacco industry sponsorship of athletic events and athletes.[101] Alongside the policy, CUNY also provided cessation support to interested students, used a variety of communication strategies to publicize the policy (i.e., emails, websites, newsletters, electronic bulletin boards, videos and student forums), and created a culture of compliance to enforce the new policy. Early post-implementation evaluations indicated that the policy was highly-supported by students, staff and faculty.[101]

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Campus-Based Tobacco Policies - Supported

The best available research evidence for campus-wide smoke-free policies (which address cigarettes) and tobacco-free policies (which address additional tobacco products) came from one Level I quality systematic review and meta-analysis, as well as several recent grey literature reports and a moderate quality primary study. Policies that restrict or ban the use of tobacco products reduce social exposure to tobacco products. Campus-wide smoke-free and tobacco-free policies are associated with lower smoking prevalence, decreased

intentions to smoke, and less social exposure to smoking. They have high potential to prevent tobacco use among young adults who attend universities, colleges and trade schools.

Policies are more effective when they are more comprehensive (e.g., prohibit the advertising, promotion and sale of all tobacco products; forbid any tobacco industry funding (such as grants, student scholarships or sponsorships); bar tobacco industry participation in campus career fairs or recruitment activities and/or prohibit investment in tobacco industry stock by the educational institution). Effective policy development and implementation requires administrative and staff support, sufficient resources to support policy implementation and enforcement, and the availability of educational and supportive resources.

SFO-SAC 2016 Scientific Consensus Statement - Moderate (Intensify)

Comprehensive tobacco-free policies that prohibit tobacco advertising, promotion and sales, and bar tobacco industry funding, investments and representation can reduce smoking uptake among young adults attending colleges, universities and trades schools. Currently, the *Smoke-Free Ontario Act (SFOA)* does not prohibit tobacco use on post-secondary campuses, and no Ontario post-secondary institution has implemented its own ban on smoking and/or tobacco use on all campus property. Opportunity exists not only for more extensive bans of tobacco use, but also for more comprehensive treatment of tobacco promotions and industry involvement on Ontario's post-secondary campuses.

The scientific consensus regarding the potential contribution for Ontario is: Moderate (Intensify).

Key Message

Tobacco control policies are more effective when they are more comprehensive (i.e., address product promotions and sales and industry presence on campus, as well as individuals' use of conventional and alternative tobacco products). Given that campus-wide, comprehensive tobacco-free policies are associated with lower smoking prevalence, intentions to smoke and social exposure to smoking, and that neither the *SFOA* nor individual campus policies are comprehensive, there is opportunity to enhance tobacco use prevention among young adults attending Ontario colleges, universities and trade schools.

Other Interventions

Onscreen Tobacco Use and Product Placement

> *The association between exposure to tobacco use and products in movies and smoking initiation among young people presents an opportunity for intervention. Advocacy for smoke-free movies is occurring within Ontario, but there are no legislated requirements to rate movies based on tobacco imagery or screen anti-tobacco advertisements in advance of movies or videos games which contain tobacco imagery. It is likely that restricting movies with tobacco imagery to adults in Ontario would substantially decrease smoking initiation.*
>
> *SFO-SAC 2016 Scientific Consensus Statement*

Background

The tobacco industry uses advertising to create positive imagery about a product, generate positive product associations or connect the product with desirable traits, activities or outcomes.[103] Onscreen advertising (in the forms of product placement or depiction of smoking in movies, television, video games) is a powerful vehicle to promote tobacco use to youth,[104] because overall, youth have high screen exposure to entertainment media.[105] In the 1990s, tobacco advertising and product placement appeared in about 33% of movies and 20% of television shows.[105] Between 2002 and 2010, the number of youth-rated (e.g., PG-13) films with smoking declined by half, but subsequently rebounded, and then returned to historically low levels in 2015.[106] Despite these declines in 2015, levels of smoking in youth-rated films remain high.[106]

Portrayals of tobacco use onscreen often include images of tobacco product brand names and logos and rarely show the health consequences of smoking.[105] Higher exposure to onscreen tobacco has been demonstrated to increase the uptake of smoking among youth, thus undermining prevention efforts.[104]

The Ontario/Canadian Context

More than half (56%) of the top-grossing movies in Ontario between 2004-14 featured tobacco content; of those, 86% were youth-rated (e.g., G, PG, PG-13) compared to 54% that were youth-rated in the U.S.[104] This suggests that youth in Ontario have greater potential for exposure to onscreen smoking than youth in the U.S.[104]

Modelling studies based on youth exposure to top-grossing movies in Ontario suggest that at least 185,000 Ontario youth (up to age 17) could be influenced to initiate cigarette smoking by their exposure to onscreen smoking and associated risks of smoking initiation. This would subsequently result in $1.1 billion in healthcare costs attributable to smoking.[104] Furthermore, at least 59,000 of these smokers would die prematurely from smoking-related disease (e.g., tobacco-related cancers, strokes, heart disease and emphysema).[104]

Under *Ontario Regulation 452/05* of the *Film Classification Act, 2005,* the Ontario Film Review Board (OFRB) is responsible to assign ratings and classifications of movies while the Entertainment Software

Rating Board (ESRB) is responsible for video games.[107,108] However, there are no requirements to rate movies with tobacco imagery as 'adult' (18A) or as 'mature' (for video games), nor is there a requirement for anti-tobacco advertisements to be screened at the beginning of movies or video games that contain tobacco imagery.[67]

To address this gap, the Ontario Coalition for Smoke-free Movies was created to take action to counter the harmful impact of smoking in movies.[109] The coalition supports five actions: 1) rate new movies depicting tobacco use with an adult rating, 2) require strong anti-smoking ads prior to movies depicting tobacco use in all distribution channels, 3) certify no payoffs for displaying tobacco, 4) stop identifying tobacco brands, and 5) require films with tobacco imagery assigned a youth rating to be ineligible for government film subsidies.[109]

Additionally, in 2015, the North-America-wide social marketing campaign, *#tellthemyourselfie*, was developed with involvement from the Ontario Coalition for Smoke Free Movies.[110] The campaign urges individuals to post selfies to raise awareness for rating changes in Hollywood movies and send the message to Hollywood that on-screen smoking is "not ok".[110]

Hooked By Hollywood is an advocacy initiative led by parents, teens, public health professionals and volunteers, and supported by a group of public health units in southern Ontario. *Hooked by Hollywood* hosts events and provides information to influence rating changes that prevent tobacco from being shown in movies rated for children and teens.[111]

Evidence

There were no reviews on this topic identified from the pre-appraised literature. The best available research evidence was provided by SFO-SAC members, and comprised a systematic review and meta-analysis,[112] a systematic review,[113] and two grey literature reports.[104,105] One review was appraised as Level I quality,[112] and the other was appraised as Level II quality.[113] The majority of the included studies within reviews were from the U.S., Mexico, Germany, India, and the U.K. as a well as some other (unidentified) European countries.

Evidence of Effectiveness

Movies

One recent systematic review and meta-analysis[112] and two grey literature reports examined the association between depictions of smoking in movies and smoking-related attitudes and behaviours of youth.[104,105] Leonardi-Bee et al. (2016) conducted a systematic review and meta-analysis examining the association between exposure to smoking in movies and smoking initiation among adolescents (ages 7-19).[112] Similar to the findings from the SF0-SAC 2010 Report (indicating a dose-response relationship between onscreen smoking and youth tobacco initiation),[6] Leonardi et al. found that exposure to tobacco imagery in movies significantly increased the risk of 'ever trying smoking' and initiating smoking among adolescents.[112] Cross-sectional studies (comparing the highest quantile vs. lowest quantile of exposure) indicated that higher exposure to smoking in movies was associated with a doubling of the risk of ever trying smoking (RR: 1.93, 95% CI: 1.66-2.25).[112] Longitudinal studies also indicated that

higher exposure to smoking in movies was significantly associated with increased risk of initiating smoking (RR: 1.46; 95% CI 1.23-1.73).[112]

Luk (2015) cites findings from the U.S. Surgeon General's Report (2014) that indicate there is sufficient evidence supporting the causal relationship between exposure to smoking in movies and smoking initiation among young people.[36] Similarly, a report by the National Cancer Institute (2008) concluded that the evidence from cross-sectional, longitudinal and experimental studies also indicate a causal relationship between exposure to smoking in movies and smoking initiation among youth.[105] In addition, exposure to smoking in movies was associated with more positive attitudes towards smoking and pro-smoking beliefs and intentions.[105]

Potential Interventions to Minimize Onscreen Tobacco Advertising

Interventions that minimize the impacts of onscreen tobacco advertising have been proposed.[104,105] For example, parental control of their children's media exposure in movies, TV and video games used at home may be effective. One longitudinal study cited in the National Cancer Institute (NCI) report found that parental steps to reduce their 10 to14 year-old children's exposure to R-rated movies (which have a higher number of smoking events) reduced smoking initiation among children who had never smoked.[105]

Data cited by Luk (2015) suggests that eliminating smoking in movies could reduce smoking rates among teens by 18%.[104] Other efforts to reduce onscreen tobacco include restricting tobacco advertising and product placements, which may involve advocacy targeted to entertainment providers, continued dialogue with key stakeholders in the entertainment industry and self-regulation by the movie industry.[105]

Another method to limit exposure to onscreen tobacco use and products is the use of movie rating systems. Many countries have government-sponsored censor boards that are responsible to evaluate the appropriateness of entertainment media for youth.[105] The SFO-SAC 2010 recommended that movies with any tobacco imagery require an adult rating (e.g., 18A).[6] Luk (2015) cites evidence that suggests that applying adult ratings for movies depicting smoking would avert one million future tobacco deaths among today's American children and teens (aged 0-17).[104]

Experimental studies have suggested that screening anti-tobacco advertisements before films may counteract the pro-tobacco, smoking impacts of tobacco imagery.[105] For example, anti-tobacco advertisements before the start of a movie have been shown to result in stronger viewer disapproval of smoking characters in the movie (among non-smoking viewers) and reduced intentions for future smoking (among viewers who are current smokers).[105]

Media literacy, defined as an educational approach that helps viewers understand the media to which they are exposed, can reduce impacts of onscreen tobacco imagery.[105] For example, teaching youth critical viewing skills, the mechanisms the media uses to persuade its viewers, and how to discern advertisers' identities or motives may encourage more skeptical responses to tobacco advertisements.[105] Youth who are more knowledgeable about the use of product placement may be

more resistant to accepting the positive imagery that the tobacco industry is trying to associate with its products.[105]

Video Games

One recent systematic review provided by SFO-SAC examined the association between playing video games and smoking behaviour among children and adolescents (up to age 25).[113] Results showed that tobacco imagery is present in video games, but the association between video game playing and smoking behaviour is unclear. Some included studies found a positive association between smoking and video game playing, some found no association, and one study found a negative association.[113] The authors suggest that the type of video game played may influence the association with smoking behaviour.[113]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Onscreen Tobacco Use and Product Placement - Emerging

The body of evidence for this topic comprised a recent systematic review and meta-analysis (Level I quality), a systematic review (Level II quality), and two grey literature reports. Overall, there is consistent evidence that young people exposed to tobacco use and product placement in movies are more likely to: 1) experiment with or take up smoking, 2) report more positive attitudes towards smoking, and 3) endorse pro-smoking beliefs and intentions. No clear relationship was established between playing video games and smoking behaviour among children and adolescents.

There is limited evidence that addresses onscreen tobacco use and product placement interventions. One modelling study suggested that using a movie-rating system that limited children's and adolescents' exposure to onscreen tobacco use and tobacco products would reduce youth smoking rates and avert tobacco-related deaths. Another study determined that anti-tobacco advertisements presented before a movie can elicit stronger disapproval of smoking characters in the movie (among non-smoking viewers) and reduce intentions for future smoking (among viewers who are current smokers).

SFO-SAC 2016 Scientific Consensus Statement - Innovative

The association between exposure to tobacco use and products in movies and smoking initiation among young people presents an opportunity for intervention. Advocacy for smoke-free movies is occurring within Ontario, but there are no legislated requirements to rate movies based on tobacco imagery or screen anti-tobacco advertisements in advance of movies or videos games which contain tobacco imagery. It is likely that restricting movies with tobacco imagery to adults in Ontario would substantially decrease smoking initiation.

The scientific consensus regarding the potential contribution for Ontario is: Innovative.

Key Message

There is compelling evidence that exposure to tobacco use and products in movies is associated with smoking initiation, positive attitudes towards smoking and endorsement of pro-smoking beliefs among young people. Presenting anti-tobacco messages before movies and implementing movie rating systems that bar youth from movies with tobacco imagery could substantially decrease smoking initiation in Ontario.

Prevention in the Family Setting

High-intensity interventions that target families and parents may have potential to reduce smoking initiation among youth, especially if the interventions include education about all tobacco products and are delivered by well-trained facilitators. Additional evaluation is needed to confirm whether high-intensity interventions would reduce the risk of smoking initiation among Ontario youth and young adults.

SFO-SAC 2016 Scientific Consensus Statement

Background

Aside from school and campus settings, prevention interventions for youth and young adults may also take place in family-based settings. Family-based tobacco-related interventions aim to reduce tobacco use in young people by changing dysfunctional family patterns, relationships and behaviour by improving communication and parenting skills.[62]

The Ontario/Canadian Context

No information related to the Ontario or Canadian context was identified from the included literature of this report.

Evidence

The best available research evidence comprised one systematic review (from the pre-appraised literature)[114] and one recent overview of reviews provided by SFO-SAC.[62] One review was appraised as Level I quality,[114] and one was appraised as Level II quality.[62] The majority of the included studies within reviews were from the U.S., Australia, the U.K., Norway, India and Finland.

Evidence of Effectiveness

A recent overview of reviews by Stocking (2016) provided by SFO-SAC found some evidence to suggest that high-intensity prevention interventions delivered to families and parents can reduce the risk of smoking initiation among young people by 16-32%.[62] They found that these interventions were most effective when they involved developing parental skills, communication skills, positive reinforcement, limit-setting, problem-solving and encouraging an authoritative parenting style (e.g., showing a strong interest in, and care for, the young person, paired with rule- setting).[62]

The Cochrane review by Thomas (2015) examined the effectiveness of family-based interventions targeting both children and adolescents (ages 5-18) and their family members. The review found mixed results on the effects of the programs to prevent tobacco use.[114] Well-executed family-based interventions demonstrated that they may prevent smoking among children and adolescents; however, less well-executed interventions demonstrated mostly neutral or negative results.[114] The authors concluded that better training for those implementing the intervention and fidelity of implementation (i.e., the degree to which the intervention was implemented as intended) may lead to more positive outcomes.[114]

Intervention Characteristics/Implementation Considerations

See the 'evidence of effectiveness' section above for effective intervention characteristics and implementation considerations.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Prevention in the Family Setting - Supported

Family-based, tobacco-related interventions aim to reduce tobacco use among youth by changing dysfunctional family patterns, relationships and behaviours by improving communication and parenting skills. The evidence examining family settings comprised one Level I quality systematic review and one Level II quality overview of reviews. The evidence suggests that high-intensity interventions that target families and parents can reduce the risk of smoking initiation among youth. Better training of those implementing the intervention and fidelity of implementation can lead to more positive outcomes.

SFO-SAC 2016 Scientific Consensus Statement - Uncertain at this time

High-intensity interventions that target families and parents may have potential to reduce smoking initiation among youth, especially if the interventions include education about all tobacco products and are delivered by well-trained facilitators. Additional evaluation is needed to confirm whether high-intensity interventions would reduce the risk of smoking initiation among Ontario youth and young adults.

The scientific consensus regarding the potential contribution for Ontario is: Uncertain at this time.

Key Message

High-intensity family interventions that aim to prevent smoking initiation by changing dysfunctional family patterns, relationships, and behaviours through improved communication and parenting skills may be effective. Additional evaluation is required to identify the intervention components that would be most effective within the Ontario context.

Prevention in the Primary Care Setting

Interventions delivered in primary-care settings can reduce smoking initiation among youth. Addressing conventional and alternative tobacco/nicotine products may be beneficial to overall efforts to reduce smoking initiation.

SFO-SAC 2016 Scientific Consensus Statement

Background

Prevention interventions can take place in primary-care settings. Primary-care prevention interventions target parents, children or both, and are conducted in (or referred from) a primary-care setting.[115] Interventions may take place in dental, medical, or research clinics, pediatric offices, and typically involve telephone, print, or face-to-face conversations.[115]

The Ontario/Canadian Context

No information related to the Ontario or Canadian context was identified from the included literature of this report.

Evidence

The best available research evidence comprised one Level I quality systematic review (from the pre-appraised literature).[115] The majority of the included studies within the review were from the U.S., the U.K. and the Netherlands.

Evidence of Effectiveness

One systematic review examined the effectiveness of primary care interventions that aim to reduce tobacco use among children and adolescents through prevention.[115] Overall, the results suggest that primary-care interventions effectively reduce smoking initiation among children and adolescents.[115] Pooled analyses from a random-effects meta-analysis suggest a 19% relative reduction in smoking initiation among participants who received a behaviour-based prevention intervention delivered in a primary care setting (after seven to 36 month follow-up) compared with control groups (RR: 0.81, 95% CI: 0.70-0.93).[115] Authors were unable to determine which intervention characteristics were most effective.[115]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Prevention in the Primary Care Setting - Supported

Tobacco use prevention interventions are conducted in (or referred from) primary care settings and are delivered to parents, children or both. The evidence examining these interventions comprised one (Level I quality) systematic review and showed that primary-care interventions are effective at reducing smoking initiation among children and adolescents.

SFO-SAC 2016 Scientific Consensus Statement - Uncertain at this time

Interventions delivered in primary-care settings can reduce smoking initiation among youth. Addressing conventional and alternative tobacco/nicotine products may be beneficial to overall efforts to reduce smoking initiation.

The scientific consensus regarding the potential contribution for Ontario is: Uncertain at this time.

Key Message

Tobacco use prevention delivered in primary-care settings to parents, children or both can reduce smoking initiation among youth. Characteristics that contribute to effectiveness of these interventions require more evaluation.

Tailoring Interventions to Specific Populations

While culturally-tailored prevention interventions may reduce initiation of smoking among adolescents from certain ethnic and racial minority groups, it is unclear whether the same is true for indigenous youth. Additional evaluation is required to identify intervention characteristics, population characteristics and intervention-population interactions that would allow for effective programming in the Ontario context.

SFO-SAC 2016 Scientific Consensus Statement

Background

The tobacco industry relies heavily on marketing its products to specific gender, age, race, socioeconomic status (SES) and psychographic groups.[86] As a result, some groups may be at greater risk of initiating tobacco use than others. Tailoring prevention interventions to specific high-risk groups may help prevent tobacco use initiation among these groups.

The Ontario/Canadian Context

No information related to the Ontario or Canadian context was identified from the included literature of this report.

Evidence

The best available evidence for this topic comprised three systematic reviews; two were identified from the pre-appraised literature,[116,117] and one from a PHO library search.[86] One review was appraised as Level I quality,[116] and two were appraised as Level III quality.[86,117] The majority of the included studies within reviews were from the U.S., New Zealand, the U.K. and Canada.

Evidence of Effectiveness

The evidence for tailoring interventions to prevent specific groups of populations from initiating tobacco use is currently limited. The Cochrane review by Carson (2012) attempted to evaluate the effectiveness of interventions to prevent tobacco use initiation or progression to regular smoking among young Indigenous populations.[116] Based on the results of two primary studies, the review found that multi-component, community-based interventions did not result in statistically significant changes in tobacco use status at final follow-up.[116] The authors were unable to conclude whether tailored tobacco

prevention programmes prevent Indigenous youth from using tobacco. More research is needed in this area.[116]

Another systematic review examined the efficacy and components of culturally-tailored prevention interventions developed for ethnic and racial minority adolescents (e.g., African-American, Chinese-American, Hispanic and Native American, and a mixed group of minorities, including Hispanic, African-American and Arab-American).[117] They found that culturally-tailored prevention interventions reduced the tobacco use initiation rates among adolescent minority groups.[117]

Intervention Characteristics/Implementation Considerations

A third systematic review examined characteristics of short-term Research-Tested Intervention (prevention) Programs (RTIPs) by the National Cancer Institute (NCI) that were deemed to be successful.[86] The five programs included were community- or school- based preventions that were targeted towards a particular socio-demographic group (e.g., Hispanic migrant communities)(Sherman 2009).[86] Researchers found that the programs that were most successful were those that were relatively brief (i.e., less than one year), were targeted to a specific demographic group, were conducted in schools and used trained health educators or community members.[86] See Elementary and Secondary School Prevention Programs for more information on these topics.

Specific Populations/Equity Considerations

Not applicable.

Note: The tripartite statement for this topic does not have a scientific consensus regarding the potential contribution for Ontario because focusing on specific populations is not an intervention in and of itself. Interventions focusing on these sub-populations do not necessarily have a high overall contribution for Ontario but specifically address the equity contribution where specific populations can have a higher prevalence of smoking compared to the general population.

Intervention Summary

Evidence Summary - Tailoring Interventions to Specific Populations - Emerging/Promising Direction

The body of evidence for this topic comprised three systematic reviews (one Level I and two Level III quality). The evidence supported the use of culturally-tailored interventions to prevent smoking initiation among ethnic and racial minority adolescents (e.g., Hispanic migrant communities). In contrast, it is unclear whether multi-component, community-based interventions tailored to Indigenous youth (<25 years) prevent initiation of tobacco use.

SFO-SAC 2016 Scientific Consensus Statement

While culturally-tailored prevention interventions may reduce initiation of smoking among adolescents from certain ethnic and racial minority groups, it is unclear whether the same is true for indigenous youth. Additional evaluation is required to identify intervention characteristics, population characteristics and intervention-population interactions that would allow for effective programming in the Ontario context.

Key Message

The use of culturally-tailored prevention interventions in Ontario requires additional evaluation.

Tobacco-Free Generation

While there is no scientific consensus regarding the effectiveness and feasibility of implementing a tobacco-free generation, some countries (including Singapore, Australia, New Zealand and the U.K.) view it as a promising strategy to reduce smoking prevalence. Banning tobacco sales to Ontarians born after a certain date (i.e., creating a tobacco-free generation) has potential to reduce smoking prevalence across the entire population. Whether a tobacco-free generation is feasible in Ontario requires further investigation.

SFO-SAC 2016 Scientific Consensus Statement

Background

One method of restricting the initiation of tobacco use among youth and young adults is to prohibit the sale of tobacco to future generations.[36] A tobacco-free generation, proposed by Khoo (2010)[118] and Berrick (2013),[119] advocates for legislation that would restrict the sale of tobacco products to individuals born after a certain year (e.g., the year 2000).[120] The only exception of this law would be foreign visitors.[37] This would prevent the initiation of smoking among new users, and would phase out a generation of current tobacco users who either quit or "age out" (creating a generation that would be tobacco-free).[120] When the population comprises only those born after the specific 'tobacco-free year', tobacco products would no longer be sold.[37]

The aims of this intervention are to 1) change social norms regarding tobacco use (e.g., the mixed message that cigarettes are safe and acceptable for adults, but not for youth), 2) reduce social sources of cigarettes (e.g., youth getting cigarettes from their older friends), and 3) address the effects of peer influence,[120] for example, media campaigns could portray smoking as a 'last century' phenomenon.[37]

The Ontario/Canadian Context

There is no information regarding a proposal of a tobacco-free generation in Canada; however, a tobacco-free generation has been proposed in other countries including Singapore, Australia, New Zealand, and the U.K.[37] In Singapore, (2007) residents strongly supported the proposal for a tobacco-free generation, although support was higher among non-smokers (72.7%) than smokers (60.0%).[37] Additionally, financial support has been provided by organizations such as Singapore's National Cancer Centre to educate the public about this proposal and develop strategic planning.[37]

In Australia and New Zealand, there were mixed reactions. Some believed that it could be part of a comprehensive plan and could be implemented in conjunction with other 'endgame' strategies, while others were opposed to the authoritarian nature of the proposal and thought that it was not needed.[37]

In the U.K., stakeholders were intrigued by the idea of a tobacco-free generation, but wanted to see it implemented elsewhere before considering it, as they felt that it might not be practical or feasible in the U.K.[37]

Evidence

The best available research evidence for this topic comprised three grey literature reports (provided by SFO-SAC).[37,62,120] All reports cited two primary studies through which the idea of a tobacco-free generation was originally proposed.[118,119]

Evidence of Effectiveness

Currently, no jurisdictions have implemented legislation requiring a tobacco-free generation and therefore there is no evidence of effectiveness; however, important implementation considerations and reactions to the proposal in different countries are described below.

Intervention Characteristics/Implementation Considerations

A number of implementation considerations have been proposed. First, compliance is likely to be a challenge.[118-120] Retailers may be reluctant to comply with the legislation as they may fear losing a high-margin product.[119] To ensure retailer compliance, it has been suggested to: 1) conduct numerous spot checks (until the new norm becomes established), 2) enforce consequences for infractions (e.g., licences revoked) and 3) heavily publicize initial licence revocations.[119]

Alternative supply may also be an issue. Youth who fall within the tobacco-free generation may get tobacco products from older friends and siblings who are not affected by the law.[119] Additionally, they may purchase tobacco products from other countries/jurisdictions that do not have this legislation in place.

Specific Populations/Equity Considerations

Age discrimination has been highlighted as an issue of the proposed tobacco-free generation legislation. Introduction of a tobacco-free generation is suggested to discriminate this generation, by removing their ability to make their own decisions regarding tobacco use.[119] However, it has been suggested that "sometimes authorities have to make decisions on behalf of future generations"[119] in consideration of the health benefits.

Intervention Summary

Evidence Summary - Tobacco-Free Generation - Emerging

The body of evidence for this topic comprised three grey literature reports. Because no jurisdiction has introduced legislation banning the sale of tobacco products to individuals born after a certain year (thereby creating a tobacco-free generation), there is no empirical evidence regarding the effectiveness of this intervention. The effectiveness of this intervention at preventing smoking initiation would be dependent on retailer compliance and management of the social supply of tobacco (e.g., from older individuals not affected by the ban).

SFO-SAC 2016 Scientific Consensus Statement - Innovative

While there is no scientific consensus regarding the effectiveness and feasibility of implementing a tobacco-free generation, some countries (including Singapore, Australia, New Zealand and the U.K.) view it as a promising strategy to reduce smoking prevalence. Banning tobacco sales to Ontarians born after a certain date (i.e., creating a tobacco-free generation) has potential to reduce smoking prevalence across the entire population. Whether a tobacco-free generation is feasible in Ontario requires further investigation.

The scientific consensus regarding the potential contribution for Ontario is: Innovative.

Key Message

Creating a tobacco-free generation (by banning tobacco sales and supply to anyone born after a certain date) could potentially end tobacco use among youth and young adults, and ultimately the entire population. Evidence regarding the effectiveness and feasibility of this approach for preventing tobacco use is required.

References

1. The Association of Faculties of Medicine of Canada. AFMC primer on population health: the stages of prevention [Internet]. Ottawa, ON: The Association of Faculties of Medicine of Canada Public Health Educators Network; 2011 [cited 2016 Aug 16]. Available from: http://phprimer.afmc.ca/Part1-TheoryThinkingAboutHealth/Chapter4BasicConceptsInPreventionSurveillanceAndHealthPromotion/Thestagesofprevention

2. Pierce JP, Choi WS, Gilpin EA, Farkas AJ, Merritt RK. Validation of susceptibility as a predictor of which adolescents take up smoking in the United States. Health Psychol. 1996;15(5):355-61.

3. Reid JL, Hammond D, Rynard VL, Burkhalter R. Tobacco use in Canada: patterns and trends [Internet]. Waterloo, ON: Propel Centre for Population Health Impact, University of Waterloo; 2015 [cited 2016 Dec 3]. Available from: http://www.tobaccoreport.ca/2015/TobaccoUseinCanada_2015.pdf

4. Andrews J, Kaufman P. Preventing young adult tobacco use: a literature update. Toronto, ON: Ontario Tobacco Research Unit; 2015.

5. Hammond D. Smoking behaviour among young adults: beyond youth prevention. Tob Control. 2005;14(3):181-5. Available from: http://tobaccocontrol.bmj.com/content/14/3/181.long

6. Smoke-Free Ontario - Scientific Advisory Committee. Evidence to guide action: Comprehensive tobacco control in Ontario [Internet]. Toronto, ON: Ontario Agency for Health Protection and Promotion; 2010 [cited 2015 Jul 29]. Available from: http://www.publichealthontario.ca/en/eRepository/Evidence%20to%20Guide%20Action%20-%20CTC%20in%20Ontario%20SFO-SAC%202010E.PDF

7. Flay B. Youth tobacco use: risks, patterns, and control. In: Slade J. O, C.T., editor. Nicotine addiction: principles and management. New York, NY: Oxford University Press; 1993. p. 365-384.

8. Gervais A, O'Loughlin J, Meshefedjian G, Bancej C, Tremblay M. Milestones in the natural course of onset of cigarette use among adolescents. CMAJ. 2006;175(3):255-61. Available from: http://www.cmaj.ca/content/175/3/255.long

9. Emerging tobacco products gaining popularity among youth [Internet]. Atlanta, GA: Centers for Disease Control and Prevention; 2013 [updated 2013 Nov 14; cited 2016 Sept 12]. Available from: https://www.cdc.gov/media/releases/2013/p1114-emerging-tobacco-products.html

10. Minaker LM, Shuh A, Burkhalter RJ, Manske SR. Hookah use prevalence, predictors, and perceptions among Canadian youth: findings from the 2012/2013 Youth Smoking Survey (YSS). Cancer Causes Control. 2015;26(6):831-8. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4438198/

11. Summary of results for 2013: Canadian tobacco, alcohol and drugs survey (CTADS) [Internet]. Ottawa, ON: Government of Canada; 2015 [updated 2015 Feb 3; cited 2016 Sept 12]. Available

from: http://healthycanadians.gc.ca/science-research-sciences-recherches/data-donnees/ctads-ectad/summary-sommaire-2013-eng.php

12. Soneji S, Sargent JD, Tanski SE, Primack BA. Associations between initial water pipe tobacco smoking and snus use and subsequent cigarette smoking: results from a longitudinal study of US adolescents and young adults. JAMA Pediatr. 2015;169(2):129-36. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4388043/

13. Tobacco Strategy Advisory Group (TSAG). Building on our gains, taking action now: Ontario's tobacco control strategy for 2011 - 2016 [Internet]. Toronto, ON: The Ontario Tobacco Research Unit; 2010 [cited 2016 Jan 4]. Available from: http://otru.org/wp-content/uploads/2012/06/TSAGReport.pdf

14. Food and Drug Administration. Preliminary scientific evaluation of the possible public health effects of menthol versus nonmenthol cigarettes [Internet]. Silver Spring, MD: Food and Drug Administration (FDA); 2013 [cited 2016 May 24]. Available from: http://www.fda.gov/downloads/UCM361598.pdf

15. Farley SM, Johns M. New York City flavoured tobacco product sales ban evaluation. Tob Control. 2017;26(1):78-87.

16. Summary of results: Canadian student tobacco, alcohol and drugs survey 2014-15 [Internet]. Ottawa, ON: Government of Canada; 2015 [updated 2015 Sept 9; cited 2016 Sept 15]. Available from: http://healthycanadians.gc.ca/science-research-sciences-recherches/data-donnees/cstads-ectade/summary-sommaire-2014-15-eng.php

17. McNeill A, Brose L, Calder R, Hitchman S, Hajek P, McRobbie H. E-cigarettes: an evidence update. A report commissioned by Public Health England [Internet]. London, UK: Public Health England; 2015 [cited 2016 Dec 3]. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/457102/Ecigarettes_an_evidence_update_A_report_commissioned_by_Public_Health_England_FINAL.pdf

18. Stanwick R. E-cigarettes: are we renormalizing public smoking? Reversing five decades of tobacco control and revitalizing nicotine dependency in children and youth in Canada. Paediatr Child Health. 2015;20(2):101-5. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4373571/

19. Leventhal AM, Strong DR, Kirkpatrick MG, Unger JB, Sussman S, Riggs NR, et al. Association of electronic cigarette use with initiation of combustible tobacco product smoking in early adolescence. JAMA. 2015;314(7):700-7. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4771179/

20. Czoli CD, Reid JL, Rynard VL, Hammond D. E-cigarettes in Canada - tobacco use in Canada: patterns and trends [Internet]. Special supplement. 2015 ed. Waterloo, ON: Propel Centre for Population Health Impact, University of Waterloo; 2015 [cited 2016 Dec 3]. Available from: https://uwaterloo.ca/tobacco-use-canada/sites/ca.tobacco-use-canada/files/uploads/files/tobacco_use_in_canada_2015_accessibleecig_supplement_final_final-s.pdf

21. Vasiljevic M, Petrescu DC, Marteau TM. Impact of advertisements promoting candy-like flavoured e-cigarettes on appeal of tobacco smoking among children: an experimental study. Tob Control. 2016;25(e2):e107-12. Available from: http://tobaccocontrol.bmj.com/content/25/e2/e107.long

22. Summary of results for 2015: Canadian tobacco, alcohol and drugs survey (CTADS) [Internet]. Ottawa: Government of Canada; 2016 [updated 2016 Nov 16; cited 2016 Nov 20]. Available from: http://healthycanadians.gc.ca/science-research-sciences-recherches/data-donnees/ctads-ectad/summary-sommaire-2015-eng.php

23. Czoli CD, Hammond D, Reid JL, Cole AG, Leatherdale ST. Use of conventional and alternative tobacco and nicotine products among a sample of Canadian youth. J Adolesc Health. 2015;57(1):123-5.

24. World Health Organization. WHO framework convention on tobacco control. Geneva: World Health Organization; 2005. Available from: http://www.who.int/tobacco/framework/WHO_FCTC_english.pdf

25. Boak A, Hamilton HA, Adlaf EM, Mann RE. Drug use among Ontario students, 1977-2015: detailed OSDUHS findings. CAMH Research Document Series No.41 ed. Toronto, ON: Centre for Addiction and Mental Health; 2015. Available from: http://www.camh.ca/en/research/news_and_publications/ontario-student-drug-use-and-health-survey/Documents/2015%20OSDUHS%20Documents/2015OSDUHS_Detailed_DrugUseReport.pdf

26. *Smoke-Free Ontario Act, S.O. 1994, c.10*. Available from: https://www.ontario.ca/laws/statute/94t10/v4

27. Institute of Medicine (IOM). Public health implications of raising the minimum age of legal access to tobacco products. Washington, DC: National Academies Press; 2015. Available from: http://www.nap.edu/read/18997/chapter/1

28. Ontario. Ministry of Health and Long-Term Care. How the act affects you. Retailers [Internet]. Toronto, ON: Queen's Printer for Ontario; 2016 [updated 2016 Jan 28; cited 2016 May 12]. Available from: http://www.mhp.gov.on.ca/en/smoke-free/factsheets/retailers.asp

29. Smoke-free Ontario. Penalties and seizure [Internet]. Toronto, ON: Smoke Free Ontario; 2014 [cited 2016 May 12]. Available from: http://www.sfoa-training.com/the-law/penalties/

30. Electronic cigarette (vape) rules [Internet]. Toronto, ON: Queen's Printer for Ontario; 2015 [updated 2015 Nov 12; cited 2016 Mar 3]. Available from: https://www.ontario.ca/page/electronic-cigarette-vape-rules

31. Hoffman SJ, Tan C. Overview of systematic reviews on the health-related effects of government tobacco control policies. BMC Public Health. 2015;15:744. Available from: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-015-2041-6

32. Richardson L, Hemsing N, Greaves L, Assanand S, Allen P, McCullough L, et al. Preventing smoking in young people: a systematic review of the impact of access interventions. Int J Environ Res Public Health. 2009;6(4):1485-514. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2681197/

33. DiFranza JR. Which interventions against the sale of tobacco to minors can be expected to reduce smoking? Tob Control. 2012;21(4):436-42.

34. Brown T, Platt S, Amos A. Equity impact of interventions and policies to reduce smoking in youth: systematic review. Tob Control. 2014;23(e2):e98-105.

35. Nagler RH, Viswanath K. Implementation and research priorities for FCTC Articles 13 and 16: tobacco advertising, promotion, and sponsorship and sales to and by minors. Nicotine Tob Res. 2013;15(4):832-46. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3601914/

36. U.S. Department of Health and Human Services.The health consequences of smoking: 50 years of progress [Internet]. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2014 [cited 2014 Aug 25]. Chapter 15, The changing landscape of tobacco control - current status and future directions; p. 845-64. Available from: http://www.surgeongeneral.gov/library/reports/50-years-of-progress/sgr50-chap-15.pdf

37. Malone RE, McDaniel PA, Smith EA. Tobacco control endgames: global initiatives and implications for the UK [Internet]. London, UK: Cancer Research UK; 2014 [cited 2016 Mar 15]. Available from: http://www.cancerresearchuk.org/sites/default/files/policy_july2014_fullendgame_report.pdf

38. Youth access to tobacco products: monitoring update [Internet]. Toronto, ON: Ontario Tobacco Research Unit (OTRU); 2013 [cited 2016 Dec 3]. Available from: http://otru.org/wp-content/uploads/2013/10/youth2013.pdf

39. Diemert L, Dubray JM, Babayan A, Schwartz R. Strategies affecting tobacco vendor compliance with youth access laws: a review of the literature [Internet]. Toronto, ON: Ontario Tobacco Research Unit (OTRU); 2013 [cited 2016 Aug 16]. Available from: http://otru.org/wp-content/uploads/2013/10/special_vendor_compliance.pdf

40. Ontario Tobacco Research Unit. Smoke-free Ontario strategy monitoring report [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2016 [cited 2016 Dec 12]. Available from: http://otru.org/wp-content/uploads/2016/02/OTRU_2015_SMR_Full.pdf

41. World Health Organization. WHO report on the global tobacco epidemic, 2015: raising taxes on tobacco. Geneva, SZ: World Health Organization; 2015. Available from: http://www.who.int/tobacco/global_report/2015/report/en/

42. Morris M, Pennucci A, Aos S, Drake E, Fumia D, Miller M, et al. Tobacco and e-cigarette prevention: what works? [Internet]. Washington, DC: Washington State Institute for Public Policy; 2014 [cited 2014

Dec 8]. Available from: http://www.wsipp.wa.gov/ReportFile/1578/Wsipp_Tobacco-and-E-Cigarette-Prevention-What-Works_Report.pdf

43. *Tobacco Tax Rates*. O. Reg. 5/05: Available from: https://www.ontario.ca/laws/regulation/050005

44. Sousa C. Jobs for today and tomorrow: 2016 Ontario budget. Toronto, ON: Queen's Printer for Ontario; 2016. Available from: http://www.fin.gov.on.ca/en/budget/ontariobudgets/2016/papers_all.pdf

45. Wilson LM, Avila Tang E, Chander G, Hutton HE, Odelola OA, Elf JL, et al. Impact of tobacco control interventions on smoking initiation, cessation, and prevalence: a systematic review. J Environ Public Health. 2012;2012:1-36. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/pmid/22719777/

46. Bader P, Boisclair D, Ferrence R. Effects of tobacco taxation and pricing on smoking behavior in high risk populations: a knowledge synthesis. Int J Environ Res Public Health. 2011;8(11):4118-39. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3228562/

47. Rice N, Godfrey C, Slack R, Sowden A, Worthy G. A systematic review of the effects of price on the smoking behaviour of young people [Internet]. York, UK: Public Health Research Consortium; 2010 [cited 2016 Dec 3]. Available from: http://phrc.lshtm.ac.uk/papers/PHRC_A2-06_Final_Report.pdf

48. Guindon GE. The impact of tobacco prices on smoking onset: a methodological review. Tob Control. 2014;23(2):e5,2012-050496.

49. U.S. Department of Health and Human Services. Preventing tobacco use among youth and young adults: a report of the surgeon general [Internet]. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2012 [cited 2016 Dec 3]. Available from: https://www.surgeongeneral.gov/library/reports/preventing-youth-tobacco-use/prevent_youth_by_section.html

50. IARC handbooks of cancer prevention, tobacco control, effectiveness of tax and price policies for tobacco control. Volume 14. . Lyon, FR: International Agency for Research on Cancer (IARC); 2011. Available from: http://www.iarc.fr/en/publications/pdfs-online/prev/handbook14/handbook14.pdf

51. Robertson L, McGee R, Marsh L, Hoek J. A systematic review on the impact of point-of-sale tobacco promotion on smoking. Nicotine Tob Res. 2015;17(1):2-17. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4832971/

52. Ontario Tobacco Research Unit (OTRU). Smoke-free Ontario strategy evaluation report [Internet]. Toronto, ON: Ontario Tobacco Research Unit (OTRU); 2012 [cited 2016 Dec 3]. Available from: http://otru.org/wp-content/uploads/2012/12/OTRU_SER_2012.pdf

53. Robertson L, Cameron C, McGee R, Marsh L, Hoek J. Point-of-sale tobacco promotion and youth smoking: a meta-analysis. Tob Control. 2016;25(e2):e83-9.

54. Ontario Tobacco Research Unit (OTRU). Prohibition of tobacco sales in specific places: monitoring update [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2012 [cited 2016 Aug 18]. Available from: http://otru.org/wp-content/uploads/2012/10/sales2012.pdf

55. Institute of Medicine (IOM). Ending the tobacco problem: a blueprint for the nation [Internet]. Washington, DC: National Academy Press; 2007 [cited 2016 Mar 10]. Available from: https://www2.aap.org/richmondcenter/pdfs/IOMReport_BlueprintforNation.pdf

56. Ontario. Ministry of Health and Long-Term Care. How the Act affects you: Prohibition of sale on post-secondary institutions [Internet]. Toronto, ON: Queen's Printer for Ontario; 2015 [updated 2015 Jan 12; cited 2016 Sept 6]. Available from: http://www.mhp.gov.on.ca/en/smoke-free/factsheets/campuses.asp

57. Ribisl KM, Luke DA, Bohannon DL, Sorg AA, Moreland-Russell S. Reducing disparities in tobacco retailer density by banning tobacco product sales near schools. Nicotine Tob Res. 2016;19(2):239-44.

58. Brinn MP, Carson KV, Esterman AJ, Chang AB, Smith BJ. Mass media interventions for preventing smoking in young people. Cochrane Database Syst Rev. 2010;(11):CD001006.

59. Bala MM, Strzeszynski L, Topor-Madry R, Cahill K. Mass media interventions for smoking cessation in adults. Cochrane Database Syst Rev. 2013(6):CD004704.

60. For youth, by youth: a campaign to keep kids from smoking [Internet]. Toronto, ON: Youth Advocacy Training Institute (YATI); cited 2016 Aug 11]. Available from: http://youthadvocacy.ca/sites/default/files/Stupid.pdf

61. Allen JA, Duke JC, Davis KC, Kim AE, Nonnemaker JM, Farrelly MC. Using mass media campaigns to reduce youth tobacco use: a review. Am J Health Promot. 2015;30(2):e71-82.

62. Stockings E, Hall WD, Lynskey M, Morley KI, Reavley N, Strang J, et al. Prevention, early intervention, harm reduction, and treatment of substance use in young people. Lancet Psychiatry. 2016;3(3):280-96.

63. Brennan E, Momjian A, Jeong M, Naugle D, Parvanta S, Hornik RC. Mass media campaigns to reduce smoking among youth and young adults: documenting potential campaign targets and reviewing the evidence from previous campaigns [Internet]. Philadelphia, PA: University of Pennsylvania; 2012 [cited 2017 Jan 5]. Available from: http://repository.upenn.edu/cgi/viewcontent.cgi?article=1384&context=asc_papers

64. U.S. Department of Health and Human Services. The health consequences of smoking: 50 years of progress [Internet]. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2014 [cited 2015 Dec 31]. Available from: https://www.surgeongeneral.gov/library/reports/50-years-of-progress/full-report.pdf

65. French J, Blair-Stevens C, McVey D, Merrit R. Social marketing and public health: theory and practice. New York: Oxford University Press; 2010.

66. Thompson TL, Parrott R, Nussbaum JF. The Routledge handbook of health communication. New York, NY: Taylor and Francis; 2011.

67. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Ontario tobacco control efforts between January 2010 and July 2015: a jurisdictional scan [draft]. Toronto, ON: Queen's Printer for Ontario; 2017.

68. Kirkwood A, Lawrance KA. Leave the pack behind party without the smoke campaign: evaluation results. St. Catherines, ON: Leave the Pack Behind; 2016.

69. About us: exposé Ottawa [Internet]. Ottawa, ON: Ottawa Public Health; [cited Dec 30 2015]. Available from: http://www.exposeottawa.ca/about-us.html

70. LML: love my life…tobacco free! [Internet]. Tobacco Control Area Network (TCAN) East; 2014 [cited 2016 Dec 3]. Available from: http://www.lmlontario.com/about.html

71. Know what's in your mouth [Internet]. Barrie, ON: Simcoe Muskoka District Health Unit; 2013 [cited 2016 Dec 3]. Available from: http://knowwhatsinyourmouth.ca/en/

72. Freeze the Industry [Internet]. Freeze the Industry; 2015 [cited 2016 Dec 3]. Available from: http://www.freezetheindustry.com/

73. Bad ways to be nice [Internet]. Barrie, ON: Simcoe Muskoka District Health Unit; 2013 [cited 2016 Dec 3]. Available from: http://badwaystobenice.com/home/

74. SWTCAN tobacco prevention: #91Reasons [Internet]. South West Tobacco Control Area Network; [cited 2016 Dec 3]. Available from: http://www.swtcanprevention.com/91-Reasons.php

75. Ontario. Ministry of Education. The Ontario curriculum grades 1-8: health and physical education. Toronto, ON: Queen's Printer for Ontario; 2015. Available from: http://www.edu.gov.on.ca/eng/curriculum/elementary/health1to8.pdf

76. Ontario. Ministry of Health and Long-term Care. Ontario public health standards 2008. Revised May 2016 [Internet]. Toronto, ON: Queen's Printer for Ontario; 2016 [cited 2016 Dec 1]. Available from: http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/ophs_2008.pdf

77. OPHEA's smoke-free Ontario pilot program [Internet]. North York, ON: Ontario Physical and Health Education Association (OPHEA); 2014 [cited 2016 June 6]. Available from: http://www.ophea.net/sites/default/files/pdfs/HSC/SFO_SFOoverview_SE14.pdf

78. Spring update – bulletin #7 (June 2015) [Internet]. North York, ON: Ontario Physical and Health Education Association (OPHEA); 2015 [cited 2016 Jun 6]. Available from: http://www.ophea.net/sites/default/files/pdfs/HSC/SFO_UpdateBulletinFinal_JN15.pdf

79. OPHEA smoke-free Ontario school-based pilot program, year one evaluation - social program evaluation group (SPEG), Queen's University [Internet]. North York, ON: Ontario Physical and Health

Education Association (OPHEA); 2014 [cited 2016 July 6]. Available from: http://www.ophea.net/sites/default/files/pdfs/HSC/SFO_Year1SummaryFINAL_OC14.pdf

80. Uthman O, Yahaya I, Pennant M, Bayliss S, Paul A, Jit M, et al. School-based interventions to prevent the uptake of smoking among children and young people: effectiveness review [Internet]. Birmingham, UK: West Midlands Health Technology Assessment Collaboration; 2009 [cited 2016 Dec 3]. Available from: http://www.nice.org.uk/guidance/ph23/evidence/quantitative-effectiveness-review-67285693

81. Bauld L, Brandling J, Tempelton L. Facilitators and barriers to the delivery of school-based interventions to prevent the uptake of smoking among children: a systematic review of qualitative research [Internet]. Bath; UK: UK Centre for Tobacco Control Studies; 2009 [cited 2016 Dec3]. Available from: https://www.nice.org.uk/guidance/ph23/evidence/review-of-qualitative-literature-371532061

82. Thomas RE, McLellan J, Perera R. School-based programmes for preventing smoking. Cochrane Database Syst Rev. 2013;4:CD001293.

83. Thomas RE, McLellan J, Perera R. Effectiveness of school-based smoking prevention curricula: Systematic review and meta-analysis. BMJ Open. 2015;5(3):e006976,2014-006976. Available from: http://bmjopen.bmj.com/content/5/3/e006976.long

84. Isensee B, Hanewinkel R. Meta-analysis on the effects of the smoke-free class competition on smoking prevention in adolescents. Eur Addict Res. 2012;18(3):110-5.

85. Flay BR. School-based smoking prevention programs with the promise of long-term effects. Tob Induc Dis. 2009;5(1):6,9625-5-6. Available from: https://tobaccoinduceddiseases.biomedcentral.com/articles/10.1186/1617-9625-5-6

86. Sherman EJ, Primack BA. What works to prevent adolescent smoking? A systematic review of the National Cancer Institute's Research-Tested Intervention Programs. J Sch Health. 2009;79(9):391-9. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3004538/

87. Onrust SA, Otten R, Lammers J, Smit F. School-based programmes to reduce and prevent substance use in different age groups: what works for whom? Systematic review and meta-regression analysis. Clin Psychol Rev. 2016;44:45-59. Available from: http://www.sciencedirect.com/science/article/pii/S027273581500152X

88. Coppo A, Galanti MR, Giordano L, Buscemi D, Bremberg S, Faggiano F. School policies for preventing smoking among young people. Cochrane Database Syst Rev. 2014;10:CD009990.

89. Smoke-free Ontario Act: how the Act affects: schools [Internet]. Toronto, ON: Queen's Printer for Ontario; 2007 [updated 2007 Jan 1; cited 2016 June 6]. Available from: http://www.mhp.gov.on.ca/en/smoke-free/factsheets/schools.pdf

90. Leatherdale ST, Cole A. Examining the impact of changes in school tobacco control policies and programs on current smoking and susceptibility to future smoking among youth in the first two years of

the COMPASS study: looking back to move forward. Tob Induc Dis. 2015;13(1):8,015-0031-1. eCollection 2015. Available from: https://tobaccoinduceddiseases.biomedcentral.com/articles/10.1186/s12971-015-0031-1

91. Galanti MR, Coppo A, Jonsson E, Bremberg S, Faggiano F. Anti-tobacco policy in schools: upcoming preventive strategy or prevention myth? A review of 31 studies. Tob Control. 2014;23(4):295-301.

92. Non-Smokers' Rights Association (NSRA); Smoking and Health Action Foundation (SHAF). Tobacco-free campus guide [Internet]. Toronto, ON: Non-Smokers' Rights Association (NSRA); 2011 [cited 2016 Jun 15]. Available from: https://www.leavethepackbehind.org/pdf/Tobacco_Free_Campus_Guide_web_final.pdf

93. Boyce JC, Mueller NB, Hogan-Watts M, Luke DA. Evaluating the strength of school tobacco policies: The development of a practical rating system. J Sch Health. 2009;79(10):495-504.

94. Smoking policy [Internet]. Toronto, ON: Seneca College; [cited 2016 Jun 6]. Available from: http://www.senecacollege.ca/policies/smoking.html

95. Smoking on campus [Internet]. Ottawa, ON: Carleton University; 2014 [cited 2016 Jun 6]. Available from: http://carleton.ca/secretariat/wp-content/uploads/Smoking-on-Campus-Policy.pdf

96. Smoking in the workplace policy [Internet]. Guelph, ON: University of Guelph; 2016; [cited 2016 Aug 19]. Available from: https://www.uoguelph.ca/hr/policies/smoking-workplace-policy

97. Smoking on campus [Internet]. Hamilton, ON: McMaster University; 2015 [updated 2015 Sep 29; cited 2016 Aug 19]. Available from: http://dailynews.mcmaster.ca/worth-mentioning/smoking-on-campus-3/

98. University of Waterloo. Waterloo residences undergraduate residence contract 2016-2017 [Internet]. Waterloo, ON: University of Waterloo; 2016 [cited 2016 Oct 19]. Available from: https://uwaterloo.ca/housing/sites/ca.housing/files/uploads/files/terms_conditions_ug_2016-2017.pdf

99. Lupton JR, Townsend JL. A systematic review and meta-analysis of the acceptability and effectiveness of university smoke-free policies. J Am Coll Health. 2015;63(4):238-47.

100. Fallin A, Roditis M, Glantz SA. Association of campus tobacco policies with secondhand smoke exposure, intention to smoke on campus, and attitudes about outdoor smoking restrictions. Am J Public Health. 2015;105(6):1098-100. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4431121/

101. Bresnahan MP, Sacks R, Farley SM, Mandel-Ricci J, Patterson T, Lamberson P. Going tobacco-free on 24 New York City university campuses: a public health agency's partnership with a large urban public university system. J Am Coll Health. 2016;64(4):343-7.

102. Seo DC, Macy JT, Torabi MR, Middlestadt SE. The effect of a smoke-free campus policy on college students' smoking behaviors and attitudes. Prev Med. 2011;53(4-5):347-52.

103. Lovato C, Watts A, Stead LF. Impact of tobacco advertising and promotion on increasing adolescent smoking behaviours. Cochrane Database Syst Rev. 2011;(10):CD003439. doi(10):CD003439.

104. Luk R, Schwartz R. Youth exposure to tobacco in movies in Ontario, Canada: 2004-2014 [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2015 [cited 2016 Jun 15]. Available from: http://otru.org/wp-content/uploads/2015/09/special_movies.pdf

105. National Cancer Institute. The role of the media in promoting and reducing tobacco use. Tobacco Control Monograph No. 19 [Internet]. Bethesda, MD: U.S. Department of Health and Human Services; 2008 [cited 2016 Jun 10]. Available from: http://cancercontrol.cancer.gov/brp/tcrb/monographs/19/m19_complete.pdf

106. Polansky JR, Titus K, Atayeva R, Glantz S. Smoking in top-grossing US movies 2015. San Francisco, CA: Center for Tobacco Control Research and Education; 2016. Available from: http://escholarship.org/uc/item/0qw7b0rh

107. Film classifications [Internet]. Toronto, ON: Ontario Film Authority; [cited 2016 Dec 3]. Available from: http://www.ontariofilmauthority.ca/en/classifications/categories

108. Moviegoers [Internet]. Toronto, ON: Ontario Film Authority; [cited 2016 Jun 21]. Available from: http://www.ontariofilmauthority.ca/en/moviegoers/video

109. About: the Ontario Coalition for Smoke-Free movies [Internet]. Toronto, ON: Ontario Lung Association; 2014; [cited 2016 Dec 3]. Available from: http://smokefreemovies.ca/content/ontario-coalition-smoke-free-movies

110. Reality Check and the Ontario Coalition for Smoke-Free Movies launch #ratesmokingR selfie campaign [Internet]. San Francisco, CA: Center for Tobacco Control Research and Education; [cited 2016 Dec 3]. Available from: http://tobacco.ucsf.edu/reality-check-and-ontario-coalition-smoke-free-movies-launch-ratesmokingr-selfie-campaign

111. About us: hooked by Hollywood [Internet]. [cited 2016 Dec 3]. Available from: http://www.hookedbyhollywood.ca/#!about/c2122

112. Leonardi-Bee J, Nderi M, Britton J. Smoking in movies and smoking initiation in adolescents: systematic review and meta-analysis. Addiction. 2016;111(10):1750-63.

113. Forsyth SR, Malone RE. Smoking in video games: a systematic review. Nicotine Tob Res. 2016;18(6):1390-8.

114. Thomas RE, Baker PR, Thomas BC, Lorenzetti DL. Family-based programmes for preventing smoking by children and adolescents. Cochrane Database Syst Rev. 2015;2:CD004493.

115. Patnode CD, O'Connor E, Whitlock EP, Perdue LA, Soh C, Hollis J. Primary care-relevant interventions for tobacco use prevention and cessation in children and adolescents: a systematic evidence review for the U.S. Preventive Services Task Force. Ann Intern Med. 2013;158(4):253-60. Available from: http://annals.org/aim/article/1476724/primary-care-relevant-interventions-tobacco-use-prevention-cessation-children-adolescents

116. Carson KV, Brinn MP, Labiszewski NA, Peters M, Chang AB, Veale A, et al. Interventions for tobacco use prevention in Indigenous youth. Cochrane Database Syst Rev. 2012;8:CD009325.

117. Kong G, Singh N, Krishnan-Sarin S. A review of culturally targeted/tailored tobacco prevention and cessation interventions for minority adolescents. Nicotine Tob Res. 2012;14(12):1394-406.

118. Khoo D, Chiam Y, Ng P, Berrick AJ, Koong HN. Phasing-out tobacco: proposal to deny access to tobacco for those born from 2000. Tob Control. 2010;19(5):355-60. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3509015/

119. Berrick AJ. The tobacco-free generation proposal. Tob Control. 2013;22 Suppl 1:i22-6. Available from: http://tobaccocontrol.bmj.com/content/22/suppl_1/i22.long

120. Navarro C, Schwartz R. Evidence to support tobacco endgame policy measures. Toronto, ON: Ontario Tobacco Research Unit; 2014

Chapter 5: Protection

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Background

Why Address Exposure to Tobacco Smoke

It is important to recognize the role of both physical and social exposure when considering the impacts of exposure to tobacco use on human health and behaviour. Physical exposure occurs when people who are not actively engaged in smoking are involuntarily exposed to pollutants from tobacco, e-cigarettes or other related products (e.g., waterpipe).[1] Physical exposure includes secondhand smoke (SHS) and thirdhand smoke (THS), as well as secondhand exposure to aerosol from e-cigarettes. SHS consists of a mixture of exhaled mainstream smoke and sidestream smoke released from a smouldering cigarette or other smoking device (e.g., cigar, pipe, bidi) and diluted with ambient air.[2] THS refers to tobacco residue from cigarettes, cigars and other combustible tobacco products that lingers in an environment where smoking has occurred.[3] THS settles in dust, is absorbed by surfaces (e.g., carpeting, upholstery, paneling and drywall), and is carried on the hair, skin, fingernails and clothing of smokers. It can also combine and react with oxidants and other compounds in the environment (e.g., ozone and nitrous acid) to create new compounds, many of which are carcinogenic and are persistent and difficult to eliminate.[4]

Physical exposure to tobacco smoke is harmful to human health[1] and is known to cause both short-term and long-term adverse health effects, such as respiratory illness (childhood asthma and decreased lung growth and pulmonary function in children), reproductive and developmental effects (low birth weight, pre-term delivery, sudden infant death syndrome and childhood cancers), cancer among adults (lung cancer and other cancers), and cardiovascular diseases (stroke and coronary heart disease).[1] There is no safe level of exposure to SHS. Children are particularly vulnerable and face greater risks due to their small size and higher respiration rates.[1] The well-supported link between physical exposure to tobacco smoke and its harmful effects on human health warrant the implementation of initiatives that protect people from involuntary exposure. Physical exposure to secondhand aerosol from e-cigarettes is also an emerging consideration. E-cigarettes emit harmful compounds (e.g., particulates, carbon monoxide (CO) and volatile organic compounds (VOCs)) that may pose health risks to bystanders.[5]

Reducing physical exposure to tobacco smoke through the implementation of smoke-free legislation has been shown to benefit populations by improving health outcomes (i.e., cardiovascular, respiratory and perinatal) and mortality. For example, it was noted that following nation-wide smoking bans there was a reduction in cardiac outcomes such as hospital admissions for acute coronary syndrome and acute myocardial infarction.[6,7] There have also been consistent reductions in hospital admissions for asthma among children (from 12.3% to 22%),[7] and overall improved asthma health[6] following the implementation of smoking ban legislation.

Social exposure to tobacco smoke includes visual and sensory cues associated with the use of tobacco, e-cigarettes or related products (e.g., waterpipe). Social exposure can include seeing these products being used in real-life or in the media (e.g., magazines or on-screen). There is evidence that social exposure influences smoking behaviour, including initiation and relapse.[8,9] Protecting adults, and in particular, children, from the behavioural influence of social exposure to tobacco smoking and tobacco products through advertising bans, point of sale display bans (N.B., these topics are covered in

the Chapter 4: Prevention) and bans on smoking in indoor and outdoor settings is also important. As noted in the SFO-SAC 1.0 Report, "Social cognitive theory and social ecological theory suggest that modelling of social behaviour is an important mechanism for social learning. Friends and family members who smoke influence behaviour by providing social reinforcement and by modelling the outcomes associated with the behaviour."[10]

Smoke-free laws, (known also as clean air laws) and related policies are integral to a comprehensive tobacco control strategy. Creating tobacco-free and clean-air environments protects people from the physical harms of tobacco smoke exposure and also protects them from social exposure to the use of these products. Smoke-free policies help to denormalize smoking and create safer environments, particularly for vulnerable groups who may be disproportionally exposed and unable to avoid the risks on their own.

The Ontario Context – Protection Interventions from 2010

Ontario has been a leader in efforts to protect people from exposure to tobacco. The *Smoke-Free Ontario Act* (2006)[11] and its amendments since 2010, when the previous SFO-SAC Report was published, have increased protection in settings such as restaurants and bar patios, areas within 20 metres of public sporting areas and children's playgrounds; as well as on the outdoor grounds of hospitals. Designated smoking areas are allowed on hospital grounds until January 1, 2018 (O. Reg. 48/06, s. 12 (2) under the *Act*), after which outdoor grounds must be completely smoke-free.[12] Regulations to restrict the display and promotion of e-cigarettes and prohibit e-cigarette use in enclosed workplaces and public spaces, places or areas have been proposed but as of December 2016 were not in effect.[13]

Since the SFO-SAC 2010 report,[10] jurisdictions across Ontario also have been implementing their own policies and by-laws that extend beyond the *SFOA*. These include strengthening by-laws in specific settings, such as:

- outdoor buffer zones around doorways and windows of buildings,
- outdoor parks, beaches and recreational facilities, and
- transit shelters.

By-laws that restrict waterpipe, non-tobacco and e-cigarette use, or that mandate smoke-free housing are other examples of how municipalities have strengthened provincial smoke-free legislation. Under the *SFOA*, tobacco waterpipe use is prohibited anywhere where smoking cigarettes and conventional tobacco products is prohibited, and several Ontario municipalities have banned all waterpipe smoking in indoor settings and at select outdoor locations (e.g., bar and restaurant patios) by prohibiting smoking tobacco, weeds and other substances (see the section Waterpipe in the this chapter).[14] Some municipalities have implemented by-laws that prohibit the use of e-cigarettes in city workplaces (see the section Electronic-Cigarettes in this chapter);[15] and some municipalities have prohibited tobacco smoking in all community housing (e.g., Ottawa, Region of Waterloo). For a more in-depth discussion of smoke-free policies in community housing, see the Home Environments section in this chapter. A full list of all provincial and municipal policies and by-laws implemented since the SFO-SAC 2010 Report can be found in the Jurisdictional Scan.

As with the SFO-SAC 2010 Report,[10] the goal remains to protect Ontarians from physical and social exposure to tobacco products, now expanded to include new and emerging products such as e-cigarettes and waterpipes. If Ontario follows five other Canadian provinces (Quebec, Alberta, Nova Scotia, New Brunswick and Prince Edward Island) and broadens its smoke-free legislation to include weeds and other substances, non-tobacco shisha for waterpipe use and marijuana would be included.[16]

Methods

Best Available Research Evidence

This chapter primarily focuses on comprehensive coverage of interventions related to protecting people from exposure to tobacco smoke; however, interventions related to other products such as waterpipe or e-cigarettes are also included in the section Integrating other Products into Smoke-free Policies.

Results

Two PHO reviewers screened all the pre-appraised reviews for relevance and categorization to this chapter. Additional library searches were conducted for Mass Media and Impacts of Post-consumer Cigarette Waste. Please see Appendix 1: Summary Tables of Library Searches for the list of research questions for these intervention topics.

The pre-appraised literature search for the Protection chapter yielded 10 relevant review level articles. A PHO library search for articles related to Mass Media and Impacts of Post-consumer Cigarette Waste relevant to Protection yielded 11 and 14 additional primary articles respectively.

SFO-SAC members contributed 36 articles that met Protection inclusion criteria (See Figure 5.1).

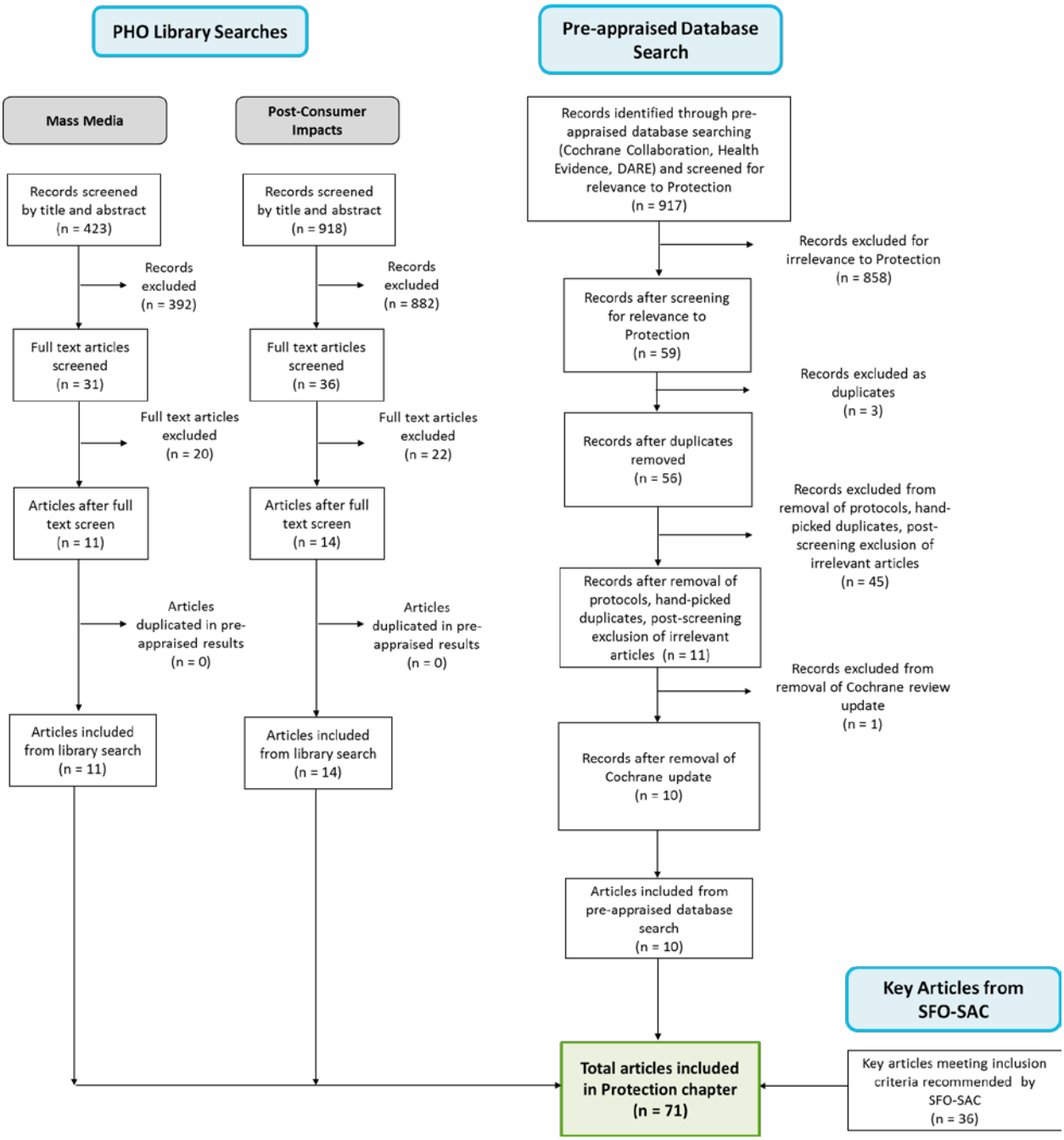

Figure 5.1: Search and Screening Flow Diagram

Protection Outcomes

Broad inclusions of protection outcomes were used in this report; for example, primary outcomes such as secondhand smoke and thirdhand smoke, and secondary outcomes such as tobacco cessation and smoking initiation/uptake. Please refer to the Glossary for definitions.

For a full description of the methods for this Report, please refer to Chapter 2: Methods.

Interventions and Innovations

Interventions Restricting Smoking in Settings not – or Insufficiently – Covered by SFOA

Exposure to SHS is harmful to human health and is known to cause lung cancer, coronary heart disease and acute respiratory disease in adults, increased risk of sudden infant death syndrome and low birth weight in babies whose mothers were exposed during pregnancy.[1] Separating non-smokers from active smoking in the same air space does not eliminate the risks from SHS exposure.[1] Ensuring non-smokers are protected from tobacco smoke exposure requires comprehensive smoke-free policies for indoor and outdoor settings.

Ontario has been a leader in ensuring protection from tobacco smoke exposure with the *Smoke-Free Ontario Act* (*SFOA*) that includes smoke-free policies for different settings, such as enclosed workplaces and public places, restaurant and bar patios, the outdoor grounds of a hospital, school property, childcare centres, motor vehicles with passengers under 16 years old, children's playgrounds and public sporting areas.[11] However, exposure to tobacco smoke still occurs in outdoor areas such as entrances to buildings, home environments, and some workplace, hospitality and institutional settings. Ensuring smoke-free policies include all settings where non-smokers are regularly exposed is an integral part of a comprehensive tobacco strategy. The following sections discuss settings that are not covered, or insufficiently covered, by the *SFOA*.

Outdoor Public Spaces

Since 2010, smoke-free policies for outdoor settings, such as children's playgrounds, sports fields and restaurant and bar patios, have been implemented through the Smoke-Free Ontario Act (SFOA) to protect Ontarians from exposure to secondhand smoke (SHS). However, Ontarians continue to report exposure to tobacco use in outdoor spaces due to gaps in policy coverage (e.g., trails, sidewalks, uncovered bus shelters, areas around patios and entrances to buildings) and non-compliance with existing policies in some settings. Nine metre buffer zones around the entrances, windows and air intakes of buildings accessed by the public and smoke-free trails, parks and beaches have already been implemented in many municipal by-laws and have been shown to be effective. Expanding these policies to the provincial level would produce beneficial outcomes. Similarly, buffer zones around patios could be explored to prevent SHS exposure of patrons and hospitality workers. Improved compliance and enforcement activities in conjunction with broader smoke-free policy development will further reduce exposure to tobacco use.

SFO-SAC 2016 Scientific Consensus Statement

Background

With the harms associated with tobacco smoke exposure firmly established, and smoke-free policies implemented in most indoor settings, the focus has now shifted to protect individuals from SHS exposure in outdoor settings. A common misconception is that SHS exposure is not an issue in outdoor settings, because many people believe that smoke simply dissipates into the air. However, a growing body of evidence has shown that SHS exposure in outdoor settings can be just as harmful as SHS exposure in indoor settings.[17] In addition, smoking in outdoor settings that do not have sufficient buffer zones can result in smoke drifting into existing smoke-free areas.[17]

In outdoor settings, there are different factors that can influence the concentration of SHS present, such as the number and density of active smokers or environmental conditions like wind.[18] SHS in outdoor settings dissipates more easily when active smoking stops or if wind conditions direct the smoke away from non-smokers (i.e., being upwind from the lit cigarette).[19] However, during active smoking, especially with a high density of lit cigarettes, or when people are downwind from smoking, exposure can be comparable to indoor SHS exposure.[20] Moreover, non-smokers are often exposed to the repeated presence of SHS outdoors in particular settings, such as the entrances to buildings and outdoor or semi-enclosed workplaces (e.g., a place with more than two walls and a roof such as a building site under construction).[21]

The Ontario/Canadian Context

On January 1, 2015, new provincial regulations were introduced to prohibit outdoor smoking in areas such as children's playgrounds, public sporting areas and restaurant and bar patios, as an addition to the *SFOA*.[11] Effective January 1, 2016, O. Reg. 48/06 s. 12 under the *Act*, new *SFOA* amendments were implemented to prohibit smoking on the outdoor grounds of hospitals, psychiatric facilities and at

specified office buildings owned by the Province, with the exception of outdoor designated smoking areas (DSA), which also will be prohibited on January 1, 2018 (O. Reg. 48/06, s. 12 (2) under the *Act*).[12] For the full review of the evidence for smoke-free policies at hospitals, please see the section Institutional Settings in this chapter. The Ontario Tobacco Research Unit (OTRU) conducted an evaluation of these regulations through pre- and post-intercept surveys of 1,305 individuals (OTRU 2016).[22] The results of the survey revealed that, while self-reported exposure to SHS decreased in all included venues (playgrounds, sports fields, restaurant and bar patios), exposure was still quite high. The largest reduction in exposure occurred on restaurant and bar patios, where it decreased from 85% in 2014 to 57% in 2015.[22] However, significant differences were also reported on sports fields (66% to 58%) and playgrounds (45% to 37%).[22]

Almost a year after the implementation of these regulations, a survey of tobacco enforcement staff in Ontario revealed that perceived compliance with the new regulations was rated highest for restaurant and bar patios (89% reporting strong compliance).[22] However, active enforcement numbers indicated that 144 warnings had been issued to individuals smoking on restaurant and bar patios. This was the highest of all venues, and more than double the number of warnings issued at sports fields, which was the second highest with 71 warnings.[22]

Despite the *SFOA*'s extensive coverage, a number of outdoor settings are not currently covered by provincial regulation. Settings such as beaches, trails, outdoor festivals and unsheltered bus stops are not covered by the *SFOA* and represent gaps in regulation that have been addressed by some municipalities. For example, the City of Kingston introduced a by-law in 2002 that banned smoking on patios, but added an amendment in 2012 that extended the smoke-free policy to beaches, trails, sporting fields, swimming pools, municipal parks, playgrounds, stadium seating areas, bus transfer stops and within nine metres of municipal buildings and three metres of publicly-accessible buildings.[23] The City of Ottawa introduced a new by-law in 2007 that banned smoking on all transit property, which included stations, stops and park-and-ride lots.[24] In March 2015, the use of e-cigarettes and the act of vaping was banned from all City of Ottawa property, which included transit property.

In 2013, the City of Toronto introduced a by-law that prohibits smoking within nine metres of any entrance or exit that is used by the public.[25] This includes municipal buildings, malls, stores, offices, institutional buildings and multi-unit housing.[25] At the provincial level, Quebec and New Brunswick have implemented smoke-free provisions at workplaces and entrances to public buildings that prohibit smoking within nine metres of their entrances, and eight other provinces have smoke-free provisions at workplaces and public building entrances that range from three to six metres.[26]

In 2015, OTRU conducted an evaluation of the City of Toronto by-law, comparing results with data collected before the bylaw was enforced in 2014.[27] Results from street intercept surveys found that 83% of respondents reported sometimes being exposed to secondhand smoke when entering a public building, and 50% of included smokers reported occasionally smoking near entrances to public buildings (no statistical difference from before enforcement of the by-law).[27] Records also showed that the number of public complaints about smoking in entranceways increased from 185 in 2014 to 234 in 2015; however, this may be indicative of an increased awareness of the by-law and was not necessarily due to

increased smoking around entranceways.[27] While it is an early evaluation, these data indicate that smokers continued to smoke in entranceways one year after the introduction of the by-law. This policy may benefit from greater resources for enforcement, and increased education to broaden public awareness of the by-law and encourage buy-in from property managers.[27]

Evidence

The best available evidence for this section included one systematic review[28] and four primary studies[29-32] obtained from SFO-SAC. Overall, three papers were appraised as Level I,[28-30] one as Level II,[31] and one as Level III.[32] All studies were conducted in Canada.

Evidence of Effectiveness

Restaurant and Bar Patios: The review by Sureda et al. studied levels of SHS exposure in outdoor settings, including hospitality and bar patios. The study further examined indoor air quality from adjacent outdoor smoking areas (e.g., bar patios).[28] The most common measure used to monitor SHS exposure was particulate matter <2.5µg/m^3 ($PM_{2.5}$), along with other measures, including carbon monoxide (CO), polycyclic aromatic hydrocarbons (PAHs), and biological markers (e.g., salivary cotinine). Across these measures, the mean SHS exposure levels were higher when smokers were present (ranged from $PM_{2.5}$ 8.32µg/m^3 to 124µg/m^3), compared to baseline measures.[28] Outdoor SHS levels vary depending on atmospheric conditions (e.g., wind direction, wind speed and atmospheric stability), density and distribution of smokers, and the structure of the outdoor location (open vs. semi-enclosed), and can therefore change and dissipate to background levels more easily, compared to indoor SHS levels.[28] However, there are still potential negative health effects from outdoor SHS exposure.

Concentrations of $PM_{2.5}$ in smoke-free indoor settings adjacent to outdoor smoking areas varied across studies.[28] In hospitality settings, such as bar patios, the mean indoor SHS exposure levels were higher than baseline measures, especially when the outdoor space was semi-enclosed. The review also highlighted an evaluation of the impact of laws that prohibit indoor smoking and found that generally, SHS exposure levels decreased in indoor settings, but increased in the adjacent outdoor spaces compared to pre-ban.[28] Factors influencing indoor SHS exposures from outdoor areas include wind speed and direction and structural barriers between indoor and outdoor spaces.

One primary study examined the effect of smoking bans on outdoor patios on exposure to SHS.[30] The study compared Canadian provinces with smoking bans on outdoor patios with other Canadian provinces without smoking bans on outdoor patios.[30] The study found that in Alberta and Nova Scotia, where smoking bans were implemented, the probability of reporting SHS exposure on outdoor patios decreased from 30.7% in 2007 to 23% in 2012, and from 26.1% in 2006 to 20.6% in 2012 respectively.[30] In contrast, the control province of Saskatchewan did not implement a smoking ban and experienced an increase in reported SHS exposure.[30]

According to a recent Ontario study, smoke-free policies may also have a protective effect on smokers making a quit attempt.[31] This study examined whether exposure to smoke on patios was associated with making a quit attempt, or having a relapse following a quit attempt.[31] While no effect was observed on quit attempts, the study showed that smokers exposed to smoke on patios were significantly more likely

to relapse compared to smokers who visited a patio but were not exposed to smoke (HR = 2.40; 95% CI: 1.07 to 5.40; p=0.033).[31] The results of this study show that smoke-free policies on outdoor patios may protect smokers who are making a quit attempt from relapsing.

Buffer zones around smoke-free restaurant and bar patios would address the issue of smoke drifting onto patios from people smoking around the perimeter of the patio; however, no evidence was identified on the effectiveness of buffer zones, which is a gap in the literature.

Entrances to Buildings: One systematic review included two studies that examined the degree of SHS exposure for individuals entering and exiting buildings.[28] The review demonstrated that on average, indoor and outdoor levels of particulate matter ($PM_{2.5}$) were significantly higher when individuals were smoking within nine metres of the building, compared to background and control levels.[28] Outdoor $PM_{2.5}$ also showed a significant positive association with the number of cigarettes being smoked in the area. Other findings suggested that individuals passing by entrances with five or more people actively smoking (up to three metres away) were exposed to 2.5 times the background level of particulate matter ($PM_{2.5}$).

Parks and Beaches: Smoke-free laws in other outdoor settings, such as parks and beaches, also protect people from exposure to SHS by decreasing smoking behaviour in these venues.[32] The results of the study by Okoli et al. (2013) showed that observed smoking rates were lower after implementing a smoke-free by-law in the three parks and three beaches included in the study. (observed pre-law mean smoking rate in parks was 37.1 versus post-law 12 month mean smoking rate=6.5, p=0.01, and observed pre-law mean smoking at beaches was 2.9 versus post-law 12 month mean smoking rate=1.0, p=0.1).[32]

Other Outdoor Settings: There is currently a gap in the available literature on the effectiveness of smoke-free policies in other settings, which can include, but is not limited to, trails, sidewalks and bus shelters.

Intervention Characteristics/Implementation Considerations

Smoke-free policies and laws are best implemented as a part of a comprehensive tobacco control strategy.[30] The effectiveness of smoke-free policies and laws for outdoor settings greatly depends on the degree of enforcement, which may require different strategies and intensities depending on the venue.[32]

Specific Populations/Equity Considerations

Subgroup analysis from a telephone survey discussed in one Canadian study found that individuals from visible minority groups were significantly more likely to support an outdoor smoke-free by-law in parks and beaches than individuals of Caucasian or European descent.[29] However, the same study found that outdoor smoke-free policies may risk increasing health inequities in low-income communities. The study notes that enforcement of smoke-free by-laws is inconsistent and that, in some cases, enforcement is not conducted in parks and beaches in low-income areas designated as “charged environments”, due to the potential harm that enforcement officials might face when trying to enforce the by-law.[29]

Intervention Summary

Evidence Summary - Outdoor Public Spaces - Supported

The best available research evidence for protection from SHS exposure in outdoor settings comes from one systematic review and four primary studies (two appraised as Level I, one Level II, one Level III). Exposure to smoking in outdoor settings such as restaurant and bar patios, building entrances, parks and beaches have been shown to put individuals at risk of harm from exposure to tobacco smoke. Overall, smoke-free policies in outdoor settings have been shown to be effective to reduce physical and social exposure to tobacco smoke, when sufficiently enforced. There is also evidence that smoke-free policies support quit attempts by reducing cues for smoking and help to denormalize smoking, which is related to smoking uptake among young people.

SFO-SAC 2016 Scientific Consensus Statement – High (Intensify)

Since 2010, smoke-free policies for outdoor settings, such as children's playgrounds, sports fields and restaurant and bar patios, have been implemented through the *Smoke-Free Ontario Act* (*SFOA*) to protect Ontarians from exposure to SHS. However, Ontarians continue to report exposure to tobacco use in outdoor spaces due to gaps in policy coverage (e.g., trails, sidewalks, uncovered bus shelters, buffers around patios and entrances to buildings) and non-compliance with existing policies in some settings. Nine metre buffer zones around the entrances, windows and air intakes of buildings accessed by the public and smoke-free trails, parks and beaches have already been implemented in many municipal by-laws and have been shown to be effective. Expanding these policies to the provincial level would produce beneficial outcomes. Similarly, buffer zones around patios could be explored to prevent SHS exposure of patrons and hospitality workers. Improved compliance and enforcement activities in conjunction with broader smoke-free policy development will further reduce exposure to tobacco use.

The scientific consensus regarding the potential contribution for Ontario is: High (Intensify).

Key Message

Smoke-free policies are effective to protect Ontarians from physical and social exposure to tobacco smoke, support quitting and change social norms about the acceptability of smoking. Continued education, monitoring and enforcement are important to maintain and increase compliance with existing outdoor smoke-free regulations. There are opportunities to expand provincial regulations to include a nine metre buffer around the entrances, windows and air intakes of buildings accessed by the public, and to implement smoke-free policies on trails, parks and beaches.

Home Environments

The Smoke-Free Ontario Act (SFOA) prohibits smoking in common areas of multi-unit housing (MUH), but does not include individual living units or outdoor areas around housing buildings. However, the adoption of voluntary smoke-free policies in MUH is growing at the local and municipal levels, particularly among affordable and community housing providers. The U.S. Department of Housing and Urban Development (HUD) has passed a regulation to prohibit smoking in public housing, including all living units, indoor common areas and outdoor areas up to 7.62 metres (25 feet) from housing buildings. Evidence demonstrates that complete smoke-free policies in MUH are effective to reduce exposure to secondhand smoke (SHS) and thirdhand smoke (THS), and smoke-free housing policies encourage positive changes in smoking behaviour, such as reduced smoking and increased cessation. With about one quarter of Ontarians living in MUH, including specific populations that are more vulnerable to SHS exposure (e.g., infants, children and seniors), smoke-free housing policies would protect a considerable number of Ontarians from harmful exposures in the home. Implementing smoke-free policies in affordable and community housing also addresses health inequalities that tenants may face from disproportionate SHS exposure and limited options for housing that is affordable and safe.

SFO-SAC 2016 Scientific Consensus Statement

Background

The home environment is where children are most exposed to SHS, and it is also a prominent setting for adult exposure.[1] People who live in homes where there is indoor smoking, show higher levels of cotinine (a metabolite of nicotine used as a biomarker to measure tobacco smoke exposure).[33] Tobacco THS consists of material remaining on surfaces, or in the dust, of areas where smoking has taken place (Thomas 2014).[4] Greater concentrations of carcinogens are found on surfaces in smokers' homes than in

non-smokers' homes;[4] indicating that thirdhand smoke could be a considerable source of carcinogen and toxicant exposure in home environments.

In 2014, 3% (or 322,500) of non-smoking Ontarians ages 12 years and over were exposed to SHS in their homes every day, or almost every day, a slight decrease from 4% the previous year.[14] In 2014, Ontario children faced high exposure rates, which were 8% (86,900 Ontario children between the ages of 12 to 18) more than double the exposure reported by all respondents ages 12 and over (3%).[34] In 2013-14, exposure to SHS in the home among non-smoking Ontarians ages 12 years and over ranged from a low of 2% in Halton Regional Health Department to a high of 9% in Huron County Health Unit.[34] Over three-quarters (78%) of Ontarians believed that there should be a law mandating that parents not smoke inside their homes if children are living there.[34]

Nearly one in four Ontarians live in multi-unit housing (MUH).[35] In 2011, 38% of people living in MUH reported SHS entering their home once every six months, 27% said SHS entered their house monthly, and 19% said SHS entered their house weekly.[35] This circumstance is more common in MUH since SHS drifts and transfers from active smokers' homes to non-smoking homes via shared air spaces, ventilation systems, windows, hallways and doors.[36-38] In 2012, these numbers dropped slightly to 33% reporting biannual SHS exposure, 24% with monthly SHS exposure and 16% with weekly SHS exposure.[35] Data from 2014 show that exposure to SHS in MUH, where SHS entered the home from neighbouring units at least once in the past month, was 29% (or 689,500) among adults ages 18 years or over.[14] Nearly 90% of Ontarians (adults >18 years) believed that smoking should not be allowed inside of MUH.[14]

Tenants of affordable housing (e.g., community, social, subsidized, rental, ownership or cooperative housing) are more often members of populations that face high rates of chronic diseases and disabilities, as well as socio-cultural and economic barriers to good health.[39-41] Studies have shown that tenants of community housing have high smoking rates,[40,42] high exposure to SHS,[36,43] and are more likely to be affected by tobacco-related diseases than other MUH residents in the general population.[40]

Since the introduction of the *Smoke-Free Ontario Act*, which prohibits smoking in common areas of MUH, no further amendments have been made at the provincial level to strengthen smoke-free policies in home environments. Given that there is no safe level of exposure to SHS,[1] the best way to protect non-smokers from its harms indoors is to have a complete smoke-free policy, that includes all living units and their balconies or patios, outdoors around buildings, and on the property when feasible. Some municipalities have extended protection beyond what is covered in the *SFOA* by implementing smoke-free policies in community housing (e.g., Ottawa, Waterloo Region and York Region).[44] Additionally, as of December 2016, the landlords and condominium/ building managements of over 200 MUH complexes across Ontario (which include private sector, non-profit, condominium and co-operative housing), have voluntarily implemented 100% smoke-free policies that make it a condition of their tenants' leases.[44] Furthermore, individual households can choose to implement voluntary household smoking bans in their own homes to help protect non-smokers.

Smoke-free MUH policies support smokers who are interested in quitting by reducing cues for smoking, promote smoke-free and non-smoking norms and prevent children, youth and young adults from

smoking even if their parents or caregivers continue to smoke outside the home.[45] Other benefits of smoke-free policies include fire prevention and reducing the cost of repairs and restoration needed as a result of smoking-related damage.[46]

The Ontario/Canadian Context

In 2009-10, the Smoking and Health Action Foundation created and supported the *Smoke-Free Housing Ontario* initiative.[47] *Smoke-free Housing Ontario* is a province-wide initiative, which promotes having MUH with clean, smoke-free indoor air. The goal is to make smoke-free MUH the norm in Ontario. The initiative has a mission to provide collaborative leadership and to execute effective strategies to increase smoke-free housing.

Approximately 95 municipalities in Ontario have at least one MUH provider that has implemented smoke-free policies, and 38 municipalities have multiple MUH providers with smoke-free policies.[44] As of December 2016, more than 200 MUH and non-profit housing corporations across 89 municipalities in Ontario had adopted, or were in the process of adopting, a 100% smoke-free policy.[44] Of note, a few large Ontario jurisdictions have adopted smoke-free policies in all of their community housing (e.g., Region of Waterloo and Ottawa); and 26 Ontario municipal providers of community housing have adopted, or are in the process of adopting, smoke-free policies.[44] Several provincial housing authorities have adopted, or are in the process of adopting, smoke-free housing policies, including the Newfoundland and Labrador Housing Corporation, Nova Scotia Department of Community Services and the Yukon Housing Corporation.[48] The Yukon Housing Corporation became 100% smoke-free on January 1, 2012, and only allows smoking on private balconies or patios and outside, at least five metres from a shared entrance of MUH.[48]

To comply with the Ontario *Residential Tenancies Act, 2006* (Section 38 (1) under the *Act*), a smoke-free clause can be included only in new tenancy agreements.[49] This means that existing tenants are exempt from smoke-free housing policies in Ontario until they sign a new lease. In some cases, an existing tenant is given an opportunity to voluntarily sign a new lease with the non-smoking clause; however, in many cases, the unit remains exempt until the existing tenant moves out and a new tenant moves in.

Ontario's first smoke-free community housing policy was implemented across all Region of Waterloo Housing and Region of Waterloo Community Housing Inc. properties in 2010. Evaluation findings reported a 13% decline in household smoking, 44% of smokers reported smoking outside more often, almost half (46%) of tenants were enrolled in a smoke-free lease, and more than a third of tenants reported that they smoked less since the smoke-free policy was introduced.[50] However, there was no significant change in the number of residents who reported being exposed to SHS in their homes, which was >50% pre- and post-implementation.[50] It should be noted that there were still some "grandfathered" leases that allowed tenants to smoke in their units, though 34% of those with a grandfathered lease reported smoking less post-implementation.[50]

Evidence

From the pre-appraised literature, the best available research evidence for protection in home environments included two systematic reviews and meta-analyses[51,52] and five systematic reviews.[53-57]

SFO-SAC provided one systematic review and meta-analysis,[58] two systematic reviews,[59,60] and three primary studies.[50,61-63]

Overall, five meta-analyses and/or systematic reviews were appraised as Level I,[51,52,54,57,58] four as Level II,[55,56,59,60] and one as Level III.[53] Of the primary studies included, one was appraised as Level I[63] and two were of Level II.[61,62] The majority of studies included in these reviews were conducted in the U.S., with some in Canada.

Evidence of Effectiveness

Four systematic reviews were identified that assessed the effects of household smoking bans in single family homes and MUH.[55,56,59,60] Based on the results of the reviews, there was some evidence that household smoking bans can be effective to protect household members, including children, from tobacco smoke exposure (i.e., secondhand smoke and thirdhand smoke), as well as lead to increased smoking cessation.[55,59,60] For more information on cessation outcomes of home smoking bans, click here. A review of 35 studies on the effects of smoke-free policies in MUH, found that the majority of residents had voluntarily prohibited smoking in their own units (Range: 50% to over 95%).[60] However, despite household smoking bans, the prevalence of SHS incursion remained high (range: 26% to 64%).[60]

Kabir (2010) summarized the health benefits of smoke-free homes for children. In their review of 19 studies, there was a significant reduction (20-50%) in childhood SHS exposure following the adoption of household smoking bans.[55] Mills et al. (2009) reviewed the association between smoke-free homes (i.e., households with smoking restrictions or bans) and adult smoking behavior.[59] Of the 23 included studies, the prevalence of smoke-free homes among smokers increased rapidly over time.[59] Most studies found current smokers with lower cigarette consumption were more likely to report a smoke-free home and to show a significant association between presence of a smoke-free home and future quitting behavior.[59]

U.S. and U.K primary studies support the conclusions drawn from reviews on the effect of voluntary household smoking bans to reduce self-reported and objectively measured SHS exposure.[61,62] For example, there was evidence that individuals who lived in homes where indoor smoking occurred had greater inhalation of fine particulate matter ($PM_{2.5}$) compared to those who lived in smoke-free home.[62] Overall, the presence of $PM_{2.5}$ was 10 times more likely in smoking homes than non-smoking homes (i.e., 28 $\mu g/m^3$ more than was measured in non-smoking homes). It was estimated that smoking households could reduce residents' daily inhaled $PM_{2.5}$ if the home was established as smoke-free.

In addition, smoke-free housing policies can have economic benefits.[63] In the U.S., the Department of Housing and Urban Development (HUD) ruled on 5 December 2016 that all community housing nation-wide would become smoke-free (including waterpipe) within 18 months.[64] The timeframe to implement the smoke-free policy includes time for "grandfathered" existing leases to reach a period when they are up for renewal and addendums are added to the leases to incorporate smoke-free policies.[64] Annual economic savings from prohibiting smoking in all U.S. community-based public housing were estimated at $521 million USD per year, including savings of $341 million USD in SHS-related health care expenditures, $108 million USD in renovation expenses and $72 million USD in smoking-attributable fire losses.[63] Prohibiting smoking in U.S. public housing alone would yield cost savings of approximately $154

million USD per year.[63] Efforts to prohibit smoking in MUH could protect health and generate substantial cost savings.

Home-based smoke-free interventions: The preceding paragraphs describe interventions and smoke-free bans that were implemented by individuals and families in their homes on a voluntary basis, as part of a larger research study. One review of family-based interventions that aimed to promote smoke-free home environments for infants and young children was identified.[53] Of the 13 studies reviewed, only four reported statistically significant positive effects. Most studies reported positive post-intervention trends, including increased self-reported household restrictions on smoking, decreased cigarette consumption or avoidance of SHS exposure.[53] These findings were validated through decreased cotinine levels or improved air quality measurement (24-hour home measurement of $PM_{2.5}$), which demonstrates a decrease in SHS exposure.[53] There were no significant changes in parental reports of smoking cessation in these studies.[53] Although it was difficult to draw firm conclusions about the best approach, interventions for parental smoking cessation and relapse prevention seem to have been less successful than interventions to reduce SHS exposure.[53]

The effectiveness of interventions to reduce children's exposure to SHS was reviewed.[54] A total of 57 studies were included, with populations involving mothers, fathers, families and households. The evidence from interventions such as motivational interviewing and telephone counselling showed a reported reduction in household exposure to tobacco smoke (measured by air nicotine levels); however, there was no change in the number of cigarettes the parents or carers smoked per day.[54] Therefore, the differences in household air nicotine was due to parents and carers changing their smoking habits and the location of where they smoked (i.e., smoking outdoors).[54]

Three meta-analyses and systematic reviews[51,52,58] analysed interventions other than smoke-free policies, such as home-based smoking cessation interventions to encourage parents to protect children, and examined the effects on SHS exposure and smoking cessation.

A meta-analysis quantified the effects of interventions that encourage parental cessation, including self-help and educational materials, counselling and/or pharmacotherapy.[51] In most studies, the intervention group was compared to a control group that received usual care for smoking cessation.[51] Interventions showed positive trends in thirteen (72%) of the 18 studies, with four (22%) showing a statistically significant effect, (Relative Risk 1.34; 95% CI= 1.0-1.71; P=0.02). The Relative Difference of 0.04 (CI=0.01 to 0.07; P=0.005) showed that 4% more of the intervention parents quit smoking compared to the control parents.[51] Interventions such as counselling, phone support, nicotine replacement therapy, self-help materials and air cleaners to reduce SHS exposure in the home demonstrated some benefits, such as a reduction in SHS exposure and the number of cigarettes children were exposed to (Relative Difference=0.07 (CI 0.05 to 0.09, P<0.0001), indicating that 7% of the families in the intervention group did see improved SHS exposure in the home as measured by parental self-report and/or biomarker).[52] The results were supported by studies that measured particulate matter or air nicotine in the home, which demonstrated that interventions do protect children at home from SHS exposure; however, THS particles remain.[58]

Intervention Characteristics/Implementation Considerations

For implementation considerations specific to Ontario, it should be noted that landlords can include a smoke-free clause only in new tenancy agreements, since renewed lease agreements must contain the same terms and cannot include addendums (*Residential Tenancies Act*, 2006, section 38(1)).[49] This means that when a landlord implements a smoke-free policy, tenants who already have a lease agreement with the landlord are exempted from the policy (often referred to as grandfathering).

Specific Populations/Equity Considerations

Interventions to achieve cessation among parents and partners of pregnant women are implemented to protect babies in utero from harm due to tobacco smoke exposure.[57,58] A systematic review considered the effectiveness of interventions to encourage smoke-free homes during pregnancy and the neonatal period.[56] The review included 17 studies of households with a child <12 months of age and a pregnant, or recently pregnant, woman who smoked. Interventions varied across studies, including individually adapted smoke-free home programs, counselling and/or motivational interviewing. However, it is suggested that counselling interventions could be effective, particularly when delivered by trained individuals in a combination of in-person and telephone sessions. No recommendations were made on which interventions to avoid due to ineffectiveness. The findings regarding the effectiveness of interventions to encourage smoke-free homes for pregnant women were also mixed.[56] Overall, the findings suggested mixed evidence regarding the success of these interventions to reduce SHS in this very discrete population.[56]

Results from Tong et al. (2015) showed similar conclusions for interventions offered by health care professionals for non-smoking pregnant women to reduce their exposure to SHS at home.[57] The study demonstrated that clinical interventions delivered in prenatal settings appear to reduce women's exposure to SHS ([1]decreased mean hair nicotine concentration: intervention group= 0.5 log µg/g at baseline decreased to 0.3 log µg/g at 1-month follow-up; control group= 0.4 log µg/g at baseline ($p<0.05$) decreased to 0.5 log µg/g at 1-month follow-up; [2] self-report SHS exposure OR 0.57, 95%CI 0.38 to 0.84; [3] self-report of partners not smoking in the past 7 days 8.4% versus 4.8%, $p=0.04$).[57]

A scientific review of the smoke-free MUH literature noted results from air monitoring studies showed that high levels of SHS exposure in MUH was more common among residents in low-income housing.[60] The authors found that those who voluntarily had smoke-free rules in their own units were more likely to have children living at home. However, children living in MUH with smoke-free rules in their homes were still involuntarily exposed to tobacco smoke and showed higher mean serum cotinine levels (45%) compared to children living in detached homes due to the transfer of SHS from other units.[60]

Intervention Summary

Evidence Summary - Home Environments - Well supported

The best available body of evidence consisted of three systematic review and meta-analyses, seven systematic reviews, and three primary studies, (six appraised as Level I, six Level II, and one Level III). The body of evidence demonstrates that personal household smoking bans are effective to reduce SHS exposure among adults and children. However, in MUH environments, personal household smoking bans alone are not effective to prevent external SHS from entering homes due to the transfer of tobacco smoke from other units and outdoor spaces where smoking is allowed. Overall, complete smoke-free policies in MUH are effective to reduce exposure to SHS and THS. However, the Ontario *Residential Tenancies Act* (*RTA*) requires housing providers to exempt existing leases when new smoke-free policies are implemented, resulting in continued exposure. There is evidence that both voluntary household smoking bans and smoke-free MUH policies are effective to reduce cigarette consumption and increase smoking cessation, which can also protect non-smokers by limiting SHS exposure. Interventions that advise smokers not to smoke inside the home, such as counselling, motivational interviewing and self-help materials to encourage adult smokers to quit smoking or reduce their cigarette consumption can also reduce SHS exposure, particularly for children.

SFO-SAC 2016 Consensus Statement – High (Intensify), Targeted, Positive Equity

The *SFOA* prohibits smoking in common areas of MUH, but does not include individual living units or outdoor areas around housing buildings. However, the adoption of voluntary smoke-free policies in MUH is growing at the local and municipal levels, particularly among affordable and community housing providers. The U.S. Department of Housing and Urban Development has passed a regulation to prohibit smoking in public housing, including all living units, indoor common areas and outdoor areas up to 7.62 metres (25 feet) from housing buildings. Evidence demonstrates that complete smoke-free policies in MUH are effective to reduce exposure to SHS and THS, and smoke-free housing policies encourage positive changes in smoking behaviour, such as reduced smoking and increased cessation. With about one quarter of Ontarians living in MUH, including specific populations that are more vulnerable to SHS exposure (e.g., infants, children and seniors), smoke-free housing policies would protect a considerable number of Ontarians from harmful exposures in the home. Implementing smoke-free policies in affordable and community housing also addresses health inequalities that tenants may face from disproportionate SHS exposure and limited options for housing that is affordable and safe.

The scientific consensus regarding the potential contribution for Ontario is: High (Intensify). This would have a potential positive equity impact if targeted to affordable and community housing.

Key Message

Both personal smoking policies in the home and smoke-free MUH policies are well supported by the scientific evidence to reduce exposure to tobacco smoke, and support smoking reduction and cessation. In Ontario, the adoption of voluntary smoke-free policies in MUH is growing at the local and municipal levels, particularly among affordable and community housing providers. The exemption of existing leases in accordance with the Ontario *RTA* means that the impact on exposure outcomes is initially limited, but increases over time as units turn over and become smoke-free. Province-wide implementation of smoke-free housing policies would have a substantial impact on population health, including vulnerable groups.

Workplaces

The Smoke-Free Ontario Act (SFOA) prohibits smoking in enclosed workplaces and licensed taxis; however, it does not extend to outdoor workplace settings. When considering the overall body of evidence, smoke-free workplace policies that include outdoor smoking bans on the property or worksite, protect all employees from the harms of physical and social exposure to tobacco smoking. Smoke-free policies also help to reduce smokers' consumption and increase cessation rates, which is particularly relevant for young people entering the workforce. The workplace is a setting where many young people make the transition into adulthood, and exposure to tobacco use and secondhand smoke (SHS) in the workplace may increase their risk of smoking initiation. Smoking initiation by young people may be more likely in sectors that work outdoors, have higher rates of smoking and higher self-reported exposure to smoking (e.g., trades and equipment operators, primary industry, processing and manufacturing).

SFO-SAC 2016 Scientific Consensus Statement

Background

The *SFOA* prohibits smoking in enclosed workplaces. A workplace is defined as an enclosed building, structure or vehicle that an employee works in or frequents during the course of their employment (whether or not they are acting in the course of their employment at the time), and includes common areas such as washrooms, lobbies and parking garages (Section 9 under the *Act*).[11] Further, as outlined

in the *SFOA*, workplaces extend to private homes when home-care workers are present (i.e., home care workers have the right to request that their patients do not smoke tobacco in their presence when they are caring for them in the home) (Section 9.1 (1) under the *Act*).[11] Outdoor workplace settings (e.g., construction, mining, forestry) are not covered by the *SFOA*. As working adults spend a considerable amount of time during their day in a workplace, these settings can be major sources of SHS exposure. Data from the 2014 Centre for Addiction and Mental Health (CAMH) Monitor show that 9% (544,000) of adult workers, ages 18 years or over, were exposed to SHS indoors at work or in work vehicles for five or more minutes within the past week.[65] This remains unchanged from 2013, which showed 10% of adults exposed to SHS indoors at work or in a work vehicle.[65] Data were not stratified by workplace sector. Continued exposure is contingent on employer and employee compliance with workplace policies, as well as active inspection and enforcement. Furthermore, if there are no smoke-free policies that prohibit smoking outside and around building entrances or windows, workers inside may be exposed to SHS that drifts indoors.[28] This chapter section explores the impact of workplace smoke-free policies on tobacco smoke exposure, population health outcomes, and smoking behaviours (e.g., cessation, relapse).

The Ontario/Canadian Context

Federal workplaces and federal buildings are governed under federal legislation and regulations. If provincial legislation is stronger than the federal regulation, the provincial legislation is considered the higher standard.[48] The *Non-Smokers' Health Act* restricts smoking inside federal and federally-regulated workplaces and buildings, such as government offices, banks and inter-provincial transportation, and allows for designated smoking rooms and designated smoking areas (s. 4 under the *Act*).[66] In addition, the Treasury Board of Canada (the primary employer for the federal government) further restricts smoking in federal government buildings, allowing for designated smoking rooms in limited situations.[48] The Treasury Board also suggests that departments take measures to reduce the effects of tobacco smoke at building entrances.[48]

The *SFOA* prohibits smoking in enclosed workplaces and will be extended to prohibit the use of e-cigarettes in enclosed workplaces, with the implementation date undecided as of December 2016.[13] Jurisdictions or municipalities in Ontario can extend by-laws to regulate smoking in municipal workplaces or properties in areas not covered by the *SFOA*, e.g., outdoor areas. For a full list of Ontario jurisdictions and municipalities that have enacted these by-laws please see the Jurisdictional Scan report. Some individual workplaces also have adopted smoke-free policies to protect workers in outdoor areas, and some have designated their entire property smoke-free (including semi-enclosed areas).

Workplace smoking cessation programs have been implemented in Ontario such as “No Butts About It”, targeted to workers in the retail sector, and the *Ontario Workplace Cessation Demonstration Projects* targeted to workers in the mining, construction, manufacturing, hospitality, and service sectors.[14] For a full description of the *Ontario Workplace Cessation Demonstration Projects* and a discussion of the cessation outcomes, please see the Workplace-Based Interventions section of the Cessation chapter of this Report. While the primary outcome of these programs was smoking cessation, there was the added benefit of protecting non-smokers if the workplaces extended smoke-free policies to include smoking around doorways/entrances, windows and air intake areas, or on the entire property. A workplace

smoke-free policy, where smoking is prohibited on the entire property, provides a supportive environment to quit and removes barriers to cessation (e.g., opportunities to smoke or smokers present onsite).[1]

The British Columbia Healthy Living Alliance's *Tobacco Reduction Strategy* worked with 32 employers across the province to implement the Tobacco Free Workplace Initiative (TFWI) to decrease smoking prevalence, initiation, and exposure to SHS by implementing tobacco cessation supports and services.[67] The TFWI targeted primary industries, manufacturing, transport, service and retail sectors. Baseline data noted that approximately 50% of employees had experienced some SHS exposure at their workplace;[67] however, there were no follow-up data on SHS exposure in the workplace after implementing the TFWI. Some TFWI workplaces indicated that they had future plans for smoke-free workplace policies, such as reducing the number of designated smoking areas and implementing policies regarding smoking in work vehicles.[67]

Smoking bans at bars and restaurants, both indoors and on patios, are covered under the *SFOA* (Section 9 for indoor smoking bans and O. Reg. 48/06 s.13 for patio restrictions both under the *Act*),[12] which protects both employees and patrons from physical and social exposure to SHS. Complete information on protection from tobacco smoke in these settings is covered in the Outdoor Public Spaces and the Hospitality Settings sections of this chapter.

Evidence

The best available research evidence included a systematic review[68] and a narrative review[55] from the pre-appraised literature, and a systematic review[69] from SFO-SAC, which met inclusion criteria. A grey literature report[67] was also provided by SFO-SAC. One review was appraised as Level I[68] and two reviews were appraised as Level II.[55,69] The studies included in the reviews were from the US, the UK, Canada, Australia, Germany, Ireland, Scotland, Spain, and Hong Kong.

Evidence of Effectiveness

Currently there is a gap in the available literature that addresses protecting employees from SHS in workplaces that do not have complete smoke-free policies. Complete smoke-free policies include, but are not limited to: prohibiting outdoor designated smoking areas, prohibiting smoking in work vehicles or smoking in semi-enclosed areas (e.g., buildings under construction), and include a no-smoking buffer zone around windows, doors and air intake areas.

Evidence from the available literature did not measure non-smokers' exposure to SHS in the workplace by either self-report or by biomarkers. Rather, the evidence focused on other positive outcomes of smoke-free workplace policies and programs, such as smoking cessation. For example, Fitchenberg and Glantz (2002) demonstrated that smokers' cigarette consumption in workplaces that implemented complete smoke-free policies (i.e., did not allow smoking in designated outdoor areas) decreased by 29% per employee.[69] Hopkins et al. (2010) showed there was a measured difference in tobacco cessation rates among smokers from workplaces with smoke-free policies compared to those from workplaces without smoke-free policies (median absolute percentage difference or change in self-reported tobacco use cessation was 6.4 percentage points; interquartile interval 1.3-7.9).[68] Other

positive population-level effects of implementing workplace smoke-free policies are improved health effects such as the estimated 17% lower heart attack rate among adults after comprehensive workplace smoke-free policies were implemented in Scotland.[55]

For a complete summary of the evidence on smoking cessation interventions in the workplace setting please see Workplace-Based Interventions in the Cessation chapter.

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations for smoke-free policies in workplace settings was identified from the included literature of this report.

Specific Populations/Equity Considerations

The available literature did not address specific populations or equity considerations. However, one review noted a 25% decrease in preterm births observed in Ireland one year after implementing a workplace smoke-free policy.[55] This implies that the smoke-free workplace policy is protecting vulnerable populations, such as pregnant women.

In Ontario, workplace exposure to SHS by occupation for workers ages >15 years, shows that employees in trade occupations, equipment operators, primary industries (e.g., agriculture, forestry, mining, fishing), and the processing and manufacturing sectors experience more workplace exposure (46% in the past 30 days) compared to workers in sales and services (26% in the past 30 days), and administrative, professional and clerical positions (24% in the past 30 days).[70] Some individual workplaces and companies have implemented their own complete smoke-free workplace policies, including support for cessation.[71,72] The workplace is a setting where many young people make the transition into adulthood, and exposure to tobacco use and SHS in the workplace may increase their risk of smoking initiation.[73] Workplace-based prevention and cessation interventions provide an opportunity to reach workers, especially young adults.

Higher rates of exposure to SHS in occupations that are more likely to be outdoors (e.g., primary industry, trades and equipment operators) highlight a gap where the *SFOA* could be strengthened to include all workplaces, whether they are indoors or outdoors.

Intervention Summary

Evidence Summary - Workplaces - Supported

The body of evidence regarding the protection of individuals from tobacco smoke exposure in the workplace included two systematic reviews and one narrative review (one appraised as Level I, two as Level II), and a grey literature report from an evaluation of workplace demonstration projects in British Columbia. While evidence from the available literature did not measure non-smokers' exposure to SHS in the workplace by either self-report or by biomarkers, there is evidence that current workplace smoke-free policies are associated with improved health effects (17% lower heart attack rate among adults and a 25% decrease in preterm births) at a population-level. Comprehensive workplace smoke-free policies were also found to support other positive outcomes such as reduced smoking and increased cessation.

SFO-SAC 2016 Consensus Statement – High (Intensify), Targeted, Positive Equity

The *SFOA* prohibits smoking in enclosed workplaces and licensed taxis; however, it does not extend to outdoor workplace settings. When considering the overall body of evidence, smoke-free workplace policies that include outdoor smoking bans on the worksite or property, protect all employees from the harms of physical and social exposure to tobacco smoking. Smoke-free policies also help to reduce smokers' consumption and increase cessation rates, which is particularly relevant for young people entering the workforce. The workplace is a setting where many young people make the transition into adulthood, and exposure to tobacco use and SHS in the workplace may increase their risk of smoking initiation. Smoking initiation by young people may be more likely in sectors that work outdoors, have higher rates of smoking and higher self-reported exposure to smoking (e.g., trades and equipment operators, primary industry, processing and manufacturing).

The scientific consensus regarding the potential contribution for Ontario is: High (Intensify). This is a targeted intervention with a potential positive equity impact.

Key Message

Smoke-free workplace policies protect all employees from the harms of SHS exposure and support reduced smoking and quitting, thereby improving population health outcomes. The current *SFOA* does not address smoking in outdoor areas of workplaces, which is a substantial gap in policy that could be strengthened.

Hospitality Settings

Under the Smoke Free Ontario Act (SFOA), individuals are prohibited from smoking in hotels, motels and inns, with the exception of guest rooms designated to accommodate smoking. However, this exception leaves guests and staff exposed to the negative health effects associated with exposure to secondhand smoke (SHS) and thirdhand smoke (THS). While evidence specific to tobacco smoke exposure in hotel settings is sparse, the environment is comparable to multi-unit housing (MUH) (i.e., multiple units within a building envelope with shared common areas, walls and ventilation). Therefore, evidence that supports the risk of involuntary exposure to tobacco smoke in MUH can be applied to this setting, especially when considering chronic exposure for hotel staff. Expanding the SFOA to exclude designated smoking rooms would be instrumental to reduce exposure to SHS and THS by guests and staff.

SFO-SAC 2016 Scientific Consensus Statement

Background

Smoke-free policies in hospitality settings (e.g. bars, restaurants, hotels) present a unique opportunity to minimize harms associated with tobacco smoke exposure (i.e., SHS and THS), as they protect both customers and employees. Comprehensive smoke-free laws have been shown to improve air quality and reduce SHS exposure.[74]

While many in the hospitality industry have concerns that smoke-free policies have a negative effect on profit, published literature has repeatedly refuted this belief. The U.S. Centers for Disease Control and Prevention (CDC) states that current evidence shows that smoke-free policies do not have a negative economic impact on the hospitality industry.[74]

In Ontario, smoking is prohibited in hospitality settings where food and drink are served, such as bars, restaurants and patios, and in the common areas, but not in guest rooms of hotels, motels and inns. Therefore, this section focuses on exposure and policy interventions in those spaces. To see more information about smoke-free policies for patios at restaurants and bars please see the Outdoor Public Spaces section in this chapter.

The Ontario/Canadian Context

The *SFOA* states that smoking is prohibited everywhere in hotels, motels and inns – except in guest rooms "designated as a guest room that accommodates smoking by the management of the hotel, motel or inn" (Section 9 (10) under the *Act*).[11] Owners who choose to offer designated smoking guest rooms are responsible to ensure that *No Smoking* signs are placed at all entrances and exits of the building, in shared washrooms and in each non-smoking guest room/washroom (O. Reg. 48/06, s. 22 under the *Act*).[12] Owners must also ensure that ashtrays and any objects that could be used as ashtrays are removed and that any person who does not comply with these rules be asked to leave the building.[11] Local public health units are responsible to enforce the *SFOA*, by conducting proactive and complaint-

based inspections (Section 9 (6) under the *Act*).[11] Owners who do not comply with these regulations can be subject to fines. However, as the study by Matt et al. (2014) showed, incomplete smoking bans still leave hotel guests exposed to tobacco-related harms through surfaces contaminated with THS.[75]

In Canada, many of the popular hotel chains have implemented 100% smoke-free policies in their hotels, including Westin, Marriott, Howard Johnson, and Sheraton.[76] There are currently no regulations for home-sharing services such as Airbnb™; discretion is currently left to the home-owner, with the exception of any multi-unit housing (MUH) rules that prohibit smoking. Huron County, Ontario has implemented a municipal by-law that requires all hotels, motels, inns, bed and breakfasts and other rooms for temporary accommodation to be 100% smoke-free.[77]

Evidence

The best available evidence for this section included one primary study obtained from SFO-SAC; no reviews were identified in the literature. The study was appraised as Level II[75] and was conducted in the U.S. Evidence on how SHS transfers between units in MUH and the risks of THS in homes where smoking occurs are also relevant to hotels that have multiple guest rooms with shared walls and ventilation systems. For more information about the evidence of exposure to tobacco smoke in homes, please see the Home Environments section of this chapter.

Evidence of Effectiveness

One primary study attempted to measure differences in THS exposure levels between hotels with complete smoking bans and hotels without complete smoking bans (i.e., with designated smoking guests rooms).[75] Study results found that in non-smoking guestrooms in hotels without complete smoking bans, indicators of THS exposure such as surface and air nicotine and 3-ethynylpyridine (3EP) were much higher than in non-smoking guestrooms in hotels with complete smoking bans.[75] Surface nicotine levels were more than two times higher, and air 3EP levels were more than seven times higher in non-smoking rooms in hotels without complete smoking bans compared to non-smoking rooms in hotels with complete smoking bans. Higher levels of nicotine were also observed on the fingers of non-smoking study associates who stayed as guests in non-smoking rooms of hotels that did not have complete smoking bans, when compared to hotels with complete smoking bans.[75] Significantly higher levels of NNAL (a metabolite of NNK – a tobacco-specific carcinogen) were also observed by study associates who spent between 12 and 14 hours in the most THS-contaminated rooms included in the study.[75]

Exposure was not only limited to guest rooms, as testing of hallways connected to designated smoking rooms revealed that levels of surface nicotine were significantly higher when compared to hallways connected to non-smoking rooms in hotels with and without complete smoking bans.[75] Levels of surface nicotine in hallways in non-smoking sections of hotels without complete smoking bans were more than twice as high as in hallways in hotels with complete smoking bans.[75]

Intervention Characteristics/Implementation Considerations

The results of this study demonstrate that partial smoking bans still leave non-smokers exposed to tobacco-related harms.[75] In order to ensure that all individuals are protected from smoke exposure, hotels must be 100% smoke-free.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature for this intervention section.

Intervention Summary

Evidence Summary - Hospitality Settings - Supported

The body of evidence regarding the effectiveness of banning smoking in hotels, motels and inns included one primary study appraised as Level II. The primary study found that complete smoke-free policies in hotels (i.e., no smoking in common areas and guest rooms) reduces thirdhand (THS) smoke exposure for customers and staff when compared to hotels with incomplete policies that allow smoking in guest rooms. Although the long-term health implications of THS exposure are unknown, THS has been found to be a source of persistent carcinogenic and toxicant exposure.

SFO-SAC 2016 Scientific Consensus Statement - Moderate (Intensify), Positive Equity

Under the *Smoke Free Ontario Act* (*SFOA*), individuals are prohibited from smoking in hotels, motels and inns, with the exception of guest rooms designated to accommodate smoking. However, this exception leaves guests and staff exposed to the negative health effects associated with exposure to secondhand smoke (SHS) and thirdhand smoke (THS). While evidence specific to tobacco smoke exposure in hotel settings is sparse, the environment is comparable to multi-unit housing (MUH) (i.e., multiple units within a building envelope with shared common areas, walls and ventilation). Therefore, evidence that supports the risk of involuntary exposure to tobacco smoke in MUH can be applied to this setting, especially when considering chronic exposure for hotel staff. Expanding the *SFOA* to exclude designated smoking rooms would be instrumental to reduce exposure to SHS and THS by guests and staff.

The scientific consensus regarding the potential contribution for Ontario is: Moderate (Intensify). This intervention has a potential positive equity impact.

Key Message

Partial smoking bans in hospitality settings (e.g., hotels, motels, and inns) leave guests and employees at risk of exposure to smoke-related harms. There is an opportunity to protect guests and employees from exposure to SHS and THS by eliminating designated smoking rooms (e.g., guest rooms) in existing *SFOA* legislation.

Institutional Settings

Ontario has implemented indoor smoking bans in institutional settings as part of a comprehensive tobacco strategy, with exceptions for designated rooms in residential care facilities, psychiatric facilities and facilities for veterans. Smoking is also prohibited on the grounds of hospitals and psychiatric facilities, with outdoor designated smoking areas to be phased out by January 1, 2018. However, outdoor areas on post-secondary campuses are not covered in the legislation. There is an opportunity in Ontario to further reduce exposure to smoking for staff and young adults by implementing comprehensive tobacco-free policies on post-secondary campuses. Continuous, active enforcement of indoor and outdoor smoking bans in institutional settings is necessary to ensure their effectiveness.

SFO-SAC 2016 Scientific Consensus Statement

Background

Institutional settings for this section include environments that are not covered or are insufficiently covered by the *Smoke-Free Ontario Act* (*SFOA*) such as psychiatric facilities and facilities for veterans, outdoor areas on hospital and post-secondary campuses and prison settings.

The Ontario/Canadian Context

The *SFOA* states that "No person shall smoke tobacco or hold lighted tobacco in any enclosed public place or enclosed workplace", which includes institutional buildings such as schools, hospitals and university or college residences (Section 9 under the *Act*)[11] Smoking is also completely prohibited on school grounds and on the outdoor grounds of hospitals except where a designated smoking area is available (O. Reg. 48/06 s. 12 under the *Act*).[12] Designated smoking areas on hospital grounds in Ontario are being phased out as outlined in Bill 45, which stipulates that as of January 1, 2018, the grounds of hospitals and psychiatric facilities must be completely smoke-free.[78] However, under the *SFOA*, residential care facilities, psychiatric facilities and facilities for veterans may open and operate a controlled smoking area (CSA) and offer smoking in an indoor room (Section 9 (7-9) under the *Act*).[11]

The *SFOA* also has specific requirements for traditional tobacco use for Indigenous residents of hospitals, long-term care homes, homes for special care or independent health facilities, "The proprietor

[of these facilities] must, at the request of an Aboriginal resident, set aside an indoor area in the facility for the use of tobacco for traditional Aboriginal cultural or spiritual purposes. This area must be separate from any area where smoking is otherwise permitted (e.g., controlled smoking area). The restriction on smoking or holding lighted tobacco on the outdoor grounds of a public hospital, a private hospital or a psychiatric facility does not apply to tobacco used for traditional Aboriginal cultural or spiritual purpose." (Section 13 (4) under the *Act*).[11]

Evidence

The best available research evidence for protection against smoking in institutional settings was one systematic review and meta-analysis,[79] and five primary studies[80-84] provided by SFO-SAC. The review was appraised as Level I.[79] Of the primary studies included, one was appraised as Level I,[81] three appraised as Level II[80,83,84] and one appraised as Level III.[82] The studies included in the review were from the U.S., Europe, Australia, Canada and Japan, and the primary study took place in the U.S.

Evidence of Effectiveness

A Cochrane review analyzed 17 studies on the effect of institutional smoking bans (from partial or complete indoor bans to outdoor smoking bans) on SHS exposure and reduced mortality from smoking-related illness.[79] Four observational studies reported reductions in SHS exposure in university, healthcare and prison settings. Another four studies evaluated the impact of smoking policies in prisons and hospitals, and found reductions in smoking-related illness, significant reduction in smoking-related mortality, significant reduction in acute myocardial infarction and improved health assessments (in a Canadian psychiatric hospital). Studies in this Cochrane review were rated as low quality with high heterogeneity; therefore, results must be interpreted with caution.

A primary study on a smoke-free policy (indoors, with a nine-metre ban outside any entrance) implemented at the Centre for Addiction and Mental Health (CAMH) found an overall high level of support for the smoke-free policy that was maintained for more than two years afterwards.[83] There was a significant change in attitude among staff, with an increased belief that designated smoking rooms affected patients' health, less agreement with smoking as a social activity, less time monitoring smokers, fewer smoking breaks, and fewer staff reporting visitors, families and friends smoking in their homes.[83] Also, no evidence of behavioural consequences (e.g., patients being more anxious, increased incidences of secretive smoking, or increased number of physical assaults/aggressions) was found among patient.[83] Similar findings were seen with an outdoor smoking ban at a cancer center in the U.S.[82] and with smoke-free environment policies at two hospitals in Sydney, Australia.[80] Unrod et al. noted that the majority of staff and patients supported the smoking ban, and there was an increased interest in smoking cessation among smokers.[82] Poder et al. noted there was an overall significant 36% ($p \leq 0.05$) reduction in observed smoking on hospital grounds two years post-implementation of the smoke-free policy, with 44% reduction ($p \leq 0.05$) observed among staff, 37% reduction ($p \leq 0.05$) observed among visitors, and no change observed among inpatients.[80]

Intervention Characteristics/Implementation Considerations

Implementation of smoking bans in institutional settings may not be as effective when staff do not enforce them. For example, lack of enforcement of the smoking ban by staff in a prison setting resulted

in the continuation of smoking outdoors and inside cells.[79] There were some reports of negative health effects (e.g., reduction in mood and increased weight gain) in patients from two studies of psychiatric hospitals.[79] In a hospital-based cessation intervention that introduced a total smoking ban, the ban was perceived as being too strict by staff and patients, and there was increased reporting of patients being angry about the policy; however, the increase was not statistically significant and the short follow-up period of three months may not have been enough time to reflect acceptance.[79]

The primary study by Kunyk et al. (2007) describes in detail the implementation of a comprehensive tobacco control policy at Capital Health, a regional health authority in Alberta that is responsible for 18 hospitals and primary care facilities, 33 continuing care facilities, 29 public health programs and nine community facilities.[84] The authors identified that a critical step in developing Capital Health's smoke-free policy was determining that the primary goal was to protect everyone at the facilities from exposure to SHS. Communication, consistency, coordination and full administrative support were identified as essential for the success of the policy change.[84] Similar findings were seen in smaller inpatient psychiatric units in Northern British Columbia, with additional challenges such as lack of resources, but where a strong consultative leadership was still identified as the primary ingredient to successfully implement smoke-free policies on hospital grounds.[81]

Specific Populations/Equity Considerations

On college and university campuses, after smoke-free policies or bans limiting exposure were implemented, there was a reduction in SHS exposure at building entrances on campuses, and more staff and students preferred the smoke-free environments.[79] In addition, the smoke-free policies on campuses had secondary positive outcomes such as fewer "more frequent smokers" (i.e., those who have smoked >100 cigarettes in their lifetime and had smoked cigarettes on at least 10 of the last 30 days) and a reduction in smoking rates.[79] Please refer to Campus-Based Tobacco Policies in the Prevention Chapter for more information on the effects of campus-wide smoke- and tobacco-free policies on young adults.

Intervention Summary

Evidence Summary - Institutional Settings - Well supported

The body of evidence regarding the effectiveness of banning smoking in institutional settings included one systematic review and meta-analysis and six primary studies (two appraised as Level I, three Level II, one Level III). Overall, there was evidence that outdoor smoking policies reduced secondhand smoke (SHS) exposure in hospitals and psychiatric facilities, and on post-secondary campuses and prison grounds. Outdoor smoking policies also reduced smoking-related illness and mortality among staff, patients/residents and visitors in hospitals and prisons. There was also general support for outdoor smoking policies from staff, patients/residents and visitors in these institutional settings.

SFO-SAC 2016 Scientific Consensus Statement - Moderate (Intensify), Positive Equity

Ontario has implemented indoor smoking bans in institutional settings as part of a comprehensive tobacco strategy, with exceptions for designated rooms in residential care facilities, psychiatric facilities and facilities for veterans. Smoking is also prohibited on the grounds of hospitals and psychiatric facilities, with outdoor designated smoking areas to be phased out by January 1, 2018. However, outdoor areas on post-secondary campuses are not covered in the legislation. There is an opportunity in Ontario to further reduce exposure to smoking for staff and young adults by implementing comprehensive tobacco-free policies on post-secondary campuses. Continuous, active enforcement of indoor and outdoor smoking bans in institutional settings is necessary to ensure their effectiveness.

The scientific consensus regarding the potential contribution for Ontario is: Moderate (Intensify). This intervention has a potential positive equity impact if targeted to post-secondary campuses.

Key Message

Smoking bans in institutional settings are effective at reducing SHS exposure and have been successfully implemented in Ontario. Continued enforcement and expansion of smoking bans in all indoor and surrounding outdoor areas of institutional settings, including post-secondary campuses, will further reduce exposures to tobacco smoke.

Vehicles

As part of the Smoke Free Ontario Act, smoking in vehicles is prohibited when persons 16 years old and younger are present. Other provinces and territories restrict smoking in vehicles when persons 18 or 19 years and younger are present (e.g., Alberta and Yukon Territory's law covers persons 18 years and younger and Nova Scotia and Prince Edward Island's laws cover persons 19 years and younger). Increasing the age of coverage in Ontario would widen protection from exposure to smoking in vehicles to youth and young adults. Prohibiting smoking in rental cars and ride-share programs would limit users' exposure to SHS and THS. In addition, province-wide education campaigns to raise awareness of the health impacts of exposure to SHS and THS in vehicles may improve compliance and encourage parents not to smoke in their vehicles at any time.

SFO-SAC 2016 Scientific Consensus Statement

Background

Smoking in private vehicles has been shown to produce high tobacco concentrations, partly due to the smoke circulating in a confined space.[85] Exposure to toxic tobacco concentrations from smoking in vehicles is not safe for anyone.[85] It is particularly harmful for children who are sitting in a vehicle while someone else is smoking in the vehicle.[86] Moreover, smoking in vehicles puts passengers at risk of exposure to thirdhand smoke (THS) even when no active smoking is occurring (i.e., tobacco smoke left behind on surfaces and in upholstery). THS also combines and reacts with oxidants and other compounds in the environment (e.g., ozone and nitrous acid) to create new compounds, many carcinogenic, which are persistent and difficult to remove.[4] There are arguments against adopting smoking bans in vehicles such as intrusion on private life and individual rights, difficulty in enforceability and effectiveness, and the possibility of smokers switching from smoking inside vehicles to their home environments.[86] However, in Canada, there are already some bans against smoking in vehicles[86] including Ontario legislation that restricts people from smoking a tobacco product while children 16 years and under are present.[11] This section focuses on the effect of smoke-free policies in vehicles on SHS and THS exposure. Workplace vehicles fall under the jurisdiction of an enclosed workplace; therefore, employees cannot smoke in work vehicles. For a full description of workplace smoke-free policies please see the Workplaces section in this chapter.

The Ontario/Canadian Context

The *Smoke Free Ontario Act* states "No person shall smoke tobacco or have lighted tobacco in a motor vehicle while another person who is less than 16 years old is present in the vehicle," with enforcement by police officers (Section 9.2 (1) under the *Act*).[11] In addition, when the *Electronic Cigarette Act* (*ECA)* is implemented, protection will be expanded to include prohibiting the use of e-cigarettes or having an active e-cigarette in a vehicle when another person less than 16 years is present, (Section 12 under the *Act*).[13] *SFOA* does not currently protect non-smoking adults[10] from SHS and THS in private vehicles, rental cars or second-hand cars for purchase.

Many car rental companies in Canada provide a national service that could potentially play a significant role in promoting tobacco control efforts by prohibiting smoking in all rental cars, thereby denormalizing tobacco use.[87]

For example, some car rental companies mention their "100% smoke-free" policy in the fine print under terms and conditions and have added non-smoking symbols on their online reservation sites. As of September 2016, Avis©[88], Dollar[89] and Thrifty©[90] have a non-smoking symbol on their reservation websites clearly stating that their fleets are entirely non-smoking, and Thrifty© has an entire page dedicated to its non-smoking policy.[91] There are currently no regulations on car-sharing services such as Uber©[92] and Zipcar®.[93] Improvements could include adopting smoking restrictions in rental cars, communicating policies to customers, training employees and implementing effective strategies to monitor compliance.[87] There are simple and inexpensive solutions, such as signage in rental car offices, key rings and stickers in rental vehicles that serve as constant reminders to refrain from smoking.[87]

Evidence

The best available research evidence for policies banning smoking in vehicles are four primary studies[85,87,94,95] and one grey literature report[86] provided by SFO-SAC. One primary study was appraised as Level I,[85] and three primary studies were Level II.[87,94,95] One primary study took place in the U.S., while the rest of the primary studies and grey literature report took place in Canada.

Evidence of Effectiveness

Since 2008, nine provinces and one territory in Canada have implemented bans on smoking in vehicles primarily to protect children from SHS.[94] Based on a provincially-representative sample of 91,800 respondents in Grades 6 to 8 from the Youth Smoking Survey (YSS), Ontario had a significant pre-post decline of SHS exposures in 2008 versus 2006, compared to control provinces (Alberta and Quebec) (OR: 0.45, 95% CI: 0.30-0.66).[94] Significant declines of SHS exposures were also reported in subsequent post-ban survey waves in 2010 versus 2006 (OR: 0.61, 95% CI: 0.42-0.88) and in 2012 versus 2006 (OR: 0.58, 95% CI: 0.42-0.80).[94] British Columbia also had a significant decline in the likelihood of being exposed to smoking in vehicles in 2012 versus 2006 (OR: 0.51, 95% CI: 0.32-0.82) compared to control provinces.[94] Nova Scotia, Prince Edward Island, Saskatchewan, Manitoba and Newfoundland did not show significant pre-post ban changes compared to control provinces.[94] However, overall SHS in vehicles declined from 26.5% in 2004 to 18.2% in 2012 as the bans were implemented across the provinces.[94]

SHS in the home did not increase after the implementation of policies banning smoking in vehicles. Data from the *Canadian Tobacco Use Monitoring Survey* (CTUMS) showed an increase in complete or partial smoking restrictions in homes from 72% in 2000 to 91% in 2010.[86]

An added risk from smoking in vehicles is the THS that is left behind. A primary study examined the effectiveness of smoke-free policies on a random sample of 250 rental cars designated as non-smoker, smoker and unknown, selected from national (n=67) and local (n=27) car rental company branches in San Diego County, California, USA.[87] Overall, findings showed that existing policies and practices do not protect rental cars from accumulating THS pollutants, primarily due to lack of compliance with smoking policies. However, when signage communicating the policy was displayed (e.g., sticker on dashboard, sign on key chain), THS levels were significantly lower than in equivalent cars without such signage.[87]

The researchers found that among 100 car reservations that did not indicate preference for a smoker or a non-smoker car, only one customer service representative asked whether the customer would be smoking in the vehicle.[87] More than 60% of supposedly non-smoker cars had been smoked in previously, based on visible physical evidence of tobacco use (e.g., ash, lighter use, burn marks) or moderate to strong tobacco odour. Mean levels found in designated non-smoker rental cars were three times higher for dust nicotine and 10 times higher for surface nicotine compared to private cars of non-smokers with smoking bans. As well, between 60% and 80% of cars with unknown smoking designation showed evidence of prior tobacco use; and mean levels of nicotine in dust and on surfaces were five to 15 times higher than those found in private cars of non-smokers with smoking bans. This suggests that tobacco smoke pollutants accumulate over time in dust and on surfaces, regardless of non-smoking or smoking designations and whether the rental companies are local or national.[87]

Intervention Characteristics/Implementation Considerations

The differences across Canada in the effectiveness of banning smoking in vehicles with children may be due to the high variability in the ban implementation dates among the provinces and territories (2008 in Nova Scotia to 2014 in Alberta), the definition of children's age, penalties for smoking in vehicles with children and other policies introduced with the ban.[94] Ontario, British Columbia, New Brunswick, Manitoba, Saskatchewan and Newfoundland and Labrador have defined children as less than 16, while Alberta and Yukon Territory use less than 18, and Nova Scotia and Prince Edward Island use less than 19 years old.[85] Penalties range from $100 CAD in Prince Edward Island to $1,000 CAD in Alberta.[86] The success in Ontario is likely due to the legislation being introduced as part of a comprehensive tobacco control strategy through the *Smoke-Free Ontario Act*, which included public education, smoking cessation assistance and discouraging initiation among youth.[94]

Several implementation barriers to effectively decrease the amount of THS in rental cars were identified: there is a lack of awareness and education among rental company employees and customers about smoking policies; smoking policies are not a priority for company representatives; companies often do not place signage in offices or rental cars to communicate that smoking is prohibited; the process for returning rental cars rarely allows for immediate, reliable and valid checks on whether or not the customer smoked in the car; and there is currently no effective and safe way to remove THS embedded in upholstery and inaccessible surfaces.[87] More research is needed on a safe and cost-effective strategy to clean and remove THS pollution, as well as the development of a more reliable and valid process to monitor and enforce compliance to ensure rental cars remain smoke-free.[87]

Specific Populations/Equity Considerations

More than 10% of youth (age 11-14) in Ontario reported exposure to smoking in vehicles in the past week in 2012.[94] Analysis of the 2009-2012 CTUMS showed that current smokers, former smokers, males, younger adults and those with less education had significantly higher SHS exposure in vehicles; the same results were also seen when analyzing only non-smokers.[85] Moreover, even when children are not present in vehicles when smoking is occurring , THS exposure continues to pose a risk to their health upon entering the vehicle (i.e., THS remains on surfaces and fabrics within vehicles after smoking).[87]

In addition, there is inequity for individuals who buy used cars. There have been cases where smoke-free cars have been advertised at higher prices.[95] This may reflect a shift in social attitudes and norms about tobacco use, in which individuals may value non-smoking environments more positively than smoking environments; however, higher prices for smoke-free cars creates a disadvantage for prospective buyers who are limited by price (i.e., those who cannot afford a higher priced car).[95]

Intervention Summary

Evidence Summary - Vehicles - Supported

The body of evidence regarding the effectiveness of banning smoking in personal vehicles with children included three primary studies and one grey literature report (one appraised as Level I and two Level II). Overall, there was evidence that banning smoking in vehicles with children present decreased exposure to SHS in vehicles, especially when implemented as part of a comprehensive tobacco strategy. In addition, displaying "no smoking" signage in rental cars significantly decreased THS pollutants, thereby protecting other car users, not currently covered under *SFOA*.

SFO-SAC 2016 Scientific Consensus Statement - Moderate (Intensify), Positive Equity

As part of the *Smoke Free Ontario Act*, smoking in vehicles is prohibited when persons 16 years old and younger are present. Other provinces and territories restrict smoking in vehicles when persons 18 or 19 years and younger are present (e.g., Alberta and Yukon Territory's law covers persons 18 years and younger and Nova Scotia and Prince Edward Island's laws cover persons 19 years and younger). Increasing the age of coverage in Ontario would widen protection from exposure to smoking in vehicles to youth and young adults. Prohibiting smoking in rental cars and ride-share programs would limit users' exposure to SHS and THS. In addition, province-wide education campaigns to raise awareness of the health impacts of exposure to SHS and THS in vehicles may improve compliance and encourage parents not to smoke in their vehicles at any time.

The scientific consensus regarding the potential contribution for Ontario is: Moderate (Intensify). This intervention has a potential positive equity impact.

Key Message

Banning smoking in vehicles with children is successful to reduce exposure to tobacco smoke in Canada, and significantly effective in Ontario as part of a comprehensive tobacco control strategy. Continued enforcement of the existing legislation and increasing the age of coverage in Ontario would protect more youth and young adults from SHS exposure. Prohibiting smoking in rental and shared cars will further protect Ontarians from tobacco smoke exposure.

Integrating other Products (e.g., E-Cigarettes, Waterpipe) into Smoke-free Policies

Electronic cigarettes and waterpipe smoking are alternative methods of nicotine and tobacco delivery. Researchers argue that efforts to denormalize tobacco use are undermined by permitting these products where tobacco use has been prohibited.[96,97] E-cigarette aerosol also contains harmful compounds (e.g., volatile organic compounds (VOCs)), which have no safe exposure level.[96] Further, the emissions from waterpipe use contain harmful compounds (e.g., from the shisha product and from the burning charcoal used to heat the shisha) in concentrations that are damaging to human health.[98] Adoption of comprehensive smoke-free policies or clean air laws encompassing a broad definition of smoking, which includes alternative tobacco products (e.g., waterpipe) and e-cigarettes, can be instrumental to reduce physical and social exposure to these products.

Electronic Cigarettes

> *Ontario is in the process of implementing new policies, under the Electronic Cigarette Act (ECA), that prohibit e-cigarette use in all places where tobacco use is prohibited (e.g., indoor public places, workplaces and restaurants, bars and patios). Based on the Ontario regulations placed on existing tobacco products, the policies prohibiting the use of e-cigarettes in public places are likely to be effective to reduce physical and social exposure to e-cigarette use. Emissions from e-cigarette aerosol do contain toxic compounds that pose a risk to human health, though the link has not been consistently established in 'real-world' studies. Further, there is concern that e-cigarettes may undermine policies and interventions that aim to denormalize tobacco use and that they may act as a 'gateway' product to nicotine dependency and tobacco use. A precautionary approach, as it relates to prohibiting the use of e-cigarettes in public spaces, is the preferred option.*
>
> *SFO-SAC 2016 Scientific Consensus Statement*

Background

Electronic cigarettes also known as e-cigarettes are battery-operated devices that electronically heat a solution to create an inhalable aerosol.[99] This solution, also known as 'e-liquid' or 'e-juice', is commonly made up of propylene glycol or glycerine water and flavour, either with or without nicotine.[99] E-cigarettes can take the form of: 'cigalikes' that look like typical cigarettes and can be disposable or reusable with disposable solution cartridges; 'tank systems' that are refillable with solution and do not resemble a typical cigarette; and 'variable power e-cigarettes', systems of variable appearance on which the user can control and change the electronic output.[99] Based on a representative sample of Canadians (ages 15 and over), it is estimated that 13% (3.9 million) have ever tried an e-cigarette (2015), which is a significant increase from 9% in 2013.[100] There is concern that e-cigarettes may undermine policies and interventions that aim to denormalize tobacco use[101] and may act as a 'gateway' product to nicotine dependency and tobacco use. Smoke-free policies that include prohibiting the use of e-cigarettes in

public places will reduce the potential to re-normalize tobacco products and prevent exposure to aerosol emissions.[96]

Non-users of e-cigarettes can experience secondhand or thirdhand exposure to aerosol. Aerosol is produced during the activation of the device.[96] Non-smokers may be exposed by subsequent exhalation of aerosols by the e-cigarette user. The evidence is not clear regarding how much of the inhaled e-cigarette aerosol is exhaled into the environment where non-users can be exposed.[96] Constituents of the emissions may include nicotine, particulates, carbonyl compounds, volatile organic compounds (VOCs), polyaromatic hydrocarbons, tobacco-specific nitrosamines (TSNAs), heavy metals and glycols.[96] Evidence on the health effects of e-cigarette aerosol exposure is limited; however, some studies have demonstrated that passive exposure to e-cigarettes containing nicotine can result in an increase in serum cotinine. Serum cotinine has implications for long-term lung function.[102,103] An additional consideration for regulating e-cigarettes in indoor environments is the potential for allergic reactions in non-users caused by dermal and oral exposure to propylene glycol or common flavouring agents.[96]

The Ontario/Canadian Context

Legalisation to regulate the use of e-cigarettes is currently being addressed at the federal level as an amendment to the *Non-smokers Heath Act.* Bill S-5, if passed, will amend the *Tobacco Act* and the *Non-smokers' Health Act* and make consequential amendments to other *Acts*, has undergone its first reading in the Parliament of Canada.[104] According to the Electronic Cigarette Trade Association (ECTA) of Canada, the amended *Non-smokers Heath Act* will serve to prohibit use of e-cigarettes in federal spaces; however, setting restrictions on the use of e-cigarettes in other public spaces will be delegated to the provincial level.[105]

The Ontario government has suggested changes to the *Electronic Cigarette Act* (*ECA*) to expand the definition of e-cigarettes to e-substance, and to update policies to prohibit the use of e-cigarettes in all places where smoking is prohibited.[13] The provisions under the *ECA* prohibiting the use of e-cigarettes have yet to come into force as of December 2016.[13] However, some jurisdictions (e.g., Toronto, Town of Essex, City of Ottawa) have already included e-cigarettes in their local smoke-free policies.[106]

Evidence

The best available research evidence includes one systematic review,[107] six primary studies,[5,108-112] and one grey literature report[113] all provided by SFO-SAC. The systematic review was appraised as Level II[107] and the primary studies were appraised as Level II.[5,108-112] The majority of studies were from the U.S. and one was from Poland.

Exposure to aerosol from e-cigarettes

A review assessed the impact of secondhand aerosol compared to a non-smoking environment, and also compared the impact of secondhand aerosol with SHS from conventional cigarette smoke.[107] It found that secondhand aerosol contained harmful emissions and, as a result, could pose a health risk to bystanders, but that secondhand aerosol contained much lower levels of most harmful compounds compared to conventional cigarette smoke. Overall, it seems that the absolute impact from passive

exposure to secondhand aerosol could lead to adverse health effects, yet this exposure is likely to be less harmful than passive exposure to conventional cigarette smoke.

Two primary studies assessed the effect of e-cigarette use on air quality.[5,108] One study found that particulate matter 2.5 microns or less in diameter ($PM_{2.5}$) in the indoor air measured at six time points over a 2-day period with 50 to 90 active e-cigarettes, was significantly higher than median $PM_{2.5}$ measured in bars and hookah cafés that allowed conventional cigarette use.[108] However, the composition of $PM_{2.5}$ from e-cigarette aerosol differs from that of conventional cigarettes and hookahs.[108] Czogala et al. found that cigarettes emit significant amounts of nicotine, but compared to traditional tobacco products, e-cigarettes emit minimal carbon monoxide (CO) and volatile organic compounds (VOCs).[5] Furthermore, the magnitude of emissions of nicotine from e-cigarettes was significantly lower than that of tobacco cigarettes.[5] Despite the increasing use of e-cigarettes, less than half of American states have included e-cigarettes in their policies for smoke-free worksites, restaurants and bars.[113]

One report on e-cigarettes was identified in the grey literature.[113] The report compared calls made to poison centers in the U.S. for conventional tobacco cigarette product exposure to those made for e-cigarette exposures.[113] Although the frequency of calls for conventional tobacco products is eight times that for e-cigarettes, the number of calls made for e-cigarettes has increased exponentially since 2010.[113]

Public knowledge and attitudes regarding e-cigarettes and restrictions on use

Three primary studies from the U.S. assessed public opinions and views on e-cigarette use.[109-111] Over one-third of participants stated that e-cigarette use should not be allowed in smoke-free areas.[109] Participants typically considered exposure to e-cigarette aerosol to be moderately harmful to their health and tended to favour restricting e-cigarette use in public places.[110] However, participants who were aware of e-cigarette use, had ever used e-cigarettes and currently smoked conventional cigarettes were more likely to respond in favour of using e-cigarettes in public spaces.[109] Similarly, Tan et al. found that individuals exposed to communication about e-cigarettes (e.g., interpersonal conversations, advertising) were less likely to support “vaping restrictions” in public spaces.[111] Vaping is a term commonly used to describe inhaling and exhaling the aerosol produced by an e-cigarette. Another study found that most e-cigarette users were not bothered by current vaping restrictions in public places, except for those who were more dependent on their e-cigarettes.[112]

Although there is growing support for restrictions on the use of e-cigarettes, a significant portion of the population is still unaware of e-cigarette use and its potential risks.[109-111]

Intervention Characteristics/Implementation Considerations

There was no identification of intervention characteristics or implementation considerations. This is likely due to the limited literature on e-cigarettes. More research is needed to determine intervention characteristics and considerations to address secondhand exposure to e-cigarette use.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature for this intervention section.

Intervention Summary

Evidence Summary - Electronic Cigarettes - Emerging

The body of evidence regarding secondhand exposure to e-cigarette aerosol and regulation of e-cigarette use comprised one systematic review, six primary studies, (all appraised as Level II), and a grey literature report. The available research suggests that e-cigarettes emit harmful compounds (e.g., volatile organic compounds (VOCs) such as carbonyls and formaldehyde) that may pose a health risk to bystanders, though the magnitude of these emissions is low compared to conventional cigarettes. Findings from U.S. studies identified that a large proportion of the population remains unaware of e-cigarette use and its potential risks. Further, the current evidence demonstrates that most e-cigarette users are not bothered by restrictions on e-cigarette use in public places. No evidence was found demonstrating the effect of prohibiting e-cigarette use in public places.

SFO-SAC 2016 Scientific Consensus Statement - Innovative

Ontario is in the process of implementing new policies, under the *Electronic Cigarette Act* (*ECA*), that prohibit e-cigarette use in all places where tobacco use is prohibited (e.g., indoor public places, workplaces and restaurants, bars and patios). Based on the Ontario regulations placed on existing tobacco products, the policies prohibiting the use of e-cigarettes in public places are likely to be effective to reduce physical and social exposure to e-cigarette use. Emissions from e-cigarette aerosol do contain toxic compounds that pose a risk to human health, though the link has not been consistently established in 'real-world' studies. Further, there is concern that e-cigarettes may undermine policies and interventions that aim to denormalize tobacco use and that they may act as a 'gateway' product to nicotine dependency and tobacco use. A precautionary approach, as it relates to prohibiting the use of e-cigarettes in public spaces, is the preferred option.

The scientific consensus regarding the potential contribution for Ontario is: Innovative.

Key Message

Research on the health effects of prohibiting the use of e-cigarettes in public spaces through smoke-free policies is limited. There is evidence that demonstrates that emissions from exhaled e-cigarette aerosols contain harmful compounds that are detrimental to human health. Currently, there is no provincial legislation to protect the public from secondhand exposure emissions from exhaled e-cigarette aerosol in indoor and outdoor spaces. There are opportunities to address these gaps at a provincial level with the implementation of the proposed new policies under the *ECA* to prohibit the use of e-cigarettes in spaces where tobacco smoking is currently banned.

Waterpipe

Waterpipe smoking using tobacco-free shisha product is currently allowed indoors and outdoors in most jurisdictions in Ontario, and it is only prohibited if proven to contain tobacco. However, in recent years some jurisdictions, including large municipalities, have implemented by-laws that prohibit any waterpipe use indoors and in some outdoor spaces (i.e., prohibiting smoking of tobacco and other weeds and substances such as herbal shisha). Provincial legislation that includes non-tobacco shisha product would provide greater coverage and protect workers and patrons from the risks of secondhand waterpipe exposure. Legislation should be paired with rigorous implementation and enforcement plans, and education to raise awareness about the negative health implications of waterpipe use and exposure.

SFO-SAC 2016 Scientific Consensus Statement

Background

Waterpipe, also known as a hookah, shisha, or narghile, is a traditional method of smoking flavoured tobacco, (especially in the Eastern Mediterranean Region), in which smoke passes through a reservoir of water before being inhaled through a flexible hose by the smoker.[114] Waterpipe smokers may actually inhale more tobacco smoke than cigarette smokers because of the large volume of smoke inhaled in one smoking session, which can last as long as 60 minutes.[115] Waterpipe secondhand smoke, like cigarette smoke, is harmful to human health. Smoke from both tobacco waterpipe and non-tobacco waterpipe is harmful since in both cases, it contains carbon monoxide and other harmful toxins, and components from the charcoal that is used to burn the shisha product.[98] In 2013, 10% (2.8 million) of Canadians ages 15 years and over reported having ever tried a waterpipe.[115]

The Ontario/Canadian Context

Waterpipe that contains tobacco product is prohibited from being smoked in areas covered by the *SFOA*.[11] Several jurisdictions in Ontario have implemented comprehensive by-laws that include prohibiting waterpipe containing any non-tobacco/nicotine substance (i.e., tobacco and other weeds and substances such as herbal shisha) in indoor and select outdoor locations.[14] For a complete list of Ontario jurisdictions that indicates the settings in which waterpipe use has been restricted, please see Appendix 2 .

Evidence

The best available research evidence for this section includes one systematic review appraised as Level II[116] and one primary study appraised as Level I.[117]

The systematic review was on international practices of controlling waterpipe tobacco smoking.[116] Three qualitative studies were included in the review. In the U.S., although *Indoor Clean Air Acts* have been created for waterpipe smoking in smoke shops, cigar bars and indoor smoking lounges, compliance with ICAA and indoor air quality standards can vary, as they are not being readily enforced.[116] More than two-thirds of American cities have exemptions that allow for tobacco waterpipe smoking in freestanding bars.[116] There is minimal information available and a lack of comprehensive legislation on the control of waterpipe smoking practices.

A recent Toronto study of air quality in waterpipe cafés found indoor levels of $PM_{2.5}$ (mean 1419µg/m^3), carbon monoxide (mean 17.7ppm) and air nicotine (mean 3.3 µg/m^3) that were hazardous to human health.[117]

Intervention Characteristics/Implementation Considerations

There was no identification of intervention characteristics or implementation considerations. This is likely due to the lack of literature on policy to address waterpipe smoking. More research is needed to determine intervention characteristics and considerations for the reduction of SHS exposure created by water pipe smoking.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report. Arguments have been made about the traditional use of waterpipe, as well as misconceptions about harmful impacts of waterpipe use on human health; some countries where waterpipe is traditionally used have banned its use in indoor public places (e.g., Turkey, parts of India, Saudi Arabia).[117]

Intervention Summary

Evidence Summary - Waterpipe - Well Supported

The body of evidence regarding waterpipe smoke is comprised of one systematic review and one primary study; one was appraised as Level I and the other as Level II. Evidence is limited on both the identification and effect of comprehensive legislation prohibiting waterpipeuse in indoor settings. The evidence demonstrates that air quality within indoor environments where tobacco and non-tobacco waterpipe use is present exists at a level that is considered hazardous to human health. Based on the evidence from indoor smoking bans for conventional tobacco smoking, prohibiting the use of all waterpipe smoking, regardless of whether it contains tobacco, in all public settings can be effective at reducing secondhand exposure. Monitoring and enforcement is essential to assure effectiveness.

SFO-SAC 2016 Scientific Consensus Statement - Moderate (Intensify)

Waterpipe smoking using tobacco-free shisha product is currently allowed indoors and outdoors in most jurisdictions in Ontario, and it is only prohibited if proven to contain tobacco. However, in recent years some jurisdictions, including large municipalities, have implemented by-laws that prohibit any waterpipe use indoors and in some outdoor spaces (i.e., prohibiting smoking of tobacco and other weeds and substances such as herbal shisha). Provincial legislation that includes non-tobacco shisha product would provide greater coverage and protect workers and patrons from the risks of secondhand waterpipe exposure. Legislation should be paired with rigorous implementation and enforcement plans, and education to raise awareness about the negative health implications of waterpipe use and exposure.

The scientific consensus regarding the potential contribution for Ontario is: Moderate (Intensify).

Key Message

Expanding the *SFOA* to prohibit the use of waterpipe to smoke any substance (tobacco or non-tobacco) in indoor workspaces and public spaces, and outdoor public spaces where tobacco smoking is prohibited, would provide more complete protection of Ontarians from harmful exposures. Legislation would be most effective if paired with enforcement and education regarding the negative health implications of waterpipe use.

Other Interventions

Mass Media - Protection

In Ontario, mass media campaigns that address awareness about the dangers of secondhand smoke and increase support for smoke-free policies and reducing secondhand smoke exposure have been implemented at the municipal and provincial levels. However, there have not been any provincial mass media campaigns for protection in recent years. There are opportunities to use mass media campaigns to increase awareness about the recently-expanded SFOA restrictions on smoking in outdoor spaces. Campaigns that target specific populations are better received when they are culturally appropriate and tailored to the target audience.

SFO-SAC 2016 Scientific Consensus Statement

Background

Mass media campaigns are a common vehicle to institute broad-based public awareness and support for smoke-free policies, to inform the public about the dangers of secondhand smoke (SHS), and to encourage measures to reduce SHS exposure.[118] Tobacco control mass media campaigns are intended to reduce tobacco use using channels of communication such as television, radio, newspapers, billboards, posters, leaflets, booklets and electronic media (e.g., websites).[119] They are often implemented for an extended duration and provide brief recurring information and motivational messages at varying frequencies.[120] In this chapter, evidence pertaining to the effectiveness of mass media campaigns to stimulate public support for tobacco control interventions and to raise awareness of the health effects of exposure to tobacco use will be discussed. For more information on mass media campaigns for smoking cessation or smoking prevention, please refer to the Chapter 4: Prevention or Chapter 6: Cessation.

The Ontario/Canadian Context

In 1998, four public health units in Ontario collaborated to create the *Breathing Space: Community for Smoke-Free Homes* campaign that included three waves, spanning from 2000 to 2003.[121] The campaign rapidly grew to include 33 of the 36 health units in Ontario.[121] The objective of the campaign was "to increase public awareness of the negative health impacts of secondhand smoke toward the goal of affecting attitudinal and behavioural change", and was eventually offered in multiple languages including English, French, Cree, Ojibway and Ojicree.[121] The campaign consisted of a website, handouts, home and car decals and ads in radio, newspaper and transit shelters.[121] A telephone survey of over 1,000 residents in 2001 and 2003 determined that the campaign yielded positive results, with increases in the percentage of people who believed SHS was a health hazard (74% in 2001 to 88% in 2003), the percentage of people who would ask someone who smokes not to do so inside their home (63% in 2001 to 74% in 2003), and the percentage of smokers who indicated they would refrain from smoking if there were non-smokers present (55% in 2001 to 78% in 2003).[121] Consistent with the results of Murukutla et al. ads that focused on the effects of SHS on children received the highest ratings among smokers who

were most resistant to change, on their ability to grab attention and to make one think about protecting others from exposure to SHS.[121]

In 1999, the Heart and Stroke Foundation developed a mass media campaign that aimed to increase support for tobacco control in Ontario.[122] The campaign included two television advertisements titled "Don" and "Bernice"; true stories from individuals who were suffering the negative health effects of secondhand exposure to tobacco smoke.[122] The evaluation of the campaign showed that awareness of these ads was high, with aided recall reaching 71% for the "Don" ad and 72% for the "Bernice" ad.[122] Results also found that after the ad campaign, the proportion of the population that viewed smoking as socially acceptable decreased, while the number of individuals who were pro-tobacco control increased.[122]

Mass media campaigns that focus on protection from SHS have been implemented nationally in Canada, including the *Secondhand Smoke Diseases* campaign from 2002-03 that targeted youth, the *Heather Crowe* campaign from 2002-04, and the *Secondhand Smoke in the Home and Car* campaign in 2005, and again in 2006-07.[121]

The Ontario Tobacco Research Unit (OTRU) conducted an evaluation to assess the implementation of the new *SFOA* outdoor smoking regulations on playgrounds, sports fields and restaurant and bar patios that came into effect January 1, 2015.[123] The evaluation consisted of both street intercept-surveys with smokers and non-smokers and an online survey for tobacco control enforcement staff. Results of the evaluation highlight some of the education activities that public health unit (PHU) personnel had implemented following the new *SFOA* outdoor regulations.[123] These activities included the dissemination of media releases, creation of fact sheets, distribution of post-cards, placemats and coasters advertising smoke-free patios, as well as promotion of regulation changes on social media. Results demonstrated that 67% of street-intercept respondents were aware of the smoking ban on restaurant and bar patios; 54% were aware of the ban on smoking on and around sports fields and playgrounds.[123] Further, 55% of enforcement staff who responded indicated that lack of public awareness to *SFOA* updates posed a challenge to implementing the new *SFOA* outdoor regulations.[123]

Evidence

The best available evidence for this section included 11 primary studies obtained from a PHO library literature search, as directed by SFO-SAC, since no reviews were identified in the literature. Overall, one study was appraised as Level I,[124] five studies were appraised as Level II,[118,125-128] and five studies were appraised as Level III.[129-133] Many of the included studies were conducted in the United States, with other studies occurring in Canada, England, Australia, India, Russia, China, Taiwan and Mexico City.

Evidence of Effectiveness

Three studies looked at the effects of mass media campaigns to increase awareness of policy interventions and the health effects of tobacco exposure.[118,127,128] Results from the study by Chang et al. (2011) indicated that public awareness of smoke-free workplace legislation in Taiwan increased significantly from 28.5% pre-campaign to 87.6% during the campaign.[127] Awareness of smoke-free hotels, malls and restaurants also increased from 53.5% pre-campaign to 86.9% during the campaign.[127]

Another study found a significant increase in awareness about the dangers of chemicals in cigarettes, such as arsenic and ammonia.[128] There was also a significant positive association observed between campaign exposure and the belief that smoke-free policies will benefit the health of the individual and their family.[128] Other associations included a greater understanding about the importance of smoke-free work environments for workers, and an increase in disagreement with the idea that non-smokers should go somewhere else in order to avoid smokers.[128] Finally, one study in the U.S. found a statistically significant increase in the number of individuals who believed that SHS caused lung cancer in adults.[118]

Four studies[118,128,131,132] examined the effects of mass media campaigns on support for smoke-free policies. The study by Fosson et al. (2014) found a statistically significant increase in support for smoke-free bars, with support increasing from 38.1% pre-campaign to 43.8% post-campaign. The study also found increased support for smoke-free workplaces, restaurants and public spaces.[118] These results further supported evidence from Mexico City, which found that exposure to a mass media campaign to promote Mexico City's comprehensive smoke-free law was significantly associated with increased support to prohibit smoking in bars, cantinas, discotheques and hotels.[128] Other studies did not observe large increases in support for a smoke-free restaurant policy[131] and a smoke-free multi-unit housing policy;[132] however, the authors note that support was already high pre-campaign.

Two studies[125,127] examined the effect of mass media campaigns to reduce self-reported SHS exposure. One study found that exposure to general tobacco control campaigns was not associated with having a smoke-free home; however, exposure to SHS campaigns was associated with increased odds of making the home smoke-free in the following month.[125] One study found that self-reported workplace and household SHS exposure rates decreased after the implementation of a mass media campaign in Taiwan, dropping from 28.5% to 24.9%, and 36.8% to 34.3% respectively.[127]

Intervention Characteristics/Implementation Considerations

According to the results of a study conducted in India, China and Russia, graphic television ads that aimed to reduce exposure to SHS received the most positive ratings among male smokers and non-smokers.[129] Ads also received more positive ratings when they featured the effects of SHS on children and families.[129] The most graphic ad titled "Baby Alive" focused on the harms of SHS on children, and was more likely (OR 1.83, 95% CI:1.47-2.28, P<0.001) to receive positive ratings on message acceptance, negative emotion, perceived effectiveness and behavioural intention than ads that were informational in nature.[129]

A study conducted in the U.S. consulted tobacco-free school policy experts, legislators and other stakeholders to determine appropriate themes for a mass media campaign for tobacco-free schools.[133] Participants identified a variety of themes, including featuring experiences from successful tobacco-free school districts, emphasizing adult role modelling and including stories from youth about the importance of tobacco-free school policies to protect them from tobacco use-related harm.[133] A personal connection was identified as being a key component, which is why the recommendation was for youth, parents and school staff to deliver the campaign messages rather than politicians and celebrities.[133]

Similar results were observed in one study that used focus groups to determine how to develop effective mass media campaigns to promote and generate support for smoke-free policy in two rural American counties.[124] The study found that rural communities differed in the way that they used certain media channels. In rural communities, smoke-free ads delivered through local media were identified as being more impactful than those delivered through state-wide or nation-wide media.[124] The focus groups also suggested strategies to expand the reach of the campaign material, such as including print ads in utility bills and developing bumper stickers.[124] Key message characteristics for this population included graphic images, concise messages that were easy to understand for those with low literacy levels, statistics that tell a local story and the delivery of the messages from a local authority figure.[124]

Specific Populations/Equity Considerations

One Canadian study examined the efficacy of targeted messaging for female youth that focused on cigarette smoke exposure as a breast cancer risk factor.[130] The study found that female youth who received targeted, web-based messages were significantly more likely to agree that exposure to SHS increased their risk of developing breast cancer, when compared to standard messages that described the carcinogenic effects of tobacco SHS (adjusted relative risk: 1.10, 95% CI: 1.02 to 1.20).[130]

In 2011, an Indigenous-specific social marketing campaign called "Give Up Smokes for Good" was piloted as the first anti-tobacco social marketing campaign targeting Indigenous smokers in South Australia.[126] Indigenous community members were consulted throughout the development of campaign materials that were disseminated via television, radio, posters and newspapers. Survey results found that 73.2% of survey participants had imposed a smoking ban in their home, and that individuals who were aware of the campaign were more likely to have implemented smoke-free home policies.[126] The survey also found that 75.9% of survey participants had imposed a smoking ban in their cars; however, there was no association with campaign awareness.[126] The campaign materials were determined to be culturally appropriate by 92.3% of participants, and 96.6% of participants believed that the radio ad was culturally appropriate.[126]

Intervention Summary

Evidence Summary - Mass Media - Protection - Supported

The body of evidence regarding the effectiveness of mass media campaigns to protect the population against the dangers of tobacco smoke exposure included eleven primary studies (one appraised as Level I, five Level II, and five Level III). Overall, there is evidence that mass media campaigns aimed at general populations, as well as campaigns targeting specific populations, are effective at increasing awareness of the dangers of secondhand smoke exposure and increasing support for smoke-free policies. There is some evidence that targeted mass media campaigns resulted in reduced self-reported workplace and home exposure.

SFO-SAC 2016 Scientific Consensus Statement - High (Intensify)

In Ontario, mass media campaigns that address awareness about the dangers of secondhand smoke and increase support for smoke-free policies and reducing secondhand smoke exposure have been implemented at the municipal and provincial levels. However, there have not been any provincial mass media campaigns for protection in recent years. There are opportunities to use mass media campaigns to increase awareness about the recently-expanded *SFOA* restrictions on smoking in outdoor spaces. Campaigns that target specific populations are better received when they are culturally appropriate and tailored to the target audience.

The scientific consensus regarding the potential contribution for Ontario is: High (Intensify).

Key Message

Mass media campaigns have been shown to be effective to increase awareness about the harms associated with tobacco smoke exposure and to increase support for smoke-free policies. Mass media campaigns also could reduce secondhand smoke exposure. In Ontario, there are opportunities to use mass media campaigns to increase awareness about existing and expanded smoke-free regulations as part of a comprehensive approach.

Impacts of Post-Consumption Cigarette Waste

In Ontario, the Cigarette and Cigar Butt Litter Prevention Act, 2010, and the Highway Traffic Act prohibit the littering of tobacco products, using fines to encourage compliance. Some jurisdictions in Ontario also have by-laws in place to address cigarette litter by providing cigarette receptacles, although, when they are placed in non-smoking areas, butt receptacles can attract smoking and imply that smoking is acceptable in that location. There is no provincial strategy for mitigating post-consumer tobacco product waste. More research is needed on how to reduce and safely dispose of cigarette and cigar butts, e-cigarettes and waterpipe waste.

SFO-SAC 2016 Scientific Consensus Statement

Background

The tobacco industry, including tobacco growing, curing, product manufacturing and post-consumption waste, has a negative impact on the environment, which in turn affects human health.[134] Post-consumption waste describes what is left over after a product has been used (e.g., cigarette butt). In the WHO *Framework Convention on Tobacco Control* (WHO FCTC), protection of the environment is only

covered specifically under Article 18, which primarily applies to tobacco agriculture.[135] However, post-consumption cigarette waste is also a concern. Cigarette butts are the most frequently picked up litter item around the world,[134,136] usually making up 22% to 36% of all visible litter.[136,137] It is estimated that approximately 4.5 trillion cigarette butts are littered worldwide each year.[138] The filters in cigarette butts accumulate toxic waste and degrade slowly and there is currently no known value in recycling cigarette butts.[136] This section will explore the environmental impacts of post-consumption cigarette waste and the interventions used to mitigate this issue.

The Ontario/Canadian Context

The SFO-SAC 2010 Report mentioned strategies to deal with the environmental waste of tobacco products.[10] In Ontario, Bill 28 (called the *Cigarette and Cigar Butt Litter Prevention Act*, 2010) is being amended with a proposed minimum fine increase from $1,000 to $2,000 for a first offence (with a maximum of $3,000 for a second offence), and a repeal of section 180 of the *Highway Traffic Act* that includes prohibition of littering cigarette butts, cigarettes, cigar butts and cigars on a highway.[139] The City of Toronto passed an amendment in October 2016 to support cigarette butt litter reduction.[140] The *Municipal Code* was amended to require all restaurants, bars, night clubs and business establishments that require a licence to operate to keep the public sidewalks free from litter and the cigarette butts of their patrons. In addition, these businesses are required to provide disposal containers or receptacles for patrons to dispose of their cigarette butts.[140] Although some companies have been recycling cigarette butts, there are concerns about the safety of products made from recycled toxic waste products.[136] Overall, there is currently no comprehensive strategy to deal with post-consumer tobacco waste in Ontario.

Evidence

The best available research evidence for this section included two narrative reviews[134,141] and 10 primary studies,[137,138,142-149] retrieved from a PHO library literature search. It also included one primary study[150] and one special communication paper[151] provided by SFO-SAC. No reviews were obtained from the pre-appraised literature. Primary studies were included in addition to narrative reviews, given that the narrative reviews focused on cigarette butt waste consumption by children and animals[134] and on the environmental impact of electronic cigarettes,[141] and did not sufficiently cover the topic of the environmental impact of cigarette waste and strategies for its mitigation. Two studies were appraised as Level I,[142,144] four studies[134,141,147,148] as Level II, and six studies[138,143,145,146,149,150] do not have a quality rating because there are no tools to assess animal or experimental studies (i.e., testing on cigarette butts). The majority of primary studies and studies included in the narrative reviews were conducted in the U.S.; however, most studies were laboratory studies that did not report the jurisdiction in which they took place.

Evidence of Environmental Impact

Four primary studies[138,143,145,146] investigated aspects of the environmental impact of cigarette butts and all found evidence of negative impact. Moerman et al. (2011) found that various metals, including lead and iron, leached from smoked cigarette butts after just one day, with contamination of metals increasing the longer the butts were left in the environment.[143] Another study also found that cigarette

butt leachate (i.e., the liquid containing soluble or suspended solids resulting from water passing through the cigarette butts) is toxic, and that the toxicity varied depending on the status of the waste.[146] Toxicity increased progressively from unsmoked cigarette filters with no tobacco, to smoked cigarette filters with no tobacco, to smoked cigarette butts including the filter and tobacco.[146] The leachate was found to be acutely toxic to both fresh and saltwater fish.[146] Similarly, Lee et al. found that cigarette butt leachate could be lethal to fish at high concentrations and affected fish embryo development in low concentrations,[145] and Wright et al. found smoked cigarette filters negatively affected marine worm behaviour.[138]

Cigarette butt waste, in addition to its chemical impacts, can be physically harmful, especially to children and animals.[134] In the U.S., of 14,000 tobacco product-related injuries in children recorded by the American Association of Poison Control Centres from 2006 to 2008, 90% were from ingesting cigarettes or cigarette butts.[134] The common symptom from cigarette butt consumption is vomiting, although more severe cases of toxicity have also been reported.[134] Both wild animals and pets have also reportedly consumed cigarette butt waste, with 848 calls about such consumption in two American states between 2005 and 2010.[134]

Other forms of smoking also impact the environment. One study examined waterpipe (also known as hookah or shisha) water waste from both flavoured and non-flavoured product, and found 18 toxic elements including arsenic, lead, cadmium, mercury and uranium.[149] The authors note that this is concerning because waterpipe water waste is typically disposed of as a normal liquid and the toxic heavy metal and non-metal elements can contaminate water and soil. Waterpipe water waste cannot be retrieved from the environment.[149]

One primary study[150] and one narrative review[141] explored the evidence on the environmental impact of e-cigarette disposal. The primary study examined 15 disposable e-cigarettes and found that two leached lead in excess of regulatory thresholds, making those two e-cigarettes “toxicity characteristic hazardous waste”, which requires specific disposal care.[150] The narrative review found limited available evidence on e-cigarette disposal impacts; however, included studies found that six e-cigarettes did not come with disposal instructions, some e-cigarette manufacturers have recycling programs (their quantity and coverage was unknown), and some e-cigarettes are advertised as “green” (i.e., environmentally friendly) although their negative environmental impact may not necessarily be less.[141]

Evidence of Effectiveness

Interventions have been undertaken by environmental organizations and the tobacco industry alike, but evaluative evidence was not found in the pre-appraised literature or by a PHO library literature search. The available evidence describes proposed and implemented interventions (e.g., a tobacco litter abatement fee and a model tobacco waste act), the tobacco industry’s findings related to disposing of cigarette butt waste, and media coverage of cigarette butt waste mitigation strategies.

A tobacco litter abatement fee has been in place in San Francisco since 2009. Schneider et al. describe how to calculate such a fee.[137] It must cover, “(1) mechanical and manual abatement from streets, sidewalks and public places, (2) mechanical and manual abatement from storm water and sewer

treatment systems, (3) the costs associated with harm to the ecosystem and harm to industries dependent on clean and healthy ecosystems, and (4) the costs associated with direct harm to human health".[137] The cost required was determined to be $0.20 USD per cigarette package to mitigate the negative effects of tobacco product litter in a city the size of San Francisco, with a population greater than 700,000 and approximately 15.4 million annual visitors.[137]

A *Model Tobacco Waste Act* was proposed and discussed by Curtis et al. (2016).[151] Such an act could be national or provincial and would be adapted to fit its context, but the principles of 'Extended Producer Responsibility' (EPR) and 'Product Stewardship' would underpin it (PS).[151] EPR is the principle that a producer is responsible for their product and its impact beyond its sale and into collection and safe disposal.[151] As part of this approach, the environmental cost should become part of the retail price, and producers should have the economic burden of cleaning up product waste and its environmental impacts, therefore becoming incentivized to design their products in a more environmentally conscious way.[151] PS entails more stakeholders, applying responsibility to suppliers, retailers and consumers as well as to the producer.[151] The *Model Tobacco Waste Act* is based on American and British laws related to the environmental impact of, and responsibility for, products such as refrigerants, batteries, electronics, fluorescent lighting and paint, which utilize the principles of EPR and PS.[151] The American *Cigarette Fire Safety Standard and Firefighter Protection Act* is an example of an act that applies to tobacco producers, retailers and consumers, but environmentally focused laws for cigarette butts based on EPR and PS are not known to yet exist.[151] The authors put forth the *Model Tobacco Waste Act* to deal directly with the environmental concern of cigarette butt waste, but also for the public health outcomes of "(1) further denormalizing tobacco use and increasing anti-industry sentiments; (2) increasing the cost of tobacco products; (3) enacting new tobacco product regulations to make the product less marketable; (4) strengthening existing anti-litter and outdoor smoking prohibitions and (5) forging new alliances with environmental advocacy, tobacco control and regulatory groups".[151]

Two papers analyzed industry-implemented interventions according to the tobacco industry's own research (as accumulated through litigation) and smokers' opinions and attitudes, and as described by the media.[147,148] They found that the tobacco industry has been concerned with cigarette butt waste since the 1970s, as an issue that might negatively impact the social acceptability of smoking and might encourage regulation.[147] The industry therefore implemented interventions to mitigate the issue, and investigated smokers' beliefs and attitudes about cigarette butt waste and mitigation strategies to inform the interventions and understand their outcomes.[147,148] The tobacco industry has centred its work on the position that cigarette butt waste is the responsibility of the smoker.[148] Overall, these studies, based on tobacco industry research and industry-related media coverage, imply that the industry's extensive involvement with the environmental impacts of their products is primarily self-serving (i.e., self-promotion through their campaigns).

Intervention Characteristics/Implementation Considerations

Two studies examined the beliefs and attitudes about cigarette butt waste of relevant stakeholders. One study surveyed individuals affiliated with the Framework Convention Alliance (FCA).[142] The FCA is, "An international alliance of organisations committed to a strong and effective [WHO] *Framework Convention on Tobacco Control*" (fctc.org)[152] Most individuals surveyed believed that tobacco product

waste is harmful to the environment and that cigarette butts are toxic and not biodegradable.[142] As well, most individuals felt that "tobacco product waste is an important priority for international tobacco control", and there was "possible FCA interest in industry accountability measures for tobacco product waste".[142]

The other study gauged the attitudes of smokers.[144] From the respondents – all of whom were smokers – it found that 74.1% of them had littered a cigarette butt at least once.[144] It also found that those who do not consider cigarette butts as litter were more likely (OR=3.68, 95% CI: 2.04-6.66) to have reported ever littering cigarette butts, and more likely (OR=4.00, 95% CI: 2.53-6.32) to have littered cigarette butts in the past month.[144] Men were significantly more likely (OR = 1.49, 95% CI: 1.14-1.94) to have littered cigarette butts in past month than women.[144] Based on its findings, the study encouraged anti-cigarette litter campaigns to emphasize that cigarette butts are litter and toxic waste.[144]

Special Populations/Equity Considerations

There were no considerations for special populations or equity reported in the literature.

Intervention Summary

Evidence Summary - Impacts of Post-Consumption Cigarette Waste - Emerging

The body of evidence regarding the effectiveness of strategies to mitigate the environmental impacts of post-consumption cigarette waste includes two narrative reviews, eleven primary studies and one special communication paper (two appraised as Level I, four Level II, and six not able to appraise). Overall, cigarette butts harm the environment by leaching toxic chemicals into water systems and can harm animals and small children if ingested. Other tobacco products, such as shisha and e-cigarettes, also have negative environmental impacts if not disposed of properly; toxic elements from waterpipe waste water can enter the water system, and toxic elements can leach from e-cigarette batteries. Different strategies for dealing with post-consumer tobacco waste have been applied or proposed, including a tobacco litter abatement fee and the Model Tobacco Waste Act; however, evaluative evidence is not available.

SFO-SAC 2016 Scientific Consensus Statement - Uncertain at this time

In Ontario, the *Cigarette and Cigar Butt Litter Prevention Act*, 2010, and the *Highway Traffic Act* prohibit the littering of tobacco products, using fines to encourage compliance. Some jurisdictions in Ontario also have by-laws in place to address cigarette litter by providing cigarette receptacles, although, when they are placed in non-smoking areas, butt receptacles can attract smoking and imply that smoking is acceptable in that location. There is no provincial strategy for mitigating post-consumer tobacco product waste. More research is needed on how to reduce and safely dispose of cigarette and cigar butts, e-cigarettes and waterpipe waste.

The scientific consensus regarding the potential contribution for Ontario is: Uncertain At This Time.

Key Message

Cigarette butts and e-cigarettes, if improperly disposed of could be harmful to the natural environment and to human and animal health. More research is needed on effective ways to mitigate post-consumer tobacco and e-cigarette waste.

References

1. U.S. Department of Health and Human Services. The health consequences of involuntary tobacco smoke: a report of the Surgeon General [Internet]. Atlanta, GA: U.S. Department of Health and Human Services, Office of the Surgeon General; 2006 [cited 2016 April 11]. Available from: http://www.ncbi.nlm.nih.gov/books/n/rptsmokeexp/pdf/

2. Tobacco Free Initiative (TFI): second-hand tobacco smoke [Internet]. Geneva, SZ: World health Organization; 2015 [cited 2015 Jun 12]. Available from: http://www.who.int/tobacco/research/secondhand_smoke/en/

3. Matt GE, Quintana PJ, Destaillats H, Gundel LA, Sleiman M, Singer BC, et al. Thirdhand tobacco smoke: emerging evidence and arguments for a multidisciplinary research agenda. Environ Health Perspect. 2011;119(9):1218-26. Available from: https://ehp.niehs.nih.gov/1103500/

4. Thomas JL, Hecht SS, Luo X, Ming X, Ahluwalia JS, Carmella SG. Thirdhand tobacco smoke: a tobacco-specific lung carcinogen on surfaces in smokers' homes. Nicotine Tob Res. 2014;16(1):26-32.

5. Czogala J, Goniewicz ML, Fidelus B, Zielinska-Danch W, Travers MJ, Sobczak A. Secondhand exposure to vapors from electronic cigarettes. Nicotine Tob Res. 2014;16(6):655-62.

6. Hahn EJ. Smokefree legislation: a review of health and economic outcomes research. Am J Prev Med. 2010;39(6 Suppl 1):S66-76.

7. Frazer K, Callinan JE, McHugh J, van Baarsel S, Clarke A, Doherty K, et al. Legislative smoking bans for reducing harms from secondhand smoke exposure, smoking prevalence and tobacco consumption. Cochrane Database Syst Rev. 2016;2:CD005992.

8. International Agency for Research on Cancer. IARC handbooks of cancer prevention: tobacco control. Volume 13. Evaluating the effectiveness of smoke-free policies. Lyon, FR: International Agency for Research on Cancer; 2009. Available from: https://www.iarc.fr/en/publications/pdfs-online/prev/handbook13/handbook13-0.pdf

9. Institute of Medicine (IOM). Ending the tobacco problem: a blueprint for the nation. Washington, DC: National Academy Press; 2007. Available from: https://www2.aap.org/richmondcenter/pdfs/IOMReport_BlueprintforNation.pdf

10. Smoke-Free Ontario - Scientific Advisory Committee. Evidence to guide action: Comprehensive tobacco control in Ontario [Internet]. Toronto, ON: Ontario Agency for Health Protection and Promotion; 2010 [cited 2015 Jul 29]. Available from: http://www.publichealthontario.ca/en/eRepository/Evidence%20to%20Guide%20Action%20-%20CTC%20in%20Ontario%20SFO-SAC%202010E.PDF

11. *Smoke-Free Ontario Act*, S.O. 1994, c.10. Available from: https://www.ontario.ca/laws/statute/94t10/v4

12. *Smoke-Free Ontario Act*, O. Reg. 48/06 : General. Available from: https://www.ontario.ca/laws/regulation/060048

13. *Electronic Cigarettes Act,* 2015, S.O. 2015, c. 7, Sched. 3. Available from: https://www.ontario.ca/laws/statute/15e07

14. Ontario Tobacco Research Unit. Smoke-free Ontario strategy monitoring report [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2016 [cited 2016 Dec 12]. Available from: http://otru.org/wp-content/uploads/2016/02/OTRU_2015_SMR_Full.pdf

15. City of Toronto, by-law No. 1642-2013, *E-cigarette use in city workplaces policy,* (9 Feb 2015), c. 709. Available from: https://www1.toronto.ca/City%20Of%20Toronto/Toronto%20Public%20Health/Healthy%20Public%20Policy/Report%20Library/PDF%20Reports%20Repository/E-Cigarette%20Policy_Toronto_AODA.pdf

16. Smoking and Health Action Foundation. Waterpipe update: legislation and bylaws [Internet]. Toronto, ON: Smoking and Health Action Foundation; 2016 [cited 2016 Dec 6]. Available from: https://www.nsra-adnf.ca/cms/file/files/2016_Waterpipe_Bylaws_Update-FINAL.pdf

17. Ferrence R, Muir S. OTRU update: protection from outdoor smoking [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2013 [cited 2016 Sept 19]. Available from: http://otru.org/wp-content/uploads/2013/08/update_july2013.pdf

18. Klepeis N, Ott W, Switzer P. Real–time measurement of outdoor tobacco smoke particles. J Air Waste Manag Assoc. 2007;57(5):522-34.

19. Acevedo-Bolton V, Ott WR, Cheng KC, Jiang RT, Klepeis NE, Hildemann LM. Controlled experiments measuring personal exposure to PM2.5 in close proximity to cigarette smoking. Indoor Air. 2014;24(2):199-212.

20. Cameron M, Brennan E, Durkin S, Borland R, Travers MJ, Hyland A, et al. Secondhand smoke exposure (PM2.5) in outdoor dining areas and its correlates. Tob Control. 2010;19(1):19-23.

21. Kaufman P, Zhang B, Bondy SJ, Klepeis N, Ferrence R. Not just 'a few wisps': real-time measurement of tobacco smoke at entrances to office buildings. Tobacco Control. 2010;20(3):212-8.

22. Dubray J, Minichiello A, Schwartz R. Evaluation of the Smoke-Free Ontario Act outdoor smoking regulations [Internet]. Toronto, ON: Ontario Tobacco Research Unit (OTRU); 2016 [cited 2016 Oct 12]. Available from: http://otru.org/wp-content/uploads/2016/04/kes_update_mar2016.pdf

23. City of Kingston, by-law No. 2004-336, *A By-Law to Amend By-Law No. 2002-231, "A By-Law to Regulate Smoking in Public Places and Workplaces in the City of Kingston as Amended"* (30 Nov 2004). Available from: https://www.cityofkingston.ca/cok/bylaws/2004/doc/doc924877.PDF

24. City of Ottawa, by-law No 2007-268, *A bylaw of the City of Ottawa respecting public transit (Transit Bylaw)* (13 Jun 2007). Available from: http://database.nonsmokersrights.ca/bylaw/bylaw-2007-268-transit/

25. City of Toronto, by-law No 441-1999, *Toronto Municipal Code : smoking* (7 Aug 1999),c 709-1. Available from: http://www.toronto.ca/legdocs/municode/1184_709.pdf

26. Ontario Tobacco Research Unit (OTRU). Quebec coalition news release - smoke-free within 9m of building entrances [Internet] . Toronto, ON: Ontario Tobacco Research Unit; 2016.

27. Dubray J, Schwartz R, Kaufman P. Evaluation of the amended Toronto smoke-free bylaws: summary of the baseline and follow-up assessments [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2016 [cited 2016 Sept 6]. Available from: http://otru.org/wp-content/uploads/2016/08/special_TPH_FUP.pdf

28. Sureda X, Fernandez E, Lopez MJ, Nebot M. Secondhand tobacco smoke exposure in open and semi-open settings: a systematic review. Environ Health Perspect. 2013;121(7):766-73. Available from: https://ehp.niehs.nih.gov/1205806/

29. Pederson A, Okoli CT, Hemsing N, O'Leary R, Wiggins A, Rice W, et al. Smoking on the margins: a comprehensive analysis of a municipal outdoor smoke-free policy. BMC Public Health. 2016;16:852. Available from: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-016-3466-2

30. Azagba S. Effect of smoke-free patio policy of restaurants and bars on exposure to second-hand smoke. Prev Med. 2015;76:74-8. Available from: http://www.sciencedirect.com/science/article/pii/S009174351500119X

31. Chaiton M, Diemert L, Zhang B, Kennedy RD, Cohen JE, Bondy SJ, et al. Exposure to smoking on patios and quitting: a population representative longitudinal cohort study. Tob Control. 2014;25(1):83-8.

32. Okoli C, Johnson A, Pederson A, Adkins S, Rice W. Changes in smoking behaviours following a smokefree legislation in parks and on beaches: an observational study. BMJ Open. 2013;3:1-6. Available from: http://bmjopen.bmj.com/content/bmjopen/3/6/e002916.full.pdf

33. Biomonitoring summary : cotinine [Internet]. Atlanta, GA: Centers for Disease Control and Prevention; 2013 [updated 2013 Dec 4; cited 2016 Oct 11]. Available from: https://www.cdc.gov/biomonitoring/Cotinine_BiomonitoringSummary.html

34. Ontario Tobacco Research Unit. Smoke-free Ontario strategy monitoring report [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2015 [cited 2015 Aug 12]. Available from: http://otru.org/wp-content/uploads/2015/04/MR-2014-Final.pdf

35. Zhang B, Schwartz R. Tobacco smoke entering homes in multi-unit dwellings in Ontario [Internet]. Toronto, ON: The Ontario Tobacco Research Unit; 2014 [cited 2016 Oct 12]. Available from: http://otru.org/wp-content/uploads/2014/10/update_aug2014_v2.pdf

36. Kraev TA, Adamkiewicz G, Hammond SK, Spengler JD. Indoor concentrations of nicotine in low-income, multi-unit housing: associations with smoking behaviours and housing characteristics. Tob Control. 2009;18(6):438-44.

37. King BA, Travers MJ, Cummings KM, Mahoney MC, Hyland AJ. Secondhand smoke transfer in multiunit housing. Nicotine Tob Res. 2010;12(11):1133-41.

38. Bohac DL, Hewett MJ, Hammond SK, Grimsrud DT. Secondhand smoke transfer and reductions by air sealing and ventilation in multiunit buildings: PFT and nicotine verification. Indoor Air. 2011;21(1):36-44.

39. Purdy S. By the People, For the People: tenant organizing in Toronto's Regent Park Housing Project in the 1960s and 1970s. J Urban Hist. 2004;30(4):519-48.

40. Digenis-Bury EC, Brooks DR, Chen L, Ostrem M, Horsburgh CR. Use of a population-based survey to describe the health of Boston public housing residents. Am J Public Health. 2008;98(1):85-91.

41. Hood NE, Ferketich AK, Klein EG, Wewers ME, Pirie P. Smoking behaviors and cessation interests among multiunit subsidized housing tenants, Columbus, Ohio, 2011. Prev Chronic Dis. 2013;10:E108; quiz E108.

42. Lee D, Turner N, Burns J, Lee T. Tobacco use and low-income African Americans: policy implications. Addict Behav. 2007;32(2):332-41.

43. Arku RE, Adamkiewicz G, Vallarino J, Spengler JD, Levy DE. Seasonal variability in environmental tobacco smoke exposure in public housing developments. Indoor Air. 2015;25(1):13-20.

44. Smoke-free housing directory [Internet]. Toronto, ON: Smoke-free Housing Ontario; 2016 [updated 2016 Oct 1; cited 2016 Oct 12]. Available from: http://smokefreehousingon.ca/smoke-free-housing-directory/

45. Kernoghan A, Lambraki I, Pieters K, Garcia JM. Smoke-free housing: a review of the evidence [Internet]. Toronto, ON: Program Training and Consultation Centre and the Propel Centre for Population Health Impact, University of Waterloo; 2014 [cited 2016 Oct 12]. Available from: http://www.habitationssansfumeeqc.ca/hsfq/file/files/2014_PTCC_Smoke_Free_Housing.pdf

46. Non-Smokers' Rights Association Smoking and Health Action Foundation (NSRA/SHAF). Smoke-free policies make good dollars and sense: the business case for smoke-free multi-unit housing [Internet]. Toronto, ON: Non-Smokers' Rights Association Smoking and Health Action Foundation (NSRA/SHAF); 2008 [cited 2016 Oct 12]. Available from: http://www.smokefreehousing.ca/PDF/Business_Case_for_S-F_MUDs.pdf

47. Overview: smoke free housing Ontario [Internet]. Toronto, ON: Smoke Free Housing Ontario; 2010 [cited 2016 Dec 3]. Available from: http://www.smokefreehousingon.ca/sfho/overview.html

48. Reid JL, Hammond D. Tobacco Use in Canada: patterns and trends, 2015 Edition (Supplement: Tobacco Control Policies in Canada). Waterloo, ON: Propel Centre for Population Health Impact, University of Waterloo; 2015. Available from: http://www.tobaccoreport.ca/2015/TobaccoUseinCanada_2015_PolicySupplement.pdf

49. *Residential Tenancies Act,* 2006, SO 2006, c17, S38 (1). Available from: https://www.ontario.ca/laws/statute/06r17#BK43

50. Kennedy RD, Ellens-Clark S, Nagge L, Douglas O, Madill C, Kaufman P. A smoke-free community housing policy: changes in reported smoking behaviour-findings from Waterloo Region, Canada. J Community Health. 2015;40(6):1207-15.

51. Rosen LJ, Noach MB, Winickoff JP, Hovell MF. Parental smoking cessation to protect young children: a systematic review and meta-analysis. Pediatrics. 2012;129(1):141-52.

52. Rosen LJ, Myers V, Hovell M, Zucker D, Ben Noach M. Meta-analysis of parental protection of children from tobacco smoke exposure. Pediatrics. 2014;133(4):698-714. Available from: http://pediatrics.aappublications.org/content/133/4/698.full-text.pdf

53. Brown N., Luckett T., Davidson P.M., Di GM. Interventions to reduce harm from smoking with families in infancy and early childhood: a systematic review. Int J Environ Res Public Health. 2015;12(3):3091-119.

54. Baxi R, Sharma M, Roseby R, Polnay A, Priest N, Waters E, et al. Family and carer smoking control programmes for reducing children's exposure to environmental tobacco smoke. Cochrane Database Syst Rev. 2014;(3):CD001746.

55. Kabir Z, Alpert HR, Goodman PG, Haw S, Behm I, Connolly G, N., et al. Effect of smoke-free home and workplace policies on second-hand smoke exposure levels in children: an evidence summary. Ped Health. 2010;4(4):391-403.

56. Baxter S, Blank L, Everson-Hock ES, Burrows J, Messina J, Guillaume L, et al. The effectiveness of interventions to establish smoke-free homes in pregnancy and in the neonatal period: a systematic review. Health Educ Res. 2011;26(2):265-82.

57. Tong VT, Dietz PM, Rolle IV, Kennedy SM, Thomas W, England LJ. Clinical interventions to reduce secondhand smoke exposure among pregnant women: a systematic review. Tob Control. 2015;24(3):217-23.

58. Rosen LJ, Myers V, Winickoff JP, Kott J. Effectiveness of interventions to reduce tobacco smoke pollution in homes: a systematic review and meta-analysis. Int J Environ Res Public Health. 2015;12(12):16043-59. Available from: http://www.mdpi.com/1660-4601/12/12/15038

59. Mills AL, Messer K, Gilpin EA, Pierce JP. The effect of smoke-free homes on adult smoking behavior: a review. Nicotine Tob Res. 2009;11(10):1131-41.

60. Snyder K, Vick JH, King BA. Smoke-free multiunit housing: a review of the scientific literature. Tob Control. 2016;25(1):9-20.

61. King BA, Patel R, Babb SD, Hartman AM, Freeman A. National and state prevalence of smoke-free rules in homes with and without children and smokers: two decades of progress. Prev Med. 2016;82:51-8.

62. Semple S, Apsley A, Azmina Ibrahim T, Turner SW, Cherrie JW. Fine particulate matter concentrations in smoking households: just how much secondhand smoke do you breathe in if you live with a smoker who smokes indoors? Tob Control. 2015;24(e3):e205-11.

63. King BA, Peck RM, Babb SD. Cost savings associated with prohibiting smoking in U.S. subsidized housing. Am J Prev Med. 2013;44(6):631-4.

64. U.S. Department of Housing and Urban Development. Instituting Smoke-Free Public Housing.Code of Federal Regulations parts 965 and 966. Washington, DC: Office of the Assistant Secretary for Public and Indian Housing; 2016. Available from: http://portal.hud.gov/hudportal/documents/huddoc?id=smokefreephfinalrule.pdf

65. Ialomiteanu AR, Hamilton HA, Adlaf EM, Mann RE. CAMH monitor eReport 2015: substance use, mental health and well-being among Ontario adults, 1977–2013 [Internet]. CAMH Research Document Series No. 40 ed. Toronto, ON: Centre for Addiction and Mental Health; 2014 [cited 2016 Dec 3]. Available from: http://www.camh.ca/en/research/news_and_publications/CAMH%20Monitor/CAMH-Monitor-2015-eReport-Final-Web.pdf

66. *Non-Smokers' Health Act,* R.S.C 1985, c. 15 (4th Supp.). Available from: http://laws-lois.justice.gc.ca/PDF/N-23.6.pdf

67. Social Research and Demonstration Corporation. Evaluation of the tobacco-free workplace initiative [Internet]. Toronto, ON: Social Research and Demonstration Corporation; 2010 [cited 2016 Dec 3]. Available from: http://www.srdc.org/uploads/BCHLA_TobaccoFree.pdf

68. Hopkins DP, Razi S, Leeks KD, Priya Kalra G, Chattopadhyay SK, Soler RE, et al. Smokefree policies to reduce tobacco use. A systematic review. Am J Prev Med. 2010;38(2 Suppl):S275-89.

69. Fichtenberg CM, Glantz SA. Effect of smoke-free workplaces on smoking behaviour: systematic review. BMJ. 2002;325(7357):188-91.

70. Government of Canada. Canadian Tobacco Use Monitoring Survey (CTUMS) 2012 [Internet]. Ottawa, ON: Health Canada; 2013 [updated 2013 Oct 1; cited 2015 Jul 22]. Available from: http://www.hc-sc.gc.ca/hc-ps/tobac-tabac/research-recherche/stat/ctums-esutc_2012-eng.php

71. Goldcorp Porcupine Gold Mines. Tobacco free property information sheet [Internet]. South Porcupine, ON: Goldcorp Porcupine Gold Mines; 2016 [cited 2016 Oct 31]. Available from: http://api.ning.com/files/crXYYahgnZqcF2aPOJPIeG5gwglFRvQvDT-YGeVQQTl06pl5HcyB2KMMK8IJm-qTv0wGrSQcSti04ZUUvRsPVwQDFAdWTaiN/GoldcorpTobaccoFreeInfoSheet.pdf

72. Edwards J. Pilkington butts out. Simcoe.com [Internet], 2013 Mar 28 [cited 2016 Oct 26]; News. Available from: http://www.simcoe.com/news-story/2516296-pilkington-butts-out/

73. Hammond D. Smoking behaviour among young adults: beyond youth prevention. Tob Control. 2005;14(3):181-5. Available from: http://tobaccocontrol.bmj.com/content/tobaccocontrol/14/3/181.full.pdf

74. Smoke free policies improve air quality in hospitality settings [Internet]. Atlanta, GA: Centers for Disease Control and Prevention; 2016 [updated 2016 Feb 17; cited 2016 Oct 13]. Available from: http://www.cdc.gov/tobacco/data_statistics/fact_sheets/secondhand_smoke/protection/air_quality/

75. Matt GE, Quintana PE, Fortmann AL, Zakarian JM, Galaviz VE, Chatfield DA, et al. Thirdhand smoke and exposure in California hotels: non-smoking rooms fail to protect non-smoking hotel guests from tobacco smoke exposure. Tob Control. 2014;23(3):264-72.

76. Non-Smokers' Rights Association Smoking and Health Action Foundation. Clean air: the new tourism amenity [Internet]. Toronto, ON: Non-Smokers' Rights Association; 2008 [cited 2016 Sept 19]. Available from: https://www.nsra-adnf.ca/cms/file/files/pdf/smoke-free_tourism_March_2008.pdf

77. Huron County, by-law No 21, 2003, *A Bylaw of the corporation of the County of Huron to regulate smoking in public places and workplaces in Huron County and to repeal By-law No 9, 2003*. [Internet].(4 Sep 2004). Available from: http://database.nonsmokersrights.ca/bylaw/bylaw-no-21-2003-a-bylaw-of-the-corporation-of-the-county-of-huron-to-regulate-smoking-in-public-places-and-workplaces-in-huron-county-and-to-repeal-bylaw-no-9-2003/

78. Bill 45, *An Act to enhance public health by enacting the Healthy Menu Choices Act, 2014 and the Electronic Cigarettes Act, 2015 and by amending the Smoke-Free Ontario Act,* 1st Sess, 41st Leg, Ontario, 2015 (assented to 28 May 2015), SO 2015, c 7.

79. Frazer K, McHugh J, Callinan JE, Kelleher C. Impact of institutional smoking bans on reducing harms and secondhand smoke exposure. Cochrane Database Syst Rev. 2016;(5):CD011856.

80. Poder N, Carroll T, Wallace C, Hua M. Do smoke-free environment policies reduce smoking on hospital grounds? Evaluation of a smoke-free health service policy at two Sydney hospitals. Aust Health Rev. 2012;36(2):158-62.

81. Grant LG, Oliffe JL, Johnson JL, Bottorff JL. Health care professionals implementing a smoke-free policy at inpatient psychiatric units. Qual Health Res. 2014;24(12):1732-44.

82. Unrod M, Oliver JA, Heckman BW, Simmons VN, Brandon TH. Outdoor smoking ban at a cancer center: attitudes and smoking behavior among employees and patients. J Public Health Manag Pract. 2012;18(5):E24-31.

83. Voci S, Bondy S, Zawertailo L, Walker L, George TP, Selby P. Impact of a smoke-free policy in a large psychiatric hospital on staff attitudes and patient behavior. Gen Hosp Psychiatry. 2010;32(6):623-30.

84. Kunyk D, Els C, Predy G, Haase M. Development and introduction of a comprehensive tobacco control policy in a Canadian regional health authority. Prev Chronic Dis. 2007;4(2):A30.

85. Azagba S. Trends in adult exposure to secondhand smoke in vehicles: findings from the 2009-2012 Canadian Tobacco Use Monitoring Survey. Drug Alcohol Depend. 2015;155:141-6.

86. Nguyen H. Effectiveness of bans against smoking inside private vehicles in Canada [Internet]. Toronto, ON: Cancer Advocacy Coalition Canada; 2013 [cited 2016 Oct 3]. Available from: http://www.canceradvocacy.ca/reportcard/2013/Effectiveness%20of%20Bans%20Against%20Smoking%20Inside%20Private%20Vehicles%20in%20Canada.pdf

87. Matt GE, Fortmann AL, Quintana PJ, Zakarian JM, Romero RA, Chatfield DA, et al. Towards smoke-free rental cars: an evaluation of voluntary smoking restrictions in California. Tob Control. 2013;22(3):201-7.

88. Make a reservation [Internet]. Parsippany, NJ: Avis Canada; 2016 [cited 2016 Oct 13]. Available from: https://www.avis.ca/car-rental/avisHome/home.ac?Logo=true

89. Find a rental car [Internet]. Oklahoma City, OK: Dollar; 2016 [cited 2016 Oct 13]. Available from: https://www.dollar.com/Cars/FindACar.aspx

90. Find a rental car [Internet]. Oklahoma City, OK: Thrifty; 2016 [cited 2016 Oct 13]. Available from: https://www.thrifty.com/OurCars.aspx?flash=true

91. Thrifty non-smoking fleet policy [Internet]. Oklahoma City, OK: Thrifty; 2016 [cited 2016 Oct 13]. Available from: https://www.thrifty.com/~/link.aspx?_id=3193E6F4BB074984B69C07CBA80D60D6&_z=z

92. Uber B.V. term and conditions [Internet]. San Francisco, CA: Uber; 2015 [updated 2015 Nov 12; cited 2016 Oct 13]. Available from: https://www.uber.com/legal/terms/ca/

93. What's zipcar? [Internet]. Boston, MA: Zipcar; 2016 [cited 2016 Oct 13]. Available from: http://www.zipcar.ca/?redirect_p=0

94. Elton-Marshall T, Leatherdale ST, Driezen P, Azagba S, Burkhalter R. Do provincial policies banning smoking in cars when children are present impact youth exposure to secondhand smoke in cars? Prev Med. 2015;78:59-64.

95. Matt GE, Romero R, Ma DS, Quintana PJE, Hovell MF, Donohue M, et al. Tobacco use and asking prices of used cars: prevalence, costs, and new opportunities for changing smoking behavior. Tob Induc Dis. 2008;4(1):2. Available from: https://tobaccoinduceddiseases.biomedcentral.com/articles/10.1186/1617-9625-4-2

96. U.S. Department of Health and Human Services. E-cigarette use among youth and young adults: a report of the surgeon general [Internet]. Atlanta, GA: Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2016 [cited 216 Dec 10]. Available from: https://e-cigarettes.surgeongeneral.gov/documents/2016_SGR_Full_Report_non-508.pdf

97. David McKeown, City of Toronto Medical Officer of Health. Hookah (waterpipe) use in licensed establishments [Internet]. Toronto, ON: City of Toronto; 2015 [cited 2016 Dec 3]. Available from: http://www.toronto.ca/legdocs/mmis/2015/hl/bgrd/backgroundfile-80194.pdf

98. Smoking and tobacco use: hookahs [Internet]. Atlanta, GA: Centers for Disease Prevention and Control; 2016 [updated 2016 Dec 1; cited 2016 Dec 19]. Available from: https://www.cdc.gov/tobacco/data_statistics/fact_sheets/tobacco_industry/hookahs/index.htm

99. McNeill A, Brose L, Calder R, Hitchman S, Hajek P, McRobbie H. E-cigarettes: an evidence update. A report commissioned by Public Health England [Internet]. London, UK: Public Health England; 2015 [cited 2016 Dec 3]. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/457102/Ecigarettes_an_evidence_update_A_report_commissioned_by_Public_Health_England_FINAL.pdf

100. Summary of results for 2015: Canadian Tobacco, Alcohol and Drugs Survey (CTADS) [Internet]. Ottawa: Government of Canada; 2016 [updated 2016 Nov 16; cited 2016 Nov 20]. Available from: http://healthycanadians.gc.ca/science-research-sciences-recherches/data-donnees/ctads-ectad/summary-sommaire-2015-eng.php

101. Stanwick R. E-cigarettes: are we renormalizing public smoking? Reversing five decades of tobacco control and revitalizing nicotine dependency in children and youth in Canada. Paediatr Child Health. 2015;20(2):101-5. Available from: https://tobaccoinduceddiseases.biomedcentral.com/articles/10.1186/1617-9625-4-2

102. Flouris AD, Poulianiti KP, Chorti MS, Jamurtas AZ, Kouretas D, Owolabi EO, et al. Acute effects of electronic and tobacco cigarette smoking on complete blood count. Food Chem Toxicol. 2012;50(10):3600-3.

103. Flouris AD, Chorti MS, Poulianiti KP, Jamurtas AZ, Kostikas K, Tzatzarakis MN, et al. Acute impact of active and passive electronic cigarette smoking on serum cotinine and lung function. Inhal Toxicol. 2013;25(2):91-101.

104. Bill S-5*, An Act to amend the Tobacco Act and the Non-smokers' Health Act and to make consequential amendments to other Acts*, 1st Sess, 42nd Leg, Ontario, 2016. Available from: http://www.parl.gc.ca/HousePublications/Publication.aspx?DocId=8616193

105. ECTA of Canada news brief and timeline: senate Bill S-5 completes first reading [Internet]. Calgary, AB: Electronic Cigarette Trade Association of Canada; 2016 [updated 2016 Dec 4; cited 2016 Dec 7]. Available from: http://ectaofcanada.com/senate-bill-s-5-completes-first-reading/

106. Search Results [Internet]. Toronto, ON: NSRA's Smoke-free Laws Database; 2016 Available from: http://database.nonsmokersrights.ca/your-search-results/?wpv_post_search=&province-territory%5B%5D=Ontario&level-of-government%5B%5D=&name-of-jurisdiction%5B%5D=&wpv-place-prohibited=0&wpv-buffer-zone=0&wpv-age-restriction=0&leading-edge%5B%5D=&sfoa-status%5B%5D=&wpv-category%5B%5D=electronic-smoking-devices&date-passed_min=&date-passed_min-format=F+j%2C+Y&date-passed_max=&date-passed_max-format=F+j%2C+Y&date-last-amended_min=&date-last-amended_min-format=F+j%2C+Y&date-last-amended_max=&date-last-amended_max-format=F+j%2C+Y

107. Hessa IMR, Lachireddya K, Capona A. A systematic review of the health risks from passive exposure to electronic cigarette vapour. Public Health Res Pract. 2016;26(2):e2621617.

108. Soule EK, Maloney SF, Spindle TR, Rudy AK, Hiler MM, Cobb CO. Electronic cigarette use and indoor air quality in a natural setting. Tob Control. 2017;26(1):109-122.

109. Majeed BA, Dube SR, Sterling K, Whitney C, Eriksen MP. Opinions about electronic cigarette use in smoke-free areas among U.S. Adults, 2012. Nicotine Tob Res. 2015;17(6):675-81.

110. Mello S, Bigman CA, Sanders-Jackson A, Tan AS. Perceived harm of secondhand electronic cigarette vapors and policy support to restrict public vaping: results from a national survey of US adults. Nicotine Tob Res. 2016;18(5):686-93.

111. Tan AS, Bigman CA, Sanders-Jackson A. Sociodemographic correlates of self-reported exposure to e-cigarette communications and its association with public support for smoke-free and vape-free policies: results from a national survey of US adults. Tob Control. 2015;24(6):574-81.

112. Yingst JM, Veldheer S, Hammett E, Hrabovsky S, Foulds J. Should electronic cigarette use be covered by clean indoor air laws? Tob Control. 2016 Sept 5 [Epub ahead of print].

113. Notes from the fields: calls to poison centers for exposures to electronic cigarettes — United States, September 2010 – February 2014. [Internet]. Atlanta, GA: Centers for Disease Control and Prevention; 2014 [updated April 4 2014; cited 2016 Oct 13]. Available from: https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6313a4.htm

114. Maziak W., Jawad M., Jawad S., Ward K.D., Eissenberg T., Asfar T. Interventions for waterpipe smoking cessation. Cochrane Database Syst Rev. 2015;2015(7):CD005549.

115. Boak A, Hamilton HA, Adlaf EM, Mann RE. Detailed OSDUHS findings: drug use among Ontario students, 1977-2015. CAMH Research Document Series No.41 ed. Toronto, ON: Centre for Addiction and Mental Health; 2015. Available from: http://www.camh.ca/en/research/news_and_publications/ontario-student-drug-use-and-health-survey/Documents/2015%20OSDUHS%20Documents/2015OSDUHS_Detailed_DrugUseReport.pdf

116. Tee GH, Hairi NN, Nordin F, Choo WY, Chan YY, Kaur G, et al. Systematic review on international practices in controlling waterpipe tobacco smoking. Asian Pac J Cancer Prev. 2015;16(9):3659-65.

117. Zhang B, Haji F, Kaufman P, Muir S, Ferrence R. 'Enter at your own risk': a multimethod study of air quality and biological measures in Canadian waterpipe cafes. Tob Control. 2015;24(2):175-81.

118. Fosson GH, McCallum DM, Conaway MB. Antismoking mass media campaigns and support for smoke-free environments, Mobile County, Alabama, 2011-2012. Prev Chronic Dis. 2014;11:E150.

119. Wilson LM, Avila Tang E, Chander G, Hutton HE, Odelola OA, Elf JL, et al. Impact of tobacco control interventions on smoking initiation, cessation, and prevalence: a systematic review. J Environ Public Health. 2012;2012:1-36.

120. Morris M, Pennucci A, Aos S, Drake E, Fumia D, Miller M, et al. Tobacco and e-cigarette prevention: what works? [Internet]. Washington, DC: Washington State Institute for Public Policy; 2014 [cited 2014 Dec 8]. Available from: http://www.wsipp.wa.gov/ReportFile/1578/Wsipp_Tobacco-and-E-Cigarette-Prevention-What-Works_Report.pdf

121. Kosir M, Gutierrez K. Lessons learned globally: secondhand smoke mass media campaigns [Internet]. Saint Paul, MN: Global Dialogue for Effective Stop Smoking Campaigns; 2009 [cited 2016 Oct 13]. Available from: http://global.tobaccofreekids.org/files/global_dialogue/Lessons_Learned_Globally.pdf

122. Ontario Tobacco Research Unit. OTS project evaluations, 2003-2004: a coordinated review [Internet]. Special Reports: Monitoring and Evaluation Series, 2003-2004 (Vol.10, No.2) ed. Toronto, ON: Ontario Tobacco Research Unit; 2004 [cited 2016 Sept 14]. Available from: http://otru.org/wp-content/uploads/2012/06/10mr_no2_appb.pdf

123. Ontario Tobacco Research Unit. Evaluation news: evaluation of the smoke-free Ontario act outdoor smoking regulations [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2016 [cited 2016 Nov 2]. Available from: http://otru.org/wp-content/uploads/2016/04/kes_update_mar2016.pdf

124. Riker CA, Butler KM, Ricks JM, Record RA, Begley K, Anderson DG, et al. Creating effective media messaging for rural smoke-free policy. Public Health Nurs. 2015;32(6):613-24.

125. Lewis S, Sims M, Richardson S, Langley T, Szatkowski L, McNeill A, et al. The effectiveness of tobacco control television advertisements in increasing the prevalence of smoke-free homes. BMC Public Health. 2015;15:869.

126. Maksimovic L, Shen D, Bandick M, Ettridge K, Eckert M. Evaluation of the pilot phase of the 'Give up smokes for good' social marketing campaign. Health Promot J Austr. 2015;26(1):16-23.

127. Chang FC, Chung CH, Chuang YC, Hu TW, Yu PT, Chao KY, et al. Effect of media campaigns and smoke-free ordinance on public awareness and secondhand smoke exposure in Taiwan. J Health Commun. 2011;16(4):343-58.

128. Thrasher JF, Huang L, Perez-Hernandez R, Niederdeppe J, Arillo-Santillan E, Alday J. Evaluation of a social marketing campaign to support Mexico City's comprehensive smoke-free law. Am J Public Health. 2011;101(2):328-35.

129. Murukutla N, Bayly M, Mullin S, Cotter T, Wakefield M. Male smoker and non-smoker responses to television advertisements on teh harms of secondhand smoke in China, India and Russia. Health Educ Res. 2015;30(1):24-34.

130. Schwartz J, Bottorff JL, Ratner PA, Gotay C, Johnson KC, Memetovic J, et al. Effect of web-based messages on girls' knowledge and risk perceptions related to cigarette smoke and breast cancer: 6-month follow-up of a randomized controlled trial. JMIR Res Protoc. 2014;3(3):e53.

131. Anderson C, Holody KJ. Stimulating dialogue: measuring success of the "Smoke Free Horry" campaign. Int Q Community Health Educ. 2013;34(4):331-49.

132. Modayil MV, Consolacion TB, Isler J, Soria S, Stevens C. Cost-effective smoke-free multiunit housing media campaigns: connecting with local communities. Health Promot Pract. 2011;12(6 Suppl 2):173S-85S.

133. Summerlin-Long SK, Goldstein AO, Davis J, Shah V. Promoting tobacco-free school policies through a statewide media campaign. J Sch Health. 2009;79(4):184-92.

134. Novotny TE, Hardin SN, Hovda LR, Novotny DJ, McLean MK, Khan S. Tobacco and cigarette butt consumption in humans and animals. Tob Control. 2011;20(Suppl 1):17-20.

135. World Health Organization. WHO framework convention on tobacco control. Geneva: World Health Organization; 2005. Available from: http://www.who.int/tobacco/framework/WHO_FCTC_english.pdf

136. Barnes RL. Regulating the disposal of cigarette butts as toxic hazardous waste. Tob Control. 2011;20(Suppl 1):45-8. Available from: http://tobaccocontrol.bmj.com/content/tobaccocontrol/20/Suppl_1/i45.full.pdf

137. Schneider JE, Peterson NA, Kiss N, Ebeid O, Doyle AS. Tobacco litter costs and public policy: a framework and methodology for considering the use of fees to offset abatement costs. Tob Control. 2011;20(Suppl 1):36-41. Available from: http://tobaccocontrol.bmj.com/content/tobaccocontrol/20/Suppl_1/i36.full.pdf

138. Wright SL, Rowe D, Reid MJ, Thomas KV, Galloway TS. Bioaccumulation and biological effects of cigarette litter in marine worms. Sci Rep. 2015;5:14119.

139. Bill 28, *Cigarette and Cigar Butt Litter Prevention Act,* 2nd Sess, 39th Leg, 2010 (first reading 1 Apr 2010). Available from: http://www.ontla.on.ca/web/bills/bills_detail.do?locale=en&BillID=2305

140. City of Toronto, Bill No 1192, *To amend City of Toronto Municipal Code Chapter 545, Licensing, to require businesses to maintain their premises free from litter* (7 Oct 2016). Available from: http://www.toronto.ca/legdocs/bills/2016/bill1192.pdf

141. Chang H. Research gaps related to the environmental impacts of electronic cigarettes. Tob Control. 2014;23(Suppl 2):ii54-8.

142. Javadian S, Stigler-Granados P, Curtis C, Thompson F, Huber L, Novotny TE. Perspectives on tobacco product waste: a survey of Framework Convention Alliance members' knowledge, attuitudes, and beliefs. Int J Environ Res Public Health. 2015;12(8):9683-91.

143. Moerman JW PG. Analysis of metals leached from smoked cigarette litter. Tob Control. 2011;20(Suppl 1):30-5.

144. Rath JM, Rubenstein RA, Curry LE, Shank SE, Cartwright JC. Cigarette litter: smokers' attitudes and behaviors. Int J Environ Res Public Health. 2012;9(6):2189-203.

145. Lee W LC. Developmental toxicity of cigarette butts - an underdeveloped issue. Ecotoxicol Environ Saf. 2015;113:362-8.

146. Slaughter E, Gersberg RM, Watanabe K, Rudolph J, Stransky C, Novotny TE. Toxicity of cigarette butts, and their chemical components, to marine and freshwater fish. Tob Control. 2011;20(Suppl 1):i25-9.

147. Smith EA MP. Covering their butts: responses to the cigarette litter problem. Tob Control. 2011;20(2):100-6.

148. Smith EA NT. Whose butt is it? Tobacco industry research about smokers and cigarette butt waste. Tob Control. 2011;20(Suppl 1):2-9. Available from: http://tobaccocontrol.bmj.com/content/tobaccocontrol/20/Suppl_1/i2.full.pdf

149. Qamar W, Al-Ghadeer AR, Ali R. Analysis of toxic elements in smoked shisha waterwaste and unburnt tobacco by inductively coupled plasma-mass spectrometry: probable role in environmental contamination. Res J Environ Toxicol. 2015;9(4):204-10.

150. Krause MJ TT. Hazardous waste status of discarded electronic cigarettes. J Environ Eng Sci. 2015;39:57-62.

151. Curtis C, Novotny TE, Lee K, Freiberg M, McLaughlin I. Tobacco industry responsibility for butts: a Model Tobacco Waste Act. Tob Control. 2017;26(1):113-7.

152. WHO Framework Convention on Tobacco Control. Guidelines for implementation of article 6 of the WHO FCTC: price and tax measures to reduce the demand for tobacco [Internet]. Geneva, SZ: World Health Organization; 2013 [cited 2015 July 14]. Available from: http://www.who.int/fctc/guidelines/adopted/Guidelines_article_6.pdf?ua=1

Chapter 6: Cessation

Table of Contents

Background

What is Cessation?

The focus of the Cessation chapter is on interventions that motivate, encourage and supports efforts to quit smoking. Interventions can be broadly focused at a population level (e.g., policies and mass media) to an individual level (e.g., pharmacotherapy and behavioural therapy). These interventions can be organized into a system that includes a range of organized inputs, resources and capacities that connect with, engage and re-engage tobacco users across their 'quit journeys'. Smoking cessation can be accomplished with or without assistance. Encouraging smokers to "try and try again" is important because tobacco is highly addictive and most smokers attempt to quit smoking numerous times (unaided or aided) before they succeed.[1,2] According to the study by Chaiton et. al. smokers try on average 30 times before quitting successfully.[3] However, the ability to quit varies among individual smokers, and about 40% to 54% of former smokers quit the first time they made a serious quit attempt.[3]

Why Address Cessation?

The Ontario government is committed to reducing tobacco use and has set an ambitious goal to have the lowest smoking rates in Canada.[4] Smoking cessation is important to reduce the risk of developing smoking-related diseases, thereby decreasing the health burden caused by smoking.[5] Currently, British Columbia has the lowest rate in Canada—14.3%.[6] In 2014, the smoking rate among Ontarians ages 12 years and older was 17.4%. To achieve 14% prevalence, over 400,000 current Ontario smokers will need to quit for good (assuming there is no new uptake of smoking in the meantime).[7]

Smoking cessation strategies that target both the general population and populations that experience a greater burden of tobacco use (e.g., people with smoking-related diseases) are essential to any comprehensive tobacco control strategy to prevent intervention-generated inequity. To make the smoking cessation process easier requires a coordinated cessation service system with components such as centralized cessation services and resources for easier access, and support for the development of customized quit plans to address each smoker's personal cessation needs.[8] Ultimately, the goals of the cessation system are to lower current smoking rate and to increase quit attempts and the duration of smoking abstinence among quitters by reducing barriers to cessation services for the overall and vulnerable populations.[9] According to the 2015 CTADS survey, 50% (1.3 million) daily cigarette smokers ages 15 years and older made at least one quit attempt lasting 24 hours in the past year, and 33% tried to quit on two or more separate occasions.[10] The majority of daily smokers in Canada (63% or 1.7 million) are considering quitting in the next six months, of which 41% (645,000) are considering quitting in the next 30 days.[10]

Approach to the Cessation Chapter

Effective interventions, implemented with sufficient reach, duration and intensity, are important components of a cessation system and constitute the main subject of this chapter. The ecological model was applied to organize the evidence in this chapter. Intervention domains to address smoking cessation have been identified and categorized as environmental (including legislation and policies), community-based (including social marketing)[11] and individual level (e.g., pharmacological and behavioural

interventions).Underlying conditions, such as the context in which the intervention was applied, resources available and intensity or potential reach, moderate the impact of an intervention and were therefore taken into account. For example, behavioural counselling for smoking cessation can have varied outcomes when offered in health care settings versus workplace settings. In addition, different effects can be observed for different populations. For example, hospitalized patients with cardiac conditions have been found to have higher cessation rates than hospital patients with other conditions.[12] Therefore, intervention types may be repeated in different sections of the chapter.

Methods

Best Available Research Evidence

This chapter primarily focuses on comprehensive coverage of interventions related to cigarettes and smoking cessation; interventions related to other tobacco products, such as waterpipes and smokeless tobacco, are also included. Two PHO reviewers screened all the pre-appraised reviews for relevance and categorization to the specific sections of this chapter. Additional PHO library searches were conducted based on the advice of the Scientific Advisory Committee when more evidence was needed for a particular intervention. Please see Appendix 1: Summary Tables of Library Searches, or more details on the PHO library searches and the Chapter 2: Methods for a full description of the methods.

Broad inclusions of cessation outcomes were used in the Report; for example, abstinence, quit attempt, quit rate, smoking prevalence and tobacco cessation. Please refer to the Glossary for definitions.

Results

The pre-appraised literature search yielded 165 relevant review-level articles. SFO-SAC 2016 members contributed 25 articles that met inclusion criteria, which included 13 reports, 7 reviews, and 5 primary studies (Figure 6.1). PHO librarian-assisted searches for articles related to taxation and price, mass media and technology, financial incentives, cessation maintenance, campus-based and e-cigarettes yielded 12 additional review articles (one for taxation, two for financial incentives, one for cessation maintenance, one for campus-based, and seven for e-cigarettes) (Figure 6.2).

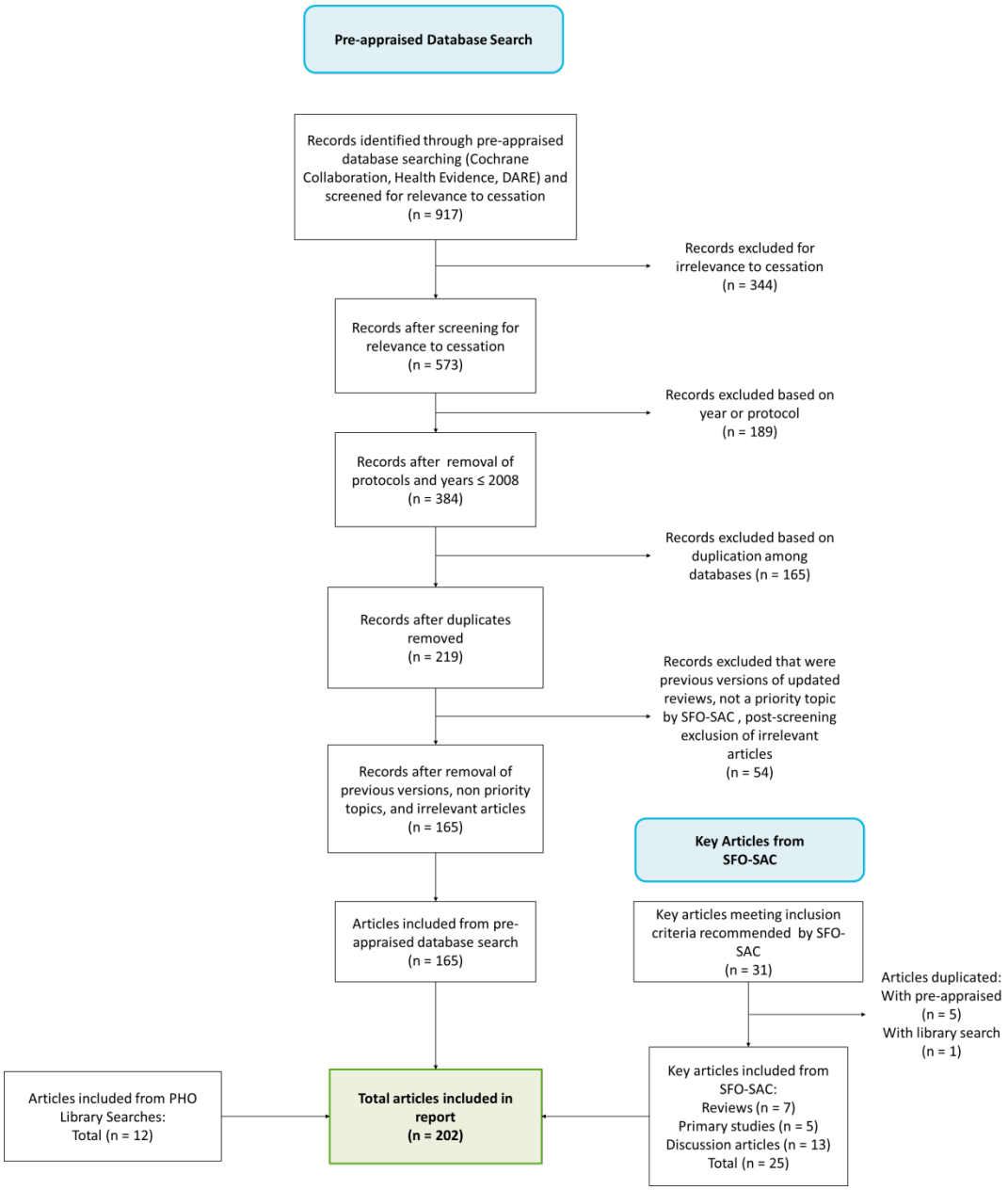

Figure 6.1: Search and Screening Flow Diagram

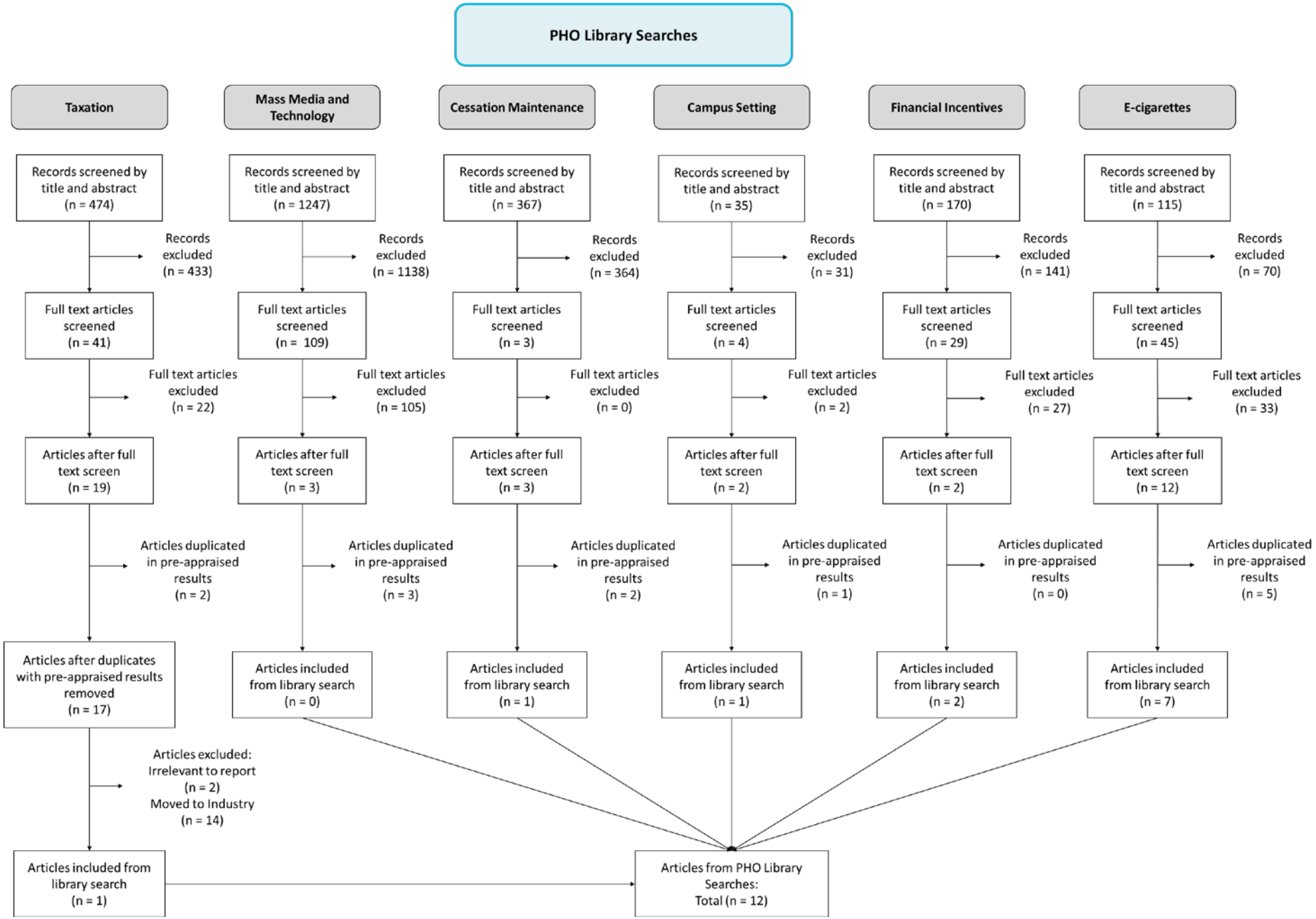

Figure 6.2: PHO Library Search and Screening Flow Diagram

Organization of Interventions and Innovations

Interventions have been categorized in four sub-sections: targeted to populations; in specific settings; targeted to individuals; and targeted to specific populations. Cessation interventions were discussed more than once if they related to more than one topic area. Where overlap occurs, hyperlinks have been provided. The prioritization of topics within the sub-sections was determined by the SFO-SAC 2016 cessation working group members. In the interventions sub-sections, the topics are organized from the environmental level (e.g., policies that support cessation, smoking restrictions, social marketing and communication) to the individual level (e.g., pharmacotherapy, self-help, cessation maintenance). For each topic, there is discussion of best available evidence with intervention effectiveness. It is important to note that where evidence was considered insufficient to conclude effectiveness does not necessarily indicate that the studies showed "no effect," but simply insufficient evidence. These studies can point to areas for future research. Each topic reports on specific intervention characteristics/implementation considerations, specific populations/equity considerations, the intervention in relation to the Ontario context and any limitations.

Interventions and Innovations

Interventions Targeted to Populations

Policies that Support Cessation

Price and Taxation

> *Compared to the other Canadian provinces and territories, Ontario has the second lowest tobacco tax and retail price on cigarettes. Based on the summary of evidence, increased tobacco tax increased smoking cessation, particularly among youth, young adults, and people with low SES and people with mental illness. Therefore, there is room for substantial increase in tobacco taxation to promote smoking cessation. Increasing taxes may create a disproportionate financial burden on smokers with low SES who do not quit or significantly reduce their consumption, which could be mitigated by the provision of cessation supports designed for these populations.*
>
> *SFO-SAC 2016 Scientific Consensus Statement*

Background

Taxation policies are intended to raise the price of tobacco products for the smoker or potential smoker, thereby reducing the products' desirability and consumer demand.[13] In terms of cessation, increasing tobacco taxes increases quitting and decreases overall consumption of tobacco among current tobacco users.[13] Article Six of the WHO's *Framework Convention on Tobacco Control* recommends "price and tax

measures to reduce the demand for tobacco," given that, "The Parties [of the treaty] recognize price and tax measures are an important and effective means of reducing tobacco consumption by various segments of the population, in particular young persons".[14] Non-tax price-related policies also exist and include such measures as minimum price policies and bans on tobacco discounts and offers[13] According to a National Cancer Institute and WHO monograph (2016), there are few studies around the world that examine the impact of taxes and prices on cessation; however, they all show consistent evidence that higher cigarette prices increase the likelihood of smoking cessation.[15]

Taxation as a tobacco control strategy has a large and supportive evidence base. The effects of taxation are evaluated according to various measures, including quitting, consumption, initiation, demand and prevalence of cigarette smoking. Extensive evidence covered in the Industry chapter demonstrates that increased taxation has a strong, significant effect on overall smoking prevalence and demand for cigarettes, which is partly due to increased cessation and reduced consumption of cigarettes. To read the full evaluation of taxation as a tobacco control strategy, including the facilitators and barriers to this strategy, please refer to Chapter 3: Industry.

The Ontario/Canadian Context

As of February 26th 2016, amendments to *Ontario's Tobacco Tax Act O. Reg. 40/16 S.1* included an increase in tobacco tax rates for individual cigarettes and per gram of tobacco from 13.975 cents to 15.475 cents per cigarette and per gram or part gram of other tobacco product.[16] Ontario has also committed to use $5 million of increased revenue from tobacco taxes (the projected tobacco tax revenue increase in 2016-2017 is $100 million, for a total annual revenue of $1.221 billion) to support improved access to smoking cessation services for priority populations across Ontario.[17] Ontario has the second lowest provincial/territorial tobacco tax (Quebec has the lowest tobacco tax), and the second lowest retail price for cigarettes in Canada.[9,18] Previously, Ontario had the lowest tobacco tax and second lowest retail price. Manitoba has the highest retail price on cigarettes, with a cost of $133.25 for 200 cigarettes, compared to $97.04 in Ontario.[9,18]

In Ontario's First Nations Cigarette Allocation System, outlined in *Ontario Regulation 649/93* (O. Reg. 649/93) made under the *Tobacco Tax Act*, First Nations individuals who are registered (Status) Indian situated on a reserve, may buy allocation cigarettes on a reserve, for their exclusive use and are exempt from Ontario tobacco tax.[19]

A report by the Ontario Tobacco Research Unit (OTRU) focused on the relationship between tobacco taxation and contraband. Overall, OTRU found that the benefits of increased tobacco taxes outweigh any minor increases in contraband due to price increases. Smokers who might move to contraband tobacco were found to return to legal tobacco within a short period of time. Further, increases can be explained by other factors such as, easy access, insufficient enforcement and penalties and organized criminal activity.[20]

For more information on Taxation in Ontario, please refer to Chapter 3: Industry.

Evidence

One overview of systematic reviews[21] and one systematic review[22] were retrieved from the pre-appraised literature, while one systematic review was retrieved from a PHO library search.[23] In addition, one systematic review[24] and one report of systematic reviews[13] were submitted by SFO-SAC. Two reviews were appraised as Level I[21,24] and two reviews were appraised as Level III.[22,23] The IARC report does not have a quality appraisal rating because it is a grey literature report. The majority of the studies within the reviews were from the United States (U.S.), but some were also from Canada, the United Kingdom (U.K.), Sweden, Spain, France, Australia and Ireland.

Evidence of Effectiveness

Increasing tobacco taxes is an effective strategy to increase smoking cessation;[22-24] this finding is affirmed in Hoffman et al.'s overview, which includes the other three systematic reviews.[21] Wilson et al. (2012) examined six studies that specifically evaluated taxation's effect on cessation and found that price elasticity of cessation ranged from 0.375 to 1.17, meaning that a 10% increase in price is associated with a 3.75% to 11.7% increase in cessation.[22]

The WHO's International Agency for Research on Cancer (IARC) released a report in 2011 that synthesized systematic reviews on the effectiveness of taxation for tobacco control. The findings in this report support the other reviews' findings that increased tobacco tax that raises the overall price of cigarettes for a smoker results in increased cessation.[13] IARC also found that this measure reduces consumption of cigarettes among smokers who do not quit.[13]

Intervention Characteristics/Implementation Considerations

Intervention and implementation considerations related to tobacco taxation, including contraband tobacco, industry pricing strategies and individual price minimization strategies are addressed in the Price and Taxation section in the Industry chapter.

Specific Populations/Equity Considerations

Three systematic reviews found that taxation was an effective strategy to increase cessation among youth and young adults,[22-24] and two systematic reviews found that it decreased individual cigarette consumption in these populations.[23,24] The systematic review by Rice et al. (2010) found evidence that a 10% price increase was associated with an 11.55% greater probability of making the first quit attempt, and a 3.5% greater probability of multiple quit attempts for persons aged 25 years or less.[24] Systematic reviews conducted by IARC (2011) similarly found taxation was effective for youth and young adult cessation, and that these populations are more price-responsive than the general population.[13]

In young black persons under age 25, higher prices decreased individual cigarette consumption compared to Caucasian populations.[24] In Indigenous populations, there was limited evidence on the effectiveness of taxation for smoking reduction; however, more evidence is needed given the high smoking prevalence among Indigenous peoples.[23]

Smokers with low SES were found to be more price responsive than the general population;[13,23] taxation had a positive effect on reducing cigarette consumption in smokers with low socio-economic status (SES).[23] However, the review by Bader et al. cautioned that taxation and price increases may create a

disproportionate financial burden for low-income smokers who are unsuccessful at quitting or choose not to quit.[23] Comprehensive strategies that involve additional support for smokers with low SES could complement increased prices from taxation on tobacco.[23] Smokers with mental illnesses or with other substance abuse disorders were found to be equally, if not more, price-responsive than the general population.[23]

For heavy and/or long-term smokers, higher prices, as opposed to clean air restrictions and media or comprehensive campaigns, was the most effective strategy in terms of quit attempts, however, there was no effect found for cessation at three or more months, and these conclusions are based on limited evidence so should be taken with caution.[23]

Intervention Summary

Evidence Summary – Price and Taxation - Well supported

The body of evidence regarding the effectiveness of taxation for smoking cessation included three systematic reviews and one overview of systematic reviews (two appraised as Level I and two as Level III). Overall, the evidence on increased tobacco tax that raises the overall price of cigarettes for smokers resulted in increased smoking cessation. Among youth, young adults, people with low SES, a mental illness or another substance abuse disorder, taxation had a positive effect on reducing cigarette consumption because these populations are more price-responsive than the general population.

SFO-SAC 2016 Scientific Consensus Statement - High (Intensify), Positive equity

Compared to the other Canadian provinces and territories, Ontario has the second lowest tobacco tax and retail price on cigarettes. Based on the summary of evidence, increased tobacco tax increased smoking cessation, particularly among youth, young adults, and people with low SES and people with mental illness. Therefore, there is room for substantial increase in tobacco taxation to promote smoking cessation. Increasing taxes may create a disproportionate financial burden on smokers with low SES who do not quit or significantly reduce their consumption, which could be mitigated by the provision of cessation supports designed for these populations.

The scientific consensus regarding the potential contribution for Ontario is: High (Intensify). This intervention has a positive equity impact, which means increased tobacco taxation is effective to increase smoking cessation in specific populations.

Key Message

Taxation of tobacco products has been shown to be effective to increase smoking cessation in Ontario. There is an opportunity for further tax increases of tobacco products.

Smoke-Free Policies

In Ontario, smoke-free policies have advanced since the SFO-SAC 2010 report, with many local jurisdictions broadening smoke-free municipal bylaws. Based on the summary of evidence, smoke-free polices in various settings (work place, public places, health care facilities, private homes and communities) increased smoking cessation. Improvements to smoke-free policies in Ontario could be expanded to other areas not currently covered under the Smoke Free Ontario Act such as beaches, trails, outdoor festivals and unsheltered bus stops. Smoke-free homes (as well as in multi-unit housing) in Ontario have the potential to reach smokers with low socio-economic status, where reach is determined by the level at which the policy is implemented (e.g., local, provincial, federal). Research so far on smoke-free homes shows effectiveness on increasing smoking cessation; therefore, this is an area of opportunity for Ontario to apply comprehensive smoke-free policies.

SFO-SAC 2016 Scientific Consensus Statement

Background

Smoke-free policies that ban smoking in public places include private-sector rules and public-sector regulations at the national, state and community levels, which prohibit or restrict smoking in indoor and designated outdoor environments.[22,25] Legislative policies can either ban smoking or tobacco-use completely (comprehensive) or restrict it to designated areas (partial).[26] Private-sector smoke-free policies may establish a complete ban on tobacco use on worksite properties or restrict smoking to designated outdoor locations.[25] The implementation of comprehensive smoke-free policies works synergistically with other tobacco control measures (such as mass media, telephone smoking cessation helplines, taxation and other smoking cessation support services) to increase smoking cessation.[26] For more information on outdoor smoke-free policies and areas not yet covered by *SFOA* please refer to Outdoor Public Spaces in the Protection chapter.

In addition, smoke-free policies could be applied to private homes, such as “no one is allowed to smoke anywhere inside”, “no one smokes regularly inside the home”, or “no one smoked inside the home in the past week”.[27] In multi-unit housing, restrictive smoking policies are sometimes implemented by the building administration. For more information on multi-unit housing (MUH), please refer to Home Environments in the Protection chapter. Smoke-free homes may increase a smoker’s motivation to quit by creating barriers to smoking. The implementation of a smoke-free home may disrupt a smoker’s

established smoking habits, increasing their ability to quit, and may also prevent relapse by reducing environmental cues.[27]

The Ontario/Canadian Context

Since the SFO-SAC 2010 report, the development of smoke free-policies at the provincial and local levels has advanced a lot Amendments to the *Smoke Free Ontario Act* have included prohibiting smoking on restaurant and bar patios, at sporting areas, spectator areas adjacent to sporting areas, and within 20 meters of a sporting area or adjacent spectator area or of a children's playground, and on outdoor hospital grounds (designated smoking areas are still allowed on hospital grounds); however, as of January 1, 2018, outdoor grounds must be completely smoke-free). Local jurisdictions have extended smoke-free municipal bylaws to buffer zones around doorways and windows and hospital and long-term care grounds.[174] A number of multi-unit housing buildings across the province have become smoke-free through policy development by municipal housing authorities and voluntary adoption by private landlords. For more information on outdoor smoke-free policies, multi-unit housing (MUHs) and areas not yet covered by *SFOA* please refer to Outdoor Public Spaces and Home Environments in the Protection chapter.

Evidence

Four systematic reviews[22,25,26,28] and one overview of systematic reviews[21] from the pre-appraised literature and one narrative review[27] submitted by SFO-SAC, focused on smoke-free policies (both comprehensive and partial) that ban or restrict smoking or tobacco-use in workplaces (mainly hospitality sites such as bars and restaurants), public places (e.g., bowling alleys, bingo, pool halls, discos, night clubs, casinos and licensed gambling venues), health care facilities (e.g., hospitals and psychiatric facilities), private homes and communities. For smoke-free campus policies, please refer to the Campus-Based Interventions section of this chapter. Three of the six reviews were appraised as Level I,[21,25,28] one as Level II,[26] and two as Level III.[22,27] Most studies in the review were conducted in the U.S., with some studies in Canada, Germany, Australia and Finland.

Evidence of Effectiveness

Overall, the systematic review by Hopkins et al. (2010) found 37 studies on smoke-free policies that decreased prevalence of tobacco use, increased quit rates, increased self-reported tobacco-use cessation and reduced cigarettes smoked per day.[25] These results were validated in Hoffman and Tan's (2015) overview of systematic reviews, which included the Hopkins et al. (2010) review and found greater reductions in comprehensive smoke-free policies.

Based on 21 studies, workplace smoke-free policies resulted in an absolute reduction in smoking prevalence of 3.4 % (interquartile range (IQR): −6.3% to −1.4%) from baseline.[25] Similar results were found in another systematic review of 20 studies that assessed the effects of smoking bans on smoking prevalence, primarily in hospitality settings.[22] For example, in Saskatoon, Canada, smoking prevalence dropped from 24.1% to 18.2% one year after implementation of a new, local and comprehensive smoking ban.[22] In contrast, a Cochrane review by Callinan et al. (2010) found that legislative bans, primarily in the hospitality sector, had inconsistent effects on smoking prevalence across 15 studies.[26] However, five of the 15 studies reported smoking prevalence as a confounder or co-variable rather than

an outcome measure in itself.[26] Eight of the remaining studies showed moderate decreases in smoking prevalence, while two remaining studies showed no change.[26]

Based on 16 studies, cigarette-smoking workers who were exposed to a smoke-free policy had a median quit rate of 13.2% (interquartile interval: 7.2% - 21.6%) with a median follow-up of one year (range: four weeks to eight years).[25] The review by Wilson et al. (2012) found that smoking bans in bars and/or restaurants had a small or insignificant effect on quit rates across nine studies. However, most of these studies lacked a comparison group.[22]

Based on 23 studies, the impact of smoke-free policies among workers resulted in a median improvement in smoking cessation of 6.4 percentage points (interquartile interval: +2.0 to +9.7 percentage points).[25] Eleven of the 23 studies reported differences in tobacco-use cessation between subjects exposed and not exposed to a smoke-free policy in a workplace setting.[25] The median absolute percentage difference in self-reported cessation was 6.4 percentage points (interquartile interval: 1.3–7.9 percentage points) and the median relative percentage change was 45% (interquartile interval: 29%–57%).[25] In addition, eight of these studies found that worksite smoke-free policies had significant effects on cessation (Odds Ratio (OR): 1.21, 95% Confidence Interval (CI): 1.00-1.45), as did community smoke-free policies, such as the Community Intervention Trial for Smoking Cessation in the U.S. and Canada (OR: 1.92, 95% CI: 1.11-3.32).[25]

Based on 18 studies, Hopkins et al. (2010) concluded that cigarette consumption in worksites was reduced by approximately 2.2 cigarettes per day per person (IQR: −1.7 to −3.3) following implementation of smoke-free policies.[25] The Cochrane review also found positive results in 13 studies that showed a drop in average consumption of tobacco after implementation of legislative bans, primarily in the hospitality sector.[26]

An economic evaluation demonstrated that smoke-free policies at worksites resulted in savings for employers through lowered health care costs and fewer losses from reduced productivity, as well as health benefits for former tobacco users.[25] Smoke-free policies may also be more cost effective than other strategies, such as free nicotine replacement therapy (NRT).[25] However, the authors of this review caution that their economic findings are based on a small number of studies, and that additional research is needed.[25]

One systematic review, which included 14 studies, investigated the impact of smoke-free policies in inpatient psychiatric facilities.[28] Results showed that smoking bans and restrictions significantly reduced cigarette consumption up to three months post-discharge, positively motivated quitting and belief about quitting ability, increased the rate of quit attempts, and decreased nicotine dependence levels.[28]

The narrative review by Mills et al. (2009) found that smoke-free homes were associated with increased smoking cessation and decreased cigarette consumption in adult smokers.[27] Smokers who lived in a smoke-free home were more likely to have made a quit attempt (OR: 1.32, 95% CI: 1.1-1.57; adjusted OR: 1.6, 95% CI: 1.3-2.1), to be abstinent at 12 month follow-up (OR: 2.10, 95% CI: 1.09-4.04; adjusted OR:3.89, 95% CI: 2.55-5.87) and to remain abstinent (90 day abstinence) (OR: 1.99, 95% CI: 0.93-4.25; adjusted OR: 4.81, 95% CI: 3.06-7.59) than smokers not living in homes with total smoking bans.[27]

Smoke-free homes were associated with a modest but significant reduction in cigarette consumption (e.g., about two cigarettes less per day) and delayed time to smoking the first cigarette of the day (e.g., delayed by about 30 minutes).[27]

Intervention Characteristics/Implementation Considerations

There are several possible barriers to the effectiveness of smoke-free policies, including weaker restrictions (e.g., exempting some worksite locations, such as designated smoking areas) and compliance and enforcement of these policies. Policies may also face opposition by tobacco industry-sponsored groups or businesses that are concerned about potential losses.[25] Despite these barriers, smoke-free policies can change social norms and reinforce compliance.

For smoke-free homes, more intense restrictions, such as 100% smoke-free homes, were found to be more beneficial (i.e., they increased the likelihood of quitting and remaining abstinent, and delayed time to the first cigarette of the day).[27] Partial home smoking restrictions showed little or no effect on quit attempts or abstinence of more than one month.

Specific Populations/Equity Considerations

Effects of smoke-free homes on relapse rates differed by gender. One primary study found that men living in smoke-free homes had lower odds of relapsing than men living in homes where smoking was allowed; however, no difference in relapse rates was found for women. No odds ratios were provided.[27] For more information, please refer to Cessation Maintenance.

Intervention Summary

Evidence Summary - Smoke-Free Policies - Well supported

The body of evidence regarding the effectiveness of smoke-free policies for smoking cessation included four systematic reviews, one overview of reviews and one narrative review (three appraised as strong Level 1, one Level II, and two as Level III). There is consistent evidence that indoor (with or without outdoor designated smoking areas or complete bans on outdoor property) smoke-free policies, primarily in the workplace setting, are effective to decrease the prevalence of tobacco use, increase quit rates, increase self-reported tobacco-use cessation, and reduce cigarettes smoked per day. There is promising evidence for smoke-free home policies to be effective to increase quit attempts and abstinence and to reduce cigarette consumption.

SFO-SAC 2016 Scientific Consensus Statement - High (Intensify)

In Ontario, smoke-free policies have advanced since the SFO-SAC 2010 report, with many local jurisdictions broadening smoke-free municipal bylaws. Based on the summary of evidence, smoke-free polices in various settings (work place, public places, health care facilities, private homes and communities) increased smoking cessation. Improvements to smoke-free policies in Ontario could be expanded to other areas not currently covered under the *Smoke Free Ontario Act* such as beaches, trails, outdoor festivals and unsheltered bus stops. Smoke-free homes (as well as in multi-unit housing) in Ontario have the potential to reach smokers with low socio-economic status, where reach is determined by the level at which the policy is implemented (e.g., local, provincial, federal). Research so far on smoke-free homes shows effectiveness on increasing smoking cessation; therefore, this is an area of opportunity for Ontario to apply comprehensive smoke-free policies.

The scientific consensus regarding the potential contribution for Ontario is: High (Intensify)

Key Message

Smoke-Free policies have been shown to be effective in Ontario and should continue to expand into other areas to promote smoking cessation.

Marketing Interventions

Mass Media - Cessation

Ontario has implemented mass media campaigns in the past; however, none have been of sufficient duration and intensity, and with adequate communication about cessation services and programs. Based on the summary of the evidence, mass media campaigns that are part of comprehensive tobacco control programs are effective at increasing smoking cessation. Future tobacco control initiatives in Ontario need to be longer in duration and intensity, as well as use more negative health effects messaging, with reference to cessation services such as quitlines (e.g., The Tips campaign in the U.S.).

SFO-SAC 2016 Scientific Consensus Statement

Background

Mass media campaigns are a common vehicle for instituting broad-based public awareness and education initiatives. A tobacco control mass media campaign is defined as "Any campaign intended to reduce tobacco use using channels of communication such as television, radio, newspapers, billboards, posters, leaflets, or booklets intended to reach large numbers of people, which are not dependent on person-to-person contact".[22] Campaigns can reach a large number of individuals.[29] They are frequently used to keep tobacco control on social and political agendas, and to challenge social norms as well as individuals' smoking behaviour.[29] Article 12 of the WHO *Framework Convention on Tobacco Control* urges the promotion of: "broad access to effective and comprehensive educational and public awareness programmes on the health risks including the addictive characteristics of tobacco consumption and exposure to tobacco smoke".[14] Social media also can be used as a platform to disseminate mass media campaigns. See a full analysis of social media in the Technology-Based Interventions: Internet /Computer and Text Messaging section.

The Ontario/Canadian Context

In 2013, the Ministry of Health and Long Term Care (MOHLTC) implemented a province-wide campaign, *Quit the Denial,* targeted at young adults, ages 18 to 29, who identified as 'social smokers'. The campaign ran till 2014.[30] In January 2016, the MOHLTC launched a tobacco cessation campaign to encourage quit attempts among regular smokers, ages 35-44. The campaign consisted of two cable television commercials and online banners.[31] No evaluation results are available. The *Leave the Pack Behind* program has implemented a number of cessation campaigns, including two complementary campaigns - *Don't Cave to the Crave,* and the *wouldurather* contest, and a pilot campaign titled *Make It Memorable: Holiday Quit Campaign* in 2014/15.[32]

Evidence

Five systematic reviews,[22,29,33-35] one narrative review,[36] one integrative review,[37] and one overview of systematic reviews[21] were identified by the pre-appraised literature search, along with one primary study[38] submitted by SFO-SAC. Three reviews were appraised as Level I,[21,29,33] four were appraised as Level II[34-37] and one was appraised as Level III.[22] The primary study was appraised as Level II on the Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies.[38] The majority of the studies took place in the U.S., Australia, New Zealand and Europe.

Evidence of Effectiveness

Tobacco control mass media campaigns that are part of comprehensive tobacco control programs have generally been shown to promote smoking cessation by reducing tobacco consumption, and increasing quit attempts, quit rates, and abstinence.[21,29,37] The overview of systematic reviews by Hoffman (2015) found that among five reviews that examined media campaigns as part of comprehensive tobacco control programs, four (including Durkin (2015) and Bala (2013)) reported reductions in smoking behaviour. Results were not pooled, so odds ratios and/or risk ratios were not reported.[21] The systematic review showed mixed results.[22]

Intervention Characteristics/Implementation Considerations

Reach, intensity, duration and message type influence the success of mass media campaigns.[37] For example, television advertisements were twice as likely as radio ads to be recalled by respondents. Television is widely accessed by most populations; however, campaigns that are limited to cable, as opposed to broadcast television, may reduce reach to rural areas.[36] Mass media campaigns that used negative health effects messages were found to increase knowledge, positive beliefs or motivation to quit more than how-to-quit messages, anti-industry messages and social norms themes.[37] Similar results were found in a review of campaigns that targeted youth, where using a negative emotional tone had greater influence than campaigns with a positive or neutral tone.[36]

In addition, a systematic review of economic evaluations of tobacco control mass media campaigns found all types of media channels (e.g., television, radio and print media) to be a cost-effective public health intervention.[33]

An example of a comprehensive mass media campaign was the *Tips* campaign, conducted in the U.S. in the spring (12 weeks) of 2012. It was the first national mass media antismoking campaign funded by the American Government, where they used personal testimonials from former smokers who were living with the health consequences of smoking.[38] Advertisements appeared on all cable television networks and were broadcast on smaller, local television channels in media markets with high smoking prevalence. Radio, print, billboard and digital and website advertisements with Spanish translation were also employed. This comprehensive campaign reached 80% of American smokers and resulted in a significant increase in the reported prevalence of quit attempts (one day or longer) from 31.1% (95% CI: 30.3-31.9) before the *Tips* campaign to 34.8% (95% CI: 34.0-35.7) after three months. Of smokers reporting a quit attempt, 13.4% reported abstinence at follow- up.[38] After its launch in 2012, the *Tips* campaign ran for 16 weeks in 2013 and for nine weeks in 2014. Overall, from 2012-2015, more than five million smokers attempted to quit because of the campaign and approximately 400,000 of those that did quit for good.[39]

Specific Populations/Equity Considerations

Anti-tobacco campaigns that are not tailored to specific populations have been found to have variable effectiveness across SES groups[35,37] and Indigenous populations.[34,35] Gould (2013) found that, while Indigenous people preferred culturally- targeted messages, such messaging did not result in additional benefit over non-targeted campaigns to change smoking behaviour.[34] Anti-tobacco media campaigns specifically targeting youth were found to be effective across racial/ethnic populations and gender.[36] However, several review authors noted the lack of research on these populations.[34-36] No peer-reviewed studies were found on Canadian Indigenous groups.[34]

Intervention Summary

Evidence Summary - Mass Media - Cessation - Well supported

The body of evidence regarding the effectiveness of mass media for smoking cessation included five systematic reviews, two reviews, an overview of systematic reviews (three were appraised as Level I, four as Level II, and one as Level III) and one primary study. There was consistent evidence that mass media campaigns that are part of comprehensive tobacco control programs overall promote smoking cessation by reducing tobacco consumption and increasing quit attempts, quit rates and abstinence. Campaigns are more effective when delivered with sufficient reach, intensity and duration, and when they feature messages that convey negative health effects. Tailored mass media campaigns to specific populations such as youth and Indigenous populations may not be more effective than mass media campaigns targeted to the general population; therefore mass media campaigns targeted to the general population are equitable.

SFO-SAC 2026 Scientific Consensus Statement - High (Intensify)

Ontario has implemented mass media campaigns in the past; however, none have been of sufficient duration and intensity, and with adequate communication about cessation services and programs. Based on the summary of the evidence, mass media campaigns that are part of comprehensive tobacco control programs are effective at increasing smoking cessation. Future tobacco control initiatives in Ontario need to be longer in duration and intensity, as well as use more negative health effects messaging, with reference to cessation services such as quitlines (e.g., The *Tips* campaign in the U.S.).

The scientific consensus regarding the potential contribution for Ontario is: High (Intensify).

Key Message

Mass media campaigns are most effective when they have sufficient intensity and duration, feature messages that convey negative health effects and are part of a comprehensive tobacco control program.

Technology-Based Interventions: Internet /Computer and Text Messaging

In Ontario, there are many online tools and resources for smoking cessation (e.g., Don't Quit Quitting, Journey 2 Quit, Break it Off). Ontario's Smokers' Helpline also offers the Smoker's Helpline Text-Messaging service, which increased in use from 2009 to 2014 from 218 to 1,645 registrants. Based on the summary of evidence, interactive Internet and computer and text messaging interventions were effective to increase smoking cessation. Investment in social media (e.g., apps, private online chat rooms and online discussion boards) in Ontario could increase reach, especially among specific populations (e.g., youth, young adults and Indigenous populations) as part of a comprehensive tobacco strategy.

SFO-SAC 2016 Scientific Consensus Statement

Background

Technology-based smoking cessation interventions that use websites, computer programs, text messaging, smart phone applications and other electronic aids[40] offer ways to provide information and behavioural support to smokers who want to quit. There is a lot of variability in the delivery and content of Internet and computer-based interventions and in the terminology used to describe the interventions. However, some common features include information and support material, links to other websites for further information, quizzes, videos, periodic e-mails, telephone calls and/or text messaging services, online 'peer coaches' and 'experts' who offer advice, and interaction with peers via chat rooms.[41] Technology-based interventions are becoming increasingly prominent because they can reach large at-risk-populations at any time (Internet and mobile networks are very accessible), can be more cost effective and could be easily scalable to large populations.[42,43]

The Ontario/Canadian Context

Since 2010, a number of websites, online programs, resources and apps have been created in Ontario to address cessation. These interventions include: Don't Quit Quitting, Quit Run Chill, Prevention of Gestational and Neonatal Exposure to Tobacco Smoke, Quit and Get Fit, MyQuit.ca, Break-it Off, Eastern Ontario Health Unit Quit Smoking Mobile Application, and Crush the Crave. In addition, the Canadian Cancer Society's province-wide *Smokers' Helpline* (see Quitlines with Cessation Telephone Support for further details) offers Smokers' Helpline Text-Messaging services (currently ongoing).[9] The Smokers' Helpline Text-Messaging service provides automated messages to registrants for up to 13 weeks based on their quit date and preferences. Registrants are also able to text key words to the service to receive additional support.[9] The reach of Smoker's Helpline Text-Messaging service increased from 218 registrants in 2009-10 to 1,645 registrants in 2013-14.[9] In addition, Smokers' Helpline also offers online support, a number of contests and free NRT (smoker's helpline website).[44,45]

Evaluation Highlight

A recent primary study assessed the effect of *Break-It Off* (BIO), a multicomponent web-based and social media intervention.[46] This study compared participants from the BIO intervention and participants using

Smokers' Helpline (SHL); results showed that SHL users were more likely to be female, Caucasian, have high school education or less, intended to quit in the next 30 days, and were much more likely to be daily smokers compared to BIO participants; there was no difference in the level of addiction measures such as cigarettes smoked per day and time to first cigarette in the morning. Results demonstrated that BIO users had significantly higher quit rates and quit attempts, compared to SHL users. In terms of reach, there were approximately 44,000 visits to the BIO web page; most visits were from Ontario, followed by Saskatchewan, and about 4,000 people actually installed the app.[46]

Evidence

A number of articles focused on technology-based interventions for smoking cessation. These included seven meta-analyses[40-42,47-50] seven systematic reviews[34,43,51-55] and two narrative reviews[56,57] were retrieved from the pre-appraised literature search. One narrative review[58] and one primary study[46] were submitted by SFO-SAC. Among the 17 meta-analyses and reviews, seven were appraised as Level I,[40,42,47,48,50,52,54] eight were appraised as Level II, [34,41,43,49,51,53,55,56] and two were appraised as Level III.[57,58] The primary study was appraised as Level III using the Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies.[46] The majority of the studies, including those within reviews, took place in the U.S., Australia, New Zealand, Canada and Europe.

Evidence of Effectiveness

Technology-based interventions that used Internet and computer were effective with respect to smoking cessation outcomes such as quit and abstinence rates, especially when tailored and/or interactive, compared to minimal, non-interactive controls (e.g., print and self-help material).[40,41,43,48,50,54] For example, from a Cochrane systematic review, the relative risk (RR) for seven day smoking abstinence rates for interactive interventions versus usual care or self-help controls was 1.48 (95% CI: 1.11-2.78).[40] From a systematic review and network meta-analysis, the RR of smoking abstinence was 1.32 (95% CI: 1.21-1.55) for computer interventions compared with no intervention or generic self-help materials.[48] Studies, which promoted cessation attempts in smokers who were not yet ready to quit, were also significantly effective with a RR: 1.41 (95% CI: 1.23-1.63).[48] In a meta-analysis for both web- and computer-based interventions versus control (e.g., standard care, intervention without web component, untailored self-help materials and waitlist), the RR for smoking abstinence was 1.44 (95% CI: 1.27-1.64).[50] In contrast, other studies showed that when compared to usual care or an interactive control (e.g., phone and face-to-face counselling), there was no significant difference.[40,41,50,54] All Internet and computer reviews found high heterogeneity among studies due to variable intensity, frequency, duration and delivery of the interventions, or because they were part of multicomponent interventions (i.e., paired with behavioural counselling or pharmacotherapy); therefore, results must be interpreted with caution.

Interventions that used text messaging showed an overall significant effectiveness to increase smoking cessation in terms of reducing cigarette consumption, increasing quit rates and self-reported abstinence.[42,47,53,57,58] For example, in a recent meta-analysis, short message, service-based interventions showed a positive effect on increasing quit rates compared to controls (OR: 1.36, 95% CI: 1.23-1.51).[42] In an older meta-analysis, continuous abstinence of 26 weeks showed RR of 1.71 (95% CI: 1.47-1.99).[47] Some reviews found significant heterogeneity,[47,57,58] while one review did not find significant

heterogeneity[42] and another did not report any heterogeneity.[53] Since text messaging was often embedded in a multicomponent intervention, results should be interpreted with caution. However, it has been suggested in a systematic review that text messaging in combination with Internet and e-mail has some positive effects.[43]

One systematic review and network meta-analysis specifically focused on the cost-effectiveness of incorporating Internet sites, computer programs, mobile text messaging and other electronic aids into existing smoking cessation programs; the analysis found that making some form of electronic support available to smokers is likely to be cost-effective.[48]

Intervention Characteristics/Implementation Considerations

Some technology-based interventions were informed by theories and models that helped interpret and aid behavioural change at different stages of quitting. Some examples of theories and models included Social Cognitive Theory, Likelihood of Action Index Theory, Health Belief Model, Theory of Planned Behaviour, Prochaska's Transtheoretical Model and Theory of Social Support.[41,51,53,54,56,57] There were no studies that compared the effectiveness of the studies based on whether or not a theory or model was used, however, most studies used an established theory or model in behaviour change.

One review analyzed a number of different moderators to identify differences in effect sizes among text messaging interventions.[42] Results showed that text messaging combined with a web site had slightly higher effect sizes (e.g., texting plus web-based, OR: 1.58, 95% CI 1.25-1.99; text only, OR: 1.32, 95% CI: 1.17-1.48).[42] Results also demonstrated that fixed scheduled texting had the highest significant effect size compared to decreasing text messaging or varied text messaging (fixed messaging, OR: 1.57, 95% CI: 1.14-2.17; decreasing messaging, OR: 1.34, 95% CI: 1.23-1.50; variable messaging, OR: 2.13, 95% CI: 0.44-19.26); however, it should be noted that variable messaging had a larger, but not statistically significant, odds ratio compared to the fixed schedule texting.[42] Other moderators such as tailoring versus targeting, on-demand messaging, assessment messages, social support components and allowing the use of NRT did not result in significant differences compared to interventions that did not have these added features.[42]

One review examined the use of text-messaging as a recruitment method for smoking cessation programming.[55] The review found that use of text messaging for recruitment alongside telephone calls increased recruitment compared to no text messaging (RR 3.38, 95% CI 1.26 to 9.08).[55] Further, if text messages were tailored and said there was a scarcity of spots left (i.e., limited spots available) in the program, recruitment rates increased in comparison to generic text messages (RR 1.45, 95% CI 1.07 to 1.96). The review also demonstrated that tailored messages through an interactive voice response system resulted in a higher recruitment rate than assessment of smoking status alone using the same system (RR 8.64, 95% CI 4.41 to 16.93).[55]

Specific Populations/Equity Considerations

In youth and college students, the effect of Internet and computer-based interventions was mixed or there were no significant findings due to insufficient evidence and/or high heterogeneity.[40,50,51,54,56] For text messaging interventions among adolescents, young adults and college students, there was an

overall positive effect on abstinence.[49,56,57] In Indigenous populations, culturally-adapted technology interventions, such as modification of a generic website and CD-ROM , were well-received and moderately favourable in terms of usability. However, in terms of changing smoking behaviours, the research indicated no change, or the change was not assessed.[34] In New Zealand, text messaging interventions resulted in no significant differences in abstinence or quit rates between Indigenous and non-Indigenous populations.[34]

One systematic review analyzed the effectiveness of age-progression technology and found mixed results in terms of intention to quit and smoking cessation rates.[52] The majority of the studies that had significant results were those with only female participants.

Intervention Summary

Evidence Summary -Technology-Based Interventions: Internet/Computer and Text Messaging - Well supported

The body of evidence regarding the effectiveness of technology-based interventions for smoking cessation included seven meta-analyses, seven systematic reviews, three narrative reviews and one primary study (seven were appraised as Level I, eight as Level II, and three as Level III). Internet and computer interventions were effective to increase quit and abstinence rates, especially when tailored and/or interactive, compared to minimal, non-interactive controls (e.g., print and self-help material). Text messaging interventions were effective to increase smoking cessation in terms of reducing cigarette consumption, increasing quit rates and self-reported abstinence. Text messaging interventions reviewed were often combined with other interventions.

SFO-SAC 2016 Scientific Consensus Statement - High (Intensify)

In Ontario, there are many online tools and resources for smoking cessation (e.g., Don't Quit Quitting, Journey 2 Quit, Break it Off). Ontario's Smokers' Helpline also offers the Smoker's Helpline Text-Messaging service, which increased in use from 2009 to 2014 from 218 to 1,645 registrants. Based on the summary of evidence, interactive Internet and computer and text messaging interventions were effective to increase smoking cessation. Investment in social media (e.g., apps, private online chat rooms and online discussion boards) in Ontario could increase reach, especially among specific populations (e.g., youth, young adults and Indigenous populations) as part of a comprehensive tobacco strategy.

The scientific consensus regarding the potential contribution for Ontario is: High (Intensify).

Key Message

Technology-based interventions that use the Internet, computer, mobile phone and/or texting are effective to increase smoking cessation. Using social media shows promise to increase the reach of tobacco control interventions in Ontario.

Quitlines with Cessation Telephone Support

Quitlines have been implemented in Ontario (Smokers' Helpline) offering both reactive and proactive telephone counselling . They are offered directly to the public and are also a resource that health care providers can use to refer smokers for additional supports. Based on the summary of evidence, proactive telephone counselling is effective to increase smoking cessation. The reach of quitlines to smokers depends on how quitline numbers are promoted. Tobacco Products Labeling Regulations require tobacco products to include a pan-Canadian toll-free quitline number. However, there are other strategies to consider, such as mass media campaigns, which have a strong correlation with increased quitline call volume, and other traditional promotion methods such as radio, print, direct mailing and providing free cessation medications. In addition, advertising quitlines over the Internet may be a better way to reach young adult populations.

SFO-SAC 2016 Scientific Consensus Statement

Background

Quitlines are telephone-based tobacco cessation counselling services to help tobacco users quit smoking.[45] They can include both proactive and reactive counselling. Proactive telephone counselling is when a counsellor initiates one or more calls to help smokers quit or avoid relapse.[59] This might involve active recruitment (i.e., where the counsellor initiates first contact) or passive recruitment (i.e., where the smoker initiates contact by calling a quitline and a counsellor returns the call).[58,60] Reactive counselling provides support on demand to individuals who call the quitlines.[58,59]

The Ontario/Canadian Context

The Canadian Cancer Society, Ontario Division, operates the province-wide Smokers' Helpline. The Smokers' Helpline is a free phone-based (both reactive and proactive) smoking cessation service, which provides confidential support (e.g., creation of quit plans, referrals and resources) to individuals who want to quit, are thinking about quitting, have quit but want support, continue to smoke and do not want to quit, or want to help someone else quit.[9] Smokers' Helpline also offers online and text messaging support, a number of contests and free NRT.[44,45] There is also the Smokers' Helpline Quit Connection, which is a referral program between Smokers' Helpline and health care providers, who

identify and refer patients or clients who smoke or want to remain tobacco-free.[44,45] This program eliminates the need for patients and clients to call Smoker's Helpline themselves.

In 2012, *The Tobacco Products Labelling Regulations (SOR/2011-177)* stated that packages must include a pan-Canadian toll-free quitline number and web address to inform tobacco users about the availability of smoking cessation services.[61]

Table 6.1 shows the reach of Smokers' Helpline from 2009-10 to 2014-15. It is estimated that Smokers' Helpline reached 0.40% of Ontario smokers in 2014-15.

Table 6.1: *Smokers' Helpline* Reach, 2009-10 to 2014-15

Fiscal Year	Number of New Clients	Percentage of Ontario Smokers Reached
2009-10	5,820	0.30
2010-11	6,844	0.34
2011-12	7,964	0.39
2012-13	10,217	0.51
2013-14	7,934	0.41
2014-15	7,467	0.40

Source: Administrative data from Smokers' Helpline via OTRU Strategy Monitoring Report (2016).[9]

Evidence

Two meta-analyses[59,60] and two systematic reviews[43,55] from the pre-appraised literature examined the effectiveness of proactive telephone cessation counselling on smoking cessation. The meta-analysis by Stead et. al. (2013) also examined the impacts of reactive counselling.[59] In addition, one narrative review from the pre-appraised literature examined traditional (i.e., TV, radio, print ads) and newer (i.e., internet and social media) tobacco cessation methods on increasing quitline call volume;[62] and one primary study[63] submitted by SFO-SAC, focused on the effectiveness of health warning labels on increasing quit volume. Two reviews were appraised as Level I,[59,60] two were appraised as Level II[43,55] and one was appraised as Level III.[62] The primary study by Baskerville et al.[63] was appraised as Level II using the Effective Public Health Practice Project (EPHPP) tool. The majority of the included studies within these reviews took place in developed countries such as the U.S., the U.K., Australia, Canada, New Zealand, Germany and Spain.

Evidence of Effectiveness

All three reviews found positive effects of proactive telephone counselling on smoking cessation.[43,59,60] One of these reviews was a Cochrane meta-analysis by Stead et al. (2013); it examined the effects of telephone support (via helplines) on smoking abstinence.[59] The number of calls and the period over which they were delivered varied across included studies; these ranged from one to seven or more telephone calls within four weeks to over six months from point of contact.[59] Among smokers who

contacted helplines (i.e., passive recruitment), quit rates (at > six months follow-up) were higher for groups randomized to receive multiple sessions of proactive counselling, compared to controls who received self-help materials or brief advice (RR: 1.37, 95% CI: 1.26-1.50).[59] Similarly, those who were recruited actively by a counsellor had greater quit rates compared to controls (RR: 1.27, 95% CI: 1.2-1.36).[59]

The meta-analysis by Tzelepis et al. (2011) found that proactive telephone counselling (both active and passive recruitment) had a statistically significant effect on point prevalence abstinence at mid-term follow-up of six to nine months (RR: 1.26, 95% CI: 1.11 to 1.43, p<0.001), but not at long-term follow-up of 12 to 15 months (RR: 1.08, 95% CI: 0.99 to 1.19, p=0.10).[60] However, proactive telephone counselling was found to have a statistically significant effect on prolonged or continuous abstinence at both mid-term (six to nine months) and long-term (12 to 18 months) follow-up (for both active and passive recruitment).[60] The systematic review by Danielsson et al. (2014) reported an advantage for repeated proactive advice over single reactive advice to reduce smoking rates.[43]

Finally, three studies included in the Stead et al. (2013) review examined the impact of reactive telephone counselling compared to standard support (that included mailed self-help materials alone, general information and standard counselling) on smoking cessation outcomes at longest follow- up; all failed to detect any significant effects (RR: 0.96, 95% CI: 0.71-1.30; RR: 1.10, 95% CI: 0.73-1.67; RR: 1.10, 95% CI: 0.80-1.52).[59]

Intervention Characteristics/Implementation Considerations

There is some uncertainty regarding the dose-response relationship between the number of calls to quitlines and the proportion of individuals who quit smoking.[43,59] However, Stead et al. (2013) suggest that, despite the limited evidence, for reactive telephone counselling, one to three brief calls are less likely to provide a benefit (RR: 1.07; 95% CI: 0.91-1.26), while more than three calls may increase the likelihood of quitting when compared with a minimal intervention such as standard self-help or brief advice (RR: 1.32; 95% CI 1.23-1.42).[59] The authors also included 12 trials of proactive telephone counselling to the reactive telephone counselling intensity subgroups, and found this confirmed the benefit of more intensive interventions (data not reported).[59]

The manner in which quitlines are promoted can influence the use of quitline services. The narrative review by Momin et al. (2014) examined different methods of promoting quitlines and their effect on caller volume.[62] Fifteen studies on television advertising within mass media campaigns found an overall strong correlation with increased quitline call volume.[62] Other traditional promotion methods such as radio, print, direct mailing and providing free cessation medications had limited evidence, but appeared to be associated with increased quitline call volume.[62] Advertising quitlines over the Internet showed an increase in quitline call volume (especially in young adults ages 18-24) and may be more cost-effective than traditional channels for promotion.[62] The authors found a lack of evidence to support the effectiveness of promotion through social media on quitline call volume.[62]

Results from a quasi-experimental study conducted in Canada suggested that quitline reach could be improved through the implementation of health warning labels that display quitline numbers.[63] In the

six months after the introduction of new health warning labels featuring toll-free quitline numbers, 86.4% of new quitline callers reported seeing the quitline number on the warning labels.[63] Also, the volume of new incoming callers significantly increased from 1,182 pre-label period to 3,671 post-label period, which was combined for all participating provinces (i.e., Manitoba, New Brunswick, Newfoundland and Labrador, Nova Scotia, Ontario, Prince Edward Island, and Saskatchewan).[63] As well, the numbers receiving cessation treatment increased from 1,063 to 2,777.[63] For more information on Health Warning Labels, please refer to the Industry chapter.

One review examined the effect of phone calls as a recruitment method, both adjunct and in comparison to other methods (e.g., newsletter, text messages), for smoking cessation programs.[55] The review demonstrated that personal, tailored phone calls were more effective in combination with other methods (e.g., text messaging) when compared to other methods (e.g., newsletter and postcard) alone (RR 65.12, 95% CI 4.06 to 1045.4).[55]

Specific Populations/Equity Considerations

It has been suggested that the inclusion of quitline numbers on health warning labels has an impact on reach equity.[63] The results of a quasi-experimental Canadian study found that following the implementation of new health warning labels, the reach of quitlines significantly increased in a number of specific populations, which included young males (ages 18-29), people with low education and residents of rural communities.[63]

Intervention Summary

Evidence Summary - Quitlines with Cessation Telephone Support - Well supported

The body of evidence on the effectiveness of quitlines with Cessation Telephone Support included two meta-analyses, two systematic reviews, one narrative review and one primary study (two were appraised as Level I, three as Level II, and one as Level III). Quitlines that use proactive telephone counselling (counsellor initiating the call) are effective for smoking cessation in terms of increasing smoking abstinence and quit rates; however, reactive telephone counselling (counsellor receives calls versus initiates calls) had no significant effect. There is some evidence to suggest that a greater number of calls from a counsellor may increase the likelihood of cessation.

SFO-SAC 2016 Scientific Consensus Statement - Moderate (Intensify)

Quitlines have been implemented in Ontario (*Smokers' Helpline*) offering both reactive and proactive telephone counselling . They are offered directly to the public and are also a resource that health care providers can use to refer smokers for additional supports. Based on the summary of evidence, proactive telephone counselling is effective to increase smoking cessation. The reach of quitlines to smokers depends on how quitline numbers are promoted. *Tobacco Products Labeling Regulations* require tobacco products to include a pan-Canadian toll-free quitline number. However, there are other strategies to consider, such as mass media campaigns, which have a strong correlation with increased quitline call volume, and other traditional promotion methods such as radio, print, direct mailing and providing free cessation medications. In addition, advertising quitlines over the Internet may be a better way to reach young adult populations.

The scientific consensus regarding the potential contribution for Ontario is: Moderate (Intensify).

Key Message

Quitlines that use proactive telephone counselling are effective to promote smoking cessation. Ontario has existing quitline programs and can continue to integrate this service with other tobacco control programs through referral and other promotional strategies.

Interventions in Specific Settings

Smoking cessation initiatives have been implemented in various settings, including workplaces, homes, campuses and health care settings. Some interventions in these settings have targeted smokers (employees, students or patients) directly, while others have been aimed at motivating health care providers to promote smoking cessation among their patients. Evidence on smoking cessation interventions in long-term care facilities were not found in the published literature. This section addresses the impact on smoking cessation outcomes of behavioural and pharmacological interventions and smoke-free policies in various settings. The following subsections are divided by setting.

Health Care Interventions

According to CDC's *Best Practices for Comprehensive Tobacco Control Programs (2014),* tobacco cessation interventions need to be institutionalized in the health care system at all levels of routine clinical care (e.g., clinics, hospitals, emergency departments, dental offices, pharmacies).[64] This approach increases the likelihood that health care providers will consistently screen patients for tobacco use and follow up with those who use tobacco to provide appropriate treatment or referral.[64] The integration of tobacco control interventions at every level of health care delivery is crucial to achieve cessation outcomes. Health care settings involve a number of different populations, for whom a variety of cessation interventions can be applied.

Various strategies can be tailored for diverse populations, including the institutionalization of cessation interventions in health care, the expansion of cessation insurance coverage to reduce barriers to counselling and medications and increased support for quitlines, which have potentially broad reach; tailoring these strategies may be effective to increase quit rates.[64] Sustained support for smokers over time is also considered crucial.[65] Please see Cessation Maintenance for more information.

Clinical practice guidelines developed by The Canadian Action Network for the Advancement, Dissemination and Adoption of Practice-informed Tobacco Treatment, (CAN-ADAPTT),[66] recommend that: health care teams acquire adequate training, electronic medical recording systems are in place for screening and recording all interventions, and systematic institutional changes promoting treatment are implemented.[66]

The Cessation Task Force, is a group formed by MOHLTC that includes the Ministry, non-governmental organizations, service providers and researchers that supports and provides advice on the implementation of the *Renewed SFO Strategy* (on hold since December 2016).[67] One of the priorities of the plan is to build a cessation system to help any tobacco user, no matter where they work or live with multiple entry points to cessation services through a variety of settings, including provincially-integrated service providers and a central access point or "hub" (could potentially be implemented in the future).[68] In theory, the hub would increase the tailored linkage of the most appropriate supports for individual smokers and improve equitable access for all smokers.

The following discussion of the health care sector covers interventions in inpatient and outpatient settings, followed by interventions for health care providers to enhance their capacity in cessation intervention, including electronic record-keeping as an aid.

Hospital-Based Cessation Interventions

> *In Ontario, most hospitals provide at least a brief cessation intervention often with post-discharge referral to ongoing support, and some provide more intensive evidence-based inpatient programs (e.g., the OMSC program and Moving On to Being Free™). Based on the summary of evidence, higher intensity counselling interventions with a minimum of one month post-discharge support, with or without NRT, are effective at increasing smoking cessation. Inpatient interventions have the potential to increase quit attempts since hospitalization provides an opportunity to intervene with smokers who might not otherwise seek smoking cessation interventions. There is an opportunity to continue to expand brief interventions with post-discharge referrals and intensive interventions into all hospitals in Ontario to provide smoking cessation services.*
>
> *SFO-SAC 2016 Scientific Consensus Statement*

Background

Hospitals are institutions for treating the sick and injured (see the Glossary for full definition). Since smoking causes many types of health problems,[69] hospitals are a setting where it is possible to reach smokers who are experiencing the negative health effects of smoking and who may be more motivated to quit smoking.[12] Clinical smoking cessation interventions for patients include brief to intensive behavioural interventions and/or pharmacotherapy, with or without continued contact after hospital discharge. Smoke-free policies in hospitals support cessation, and as of 2018, all hospitals will be required to have smoke-free campuses (*SFOA* Hospitals), which is a contributing factor to the intensity of the interventions delivered.

The Ontario/Canadian Context

In 2011, the Ontario Tobacco Research Unit (OTRU) in partnership with the former Ministry of Health Promotion and Sport (MHPS) and the Ministry of Health and Long-Term Care (MOHLTC) conducted a web survey of Ontario hospitals to identify the status of hospital-based smoking cessation services, practices and polices.[70] The survey was a first step in a larger collaborative initiative to enhance cessation support to hospital patients with chronic disease.[70] A total of 165 out of 224 (74%) hospital sites in Ontario identified by MOHTLC completed the survey. Key findings from the report included:

- A majority of hospital sites (86%) reported offering cessation services to patients.
- Nicotine replacement therapy (73%), self-help materials (65%) and patient referrals to external sources (50%) were the three most common cessation services provided for inpatients.
- Nurses (89%) and physicians (79%) were the most commonly cited health professionals within the hospital who provided smoking cessation services to patients.

- The most commonly reported policies and practices to support smoking cessation were:
    - Documenting patient smoking status upon admission (79%)
    - Making smoking cessation pharmacotherapies available in the hospital formulary (73%)
    - Having standard methodology to identify smoking status (69%)
    - Having smoking cessation support for hospital staff (62%).[70]

The Ottawa Model for Smoking Cessation (OMSC), developed at the University of Ottawa Heart Institute, uses outreach facilitation (implementation support) and principles of organizational change and knowledge translation to embed and systematize evidence-based tobacco cessation interventions within hospitals and other health care organizations.[71] Once implemented, the model leads to the following five components: systematic identification of patient smoking status, documentation of smoking status on patient record, strategic advice for withdrawal management and quit attempts, offer of pharmacotherapy, and follow-up support for six-months post-discharge.[72] As of 2014, the OMSC has been implemented in 100 hospitals in Canada,[73] and evaluations show that Ontario hospitals reached 14,675 smokers in 2014/2015.[9]

The intensive case-managed smoking cessation intervention, Moving On to Being Free™, developed at Stanford University,[74] has been available for implementation into North Western (NW) Ontario hospitals since 2012. The intervention, which has consistently achieved the highest cessation outcomes in the published literature, involves an initial face-to-face session, followed by seven telephone counselling sessions over the first two months post-discharge, additional sessions as requested and follow-up at three, six and 12 months post-discharge.[12] The outcomes in NW Ontario (not yet published) are identical to the outcomes in the randomized clinical trials, and are among the highest quit rates reported in the literature.

From 2013-15, the MOHLTC provided funding to fourteen hospitals across Ontario to develop and implement an evidence-based smoking cessation intervention that targets inpatients and outpatients with chronic diseases (asthma, cardiovascular disease, COPD, diabetes and lung cancer). The project was known as the Hospital Demonstration Project Initiatives.[9] The 14 demonstration project sites represented a geographic spread across 10 of the 14 Local Health Integration Networks (LHIN) regions and a mix of hospital types (seven community hospitals, one academic ambulatory care hospital, three teaching hospitals, one chronic rehabilitation hospital and two mental health hospitals).[9] There is no evaluation information available at this time.

Evaluation Highlight

In 2010, an evaluation was conducted using the RE-AIM framework (Reach, Efficacy, Adoption, Implementation and Maintenance) to determine the impact of the OMSC in nine hospitals in the Champlain Local Health Integration Network.[71] The evaluation found that the six-month continuous abstinence rate was significantly higher post-OMSC than pre-OMSC (OR: 1.71, 95% CI: 1.11-2.64).[71] Similar results were found in a larger evaluation that included an additional four hospitals in New Brunswick and three in British Columbia (OR: 1.78, 95% CI: 1.30-2.45).[72] The OMSC has also been shown to be a cost-effective strategy for treating smokers with chronic diseases, such as acute myocardial infarction, unstable angina, heart failure and chronic obstructive pulmonary disease (COPD) (Mullen

2015).[73] A recent before-and-after study, completed in partnership with the Institute for Clinical Evaluative Sciences (ICES), examined the effectiveness of implementation of the OMSC in 14 Ontario hospitals on health and health care outcomes (n=1367 patient smokers).[75] Main findings were:

- 35% of the patients who received the OMSC were smoke-free at six-months, compared to only 20% of the usual care participants
- Within 30 days of discharge, patients who received the OMSC were 50% less likely to be re-admitted to the hospital for any cause, and 30% less likely to visit an emergency department
- Two years after discharge, smokers who received the OMSC were 21% less likely to be re-hospitalized and 9% less likely to visit an emergency department
- Smokers who received the OMSC had a 40% reduction in risk of death over two years.

As of March 2015, OMSC hospital partners more than doubled the number of smokers who receive cessation support each year, from just over 7,000 in 2009-10 to 14,675 in 2014-15.[9] Partners included 75 hospital sites in Ontario, representing 56 hospital organizations.[9] An analysis of a large sample of OMSC participants found that 55.3% of participants were male, and that the average age of participants was 55.7 years.[9]

Evidence

One Cochrane meta-analysis[12] was retrieved from the pre-appraised literature search. It was appraised as Level I. Most studies in this meta-analysis were conducted in the U.S., with some in Europe, Canada and Australia and one each in Japan and Israel.

Evidence of Effectiveness

The Cochrane meta-analysis included fifty trials that investigated the effects of various cessation interventions on hospitalized patients.[12] The authors grouped the interventions into four categories based on intervention intensity: single in-hospital contact lasting 15 minutes or less with no post-discharge follow-up support (level 1); one or more in-hospital contacts lasting more than 15 minutes in total with no post-discharge follow-up support (level 2); any in-hospital contact with post-discharge follow-up support for one month or less (level 3); and, any in-hospital contact with post-discharge follow-up support continuing for longer than one month (level 4).[12] The authors found that the most intensive (level 4) significantly increased quit rates (RR: 1.37, 95% CI: 1.27-1.48) one-year after discharge compared to usual care.[12] The less intensive interventions (levels 1-3) were not effective. NRT along with the most intensive intervention significantly increased quit rates (RR: 1.54, 95% CI: 1.34-1.79) compared to the intensive intervention alone.[12] Significant effects were not found for varenicline or bupropion.[12]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Hospital-based Cessation Interventions- Well supported

The body of evidence for the effectiveness of smoking cessation interventions in hospital-based cessation interventions included one systematic review appraised as Level I. Highly-intensive behavioural interventions, defined as any in-hospital contact with >one month follow-up post-discharge, with or without NRT, are effective for smoking cessation (at ≥six months of follow-up). There is no evidence for lower intensity interventions (i.e., no follow-up or follow-up less than one month post-discharge) or for varenicline or bupropion. The interventions in hospital settings examined in the review varied in type and intensity, and were delivered by various health professionals (mostly nurses and counsellors) in staff positions dedicated to cessation and not added to all clinicians' workloads.

SFO-SAC 2016 Scientific Consensus Statement - High (Intensify)

In Ontario, most hospitals provide at least a brief cessation intervention often with post-discharge referral to ongoing support, and some provide more intensive evidence-based inpatient programs (e.g., the OMSC program and Moving On to Being Free™). Based on the summary of evidence, higher intensity counselling interventions with a minimum of one month post-discharge support, with or without NRT, are effective at increasing smoking cessation. Inpatient interventions have the potential to increase quit attempts since hospitalization provides an opportunity to intervene with smokers who might not otherwise seek smoking cessation interventions. There is an opportunity to continue to expand brief interventions with post-discharge referrals and intensive interventions into all hospitals in Ontario to provide smoking cessation services.

The scientific consensus regarding the potential contribution for Ontario is: High (Intensify).

Key Message

Intensive behavioural interventions with or without NRT, which are effective for smoking cessation in hospital-based cessation interventions, are currently in many Ontario hospitals, and should be available in all hospitals. Follow-up is an essential component for success and access to post-discharge NRT would be beneficial.

Other Health Care Setting Cessation Interventions

There are programs in Ontario that support other health care setting cessation interventions to provide smoking cessation services. Examples include the TEACH Project and the Registered Nurses' Association of Ontario: Nursing Best Practice Smoking Cessation Initiative. There are also Ontario initiatives that aim to facilitate the delivery of cessation services, including the OMSC, Moving On to Being Free™, and Smoking Treatment for Ontario Patients program (STOP). Based on the summary of evidence, smoking cessation interventions were effective at increasing smoking cessation in all locations (except in emergency departments), regardless of the type of health professional who delivered the intervention. Interventions in other health care settings could reach a number of smokers in Ontario. It is important to ensure that all types of primary health care teams (i.e., solo primary care physicians and physician groups) and private practices (i.e., dentistry) receive support to deliver smoking cessation interventions.

SFO-SAC 2016 Scientific Consensus Statement

Background

This section includes interventions for people receiving primary care, outpatient surgery, emergency care, dental care and pharmacy services, as well as interventions that focus on improving the capacity of health care professionals as an implementation consideration. Although smoking cessation services are also provided in private homes and residences by health care professionals (e.g., nurses and occupational therapists), evidence on these smoking cessation interventions was not found in the published literature.

The Ontario/Canadian Context

In Ontario, there are a variety of primary care funding models that ultimately can affect the type and extent to which cessation services are offered. The funding models range from the traditional fee-for-service model for solo practitioners to a variety of more recently-developed group practice models.[76] Group models provide varying levels of support for physicians and nurse practitioners to work in cooperation and use the services of other health care professions.[76] Some of the models support dedicated positions for chronic disease prevention and management care and strongly support the delivery of cessation services, including more intensive interventions, which can be challenging to deliver in solo fee-for-service practices.

Since 2010, there have been various initiatives funded through the MOHLTC SFO Strategy to increase access to cessation support in primary care and other health care settings. Moving On to Being Free™, a derivative of Staying Free, an intensive provider-managed cessation intervention modified for the outpatient setting, is currently in 21 sites in northern Ontario (e.g., Family Health Team clinics, Community Health Centres and mobile units, Aboriginal Health Access Centres, public health units and home visits, and hospital outpatient programs) and has provided interventions to patients in 73 communities, including 36 First Nations communities.[74] The intervention includes web-based software

that guides providers through the intensive cessation intervention using branching algorithms that tailor the intervention to individuals.

In 2011, the Ontario government established the Ontario Pharmacy Smoking Cessation Program, which provides funding to community pharmacists to offer cessation support to Ontario Drug Benefit recipients and some Green Shield Canada plan members, through quit smoking materials and counselling.[77]

Since 2010, the Ottawa model has partnered with a total of 83 primary care organizations that represent more than 160 primary-care sites.[9] Examples of Ontario Primary Care Teams includes Family Health Teams, Community Health Centers and Nurse Practitioner-Lead Clinics.[78]

The Smoking Treatment for Ontario Patients program (STOP*),* which provides clients with cost-free NRT along with ongoing practitioner training support, has expanded into Family Health Teams, Community Health Centers, Aboriginal Health Access Centers, and Nurse Practitioner-Lead Clinics.[78] In 10 years, STOP has treated 170,000 Ontario smokers or roughly 8.5% of smokers. Current offerings in non-hospital settings treat approximately 25,000 smokers annually (1.25% of smokers). STOP is adopted and implemented in 84% of FHTs, 78% of CHCs, 45% of Community Addiction Agencies, 75% of NPLCs, and 100% of Aboriginal Health Access Centres. In addition, 100% of public health units operationalize the STOP on the Road program and have held 635 cessation workshops across Ontario. Quit rates at three, six and 12 months are available and range from 10% to 30%, using various models to handle missing data.

The following programs and resources have been developed since 2010to target health care professionals: The Registered Nurses' Association of Ontario Best Practice Champions for Smoke-Free Pregnancies Workshops, You Can Make it Happen, Brief Counselling for Tobacco Cessation: A Guide for Health Professionals, Women and Tobacco Info Pack: Gain A Better Understanding of How Smoking Affects Women's Health, and Reach 'n Teach. The main goal of these initiatives is to strengthen the capabilities of health professionals to provide cessation-based services to a diverse range of tobacco users. (Please see The Jurisdictional Scan for further details).

One other ongoing Ontario initiative that targets health care professionals is the Training Enhancement in Applied Cessation Counselling and Health Project (TEACH). TEACH is an Ontario-wide initiative, launched in 2006, to improve the capacity of health care professionals to provide intensive cessation counselling.[9] The project offers evidence-based core training courses to a variety of health care professionals (e.g., registered nurses, addiction counsellors, social workers, respiratory therapists and pharmacists). To date, TEACH has trained 4,536 health practitioners across Ontario. It also offers tailored courses for interventions with specific populations including patients with mental health, addictions or chronic disease, woman-centred approaches, and First Nations, Inuit and Métis populations.[9] The program has become a standard training method for primary-care and community-based centres that offer cessation services, such as, Family Health Teams, Community Health Centres, Addiction Agencies, and Aboriginal Health Access Centres.[9] Outcomes of the TEACH training are evident at six months and one year later. It should be noted that all Stop On the Road interventions are offered by TEACH-trained

practitioners.[9] A specialized TEACH is also offered to dentists in partnership with the Ontario Dental Association.[9]

In 2012, OTRU conducted a study on behalf of the MOHLTC to explore the experiences of dentists, dental hygienists and dental assistants in providing smoking cessation services to their patients within routine daily practice.[79] An online survey was distributed to 21, 922 dental health professionals across the province using convenience sampling. The response rate was 9% (1,966 out of 21,922).[79] Main findings of the study indicate that 21% of online survey respondents had received formal training in smoking cessation and less than 50% of respondents provided any form of smoking cessation services to all or most of their patients who smoke.[79] The majority of respondents reported being only somewhat confident in their knowledge and skills to provide smoking cessations services, though many responded that they were enthusiastic to provide such services.[79] As the response rate for the survey was very low, the results may not be representative of the experiences of dentists, dental hygienists and dental assistants; results should be interpreted with caution. For a detailed overview of OTRU's findings refer to the *Provision of Smoking Cessation by Ontario Dental Health Professionals* report 2012.[79]

In a 2004 position paper, the Canadian Dental Hygienists Association indicated that dental hygienists play a key role in delivering consistent tobacco use cessation messaging as members of an inter-disciplinary health professional team, and have a responsibility to provide tobacco cessation services as an integral part of oral health services.[80] Screening for tobacco use is currently on a voluntary basis for private oral health services.

Evaluation Highlight

OTRU conducted an evaluation of the Ontario Pharmacy Smoking Cessation Program, highlighting reach and types of service usage. It was reported that there has been a steady increase in enrollment rates by Ontario Drug Benefit recipients since the initial start date. However, only a third of Ontario pharmacies have participated in the program, with 56% of patients receiving follow-up services. OTRU's evaluation found that 25,625 Ontario Drug Benefit patients received cessation medication or counselling in 20-15. Of these patients, 24,815 received medication and 3,704 received counselling. The majority consisted of individuals using Ministry of Community and Social Services programs (Ontario Disability Support Program or Ontario Works); 32% were age 65+.[9]

Evidence

Eleven systematic reviews with meta-analyses,[81-91] one meta-analysis,[92] and six systematic reviews[93-98] were retrieved from the pre-appraised literature search. One review[58] was submitted by SFO-SAC. Fourteen reviews were appraised as Level I,[83-95,97] four as Level II[81,82,96,98] and one as Level III (West 2015).[58] Most studies took place in Europe and the U.S., some in Canada and Australia, and individual studies in Chile, Israel, Turkey, Japan and Korea.

Evidence of Effectiveness

In **primary care** settings, a Cochrane systematic review found physician advice significantly increased quitting rate (RR: 1.66, 95% CI: 1.42-1.94) compared to no advice or usual care.[86] It was found that significantly higher quit rates resulted from greater intensity of physician advice (through greater time

commitment and additional materials, besides leaflets) compared to no advice (RR: 1.86, 95% CI: 1.60-2.15) or minimal control (e.g. brief single consultation with or without leaflet, plus up to one follow-up visit) (RR: 1.37, 95% CI: 1.20-1.56).[86] A systematic review and meta-analysis found adjunct counselling significantly increased abstinence rates (OR: 1.73, 95% CI: 1.48-2.01), as did multi-component interventions (e.g., cost-free NRT in addition to education and practice-based supports to physician/professional delivering intervention) (OR: 2.19, 95% CI: 1.7-2.8) compared to no intervention, self-help materials, or usual care.[82] Similar results were also seen in an older systematic review[89] and in interventions in which nurses delivered cessation advice.[90] Behavioural/counselling interventions, such as group counselling, 'buddy' interventions (where individual smokers pair up to offer mutual support while trying to quit), brief advice and face-to-face behavioural support showed promising results in increasing abstinence or quit rates (where reviews did not report relative risk or odds ratio with confidence intervals).[58,93] Printed self-help materials showed small (OR: 1.50, 95% CI: 1.1-2.1)[82] or non-significant effects on abstinence rates.[58,82]

A review of the outpatient **pre-operative** setting found that intense behavioural interventions (multiple contacts, initiated at least four weeks before surgery) showed a larger significant effect in both short-term (RR: 10.76, 95% CI: 4.55-25.46) and long-term follow-up (RR: 2.96, 95% CI: 1.57-5.55) compared to control group participants (who received standard care with little or no information about smoking cessation or harm of tobacco smoking).[87]

Two systematic reviews (one also a meta-analysis) that focused on cessation interventions delivered in **emergency department** settings found the majority of interventions, including a combination of self-help materials, motivational interviewing, referrals to cessation programs, additional phone calls, counselling and brief advice, compared to a control (e.g., self-help material, referral or brief advice alone) did not have significant effects on smoking abstinence with various follow-up periods ranging from one to 12 months post-enrollment.[83,94] For example, based on seven randomized control trials primarily on adults (one study was on adolescents) in mostly urban emergency departments, there was a significant increase in point prevalence tobacco abstinence at one month (RR: 1.47, 95% CI: 1.06-2.06) but not at 3, 6 or 12 months follow-up (RR 1.24, 95% CI: 0.93-1.65; RR: 1.13, 95% CI: 0.86-1.49; RR 1.25, 95% CI: 0.91-1.72).[83]

With respect to **dental care** settings, a Cochrane review reported that interventions such as self-help materials, counselling, pharmacotherapy, referral to other sources of support or any combination of these interventions had significant effects on increasing abstinence rates compared to usual care or less treatment intensive controls (OR: 2.38, 95% CI: 1.70-3.35).[84] An older systematic review and meta-analysis came to the same conclusions, with the same but fewer included studies.[81]

In **community pharmacy** settings, a meta-analysis reported that five pharmacist-led interventions, including some form of advice and counselling (one-on-one or within a group), significantly increased abstinence rates compared to the control group receiving standard or usual care.[85] This was the case for short-term (<12 weeks) (RR: 2.48, 95% CI: 1.15-5.31), mid-term (12-24 weeks) (RR: 2.72, 95% CI: 1.38-5.38), and long-term (>24 weeks) (RR: 2.40, 95% CI: 1.37-4.23) abstinence.[85] There was moderate heterogeneity for overall and long-term follow-up and significantly high heterogeneity for short-term (I^2

= 87.6%) and mid-term follow-up (I^2 = 77.7%); therefore, results must be interpreted with caution because the moderate/high heterogeneity indicates there is a substantial amount of variability between the studies analyzed in this paper.[85]

Furthermore, a systematic review with 10 included studies (three of which were included in Saba et al. 2014) also analyzed pharmacist-led interventions.[95] Results showed that four out of six studies on non-pharmacological interventions (i.e., behavioural counselling or support) delivered by pharmacy personnel showed statistically significant benefits of the intervention compared to the control group (e.g., adjusted OR: 2.42, 95%CI: 1.90-3.08).[95] Results also suggested that multiple sessions were better than only one session. Two studies on pharmacological interventions (using nicotine patches) found mixed results; one study reported intervention benefits and the other two reported no intervention benefit at six months.[95] Similar results were also seen in three studies on interventions with a non-pharmacological and a pharmacological component.

Intervention Characteristics/Implementation Considerations

There were a few reviews that focused on interventions that strengthen the capacity of health care professionals (e.g., primary care physicians, nurses, dentists, psychologists or pharmacists) to provide cessation services. Health care professional capacity-building interventions such as training in smoking cessation care, financial incentives (e.g., l pay for good performance and practice, fee-per-service, salary capitation), and the use of electronic medical records (EMR) as a prompt for providing cessation care, are effective on provider-level outcomes (i.e., provision of smoking cessation interventions and referrals).[92,97,98] No significant effect was found for provider-level outcomes related to providing NRT.[92] Health care professional training was also effective on client-level outcomes such as significantly increasing the point prevalence of smoking in the intervention, compared to control (OR: 1.36, 95% CI: 1.20-1.55) and continuous abstinence (OR: 1.60, 95% CI: 1.26-2.03);[92] with the exception of financial incentive interventions, which did not have a significant effect on client-level outcomes.[91,96]

In contrast, the Papadakis et al. (2010) review found that practice-level interventions (including screening for smoking status and readiness to quit, checklists, electronic prompts, educational outreach provided to physicians and increased duration of physician visit) did not show a significant effect on smoking abstinence at six or 12 months.[82] However, multi-component interventions that combined education and practice-based supports were shown to increase practitioners' delivery of smoking cessation interventions, thereby significantly increasing smoking abstinence at six or 12 months (OR: 2.19, 95% CI: 1.71-2.79).[82]

Specific Populations/Equity Considerations

In the U.K., it was found that younger smokers, females, pregnant smokers and smokers living in deprived areas, who receive National Health Service counselling in primary care, appear to have lower short-term quit rates than other groups.[93] A systematic review of primary-care interventions for children and adolescents found that neither behavioural or bupropion cessation interventions improved cessation rates.[88]

Intervention Summary

Evidence Summary - Other Healthcare Setting Cessation Interventions - Well supported

The body of evidence regarding the effectiveness of interventions in primary care and other health care settings for smoking cessation included ten systematic reviews with meta-analysis, three systematic reviews and one review (11 appraised as Level I, two as Level II, and one as Level III). Interventions (mostly behavioural support/counselling of varying intensities, with or without pharmacotherapy) were overall effective at increasing smoking cessation and abstinence in primary care, outpatient pre-operative, dental care and pharmacy, but not in the emergency department setting. Interventions in these healthcare settings can vary in terms of intervention type and intensity, health care provider (i.e., nurses, pharmacists, primary care physicians and dentists), and setting.

SFO-SAC 2016 Scientific Consensus Statement - High (Intensify)

There are programs in Ontario that support other health care setting cessation interventions to provide smoking cessation services. Examples include the TEACH Project and the Registered Nurses' Association of Ontario: Nursing Best Practice Smoking Cessation Initiative. There are also Ontario initiatives that aim to facilitate the delivery of cessation services, including the OMSC, Moving On to Being Free™, and Smoking Treatment for Ontario Patients program (STOP). Based on the summary of evidence, smoking cessation interventions were effective at increasing smoking cessation in all locations (except in emergency departments), regardless of the type of health professional who delivered the intervention. Interventions in other health care settings could reach a number of smokers in Ontario. It is important to ensure that all types of primary health care teams (i.e., solo primary care physicians and physician groups) and private practices (i.e., dentistry) receive support to deliver smoking cessation interventions.

The scientific consensus regarding the potential contribution for Ontario is: High (intensify).

Key Message

Interventions in health care settings other than hospitals, such as primary care and outpatient pre-operative clinics, dental practices and pharmacies, but not in emergency departments, are effective at increasing smoking cessation. There is an opportunity in Ontario for further development of tobacco control initiatives in these settings.

Specific Medical Conditions

A number of interventions were identified that specifically target smokers who have been diagnosed with a medical condition, including mental illness, heart or lung disease, cerebrovascular disease, diabetes or cancer, or who are undergoing specific treatments, including methadone maintenance. The Intervention Summaries for the specific medical conditions do not have scientific consensus categorizations regarding their potential contribution for Ontario, because populations with specific medical conditions received the interventions already covered under healthcare settings. Focusing on these sub-populations does not necessarily have a high overall contribution for Ontario, but does address equity considerations, since populations with specific medical conditions can have a higher prevalence of smoking compared to the general population.

Overall, there is not a lot of review-level evidence within these specific populations; however, this does not mean that these smokers would not respond to a cessation treatment that was focused on the specific needs of a given patient population. Individuals suffering from disease caused by smoking are more likely to be motivated to quit smoking.[12] Specialists treating smokers may not necessarily have to deliver smoking cessation services, but should be able to have resources that are readily available and can be easily passed on to their patients to refer them to the appropriate smoking cessation program. Please refer to the Health Care Interventions section for more information. The evidence below is organized according to medical conditions. All articles were retrieved from the pre-appraised literature search.

Individuals with Cancer

> *In Ontario, there are currently 14 regional cancer programs that screen new patients for tobacco use, provide advice on the potential benefits of quitting, and provide referral to smoking cessation services for additional support. Based on the body of evidence, combined interventions of counselling and pharmacotherapy increased smoking cessation, especially in the perioperative period.*
>
> *SFO-SAC 2016 Scientific Consensus Statement*

Background

An oncology patient is an individual who has been diagnosed with cancer and is seeking treatment in a health care setting.[99] According to data from the Canadian Community Health Survey 2011-14, 20% of cancer patients reported daily or occasional smoking. Evidence has shown that smoking can diminish effectiveness of cancer treatments, exacerbate side effects of radiation and chemotherapy treatment, and increase the risk of developing additional complications.[100] Smoking diminishes overall quality of life for cancer patients and can decrease chance of survival (e.g., reoccurring cancer or second primary cancer).[100] Smoking cessation before and during treatment can have a positive benefit on treatment outcomes and lead toward a better quality of life for individuals diagnosed with cancer.[99,100]

The Ontario/Canadian Context

In Ontario, there are currently 14 regional cancer programs that screen new patients for tobacco use. Individuals who are identified as smokers are advised about the potential benefits of quitting, and then referred to cessation services for additional support. Cancer Care Ontario provides support for these programs, and is in the process of refining program implementation to make them more effective and sustainable. Current goals include the development of an implementation guide, exploring opportunities for collaboration with existing smoking cessation programs, creating a person-centred approach to referrals and follow-up, and creating a communications knowledge exchange strategy.[101]

Evidence

One systematic review and meta-analysis[102] and one narrative review[103] focused on the effectiveness of smoking cessation interventions in the adult oncology population. One was appraised as Level II[102] and the other was Level III.[103] The jurisdiction for the included studies in the reviews was not reported.

Evidence of Effectiveness

In the systematic review and meta-analysis by Nayan et al. (2013), ten RCTs and three prospective cohorts were included.[102] Cessation interventions consisted of counselling, NRT, bupropion and varenicline.[102] Results showed a non-significant difference in cessation between intervention and control (provided in the clinic) at a follow-up of five weeks (OR: 1.54, 95% CI: 0.91-2.64) and six months (OR: 1.31; 95% CI: 0.93 to 1.84).[102] In the perioperative period, pharmacological interventions combined with non-pharmacological interventions were effective to improve abstinence rates compared to usual care (OR: 1.40, 95% CI: 1.06 to 1.87), as well as a significantly higher likelihood of cessation compared to usual care (OR: 2.31, 95% CI: 1.32-4.07).[102] Therefore, Nayan et al. (2013) concluded that the perioperative period was the ideal time to intervene with cessation support for this population.[102]

One narrative review examined the efficacy of smoking cessation interventions in patients with lung disease, including lung cancer. The results were inconclusive due to insufficient evidence.[103]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Individuals with Cancer - Well supported

The body of evidence regarding the effectiveness of tobacco control interventions for oncology patients included one systematic review and meta-analysis and one narrative review (one appraised as Level II and one as Level III). There was evidence that pharmacological interventions combined with non-pharmacological interventions in the perioperative period were effective at improving abstinence rates, with a higher likelihood of achieving smoking cessation.

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In Ontario, there are currently 14 regional cancer programs that screen new patients for tobacco use, provide advice on the potential benefits of quitting, and provide referral to smoking cessation services for additional support. Based on the body of evidence, combined interventions of counselling and pharmacotherapy increased smoking cessation, especially in the perioperative period.

Key Message

Cancer programs in Ontario should continue to screen patients for tobacco use and provide services for smoking cessation and to be a model for other specialties.

Women during Prenatal and Postpartum Periods

In Ontario, the Prevention of Gestational and Neonatal Exposure to Tobacco Smoke (PREGNETS) is a program targeted to pregnant women and their families to help pregnant women quit smoking (before or during their pregnancies). Based on the summary of evidence, tailored multi-component counselling interventions are effective to increase smoking cessation in pregnant women (i.e., tailored advice, text messaging and self-help pamphlets). Evaluation of programs targeted to pregnant women in Ontario is important to determine if these programs meet the needs of women to quit smoking before or during prenatal and postpartum periods. More research is needed on the effectiveness of pharmacotherapy interventions for pregnant women.

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Background

A well-established body of evidence has documented the risk of smoking during pregnancy, including the increased risks of miscarriage, of delivering a baby preterm (37 weeks) or of low-birth weight and of various birth defects (e.g., cleft palate).[104] Smoking during the post-partum period can affect the baby's health through exposure to second and thirdhand smoke, as well through the presence of nicotine in breast milk.[105] Babies whose mothers smoke are more likely to develop weaker lungs and are more likely to die from sudden infant death syndrome (SIDS).[105]

Studies demonstrate that pregnant women are likely to under-report smoking status.[105] Negative attitudes toward smoking are often intensified when the smoker is pregnant. Overt anti-smoking attitudes may create an environment which makes it difficult for pregnant smokers to seek assistance to stop.[106] Furthermore, studies show that that more than half of women who smoke do not quit during

pregnancy. Those who do quit are likely to continue to smoke following pregnancy.[105] Given these factors, there is a need to develop smoking cessation programming that incorporates the psychological (e.g., addiction) and social factors which influence smoking behaviour to ensure successful quit attempts and long-term abstinence.

The Ontario/Canadian Context

The Prevention of Gestational and Neonatal Exposure to Tobacco Smoke (PREGNETS) is an online resource launched in 2003 that focuses on reducing smoking in pregnant and postpartum women.[107] The website offers smoking cessation practices for pregnant and post-partum women, a toolkit for health providers, educators and researchers, and an anonymous online discussion board.[107] PREGNETS was created with funding from Echo: Improving Women's Health in Ontario.[107] In addition, there are interventions targeted to health professionals, such as the Best Practice Champions for Smoke-Free Pregnancies Workshop Series, which trains nurses and health care providers by enhancing their knowledge and skills to deliver cessation services to pre- and postnatal women and their families.[108] In addition, Moving On to Being Free™, an evidence-based intensive cessation intervention is available at the Maternity Centre, Thunder Bay Regional Health Sciences Centre, and the prenatal program at Meno Ya Win Health Centre.[109] The program is available to pregnant women and partners, and involves tobacco reduction/cessation counselling pre- and post-natal, with follow-up continuing for one year after enrollment.

Evidence

Five systematic reviews and meta-analysis,[110-114] two systematic reviews,[115,116] and two narrative reviews[117,118] investigated smoking cessation interventions for pregnant women. One systematic review[119] and one narrative review[120] investigated smoking cessation interventions with partners of pregnant smokers. Five reviews were appraised as Level I[110-112,114,115], four reviews were appraised as Level II,[113,117,119,120] and two reviews were appraised as Level III.[116,118] Studies within the reviews primarily took place in the U.S., Europe, Canada, Australia, New Zealand, with a few from Latin America, Japan, China and Israel.

Evidence of Effectiveness

The Cochrane review by Chamberlain et al. (2013) included 86 trials that focused on psychosocial interventions to support women to stop smoking in pregnancy.[115] Counselling interventions had a statistically significant effect on smoking abstinence when compared to usual care (RR: 1.44, 95% CI: 1.19-1.75).[115] However, further analysis showed that results were statistically significant for counselling combined with other strategies (such as educational materials) (RR: 1.59, 95% CI: 1.15-2.21) and tailored counselling to the needs of individual women (RR: 1.49, 95% CI: 1.01-2.20), but not for counselling on its own (RR: 1.12, 95% CI: 0.89-1.42).[115] These results were supported by a review that found that generic counselling in isolation was not effective at improving smoking cessation rates in pregnant women (RR: 1.08, 95% CI: 0.84-1.40).[113] Other reviews found similar results, supporting the use of targeted psychosocial interventions such as counselling and interviewing as first-line treatments for pregnant women.[117,118] Another review also concluded that multi-component interventions were more likely to be successful than single component interventions, and that the included components should be tailored to

the characteristics of the individual, as well as what resources were available.[114] However, the effects did not persist at six months postpartum, and postpartum relapse rates were high.[114] For more information on relapse prevention in pregnant and postpartum women, please refer to Cessation Maintenance. Based on limited evidence, positive effects were seen for other psychosocial interventions such as health education, feedback, social support and incentives; however, the results for most of these interventions were not statistically significant.

A Cochrane review by Coleman et al. (2012) included six trials of pharmacological smoking cessation interventions during pregnancy.[110] The authors determined that there was insufficient evidence to support the use of NRT during pregnancy, confirming the results of a previous Cochrane review by Coleman (2011).[111] Their results showed a positive, but not statistically significant, effect for NRT compared with placebo and non-placebo controls (RR: 1.33, 95% CI: 0.93-1.91).[110] The authors also determined that there was insufficient evidence to support the safety of NRT for pregnant smokers, though they did not find statistically significant effects in any of their safety-related outcomes, including miscarriage (RR: 1.24, 95% CI: 0.37-4.17), stillbirth (RR: 1.98, 95% CI: 0.55-7.07), preterm birth (RR: 0.85, 95% CI: 0.57-1.26), neonatal intensive care unit admissions (RR: 0.94, 95% CI: 0.64-1.38), or neonatal deaths (RR: 0.28, 95% CI: 0.06-1.41).[110] No trials of bupropion or varenicline were found in this review.[110]

In contrast, a systematic review and meta-analysis by Myung et al. (2012) found a statistically significant effect in favour of pharmacotherapy for smoking cessation in pregnant women (RR: 1.80, 95% CI: 1.32-2.44).[112] Although many of the same studies from the Coleman et al. (2012) review were included, Myung et al. (2012) included two additional studies that were excluded in Coleman et al. (2012) because they were not RCTs; this inclusion accounts for the difference in findings.[112] One of the additional studies was a small study of bupropion, which found a statistically significant effect for smoking cessation compared to no medication (RR: 3.33, 95% CI: 1.06-10.49).[112] Pharmacotherapies were also identified in a review by Oncken et al. (2010) as an effective intervention to increase cessation of tobacco use during pregnancy.[118]

Two reviews examined the effects of partner support and partner-focused smoking cessation interventions on pregnant women.[119,120] It is important to consider interventions with partners of pregnant women, as it is more difficult for women to quit if their partners smoke.[116] Please refer to Enhancing Partner Support for more information. Hemsing et al. (2012) found that most interventions (seven of nine studies) did not have statistically significant effects on the smoking behaviour of partners of pregnant women.[119] The two studies that found statistically significant effects examined multi-component interventions, including counselling, free-NRT and self-help materials.[119] These results were confirmed by another review, which included many of the same studies.[120] However, no significant effects were observed at two, six, and 12 months postpartum, indicating high rates of relapse.[119]

Hemsing (2012) also examined the effect of increasing partner support for smoking cessation in pregnant women.[119] Based on limited evidence, increasing partner support does not appear to be effective for improving cessation among pregnant women.[119] However, as mentioned in Enhancing Partner Support, the observed effects may be confounded by the type of intervention delivered to the partner.

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Women during Prenatal and Postpartum Periods - Well supported

The body of evidence regarding the effectiveness of interventions for adults during the prenatal and postpartum period included five systematic review and meta-analyses, three systematic reviews and three narrative reviews (five appraised as Level I, four as Level II, and two as Level III). Overall, psychosocial interventions that were multi-component, such as counselling combined with other strategies (i.e. health education, feedback, and social support) as well as being tailored, were effective at increasing smoking cessation in pregnant women. Evidence on pharmacotherapy interventions had mixed effects and partner support-focused interventions did not appear to have an effect on increasing smoking cessation among pregnant women.

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In Ontario, the Prevention of Gestational and Neonatal Exposure to Tobacco Smoke (PREGNETS) is a program targeted to pregnant women and their families to help pregnant women quit smoking (before or during their pregnancies). Based on the summary of evidence, tailored multi-component counselling interventions are effective to increase smoking cessation in pregnant women (i.e., tailored advice, text messaging and self-help pamphlets). Evaluation of programs targeted to pregnant women in Ontario is important to determine if these programs meet the needs of women to quit smoking before or during prenatal and postpartum periods. More research is needed on the effectiveness of pharmacotherapy interventions for pregnant women.

Key Message

Tailored multi-component counselling interventions are effective at increasing smoking cessation in prenatal and postpartum women and need to be easily accessible for pregnant women and their families (e.g., maternity wards and community centers).

Individuals with Chronic Obstructive Pulmonary Disease (COPD)

Based on the summary of evidence, interventions (especially those with combined behavioural and pharmacotherapy interventions), targeted to individuals with COPD are effective to increase smoking cessation. Individuals with COPD are generally highly motivated to quit. There is opportunity for Ontario to implement smoking cessation interventions with this population.

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Background

Chronic Obstructive Pulmonary Disease (COPD) is a lung disease that includes chronic bronchitis and emphysema. Individuals with COPD have obstructed, or blocked, lungs and experience difficulty breathing.[121] Smoking is a risk factor for COPD.[122] It is estimated that over 850,000 individuals living in Ontario, ages 35 and older, have COPD,[123] and approximately 680,000 to 765,000 of these Ontarians' COPD is caused by smoking.[121]

The Ontario/Canadian Context

No information related to the Ontario or Canadian context was identified from the included literature of this report.

Evidence

Six reviews examined the effectiveness of interventions for individuals with chronic obstructive pulmonary disease (COPD). These included one systematic review and meta-analysis,[124] one systematic review and network meta-analysis,[125] three systematic reviews,[126-128] and one narrative review.[103] Four reviews were appraised as Level I,[124-126,128] one review was appraised as Level II,[127] and one review was appraised as Level III.[103] Five of the six reviews did not report the jurisdiction of included studies; however, the one review that did, included studies from the Netherlands, Denmark, Ireland, the U.S., Spain, France and Italy.[128]

Evidence of Effectiveness

All reviews except one narrative review[103] demonstrated positive effects of smoking cessation interventions for individuals with COPD.[124-128] Behavioural interventions were shown to have a positive effect of smoking cessation among individuals with COPD in a medical setting (pooled mean effect size estimate: 0.46, 95% CI: 0.37-0.55),[124] (RR: 2.3, 95% CI: 1.3-4.2).[128]

From two systematic reviews, abstinence rates were found to be higher in COPD patients receiving NRT (RR: 3.01, 95% CI: 1.02 to 8.89,[127] bupropion (RR: 2.01, 95% CI: 1.24-3.24) (Thabane 2012),[127] Nortriptyline (RR: 2.54, 95% CI: 0.87-7.44),[127] and Varenicline (RR: 3.3, 95% CI: 1.9-5.9)[128] compared to a placebo.[127,128]

A systematic review reported that psychosocial interventions combined with pharmacotherapy were found to be effective in smoking cessation (12 months post-intervention) among individuals with COPD

(OR: 2.35, 95% CI: 0.25-21.74); however, the effect is not statistically significant due to small sample size and heterogeneity among studies.[126]

In an older systematic review and network meta-analysis, smoking cessation counselling, when combined with NRT was significantly more effective in prolonging abstinence among individuals with COPD, compared to usual care (OR: 5.08, 95% CI: 4.32-5.97) or counselling alone (OR: 2.80, 95% CI: 1.49-5.26).[125] Behavioural counselling alone was shown to be somewhat, although not significantly, more effective than usual care (OR: 1.82, 95% CI: 0.96-3.44).[125] The intensity of counselling or the choice of drug did not seem to influence the results[125,128] with the exception of combined high-intensity counselling and NRT, which were significantly more effective than combined low-intensity counselling and NRT (OR: 1.81, 95% CI: 1.04-3.15).[125]

One narrative review reported that there was insufficient evidence to comment on the efficacy of smoking cessation methods in individuals with COPD, however, the results were generally positive.[103]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Individuals with Chronic Obstructive Pulmonary Disease (COPD) – Supported

The body of evidence on the effectiveness of interventions for individuals with chronic obstructive pulmonary disease (COPD) included one systematic review and meta-analysis, one systematic review and network meta-analysis, three systematic reviews, and one narrative review (four appraised as Level I, one as Level II, and one as Level III). Overall, the evidence showed positive, but not consistently significant, effects for smoking cessation interventions (e.g. behavioural and pharmacotherapy interventions), with greater effectiveness seen in combination treatments (e.g., intensive counselling with NRT).

SFO-SAC 2016 Scientific Consensus Statement

Based on the summary of evidence, interventions (especially those with combined behavioural and pharmacotherapy interventions), targeted to individuals with COPD are effective to increase smoking cessation. Individuals with COPD are generally highly motivated to quit. There is opportunity for Ontario to implement smoking cessation interventions with this population.

Key Message

More research is needed in Ontario on the effectiveness and implementation of interventions targeted to smokers with COPD.

Individuals with Cardiovascular Disease

Based on the body of evidence, interventions targeted to individuals with cardiovascular disease are effective to increase smoking cessation. Individuals with heart disease are considered to be highly motivated to quit. There is opportunity for Ontario to implement smoking cessation interventions with this population (e.g., in cardiac wards in hospitals or for people who have survived heart attacks).

SFO-SAC 2016 Scientific Consensus Statement

Background

Cardiovascular disease is commonly called "heart disease" and refers to conditions in which the blood vessels of the heart are narrowed or blocked, increasing the risk for heart attack (coronary heart disease).[129,130] There is evidence that smoking is a risk factor for developing cardiovascular disease.[131]

The Ontario/Canadian Context

No information related to the Ontario or Canadian context was identified from the included literature of this report.

Evidence

Five systematic reviews and meta-analyses[12,132-135] examined the efficacy of smoking cessation interventions for individuals with cardiovascular disease. These interventions include, but are not limited to, behavioural therapy, telephone support, self-help materials, pharmacotherapy or a combination of these interventions. Three reviews were appraised as Level I[12,132,135] and two reviews were appraised as Level II.[133,134] The majority of the included studies were from the U.S., with additional studies from Canada, Norway, the U.K., Netherlands, Australia, Denmark, Spain, Lithuania, Sweden, Brazil, Germany, Japan, Belgium, Israel and China. Two reviews did not report jurisdictions.[133,134]

Evidence of Effectiveness

In all five meta-analyses, smoking cessation interventions targeted to patients with cardiovascular disease were shown to be effective in promoting short-term abstinence, compared with usual care or placebos. For example, higher-intensity interventions, in which there was a follow-up of a month or more after the first hospital contact, resulted in increased smoking cessation rates (e.g., RR: 1.28, 95% CI: 1.17-1.40)[132] in cardiovascular disease patients.[12,132,135] A Cochrane review reported a RR: 1.22, 95%

CI: 1.13-1.32 when comparing psychosocial smoking cessation interventions with usual care.[132] Two reviews found that this effect was lost at long-term follow-up,[132,133] though one systematic review and meta-analysis notes that this finding may have resulted from the small sample of included studies.[133]

Three systematic reviews and meta-analyses looked at the effectiveness of pharmacotherapy in this population, whether alone or in conjunction with another intervention.[133-135] Two reviews found that the use of bupropion significantly improved short-term smoking abstinence (e.g., RR: 1.21, 95% CI: 1.02-1.45;[133] when compared to a placebo.[133,134] One review found that the addition of NRT or bupropion to psycho-educational interventions did not significantly improve smoking cessation.[135] However, the safety profile for bupropion in this population is still unclear due to inconsistencies in the reporting of safety data.[133]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Individuals with Cardiovascular Disease - Well supported

The body of evidence on the effectiveness of interventions for individuals with cardiovascular disease included five systematic review and meta-analyses (three appraised as Level I and two as Level II). Overall, the evidence showed effectiveness of NRT, bupropion and psycho-educational/social interventions to improve smoking abstinence. More intensive interventions (i.e., greater than, or equal to, a month of follow-up) were more effective than less intensive interventions.

SFO-SAC 2016 Consensus Statement

Based on the body of evidence, interventions targeted to individuals with cardiovascular disease are effective to increase smoking cessation. Individuals with heart disease are considered to be highly motivated to quit. There is opportunity for Ontario to implement smoking cessation interventions with this population (e.g., in cardiac wards in hospitals or for people who have survived heart attacks).

Key Message

More smoking cessation interventions targeted to smokers with cardiovascular disease need to be implemented in Ontario.

Individuals with Mental illness

Based on the summary of evidence, interventions targeted to individuals with mental illnesses are effective at increasing smoking cessation. Implementation of pharmacotherapy and behavioural counselling for individuals with mental illness in Ontario needs to be explored further and evaluated for effectiveness (e.g., in psychiatric hospitals/clinics and mental health facilities).

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Background

The most common mental illnesses in Ontario are depression, bipolar disorder, alcohol use disorders, social phobia and schizophrenia.[136] According to the Canadian Mental Health Association (CMHA), one in five Ontarians experience mental illness within a given year, which is an estimated 2.72 million Ontarians directly affected by mental illness in 2014.[137] Furthermore, it is estimated that individuals living with a mental illness are two to four times more likely to smoke than those without mental illness.[138] For example, the prevalence of smoking rates for schizophrenia, alcohol dependence and depression are estimated to be 88%, 85% and 49%, respectively.[138] Individuals with mental illness also have been found to have higher rates of relapse after a quit attempt, have higher nicotine dependence, experience negative mood symptoms from withdrawal, and have a higher burden of smoking-related morbidity and mortality than the general population.[139,140]

The Ontario/Canadian Context

The Smoking Treatment for Ontario Patients (STOP) program was expanded to addiction agencies across the province through the implementation of the STOP with Addictions program. Please refer to the Ontario Context section of Individuals with Alcohol and Other Substance Abuse Issues for more information.

Evidence

Five systematic review and meta-analyses[139-143] and two narrative reviews[144,145] examined the effectiveness of health care smoking cessation interventions for individuals with mental illness (a population known for high smoking rates). Four reviews were appraised as Level I,[139,140,142,143] two reviews were appraised as Level II,[141,144] and one review was appraised as Level III.[145] The majority of the included studies took place in the U.S., with additional studies from Australia, Canada, Israel, Korea, Taiwan, Iran, Germany, Iceland and the Netherlands.

Evidence of Effectiveness

Two reviews examined the impact of smoking cessation interventions on individuals with **severe mental illness** (e.g., bipolar disorder, delusional disorder, severe mood disorders).[139,145] The systematic review and meta-analysis by Banham (2010) suggested that in comparison to no therapy, pharmacotherapy (RR: 2.77, 95% CI: 1.48-5.16) and combined pharmacotherapy and psychological interventions (RR: 4.18, 95% CI: 1.30-13.42) significantly reduce smoking in this population.[139] The narrative review by Mistler

(2012) suggested that shared decision-making, decision aids and behavioural support interventions may increase quit behaviours (e.g., intention to quit, quit attempts) and reduce smoking among individuals with severe mental illness.[145]

Three reviews examined the impact of smoking cessation interventions on individuals with **schizophrenia or schizoaffective disorder**.[141,142,144] Two reviews examined the effect of bupropion on smoking behaviour and found that it increased abstinence among people with schizophrenia.[142,144] The Cochrane review by Tsoi (2013) found that smoking abstinence among individuals using bupropion was significantly higher at the end of treatment compared to people using a placebo (RR: 3.03, 95% CI: 1.69-5.42) and also at six month follow-up (RR: 2.78, 95% CI: 1.02-7.58).[142] Similarly, the narrative review by Ferron (2009) found that among the five studies examining bupropion, the effect sizes at the end of treatment compared with placebo were large and ranged from 0.62 to 0.83; however, at three month follow-up, effect sizes ranged from no effect to large effect (ES: 0.0 to 0.77).[144] In most of the studies, smoking rates increased after the medication was discontinued. There was no direct comparison to baseline reported.[144]

Additionally, Tsoi et al. (2013) found that abstinence rates among individuals using varenicline were significantly higher at the end of treatment compared to those using a placebo (RR: 4.74, 95% CI: 1.34-6.71).[142] In contrast, a more recent systematic review and meta-analysis of seven trials reports that varenicline had no significant effect on abstinence compared to placebo in individuals with schizophrenia.[141] Lastly, one included study in the systematic review by Ferron (2009) found that NRT resulted in greater abstinence rates (27%) than the control (0%).[144]

It is important to note that due to the specific participant characteristics (i.e., individuals with schizophrenia), most studies had a small number of participants (n= 8 to 298), and few studies reported outcomes beyond a six month follow-up.[142,144]

Two systematic reviews and meta-analyses (one of them a Cochrane review)[143] examined the impact of smoking cessation interventions (i.e., mood management, anti-depressants and NRT) for individuals with **depression**.[140,143] Both found a positive effect of adding psychosocial mood management to standard smoking cessation interventions (RR: 1.41, 95% CI: 1.01-1.96;[140] RR: 1.47, 95% CI: 1.13-1.92),[143] a non-significant effect of anti-depressants (e.g., bupropion) (RR: 1.37, 95% CI: 0.83-2.27;[143] RR: 1.31, 95% CI: 0.73-2.34[140]) and a positive effect of NRT on cessation rates among individuals with depression; however, neither study had a sufficient number of NRT trials to conduct a meta-analysis of NRT results.[140,143]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Individuals with Mental Illness - Well supported

The body of evidence regarding the effectiveness of interventions on individuals with mental illness included five systematic review and meta-analyses and two narrative reviews (four appraised as Level I, two as Level II, and one as Level III). The evidence showed variable levels of effectiveness, depending on both the intervention and the type of mental illness. Pharmacotherapy and pharmacotherapy with behavioural therapy showed strong effectiveness at increasing abstinence when compared to control groups in individuals diagnosed with severe mental illness. Bupropion showed strong effectiveness at increasing abstinence when compared to control groups for individuals with schizophrenia. Psychosocial mood management showed moderate effectiveness at increasing abstinence when compared to control groups for individuals with depression.

SFO-SAC 2016 Scientific Consensus Statement

Based on the summary of evidence, interventions targeted to individuals with mental illnesses are effective at increasing smoking cessation. Implementation of pharmacotherapy and behavioural counselling for individuals with mental illness in Ontario needs to be explored further and evaluated for effectiveness (e.g., in psychiatric hospitals/clinics and mental health facilities).

Key Message

More research is needed in Ontario on implementing smoking cessation interventions targeted to smokers with mental illnesses.

Individuals with Cerebrovascular Disease

Based on the summary of evidence, there is insufficient evidence to determine if interventions targeted to individuals with cerebrovascular disease are effective to increase cessation rates. More research is needed on designing more effective interventions to increase smoking cessation for people with cerebrovascular disease.

SFO-SAC 2016 Scientific Consensus Statement

Background

Cerebrovascular disease is an umbrella term for any diseases in which areas of the brain are temporarily or permanently, and partially or fully affected by blockage or bleeding.[146] Stroke is the most common form of cerebrovascular disease. Smoking is a risk factor for cerebrovascular diseases like stroke.[147] According to the Ontario Stroke Network (2016), there are approximately 25,500 new stroke events in Ontario and 15,500 inpatient admissions related to stroke, each year.[148] However, it is unknown how many individuals with cerebrovascular disease have smoking as a risk factor.

The Ontario/Canadian Context

No information related to the Ontario or Canadian context was identified from the included literature of this report.

Evidence

One systematic review analyzed the effectiveness of interventions to increase cessation rates in adult smokers with cerebrovascular disease. Interventions included behavioural counselling and pharmacotherapy (e.g., NRT, bupropion and varenicline) delivered by various health care providers (e.g., general practitioners, nurse specialists).[149] The article was appraised as Level I. These studies took place in the U.K., Canada and Denmark.

Evidence of Effectiveness

Based on four included studies in the systematic review, the overall cessation rate was 23.9%, (42 of 176) compared to 20.8% (37 of 128) without intervention.[149] In general, authors note the limited number of studies that examined smoking cessation interventions with this population, as well as the need for larger studies to examine effectiveness.[149]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Individuals with Cerebrovascular Disease - Undetermined

The body of evidence on the effectiveness of interventions for individuals with cerebrovascular disease included one systematic review appraised as Level I. The results of the review showed no effect on cessation rates.

SFO-SAC 2016 Scientific Consensus Statement

Based on the summary of evidence, there is insufficient evidence to determine if interventions targeted to individuals with cerebrovascular disease are effective to increase cessation rates. More research is needed on designing more effective interventions to increase smoking cessation for people with cerebrovascular disease.

Key Message

More research is needed on the effectiveness of interventions targeted to smokers with cerebrovascular disease.

Individuals with Diabetes

Based on the summary of evidence, there is some promising evidence that more intensive interventions (i.e., pharmacotherapy plus counselling) are effective to increase smoking cessation. More research is needed on smoking cessation interventions that are targeted to people with diabetes.

SFO-SAC 2016 Scientific Consensus Statement

Background

Diabetes is a chronic disease in which insulin production or usage is impaired in the body, causing high blood sugar that can damage organs, blood vessels and nerves.[150] Type 1 diabetes is the impairment of insulin production.[150] Type 2 diabetes occurs when the body does not make enough insulin, or cannot properly use the insulin that is released (called insulin insensitivity).[151] Smoking is a known risk factor for Type II diabetes, with a positive dose-response relationship.[69] In 2014, approximately 7.4% of the Ontario population ages 12 and over reported that they have been diagnosed by a health professional as having Type 1 or Type 2 diabetes.[152] It is unknown how many individuals with living with diabetes are also smokers, in Ontario.

The Ontario/Canadian Context

No information related to the Ontario or Canadian context was identified from the included literature of this report identified.

Evidence

One systematic review and meta-analysis of randomized trials evaluated the effectiveness of smoking cessation interventions in individuals with type 1 or type 2 diabetes.[153] In total, eight trials were included in the qualitative analysis (n=4 for meta-analysis). Intensive interventions included both pharmacological (e.g., NRT, bupropion) and non-pharmacological methods (e.g., counselling, referral to smoking cessation clinic), while less intensive interventions consisted of usual care (e.g. counselling, optional medication).[153] The review was appraised as Level I. Studies were conducted in Europe, Asia, Australia and North America.

Evidence of Effectiveness

Results from the review indicate that there was no significant improvement in cessation rates between patients who received the more intensive intervention compared to the less intensive intervention (OR: 1.32, 95% CI: 0.23-7.43).[153] Authors noted that interventions were not tailored to the patient population, with the exception of an educational component about the effects of smoking on the complications of diabetes and glycemic control).[153]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Individuals with Diabetes - Promising direction

The body of evidence on the effectiveness of interventions for individuals with diabetes included one systematic review and meta-analysis appraised as Level I. The results of the review showed some possible effectiveness in more intensive interventions (i.e., pharmacotherapy and counselling) on smoking cessation.

SFO-SAC 2016 Scientific Consensus Statement

Based on the summary of evidence, there is some promising evidence that more intensive interventions (i.e., pharmacotherapy plus counselling) are effective to increase smoking cessation. More research is needed on smoking cessation interventions that are targeted to people with diabetes.

Key Message

More research is needed on the effectiveness of interventions targeted to smokers with diabetes.

Individuals with Alcohol and Other Substance Abuse Issues

In Ontario, the Smoking Treatment Ontario Patients (STOP) program provides cessation services to addiction agencies across the province. Based on the summary of evidence, there is insufficient evidence to determine if interventions specifically targeted to people undergoing methadone maintenance are effective to increase cessation rates. When looking at people with substance abuse issues more broadly, smoking cessation services can have a beneficial impact on both cessation and sobriety outcomes. There is potential for Ontario to continue to address cessation within substance abuse treatment through the integration of services into treatment plans across the province.

SFO-SAC 2016 Scientific Consensus Statement

Background

People with alcohol or other substance abuse issues are more likely to smoke, and can be more vulnerable to the health effects of smoking, compared to the general public.[154] Cannabis and alcohol are the two substances most frequently used alongside tobacco; others include cocaine and opioids.[155] The literature supports the use of treatments for tobacco dependence for concurrent addiction and substance abuse disorders, although success rates are typically lower than in the general population.[155] Smoking cessation interventions during addictions treatment also have been shown to enhance, rather than compromise, long-term sobriety.[154] Further, the literature suggests that an aggressive, integrated treatment model may improve effectiveness of tobacco cessation for people with concurrent alcohol addiction. For people with concurrent cannabis addiction, use of transdermal nicotine and cognitive-behavioural therapy (CBT) have been shown to be safe and effective; however, evidence to support this claim derives from one pilot study.[155] Moreover, polysubstance use disorders are associated with a lower likelihood of smoking cessation.[155] In general, cessation treatment for people with concurrent substance use disorders has not been well-studied with respect to integrating cessation treatment with substance abuse treatment, posing more challenges for clinicians developing treatment plans for these smokers.[154,155]

Given the parameters of the search criteria for the included literature, only interventions targeted to individuals undergoing methadone maintenance treatment were found.

The Ontario/Canadian Context

According to the Canadian Centre for Substance Abuse (CCSA) *National Treatments Indicators Report 2013–2014*, 83,232 unique individuals accessed publicly-funded substance use treatment services in Ontario (e.g., alcohol, opioid and cocaine), of whom 74.7% were new cases.[156] In total, these 83,232 individuals accounted for 111,493 treatment episodes, representing about 0.73% of the Ontario population 2013-14.[156] Approximately 75% of individuals who accessed substance abuse and addiction treatment were cigarette smokers. The majority of individuals who used substance abuse treatment services were treated for alcohol abuse.[156]

In 2012, the Smoking Treatment Ontario Patients (STOP) program expanded its services into addiction agencies across the province.[157] The program is currently running in all addiction agencies that are listed with Connex Ontario and is seeking to partner with as many other addiction agencies In Ontario as possible. The goal of the program is to 1) provide cost-free NRT for addiction agency clients and 2) increase capacity of addiction practitioners to provide comprehensive smoking cessation counselling. The program further supports ongoing training and knowledge exchange opportunities for practitioners to encourage them to incorporate up-to-date smoking cessation treatment approaches in their routine practice.[157] In 2014-15 2,348 people were enrolled in this branch of the STOP program. At six months post-treatment, the self-reported seven-day point prevalence abstinence was 31.7%.[9]

Evidence

One narrative review examined interventions for tobacco cessation among individuals undergoing methadone maintenance.[158] The review was rated Level II. All the included studies in the review were conducted in the U.S.

Evidence of Effectiveness

Cessation interventions (e.g., pharmacotherapy, incentives and counselling) were used across eight included studies.[158] Studies attempted to capture both abstinence at end of treatment and reduction of average number of cigarettes per day. There were no significant differences reported across studies on either outcome.[158] Moreover, the authors noted that, although studies suggest an increase in smoking cessation during interventions regardless of statistical significance, the rate of success was low and of short duration.[158]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Individuals with Alcohol or other Substance Abuse Issues - Undetermined

The body of evidence regarding the effectiveness of interventions for persons undergoing methadone maintenance included one narrative review appraised as Level II. Overall, the results of the review showed no significant effect on increasing abstinence or reducing the average number of cigarettes per day.

SFO-SAC 2016 Scientific Consensus Statement

In Ontario, the STOP program provides cessation services to addiction agencies across the province. Based on the summary of evidence, there is insufficient evidence to determine if interventions specifically targeted to people undergoing methadone maintenance are effective to increase cessation rates. When looking at people with substance abuse issues more broadly, smoking cessation services can have a beneficial impact on both cessation and sobriety outcomes. There is potential for Ontario to continue to address cessation within substance abuse treatment through the integration of services into treatment plans across the province.

Key Message

More research is needed on the effectiveness of interventions targeted to people undergoing methadone maintenance, as well as ensuring smoking cessation programs are accessible with addiction services.

Other Settings

Workplace-Based Interventions

Workplace-based interventions have been implemented in Ontario. Based on the summary of evidence, comprehensive cessation interventions in the workplace are effective to increase smoking cessation. Factors to consider when implementing workplace interventions are sustained engagement of employers and employees, activities aimed at altering the smoking culture, facilitating participation on-site during work hours, targeting workplace sectors with high smoking rates (i.e., trades, construction and equipment operators, manufacturing, restaurants, bars, retail), and having tailored, flexible and multi-component strategies (i.e., with cessation interventions and smoke-free policies). There is a need to provide support at the health unit level for workplace-based cessation interventions, especially in sectors with high smoking rates for the young adult smokers who work in these sectors. Providing incentives to workplaces to support cessation (e.g., benefits that include cessation support, implementation of smoke-free policies) may facilitate a shift to a non-smoking culture in the workplace.

SFO-SAC 2016 Scientific Consensus Statement

Background

Since most adults spend approximately one-third of their day at work, the workplace presents a unique setting where large groups of smokers can be reached.[159] In 2010, the direct cost of smoking to Canadian employers was an estimated $4,256 annually per daily smoker, attributable to smoking-related occurrences in the workplace such as unsanctioned smoke breaks and worker absenteeism.[160] In the same year, in Canada, the cost to society was an estimated $11.4 billion, attributable to short- and long-term disability costs and premature mortality.[160]

Individuals who work in trades, construction, primary industry, retail and hospitality tend to have the highest smoking rates among occupations, as well as lower uptake of smoking cessation interventions in the workplace.[161,162] In Ontario, 33% of the working population in processing and manufacturing, and 32% of workers in trades, transport and equipment operation identified as current smokers, compared to other occupations such as business (14%), health (13%) and natural and applied sciences (9%).[9]

The Ontario/Canadian Context

In 2011, the Program Training and Consultation Centre implemented a workplace health promotion program, called No Butts About It, which targets the retail trade industry.[163] The program offers a range of smoking cessation activities at the organizational, interpersonal and individual levels. Its aim is to offer a smoke-free environment for employees and to support them in their quit attempts, with a specific focus on young adults.[163] No evaluative information is available.

MOHLTC provided one time funding to 11 Ontario public health units (PHUs) from 2012-14 to implement the Workplace-based Cessation Demonstration Project Initiative at worksites in a variety of

occupational sectors (e.g., construction, mining, manufacturing and hospitality).[9] PHUs worked with employers and employees to deliver cessation initiatives that were designed to suit the context of each workplace. Common intervention components included the provision of cost-free NRT, referral to support through Smokers' Helpline, individual or group counselling and a variety of other supports and activities, including: self-help materials, cessation training for workplace staff, smoke-free policy development and increased access to cessation medications.[9]

Evaluation Highlight

An evaluation of the Workplace-based Cessation Demonstration Project Initiative was conducted by OTRU, in collaboration with participating PHUs and Tobacco Control Area Networks (TCANs), workplace leaders, the Canadian Cancer Society's Smokers' Helpline, and CAMH's Smoking Treatment for Ontario Patients.[9] The demonstration projects engaged an estimated 14% of smokers employed at 43 workplaces. The effectiveness of the project on smoking status was gleaned from a 6 month follow-up survey (n=319). According to the survey responses, 30% of participants reported not smoking in the seven days prior to the follow-up, 27% reported not smoking in the month before the follow-up and 14% reported not smoking during the six months between intake and follow-up.[9] Of the participants who continued to smoke at six month follow-up,(N=223), 81% had reduced the number of cigarettes they smoked in past six months, with the average number of cigarettes smoked per day significantly reduced from intake (21 to 13 cigarettes per day).[9]

Evidence

Three systematic reviews[159,164,165] and one qualitative evidence synthesis,[166] which focuses on intervention characteristics, were retrieved from the pre-appraised literature search. One review of reviews[167] was submitted by SFO-SAC. Two reviews were appraised as Level I[159,166] and three reviews were appraised as Level II.[164,165,167] The majority of the studies took place in the U.S., the U.K., Europe and Asia, with one study from Canada.

Evidence of Effectiveness

The Cochrane review by Cahill et al. (2014) included 57 studies and investigated the effectiveness of various workplace interventions to help workers quit smoking.[159] Group behavioural therapy (OR: 1.71, 95% CI: 1.05-2.80), individual counselling (OR: 1.96, 95% CI: 1.51-2.54), and pharmacological support (OR: 1.98, 95% CI: 1.26-3.11) were found to be effective to improve smoking cessation when targeting the individual without altering the worksite.[159] Other individual-level interventions such as self-help interventions (OR: 1.16, 95% CI: 0.74-1.82) and social support from family and friends (OR: 0.69, 95% CI: 0.18-2.62) were not shown to be effective.[159] The review also found that comprehensive multi-component interventions in the workplace (e.g., self-help materials with group counselling and workplace policies) were effective to increase smoking cessation rates when compared to control conditions (OR: 1.60, 95% CI: 1.12-2.30).[159] An advantage of multi-component interventions is that they are more likely to be inclusive of all smokers at various stages of the quitting process.[166]

Some comprehensive workplace interventions targeted multiple risk factors (e.g., smoking, body-mass index, blood pressure) with unclear effectiveness for cessation. One review did not find an effect in their narrative synthesis of the evidence,[159] while another systematic review found that comprehensive

interventions targeting multiple risk factors increased cessation rates in three of the five studies identified.[164]

Results for workplace incentive programs (e.g., monetary incentives) were mixed. The Cochrane review by Cahill et al. (2014) found that workplace incentive programs were effective to increase cessation rates (OR: 1.60, 95% CI: 1.12-2.30).[159] Due to the large size, high-quality and strong methodology of the studies, the authors were able to pool the results.[159] However, they noted that four of the studies failed to detect an effect.[159] A single trial contributed to 37% of the weighted value and was deemed responsible for the observed effect.[159] Two other systematic reviews looked at incentive programs in the workplace.[164,165] One review found mixed results,[164] while the other found that workplace incentive programmes and competitions did increase cessation rates when combined with other interventions.[165]

Refer to Financial Incentives for more information on financial incentives for smoking cessation in the general population. Evidence on smoke-free policies in the workplace setting can be found in Smoke-Free Policies.

There is currently limited literature on the cost-effectiveness of workplace interventions. Cahill et al. (2014) were able to obtain cost data from only six of 57 included studies.[159] Differences in time, jurisdiction and methods of calculation also made it difficult to compare results. The authors note that future research should include direct and indirect costs.[159] These conclusions were confirmed in an overview of reviews that included results on cost-effectiveness from three reviews;[167] including an earlier version of the Cahill et al. (2014) review.[168]

Intervention Characteristics/Implementation Considerations

Carroll et al. (2013) identified key barriers and enablers to workplace cessation programs in a qualitative evidence synthesis of employee views.[166] The results showed that readiness to quit is the key factor that motivates employees to participate in workplace cessation interventions. Because some workplace interventions, such as smoking bans, can trigger anxiety in those who are not ready to quit, the authors suggest that workplace interventions should incorporate multiple components suited to smokers at various stages of the quitting process, as this would encourage participation.[166] Multi-component interventions would also work to change the smoking culture of workplaces, as some smokers and non-smokers alike indicated that they did not feel that there was any problem with smoking in the workplace.[166]

Employer support was identified as an important enabler. Employees felt more encouraged to quit smoking when supported by employers, and when restrictions and policies were effectively enforced. This qualitative synthesis found that cost and inconveniently-timed services were two of the largest barriers to quitting smoking; it suggested that employers can facilitate quitting through the provision of convenient and affordable cessation services.[166]

There were two key articles on the implementation of workplace smoking cessation interventions for workers in trades, construction, primary industry, retail and hospitality.[161,162] While most workplaces in these industries have smoking cessation support programs, participation rates in these programs are generally low because programs often rely on community resources and are not tailored to the

organization or its workers.[162] A review of the literature suggests that most effective programs take collaborative approaches with the worker, including supportive, one-on-one communication.[162] These results were substantiated in interviews with workers, who specified that one-on-one communication along with peer group sessions were the best strategies.[162] A primary study that conducted focus groups and surveys among carpenters in St. Louis found that participants were motivated by tailored messages that emphasized family and taking pride in their work.[161]

Specific Populations/Equity Considerations

The Tobacco Free Workplace Initiative was funded by the British Columbia Healthy Living Alliance, and implemented by the Canadian Cancer Society.[169] The program targeted young adults in British Columbia (BC) working in primary industries, manufacturing, transportation, service and retail.[169] The Tobacco Free Workplace Initiative provided NRT, financial incentives and face-to-face support for employees (SRDC 2010).[169] It also tailored components of the program, for example, employing the slogan "Tell Your Boss I Quit!" to appeal to the younger population.[169]

In 2010, the Social Research and Demonstration Corporation conducted an evaluation of the Tobacco Free Workplace Initiative pilot project with 32 employers across BC.[169] The results of the evaluation showed that, of 418 participants, 122 (or 23%) successfully quit smoking at the end of the six-week program.[169] The program also raised awareness about available cessation services and increased knowledge about facilitators and barriers to quit attempts.[169] Unfortunately, participation from the target age group was low; focus groups and interviews with this age group revealed that, while they were aware of the program, they were not ready to quit.[169]

Intervention Summary

Evidence Summary - Workplace-Based Interventions - Well supported

The body of evidence regarding the effectiveness of workplace-based interventions included three systematic reviews, one qualitative evidence synthesis and one review of reviews (two appraised as Level I and three as Level II). Certain workplace-based interventions, such as individual counselling, group behavioural therapy, pharmacological treatments, and comprehensive multi-component interventions are effective to improve smoking cessation rates. Results for workplace incentive programs are mixed. Qualitative evidence showed that interventions should be comprehensive with multiple components to suit the needs of smokers at all stages of quitting.

SFO-SAC 2016 Scientific Consensus Statement - Moderate (Intensify)

Workplace-based interventions have been implemented in Ontario. Based on the summary of evidence, comprehensive cessation interventions in the workplace are effective to increase smoking cessation. Factors to consider when implementing workplace interventions are sustained engagement of employers and employees, activities aimed at altering the

smoking culture, facilitating participation on-site during work hours, targeting workplace sectors with high smoking rates (i.e., trades, construction and equipment operators, manufacturing, restaurants, bars, retail), and having tailored, flexible and multi-component strategies (i.e., with cessation interventions and smoke-free policies). There is a need to provide support at the health unit level for workplace-based cessation interventions, especially in sectors with high smoking rates for the young adult smokers who work in these sectors. Providing incentives to workplaces to support cessation (e.g., benefits that include cessation support, implementation of smoke-free policies) may facilitate a shift to a non-smoking culture in the workplace.

The scientific consensus regarding the potential contribution for Ontario is: Moderate (Intensify).

Key Message

Workplace interventions are effective to improve smoking cessation, especially comprehensive multi-component interventions that may be better suited to the needs of smokers at all stages of quitting. Comprehensive workplace interventions have demonstrated effectiveness in Ontario and need to be further implemented, monitored and evaluated.

Campus-Based Interventions

In Ontario, smoking cessation programs have been initiated on post-secondary campuses (e.g., Leave the Pack Behind), and it is illegal to sell tobacco products on campuses. Based on the summary of evidence, comprehensive tobacco programs using a variety of strategies have shown to be effective to increase smoking cessation. However, there are currently no universities or colleges in Ontario that have 100% smoke-free campuses. There is huge potential to reaching young adult smokers in campus settings and encourage them to quit smoking.

SFO-SAC 2016 Scientific Consensus Statement

Background

Tobacco-free and smoke-free policies on campuses (i.e., colleges, universities and trade schools) support cessation as well as helping to protect individuals from secondhand smoke and social exposure to smoking .[170,171] Such policies help to prevent smoking initiation, help smokers to quit and support former smokers to remain abstinent.[172] The American College Health Association has adopted a “No Tobacco

Use policy and encourages colleges and universities to achieve a 100% indoor and outdoor campus-wide tobacco free environment.[173] For more information on elementary- and secondary-school based interventions, please refer to School- and Campus-Based Interventions in the Prevention chapter.

The Ontario/Canadian Context

Since 2010, there have been both policy and program initiatives directed at Ontario post-secondary campuses, particularly for young adults. Updates to the *Smoke-Free Ontario Act*, which came into effect on January 1, 2016, prohibit the sale of tobacco on campuses and in buildings owned or leased by the institution, including student unions.[174] While it is not mandatory to implement smoke-free policies on campuses, the majority of Ontario campuses do implement restrictions, such as prohibiting smoking within nine metres of building entrances.[175] Twelve universities or colleges in other provinces and territories have implemented 100% smoke-free campus policies.[176]

Universities/Colleges in Canada with 100% Smoke-free Campuses

1. Acadia University (Wolfville, NS)[177]
2. Dalhousie University (Halifax, NS)[178]
3. Saint Mary's University (Halifax, NS)[179]
4. University of King's College (Halifax, NS)[180]
5. Memorial University of Newfoundland (with several campuses in NL)[181]
6. University of Winnipeg (Winnipeg, MB)[182]
7. Trinity Western University (Langley, BC)[183]
8. Emily Carr College of Art + Design (Vancouver, BC)[184]
9. Holland College (13 locations across PEI)[185]
10. Northern Alberta Institute of Technology (Edmonton and St. Albert, AB)[186]
11. Yukon College (Whitehorse, YT)[187]
12. College of the North Atlantic (17 locations across NL)[188]

According to a2016 environmental scan of Ontario College and University tobacco control policies conducted by Leave the Pack Behind, 23 out of 24 colleges exceed *SFOA* by having designated smoking areas, while 11 out of 20 universities exceed *SFOA*. For pharmacotherapy coverage, only two colleges and two universities cover just Champix/Zyban and another two colleges and four universities cover both Champix/Zyban and NRT in their Student Drug Plan.[189]

Leave the Pack Behind (LTPB) is a comprehensive and age-tailored initiative, which operates in all 20 universities and all 24 applied arts colleges in Ontario. The initiative supports cessation through policy development, communications campaigns, peer-to-peer programs and the provision of brief intensive smoking cessation counselling, as well as provision of an eight-week course of free NRT (accessible through an online platform). In 2011, LTPB implemented an online smoking cessation program called

Quit Run Chill.[9] The program pairs smoking cessation with developing a healthy lifestyle, offering information to support current and ex-smokers to avoid smoking (quit), to be more active (run), and to manage stress (chill).[9] The program is promoted to all young adults in Ontario both online and through peer-to-peer outreach on post-secondary campuses. In 2014-15, the *Quit Run Chill* program had 134 participants.[9]

Table 6.2 shows the reach of *Leave the Pack Behind* in 2014-15, which is estimated at 41,399 smokers, or approximately 10% of young adult smokers in Ontario, across all non-clinical programs and services.[9]

Table 6.2: Participants in Leave the Pack Behind, by Non-clinical Program/Service, 2014-15

Program or Service	# of Participants
Quit Run Chill	134
Wouldurather contest	4,603
Self-help books distributed by Public Health	6,124
SMOKE|QUIT self-help booklets distributed by student teams	29,320
One Step at a Time booklets distributed by student teams	1,218

Source: OTRU Strategy Monitoring Report (2016)[9]

Evidence

One systematic review and meta-analysis [190] and one systematic review [191] were retrieved from the pre-appraised literature search. In addition, one narrative review[172] was included from a PHO library search. Finally, one narrative review[192] and one primary study[193] were submitted by SFO-SAC. One review was assessed as Level I,[190] one review was assessed as Level II,[191] and two reviews were assessed as Level III.[172,192] The primary study[193] was appraised as Level I (using the CASP Qualitative Checklist). The majority of the studies were from the U.S., with a few from other western nations (e.g., Australia, New Zealand and Western European countries), and one primary study focused on Canadian university campuses.

Evidence of Effectiveness

From a recent systematic review and meta-analysis, four studies that measured effectiveness found that smoke-free or tobacco-free campus policies were shown to significantly decrease smoking prevalence (e.g., 16.5% baseline in 2007 to 12.8% in 2008) and cigarette consumption (e.g., 8.9 cigarettes to 3.6 cigarettes per day).[190] A systematic review examined smoking cessation programs for students at alternative and vocational high schools and showed an increase in smoking abstinence (OR: 4.24, 95% CI: 1.20-15.02) and cigarette consumption (OR: 1.9, 95% CI: 1.4-2.7).[191] A narrative review found short-

term (six week) effectiveness for text messaging and online cessation programs to significantly reduce smoking consumption and dependence among 45% of participants at a large university in the Washington, D.C., area.[192] Elements of a comprehensive tobacco control program were shown to increase quit rates, decrease smoking on campus and decrease chances of relapse; such elements included, creation of tobacco-free normative environments, restrictions on tobacco sales, advertising and promotions, increased enforcement of tobacco-related policies, education of students about smoking prevention, and implementation of tobacco cessation programs aimed at college students.[172]

Intervention Characteristics/Implementation Considerations

The systematic review and meta-analysis found a favourable level of support for a smoke-free campus policy among students, staff, and faculty.[190] Seven included studies of the review indicated that support before implementing the ban was 58.94% (95% CI: 52.35-65.52%; however, there was high heterogeneity) among students and 68.39% (95% CI: 65.12-71.76%) among staff and faculty.[190] Higher levels of support may assist in the implementation of a smoke-free policy, as resistance to the policy may be a barrier to implementation.

Baillie et al. (2009) conducted a study across 33 undergraduate Canadian universities to understand how tobacco control policies on university campuses are developed, introduced, implemented and enforced.[193] They found that 29 of 33 campuses favoured policies that emphasized protection from involuntary exposure to secondhand smoke, rather than punishment of smokers (e.g., issuing fines for smoking infractions).[193] This study cited common questions on policy enforcement, concerning, for instance, who was responsible to enforce regulations, how enforcement should be enacted, how much money should be allocated to enforcement and from where funds should be allocated (i.e., provincial, regional or campus finances).[193]

Participants also addressed the ethics of smoke-free policies with respect to infringement of civil liberties, potential to deter enrollment, recognition of nicotine dependence and the relocation of smoking to the surrounding community.[193] Overall, the authors suggested that more research is required to develop tobacco control policies that suit the needs of Canadian universities, with specific attention to enforcement.[193] Moreover, they argued that policies should be implemented alongside adequate cessation support for students.[193]

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Campus-Based Interventions - Well supported

The body of evidence regarding the effectiveness of campus-based interventions (e.g., colleges, universities and trade schools) included one systematic review and meta-analysis, one systematic review, two narrative reviews and one primary study (two appraised as Level I, one as Level II, and two as Level III). Young adults have the highest rates of smoking, and campus-based interventions such as cessation programs on campuses (including provision of NRT, self-help materials and technology-based supports), smoke-free policies and comprehensive tobacco control strategies (including policies and programs, media campaigns and advertising bans) have shown to be effective to increase quit rates and decrease cigarette consumption.

SFO-SAC 2016 Scientific Consensus Statement - Moderate (Intensify)

In Ontario, smoking cessation programs have been initiated on post-secondary campuses (e.g., Leave the Pack Behind), and it is illegal to sell tobacco products on campuses. Based on the summary of evidence, comprehensive tobacco programs using a variety of strategies have shown to be effective to increase smoking cessation. However, there are currently no universities or colleges in Ontario that have 100% smoke-free campuses. There is huge potential to reaching young adult smokers in campus settings and encourage them to quit smoking.

The scientific consensus regarding the potential contribution for Ontario is: Moderate (Intensify).

Key Message

Smoking cessation interventions in campus settings have been shown to be effective to increase quit attempts among students, and could have a large impact on all Ontario school campuses.

Interventions Targeted to Individuals

Pharmacotherapy

Ontario has the Ontario Drug Benefit program, which includes varenicline and bupropion for smoking cessation. Based on the summary of evidence, pharmacotherapy drugs such as NRT, varenicline and bupropion are effective to increase smoking cessation. Vulnerable populations, such as youth and young adults, the unemployed, underemployed and working poor, and those without private insurance or coverage have less access to smoking cessation medication. STOP has excess reach equity with low- and middle- income smokers, those with less than high school education, concurrent mental illness, other addictions and chronic health conditions.

SFO-SAC 2016 Scientific Consensus Statement

Background

Pharmacotherapy assists smokers to quit by reducing nicotine withdrawal symptoms. First-line drugs for aiding smoking cessation, which have been approved by Health Canada, include NRT and the non-nicotine drugs *bupropion hydrochloride* and *varenicline tartrate*.[194]

The Ontario/Canadian Context

Since 2011, The Ontario Drug Benefit program provides reimbursement for bupropion (Zyban™) and varenicline (Champix™) for smoking-cessation treatment, in conjunction with smoking-cessation counselling (provided by community pharmacists through the Pharmacy Smoking Cessation program), for Ontario Drug Benefit-eligible recipients (i.e., Ontarians ages 65 years and older, recipients of Ontario Disability Support Program or Ontario Works, residents of long-term care homes or homes for special care, Ontarians receiving home care services, and Ontarians registered in the Trillium Drug Program).[9] Treatment with each agent is limited to 12 weeks (168 tablets) of reimbursement per 365 days per patient.[9] According to the 2016 *OTRU Monitoring Report*, 25,625 smokers received drugs or counselling in the 2014-15 fiscal year.[9] From 2011 to 2013, 23% of clients enrolled in the Ontario Drug Benefit program reported quitting at six-month follow-up and 29% at 12-month follow-up.[9] NRT is an over-the-counter drug that is not covered by the Ontario Drug Benefit program. Ontario residents can access cost-free NRT through STOP if they are patients at an Ontario Family Health Team (FHT), Community Health Centre (CHC), addictions agency, or if they enroll in STOP on the Road programming. Furthermore, Ontario residents ages 18 to 29 can access cost-free NRT through programming offered by Leave the Pack Behind, where overall, more than 29,000 young adults have received NRT.[195,196]

Evidence

Twenty review articles were retrieved from the pre-appraised literature on pharmacotherapy cessation treatments. These included: eleven systematic reviews and meta-analysis,[91,197-206] two meta-analyses,[207,208] four systematic reviews,[209-213] two narrative reviews,[214,215] and one review of Cochrane reviews.[216] One narrative review,[217] one review of Cochrane reviews[58] and one primary study[218] were

submitted by SFO-SAC. Ten of the reviews were appraised as Level I,[200,205,207-210,213-216] and two as Level III.[58,217] Using the Newcastle-Ottawa Scale, the one primary study was appraised as Level I.[218] The majority of studies included in the reviews were conducted in the U.S.; some were conducted in other countries, including Canada, Australia and the U.K.

Evidence of Effectiveness

One of the most comprehensive reviews in the literature was the review of Cochrane reviews by Cahill (2013).[216] The review included 12 Cochrane reviews of randomized control trials (RCTs) examining a wide variety of pharmacotherapies. Details of this review are reported along with the findings of the other reviews in the corresponding sections below.

NRT is available in the form of **gum, inhalers, patches, mouth sprays or lozenges**. NRT supplies nicotine to the smoker in a manner that is safer than smoking tobacco cigarettes. The review by Cahill et al. (2013) reported that NRT in any form significantly increased the likelihood of achieving smoking abstinence at six or more months after the start of treatment compared to a placebo control (RR: 1.60, 95% CI: 1.53-1.68).[216] These results are further supported by a systematic review and meta-analysis of seven controlled trials, which found similar results on smoking abstinence at the end of the study follow-up period (NRT versus placebo or no pharmacotherapy; RR: 3.44, 95% CI: 1.48-7.96).[199]

Contrary to the above reviews, a systematic review of 12 population-based surveys conducted in multiple countries, including the U.S. and Canada, found inconsistent evidence on the association between NRT and smoking cessation.[211] Nevertheless, these results should be interpreted with caution due to the bias and methodological limitations inherent in survey studies.

A meta-analysis of controlled trials by Kimura et al. (2009) found that the **nicotine patch** (alone or with smoking cessation support) resulted in greater increases in cessation rates after one year than the placebo (alone or with cessation support) (RR: 1.59, 95% CI: 1.41-1.81).[207] Several other reviews of controlled trials found similar significant, positive findings on smoking abstinence for nicotine lozenges, gums and patches.[199,200,217]

A quality meta-analysis of controlled trials by Lindson et al. (2011) assessed **preloading**, which is the use of NRT prior to quitting smoking.[208] They found no significant increase on both short- and long-term smoking cessation (RR: 1.05, 95% CI: 0.92-1.19, I^2 (heterogeneity) =69% and RR: 1.16, 95% CI: 0.98-1.38, I^2=39%, respectively).[208] However, there was some evidence for pre-quit NRT (gum and/or patch form) on long-term quit rates in their narrative review (RR range: 1.1 to 3.1).[208] Inconsistencies in these findings are likely due to differences in review methods.[208]

A systematic review and multi-treatment meta-analysis of controlled trials by Mills et al. (2012) examined various NRT strategies, including **combining different NRT types** (nicotine patch and acute formulation), standard-dose NRT (≤22 mg), and **high-dose NRT** (>22mg).[205] They found a small effect for high-dose NRT on smoking abstinence at 12 months compared to standard-dose NRT (RR: 1.23, 95% CI: 1.05-1.46).[205] However, when compared with a placebo control, high-dose NRT demonstrated no therapeutic benefit.[205] The authors also found positive effects on smoking abstinence for combined NRT compared to a placebo control (RR: 1.37, 95% CI: 1.07-1.75).[205] In contrast, a narrative review of trials by

Carpenter et al. (2013) found no consistent benefits for high-dose NRT (RR range: 0.5 to 1.4) and combined NRT (RR range: 0.6 to 2.0).[214]

In a systematic review of observational studies, Hughes et al. (2011) found that the evidence on **over-the-counter NRT is unclear**.[210] Seven of the 11 retrospective cohort studies reported a total of nine analyses that were adjusted for confounders.[210] Six of the nine analyses found that over-the-counter NRT users had significantly greater quit rates than non-users (i.e., adjusted ORs were statistically significant and greater than 1.1).[210] Similar results were also seen in the pre- versus- post studies.[210] Despite these positive findings, the authors concluded that further research is needed, especially since the most rigorous studies did not find any effectiveness for over-the-counter NRT.[210] In particular, poor compliance can undermine the effectiveness of over-the-counter NRT. In this review, the measures of compliance were so varied that the researchers were unable to test the difference in compliance among treatment settings.[210]

Cahill et al. (2013) found that, in comparison with a placebo control, smoking abstinence at six months from treatment initiation was greater for **bupropion** (RR: 1.69, 95% CI: 1.53-1.85) and **nortriptyline** (RR: 2.03, 95% CI: 1.48-2.78).[216] However, there was insufficient or no evidence supporting **fluoxetine, paroxetine, sertraline, moclobemide, venlafaxine** and **selegiline**.[216] Other reviews that examined controlled trials or Cochrane reviews of controlled trials, also found benefits with bupropion.[58,200,205,206,217]

A systematic review (with a meta-analysis) by Leaviss et al. (2014) conducted controlled trials on **nicotine receptor partial agonists** which included varenicline and cytisine.[206] They found that the smoking cessation rate for the **varenicline** group at 0.5 or 1.0 mg twice daily (bid) was more than twice the rate in the placebo group (Hazard Ratio (HR): 2.16, 95% CI: 1.54-3.38 for 0.5 mg bid and HR: 2.58, 95% CI: 2.16-3.15 for 1.0 mg bid).[206] Consistent results on smoking abstinence were seen for varenicline versus placebo in the review by Cahill et al. (2013) (RR: 2.27, 95% CI: 2.02-2.55),[216] and in a systematic review and meta-analysis of 10 trials by Huang et al (2012) (RR: 2.83, 95% CI: 2.20-3.63).[201] All of these findings have also been noted in two additional reviews that examined controlled trials or Cochrane reviews of controlled trials.[58,215,217] There were greater smoking cessation rates with **cytisine** than placebo (HR: 4.27, 95% CI: 2.05-10.05).[206] Similar findings were found in the review by Cahill et al. (2013) (RR: 3.98, 95% CI 2.01-7.87)[216] and in a systematic review and meta-analysis of controlled trials by Hajek et al. (2013) (RR: 1.59, 95% CI: 1.43-1.75).[198]

One systematic review and meta-analysis of eight trials examined the **opioid antagonist naltrexone**.[197] The review found no evidence on naloxone (with or without behavioural support or NRT) for smoking cessation in the long-term (RR: 0.97, 95% CI: 0.76-1.24, I^2=0%).[197]

A number of **other pharmacotherapies** for aiding cessation were reviewed by Cahill (2013).[216] These include **anti-anxiety medications or anxiolytics** such as **buspirone, diazepam, meprobamate, oxprenolol** and the beta-blocker **metoprolol**. There were no improvements in smoking abstinence with these anxiolytics when compared to placebo or NRT.[216] Similarly, there were no improvements in smoking abstinence for **silver acetate** and **nicotine vaccines**.[216] They also found insufficient or limited

evidence on **lobeline, nicobrevin** and **mecamylamine**.[216] However, they did find some evidence supporting **clonidine** for smoking cessation.[216]

Behavioural support for smoking cessation may include counselling sessions, education, or video-enhanced self-help resources. The **combination of behavioural and pharmacological** interventions has been reflected in clinical practice guidelines.[66] In addition to behavioural support aimed specifically at smoking cessation, there are also interventions aimed at promoting adherence to smoking cessation medications. These interventions may include provision of information or reminders, monitoring medication use and providing feedback, or psychological therapy or counselling.[203]

Two Cochrane reviews of controlled trials examined the combination **of behavioural and pharmacological interventions**, or behavioural interventions of various intensity levels as an adjunct to pharmacotherapy.[202,204] One included 41 trials and found the combination of behavioural and pharmacological interventions could lead to greater smoking cessation rates, relative to minimal intervention or standard care (RR: 1.82, 95% CI: 1.66-2.00, I^2=40%).[202] The other Cochrane review found greater benefits with more intensive behavioural intervention as an adjunct to NRT (RR: 1.15, 95% CI: 1.06-1.25), compared to less intensive behavioural intervention as an adjunct to NRT.[204] The positive results of pharmacotherapy in combination with behavioural interventions are further supported in other reviews.[58,213]

A third Cochrane review of controlled trials showed that compared to standard care, interventions to promote medication adherence in addition to standard behavioural support can increase the likelihood of smoking abstinence in the long-term (RR: 1.16, 95% CI: 1.01-1.34).[203] Interventions to promote medication adherence included providing information on the rationale and importance of adherence to medication and assisting individuals with developing strategies to overcome barriers to adherence.[203] A systematic review of randomized trials and observational studies suggested that low medication adherence may limit the effects of smoking cessation medications; however, more research is needed to confirm this.[209]

Disclaimer*:* The above section is not to be used for medical advice. Please consult your nearest health care professional for further information about smoking cessation interventions.

Intervention Characteristics/Implementation Considerations

Providing insurance coverage for pharmacotherapy is one method to reduce the cost of cessation treatment for smokers.[91] This coverage may include changes to copayment or out-of-pocket payments, direct coverage (i.e., prescriptions for free pharmacotherapy) and coverage of health insurance fees (i.e., changes to premiums or fees paid for health insurance).

A systematic review and meta-analysis by Reda et. al. (2012) examined the effectiveness of insurance coverage on smoking cessation.[91] Full health insurance coverage interventions were defined as the intervention covered the cost of both pharmacotherapy and behavioural support and could be complemented by already-existing financial arrangements outside the intervention (e.g., insurance); partial coverage included either pharmacotherapy or behavioural support; no coverage meant that no insurance was offered by the intervention or from pre-existing financial arrangements.[91]

Results showed that full health insurance coverage interventions compared to no financial intervention significantly increased the proportion of smokers who attempted to quit (RR: 1.11, 95% CI: 1.04-1.32), and who used smoking cessation treatments (e.g., pooled estimates of NRT RR: 1.83, 95% CI: 1.55-2.15, I^2=43%; bupropion RR: 3.22, 95% CI: 1.41-7.34, I^2=71%; behavioural support RR: 1.77, 95% CI: 1.19-2.65, I^2=75%); it also increased abstinence at six months or longer (RR: 2.45, 95% CI: 1.17-5.12) compared to no health insurance coverage.[91] Comparison between full coverage and partial coverage showed no significant effect on smoking cessation or quit attempts (RR: 0.85, 95% CI: 0.52-1.38).[91]

A cross-sectional study by White et al. (2015) examined Canadian trends in stop-smoking medication use and quit success over time, as well as comparing trends across provinces with different subsidization policies.[218] Comprehensive coverage meant that province-wide coverage was provided for both product types (NRT and prescription medication). Partial coverage meant coverage through a regional cessation program for one or both product types, or full coverage for just one product type. No coverage meant that neither product type was covered.

Results found significantly greater use of NRT with comprehensive coverage compared to partial (OR: 1.39, 95% CI: 1.22-1.59) or no coverage (OR: 1.43, 95% CI: 1.21-1.68).[218] In provinces with comprehensive coverage, smokers who quit were significantly more likely to remain abstinent compared to those in provinces with partial (OR: 1.20, 95% CI: 1.12-1.28) or no coverage (OR: 1.23, 95% CI: 1.00-1.50).[218] Smokers with partial coverage of prescription medication, such as bupropion or varenicline, had significantly greater use of prescription medication than smokers with no coverage when trying to quit (OR: 1.27, 95% CI: 1.01-1.59).[218] There was less use of prescription medication in smokers with comprehensive coverage compared to partial and no coverage.[218] Quit success was significantly greater among heavier smokers (≥20 cig/day) with comprehensive coverage compared to partial and no coverage.[218] In Ontario, there was partial coverage for NRT and comprehensive coverage of prescription medication; with an overall partial stop-smoking medication coverage.[218] Ontario's pharmacotherapy coverage was only available to Ontario Drug Benefit recipients.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Pharmacotherapy - Well supported

The body of evidence on the effectiveness of pharmacotherapy interventions included two reviews of Cochrane reviews, eleven systematic review and meta-analyses, two meta-analyses, four systematic reviews, three narrative reviews, and one primary study (11 appraised as Level I, 10 as Level II, and two as Level III). First-line medications such as NRT, varenicline and bupropion have been shown to be effective to increase quit rates and smoking abstinence. Other drugs such as cytisine, nortriptyline, and clonidine, along with combination of pharmacotherapy and behavioural support or counselling have shown effectiveness to increase smoking abstinence in reviews of controlled trials. In addition, full health insurance coverage of both pharmacotherapy and behavioural support increased the odds of quit attempts, use of smoking cessation treatments and smoking abstinence. There was no, or insufficient, evidence supporting the benefits of other antidepressants, such as naloxone, anxiolytics, silver acetate, nicotine vaccines, lobeline, nicobrevin and mecamylamine.

SFO-SAC Scientific Consensus Statement - High (Intensify)

Ontario has the Ontario Drug Benefit program, which includes varenicline and bupropion for smoking cessation. Based on the summary of evidence, pharmacotherapy drugs such as NRT, varenicline and bupropion are effective to increase smoking cessation. Vulnerable populations, such as youth and young adults, the unemployed, underemployed and working poor, and those without private insurance or coverage have less access to smoking cessation medication. STOP has excess reach equity with low- and middle- income smokers, those with less than high school education, concurrent mental illness, other addictions and chronic health conditions.

The scientific consensus regarding the potential contribution for Ontario is: High (Intensify).

Key Message

Pharmacotherapy treatments such as NRT, varenicline, bupropion in combination with behavioural support or counselling are effective to increase smoking cessation. The Ontario Drug Benefit program covers a number of smoking cessation drugs; however, the program does not cover other vulnerable populations, such as youth and young adults or the unemployed/underemployed.

Behavioural Interventions

A number of cessation initiatives in Ontario include behavioural counselling as part of a multi-intervention approach (e.g., the Smoking Treatment for Ontario Patients Program, the OMSC Program and the Ontario Pharmacy Smoking Cessation Program). Based on the summary of evidence, there is a dose-response relationship in which more intensive behavioural counselling has a greater increase in smoking cessation. Stage-based behavioural interventions are not supported by the evidence.

SFO-SAC 2016 Scientific Consensus Statement

Background

Behavioural interventions are verbal or written instructions to encourage, support and modify health-related behaviour;[219,220] these can include brief advice, individual or group counselling (e.g., providing problem-solving/skills training and support/encouragement), telephone counselling (quitlines), self-help materials and other activities designed to assist with smoking cessation.[220-222] Behavioural interventions are commonly-based on behavioural change techniques. There are many behavioural techniques that health professionals could use for smoking cessation, and therefore, are not limited to the techniques that have been studied in the literature. For the purposes of this Report, attention is given to two behavioural change techniques that were cited frequently in the literature, including motivational interviewing and methods from the Stages of Change model.[220,222] Behavioural interventions are employed in conjunction with many other smoking cessation interventions described throughout the chapter.

The Ontario/Canadian Context

A number of cessation initiatives in Ontario include behavioural counselling as a component of a multi-intervention approach. Initiatives typically provide counselling by a health care provider alongside the provision of pharmacotherapy. Such initiatives currently operating in Ontario include the Ontario Drug Benefit Smoking Cessation Program, Leave the Pack Behind, Moving On to Being Free™, Smoking Treatment for Ontario Patients in multiple settings, the Ontario Pharmacy Smoking Cessation Program and the Ottawa Model for Smoking Cessation (OMSC).

Evidence

Four systematic reviews and meta-analyses,[223-226] one review of systematic reviews,[227] two meta-analyses,[219,228] and one narrative review[229] focused on various behavioural interventions for smoking cessation were retrieved from the pre-appraised literature. Five of the reviews were appraised as Level I,[223,225-228] two as Level II,[219,224] and one as Level III.[229] The majority of studies included in the reviews were conducted in the U.S.; some were conducted in the U.K. and Australia.

Evidence of Effectiveness

A meta-analysis by Mottillo et al. (2009) synthesized the treatment effects of behavioural interventions of varying intensity in a meta-analysis of 50 RCTs.[219] The behavioural interventions examined included brief advice, support and counselling. The mean total duration, number of delivered sessions and timeframe of the interventions varied across the included trials. In the review, the behavioural interventions were grouped into minimal clinical interventions (brief advice from a health care worker) or intensive interventions (individual counselling, group counselling and telephone counselling).[219] For minimal clinical interventions (delivered by a nurse, physician or research assistant), there was a non-significant increase in the odds of smoking abstinence, compared to usual care (self-help materials or no treatment) (OR: 1.50, 95% Credible Interval [CrI]: 0.84-2.78).[219] However, Mottillo et. al. (2009) concluded that more research is needed to confirm the effects of minimal clinical interventions, as these findings were based on limited evidence.

For intensive interventions compared to usual care (brief advice with, or without, self-help materials), intensive behavioural interventions resulted in significantly greater odds of smoking abstinence (individual counselling- OR: 1.49, 95% CrI: 1.08-2.07; group counselling- OR: 1.76, 95% CrI: 1.11-2.93; telephone counselling- OR: 1.58, 95% CrI: 1.15–2.29).[219] For more information on physician advice please refer to Other Health Care Setting Cessation Interventions.

A review of a systematic review by Ramsier et al. (2015) examined the use of various behavioural change counselling interventions for tobacco-use cessation (including motivational interviewing) in the dental or oral health setting.[227] They found five systematic reviews on tobacco-use cessation. Three of the five systematic reviews showed supporting evidence on dental/oral health behavioural change counselling for smoking cessation.[227]

A systematic review and meta-analysis by Spring et al. (2009) compared behavioural interventions addressing both smoking cessation and weight control (intervention) to behavioural interventions addressing smoking cessation only (control).[225] Based on 10 trials, smoking plus weight treatment was found to be more effective than cessation for short-term (<three months) smoking abstinence (OR: 1.29, 95% CI: 1.01-1.64).[225] No statistically significant benefits were seen with the intervention on long-term (>three months) smoking abstinence overall, short- and long-term continuous abstinence, and short- and long-term seven-day point prevalence abstinence.[225]

Motivational interviewing is a directive, client-centered counselling approach to promote behavioural change.[230] It involves helping smokers to overcome ambivalence or resistance to change, to initiate and establish the intrinsic motivation to change and to develop a commitment to change.[229-231] Motivational interviewing is complemented by the Stages of Change model.

Three reviews found that motivational interviewing had positive effects on smoking abstinence.[223,224,229] The Cochrane review by Lindson-Hawley et al. (2015) found that smokers who received motivational interviewing interventions were significantly more likely to achieve smoking abstinence (at six or more months follow-up) than smokers receiving brief advice or usual care (RR: 1.26, 95% CI: 1.16-1.36).[223]

An earlier systematic review and meta-analysis review by Heckman et al. (2010) also found significant increases in the odds of smoking abstinence at follow-up with motivational interviewing over brief advice or other cessation interventions (OR: 1.45, 95% CI:1.14-1.83).[224] Motivational interviewing had significant benefits at various follow-up time points (four to 26 weeks), and in both adolescents (pooled OR: 2.29, 95% CI: 1.34-3.89) and adults (OR: 1.44, 95% CI: 1.04-2.01).[224] A meta-analytic review by Hettema et al. (2010) found that motivational interviewing increased the odds of long-term smoking abstinence (OR: 1.35, 95% CI: 1.02-1.78 versus control), but not of short-term smoking abstinence (OR: 1.07, 95% CI: 0.96-1.19).[228]

In addition, significant benefits with motivational interviewing on self-reported smoking cessation behaviour, quit attempts and uptake of other cessation interventions (e.g.., NRT and written materials) were also reported in a narrative review on the use of motivational interviewing in older adults with various health challenges.[229]

Despite the general consistency in the evidence supporting motivational interviewing, the above results should be interpreted with caution as there was variability in the administration of motivational interviewing, especially as it was often combined with other interventions (e.g., cognitive behavioural therapy, written materials and pharmacotherapy).

The Stages of Change model, a component of the Transtheoretical Model of Change, is based on six hypothesized passages that an individual goes through when attempting to change behaviour.[232] These include: 1) pre-contemplation, 2) contemplation 3) preparation/determination, 4) action, 5) maintenance and 6) termination.[232]

The Cochrane review by Cahill et al. (2010) examined the effects of stage-based interventions on smoking cessation at six or more months of follow-up compared to no intervention or non-stage-based interventions of equivalent or lesser intensity (41 RCTs).[226] In their meta-analysis, no statistically significant differences in smoking cessation outcomes were seen when comparing stage-based counselling, stage-based self-help materials, and training practitioners in the Stages of Change model.[226]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Behavioural Interventions - Well supported

The body of evidence on the effectiveness of behavioural interventions included four systematic review and meta-analyses, one review of systematic reviews, two meta-analyses and one narrative review (five appraised as Level I, two as Level II, and one as Level III). More intense (dose response) behavioural interventions (i.e., individual counselling, group counselling and telephone counselling) and motivational interviewing (a client-centered counselling approach) were effective to increase smoking abstinence. Stage- based interventions and interventions focused on smoking cessation and weight control (longer than three months) were not effective to increase smoking cessation.

SFO-SAC Scientific Consensus Statement - High (Intensify)

A number of cessation initiatives in Ontario include behavioural counselling as part of a multi-intervention approach (e.g., the Smoking Treatment for Ontario Patients Program, the OMSC Program and the Ontario Pharmacy Smoking Cessation Program). Based on the summary of evidence, there is a dose-response relationship in which more intensive behavioural counselling has a greater increase in smoking cessation. Stage-based behavioural interventions are not supported by the evidence.

The scientific consensus regarding the potential contribution for Ontario is: High (Intensify).

Key Message

Behavioural interventions that are more intense have been shown to be effective to increase smoking cessation. The specific behavioural technique of motivational interviewing also demonstrated effectiveness; however, there are several other techniques that professionals can use (with the exception of stage-based).

Cessation Maintenance

Ontario self-help programs and behavioural counselling programs, as well as the Don't Cave to the Crave campaign and the wouldurather contest support participants from relapsing. Based on the summary of evidence, the effectiveness of relapse prevention interventions for cessation maintenance was mixed, as there was some evidence that cessation maintenance interventions such as NRT, bupropion, varenicline and self-help materials prevent relapse into smoking; however, there was evidence that showed no effect for these interventions. More research is needed to isolate the effects of relapse prevention interventions for cessation maintenance, especially for vulnerable populations such as pregnant and/or post-partum women. Those already using pharmacotherapy to quit smoking may consider extending their use of cessation medication for a longer time to prevent relapse.

SFO-SAC 2016 Scientific Consensus Statement

Background

Relapses from quit attempts are common due to the addictive nature of tobacco and it can take multiple quit attempts to achieve long-term cessation. Relapse prevention interventions are intended to help a smoker maintain cessation once they have made a quit attempt or are quitting with an intervention. Interventions designated as relapse prevention interventions are highly heterogeneous, and can be administered either to abstainers who have quit following a separate cessation intervention or a self-quit attempt or to smokers that have not yet quit. In the latter case, relapse prevention interventions can be components, or extensions, of a cessation intervention that are specifically tailored to relapse prevention and cessation maintenance (e.g., extended treatment of varenicline, components of a behavioural intervention that target cravings management). Relapse prevention interventions are generally difficult to separate from cessation interventions, however, the included reviews in this chapter focus explicitly on relapse.

The Ontario/Canadian Context

In 2014, Leave the Pack Behind ran the Don't Cave to the Crave campaign to support participants in the wouldurather contest from relapsing.[9,233] The Don't Cave to the Crave social marketing campaign supported maintenance of quit attempts by encouraging quitters to respond to cravings in a creative fashion, for example, by engaging in physical activity, relaxation techniques and healthy eating (OTRU 2016).[9] Evaluation information is unavailable at this time.

Evidence

Two systematic reviews and meta-analyses,[234,235] one meta-analysis,[236] three systematic reviews,[53,237,238] and one narrative review[239] were retrieved from the pre-appraised literature. One meta-analysis[240] was retrieved from a PHO library search. Five reviews were appraised as Level I,[234-237,240] two were appraised as Level II,[53,239] and one was appraised as Level III.[238] The studies included within these reviews took place primarily in the U.S., as well as in Canada, Europe, Japan, Australia and New Zealand, and two reviews did not report study jurisdiction.

Evidence of Effectiveness

There were overall mixed results for relapse prevention interventions, with varying levels of effect, depending on the nature of the intervention and whether it followed a separate quit attempt or was part of a cessation intervention.[234,235,237]

In terms of **behavioural interventions to prevent relapse**, the Cochrane review found that none of the behavioural interventions investigated were significantly effective for relapse prevention.[234] The review noted that this intervention category only included minimal interventions (e.g., brief, short-term counselling, self-help materials) and relapse skills training (i.e., learning to recognize and overcome smoking temptations).[234] In contrast, the systematic review by Agboola et al. 2010, found long-term effectiveness for self-help materials to prevent relapse in initially unaided quitters (OR: 1.52, 95% CI: 1.15-2.01).[235] Their results differed from the Cochrane meta-analysis by Hajek et al. (2013) despite using overlapping evidence bases, due to a different method of pooling individual studies by separating studies by intervention type and length of treatment, which is more exacting.[235] Another systematic review by Coleman et al. 2010 evaluated behavioural interventions and found mixed results.[237] The interventions included self-help booklets, telephone counselling, individual counselling and group counselling and did not specify effectiveness further for each type of behavioural intervention.[237]

A meta-analysis by Song et al. (2009) investigated a specific type of behavioural intervention called **psycho-educational skills training** that is administered through self-help materials or counselling; the aim was to train smokers making a quit attempt to recognize and overcome the triggers of relapse.[236] Results showed psycho-educational skills training to be effective for individuals who have already quit to avoid relapse (OR: 1.27, 95% CI 1.08-1.49), especially if they have been abstinent for at least one week at baseline (OR: 1.52, 95% CI 1.20-1.93).[236] However, the review noted a high potential of bias due to the studies included; there is a need for further research to confirm these results.[236] In contrast, the Cochrane review by Hajek et al. (2013) found no benefit of skills training, but noted the evidence may not have been sufficient to measure small effects of the interventions.[234] Please see Behavioural Interventions for more information.

For **pharmacological relapse prevention interventions**, six pooled trials from the Cochrane meta-analysis found that extended treatment with bupropion had no significant effect for cessation maintenance (RR 1.15, 95% CI 0.98 to 1.35).[234] However, Agboola et al. (2010) found bupropion had a significant effect on relapse prevention from four pooled trials (OR: 1.49, 95% CI 1.10-2.01).[235] They also examined the use of NRT for cessation maintenance, and found significant effectiveness of NRT at medium- and long-term follow-up from four pooled trials (OR: 1.56, 95% CI: 1.16-2.11; OR: 1.33, 95% CI: 1.08-1.63).[235] Hajek et al. (2013), found mixed effects for NRT from poor quality evidence and strongly recommended further research for extended NRT treatment for cessation maintenance.[234] Hajek et al. (2013) and Agboola et al. (2010) each found single trials for varenicline that showed positive impacts on cessation maintenance (e.g., RR: 1.18, 95% CI: 1.03-1.36 Hajek (2013);[234] Short-term one -three months OR : 2.54, 95% CI: 1.93–3.36, Medium term six-nine months OR 1.40; 95% CI 1.12–1.76.[235] However, the findings for varenicline are disputed by the recent meta-analysis by Agboola et al. (2015), where they found from 19 RCTs that varenicline helped smokers quit, but was no more effective than a placebo to

prevent relapse at the end of treatment to 52 weeks.[240] For more information,please refer to Pharmacotherapy.

A systematic review on **text messaging interventions** for relapse prevention were found to be effective; however, results of relapse prevention were not separated from smoking cessation, therefore, the effect of text messaging on only relapse prevention could not be determined.[53] For more information on smoking cessation text messaging interventions, please refer to Technology-Based Interventions: Internet /Computer and Text Messaging.

Coleman et al. (2010) and Hajek et al. (2013) examined behavioural relapse prevention interventions delivered to smokers in **conjunction with cessation interventions**, as opposed to following a separate quit; they did not find these interventions, alone, or coupled with pharmacotherapy interventions, to be effective.[234,237]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Specific Populations/Equity Considerations

In pregnant and/or post-partum women, results showed some individual studies that found behavioural relapse prevention interventions effective for pregnant women, however, the majority of evidence showed no significant effect of relapse prevention interventions in this population.[234-239] One narrative review found that relapse prevention interventions, including behavioural, pharmacotherapy (NRT) and incentives-based interventions were effective for cessation maintenance in pregnant and early post-partum women, but not in the long-term.[239] Hoedjes et al. (2010) found mixed effectiveness of relapse prevention interventions for post-partum women in the short-term, but primarily no evidence of effect in the long-term.[238] However, one large study in Agboola et al.'s review (2010) found that individual behavioural interventions were effective as long-term relapse prevention interventions for post-partum women (12-18 months) (OR 1.38, 95% CI 1.05 to 1.82); the review suggests further research on this type of relapse prevention interventions.[235] Please refer to the Women during Prenatal and Postpartum Periods section for more information on cessation interventions for this specific population.

In hospitalized patients, who had undergone a period of mandated and enforced abstinence while in hospital, there was no evidence of effect of relapse prevention interventions in this population following hospitalization.[234-237] In military personnel, who underwent mandated and enforced smoking abstinence, there was also no evidence of effect for relapse prevention interventions in this population following training.[234,235,237]

Intervention Summary

Evidence Summary - Cessation Maintenance - Promising direction

The body of evidence on the effectiveness of cessation maintenance interventions included two systematic reviews and meta-analyses, two meta-analyses, three systematic reviews and one narrative review (five appraised as Level I, two as Level II, and one as Level III). Overall, there is some evidence on the effectiveness of relapse prevention interventions for cessation maintenance, which include behavioural, psycho-educational skills training, pharmacotherapy and text messaging interventions. Similar findings were also found in specific populations that included pregnant and/or post-partum women and hospitalized patients. However, it is difficult to separate effects of relapse prevention interventions for cessation maintenance interventions from cessation interventions; therefore, there is conflicting evidence that shows no effect.

SFO-SAC 2016 Scientific Consensus Statement - Innovative

Ontario self-help programs and behavioural counselling programs, as well as the Don't Cave to the Crave campaign and the wouldurather contest support participants from relapsing. Based on the summary of evidence, the effectiveness of relapse prevention interventions for cessation maintenance was mixed, as there was some evidence that cessation maintenance interventions such as NRT, bupropion, varenicline and self-help materials prevent relapse into smoking; however, there was evidence that showed no effect for these interventions. More research is needed to isolate the effects of relapse prevention interventions for cessation maintenance, especially for vulnerable populations such as pregnant and/or post-partum women. Those already using pharmacotherapy to quit smoking may consider extending their use of cessation medication for a longer time to prevent relapse.

The scientific consensus regarding the potential contribution for Ontario is: Innovative.

Key Message

Relapse prevention interventions for cessation maintenance have shown some evidence on preventing smoking relapse. More research is needed on the effectiveness of various types of cessation maintenance interventions.

Electronic Cigarettes

E-cigarettes are being used in Ontario, with a sizeable minority using e-cigarettes that contain nicotine, despite the fact that e-cigarettes with nicotine are not approved for sale in Canada. Based on the summary of evidence, it is unclear whether e-cigarettes (with or without nicotine) are an effective smoking cessation device. A number of older adult smokers have used e-cigarettes as smoking cessation aids, and a large number of youth in Ontario have tried electronic cigarettes. The e-cigarette industry is evolving rapidly, which makes it difficult to assess overall effectiveness as new products emerge. More research is needed on the effectiveness of e-cigarettes (with or without nicotine) as a smoking cessation device.

SFO-SAC 2016 Scientific Consensus Statement

Background

Electronic cigarettes, also known as e-cigarettes, are battery-operated devices that electronically heat a solution to create an inhalable aerosol, often referred to as a vapour.[241] This solution is commonly made up of propylene glycol or glycerine water, flavour and nicotine. However, some solutions, also known as 'e-liquid' or 'e-juice', are sold without nicotine.[241] E-cigarettes can take the form of: 'cigalikes' that look like typical cigarettes and can be disposable or reusable with disposable solution cartridges, 'tank systems' that are refillable with solution and do not resemble a typical cigarette and 'variable power e-cigarette' systems of variable appearances.[241]

It is important to note that the safety of e-cigarettes is still unknown. The evidence base on overall and relative risks of e-cigarettes in comparison with smoking is still developing; however, the current available evidence suggests that e-cigarettes have around 4% of the relative harm of cigarettes overall (including social harm) and 5% of the harm to users.[241]

E-cigarettes are viewed as having potentially contrasting functions in tobacco control, and can be examined through the lenses of cessation, prevention, protection and industry. This section will focus on the role and effectiveness of e-cigarettes as a potential smoking cessation aid. Please see Regulation to Favour Electronic Cigarettes over Cigarettes in the Industry Chapter and Electronic Cigarettes in the Protection Chapter for more information on electronic cigarettes.

The Ontario/Canadian Context

According to the 2015 *Canadian Tobacco, Alcohol and Drug Survey* (CTADS), among those who ever tried an e-cigarette, 26% (534,000) were youth ages 15 to 19, and 31% (743,000) were young adults ages 20 to 24.[10] There were 3% (949,000) of Canadians ages 15 years and older who have used e-cigarettes in the past 30 days, of whom 63% (599,000) were current smokers, 24% (229,000) were former smokers and 13% (122,000) were never smokers.[10] This finding suggests dual use of cigarettes and e-cigarettes.[242] In addition, of those that used e-cigarettes in the past 30 days, 32% reported fruit as their usual flavour, 26% reported tobacco flavour and 23% reported no usual flavour.[10] A higher proportion of youth (45%)

and young adult (39%) reported fruit as their usual flavour, while among adults 25 years and older, 34% reported tobacco flavour as their usual flavour, followed by 27% reporting fruit flavour.[10] Additionally, 13% (3.9 million) of Canadians 15 years and older have reported ever trying an e-cigarette, which is an increase of 9% (2.5 million) from what was reported in 2013.[10]

Specifically in Ontario, 5.6% of Canadians 15 years and older have ever used electronic cigarettes, which is the lowest among the other provinces, the highest being 13.4% in Nova Scotia.[242] As well, 14.8% of youth in Ontario ages 15-19 have ever used e-cigarettes.[242] Of those who reported ever using electronic cigarettes, 28.3% used e-cigarettes as a quit aid within the past two years, and it appears to be more prevalent among adults 25 and older.[242] Additionally, 12.9% reported ever using an e-cigarette to replace a cigarette.[242] In Canada as a whole, half (50% or 886,000) of current or former smokers who had ever tried an e-cigarette reported using it as a cessation aid in the past two years.[10] CTADS does not have information about the success of any smoking cessation attempts using e-cigarettes.[10]

In Canada, e-cigarettes that contain nicotine fall within the scope of the *Food and Drugs Act* because they have not been granted a market authorization. E-cigarettes with nicotine cannot be imported, advertised or sold.[243] E-cigarettes without nicotine are permitted. However, 47% (1.9 million) of adults who reported using e-cigarettes said the last e-cigarette they used did contain nicotine.[10] Additionally, since January 2016, it is illegal to sell or supply e-cigarettes and component parts (e.g., battery, atomizer) to anyone less than 19 years old.[244,245] Stores or vape shops that sell cigarettes are required to post signs about the e-cigarette rules.[244] The same law will also ban the use of e-cigarettes in any enclosed public place or enclosed workplace; however, this amendment has not yet been put in place.[245]

Evidence

One systematic review and meta-analysis[246] and four systematic reviews[247-250] were retrieved from the pre-appraised literature. The remaining seven reviews were identified through a PHO library search and included two systematic reviews and meta-analysis,[251,252] one systematic review,[253] three narrative reviews[254-256] and one review of reviews,[257] which conducted an additional search of primary literature on e-cigarettes. All reviews reported on a similar, although limited and generally low-quality, body of literature (i.e., many reviews included the same few primary studies). Two reviews were appraised as Level I,[246,257] four were appraised as Level II[247,248,252,253] and six were appraised as Level III.[249-251,254-256] The majority of the included studies within reviews took place in developed countries including Italy, the U.S., New Zealand, the U.K., Switzerland and South Africa.

Evidence of Effectiveness

The Cochrane review by McRobbie et al. (2014) and a systematic review and meta-analysis by Rahman et al. (2015) suggested that e-cigarettes (with nicotine) help smokers to stop smoking in the long-term (> six months) compared to a placebo (RR: 2.29, 95% CI: 1.05 to 4.96),[246] (RR: 2.29, 95% CI: 1.05-4.97),[252] but were not more effective than the nicotine patch (RR: 1.26, 95% CI: 0.68 to 2.34).[246] However, the lack of a significant difference between e-cigarettes and the nicotine patch may have been due to insufficient power of the single included study. Similarly, Rahman (2015) found that, despite high heterogeneity among studies, e-cigarettes were positively associated with smoking cessation (Pooled Effect Size: 0.20, 95% CI: 0.11-0.28).[252] Individual studies within the remaining reviews reported similar

findings .[247-250,253-257] In contrast, a systematic review and meta-analysis by Grana (2014) found that using e-cigarettes was associated with significantly lower odds of quitting smoking (OR: 0.61, 95% CI: 0.50 to 0.75).[251]

E-cigarettes have also been associated with reduced cigarette consumption. McRobbie (2014) found that e-cigarettes led to a greater proportion of smokers reducing their cigarette consumption by at least half, compared to placebo e-cigarettes (i.e., e-cigarettes without nicotine) (RR: 1.31, 95% CI: 1.02 to 1.68) and the nicotine patch (RR: 1.41, 95% CI: 1.20 to 1.67).[246] The remaining reviews have also reported that e-cigarettes are associated with a reduction in cigarette consumption.[247-256]

Lastly, e-cigarettes with nicotine have been shown to reduce the desire to smoke;[247,248,250,253,254,256] however, non-nicotine e-cigarettes have also been shown to have this effect.[254,256]

Overall, the efficacy of e-cigarettes as a smoking cessation aid remains unclear. Randomized controlled trials suggest that nicotine-containing e-cigarettes are more effective than placebo e-cigarettes, but are not superior to NRT. Population studies, on the other hand, suggest that smokers using e-cigarettes were less likely to stop smoking. However, the included literature within these reviews was limited, and authors have cautioned that there was not enough research to determine if e-cigarettes are efficacious for cessation.

Intervention Characteristics/Implementation Considerations

The above evidence suggests that nicotine e-cigarettes were more effective for cessation than those without nicotine.[246] Additionally, the number of cartridges used per day (i.e., zero to four)[256] or the amount of nicotine within e-cigarettes[251] did not impact cigarette consumption. However, this finding was based only on two single studies.

There is significant heterogeneity among different types of electronic cigarettes, each providing different amounts of nicotine at varying rates.[241] If e-cigarettes continue to evolve, and the speed of nicotine delivery continues to increase, they may appeal to more smokers, making it easier for them to switch from smoking to using e-cigarettes.[241]

Specific Populations/Equity Considerations

E-cigarettes have shown to be equally effective for smoking cessation among individuals with and without mental illness.[241] However, greater relapse rates were seen among those with mental illness.[241]

Intervention Summary

Evidence Summary - Electronic Cigarettes - Emerging

The body of evidence regarding e-cigarettes included three systematic reviews and meta-analyses, five systematic reviews, three narrative reviews and one review of reviews (two appraised as Level I, four as Level II, and six as Level III). Overall the evidence is unclear on whether e-cigarettes are effective to increase smoking cessation.

SFO-SAC 2016 Scientific Consensus Statement - Uncertain at this time

E-cigarettes are being used in Ontario, with a sizeable minority using e-cigarettes that contain nicotine, despite the fact that e-cigarettes with nicotine are not approved for sale in Canada. Based on the summary of evidence, it is unclear whether e-cigarettes (with or without nicotine) are an effective smoking cessation device. A number of older adult smokers have used e-cigarettes as smoking cessation aids, and a large number of youth in Ontario have tried electronic cigarettes. The e-cigarette industry is evolving rapidly, which makes it difficult to assess effectiveness as new products emerge. More research is needed on the effectiveness of e-cigarettes (with or without nicotine) as a smoking cessation device.

The scientific consensus regarding the potential contribution for Ontario is: Uncertain at this time.

Key Message

The effectiveness of e-cigarettes as a cessation aid is unclear. There needs to be more research on the effectiveness of e-cigarettes (with or without nicotine) as a smoking cessation device.

Other Interventions Targeted to Individuals

Financial Incentives

In Ontario, there are several contests that use financial incentives to motivate smokers that are based on 'quit and win' contests such as Driven to Quit Contest, formerly un by the Canadian Cancer Society wouldurather, run by Leave the Pack Behind, and In the Nic-o Time, run out of public health units within the South Western TCAN. Based on the summary of evidence, financial incentives with monetary value are consistently effective to increase smoking cessation. There are currently no payment-based (i.e., direct payment using cash) programs implemented in Ontario (all are contest-based); there is opportunity to try other financial incentive strategies. Financial incentives can have a broad reach depending, on how they are promoted, and they could be particularly helpful to reach specific populations such as pregnant women and smokers of lower SES.

SFO-SAC 2016 Scientific Consensus Statement

Background

Financial incentives for smoking cessation include various forms of monetary rewards such as cash, vouchers, salary bonuses, lotteries, raffles, rewards and money deposits (i.e., receiving back a personal monetary deposit after successfully quitting). Such incentives can be provided in workplace, community, academic or outpatient health care settings.

The Ontario/Canadian Context

At the community level, 'quit and win'-based contests have been implemented across Ontario to provide financial incentives to support quit attempts for a wide-range of smokers. Three examples are the Driven to Quit Contest, run by the Canadian Cancer Society, wouldurather, run by Leave the Pack Behind, and In the Nic-o Time, run out of public health units within the South Western Tobacco Control Area Network (TCAN).

The Driven to Quit Contest is a longstanding initiative to encourage smoking cessation by Ontario residents over the age of 19.[9] The contest is open to all individuals who have used tobacco at least once weekly for a minimum of ten months in the previous year and have smoked 100 cigarettes in their lifetime.[9] The main goals of the contest are to enable quit attempts, increase awareness of cessation resources and link tobacco users to the Smokers' Helpline. The campaign was funded by the Canadian Cancer Society (CCSC) and occurred on an annual basis.[9] The CCS no longer funds the Driven to Quit Contest and instead has implemented a new campaign called First Week Challenge Contest.[258] Over the years, the Driven to Quit Contest expanded its scope of participants: in 2010, occasional tobacco users were allowed to participate along with daily tobacco users; in 2012, promotion efforts were directed toward health care providers;[9] in 2014-15, 8,585 tobacco users registered for the Driven to Quit Contest. This number has decreased from previous years due to reduced funding. The highest number of registrants was in 2010-11, at 36,091.[9]

In 2013, Leave the Pack Behind introduced the wouldurather campaign that consisted of a six-week quit smoking contest targeted at post-secondary students and young adults ages 18 to 29.[233] The possible cessation goals were to pledge to quit smoking, to reduce smoking by 50% or to refrain from smoking when drinking alcohol. In 2016, 8,629 young adults signed up for the program, including 3,344 smokers. Out of smokers who participated, 366 were expected to quit from the Quit for Good group (Quit rate: 19.8%), 68 from the Keep the Count group (Quit rate: 12.9%), and 86 from Party Without the Smoke (Quit rate: 8.99%). Close to one out of every four contestant identified belonging to a priority group (e.g., Indigenous, LGBTQ).[44]

In the Nic-o Time ran from 2011 to 2012 within the Southwestern TCAN. The contest was created in response to a high volume of youth (ages 14 to 19) who expressed interest in the Driven to Quit Contest but were ineligible, due to their age.[259] The contest was tailored to tobacco and non-tobacco users ages 14to 19. By registering for the challenge, individuals pledged to quit, to cut back or not to begin smoking for a period of one month.[259] Participants were required to fill out a survey, pre- and post- challenge, and would have the chance to win a grand prize.[259] Between 2011 and 2012, 1,988 people registered for the contest and 600 completed the post-challenge survey.[9]

Evidence

One systematic review and meta-analysis,[260] one overview of systematic reviews[21] and one systematic review[55] were retrieved from the pre-appraised literature and two systematic reviews and meta-analysis[261,262] were retrieved from a PHO Library search. Four reviews were appraised as Level I,[260, 21,261,262] and one review was appraised as Level II.[55] The majority of the studies took place in the U.S., with a few in Europe and Asia.

Evidence of Effectiveness

Among trials examining monetary type incentives, a Cochrane review and systematic review and meta-analysis found positive results regarding long-term (six month or more) smoking cessation when participants were financially incentivized;[260,261] these findings were also confirmed in the overview by Hoffman (2015).[21] Based on six studies in the systematic review and meta-analysis conducted by Giles et al. smokers who received financial incentives were significantly more likely to stop smoking (at follow-up of more than six months) compared to smokers who did not receive such incentives (RR: 1.50, 95% CI: 1.05-2.14).[261] After pooling the results of 21 studies, Mantzari et al. (2015) also found improved cessation rates after six months of the intervention (OR: 1.80, 95% CI: 1.37-2.37) when compared to baseline.[262] Also, pooled estimates of seven studies showed that improved cessation rates were sustained for up to three months after incentive removal (OR: 2.57, 95% CI: 1.20-5.54).[262]

The type of financial incentives may influence the effectiveness of financial interventions. For example, sub-group analysis conducted by Giles et al. (2014) showed that the effect of cash-only financial incentives was greater and statistically significant (RR: 1.57, 95% CI: 1.06-2.32) compared to other formats (e.g., vouchers, deposit contracts and rewards) (RR: 1.16, 95% CI: 0.45-2.94).[261] The value of financial incentives that participants could receive for successful behavioural change had a wide range of $5.16 to $786 USD.[261] The value of financial incentives might influence effectiveness, as high-value incentives were associated with a higher increase in cessation compared to lower-value incentives.[262] A

U.S. trial among employees of a national pharmacy chain tested whether deposit programs (participants deposit their own money and the study tops up the deposit if successful) or reward-based programs (funded entirely from the study) were more effective to promote cessation.[260] In the reward group, 8.1% achieved sustained quit rate at 12 months compared to 4.7% of the deposit group.[260] The likelihood of quitting in the reward group was significantly higher (OR: 1.76, 95% CI: 1.22-2.53) than in the deposit group.[260] Long-term feasibility of financial incentive interventions may be dependent on source of funding, and the affluence and education level of the population,[260] where evidence suggests that the effect does not persist beyond three months after incentive removal.[262]

Intervention Characteristics/Implementation Considerations

One systematic review analyzed recruitment strategies that were most effective at engaging smokers to participate in smoking cessation programs.[55] Five studies in this review looked at the effects of adding monetary incentives to existing recruitment strategies.[55] The four studies that added cash incentives found a statistically significant increase in recruitment.[55] The one study that used a contest structure in which each participant received a chance to win a small prize, found similar results in the intervention and control groups.[55]

Specific Populations/Equity Considerations

In targeted populations, incentive schemes for pregnant smokers significantly improved cessation rates at the end of pregnancy and post-partum.[260,262] In highly -deprived participants (classified by income, employment, education, ethnicity and SES scores), financial incentives were found to be twice as effective, compared to non-deprived participants.[262]

Intervention Summary

Evidence Summary - Financial Incentives - Well supported

The body of evidence on the effectiveness of financial incentive interventions included three systematic review and meta-analyses and one overview of systematic reviews and one systematic review (four appraised as Level I and one as Level II). Financial incentives with monetary value (e.g., cash, vouchers, salary bonuses, lotteries, raffles, rewards and money deposits) were consistently effective to increase smoking cessation rates, quitting and abstinence. Cash-only reward-based financial incentives were more effective than other monetary types; higher monetary values correlated with increased smoking cessation. There was greater uptake by smokers already motivated to quit, in particular, pregnant women and smokers of lower SES (based on social, cultural and economic factors). The effectiveness of financial incentive interventions is dependent on the amount and source of funding, and on the affluence and education level of the population.

SFO-SAC 2016 Scientific Consensus Statement- Moderate (Intensify), Targeted, Positive Equity

In Ontario, there are several contests that use financial incentives to motivate smokers that are based on 'quit and win' contests such as Driven to Quit Contest, *formerly* un by the Canadian Cancer Society wouldurather, run by Leave the Pack Behind, and In the Nic-o Time, run out of public health units within the South Western TCAN. Based on the summary of evidence, financial incentives with monetary value are consistently effective to increase smoking cessation. There are currently no payment-based (i.e., direct payment using cash) programs implemented in Ontario (all are contest-based); there is opportunity to try other financial incentive strategies. Financial incentives can have a broad reach depending, on how they are promoted, and they could be particularly helpful to reach specific populations such as pregnant women and smokers of lower SES.

The scientific consensus regarding the potential contribution for Ontario is: Moderate (Intensify). This is a targeted intervention with a positive equity impact.

Key Message

Financial incentives are effective to increase smoking cessation, however, effectiveness is dependent on the amount and source of funding, and the affluence and education level of the population. Implementation of financial incentives is best when smokers are motivated to quit.

Self-Help Interventions

Printed self-help materials are part of standard practice for most smoking cessation interventions in Ontario and can have a broad reach depending on how they are promoted. Based on the summary of evidence, self-help materials are effective (especially when tailored) to increase smoking cessation when compared to no materials, but do not increase effectiveness compared to other interventions, such as advice from health care professionals and NRT. This option is best when few resources are available and when incorporated into a comprehensive tobacco control strategy as an easy program delivery tool (e.g., family doctors giving pamphlets with smoking cessation information).

SFO-SAC 2016 Scientific Consensus Statement

Background

Self-help interventions traditionally consist of written materials that contain various forms of information, including health education messages, encouragement from health professionals and instructions on how to quit. Self-help interventions are traditionally delivered in print, but can also appear in other formats, such as videos, audiotapes, over the internet and through mobile phones.[263]

Self-help materials can help smokers through the quitting experience in both aided and unaided quit attempts. According to the 2003 CTUMS report, among former smokers who did not report using any of the quit methods listed, 80% said they quit on their own without special preparation or help.[264] Based on interviews conducted by OTRU in 2009-10, 66%of young male smokers ages 19 to 29 in Ontario reported they would quit 'cold turkey', and even those who were unsuccessful, would try using that method again.[265] Similar results were seen among low SES smokers over the age of 24.[266]

The Ontario/Canadian Context

A number of self-help tobacco cessation materials have been created in Ontario. For example, the Ontario Lung Association created a guidebook titled, Journey 2 Quit, which is available online., its three parts: Get Ready!, Get Set!, and Go![20] provide information and resources to help people to assess their readiness to quit, create a quit plan with supports and put the plan into action. On the Road to Quitting and One Step at a Time are two other online guidebooks designed to provide smokers with information and skills to help them quit. Both of these guides can be used at any point during the cessation process. (Journey 2 Quit, On the Road…, One Step at….)[267-269] lease refer to The Jurisdictional Scan for detailed information.

Evidence

One systematic review and meta-analysis (from the pre-appraised literature search) reviewed the effect of print-based self-help interventions for smoking cessation.[263] The review was appraised as Level II. Most studies were conducted in the U.S. and the U.K.

Evidence of Effectiveness

The Cochrane review found from 11 trials that non-tailored self-help materials used in isolation significantly increased long-term abstinence rates when compared to no materials (RR: 1.19, 95% CI: 1.04-1.37).[263] Larger effect sizes were seen (in 9 trials) when comparing tailored self-help materials with no materials (RR: 1.35, 95% CI: 1.19-1.53).[263] Adding self-help materials to advice from health care professionals and to NRT did not show a statistically significant effect when compared to these interventions alone.[263] Despite significant results in self-help material interventions, only a few smokers successfully quit; however these intervention are typically sent to people who are not trying to quit which may explain the low quit rates.[263]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Self-Help Materials - Well supported

The body of evidence on the effectiveness of printed self-help material interventions included one systematic review and meta-analysis appraised as Level II. Self-help materials are effective to improve sustained abstinence when compared with no intervention. Tailoring self-help materials increases the effectiveness of the intervention; however, motivation of participants to quit is a key factor of self-help materials.

SFO-SAC 2016 Scientific Consensus Statement - Moderate (Continue)

Printed self-help materials are part of standard practice for most smoking cessation interventions in Ontario and can have a broad reach depending on how they are promoted. Based on the summary of evidence, self-help materials are effective (especially when tailored) to increase smoking cessation when compared to no materials, but do not increase effectiveness compared to other interventions, such as advice from health care professionals and NRT. This option is best when few resources are available and when incorporated into a comprehensive tobacco control strategy as an easy program delivery tool (e.g., family doctors giving pamphlets with smoking cessation information).

The scientific consensus regarding the potential contribution for Ontario is: Moderate (Continue).

Key Message

Self-help materials are effective to increase smoking cessation and should continue to be included in a comprehensive tobacco control strategy.

Enhancing Partner Support

Based on the summary of evidence, there is insufficient evidence to determine if enhancing partner support is effective to increase cessation rates. There need to be better-developed interventions to enhance partner support for smoking cessation, especially for supporting pregnant and/or postpartum women to quit smoking.

SFO-SAC 2016 Scientific Consensus Statement

Background

Interventions to enhance partner support may be an effective intervention for smoking cessation, as partner behaviour can have a strong influence on a smoker attempting to quit.[270] There is evidence that one partner's smoking status can influence the other partner's smoking behaviour, but more so into relapse, rather than to cessation.[271] This result was seen more from the husband's influence compared to wife's influence, which suggests women are more likely to resume smoking if their partners smoke.[271] For more information on vulnerable pregnant women, please refer to the Women during Prenatal and Postpartum Periods section. It is important to promote partner smoking cessation not only to increase smoking cessation, but also to support the other partner to quit or prevent relapse into smoking. The evidence below focuses on interventions that either target smokers' partners to support them (smokers) to quit or target partners themselves to quit smoking .[270]

The Ontario/Canadian Context

According to the 2006–07 *Canadian Maternity Experiences Survey* (MES), approximately 50% of mothers who quit smoking during pregnancy, relapsed after the birth of their children, and the risk of relapse was higher among those who lived with smokers.[272] Therefore, helping partners quit smoking could also help mothers quit, especially around the vulnerable time of pregnancy. For more information on pregnant women please refer to the Women during Prenatal and Postpartum Periodssection.

Please refer to the Home Environments in the Protection chapter for more information on secondhand smoke in the home.

Evidence

One systematic review (from the pre-appraised literature search) examined the effect of partner support interventions on smoking cessation.[270] The review was appraised as Level I. Interventions were delivered to the smoker, the partner or both. Most studies were conducted in the U.S.

Evidence of Effectiveness

The results of the review from 13 included studies showed that interventions designed to increase partner support did not result in greater smoking cessation rates at follow-up periods of six to nine months (RR: 0.99, 95% CI: 0.84-1.15) and at 12 months or longer (RR: 1.04, 95% CI: 0.87-1.24).[270] However, the authors noted that these results may not be fully representative due to limitations in the

included evidence, and that no firm conclusions could be drawn.[270] The results may have been due to ineffective interventions delivered to increase partner support, which would have affected the results.[270]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Enhancing Partner Support - Emerging

The body of evidence on the effectiveness of enhancing partner support interventions included one systematic review appraised as Level I. The results of the review showed no effect on cessation rates; however, this may have been due to ineffective interventions at increasing partner support.

SFO-SAC 2016 Scientific Consensus Statement - Uncertain at this time, Targeted, Positive Equity

Based on the summary of evidence, there is insufficient evidence to determine if enhancing partner support is effective to increase cessation rates. There need to be better-developed interventions to enhance partner support for smoking cessation, especially for supporting pregnant and/or postpartum women to quit smoking.

The scientific consensus regarding the potential contribution for Ontario is: Uncertain at this time. This is a targeted intervention with a potential positive equity impact.

Key Message

More research is needed on developing better interventions that enhance partner support for smoking cessation.

Biomedical Risk Assessment

Based on the summary of evidence, there is insufficient evidence to determine if biomedical risk assessment is effective to increase smoking cessation. More research is needed to determine effectiveness of biomedical risk assessment techniques for smoking cessation.

SFO-SAC 2016 Scientific Consensus Statement

Background

Biomedical risk assessment involves screening patients for smoking-related impacts or potential impacts on their health. Methods include exhaled carbon monoxide measurement, spirometry (a measurement of air inhalation and exhalation), atherosclerotic plaque (plaque build-up on arteries) imaging or genetic susceptibility testing for smoking-related cancers.[273]

The Ontario/Canadian Context

According to the Ontario Lung Association, there are 179 spirometry clinics within 150 kilometres of the five most populated cities in Ontario (Toronto, Ottawa, Hamilton, Kitchener, London).[274] No information was found on the number of carbon monoxide measurement centres and whether carbon monoxide exhalation is used to measure successful smoking cessation in Ontario.

Evidence

One systematic review and meta-analysis (from the pre-appraised literature search), reviewed the effectiveness of biomedical risk assessment for smoking cessation.[273] The review was appraised as Level I. Most included studies were conducted in the U.S, with others from Europe, Japan, and Seychelles.

Evidence of Effectiveness

The Cochrane review, which included 15 trials, reviewed a number of biomedical tests that aimed to increase motivation to quit smoking.[273] Due to clinical heterogeneity, results for all studies were not combined. Pooled results of two similar studies found no significant benefit of carbon monoxide measurement in primary care.[273] Similarly, pooled results of another two studies also did not find any significant benefits for spirometry in clinics.[273] However, one study found significant positive results (RR: 2.12, 95% CI: 1.24-3.62) on smoking cessation for spirometry compared to a control group when 'lung-age feedback' was provided to patients.[273] Other studies either did not report significant results or were potentially biased.[273] The review noted that there is limited evidence to make conclusions on the effectiveness of biomedical assessment strategies, alone or in combination.[273]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Biomedical Risk Assessment - Undetermined

The body of evidence on the effectiveness of biomedical risk assessment interventions included one systematic review and meta-analysis appraised as Level I. Overall, the results from the review showed various biomedical risk assessments (e.g., exhaled carbon monoxide, spirometry, atherosclerotic plaque imaging or genetic susceptibility testing) did not significantly increase smoking cessation.

SFO-SAC 2016 Scientific Consensus Statement - Uncertain at this time

Based on the summary of evidence, there is insufficient evidence to determine if biomedical risk assessment is effective to increase smoking cessation. More research is needed to determine effectiveness of biomedical risk assessment techniques for smoking cessation.

The scientific consensus regarding the potential contribution for Ontario is: Uncertain at this time.

Key Message

More research is needed on the effectiveness of biomedical risk assessments for smoking cessation.

Acupuncture and Related Interventions

Based on the summary of evidence, there is insufficient evidence to determine if acupuncture and related interventions are effective to increase cessation rates. There was some evidence of short- term (less than six weeks) effect of significantly increasing smoking cessation; however, acupuncture and related interventions are less effective than evidence-based interventions such as NRT.

SFO-SAC 2016 Scientific Consensus Statement

Background

Acupuncture is a form of therapy that involves inserting fine needles through the skin at pressure points in the body. Other related therapies do not use needles. For example, acupressure, laser therapy and electro-stimulation for smoking cessation involve the application of pressure, laser or electrical current to acupuncture points. However, these related practices are not regulated by the Ontario government.[275] These therapies aim to help quitters cope with their withdrawal symptoms.[276]

The Ontario/Canadian Context

The College of Traditional Chinese Medicine Practitioners and Acupuncturists of Ontario is the governing body, established by the Government of Ontario under the *Regulated Health Professions Act* (1991) and the *Traditional Chinese Medicine Act* (2006).[277] However, there is no specific information on the regulation of acupuncture for smoking cessation in Ontario.

Evidence

One systematic review and meta-analysis retrieved from the pre-appraised literature reviewed the effectiveness of acupuncture and related interventions on smoking cessation.[276] This review was rated Level I. The included studies were conducted in a variety of locations which include U.S., Canada, Australia, New Zealand, countries in Europe and countries in Asia.

Evidence of Effectiveness

From the most recent Cochrane review, results from 38 included studies showed no consistent evidence that acupuncture, or any related interventions, such as acupressure, laser therapy, and electro-stimulation, were effective interventions for smoking cessation.[276] Acupuncture (RR: 1.22, 95% CI: 1.08-1.38), acupressure (RR: 2.54, 95% CI: 1.27-5.08), and continuous auricular (ear) stimulation (RR: 1.69, 95% CI: 1.32-2.16) had statistically significant effects on short-term (less than six weeks) abstinence and no significant long-term effects (greater than six months) when compared to placebo treatments; however, these results are unreliable due to small sample size.[276] Acupuncture was less effective compared to NRT (short -term RR: 0.76, 95% CI: 0.59-0.98; long-term RR: 0.64, 95% CI: 0.42-0.98) and showed no difference compared to counselling and psychological approaches (short-term RR: 0.95, 95% CI: 0.72-1.26; long-term RR: 1.34, 95% CI: 0.80-2.24).[276] More research is needed to determine if acupuncture and related interventions are effective to improve smoking cessation.

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Acupuncture and Related Interventions - Undetermined

The body of evidence on the effectiveness of acupuncture interventions included one systematic review and meta-analysis appraised as Level I. Overall, the results from the review showed acupuncture and related interventions (e.g., acupressure, laser therapy, electro-stimulation and continuous auricular (ear) stimulation) suggest possible short-term (less than six weeks) effects, but no clear evidence on long-term effects (greater than six months).

SFO-SAC 2016 Scientific Consensus Statement - Uncertain at this time

Based on the summary of evidence, there is insufficient evidence to determine if acupuncture and related interventions are effective to increase cessation rates. There was some evidence of short- term (less than six weeks) effect of significantly increasing smoking cessation; however, acupuncture and related interventions are less effective than evidence-based interventions such as NRT.

The scientific consensus regarding the potential contribution for Ontario is: Uncertain at this time.

Key Message

More research is needed on the effectiveness of acupuncture and related interventions for smoking cessation.

Hypnotherapy

Based on the summary of evidence, there is insufficient evidence to determine if hypnotherapy is effective to increase cessation rates, and it is therefore an unsupported smoking cessation intervention at this time. More rigorous research is needed to determine effectiveness of hypnotherapy for smoking cessation.

SFO-SAC 2016 Scientific Consensus Statement

Background

Hypnotherapy aims to help control underlying impulses in smokers who are trying to quit by lessening the desire to smoke.[278] There are several different hypnotherapy techniques, however, the most common are those that employ versions of the "one session, three point" method.[279] The technique attempts to modify the client's perceptions of smoking using the hypnotherapy to induce deep concentration. When under hypnosis, smokers are instructed that 1) smoking is poison, 2) the body should be protected from smoke and 3) there are benefits of being a non-smoker.[279]

The Ontario/Canadian Context

There is no specific organization to regulate hypnosis services for smoking cessation in Ontario. However, there is an International organization called the National Guild of Hypnotists (NGH) in Boston, Massachusetts that offers hypnosis certification. Individuals can use this certification to practice hypnosis in Canada.

Evidence

One systematic review retrieved from the pre-appraised literature reviewed the effectiveness of hypnotherapy for smoking cessation.[278] The review was appraised as Level I. Most of the included studies took place in the U.S. and Canada, along with individual studies from the U.K. and Australia.

Evidence of Effectiveness

From the most recent Cochrane review, results from 11 included studies showed no clear and consistent evidence that hypnotherapy is effective to improve cessation rates, compared to other interventions or no interventions.[278] Only one included study compared hypnotherapy with no treatment, and while the results showed statistically significant effects (RR: 19.00, 95% CI: 1.18-305.88), the confidence interval was very large, making it difficult to draw conclusions.[278] The majority of the other comparisons showed no statistically significant effects.[278]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Hypnotherapy - Unsupported

The body of evidence regarding the effectiveness of hypnotherapy included one systematic review appraised as Level I. Overall, the results from the review showed no clear evidence that hypnotherapy is effective to improve smoking cessation rates.

SFO-SAC 2016 Scientific Consensus Statement - Unsupported at this time

Based on the summary of evidence, there is insufficient evidence to determine if hypnotherapy is effective to increase cessation rates, and it is therefore an unsupported smoking cessation intervention at this time. More rigorous research is needed to determine effectiveness of hypnotherapy for smoking cessation.

The scientific consensus regarding the potential contribution for Ontario is: Unsupported at this time.

Key Message

More research is needed on the effectiveness of hypnotherapy for smoking cessation.

Interventions Targeted to Specific Demographic Populations

A number of reviews address cessation efforts within particular populations, focusing on group physiologic or social factors that influence smoking and cessation behaviour. The Intervention Summaries for specific populations do not have scientific consensus categorizations on the potential contribution for Ontario because focusing on a specific population received interventions already covered under interventions targeted to populations and Individuals. Focusing on these sub-populations does not necessarily have a high overall contribution for Ontario, but specifically addresses the equity contribution where specific populations can have a higher prevalence of smoking compared to the general population.

The majority of the included evidence focused on the effectiveness of interventions that targeted specific populations (that tend to be vulnerable). These interventions can be the same interventions as previously discussed (e.g., mass media, behavioural counselling and pharmacotherapy) as they are applied to a specific population or adapted and/or have additional tailored components that make them more applicable to particular populations, which are then compared to the usual intervention (general to whole population) or control (no intervention). Reviews generally combined results of targeted and general interventions that are applied to a specific population. The few reviews that

focused on equity impacts examined the differences in effect among populations in relation to an intervention. Interventions that are equally effective regardless of gender, race or SES have fewer inequities and greater impact of effectiveness at the population level. If interventions have inequities, then targeted interventions are probably needed. The evidence is summarized below according to various determinants of health, but it is also important to note that the categories are not mutually exclusive and that there is substantive overlap, i.e., gender, SES and age may all function together to shape smoking and cessation behaviour.

Youth and Young Adults

> *In Ontario, prevention-focused interventions are primarily targeted to youth, such as education about the dangers of smoking in school curricula. . Based on the summary of evidence, counselling interventions have been effective among youth and young adults to increase smoking cessation. For young adults, the same smoking cessation techniques used with adults should be effective (e.g., pharmacotherapy), but may not be as effective with youth who are likely experimental smokers (rather than established smokers). Reaching the youth population can be a challenge; however, this may be due to inaccessibility of cessation services for this group (e.g. behavioural counselling). Price and tax increases have been shown to be effective for smoking cessation among youth and young adults, particularly lower SES youth and young adults. There is opportunity in Ontario to raise tobacco taxes and provide better access to cessation services for youth such as improved access to smoking cessation behavioural counselling.*
>
> *SFO-SAC 2016 Scientific Consensus Statement*

Background

There is review-level evidence that the smoking behaviours of youth are influenced by their peers and parents.[280] Furthermore, it is important that young smokers quit early because one-third of youth who become regular smokers and carry on into adulthood will eventually die from smoking.[281] There is evidence that the longer the duration of smoking in number of years, the higher the likelihood of dying earlier from diseases caused by smoking.[282] As a result, the younger the age that individuals begin smoking, the higher the chance that they will die from causes created by smoking. It is important to target youth and young adult smokers to quit smoking in order to decrease the long-term health risks.

The Ontario/Canadian Context

According to the 2015 *Ontario Student Drug Use and Health Survey* (OSDUHS) 8.6% of students in grades 7 to 12 reported smoking tobacco cigarettes in the past year; prevalence rates were similar among males (9.1%) and females (8.2%).[283] According to the 2015 CTADS report, the prevalence of smoking among Canadian youth (ages 15-19) was 10% (201,000); 4% reported daily smoking and 5% reported occasional smoking.[10] Among younger youth, (ages 15-17), the smoking rate was 6% (72,000), and for older youth (ages 18-19), 14% were current smokers.[10] For young adults, ages 20 to 24, the smoking

prevalence was 18% (453,000), with a current rate of smoking of 23%. The rate of daily smoking among young adults was 10% and 8% reported smoking occasionally.[10]

Leave the Pack Behind (LTPB) offers various cessation programs, including cost-free NRT to young adults ages 18 to 29. Please refer to the Ontario context section in Campus-Based Interventions for more information about LTPB programming.

Tobacco interventions for youth tend to be prevention-focused rather than cessation-focused. Please refer to Elementary and Secondary School Prevention Programs and Elementary and Secondary School Tobacco Policies in the Prevention chapter for more information.

Evidence

One systematic review and meta-analysis,[284] two meta-analyses,[285,286] and three systematic reviews[287-289] were retrieved from the pre-appraised literature and focused on smoking cessation interventions with youth or young adults. Three studies were appraised as Levell[284,287,289] and three as Level II.[285,286,288] The majority of included studies took place in the U.S.; other jurisdictions included the U.K., Australia, Germany, Canada, Finland, France, Israel, the Netherlands, Portugal, Spain and Sweden.

Evidence of Effectiveness

Stanton et al. (2013) conducted a Cochrane review of 28 trials investigating the effectiveness of various tobacco cessation interventions with young people (under age 20) who were regular smokers.[284] Many interventions were multifaceted, combining motivational enhancement with forms of counselling support, and some were tailored to stages of change according to the Transtheoretical model.[284] Some studies examined the Not on Tobacco program, and some included NRT and other pharmacotherapies.[284]

Twelve trials employed motivational enhancement that significantly increased smoking cessation (estimated RR: 1.60, 95% CI 1.28 to 2.01).[284] Thirteen individual trials used complex interventions including cognitive behavioural therapy; none showed statistically significant results.[284] Six pooled studies of the Not on Tobacco program showed a small significant effect on smoking cessation (RR: 1.31, 95% CI 1.01 to 1.71).[284] A small study of NRT did not detect a statistically significant effect, nor did two trials of bupropion.[284] Similarly, Kim et al. (2011), in a meta-analysis of six RCTs, found no statistically significant increases in adolescent cessation rates with pharmacotherapy compared to controls.[286]

A systematic review of four trials examined the effects of mentoring to prevent or reduce tobacco use in adolescents ages 13 to 15.[287] In only one trial did mentoring result in a reduction in adolescent smoking immediately after the intervention (OR: 0.75, 95% CI: 0.55-1.01), at one-year follow-up (OR: 0.75, 95% CI: 0.55-1.01), and at two-year follow-up (OR: 0.85, 95% CI: 0.72-1.01).[287]

Villanti et al. (2010) provided a systematic review on cessation interventions for young adults ages 18 to 24. Interventions (from two studies) based on social cognitive theory were effective to promote short-term cessation in young adults.[289] The addition of telephone counselling to an established quit-line program increased self-reported 48-hour point prevalence abstinence at three and six months in the intervention group ($p<0.05$).[289] Direct counselling for lower-income young adults also increased 30-day

abstinence at three months (intervention: 15.7% vs. control: 6.7%, p=0.05).[289] Two studies used either cognitive dissonance or cognitive behavioural approaches to encourage smoking cessation.[289] Only one showed effectiveness to promote smoking cessation at one year. In the three interventions with significant results, improvements in cessation rates ranged from 6.6% to 20.6%.[289]

Another meta-analysis of 14 studies analyzed the efficacy of cessation programs for young adults ages 18 to 24.[285] Programs in the included studies used multiple interventions, including counselling, behavioural support, pharmacotherapy (e.g., NRT and bupropion), quitline referrals, written materials, self-help materials and/or computer-tailored letters.[285] They found that all the interventions showed greater effects than controls, and concluded that effective interventions for adults show similar promise for young adults.[285]

A systematic review of 38 studies by Brown et al. (2014) assessed the equity impact, by SES, of interventions to reduce smoking in youth (less than 25 years).[288] Equity impact was assessed as: positive (the intervention/s reduced inequity by SES), neutral (made no difference), negative (increased inequity), mixed (equity impact varied) or unclear.[288] Regarding cigarette tax or price increases, the review reported positive equity effects in four of seven studies (one neutral, two negative).[288] Youth of lower SES were more likely to respond to price increases than those of higher SES, although the impact of price/tax varied among youth of different age groups.[288] Smoke-free policies showed mainly neutral or negative effects across 12 studies.[288] One study found that mass media campaigns had mixed results, while controls on advertising and promotion were found to have negative (two studies) or neutral (two studies) effects.[288] Controls on access to tobacco products showed varied equity impacts, but it was noted that comprehensive and enforced state policies were moderately associated with lower rates of smoking initiation in adolescent girls of lower SES.[288] Overall, there is very little evidence that any policies or interventions reduce inequality in smoking initiation across SES in young people, with the exception of price or tax increases.[288]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Youth and Young Adults - Well supported

The body of evidence on the effectiveness of interventions targeted to youth included one systematic review and meta-analysis, two meta-analyses and three systematic reviews (three appraised as Level I, and three as Level II). Overall, interventions that involved mentoring, counselling or motivational interviewing were effective to increase smoking cessation among youth and young adults. Interventions with pharmacotherapy (e.g., NRT or bupropion) were effective for young adults but not for youth. Tax increases on cigarettes reduce inequality in smoking initiation across SES in young people.

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In Ontario, prevention-focused interventions are primarily targeted to youth, such as education about the dangers of smoking in school curricula. Based on the summary of evidence, counselling interventions have been effective among youth and young adults to increase smoking cessation. For young adults, the same smoking cessation techniques used with adults should be effective (e.g., pharmacotherapy), but may not be as effective with youth who are likely experimental smokers (rather than established smokers). Reaching the youth population can be a challenge; however, this may be due to inaccessibility of cessation services for this group (e.g. behavioural counselling). Price and tax increases have been shown to be effective for smoking cessation among youth and young adults, particularly lower SES youth and young adults. There is opportunity in Ontario to raise tobacco taxes and provide better access to cessation services for youth such as improved access to smoking cessation behavioural counselling.

Key Message

Better access to cessation services and tobacco tax increases are needed to increase smoking cessation among youth and young adults in Ontario.

Older Adults

Based on the summary of evidence, interventions that used multiple strategies or were tailored to older adults were effective to increase cessation rates. Therefore, tailored interventions are effective, but not necessary to increase smoking cessation among older adults. Multi-component interventions for the general population should work for older adults as well (e.g., combined behavioural counselling and pharmacotherapy). Ensuring smoking cessation services are easily accessible (e.g., in primary care and long-term care facilities) is important to reach older adults in Ontario.

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Background

The review level evidence is mixed; however, older cigarette smokers have been found to be less interested in quitting smoking, making quit attempts and achieving cessation when compared to young adult smokers.[290] Though cigarette smoking poses a substantial health risk at any age, the smoking-related health risk for individuals who are 50 years and older is particularly dangerous. Older adults may already be at a heightened risk for cardiovascular disease, respiratory conditions and cancer, as well as physical and mental disabilities, all of which are exacerbated by smoking.[69] The health benefits of quitting at this age have been shown to prevent premature death and rates of illness. In Canada, 9.4% (approx. 500,000) of adults 65 years and older reported being daily or occasional smokers, a decline compared to adults 45-64.[152]

The Ontario/Canadian Context

In 2013, the age-specific prevalence of current daily or occasional smoking among individuals 55 and older was 10.8%. Individuals 55 and older have the lowest age-specific prevalence when compared to younger adults, though slightly higher than youth ages 15-19.[291] A lower prevalence in the older age groups likely reflects a combination of higher rates of successful quitting among ever-smokers in these age groups and greater tobacco-related mortality as smokers age.[291]

Evidence

One systematic review and meta-analysis[292] and one systematic review[293] from the pre-appraised literature examined smoking cessation interventions for adults ages 50 and over. One study was appraised as Level I [292] and one as Level II.[293] The majority of included studies were conducted in the U.S.

Evidence of Effectiveness

Chen et al. (2015) reported that while pharmacotherapy alone showed effectiveness for cessation, (RR: 3.18, 95% CI: 1.89-5.36 vs. RR: 1.80, 95% CI: 1.67-1.94 for non-pharmacological interventions), combined approaches may be more effective, as medication compliance may be improved through behavioural interventions.[292] Zbikowski et al. (2012) reported that intensive interventions and those with multiple approaches, including medications and follow-up counselling, achieved the greatest effects.[293] However, treatment effects were mainly of short duration, and long-term quit rates were low.

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Older Adults - Supported

The body of evidence on the effectiveness of interventions on older adults (ages 50 and over) included one systematic review and meta-analysis and one systematic review (one appraised as Level I and one as Level II). Overall, the results of the reviews showed that combined/multiple approaches (e.g., pharmacotherapy and behavioural) and tailored interventions were the most effective to increase smoking cessation in the short-term, but not necessarily long-term.

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Based on the summary of evidence, interventions that used multiple strategies or were tailored to older adults were effective to increase cessation rates. Therefore, tailored interventions are effective, but not necessary to increase smoking cessation among older adults. Multi-component interventions for the general population should work for older adults as well (e.g., combined behavioural counselling and pharmacotherapy). Ensuring smoking cessation services are easily accessible (e.g., in primary care and long-term care facilities) is important to reach older adults in Ontario.

Key Message

Targeted interventions or interventions that use multiple strategies are effective to increase smoking cessation among older adults. It is important to ensure that smoking cessation services are accessible for older adults in Ontario.

Sex and Gender Considerations

Based on the summary of evidence, targeted interventions with sex and gender considerations are effective to increase cessation rates. Particularly for women, having components that addressed weight issues, stress and menstrual cycles were effective to increase smoking cessation. However, due to limited and weak evidence, more research is needed on interventions targeted to either men or women. Intervention efforts should focus on providing services for disadvantaged women in a greater variety of settings.

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Background

Both gender and sex influence smoking behaviour, and in turn, have an effect on the delivery of cessation interventions. Sex refers to a set of biological traits that are used to categorize individuals as male or female. Gender is a concept used to determine and manage sex categories, cultural meanings attached to men and women's roles and how an individual understands their identity. Gender is fluid, and individuals can understand their identities as being, but not limited to, man, woman, transgender, intersex, gender queer and other gender options. Gender involves social norms and attitudes that society deems more appropriate for one sex over another. The reviews cited in this section focus on the biological differences between males and females as related to differences in their interaction with cessation medication. Evidence that focuses on individuals who identify as cis-gender, with no clear delineation on individuals who identify as transgender is addressed in the Individuals Who Identify as Lesbian, Gay, Bisexual or Transgender (LGBT) section.

The Ontario/Canadian Context

According to data from Statistics Canada 2014, in Ontario 21.6% of males and 13.3% of females ages 12 and over, reported being a current smoker. Rates have declined since 2010, when they were 23.4% for men and 15.6% for women.[294]

In 2010, the Ontario Program Training and Consultation Centre created the Women and Tobacco Info Pack to help health care professionals and other audiences better understand how smoking affects women's health, and the importance of approaching the issue of women's smoking in a gender-specific manner.[295] The Info Pack addresses both sex and gender in relation to tobacco use among women. The resource provides clinicians, public health practitioners and community workers with scientific evidence on smoking and health to assist women to reduce or eliminate their tobacco use.[295]

Evidence

One systematic review[296] and one narrative review[297] from the pre-appraised literature investigated sex and gender considerations in smoking interventions. Both studies were appraised as Level III.[296,297] These reviews suggest ways in which the success of cessation interventions may depend on a greater understanding of sex (physical/biological) and gender (socially-determined) differences among smokers. Both reviews were appraised as Level III. The majority of included studies were conducted in the U.S.

Evidence of Effectiveness

Torchalla et al. (2012) conducted a systematic review to examine the effectiveness of tobacco interventions developed specifically for women.[296] In general, women have lower abstinence rates than men; they also report body image concerns that are less-commonly found in men, such as weight-gain.[296] Hormonal fluctuations, particularly with menstrual cycles, are also believed to affect withdrawal and smoking behaviour.[296] As such, many interventions examined in the review by Torchalla et al. (2012) included tailored components on weight and stress management (e.g., phenylpropanolamine an appetite suppressant), or timing of cessation attempts to the menstrual cycle, along with pharmacotherapies (e.g., NRT and bupropion) and various counselling and behavioural interventions.[296] Of the 39 studies identified, most found that the interventions facilitated abstinence from baseline through follow-up.[296] The available evidence suggests that smoking by low-income women should be

addressed in public health clinics, and that greater efforts should focus on providing services for disadvantaged women in a greater variety of settings.[296]

Okoli et al. (2011) conducted a narrative review of literature examining smoking cessation programs aimed at men.[297] They highlight that men are at greater risk for various health conditions, and experience more years of life lost due to cardiovascular disease, for which smoking is a major risk factor compared to women.[297] Only recently, has attention been paid to men's gender-specific understanding of their social roles, relationships and identities and how these factors influence their smoking behaviour.[297] The review examined studies with male smokers from a variety of backgrounds, occupations and health statuses, across a variety of interventions, including NRT, group treatment, peer support, counselling and mass media advertising.[297] Six of the seven included RCTs showed significant effects on smoking cessation outcomes in favour of intervention groups.[297] In three cohort studies, the use of behavioural counselling with pharmacotherapy was associated with cessation outcomes of 22%, 36.4% and 64%.[297]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Sex and Gender Considerations - Promising direction

The body of evidence on the effectiveness of interventions with sex and gender considerations included one systematic review and one narrative review (both appraised as Level III). Overall, the results of the reviews showed that interventions targeted towards either men or women were effective to increase cessation. For example, tailored components (e.g., weight and stress management, timing of menstrual cycle and pharmacotherapy) worked well for women and behavioural counselling with pharmacotherapy worked well for men.

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Based on the summary of evidence, targeted interventions with sex and gender considerations are effective to increase cessation rates. Particularly for women, having components that addressed weight issues, stress and menstrual cycles were effective to increase smoking cessation. However, due to limited and weak evidence, more research is needed on interventions targeted to either men or women. Intervention efforts should focus on providing services for disadvantaged women in a greater variety of settings.

Key Message

Evidence suggests interventions targeted to either men or women are effective; however, more research is needed and should have a focus on providing services for disadvantaged women in a greater variety of settings.

Ethnic Minorities

Based on the summary of evidence, interventions that are culturally-adapted to ethnicities are effective to increase cessation rates. However, with low generalizability due to so many types of interventions, further research is needed on the effectiveness of interventions culturally adapted for ethnic minorities. In Ontario, the Smoker's Helpline is available in French and provides culturally-adapted self-help materials. Other smoker cessation programs in Ontario could consider providing more culturally-adapted services and materials (especially in diverse cities such as Toronto).

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Background

Smoking is influenced by an individual's physical and social environment, which in turn, is influenced by their ethnicity and its relationship with their living conditions, social relationships, understandings of health and access to health services.[298] An individual's response to smoking cessation interventions is also influenced by these same factors.[298,299] As a result, to improve intervention effectiveness and to respect culturally-relevant values, beliefs and practices, smoking cessation interventions may be designed and adapted to acknowledge the social and environmental differences between ethnic minority groups.

The Ontario/Canadian Context

The *Canadian Community Health Survey* collects data on the prevalence of smoking among various cultural backgrounds, but the data is inconsistently collected and not publically available. The Smoker's Helpline website is also fully translated in French and provides culturally-adapted self-help materials.[300]

Evidence

One systematic review and meta-analysis,[301] two systematic reviews,[302,303] one mixed methods review[299] and two narrative reviews[304,305] from the pre-appraised literature examined the use of smoking cessation interventions by various ethnic minority groups. One study was appraised as Level I,[302] three studies as Level II[299,301,305] and two studies as Level III.[303,304] The majority of studies included in the reviews were conducted in the U.S.

Evidence of Effectiveness

A systematic review included several studies that found statistically significant results on smoking rates and smoking abstinence in favour of interventions with cultural adaptations for various ethnic minority groups (African American, Latino population and Chinese American) in high income societies.[302] Out of four studies that focused on smoking cessation, three studies that included cultural adaptations to standard telephone counselling significantly increased smoking abstinence.[302] The one other study showed no differences in cessation-related outcomes (seven-day abstinence, smoking reduction and readiness to quit) from a culturally-adapted videotape and guide versus a standard videotape and guide.[302]

Culturally-adapted interventions among various ethnic minority groups (African, Chinese and South Asian) in a mixed-methods evidence synthesis[299] and a systematic review[303] were also examined. The culturally-adapted interventions, which varied in type and intensity, included media-based programs and campaigns (e.g., videotapes, television and radio), clinician and professional advice, self-help manuals, written materials, telephone calls, NRT, counselling or a combination in the form of community outreach programs. In the systematic review, they found that adapted smoking cessation interventions had greater acceptability among ethnic minority groups.[303] However, they did not find clear evidence of effectiveness for culturally-adapted interventions; only 13 of 28 studies showed statistically significant results on smoking cessation-related outcomes (e.g., quit attempts, quit rates, abstinence).[303] Furthermore, among six studies directly comparing culturally-adapted interventions to non-adapted interventions, only one study showed that adapted interventions were effective (the remaining 22 studies did not allow for direct comparisons).[303] Liu et al. (2012) noted similar findings on the acceptability and effectiveness of adapted interventions in their mixed-methods evidence synthesis.[299] They reported that adapted interventions were more feasible to conduct than their non-adapted form, especially if an existing organization or setting could be used for the culturally-adapted intervention (e.g., religious organizations).[299] However, interventions delivered in some settings may not be accessible for all individuals.

A systematic review and meta-analysis examined smoking cessation interventions specifically among American Hispanic adult smokers.[301] Interventions included self-help, NRT, community-based interventions and counselling (individual, group and telephone).[301] In their meta-analysis of five studies, the authors found evidence supporting the efficacy of smoking cessation interventions at the end of treatment (OR: 1.54, 95% CI: 1.09-2.16).[301] However, based on three studies, no significant results at the first follow-up were seen (OR: 1.46, 95% CI: 0.96-2.23).[301]

A narrative review by Cox et al. (2011) examined the use of pharmacotherapy and behavioural interventions for smoking cessation among American adults from various ethnic minority groups.[305] They report general evidence supporting the benefits of behavioural counselling and pharmacotherapy on smoking abstinence.[305] There was specific evidence supporting the nicotine patch for Latino smokers, and the nicotine patch, nicotine nasal spray and bupropion for African American smokers.[305] There was also evidence supporting telephone counselling, group counselling and community-wide smoking cessation interventions among ethnic minority groups.[305]

A narrative review examined culturally-adapted behavioural and psychosocial interventions for American adolescents from various ethnic minority groups (African American, Chinese American, Hispanic, Arab American and Native American).[304] The interventions were targeted to minority groups and/or adapted to consider their experiences, norms and values.[304] The interventions, which were school or classroom-based, included cognitive behavioural group therapy, peer-support, and advice/education.[304] They found that there was no improvement in tobacco abstinence rates overall with adapted cessation interventions, compared to control or standard-care conditions.[304] However, compared to control conditions, adapted prevention interventions did result in lower tobacco initiation rates than control or standard-care conditions.[304]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Ethnic Minorities - Promising direction

The body of evidence on the effectiveness of interventions culturally-adapted to ethnic minorities included one systematic review and meta-analysis, two systematic reviews, one mixed methods review and two narrative reviews (one appraised as Level I, three as Level II, and two as Level III). Overall, the evidence showed mixed effectiveness with culturally-adapted interventions that typically combined two or more strategies (e.g., behavioural counselling, pharmacotherapy, self-help materials and media). The evidence is unclear on how well the interventions were culturally-adapted to ethnic minorities (their acceptability), which may be the reason why some interventions were effective and others were not.

SFO-SAC Scientific Consensus Statement

Based on the summary of evidence, interventions that are culturally-adapted to ethnicities are effective to increase cessation rates. However, with low generalizability due to so many types of interventions, further research is needed on the effectiveness of interventions culturally adapted for ethnic minorities. In Ontario, the Smoker's Helpline is available in French and provides culturally-adapted self-help materials. Other smoker cessation programs in Ontario could consider providing more culturally-adapted services and materials (especially in diverse cities such as Toronto).

Key Message

More research is needed on the effectiveness of interventions culturally-adapted for ethnic minorities and an opportunity to expand the availability of culturally- adapted services and materials in Ontario.

Indigenous Populations

Ontario has cessation programs targeted towards Indigenous populations such as the Aboriginal Tobacco Program of Cancer Care Ontario. Based on the summary of evidence, interventions targeted to Indigenous populations are effective to increase cessation rates. Evaluations of cessation programs targeted to Indigenous populations are needed in Ontario in order to improve cultural adaptation and access to these services (especially for First Nations that live on-reserve).

SFO-SAC 2016 Scientific Consensus Statement

Background

Indigenous communities suffer from substantial health disparities and are overrepresented in tobacco-related morbidity and mortality;[306] they tend to have significantly higher smoking rates than the general population, yet are underrepresented in the tobacco research literature.

The Ontario/Canadian Context

The Aboriginal Tobacco Program of Cancer Care Ontario is one example of cessation programming that targets Indigenous populations. The goal of the program is to engage stakeholders across Aboriginal communities to create health promotion strategies to both decrease and prevent the misuse of commercial tobacco.[307] The program has helped to provide funding for tobacco cessation programs in Aboriginal communities as well as to connect front-line staff to training programs that address commercial tobacco prevention, cessation and protection.[307]

The integration of Moving On to Being Free™ into Meno Ya Win Health Centre, which serves 33 First Nations communities in NW Ontario, is another example of cessation programming that targets Indigenous populations. Patients from 28 of the 33 communities served have enrolled. Preliminary unpublished outcomes show a one-year cessation rate of 50% (intention to treat). Smoking Treatment for Ontario Patients STOP is implemented in 100% of (Aboriginal Health Access Centers (AHACs) as a program.[74]

The Ontario Tobacco Research Unit (OTRU) with Well Living House at the Centre for Research on Inner City Health (CRICH) studied which interventions best address non-traditional tobacco use in both First Nations on-reserve communities and urban Aboriginal Communities in Ontario. The project was called

Research on Non-Traditional Tobacco Use Reduction in Aboriginal Communities (RETRAC) and was conducted in collaboration with the Aboriginal Cancer Unit and Cancer Care Ontario (CCO).[308] The project included a knowledge synthesis of tobacco control interventions with Indigenous peoples worldwide, an analysis of evidence from this synthesis and primary research. Four exemplar communities (i.e., that have shown success in reducing non-traditional tobacco use) with one in Canada, two in United States, one in Australia were selected, where in Canada, engagement activities were conducted in seven Ontario Aboriginal communities.[309] Overall, initial findings from the knowledge synthesis demonstrated that a variety of interventions can lead to reductions in smoking and protection from non-traditional tobacco use in Indigenous communities. Further, interventions were likely to be successful if they focused on forming meaningful relationships with community members, provided access to culturally-relevant health care, and grounded work in cultural protocol and practice.[309] The RETRAC project was completed in March 2016; it will continue with primary research at the community level and the knowledge synthesis work will be updated annually to reflect new literature,[309] which started in late 2016 in the RETRACT II program.

Evidence

One systematic review and meta-analysis[306] and three systematic reviews[310-312] from the pre-appraised literature examined smoking interventions in Indigenous populations. Two reviews were appraised as Level I,[306,310] one review was appraised as Level II,[311] and one review was appraised as Level III.[312] The majority of studies took place in New Zealand and Australia, with a few in the U.S. and one in Canada. Most reviews included studies of pharmacotherapies, various forms of counselling, text messaging and quit line services, as well as multi-component interventions.

Evidence of Effectiveness

There is evidence that cessation interventions can be effective in Indigenous populations, although there is an overall lack of evidence about how best to employ interventions and about whether tailoring them to the population is necessary or beneficial. A Cochrane review included four studies, two of combined approaches (pharmacotherapy and cognitive and behavioural therapies) and two using cognitive and behavioural therapy.[306] Cessation data were pooled across all studies, producing a statistically and clinically significant effect in favour of the intervention (RR: 1.43, 95% CI: 1.03-1.98).[306] The authors urge that more rigorous research is needed on interventions with Indigenous groups.[306]

Johnston et al. (2013) conducted a systematic review to assess whether cultural adaptation was necessary for interventions to be effective with Indigenous populations.[310] They concluded that there is likely no significant difference between Indigenous and non-Indigenous populations regarding the efficacy of interventions, but there is a shortage of evidence as to whether culturally-adapted interventions are necessary.[310] Similarly, Power et al. (2009) concluded that individual-level strategies, such as NRT and/or counselling, are likely to be as effective for Indigenous as for non-Indigenous people overall.[311] They suggested that interventions provided by Indigenous health care workers are likely to contribute to improving quit rates.[311] However, they found that, among Indigenous Australians, there was a lack of evidence on how best to encourage the population to access available quit supports.[311] A systematic review by Digiacomo et al. (2011) found that quit lines were effective in three North

American Indigenous populations, but asserted that further attention to cultural adaptation is needed.[312]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Indigenous Populations - Promising Direction

The body of evidence on the effectiveness of interventions culturally-adapted to Indigenous populations included one systematic review and meta-analysis and three systematic reviews (two appraised as Level I, one as Level II, and one as Level III). Overall, there is evidence that interventions (e.g., pharmacotherapy and cognitive and behavioural therapies) are effective to increase smoking cessation in Indigenous populations. However, the evidence consistently stated that more research was needed on whether culturally-adapted interventions for Indigenous populations are needed.

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Ontario has cessation programs targeted towards Indigenous populations such as the Aboriginal Tobacco Program of Cancer Care Ontario. Based on the summary of evidence, interventions targeted to Indigenous populations are effective to increase cessation rates. Evaluations of cessation programs targeted to Indigenous populations are needed in Ontario in order to improve cultural adaptation and access to these services (especially for First Nations that live on-reserve).

Key Message

More evaluation research is needed on the reach of interventions targeted to Indigenous populations. Engagement and accessibility of cessation services with Indigenous populations to quit commercial tobacco is important (especially for First Nations that live on-reserve) for decreasing the higher smoking prevalence.

Individuals Who Identify as Lesbian, Gay, Bisexual or Transgender (LGBT)

Ontario has cessation programs such as the Clear the Air project targeted to LGBT populations. Based on the summary of evidence, interventions targeted to individuals who identify as LGBT are effective to increase cessation rates. However, general interventions with pharmacotherapy and counselling could also work in this population. More longitudinal research is needed in LGBT populations. Programs are not readily available to all LGBT individuals, given the accessibility of programs outside urban areas (e.g., in Northern Ontario); evaluations of cessation programs targeted to LGBT populations are needed to improve access to these services in Ontario.

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Background

There is evidence that suggests lesbian, gay, and bisexual (LGB) people are more likely to smoke cigarettes compared to the general population.[313] According to the American Centers for Disease Control and Prevention (CDC), from 2005-14 approximately 25% of LGB adults smoked cigarettes compared to 17% of heterosexual adults. Smoking prevalence data are not captured in Canada through CTUMS or any national smoking research.[313] Moreover, research has primarily focused on lesbian and gay populations, with limited prevalence data for individuals who identify as bisexual, transsexual or transgender.[314] Research on these subgroups is important as these groups may correspond to 'communities' with distinct smoking prevalence and determinants to smoking. There is also a paucity of evidence to explain why smoking rates are higher in LGB individuals, though some evidence points to four main factors 1) stigma, discrimination and oppression, 2) community norms, 3) targeted marketing by tobacco companies and 4) reduced access to health services.[314]

The Ontario/Canadian Context

The Clear the Air project, launched in 2012, is an example of how organizations across Ontario have partnered to address the high rates of tobacco use among LGBT communities. Rainbow Health Ontario, in partnership with Toronto Public Health, Rainbow Servicers at the Centre for Addiction and Mental Health and the Smoker's Helpline created the Clear the Air project to raise awareness about smoking in LGBT communities and to get community members involved in the discussions about how to decrease smoking rates. The project includes an online platform that provides stories written by community members as well tools and strategies to help to facilitate quit attempts. [315]

Evidence

One narrative review by Lee et al. (2014) from the pre-appraised literature examined smoking cessation interventions for individuals who identify as lesbian, gay, bisexual, and transgender (LGBT).[316] This review was appraised as Level II. The majority of included studies were conducted in the U.S.

Evidence of Effectiveness

The review found that overall, group cessation curricula tailored for LGBT populations were found to be effective and feasible to implement.[316] Additionally, two studies in the review (intensive counselling and pharmacotherapy using NRT) that were not tailored to LGBT populations were found to be equally effective for both LGBT and heterosexual individuals.[316] Community interventions for LGBT individuals have also been implemented and have been shown to be feasible; however, no rigorous outcome evaluations have been published.[316]

Results from focus groups and community surveys suggested that individuals from LGBT communities desire LGBT-specific or LGBT-friendly interventions; however, many LGBT individuals prefer to quit using an unassisted or 'cold turkey' approach.[316] Additionally, individuals who identify as LGBT may experience specific stressors, and it has been suggested that interventions should address stigma as well as provide social support.[316]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Individuals Who Identify as Lesbian, Gay, Bisexual, or Transgender (LGBT) - Promising Direction

The body of evidence on the effectiveness of interventions targeted to individuals who identify as LGBT included one narrative review appraised as Level II. Overall, the results of the review showed that tailored "LGBT-friendly" interventions were effective, however, two studies (using intensive counselling and pharmacotherapy) that were not tailored to LGBT were found to be equally effective for both LGBT and heterosexual individuals.

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Ontario has cessation programs such as the Clear the Air project targeted to LGBT populations. Based on the summary of evidence, interventions targeted to individuals who identify as LGBT are effective to increase cessation rates. However, general interventions with pharmacotherapy and counselling could also work in this population. More longitudinal research is needed in LGBT populations. Programs are not readily available to all LGBT individuals, given the accessibility of programs outside urban areas (e.g., in Northern Ontario); evaluations of cessation programs targeted to LGBT populations are needed to improve access to these services in Ontario.

Key Message

More evaluation research is needed on the reach of interventions targeted to individuals who identify as LGBT. Engagement and accessibility of cessation services with LGBT communities are important because these communities have higher rates of smoking.

Low-Income & Other Socially-Disadvantaged Groups

Based on the summary of evidence, interventions targeted to low-income and other socially-disadvantaged groups were effective to increase cessation rates in the short term. For interventions not targeted to low-income and other socially-disadvantaged groups, most population level interventions (e.g., tax increases) and individual level interventions (e.g., technology-based interventions) were effective to increase smoking cessation across all SES. Evaluation of cessation programs in Ontario is important to determine if there is adequate access to smoking cessation services, especially for low- income and disadvantaged groups and to maximize the reach of those services. For example, unemployed, underemployed and people without private insurance coverage in low SES populations have less access to smoking cessation medication through the current Ontario Drug Benefit program.

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Background

The burden of tobacco use varies considerably across different socio-economic status. People with disadvantaged circumstances such as lower education levels low income job or unemployment experience more tobacco-related illness than the general population.[317,318] Although the percentage of Ontarians who smoke cigarettes on a daily or occasional basis has decreased over the last decade, there is concern that reductions in smoking prevalence might have been achieved mainly among smokers with higher SES rather than among those with lower SES, thus contributing to health disparities.[317,319]

The Ontario/Canadian Context

Household income in Ontario demonstrated a significant association with daily smoking among Ontarians ages 18 and older. People with lower income had a higher rate of smoking compared to people with higher incomes. From 2011 to 2013, daily cigarette smoking increased significantly from 17.5% to 28% among people with incomes of less than $30,000 compared to 9.1% to 11.2% among people with incomes of $80,000 and more.[320] The Ontario Drug Benefit program covers seniors, MOHLTC programs (Long-Term Care, Home Care and Homes for Special Care), Ministry of Community and Social Services (Ontario Disability Support Program and Ontario Works) and the Trillium Drug Plan.[9] There tends to be a higher number of unemployed, underemployed and people without private

insurance coverage in low SES populations; therefore with the current Ontario Drug Benefit program, low SES populations, other than those covered, would have less access to smoking cessation medication.

Table 6.3: Daily cigarette smoking among Ontarians aged 18+ in the past year, by income level[320-322]

Year	2009	2011	2013
< $30,000	20.8%	17.5%	28.0%
$30,000 - $49,999	17.8%	14.8%	15.2%
$50,000 - $79,999	18.4%	14.7%	13.0%
$80,000 +	12.3%	9.1%	11.2%
Not Stated	11.7%	9.4%	11.7%

Evidence

Two systematic reviews and meta-analyses[323,324] and two systematic reviews[325,326] (from the pre-appraised literature) examined the effects of smoking cessation interventions on smoking cessation-related outcomes among low-income and other socially-disadvantaged populations. Two additional systematic reviews[327,328] examined the equity impact, in terms of SES, of a variety of smoking cessation interventions with adults. Two of the studies were appraised as Level I[324,326] and four as Level II.[323,325,327,328] The majority of studies included in the reviews were conducted in the U.S.

Evidence of Effectiveness

A systematic review and meta-analysis by Bryant et al. (2011) examined behavioural smoking cessation interventions (e.g., motivational interviewing, brief advice, incentives for quitting, self-help interventions and behavioural support).[324] Among low income female smokers, multi-component motivational interviewing interventions resulted in significantly better abstinence rates in the short-term (≤ three months) (RR: 1.68, 95% CI: 1.21-2.33) but not in the long-term (six months or the longest follow-up) (RR: 1.28, 95% CI: 0.96-1.72), when compared to usual care or brief advice.[324] For low income individuals living in deprived areas, behavioural support interventions had neither significantly better short-term (RR: 1.87, 95% CI: 0.91-3.83) nor long-term (RR: 1.58, 95% CI: 0.79-3.14) abstinence rates when compared to controls.[324]

Two reviews by Bull et al. (2014) and Ford et al. (2013) corroborate the above findings on behavioural interventions.[323,325] Bull et al. found that, among adult smokers of low-income, behavioural change support interventions improved smoking abstinence immediately at the end of treatment compared to controls (RR: 1.59, 95% CI: 1.34-1.89).[323] However, long-term follow-up of smoking abstinence at three

to 12 months was not significantly maintained (RR: 1.11, 95% CI: 0.93-1.34).[323] Ford et al. found five of eight studies showing the efficacy of peer and partner support programs for smoking cessation among disadvantaged populations, including low-income women.[325] Two studies showed short-term (less than three months) effects and three studies showed mid-term (three to six months) effects on smoking abstinence.[325]

In two reviews, the equity impact of smoking cessation interventions was examined in adult smokers, where equity impact was assessed in terms of SES and as follows: positive (the intervention reduced inequity by SES), neutral (made no difference), negative (increased inequity), mixed (equity impact varied), or unclear.[327,328] In one of the reviews, Brown et al. (2014a) examined the equity impact of individual-level interventions in Europe.[327] The authors found that studies examining combined behavioural and pharmacological interventions had negative equity impact.[327] However, the authors found that service reach of the combined interventions was comparatively higher among low-SES smokers, which may compensate for the lower quit rates and potentially reduce smoking inequalities.[327] Regarding behavioural therapy alone, the majority of studies had negative equity impact (four of five studies).[327] The review identified only one study each for pharmacotherapy alone and quit/win contests, which all had negative equity impact.[327] All studies on quitlines, and Internet- and text-messaging based interventions had neutral equity effects.[327]

In the second review, Brown et al. (2014c) examined population-level interventions for smoking cessation.[328] Most of the studies examining cigarette price/tax increases had positive equity impact.[328] In contrast, most of the studies on smoke-free policies that were voluntary, regional or partial smoke-free policies had negative equity impact; however, smoke-free policies across Australia, Canada, the U.K, and the U.S. have reduced inequalities in policy coverage by SES.[328] Mass media campaigns had inconsistent impact on equity, and combined population-level cessation support interventions had mostly positive equity impact.[328] Multiple tobacco control policies, settings-based interventions (community, workplace and hospital) or cigarette marketing controls had mostly neutral effects on equity.[328]

Intervention Characteristics/Implementation Considerations

A systematic review by Murray et al. (2009) examined various smoking cessation programs among disadvantaged groups, including low-income and homeless smokers.[326] The review focused on improving access to smoking cessation services for disadvantaged groups. They found some evidence of the effects of proactively identifying and enrolling disadvantaged smokers into services, as well as some promise with combining cessation interventions with other interventions (e.g., health care services).[326] However, there are several barriers that are particularly prevalent among smokers from low SES groups, which include fear of being judged, fear of failure and lack of knowledge needed to motivate smokers to access cessation services. Therefore, interventions should address both social and psychological barriers to quitting.[326]

Intervention Summary

Evidence Summary - Low-Income & Other Socially-Disadvantaged Groups - Supported

The body of evidence regarding the effectiveness of low-income and other socially-disadvantaged groups included two systematic reviews and meta-analyses and four systematic reviews (two appraised as Level I and four as Level II). Overall, multi-component interventions using behavioural or peer/partner support strategies showed short-term (less than six months) effectiveness to increase smoking abstinence in adult smokers of low-income. In terms of equity impact of smoking cessation interventions, at the individual level (in European adults), there was an increase in inequity in low SES for behavioural, pharmacotherapy and quit and win contest interventions, while quit lines, Internet and text-messaging based interventions had equal effect across SES. At the population level, interventions (e.g., price and taxation, smoke-free policies, and cigarette marketing control) showed a positive or equal effect across SES overall. Only smoke-free policies that were not comprehensive (i.e., voluntary or partial) increased inequity.

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Based on the summary of evidence, interventions targeted to low-income and other socially-disadvantaged groups were effective to increase cessation rates in the short term. For interventions not targeted to low-income and other socially-disadvantaged groups, most population level interventions (e.g., tax increases) and individual level interventions (e.g., technology-based interventions) were effective to increase smoking cessation across all SES. Evaluation of cessation programs in Ontario is important to determine if there is adequate access to smoking cessation services, especially for low- income and disadvantaged groups and to maximize the reach of those services. For example, unemployed, underemployed and people without private insurance coverage in low SES populations have less access to smoking cessation medication through the current Ontario Drug Benefit program.

Key Message

More evaluation research is needed on how to reach and provide access to smoking cessation services to low-income and disadvantaged groups.

Cessation of Other Tobacco Products

Combustible Products – Waterpipes

Based on the summary of evidence, tobacco cessation interventions are effective to increase cessation rates for waterpipe users; however, due to the limited number of studies, more research is needed. Smoking cessation interventions should be effective for waterpipe users, but access to and communication about including waterpipe users in current cessation services in Ontario are probably needed.

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Background

Waterpipe is a traditional method of smoking tobacco (especially in the Eastern Mediterranean Region), in which smoke passes through a reservoir of water before being inhaled by the smoker.[212] Cigarette smoking is prominent among waterpipe smokers and cigarette smoking has been shown to be a major predictor of waterpipe smoking among youth.[212] Many waterpipe smokers become dependent users, who experience withdrawal symptoms and difficulty quitting.[212]

The Ontario/Canadian Context

According to the 2013 *Canadian Tobacco, Alcohol and Drugs Survey*, 10% (or 2.8 million) of respondents 15 years and older have ever tried tobacco waterpipe where 14% (296,000) are youth (ages 15 -19) and 29% are young adults (ages 20-24).[329] Less than 1% of Canadians 15 years and older reported smoking a waterpipe in the past 30 days, unchanged in the 2015 CTADS report, where 2% (35,000) of youth, ages 15 to 19 and 3% (66,000) of young adults, ages 20 to 24 reported using a waterpipe to smoke tobacco in the past 30 days.[10] Among those who reported using waterpipe during the past 30 days, 43% believed that smoking tobacco in a waterpipe was more harmful, and 21% believed it was less harmful, than smoking cigarettes.[10] There are currently no statistics on the prevalence of regular waterpipe users or dual users of waterpipe and cigarettes.

Please refer to Integrating other Products (e.g., E-Cigarettes, Waterpipe) into Smoke-free Policies in the Protection chapter for more information on waterpipe restrictions.

Evidence

One narrative Cochrane review (from the pre-appraised literature) examined the effectiveness of tobacco cessation interventions for waterpipe users.[212] The review was appraised as Level I. This review included three primary studies, two of which were conducted in the Middle East (Egypt and Pakistan) and one in the U.S.[212]

Evidence of Effectiveness

Overall, the results suggest that cessation interventions may help waterpipe smokers to quit.[212] In all three studies, smoking cessation rates were higher in the intervention group (e.g., behavioural or combined behavioural/ NRT interventions) compared to the control (e.g., standard care, information)

(RR: 1.46, 95% CI: 0.81-2.62 to RR: 3.25, 95% CI 1.19-2.12) (with significant differences among two of the three studies).[212] Adding a pharmacological agent (bupropion) did not seem to provide an additional benefit in achieving cessation when combined with behavioural support; however, this conclusion was based on a single primary study.[212]

Intervention Characteristics/Implementation Considerations

To address smoking cessation among waterpipe users, it may be useful to build upon the evidence regarding smoking cessation for cigarette users, adding components and assessment tools that specifically address waterpipe smoking (e.g., social dimensions, unique experiences and cues).[212]

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Combustible Tobacco Products - Waterpipes - Supported

The body of evidence on the effectiveness of tobacco cessation interventions for waterpipe users included one narrative review appraised as Level I. Overall, the results from the review showed some evidence that behavioural, or combined behavioural and pharmacological (NRT) interventions, increased smoking cessation. The pharmacological agent bupropion did not appear to provide additional benefit when used along with behavioural support.

SFO-SAC 2016 Scientific Consensus Statement - Uncertain at this time, Positive Equity

Based on the summary of evidence, tobacco cessation interventions are effective to increase cessation rates for waterpipe users; however, due to the limited number of studies, more research is needed. Smoking cessation interventions should be effective for waterpipe users, but access to and communication about including waterpipe users in current cessation services in Ontario are probably needed.

The scientific consensus regarding the potential contribution for Ontario is: Uncertain at this time. This intervention has a potential positive equity impact.

Key Message

More research is needed on access to tobacco cessation interventions for waterpipe users.

Smokeless Tobacco

Based on the summary of evidence, tobacco cessation interventions such as varenicline and interventions in dental settings are effective to increase tobacco cessation among smokeless tobacco users. There is opportunity to integrate tobacco cessation interventions for smokeless tobacco users in a comprehensive tobacco control strategy in Ontario.

SFO-SAC 2016 Scientific Consensus Statement

Background

Smokeless tobacco is tobacco that is consumed orally and is not burned.[330] This includes chewing tobacco (cut tobacco leaves), snuff (moist ground tobacco) or snus (finely-ground moist tobacco).[330,331] Smokeless tobacco may also be mixed with other ingredients, such as areca nut and lime.[331]

The Ontario/Canadian Context

In 2013, 8% of Canadians 15 years and older reported having ever tried smokeless tobacco products. Six percent of youth ages 15 to 19, and 10% of young adults, ages 20 to 24 reported having ever tried smokeless tobacco.[329] Rates have remained unchanged since 2011. According to the 2015 CTADS survey:1% (113,000) of Canadians ages 15 years and older reported past-30-day smokeless tobacco use; 1% of youth ages 15 to 19, reported past-30-day smokeless tobacco use and 2% was reported among young adults ages 20 to 24.[10] These results from the 2015 CTADS were unchanged from 2013.[10] There are currently no statistics on the prevalence of regular smokeless tobacco users or dual users of smokeless tobacco and cigarettes.

Based on the 2004 Canadian Dental Hygienists Association position paper, dental hygienists in Ontario believe they play a key role in delivering consistent tobacco use cessation messaging as members of inter-disciplinary health professional teams, with a responsibility to provide tobacco cessation services as an integral part of oral health services.[80] Spit tobacco is not considered as a safe alternative for cigarettes. Screening for tobacco use is currently on a voluntary basis for private oral health services. There is evidence that dental health professionals are successful to increase quit rates among smokeless tobacco users.[79]

Since January 2015, retailers are not allowed to sell flavoured tobacco products, including flavoured chewing tobacco or snuff. Please refer to Banning Flavours in Tobacco Products for more information.

Evidence

Three meta-analyses[81,84,330] and one narrative review[331] from the pre-appraised literature search examined the effectiveness of interventions targeting users of smokeless tobacco products. Two reviews were appraised as Level I,[84,330] one was appraised as Level II[81] and one was appraised as Level III (Ebbert 2012).[331] The majority of studies took place in the U.S.[84,330]

Evidence of Effectiveness

One Cochrane review[330] and one narrative review[331] examined the impact of pharmacological and/or behavioural interventions for smokeless tobacco users. Both found that varenicline increased abstinence rates among smokeless tobacco users, while NRT and bupropion showed little to no effect.[330,331] The Cochrane review by Ebbert et al. (2011) found no effect on continuous all-tobacco abstinence among tobacco users for bupropion (OR: 0.86, 95% CI: 0.47-1.57) and NRT (OR: 1.14, 95% CI: 0.91-1.42), and found that varenicline increased tobacco abstinence rates at six months compared to a placebo (OR: 1.6, 95% CI: 1.08-2.36) (however, this varenicline finding was based on a single study).[330] Similarly, the narrative review by Ebbert (2012) found that although NRT was shown to have some benefit for abstinence in the short-term, bupropion and NRT did not demonstrate efficacy for increasing tobacco abstinence rates among smokeless tobacco users in the long-term.[331] Varenicline, however, was found to increase both short- and long-term tobacco abstinence rates.[331]

Additionally, the meta-analysis by Ebbert (2011) found that behavioural interventions increased tobacco abstinence rates among smokeless tobacco users (OR: 1.66, 95% CI: 1.48-1.88).[330] In particular, interventions with telephone support provided significant benefit (OR: 2.24, 95% CI: 1.89-2.66).[330]

Two meta-analyses examined the effectiveness of dental setting interventions for smokeless tobacco users; the interventions resulted in greater tobacco abstinence (at six month follow-up or longer) compared to controls (OR: 1.86, 95% CI: 1.10-3.14);[81] (OR: 1.70, 95% CI: 1.36-2.11).[84]

Intervention Characteristics/Implementation Considerations

No information on intervention characteristics and/or implementation considerations was identified from the included literature of this report.

Specific Populations/Equity Considerations

No information on specific populations and/or equity was identified from the included literature of this report.

Intervention Summary

Evidence Summary - Smokeless Tobacco - Promising direction

The body of evidence on the effectiveness of tobacco cessation interventions for smokeless tobacco users included three meta-analyses and one narrative review (two appraised as Level I, one as Level II, and one as Level III). Overall, the results showed varenicline was effective to increase abstinence rates, while NRT and bupropion were not effective among smokeless tobacco users. Interventions in the dental setting were also effective to increase tobacco abstinence.

SFO-SAC 2016 Scientific Consensus Statement - Uncertain at this time

Based on the summary of evidence, tobacco cessation interventions such as varenicline and interventions in dental settings are effective to increase tobacco cessation among smokeless tobacco users. There is opportunity to integrate tobacco cessation interventions for smokeless tobacco users in a comprehensive tobacco control strategy in Ontario.

The scientific consensus regarding the potential contribution for Ontario is: Uncertain at this time

Key Message

Varenicline and interventions in dental settings are effective to increase tobacco cessation among smokeless tobacco users. There is opportunity to integrate tobacco cessation interventions for smokeless tobacco users in Ontario.

References

1. Zhu SH, Lee M, Zhuang YL, Gamst A, Wolfson T. Interventions to increase smoking cessation at the population level: how much progress has been made in the last two decades? Tob Control. 2012;21(2):110-8.

2. Smith AL, Carter SM, Chapman S, Dunlop SM, Freeman B. Why do smokers try to quit without medication or counselling? A qualitative study with ex-smokers. BMJ Open. 2015;5(4):e007301. Available from: http://bmjopen.bmj.com/content/bmjopen/5/4/e007301.full.pdf

3. Chaiton M, Diemert L, Cohen JE, Bondy SJ, Selby P, Philipneri A, et al. Estimating the number of quit attempts it takes to quit smoking successfully in a longitudinal cohort of smokers. BMJ Open. 2016;6:e011045. Available from: http://bmjopen.bmj.com/content/bmjopen/6/6/e011045.full.pdf

4. Ontario. Ministry of Health and Long-term Care. Helping smokers quit Ontario's smoking cessation action plan: a smoke-free Ontario initiative [Internet]. Toronto, ON: Queen's Printer for Ontario; 2016 [updated 2016 May 31; cited 2016 Dec 13]. Available from: http://www.health.gov.on.ca/en/common/ministry/publications/reports/cessation/default.aspx

5. Quitting smoking [Internet]. Atlanta, GA: Centers for Disease Control and Prevention (CDC); 2016 [updated 2016 Dec 1; cited 2016 Dec 13]. Available from: https://www.cdc.gov/tobacco/data_statistics/fact_sheets/cessation/quitting/

6. Table 105-0501 - Health indicator profile, annual estimates, by age group and sex, Canada, provinces, territories, health regions (2013 boundaries) and peer groups [Internet]. Ottawa, ON: Statistics Canada; 2016 [updated 2016 Apr 21; cited 2015 July 31]. Available from: http://www5.statcan.gc.ca/cansim/a26?lang=eng&id=1050501

7. Zawertailo L. Email sent to: Brandon Cheung. 2016 Mar 15

8. Kirst M, Manji N, Andrews J, Di Sante E, Babayan A, Chaiton M, et al. Cessation pathways: exploring opportunities for developing a coordinated smoking cessation system in Ontario [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2013 [cited 2016 Mar 10]. Available from: http://otru.org/wp-content/uploads/2013/10/special_cessation_pathways.pdf

9. Ontario Tobacco Research Unit. Smoke-free Ontario strategy monitoring report [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2016 [cited 2016 Dec 12]. Available from: http://otru.org/wp-content/uploads/2016/02/OTRU_2015_SMR_Full.pdf

10. Summary of results for 2015: Canadian tobacco, alcohol and drugs survey (CTADS) [Internet]. Ottawa: Government of Canada; 2016 [updated 2016 Nov 16; cited 2016 Nov 20]. Available from: https://www.canada.ca/en/health-canada/services/canadian-tobacco-alcohol-drugs-survey/2015-summary.html

11. The social-ecological model: a framework for prevention [Internet]. Atlanta, GA: Centers for Disease Control and Prevention; 2015 [updated 2015 Mar 25; cited 2016 Dec 3]. Available from: https://www.cdc.gov/violenceprevention/overview/social-ecologicalmodel.html

12. Rigotti NA, Clair C, Munafo MR, Stead LF. Interventions for smoking cessation in hospitalised patients. Cochrane Database Syst Rev. 2012(5):CD001837. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001837.pub3/epdf

13. International Agency for Research on Cancer. IARC handbooks of cancer prevention: volume 14: tobacco control. Effectiveness of tax and price policies for tobacco control. Lyon, FR: International Agency for Research on Cancer (IARC); 2011. Available from: http://www.iarc.fr/en/publications/pdfs-online/prev/handbook14/handbook14.pdf

14. World Health Organization. WHO report on the global tobacco epidemic, 2015: raising taxes on tobacco. Geneva, SZ: World Health Organization; 2015. Available from: http://apps.who.int/iris/bitstream/10665/178574/1/9789240694606_eng.pdf?ua=1&ua=1

15. U.S. National Cancer Institute and World Health Organization. National Cancer Institute Tobacco Control: monograph 21.The economics of tobacco and tobacco control. Bethesda, MD: U.S; Geneva, CH: Department of Health and Human Services, National Institutes of Health, National Cancer Institute; World Health Organization; 2016. Available from: https://cancercontrol.cancer.gov/brp/tcrb/monographs/21/docs/m21_complete.pdf

16. *Tobacco Tax Rates*. O. Reg. 5/05. Available from: https://www.ontario.ca/laws/regulation/050005

17. Ontario. Ministry of Finance. Tobacco tax rate increases. Toronto, ON: Queen's Printer for Ontario; 2016. Available from: http://www.fin.gov.on.ca/publication/tobacco-tax-rate-increases-en.pdf

18. Sousa C. Jobs for today and tomorrow: 2016 Ontario budget. Toronto, ON: Queen's Printer for Ontario; 2016. Available from: http://www.fin.gov.on.ca/en/budget/ontariobudgets/2016/papers_all.pdf

19. Ontario. Ministry of Finance. First Nations cigarette allocation system [Internet]. Toronto, ON: Queen's Printer for Ontario; 2010 [cited 2016 Dec 11]. Available from: http://www.fin.gov.on.ca/en/tax/tt/fncigaretteallocation.html

20. Zhang B, Schwartz R. What effect does tobacco taxation have on contraband? Debunking the taxation — contraband tobacco myth [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2015 [cited 2016 Jul 27]. Available from: http://otru.org/wp-content/uploads/2015/02/special_tax_contraband_final.pdf

21. Hoffman SJ, Tan C. Overview of systematic reviews on the health-related effects of government tobacco control policies. BMC Public Health. 2015;15:744.

22. Wilson LM, Avila Tang E, Chander G, Hutton HE, Odelola OA, Elf JL, et al. Impact of tobacco control interventions on smoking initiation, cessation, and prevalence: a systematic review. J Environ Public Health. 2012;2012:1-36. Available from: https://www.hindawi.com/journals/jeph/2012/961724/

23. Bader P, Boisclair D, Ferrence R. Effects of tobacco taxation and pricing on smoking behavior in high risk populations: a knowledge synthesis. Int J Environ Res Public Health. 2011;8(11):4118-39.

24. Rice N, Godfrey C, Slack R, Sowden A, Worthy G. A systematic review of the effects of price on the smoking behaviour of young people [Internet]. York, UK: Public Health Research Consortium; 2010 [cited 2016 Dec 3]. Available from: http://phrc.lshtm.ac.uk/papers/PHRC_A2-06_Final_Report.pdf

25. Hopkins DP, Razi S, Leeks KD, Priya Kalra G, Chattopadhyay SK, Soler RE, et al. Smokefree policies to reduce tobacco use. A systematic review. Am J Prev Med. 2010;38(2 Suppl):S275-89.

26. Callinan JE, Clarke A, Doherty K, Kelleher C. Legislative smoking bans for reducing secondhand smoke exposure, smoking prevalence and tobacco consumption. Cochrane Database Syst Rev. 2010(4):CD005992.

27. Mills AL, Messer K, Gilpin EA, Pierce JP. The effect of smoke-free homes on adult smoking behavior: a review. Nicotine Tob Res. 2009;11(10):1131-41.

28. Stockings E, Bowman J, Prochaska J, Baker A, Clancy R, Knight J, et al. The impact of a smoke-free psychiatric hospitalization on patient smoking outcomes: a systematic review. Aust N Z J Psychiatry. 2014;48(7):617-33.

29. Bala MM, Strzeszynski L, Topor-Madry R, Cahill K. Mass media interventions for smoking cessation in adults. Cochrane Database Syst Rev. 2013(6):CD004704.

30. Ontario. Ministry of Health and Long Term Care. Quit the denial.ca [Internet]. Toronto, ON: Ontario. Ministry of Health and Long Term Care; 2013 [cited 2015 Jan 1]. Available from: http://napkinscribbler.com/assets_d/11046/portfolio_media/cannes-effectiveness---quit-the-denial-final.pdf

31. Mutton R. Ministry of Health and Long-Term Care tobacco cessation campaign 2015/16 [Internet]. Toronto, ON: Ontario. Ministry of Health and Long-term Care; 2016 [cited 2016 Dec 3]. Available from: https://www.ptcc-cfc.on.ca/common/pages/UserFile.aspx?fileId=353125

32. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Ontario tobacco control efforts between January 2010 and July 2015: a jurisdictional scan [draft]. Toronto, ON: Queen's Printer for Ontario; 2017.

33. Atusingwize E, Lewis S, Langley T. Economic evaluations of tobacco control mass media campaigns: a systematic review. Tob Control. 2015;24(4):320-7. Available from: http://tobaccocontrol.bmj.com/content/24/4/320.long

34. Gould G, McEwen A, Watters T, Clough A, van der Zwan R. Should anti-tobacco media messages be culturally targeted for Indigenous populations? A systematic review and narrative synthesis. Tob Control. 2013;22(4):1-10.

35. Guillaumier A, Bonevski B, Paul C. Anti-tobacco mass media and socially disadvantaged groups: a systematic and methodological review. Drug Alcohol Rev. 2012;31(5):698-708.

36. Allen JA, Duke JC, Davis KC, Kim AE, Nonnemaker JM, Farrelly MC. Using mass media campaigns to reduce youth tobacco use: a review. Am J Health Promot. 2015;30(2):e71-82.

37. Durkin S, Brennan E, Wakefield M. Mass media campaigns to promote smoking cessation among adults: an integrative review. Tob Control. 2012;21:127-138.

38. McAfee T, Davis KC, Alexander RL,Jr, Pechacek TF, Bunnell R. Effect of the first federally funded US antismoking national media campaign. Lancet. 2013;382(9909):2003-11.

39. Tips impact and results [Internet]. Atlanta: Centers for Disease Control and Prevention; 2016 [updated 2016 Sept 29; cited 2016 Nov 4]. Available from: http://www.cdc.gov/tobacco/campaign/tips/about/impact/campaign-impact-results.html

40. Civljak M, Stead LF, Hartmann-Boyce J, Sheikh A, Car J. Internet-based interventions for smoking cessation. Cochrane Database Syst Rev. 2013(7):CD007078.

41. Shahab L, McEwen A. Online support for smoking cessation: a systematic review of the literature. Addiction. 2009;104(11):1792-804.

42. Spohr SA, Nandy R, Gandhiraj D, Vemulapalli A, Anne S, Walters ST. Efficacy of SMS text message interventions for smoking cessation: a meta-analysis. J Subst Abuse Treat. 2015;56:1-10.

43. Danielsson A.K., Eriksson A.K., Allebeck P. Technology-based support via telephone or web: a systematic review of the effects on smoking, alcohol use and gambling. Addict Behav. 2014;39(12):1846-68.

44. wouldurather: the January contest [Internet]. St. Catharines, ON: Leave the Pack Behind; 2016 [cited 2016 Dec 3]. Available from: https://wouldurather.ca/pdf/WURreport_2016.pdf

45. About smokers' helpline [Internet]. Toronto, ON: Canadian Cancer Society; 2012 [cited 2015 July 27]. Available from: http://www.smokershelpline.ca/about

46. Baskerville NB, Azagba S, Norman C, McKeown K, Brown KS. Effect of a digital social media campaign on young adult smoking cessation. Nicotine Tob Res. 2015;18(3):351-60.

47. Whittaker R, McRobbie H, Bullen C, Borland R, Rodgers A, Gu Y. Mobile phone-based interventions for smoking cessation. Cochrane Database Syst Rev. 2012(11):CD006611.

48. Chen YF, Madan J, Welton N, Yahaya I, Aveyard P, Bauld L, et al. Effectiveness and cost-effectiveness of computer and other electronic aids for smoking cessation: asystematic review and network meta-

analysis. Health Technol Assess. 2012;16(38):1-205. Available from: https://www.journalslibrary.nihr.ac.uk/hta/hta16380#/abstract

49. Mason M., Ola B., Zaharakis N., Zhang J. Text messaging interventions for adolescent and young adult substance use: a meta-analysis. Prev Sci. 2015;16(2):181-8.

50. Myung SK, McDonnell DD, Kazinets G, Seo HG, Moskowitz JM. Effects of web- and computer-based smoking cessation programs: meta-analysis of randomized controlled trials. Arch Intern Med. 2009;169(10):929-37.

51. Park E, Drake E. Systematic review: internet-based program for youth smoking prevention and cessation. J Nurs Scholarsh. 2015;47(1):43-50.

52. Flett K, Clark-Carter D, Grogan S, Davey R. How effective are physical appearance interventions in changing smoking perceptions, attitudes and behaviours? A systematic review. Tob Control. 2013;22(2):74-9.

53. Sampson A, Bhochhibhoya A, Digeralamo D, Branscum P. The use of text messaging for smoking cessation and relapse prevention: a systematic review of evidence. J Smok Cessat. 2015;10(1):50-8.

54. Hutton HE, Wilson LM, Apelberg BJ, vila Tang E, Odelola O, Bass EB, et al. A systematic review of randomized controlled trials: web-based interventions for smoking cessation among adolescents, college students, and adults. Nicotine Tobacco Res. 2011;13(4):227-38.

55. Belisario JS, Bruggeling MN, Gunn LH, Brusamento S, Car J. Interventions for recruiting smokers into cessation programmes. Cochrane Database Syst Rev. 2012;12:CD009187.

56. Brown J. A review of the evidence on technology-based interventions for the treatment of tobacco dependence in college health. Worldviews Evid Based Nurs. 2013;10(3):150-62.

57. Kong G, Ellis DM, Camenga DR, Krishnan-Sarin S. Text messaging-based smoking cessation intervention: a narrative review. Addict Behav. 2014;39(5):907-17.

58. West R, Raw M, McNeill A, Stead L, Aveyard P, Bitton J, et al. Health-care interventions to promote and assist tobacco cessation: a review of efficacy, effectiveness and affordability for use in national guideline development. Addiction. 2015;110(9):1388-403.

59. Stead LF, Hartmann-Boyce J, Perera R, Lancaster T. Telephone counselling for smoking cessation. Cochrane Database Syst Rev. 2013(8):CD002850.

60. Tzelepis F, Paul CL, Walsh RA, McElduff P, Knight J. Proactive telephone counseling for smoking cessation: meta-analyses by recruitment channel and methodological quality. J Natl Cancer Inst. 2011;103(12):922-41.

61. Tobacco products labelling regulations (cigarettes and little cigars) [Internet]. Ottawa, ON: Health Canada; 2012 [updated 2012 May 7; cited 2015 Aug 12]. Available from: http://www.hc-sc.gc.ca/hc-ps/tobac-tabac/legislation/reg/label-etiquette/index-eng.php

62. Momin B, Neri A, McCausland K, Duke J, Hansen H, Kahende J, et al. Traditional and innovative promotional strategies of tobacco cessation services: a review of the literature. J Community Health. 2014;39(4):800-9.

63. Baskerville NB, Hayward L, Brown KS, Hammond D, Kennedy RD, Campbell HS. Impact of Canadian tobacco packaging policy on quitline reach and reach equity. Prev Med. 2015;81:243-50. Available from: http://www.sciencedirect.com/science/article/pii/S0091743515002893

64. Centers for Disease Control and Prevention (CDC). Best practices for comprehensive tobacco control programs [Internet]. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2014 [cited 2015 Aug 24]. Available from: http://www.cdc.gov/tobacco/stateandcommunity/best_practices/pdfs/2014/comprehensive.pdf

65. Kernoghan A, Honsberger N, Lambraki I, Doxey J, McCammon-Tripp L, Garcia J. Building capacity for an integrated smoking cessation system at the local level: people, context, technology and the role of public health [conference abstract]. Presented at: Canadian Public Health Association (CPHA) Conference; 2015 May 27; Vancouver, BC.

66. Exploring Components of Effective Smoking Cessation System(s) Across Canada -DRAFT [Internet]. Toronto, ON: Canadian Action Network for the Advancement, Dissemination and Adoption of Practice-informed Tobacco Treatment (CAN-ADAPTT); 2010 [cited 2016 Dec 3]. Available from: https://www.nicotinedependenceclinic.com/English/CANADAPTT/Documents/Population%20Level%20Approaches%20Paper.pdf

67. Ontario Tobacco Research Unit (OTRU). Smoke-free Ontario strategy monitoring report [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2014 [cited 2016 Dec 15]. Available from: http://otru.org/wp-content/uploads/2014/02/OTRU-SMR-2013.pdf

68. Ontario's Smoking Cessation Action Plan A Smoke-Free Ontario Initiative [Internet]. Ottawa: Queen's Printer for Ontario; 2016 [updated May 31, 2016; cited 2017 Mar 3]. Available from: http://www.health.gov.on.ca/en/common/ministry/publications/reports/cessation/default.aspx

69. U.S. Department of Health and Human Services. The health consequences of smoking: 50 years of progress [Internet]. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2014 [cited 2015 Dec 31]. Available from: https://www.surgeongeneral.gov/library/reports/50-years-of-progress/full-report.pdf

70. Babayan A, Dubray J, Taylor E, Yates E, Schwartz R. Smoking cessation activities in Ontario hospitals: survey results [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2011 [cited 2016 Dec 3]. Available from: http://otru.org/wp-content/uploads/2012/06/special_ontario_hospitals_2011.pdf

71. Reid RD, Mullen KA, Slovinec D'Angelo ME, Aitken DA, Papadakis S, Haley PM, et al. Smoking cessation for hospitalized smokers: an evaluation of the "Ottawa Model". Nicotine Tob Res. 2010;12(1):11-8.

72. Best practices for clinical smoking cessation in Canada: the Ottawa model for smoking cessation 2011-2012 highlight document [Internet]. Ottawa, ON: University of Ottawa Heart Institute and Ottawa Model for Smoking Cessation [cited 2016 Dec 3]. Available from: http://ottawamodel.ottawaheart.ca/files/omsc/docs/omsc2011-12report.pdf

73. Mullen KA, Coyle D, Manuel D, Nguyen HV, Pham B, Pipe AL, et al. Economic evaluation of a hospital-initiated intervention for smokers with chronic disease, in Ontario, Canada. Tob Control. 2015;24(5):489-96. Available from: http://tobaccocontrol.bmj.com/content/tobaccocontrol/24/5/489.full.pdf

74. Smith PM, Taylor CB. Implementing an inpatient smoking cessation program. New Jersey: Psychology Press; 2006.

75. Mullen KA, Manuel DG, Hawken SJ, Pipe AL, Coyle D, Hobler LA, et al. Effectiveness of a hospital-initiated smoking cessation programme: 2-year health and healthcare outcomes. Tob Control. 2016;0:1-7. Available from: http://tobaccocontrol.bmj.com/content/tobaccocontrol/early/2016/05/17/tobaccocontrol-2015-052728.full.pdf

76. Health force Ontario. Family practice models [Internet].: Queen's Printer for Ontario; 2013 [updated 2013 May 3; cited 2016 Nov 10]. Available from: http://www.healthforceontario.ca/en/Home/Physicians/Training_%7C_Practising_in_Ontario/Physician_Roles/Family_Practice_Models

77. Ontario. Ministry of Health and Long-Term Care. Pharmacy smoking cessation program [Internet]. Toronto, ON: Queen's Printer for Ontario; 2014 [updated 2014 Aug 14; cited 2016 Dec 6]. Available from: http://www.health.gov.on.ca/en/pro/programs/drugs/smoking/

78. University of Ottawa Heart Institute. Best practices for smoking cessation in Canada: 2011-2012 highlight document [Internet]. Ottawa, ON: University of Ottawa Heart Institute [cited 2016 Dec 3]. Available from: http://ottawamodel.ottawaheart.ca/files/omsc/docs/omsc2011-12report.pdf

79. Babayan A, Dubray J, Haji F, Schwartz R. Provision of smoking cessation by Ontario dental health professionals [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2012 [cited 2017 Jan 4]. Available from: http://otru.org/wp-content/uploads/2014/09/special_dental_professionals.pdf

80. Canadian Dental Hygienists Association. Tobacco use cessation services and the role of the dental hygienist—a CDHA position paper. Can J Dent Hyg. 2004;38(6):260-79. Available from: https://www.cdha.ca/pdfs/Profession/Resources/1004_tobacco.pdf

81. Needleman I, Binnie V, Ainamo A, Carr A, Fundak A, Koeber A, et al. Improving the effectiveness of tobacco use cessation (TUC). Int Dent J. 2010;60(1):50-9.

82. Papadakis S, McDonald P, Mullen K, Reid R. Strategies to increase the delivery of smoking cessation treatments in primary care settings: a systematic review and meta-analysis. Prev Med. 2010;51(3-4):199-213.

83. Rabe GL, Wellmann J, Bagos P, Busch MA, Hense HW, Spies C, et al. Efficacy of emergency department-initiated tobacco control- systematic review and meta-analysis of randomized controlled trials. Nicotine Tobacco Res. 2013;15(3):643-55.

84. Carr AB, Ebbert JO. Interventions for tobacco cessation in the dental setting. Cochrane Database Syst Rev. 2012(6):CD005084.

85. Saba M, Diep J, Saini B, Dhippayom T. Meta-analysis of the effectiveness of smoking cessation interventions in community pharmacy. J Clin Pharm Ther. 2014;39(3):240-7.

86. Stead LF, Buitrago D, Preciado N, Sanchez G, Hartmann-Boyce J, Lancaster T. Physician advice for smoking cessation. Cochrane Database Syst Rev. 2013(5):CD000165.

87. Thomsen T, Villebro N, Moller AM. Interventions for preoperative smoking cessation. Cochrane Database Syst Rev. 2014(3):CD002294.

88. Patnode CD, O'Connor E, Whitlock EP, Perdue LA, Soh C, Hollis J. Primary care-relevant interventions for tobacco use prevention and cessation in children and adolescents: a systematic evidence review for the U.S. Preventive Services Task Force. Ann Intern Med. 2013;158(4):253-60.

89. Bodner ME, Dean E. Advice as a smoking cessation strategy: a systematic review and implications for physical therapists. Physiother Theory Pract. 2009;25(5-6):369-407.

90. Rice VH, Hartmann-Boyce J, Stead LF. Nursing interventions for smoking cessation. Cochrane Database Syst Rev. 2013(8):CD001188.

91. Reda AA, Kotz D, Evers SM, van Schayck CP. Healthcare financing systems for increasing the use of tobacco dependence treatment. Cochrane Database Syst Rev. 2012(6):CD004305.

92. Carson KV, Verbiest ME, Crone MR, Brinn MP, Esterman AJ, Assendelft WJ, et al. Training health professionals in smoking cessation. Cochrane Database Syst Rev. 2012(5):CD000214.

93. Bauld L, Bell K, McCullough M, Richardson L, Greaves L. The effectiveness of NHS smoking cessation services: a systematic review. J Public Health (Oxf). 2010;32(1):71-82.

94. Pelletier JH, Strout TD, Baumann MR. A systematic review of smoking cessation interventions in the emergency setting. Am J Emerg Med. 2014;32(7):713-24.

95. Mdege N, Chindove S. Effectiveness of tobacco use cessation interventions delivered by pharmacy personnel: a systematic review. Res Social Adm Pharm. 2014;10(1):21-44.

96. Hamilton FL, Greaves F, Majeed A, Millett C. Effectiveness of providing financial incentives to healthcare professionals for smoking cessation activities: systematic review. Tob Control. 2013;22(1):3-8.

97. Boyle R, Solberg L, Fiore M. Use of electronic health records to support smoking cessation. Cochrane Database Syst Rev. 2014(12):CD008743.

98. Boyle R, Solberg L, Fiore M. Electronic medical records to increase the clinical treatment of tobacco dependence: a systematic review. Am J Prev Med. 2010;6(Suppl 1):S77-82.

99. Princess Margaret Cancer Centre. Smoking cessation programs at Princess Margaret [Internet]. Toronto, ON: University Hospital Network; 2015 [updated 2015 Feb 8; cited 2016 Nov 8]. Available from: http://www.uhn.ca/PrincessMargaret/PatientsFamilies/Patient_Family_Library/Newsletter/Pages/2015/smoking_cessation_programs_princess_margaret.aspx

100. Liu J, Chadder J, Fung S, Lockwood G, Rahal R, Halligan M, et al. Smoking behaviours of current cancer patients in Canada. Curr Oncol. 2016;23(3):201-3.

101. Peter A. Director Population Health and Prevention, Cancer Care Ontario. Email sent to: Tiffany Oei. 2016 Feb 26.

102. Nayan S, Gupta MK, Strychowsky JE, Sommer DD. Smoking cessation interventions and cessation rates in the oncology population: an updated systematic review and meta-analysis. Otolaryngol Head Neck Surg. 2013;149(2):200-11.

103. Tsiapa G, Gkiozos I, Souliotis K, Syrigos K. Review: smoking cessation strategies in patients with lung disease. In Vivo. 2013;27(2):171-6.

104. How does smoking during pregnancy harm my health and my baby? [Internet]. Atlanta, GA: Centers for Disease Control and Prevention (CDC); 2016 [updated 2016 July 20; cited 2016 Nov 8]. Available from: http://www.cdc.gov/reproductivehealth/maternalinfanthealth/tobaccousepregnancy/

105. Smoking after giving birth [Internet]. Toronto, ON: Pregnets-Centre for Addiction and Mental Health; 2017 [cited 2016 Nov 8]. Available from: http://www.pregnets.org/mothers/GivingBirth.aspx

106. Hoek J, Gifford H, Maubach N, Newcombe R. A qualitative analysis of messages to promote smoking cessation among pregnant women. BMJ Open. 2014;4(11):e006716.

107. About PREGNETS [Internet]. Toronto, ON: Center for Addition and Mental Health (CAMH); 2017 [cited 2016 Nov 3]. Available from: http://www.pregnets.org/AboutPregnets.aspx

108. Events-best practice champions for smoke-free pregnancies [workshop]. Toronto, ON: Registered Nurses' Association of Ontario; 2014.

109. Thunder Bay Regional Health Sciences Centre. In-patient smoking cessation program-moving on to being free. Thunder Bay, ON: Thunder Bay Regional Health Sciences Centre;2011. Available from: http://www.tbrhsc.net/wp-content/uploads/2015/01/Inpatient-Quitting-Program.pdf

110. Coleman T, Chamberlain C, Davey MA, Copper S. E, Leonardi-Bee J. Pharmacological interventions for promoting smoking cessation during pregnancy. Cochrane Database Syst Rev. 2012(9):CD010078.

111. Coleman T, Chamberlain C, Cooper S, Leonardi-Bee J. Efficacy and safety of nicotine replacement therapy for smoking cessation in pregnancy: systematic review and meta-analysis. Addiction. 2011;106(1):52-61.

112. Myung S, Ju W, Jung H, Park C, Oh S, Seo H, et al. Efficacy and safety of pharmacotherapy for smoking cessation among pregnant smokers: a meta-analysis. BJOG. 2012;119(9):1029-39. Available from: http://onlinelibrary.wiley.com/doi/10.1111/j.1471-0528.2012.03408.x/epdf

113. Filion KB, Abenhaim HA, Mottillo S, Joseph L, Gervais A, O'Loughlin J, et al. The effect of smoking cessation counselling in pregnant women: a meta-analysis of randomised controlled trials. BJOG. 2011;118(12):1422-8. Available from: http://onlinelibrary.wiley.com/doi/10.1111/j.1471-0528.2011.03065.x/epdf

114. Likis FE, Andrews JC, Fonnesbeck CJ, Hartmann KE, Jerome RN, Potter SA. Smoking cessation interventions in pregnancy and postpartum care [Internet]. Rockville, MD: Agency for Healthcare Research and Quality; 2014 [cited 2016 Nov 3]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK190501/pdf/Bookshelf_NBK190501.pdf

115. Chamberlain C, O'Mara-Eaves A, Oliver S, Caird JR, Perlen SM, Eades SJ, et al. Psychosocial interventions for supporting women to stop smoking in pregnancy. Cochrane Database Syst Rev. 2013(10):CD001055.

116. Schneider S, Huy C, Schütz J, Diehl K. Smoking cessation during pregnancy: a systematic literature review. Drug Alcohol Rev. 2010;29(1):81-90.

117. Miyazaki Y., Hayashi K., Imazeki S. Smoking cessation in pregnancy: psychosocial interventions and patient-focused perspectives. Int J Womens Health. 2015;7:415-27.

118. Oncken CA, Dietz PM, Tong VT, Belizan JM, Tolosa JE, Berghella V, et al. Prenatal tobacco prevention and cessation interventions for women in low- and middle-income countries. Acta Obstet Gynecol Scand. 2010;89(4):442-53.

119. Hemsing N, Greaves L, O'leary R, Chan K, Okoli C. Partner support for smoking cessation during pregnancy: a systematic review. Nicotine Tob Res. 2012;14(7):767-76.

120. Duckworth AL, Chertok IRA. Review of perinatal partner-focused smoking cessation interventions. MCN Am J Matern Child Nurs. 2012;37(3):174-81.

121. Chronic obstructive pulmonary disease (COPD) [Internet]. The Canadian Lung Association; 2014 [updated 2014 Aug 8; cited 2016 Nov 10]. Available from: https://www.lung.ca/copd

122. Mannino DM, Buist AS. Global burden of COPD: risk factors, prevalence, and future trends. Lancet. 2007;370(9589):765-73.

123. Gershon AS, Guan J, Victor JC, Goldstein R, To T. Quantifying health services use for chronic obstructive pulmonary disease. Am J Respir Crit Care Med. 2013;187(6):596-601.

124. Bartlett Y, Sheeran P, Hawley M. Effective behaviour change techniques in smoking cessation interventions for people with chronic obstructive pulmonary disease: a meta-analysis. Br J Health Psychol. 2014;19(1):181-203. Available from: http://onlinelibrary.wiley.com/doi/10.1111/bjhp.12071/epdf

125. Strassmann R, Bausch B, Spaar A, Kleijnen J, Braendli O, Puhan M. Smoking cessation interventions in COPD: a network meta-analysis of randomised trials. Eur Respir J. 2009;34(3):634-40. Available from: http://erj.ersjournals.com/content/erj/34/3/634.full.pdf

126. Pires-Yfantouda R, Absalom G, Clemens F. Smoking cessation interventions for COPD: a review of the literature. Respir Care. 2013;58(11):1955-62.

127. Thabane M, COPD Working G. Smoking cessation for patients with chronic obstructive pulmonary disease (COPD): an evidence-based analysis. Ont Health Technol Assess Ser. 2012;12(4):1-50.

128. Warnier MJ, van Riet EE, Rutten FH, De Bruin ML, Sachs AP. Smoking cessation strategies in patients with COPD. Eur Respir J. 2013;41(3):727-34.

129. Mayo Clinic. Heart disease [Internet]. Rochester, MN: Mayo Foundation for Medical Education and Research; 2014 [updated 2014 July 29; cited 2016 Nov 10]. Available from: http://www.mayoclinic.org/diseases-conditions/heart-disease/basics/definition/con-20034056

130. Mendis S, Puska P, Norrving B, editors. Global Atlas on Cardiovascular Disease Prevention and Control. Geneva: World Health Organization; 2011. Available from: http://www.who.int/cardiovascular_diseases/publications/atlas_cvd/en/

131. Wilson PW, D'Agostino RB, Levy D, Belanger AM, Silbershatz H, Kannel WB. Prediction of coronary heart disease using risk factor categories. Circulation. 1998;97(18):1837-47. Available from: http://circ.ahajournals.org/content/97/18/1837.long

132. Barth J, Jacob T, Daha I, Critchley JA. Psychosocial interventions for smoking cessation in patients with coronary heart disease. Cochrane Database Syst Rev. 2015;(7):CD006886.

133. Grandi SM, Shimony A, Eisenberg MJ. Bupropion for smoking cessation in patients hospitalized with cardiovascular disease: a systematic review and meta-analysis of randomized controlled trials. Can J Cardiol. 2013;29(12):1704-11.

134. Eisenberg M, Blum L, Filion K, Rinfret S, Pilote L, Paradis G, et al. The efficacy of smoking cessation therapies in cardiac patients: a meta-analysis of randomized controlled trials. Can J Cardiol. 2010;26(2):73-9.

135. Huttunen-Lenz M, Song F, Poland F. Are psychoeducational smoking cessation interventions for coronary heart disease patients effective? Meta-analysis of interventions. Br J Health Psychol. 2010;15(Pt 4):749-77.

136. Ratnasingham S, Cairney J, Manson H, Rehm J, Lin E, Kurdyak P. The burden of mental illness and addiction in Ontario. Can J Psychiatry. 2013;58(9):529-37.

137. Mental health [Internet]. Toronto, ON: Canadian Mental Health Association (Ontario); 2016 [cited 2016 Nov 10]. Available from: http://ontario.cmha.ca/mental-health/

138. Lasser K, Boyd JW, Woolhandler S, Himmelstein DU, McCormick D, Bor DH. Smoking and mental illness: a population-based prevalence study. JAMA. 2000;284(20):2606-10.

139. Banham L, Gilbody S. Smoking cessation in severe mental illness: what works? Addiction. 2010;105(7):1176-89.

140. Gierisch JM, Bastian LA, Calhoun PS, McDuffie JR, Williams JW. Smoking cessation interventions for patients with depression: a systematic review and meta-analysis. J Gen Intern Med. 2012;27(3):351-60.

141. Kishi T, Iwata N. Varenicline for smoking cessation in people with schizophrenia: systematic review and meta-analysis. Eur Arch Psychiatry Clin Neurosci. 2015;265(3):259-68.

142. Tsoi DT, Porwal M, Webster AC. Interventions for smoking cessation and reduction in individuals with schizophrenia. Cochrane Database Syst Rev. 2013;(2):CD007253.

143. van der Meer RM, Willemsen MC, Smit F, Cuijpers P. Smoking cessation interventions for smokers with current or past depression. Cochrane Database Syst Rev. 2013;(8):CD006102.

144. Ferron J, Alterman A, McHugo G, Brunette M, Drake R. A review of research on smoking cessation interventions for adults with schizophrenia spectrum disorders. Ment Health Subst Use. 2009;2(1):64-79.

145. Mistler LA, Brunette MF, Ferron JC, Ziedonis DM. Shared decision making and behavioral support interventions for people with severe mental illness and tobacco dependence. J Dual Diagn. 2012;8(2):99-103.

146. Cerebrovascular disease [Internet]. Rolling Meadows, IL: American Association of Neurological Surgeons; 2005 [updated 2005 Dec; cited 2016 Nov 10]. Available

from: http://www.aans.org/en/Patient%20Information/Conditions%20and%20Treatments/Cerebrovascular%20Disease.aspx

147. Wolf PA, D'Agostino RB, Kannel WB, Bonita R, Belanger AJ. Cigarette smoking as a risk factor for stroke. The Framingham Study. JAMA. 1988;259(7):1025-9.

148. Ontario Stroke Network. Fact sheet: stroke statistics [Internet]. Toronto, ON: Ontario Stroke Network; 2016 [cited 2016 Nov 10]. Available from: http://www.ontariostrokenetwork.ca/pdf/Final_Fact_Sheet_Stroke_Stats_3.pdf

149. Edjoc R, Reid R, Sharma M. The effectiveness of smoking cessation interventions in smokers with cerebrovascular disease: a systematic review. BMJ Open. 2012;2(6):e002022. Available from: http://bmjopen.bmj.com/content/bmjopen/2/6/e002022.full.pdf

150. Diabetes Canada. Smoking and diabetes [Internet]. Toronto, ON: Canadian Diabetes Association; 2017 cited 2017 Jan 7]. Available from: http://www.diabetes.ca/diabetes-and-you/healthy-living-resources/heart-health/smoking-diabetes

151. Diabetes Canada. Types of diabetes [Internet]. Toronto, ON: Canadian Diabetes Association; 2017 [cited 2017 Jan 7]. Available from: http://www.diabetes.ca/about-diabetes/types-of-diabetes

152. Statistics Canada. Health indicator profile, annual estimates, by age group and sex, Canada, provinces, territories, health regions (2013 boundaries) and peer groups, occasional [Internet].Ottawa, ON: CANSIM; 2016. [updated 2016 Apr 21; cited 2016 Dec 3]. [Figure] Table 105-0501. Available from: http://www5.statcan.gc.ca/cansim/a26?lang=eng&id=1050501

153. Nagrebetsky A, Brettell R, Roberts N, Farmer A. Smoking cessation in adults with diabetes: a systematic review and meta-analysis of data from randomised controlled trials. BMJ Open. 2014;4(3):e004107. Available from: http://bmjopen.bmj.com/content/bmjopen/4/3/e004107.full.pdf

154. Baca CT, Yahne CE. Smoking cessation during substance abuse treatment: what you need to know. J Subst Abuse Treat. 2009;36(2):205-19.

155. Oullet-Plamondon C, Mohamed NS, Sharif-Razi M, Simpkin E, George TP. Treatment of comorbid tobacco addiction in substance use and psychiatric disorders. Curr Addict Rep. 2014;1(1):61-8.

156. Pririe T, Wallingford SC, Di Gioacchino LA, McQuaid RJ, National Treatment Indicators Working Group. National treatment indicators report; 2013-2014 data. Ottawa, ON: Canadian Centre on Substance Abuse; 2016. Available from: http://ccsa.ca/Resource%20Library/CCSA-National-Treatment-Indicators-Report-2016-en.pdf

157. STOP with family health teams [Internet]. Toronto, ON: Center for Addiction and Mental Health; 2011[cited 2015 Dec 3]. Available from: https://www.nicotinedependenceclinic.com/English/stop/Pages/Participate%20in%20STOP/STOP%20with%20FHTs.aspx

158. Okoli CTC, Khara M, Procyshyn RM, Johnson JL, Barr AM, Greaves L. Smoking cessation interventions among individuals in methadone maintenance: a brief review. J Subst Abuse Treat. 2010;38(2):191-9.

159. Cahill K, Lancaster T. Workplace interventions for smoking cessation. Cochrane Database Syst Rev. 2014;(2):CD003440.

160.Bounjam F, Stonebridge C, Thériault L. Smoking cessation and the workplace: benefits of Workplace Programs. Ottawa, ON: The Conference Board of Canada: 2013. Available from: https://www.quitnow.ca/files/QN/files/library/Smoking_Cessation_and_the_Workplace_Briefing_3_Benefits_of_Workplace_Programs.pdf

161. Strickland JR, Smock N, Casey C, Poor T, Kreuter MW, Evanoff BA. Development of targeted messages to promote smoking cessation among construction trade workers. Health Educ Res. 2015;30(1):107-20.

162. Central East Tobacco Control Area Network (CETCAN). Literature review: workplace cessation project [Internet]. Toronto, ON: Extreme Group; 2012 [cited 2016 Dec 3]. Available from: https://www.ptcc-cfc.on.ca/common/pages/UserFile.aspx?fileId=333536

163. Program overview: no butts about it [Internet]. Toronto, ON: Program Training and Consultation Centre [cited 2016 Dec 3]. Available from: https://www.ptcc-cfc.on.ca/cms/one.aspx?pageid=100801

164. Knowlden A, Ickes MJ, Sharma M. Systematic analysis of tobacco treatment interventions implemented in worksite settings. J Subst Use. 2014;19(4):283-94.

165. Leeks KD, Hopkins DP, Soler RE, Aten A, Chattopadhyay SK. Worksite-based incentives and competitions to reduce tobacco use: a systematic review. Am J Prev Med. 2010;38(2 Suppl):S263-74.

166. Carroll C, Rick J, Leaviss J, Fishwick D, Booth A. A qualitative evidence synthesis of employees' views of workplace smoking reduction or cessation interventions. BMC Public Health. 2013;13(1):1095. Available from: https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-13-1095

167. Fishwick D, Carroll C, McGregor M, Drury M, Webster J, Bradshaw Lea. Smoking cessation in the workplace. Occ Med. 2013;63(8):526-36.

168. Cahill K, Moher M, Lancaster T. Workplace interventions for smoking cessation. Cochrane Database Syst Rev. 2008;(4):CD003440.

169. Social Research and Demonstration Corporation. Evaluation of the tobacco-free workplace initiative [Internet]. Toronto, ON: Social Research and Demonstration Corporation; 2010 [cited 2016 Dec 3]. Available from: http://www.srdc.org/uploads/BCHLA_TobaccoFree.pdf

170. Non-Smokers' Rights Association (NSRA), Smoking and Health Action Foundation (SHAF). Tobacco-free campus guide [Internet]. Toronto, ON: Non-Smokers' Rights Association (NSRA); Smoking and

Health Action Foundation (SHAF); 2011 [cited 2016 Dec 3]. Available from: http://www.nsra-adnf.ca/cms/file/files/Tobacco_Free_Campus_Guide_web_final(1).pdf

171. Smoking and Health Action Foundation (SHAF), Non-Smokers' Rights Association (NSRA). Tobacco-related litigation in Canada [Internet]. Toronto, ON: Smoking and Health Action Foundation (SHAF), Non-Smokers' Rights Association (NSRA); 2016 [cited 2016 May 11]. Available from: https://www.nsra-adnf.ca/cms/file/files/Tobacco-related_Litigation_in_Canada_2016.pdf

172. Rodgers KC. A review of multicomponent interventions to prevent and control tobacco use among college students. J Am Coll Health. 2012;60(3):257-61.

173. ACHA Alcohol, Tobacco, and Other Drugs Committee. Position statement on tobacco on college and university campuses. J Am Coll Health. 2007;55(4):255-6.

174. *Smoke-Free Ontario Act,* S.O. 1994, c. 10. Available from: http://www.ontario.ca/laws/statute/94t10

175. Tobacco control policies on Ontario college and university campuses [Internet]. St. Catharines, ON: Leave the Pack Behind; 2014 [cited 2016 Dec 3]. Available from: https://www.leavethepackbehind.org/wp/wp-content/uploads/2014/08/2013-14_LTPB_Environmental_Scan_Tobacco_Policies.pdf

176. Universities/colleges with 100% smoke-free campuses [Internet]. Stratford, PEI: Prince Edward Island Tobacco Reduction Alliance; 2015 [updated 2015 Oct 20; cited 2017 Jan 3]. Available from: http://www.peitobaccoreduction.com/universitiescolleges-with-100-smoke-free-campuses/

177. Acadia University. Policies and procedures, tobacco free campus [Internet]. Wolfville, NS: Acadia University; 2006 [cited 2017 Jan 3]. Available from: https://hr.acadiau.ca/tl_files/sites/hr/Policies%20and%20Procedures/Tobacco%20Free%20Campus.pdf

178. Environment health and safety, smoke free [Internet]. Halifax, NS: Dalhousie University [cited 2017 Jan 3]. Available from: https://www.dal.ca/dept/safety/programs-services/occupational-safety/smoke-free.html

179. Saint Mary's University. Saint Mary's University tobacco-free campus policy [Internet]. Halifax, NS: Saint Mary's University; 2015 [cited 2017 Jan 3]. Available from: http://www.smu.ca/webfiles/6-2014TobaccoFreeCampus.pdf

180. University of King's College red book smoking policy [Internet]. Halifax, NS: University of King's College; 2015 [updated 2015 Aug; cited 2017 Jan 3]. Available from: http://redbook.ukings.ca/smoking.html

181. University policies smoking [Internet]. St. John's, NL: Memorial University; 2013 [updated 2013 Aug 1; cited 2017 Jan 3]. Available from: https://www.mun.ca/policy/site/policy.php?id=243

182. The University of Winnipeg. The University of Winnipeg policy: VPHRSA#: smoking on university premises [Internet]. Winnipeg, MN: The University of Winnipeg; 2008 [cited 2017 Jan 3]. Available from: https://www.uwinnipeg.ca/index/cms-filesystem-action?file=pdfs/admin/policies/80.0005.pdf

183. Trinity Western University. Tobacco, e-cigarettes & vaporizers [Internet]. Langley, BC: Trinity Western University [cited 2017 Jan 3]. Available from: http://www.twu.ca/student-handbook/living-community/tobacco-e-cigarettes-vaporizers

184. Emily Carr University of Art + Design. 6.8 smoking on campus [Internet]. Vancouver, BC: Emily Carr University of Art + Design; 2015 [updated 2015 Feb; cited 2017 Jan 3]. Available from: https://drive.google.com/file/d/0B1CTABrOLl2uUzkxZXpSbWJxTHc/view

185. Holland College. Student accommodations handbook: Glendenning Hall [Internet]. Charlottetown, PEI: Holland College; 2007 [cited 2017 Jan 3]. Available from: http://www.hollandcollege.com/large_docs/HC%20Residence%20Handbook%202015.pdf

186. Smoke-free campus [Internet]. Edmonton, AB: Northern Alberta Institute of Technology; 2015 [updated 2015 May 1; cited 2017 Jan 3]. Available from: http://www.nait.ca/97049.htm

187. Yukon College. Yukon College AS-07 use of college resources administrative services [Internet]. Whitehorse, YT: Yukon College; 2013 [cited 2017 Jan 3]. Available from: https://yukoncollege.yk.ca/downloads/policies/AS-07_Use_of_College_Resources_Jan_2013.pdf

188. College of the North Atlantic. College of the North Atlantic operational policy: topic: smoke free college [Internet]. Stephenville, NL: College of the North Atlantic; 2016 [cited 2017 Jan 3]. Available from: https://www.cna.nl.ca/About/pdfs/policies-and-procedures/Human%20Resources/Smoke%20Free%20College/1Policy/HR-419%20_Smoke%20Free%20College%20(R2%202016).pdf

189. Leave the Pack Behind. 2016-17 environmental scan of Ontario college and university tobacco control policies [Internet]. St. Catherines, ON: Brock University; 2016 [cited 2016 Nov 10]. Available from: http://api.ning.com/files/OoGCfrwiFG97ND*m6qnB71OA4OlK9KqJ7aVxdRQLkdFQizWxAy0hetHJgctZ11P1cyvVU9xWJIrOkasBQcowL5rp-BODMP*i/2016_LTPB_Scan.pdf

190. Lupton JR, Townsend JL. A systematic review and meta-analysis of the acceptability and effectiveness of university smoke-free policies. J Am Coll Health. 2015;63(4):238-47.

191. Sussman S., Arriaza B., Grigsby T. Alcohol, tobacco, and other drug misuse prevention and cessation programming for alternative high school youth: a review. J Sch Health. 2014;84(11):748-58.

192. Butler KM, Fallin A, Ridner SL. Evidence-based smoking cessation for college students. Nurs Clin North Am. 2012;47(1):21-30.

193. Baillie L, Callaghan D, Smith M, Bottorff J, Bassett-Smith J, Budgen C, et al. A review of undergraduate university tobacco control policy process in Canada. Health Educ Res. 2009;24(6):922-9.

194. CHAMPIX (varenicline tartrate) and ZYBAN (bupropion hydrochloride) - revision to the consumer information of non-nicotine smoking cessation aids - for health professionals [Internet]. Ottawa, ON: Government of Canada; 2013 [updated 2013 Jun 7; cited 2015 Feb 10]. Available from: http://healthycanadians.gc.ca/recall-alert-rappel-avis/hc-sc/2013/33621a-eng.php

195. Smoking treatment for Ontario patients (STOP) program [Internet]. Toronto, ON: Centre for Addiction and Mental Health (CAMH); 2011 [cited 2016 Dec 3]. Available from: https://www.nicotinedependenceclinic.com/English/stop/Pages/Home.aspx

196. Kirkwood A, Lawrance KA. Leave the pack behind party without the smoke campaign: evaluation results. St. Catherines, ON: Leave the Pack Behind; 2016.

197. David S, Chu I, Lancaster T, Stead L, Evins A, Prochaska J. Systematic review and meta-analysis of opioid antagonists for smoking cessation. BMJ Open. 2014;4(3):e004393. Available from: http://bmjopen.bmj.com/content/4/3/e004393.full.pdf

198. Hajek P, McRobbie H, Myers K. Efficacy of cytisine in helping smokers quit: systematic review and meta-analysis. Thorax. 2013;68(11):1037-42.

199. Moore D, Aveyard P, Connock M, Wang D, Fry-Smith A, Barton P. Effectiveness and safety of nicotine replacement therapy assisted reduction to stop smoking: systematic review and meta-analysis. BMJ. 2009;338:b1024.

200. Mills EJ, Wu P, Spurden D, Ebbert JO, Wilson K. Efficacy of pharmacotherapies for short-term smoking abstinence: a systematic review and meta-analysis. Harm Reduct J. 2009;6:25.

201. Huang Y, Li W, Yang L, Jiang Y, Wu Y. Long-term efficacy and safety of varenicline for smoking cessation: a systematic review and meta-analysis of randomized controlled trials. J Public Health. 2012;20(4):355-65.

202. Stead L, Lancaster T. Combined pharmacotherapy and behavioural interventions for smoking cessation. Cochrane Database Syst Rev. 2012;2012(10):CD008286.

203. Hollands GJ, McDermott MS, Lindson-Hawley N, Vogt F, Farley A, Aveyard Pl. Interventions to increase adherence to medications for tobacco dependence. Cochrane Database Syst Rev. 2015(2):CD009164.

204. Stead LF, Lancaster T. Behavioural interventions as adjuncts to pharmacotherapy for smoking cessation. Cochrane Database Syst Rev. 2012;12:CD009670.

205. Mills EJ, Wu P, Lockhart I, Thorlund K, Puhan M, Ebbert JO. Comparisons of high-dose and combination nicotine replacement therapy, varenicline, and bupropion for smoking cessation: a systematic review and multiple treatment meta-analysis. Ann Med. 2012;44(6):588-97.

206. Leaviss J, Sullivan W, Ren S, Everson-Hock E, Stevenson M, Stevens J, et al. What is the clinical effectiveness and cost-effectiveness of cytisine compared with varenicline for smoking cessation? A systematic review and economic evaluation. Health Technol Assess. 2014;18(33):1-119.

207. Kimura K, Sairenchi T, Muto T. Meta-analysis study for one year effects of a nicotine patch. Journal of Health Sciences. 2009;55(2):233-41.

208. Lindson N, Aveyard P. An updated meta-analysis of nicotine preloading for smoking cessation: investigating mediators of the effect. Psychopharmacology (Berl). 2011;214(3):579-92.

209. Raupach T, Brown J, Herbec A, Brose L, West R. A systematic review of studies assessing the association between adherence to smoking cessation medication and treatment success. Addiction. 2014;109(1):35-43.

210. Hughes JR, Peters EN, Naud S. Effectiveness of over-the-counter nicotine replacement therapy: a qualitative review of nonrandomized trials. Nicotine Tob Res. 2011;13(7):512-22.

211. Beard E, Aveyard P, Michie S, McNeill A, West R. Does use of nicotine replacement therapy while continuing to smoke undermine cessation? A systematic review. J Smok Cessat. 2013;8(1):45-56.

212. Maziak W., Jawad M., Jawad S., Ward K.D., Eissenberg T., Asfar T. Interventions for waterpipe smoking cessation. Cochrane Database Syst Rev. 2015;(7):CD005549.

213. Asfar T, Ebbert JO, Klesges RC, Relyea GE. Do smoking reduction interventions promote cessation in smokers not ready to quit? Addict Behav. 2011;36(7):764-8.

214. Carpenter MJ, Jardin BF, Burris JL, Mathew AR, Schnoll RA, Rigotti NA. Clinical strategies to enhance the efficacy of nicotine replacement therapy for smoking cessation: a review of the literature. Drugs. 2013;73(5):407-26.

215. Garrison GD, Dugan SE. Varenicline: A first-line treatment option for smoking cessation. Clin Ther. 2009;31(3):463-91.

216. Cahill K, Stevens S, Perera R, Lancaster T. Pharmacological interventions for smoking cessation: an overview and network meta-analysis. Cochrane Database Syst Rev. 2013;5:CD009329.

217. Carson KV, Brinn MP, Robertson TA, To-A-Nan R, Esterman AJ, Peters M, et al. Current and emerging pharmacotherapeutic options for smoking cessation. Subst Abuse. 2013;7:85-105.

218. White CM, Rynard VL, Reid JL, Ahmed R. Stop-smoking medication use, subsidization policies, and cessation in Canada. Am J Prev Med. 2015;49(2):188-198.

219. Mottillo S, Filion KB, Belisle P, Joseph L, Gervais A, O'Loughlin J. Behavioural interventions for smoking cessation: a meta-analysis of randomized controlled trials. Eur Heart J. 2009;30(6):718-30.

220. Roberts NJ, Kerr SM, Smith SM. Behavioral interventions associated with smoking cessation in the treatment of tobacco use. Health Serv Insights. 2013;6:79-85.

221. Coleman T. ABC of smoking cessation. Use of simple advice and behavioural support. BMJ. 2004;328(7436):397-9.

222. Michie S, Hyder N, Walia A, West R. Development of a taxonomy of behaviour change techniques used in individual behavioural support for smoking cessation. Addict Behav. 2011;36(4):315-9.

223. Lindson-Hawley N, Thompson TP, Begh R. Motivational interviewing for smoking cessation. Cochrane Database Syst Rev. 2015;3:CD006936.

224. Heckman CJ, Egleston BL, Hofmann MT. Efficacy of motivational interviewing for smoking cessation: a systematic review and meta-analysis. Tob Control. 2010;19(5):410-6.

225. Spring B, Howe D, Berendsen M, McFadden HG, Hitchcock K, Rademaker AW. Behavioral intervention to promote smoking cessation and prevent weight gain: a systematic review and meta-analysis. Addiction. 2009;104(9):1472-86.

226. Cahill K, Lancaster T, Green N. Stage-based interventions for smoking cessation. Cochrane Database Syst Rev. 2010;2010(11):CD004492.

227. Ramseier C, Suvan J. Behaviour change counselling for tobacco use cessation and promotion of healthy lifestyles: a systematic review. J Clin Periodontol. 2015;(42 Suppl):S47-58.

228. Hettema JE, Hendricks PS. Motivational interviewing for smoking cessation: a meta-analytic review. J Consult Clin Psychol. 2010;78(6):868-84.

229. Cummings SM, Cooper RL, Cassie KM. Motivational interviewing to affect behavioral change in older adults. Res Soc Work Pract. 2009;19(2):195-204.

230. Miller W, Rollnick S. Motivational Interviewing: preparing people for change. 2nd ed. New York: Guilford Press; 2002.

231. Herie M, Selby P. Getting beyond "Now is not a good time to quit smoking": increasing motivation to stop smoking [Internet]. Smoking cessation rounds. 2007;1(2):1-6. Available from: http://ottawamodel.ottawaheart.ca/sites/ottawamodel.ottawaheart.ca/files/omsc/docs/3.increasingmotivationtostopsmoking.pdf

232. Prochaska JO, Norcross JC. Stages of change. Psychother. 2001;38(4):443.

233. About us: wouldurather [Internet]. St. Catherines, ON: Leave the Pack Behind; cited 2016 Dec 3]. Available from: https://www.wouldurather.ca/en/

234. Hajek P, Stead LF, West R, Jarvis M, Hartmann-Boyce J, Lancaster T. Relapse prevention interventions for smoking cessation. Cochrane Database Syst Rev. 2013(8):CD003999.

235. Agboola S, McNeill A, Coleman T, Leonardi Bee J. A systematic review of the effectiveness of smoking relapse prevention interventions for abstinent smokers. Addiction. 2010;105(8):1362-80.

236. Song F, Huttunen-Lenz M, Holland R. Effectiveness of complex psycho-educational interventions for smoking relapse prevention: an exploratory meta-analysis. J Public Health. 2010;32(3):350-9.

237. Coleman T, Agboola S, Leonardi-Bee J, Taylor M, McEwen A, McNeill A. Relapse prevention in UK Stop Smoking Services: current practice, systematic reviews of effectiveness and cost-effectiveness analysis. Health Technol Assess. 2010;14(49):1-152.

238. Hoedjes M, Berks D, Vogel I, Franx A, Visser W, Duvekot J, et al. Effect of postpartum lifestyle interventions on weight loss, smoking cessation, and prevention of smoking relapse: a systematic review. Obstet Gynecol Surv. 2010;65(10):631-52.

239. Su A, Buttenheim AM. Maintenance of smoking cessation in the postpartum period: which interventions work best in the long-term? Matern Child Health J. 2014;18(3):714-28.

240. Agboola SA, Coleman T, McNeill A, Leonardi-Bee J. Abstinence and relapse among smokers who use varenicline in a quit attempt-a pooled analysis of randomized controlled trials. Addiction. 2015;110(7):1182-93.

241. McNeill A, Brose L, Calder R, Hitchman S, Hajek P, McRobbie H. E-cigarettes: an evidence update. A report commissioned by Public Health England [Internet]. London, UK: Public Health England; 2015 [cited 2016 Dec 3]. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/457102/Ecigarettes_an_evidence_update_A_report_commissioned_by_Public_Health_England_FINAL.pdf

242. Czoli CD, Reid JL, Rynard VL, Hammond D. Tobacco use in Canada: patterns and trends [Internet]. Special supplement: e-cigarettes in Canada. 2015 ed. Waterloo, ON: Propel Centre for Population Health Impact, University of Waterloo; 2015 [cited 2016 Dec 3]. Available from: https://uwaterloo.ca/tobacco-use-canada/sites/ca.tobacco-use-canada/files/uploads/files/tobacco_use_in_canada_2015_accessibleecig_supplement_final_final-s.pdf

243. Drugs and health products notice - to all persons interested in importing, advertising or selling electronic smoking products in Canada [Internet]. Ottawa, ON: Health Canada; 2009 [updated 2009 Mar 27; cited 2017 Jan 4]. Available from: http://www.hc-sc.gc.ca/dhp-mps/prodpharma/applic-demande/pol/notice_avis_e-cig-eng.php

244. Electronic cigarette (vape) rules [Internet]. Toronto, ON: Queen's Printer for Ontario; 2015 [updated 2015 Nov 12; cited 2016 Mar 3]. Available from: https://www.ontario.ca/page/electronic-cigarette-vape-rules

245. *Electronic Cigarettes Act, 2015,* S.O. 2015, c. 7, Sched. 3. Available from: https://www.ontario.ca/laws/statute/15e07

246. McRobbie H., Bullen C., Hartmann-Boyce J., Hajek P. Electronic cigarettes for smoking cessation and reduction. Cochrane Database Syst Rev. 2014;12:CD010216.

247. Franck C, Budlovsky T, Windle S, Filion K, Eisenberg M. Electronic cigarettes in North America: history, use, and implications for smoking cessation. Circulation. 2014;129(19):1945-52.

248. Gualano M, Passi S, Bert F, La Torre G, Scaioli G, Siliquini R. Electronic cigarettes: assessing the efficacy and the adverse effects through a systematic review of published studies. J Public Health (Oxf). 2015;37(3):488-97.

249. Harrell P, Simmons V, Correa J, Padhya T, Brandon T. Electronic nicotine delivery systems ("e-cigarettes"): review of safety and smoking cessation efficacy. Otolaryngol Head Neck Surg. 2014;151(3):381-93.

250. Waghel R., Battise D., Ducker M. Effectiveness of electronic cigarettes as a tool for smoking cessation or reduction. J Pharm Technol. 2014;31(1):8-12.

251. Grana R, Benowitz N, Glantz SA. E-cigarettes: a scientific review. Circulation. 2014;129(19):1972-86.

252. Rahman MA, Hann N, Wilson A, Mnatzaganian G, Worrall-Carter L. E-cigarettes and smoking cessation: evidence from a systematic review and meta-analysis. PLoS One. 2015;10(3):e0122544.

253. Lam C, West A. Are electronic nicotine delivery systems an effective smoking cessation tool? Can J Respir Ther. 2015;51(4):93-8.

254. Hajek P, Etter JF, Benowitz N, Eissenberg T, McRobbie H. Electronic cigarettes: review of use, content, safety, effects on smokers and potential for harm and benefit. Addiction. 2014;109(11):1801-10.

255. Born H, Persky M, Kraus DH, Peng R, Amin MR, Branski RC. Electronic cigarettes: a primer for clinicians. Otolaryngol Head Neck Surg. 2015;153(1):5-14.

256. Orr KK, Asal NJ. Efficacy of electronic cigarettes for smoking cessation. Ann Pharmacother. 2014;48(11):1502-6.

257. Patnode CD, Henderson JT, Thompson JH, Senger CA, Fortmann SP, Whitlock EP. Behavioral counseling and pharmacotherapy interventions for tobacco cessation in adults, including pregnant women: a review of reviews for the U.S. preventive services task force. Ann Intern Med. 2015;163(8):608-21.

258. First week challenge contest [Internet]. Toronto, ON: Canadian Cancer Society; 2016 [cited 2016 Aug 31]. Available from: http://convio.cancer.ca/site/TR?fr_id=21409&pg=entry#.V8blgVsrK70

259. FAQ: in the nic-o time [Internet]. Oxford County, ON; 2012 [cited 2015 Nov 3]. Available from: http://www.quit2win.ca/faq.php

260. Cahill K, Hartmann-Boyce J, Perera R. Incentives for smoking cessation. Cochrane Database Syst Rev. 2015(5):CD004307.

261. Giles EL, Robalino S, McColl E, Sniehotta FF, Adams J. The effectiveness of financial incentives for health behaviour change: systematic review and meta-analysis. PloS One. 2014;9(3):e90347.

262. Mantzari E, Vogt F, Shemilt I, Wei Y, Higgins JP, Marteau TM. Personal financial incentives for changing habitual health-related behaviors: a systematic review and meta-analysis. Prev Med. 2015;75:75-85. Available from: http://www.sciencedirect.com/science/article/pii/S0091743515000729

263. Hartmann-Boyce J., Stead L., Cahill K., Lancaster T. Efficacy of interventions to combat tobacco addiction: Cochrane update of 2013 reviews. Addiction. 2014;109(9):1414-25.

264. Health Canada. CTUMS: Canadian tobacco use monitoring survey [Internet]. Ottawa, ON: Government of Ontario; 2003 [cited 2016 Nov 10]. Available from: http://publications.gc.ca/collections/Collection/H12-35-2003-3E.pdf

265. Minian N. What young men on the street say about smoking cessation. Toronto, ON: Ontario Tobacco Research Unit; 2009. Available from: http://otru.org/wp-content/uploads/2012/06/OTRU_news9_web.pdf

266. Minian N. On the street: What low SES smokers say about smoking cessation in Ontario. Toronto ,ON: Ontario Tobacco Research Unit; 2010. Available from: http://otru.org/wp-content/uploads/2012/06/OTRU_news13_web.pdf

267. The Ontario Lung Association. Journey 2 quit: a workbook to help you quit smoking [Internet]. Toronto, ON: The Ontario Lung Association; 2012 [cited 2016 Dec 3]. Available from: http://www.on.lung.ca/document.doc?id=1217

268. On the road to quitting guides to becoming a non-smoker [Internet]. Ottawa, ON: Health Canada; 2014 [updated 2014 Jan 9; cited 2016 Dec 3]. Available from: http://www.hc-sc.gc.ca/hc-ps/pubs/tobac-tabac/road-voie-eng.php

269. Self-help guides [Internet]. Toronto, ON: Canadian Cancer Society; 2017 [cited 2017 Jan 3]. Available from: http://quit.smokershelpline.ca/custom/selfhelp.aspx

270. Park E, Tudiver F, Campbell T. Enhancing partner support to improve smoking cessation. Cochrane Database Syst Rev. 2012;(7):CD002928.

271. Homish GG, Leonard KE. Spousal influence on smoking behaviors in a US community sample of newly married couples. Soc Sci Med. 2005;61(12):2557-67.

272. Public Health Agency of Canada (PHAC). Smoking cessation during pregnancy and relapse after childbirth in Canada. Ottawa, ON: Her Majesty the Queen in Right of Canada; 2016. Available from: http://www.healthycanadians.gc.ca/publications/healthy-living-vie-saine/pregnancy-smoking-cessation-grossesse-renoncement-tabac/alt/pregnancy-smoking-cessation-grossesse-renoncement-tabac-eng.pdf

273. Bize R, Burnand B, Mueller Y, Rège Walther M, Camain JY, Cornuz J. Biomedical risk assessment as an aid for smoking cessation. Cochrane Database Syst Rev. 2012;(12):CD004705.

274. Find a lung function testing lab or spirometry clinic [Internet]. Toronto, ON: The Lung Association; 2012 [cited 2016 Nov 10]. Available from: http://sct.poumon.ca/respDB/search-testing_e.php

275. Hesketh T, Zhu WX. Health in China. Traditional Chinese medicine: one country, two systems. BMJ. 1997;315(7100):115-7.

276. White AR, Rampes H, Liu Jian P, Stead LF, Campbell J. Acupuncture and related interventions for smoking cessation. Cochrane Database Syst Rev. 2014;(1):CD000009.

277. College of Traditional Chinese Medicine Practitioners and Acupuncturists of Ontario [Internet]. Thornhill, ON: College of Traditional Chinese Medicine Practitioners and Actupuncturists of Ontario (CTCMPAO); 2016 [cited 2016 Nov 10]. Available from: https://www.ctcmpao.on.ca/

278. Barnes J, Dong Christine Y, McRobbie H, Walker N, Mehta M, Stead Lindsay F. Hypnotherapy for smoking cessation. Cochrane Database Syst Rev. 2010;(10):CD001008.

279. Spiegel D, Frischholz EJ, Fleiss JL, Spiegel H. Predictors of smoking abstinence following a single-session restructuring intervention with self-hypnosis. Am J Psychiatry. 1993;150(7):1090-7.

280. Simons-Morton BG, Farhat T. Recent findings on peer group influences on adolescent smoking. J Prim Prev. 2010;31(4):191-208.

281. Tobacco Free Kids. The path to tobacco addiction starts at very young ages [Internet]. Washington, DC: Tobacco Free Kids; 2016 [cited 2016 Nov 10]. Available from: https://www.tobaccofreekids.org/research/factsheets/pdf/0127.pdf

282. Thun MJ, Myers DG, Day-Lally C, Namboodiri MM, Calle EE, Flanders WD, et al. Age and the exposure-response relationships between cigarette smoking and premature death in Cancer Prevention Study II. In: Shopland D, Burns DM, Garfinkel L, Samet JM, editors. Changes in cigarette-related disease risks and their implications for prevention and control. Bethesda, MD: National Institutes of Health; 1997. p.383-413.

283. Boak A, Hamilton HA, Adlaf EM, Mann RE. Detailed OSDUHS findings: drug use among Ontario students, 1977-2015. CAMH Research Document Series No.41 ed. Toronto, ON: Centre for Addiction and Mental Health; 2015. Available from: http://www.camh.ca/en/research/news_and_publications/ontario-student-drug-use-and-health-survey/Documents/2015%20OSDUHS%20Documents/2015OSDUHS_Detailed_DrugUseReport.pdf

284. Stanton A, Grimshaw GM. Tobacco cessation interventions for young people. Cochrane Database Syst Rev. 2013;(8):CD003289.

285. Suls JM, Luger TM, Curry SJ, Mermelstein RJ, Sporer AK, An LC. Efficacy of smoking-cessation interventions for young adults: a meta-analysis. Am J Prev Med. 2012;42(6):655-62.

286. Kim Y, Myung S, Jeon Y, Lee E, Park C, Seo H, et al. Effectiveness of pharmacologic therapy for smoking cessation in adolescent smokers: meta-analysis of randomized controlled trials. Am J Health Syst Pharm. 2011;68(3):219-26.

287. Thomas RE, Lorenzetti DL, Spragins W. Systematic review of mentoring to prevent or reduce tobacco use by adolescents. Acad Pediatr. 2013;13(4):300-7.

288. Brown T, Platt S, Amos A. Equity impact of interventions and policies to reduce smoking in youth: systematic review. Tob Control. 2014;23(e2):e98-105.

289. Villanti AC, McKay HS, Abrams DB, Holtgrave DR, Bowie JV. Smoking-cessation interventions for U.S. young adults: a systematic review. Am J Prev Med. 2010;39(6):564-74.

290. Quitting smoking among adults-United States, 2001-2010 [Internet]. Atlanta, GA: Centers for Disease Control and Prevention (CDC); 2011 [updated 2011 Nov 11; cited 2016 Dec 3]. Available from: https://www.cdc.gov/tobacco/data_statistics/mmwrs/byyear/2011/mm6044a2/intro.htm

291. Government of Canada. Canadian Tobacco Use Monitoring Survey (CTUMS) 2012 [Internet]. Ottawa, ON: Health Canada; 2013 [updated 2013 Oct 1; cited 2015 Jul 22]. Available from: http://www.hc-sc.gc.ca/hc-ps/tobac-tabac/research-recherche/stat/ctums-esutc_2012-eng.php

292. Chen D, Wu L. Smoking cessation interventions for adults aged 50 or older: a systematic review and meta-analysis. Drug Alcohol Depend. 2015;154:14-24.

293. Zbikowski SM, Magnusson B, Pockey JR, Tindle HA, Weaver KE. A review of smoking cessation interventions for smokers aged 50 and older. Maturitas. 2012;71(2):131-41.

294. Smokers, by sex, provinces and territories (percent) [Internet]. Ottawa, ON: Statistics Canada; 2016 [updated 2016 Mar 7; cited 2016 Nov 8]. Available from: http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/health74b-eng.htm

295. Nevela J, Sears K, Steibelt E. Women and tobacco info pack: gain a better understanding of how smoking affects women's health. Toronto, ON: Program Training and Consultation Centre (PTCC); 2010. Available from: https://www.ptcc-cfc.on.ca/common/pages/UserFile.aspx?fileId=104553

296. Torchalla I, Okoli CTC, Bottorff JL, Qu A, Poole N, Greaves L. Smoking cessation programs targeted to women: a systematic review. Women Health. 2012;52(1):32-54.

297. Okoli C, Torchalla I, Oliffe J, Bottorff J. Men's smoking cessation interventions: a brief review. Jounal of Men's Health. 2011;8(2):100-8.

298. Kagawa Singer M. Applying the concept of culture to reduce health disparities through health behavior research. Prev Med. 2012;55(5):356-61.

299. Liu JJ, Davidson E, Bhopal RS, White M, Johnson MRD, Netto G. Adapting health promotion interventions to meet the needs of ethnic minority groups: mixed-methods evidence synthesis. Health Technol Assess. 2012;16(44):1-469.

300. Vous pensez à cesser? [Internet]. Toronto, ON: Canadian Cancer Society; 2012 [cited 2016 Dec 15]. Available from: http://www.smokershelpline.ca/fr/home

301. Webb MS, Rodriguez-Esquivel D, Baker EA. Smoking cessation interventions among Hispanics in the United States: a systematic review and mini meta-analysis. Am J Health Promot. 2010;25(2):109-18.

302. Nierkens V, Hartman MA, Nicolaou M, Vissenberg C, Beune EJ, Hosper K. Effectiveness of cultural adaptations of interventions aimed at smoking cessation, diet, and/or physical activity in ethnic minorities: a systematic review. PLoS One. 2013;8(10):e73373.

303. Liu JJ, Wabnitz C, Davidson E, Bhopal RS, White M, Johnson MR, et al. Smoking cessation interventions for ethnic minority groups - a systematic review of adapted interventions. Prev Med. 2013;57(6):765-75.

304. Kong G, Singh N, Krishnan-Sarin S. A review of culturally targeted/tailored tobacco prevention and cessation interventions for minority adolescents. Nicotine Tob Res. 2012;14(12):1394-406.

305. Cox SL, Okuyemi K, Choi W, Ahluwalia J. A review of tobacco use treatments in US ethnic minority populations. Am J Health Promot. 2011;25(5 Suppl):S11-30.

306. Carson KV, Brinn MP, Peters M, Veale A, Esterman AJ, Smith BJ. Interventions for smoking cessation in Indigenous populations. Cochrane Database Syst Rev. 2012;(1):CD009046.

307. Aboriginal tobacco program [Internet]. Toronto, ON: Cancer Care Ontario; 2012 [updated 2012 Jun 26; cited 2016 Nov 10]. Available from: https://www.cancercare.on.ca/cms/one.aspx?pageId=9322

308. Ontario Tobacco Research Unit (OTRU). OTRU update: research on non-traditional tobacco use reduction in Aboriginal communities [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2015 [cited 2016 Nov 9]. Available from: http://otru.org/wp-content/uploads/2015/01/update_jan2015_.pdf

309. Ontario Tobacco Research Unit (OTRU). Project news: RETRAC: research progress and preliminary knowledge synthesis findings [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2015 [cited 2016 Nov 8]. Available from: http://otru.org/wp-content/uploads/2015/07/retrac_july2015.pdf

310. Johnston V, Westphal DW, Glover M, Thomas DP, Segan C, Walker N. Reducing smoking among indigenous populations: new evidence from a review of trials. Nicotine Tobacco Res. 2013;15(8):1329-38.

311. Power J, Grealy C, Rintoul D. Tobacco interventions for indigenous Australians: a review of current evidence. Health Promot J Austr. 2009;20(3):186-94.

312. Digiacomo M, Davidson PM, Abbott PA, Davison J, Moore L, Thompson SC. Smoking cessation in indigenous populations of Australia, New Zealand, Canada, and the United States: elements of effective interventions. Int J Environ Res Public Health. 2011;8(2):388-410.

313. Lesbian, gay, bisexual, and transgender persons and tobacco use (LGBT) [Internet]. Atlanta, GA: Centers for Disease Control and Prevention; 2016 [updated 2016 Aug 17; cited 2016 Feb 3]. Available from: http://www.cdc.gov/tobacco/campaign/tips/groups/lgbt.html

314. Clarke MP, Coughlin JR. Prevalence of smoking among the lesbian, gay, bisexual, transsexual, transgender and queer (LGBTTQ) subpopulations in Toronto-the Toronto Rainbow Tobacco Survey (TRTS). Can J Public Health. 2012;103(2):132-6.

315. Why we smoke [Internet]. Toronto, ON: Rainbow Health Ontario; cited 2016 Dec 3]. Available from: http://clear-the-air.ca/why-we-smoke

316. Lee J.G., Matthews A.K., McCullen C.A., Melvin C.L. Promotion of tobacco use cessation for lesbian, gay, bisexual, and transgender people: a systematic review. Am J Prev Med. 2014;47(6):823-31.

317. Matheson FI, Moineddin R, Dunn JR, Creatore MI, Gozdyra P, Glazier RH. Urban neighborhoods, chronic stress, gender and depression. Soc Sci Med. 2006;63(10):2604-16.

318. Reid JL, Hammond D, Rynard VL, Burkhalter R. Tobacco use in Canada: patterns and trends [Internet]. Waterloo, ON: Propel Centre for Population Health Impact, University of Waterloo; 2015 [cited 2016 Dec 3]. Available from: http://www.tobaccoreport.ca/2015/TobaccoUseinCanada_2015.pdf

319. Keating DP, Hertzman C. Developmental health and the wealth of nations: social, biological, and educational dynamics. New York, NY: The Guilford Press; 1999.

320. Olds DL, Eckenrode J, Henderson CR, Kitzman H, Powers J, Cole R, et al. Long-term effects of home visitation on maternal life course and child abuse and neglect. J Am Med Assoc. 1997;278(8):637-43.

321. Olds DL, Henderson CR, Kitzman H. Does prenatal and infancy nurse home visitation have enduring effects on qualities of parental caregiving and child health at 25 to 50 months of life? Pediatrics. 1994;93(1):89-98.

322. Olds DL. Prenatal and infancy home visiting by nurses: from randomized trials to community replication. Prev Sci. 2002;3(3):153-72.

323. Bull E.R., Dombrowski S.U., McCleary N., Johnston M. Are interventions for low-income groups effective in changing healthy eating, physical activity and smoking behaviours? A systematic review and meta-analysis. BMJ Open. 2014;4(11):e006046

324. Bryant J, Bonevski B, Paul C, McElduff P, Attia J. A systematic review and meta-analysis of the effectiveness of behavioural smoking cessation interventions in selected disadvantaged groups. Addiction. 2011;106(9):1568-85.

325. Ford P, Clifford A, Gussy K, Gartner C. A systematic review of peer-support programs for smoking cessation in disadvantaged groups. Int J Environ Res Public Health. 2013;10(11):5507-22. Available from: http://www.mdpi.com/1660-4601/10/11/5507

326. Murray RL, Bauld L, Hackshaw LE, McNeill A. Improving access to smoking cessation services for disadvantaged groups: a systematic review. J Public Health. 2009;31(2):258-77.

327. Brown T, Platt S, Amos A. Equity impact of European individual-level smoking cessation interventions to reduce smoking in adults: a systematic review. Eur J Public Health. 2014;24(4):551-6.

328. Brown T, Platt S, Amos A. Equity impact of population-level interventions and policies to reduce smoking in adults: a systematic review. Drug Alcohol Depend. 2014;138:7-16.

329. Canadian Tobacco Alcohol and Drugs (CTADS): 2013 summary [Internet]. Ottawa, ON: Government of Canada; 2015 [updated 2015 Feb 03] Available from: http://healthycanadians.gc.ca/science-research-sciences-recherches/data-donnees/ctads-ectad/summary-sommaire-2013-eng.php

330. Ebbert J, Montori VM, Erwin PJ, Stead LF. Interventions for smokeless tobacco use cessation. Cochrane Database Syst Rev. 2011;(10):CD004306.

331. Ebbert JO, Fagerstrom K. Pharmacological interventions for the treatment of smokeless tobacco use. Cns Drugs. 2012;26(1):1-10.

Chapter 7: Conclusion

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Overview

Tobacco use is a main cause of preventable illness and is responsible for an estimated 13,000 deaths in Ontario per year.[1] The Ontario government has committed to becoming the lowest smoking prevalence jurisdiction in Canada.[1] Current estimates are that 17.4% (almost 1 in 5) adults still smoke tobacco in Ontario, which is slightly above British Columbia.[2] Comprehensive tobacco control strategies are critical to reduce tobacco use and its associated burden.

SFO-SAC 2016 reviewed the latest evidence to answer the question: ***Which interventions or set of interventions will have the greatest impact on reducing tobacco use in Ontario?*** We considered potential equity effects and implementation throughout the Report and across all interventions.

SFO-SAC 2016 identified 56 key interventions for the present Report, grouped within the four pillar chapters (Industry, Prevention, Protection and Cessation) and assessed each in terms of evidence of effectiveness, the Ontario context and the potential contribution to reduce tobacco use and/or its associated burden in Ontario. Together, these interventions, categorized by potential contribution, can form the basis of a comprehensive plan to enhance Ontario's tobacco control strategy.

The *SFO-SAC 2016 Report* is intended for a range of audiences, including government, non-government organizations, program developers, policy-makers and service providers. All audiences can contribute towards reducing tobacco use and associated burden in Ontario.

This final chapter summarizes our overall findings and reiterates the importance of addressing equity and considering implementation within a coordinated and comprehensive strategy. The chapter concludes by situating the evidence in relation to current thinking about a tobacco control endgame strategy for Ontario.

Potential Contribution of Interventions

The 56 key interventions included in this report provide a diverse range of activities and approaches to reduce tobacco use and its associated burden in Ontario. Evidence from the published literature confirms that most of these interventions are 'well-supported', 'supported' or 'promising' in terms of effectiveness using the CDC's guide to the continuum of evidence of effectiveness.[3] Our scientific consensus process categorized interventions based on their potential contribution for Ontario. Further detail on the process SFO-SAC 2016 used to categorize interventions based on potential contribution is provided in Chapter 2: Methods. Table 7.1 provides a summary of the potential contribution of each intervention within each pillar. Within this framework, a number of important observations can be made.

First, we note that several interventions within the 'high (intensify)' category are considered impactful in a cross-cutting way across multiple pillar chapters. This category describes interventions where the body of evidence is primarily well-supported or supported and the intervention is currently implemented in Ontario, but where there is an opportunity gap because the intervention could make a greater (substantial or transformational) contribution if its intensity was greater than what is currently being

done. The term 'intensify' refers to both intensifying the scope/breadth of the intervention and to the degree to which the intervention is implemented.

Price and taxation was determined to be 'high (intensify)' within the Industry, Prevention and Cessation chapters, based on evidence that showed effectiveness on (i) reducing the demand for tobacco products, (ii) reducing the prevalence, initiation and uptake of tobacco use among young people, and (iii) increasing smoking cessation. Ontario has the second lowest tobacco tax rate in Canada at 15.475 cents per cigarette and has not had substantial tax increases for many years, thus there is clear opportunity in this area. Mass media campaigns are another example of a cross-cutting 'high (intensify)' intervention, particularly when implemented as part of a comprehensive strategy.

Second, we note that a number of interventions are categorized as 'innovative'. This category describes interventions where the body of evidence is emerging or in a promising direction. Although the intervention is not currently implemented in Ontario, SFO-SAC concluded that, if well-implemented, the potential contribution may shift the landscape of tobacco control for Ontario (potential contribution may be transformational).

For example, a number of interventions in the Industry Chapter, such as retail licenses and government-controlled outlets, were identified as 'innovative', as were some interventions in the Prevention Chapter, such as raising the minimum purchase age and tobacco-free generation. These interventions may be considered as part of a tobacco endgame strategy, and are discussed in the Endgame Framing section to follow.

Third, several interventions assessed as 'moderate (intensify)' are considered impactful in a cross-cutting way across multiple pillar chapters. 'moderate (intensify)' describes interventions where the body of evidence ranges generally from 'promising' to 'well supported'; however they tend to target a specific population or setting, and as such they are considered less impactful than 'high (intensify)' interventions. The intervention is currently implemented in Ontario, and there is an opportunity gap because the intervention could make a greater contribution if its intensity was greater than what is currently being done.

For example, tobacco policies in elementary, secondary and post-secondary campuses were determined to impact tobacco use across multiple pillars. For example school tobacco polices can reduce susceptibility to smoking, reduce physical and social exposure to tobacco smoke, and increase quit rates and decrease cigarette consumption. Workplace-based (e.g., trades, construction, primary industry, retail and hospitality) interventions provide another example of cross-cutting 'moderate (intensify)' interventions.

Finally, there are interventions that are categorized as 'uncertain at this time'. This category describes interventions where there is not enough information from the body of evidence at this time to discern which category the intervention best fits. Therefore, their potential contribution to reduce tobacco use and associated burden in Ontario is uncertain, if initiated.

Several cessation techniques (e.g., enhancing partner support, biomedical risk assessment, acupuncture and e-cigarettes) require more research on their effectiveness to help people quit smoking. How to safely dispose of cigarette waste and remove thirdhand smoke from objects and surfaces are other areas that require more research. Several interventions related to the emerging area of e-cigarettes are likewise categorized as 'uncertain at this time' (i.e., Regulation to favour electronic cigarettes over cigarettes and e-cigarettes as a cessation aid).

The titles in the table below reflect the intervention titles from the specific chapters. Links to these sections are in the table.

Table 7.1: Potential Contribution of Interventions by Pillar Chapter

Potential contribution	Industry	Prevention	Protection	Cessation
High (Intensify)	• Price and Taxation (+) • Tobacco Advertising Promotion and Sponsorship Bans • Anti-Contraband Measures • Banning Flavours in Tobacco Products (+)	• Price and Taxation (+) • Mass Media - Prevention (+)	• Mass Media - Protection • Protection from Tobacco Smoke Exposure in Outdoor Public Spaces • Protection from Tobacco Smoke Exposure in Home Environments (+)(T) • Protection from Tobacco Smoke Exposure in Workplaces (+)(T)	• Price and Taxation (+) • Smoke-Free Policies • Mass Media - Cessation • Technology-Based Interventions: Internet /Computer and Text Messaging • Hospital-Based Cessation Interventions • Other Health Care Setting Cessation Interventions • Pharmacotherapy • Behavioural Interventions
High (Initiate)	• Plain and Standardized Packaging	• N/A	• N/A	• N/A
High (Continue)	• N/A	• Bans on Point-of-Sale Displays	• N/A	• N/A
Innovative	• Zoning Restrictions to Create Tobacco Retail-free Areas • Retail Licenses • Government-Controlled Outlets • Imposing a Quota on Tobacco Product Availability (Sinking Lid) (+) • Regulated Market Model • Non-Profit Enterprise with a Public Health Mandate • Performance-Based Regulation	• Reducing the Availability of Tobacco Products (+) • Raising the Minimum Purchase Age • Social Marketing (T) • Onscreen Tobacco Use and Product Placement • Tobacco-Free Generation	• Integrating Electronic Cigarettes into Smoke-Free Policies	• Cessation Maintenance

Potential contribution	Industry	Prevention	Protection	Cessation
Moderate (Intensify)	• Health Warning Labels	• Elementary and Secondary School Tobacco Policies • Campus-Based Tobacco Policies	• Protection from Tobacco Smoke Exposure in Institutional Settings (+) • Protection from Tobacco Smoke Exposure Hospitality Settings (+) • Protection from Tobacco Smoke Exposure in Vehicles • Protection from Waterpipe Smoke	• Workplace-Based Interventions • Campus-Based Interventions • Quitlines with Cessation Telephone Support • Financial Incentives (+) (T)
Moderate (Initiate)	• N/A	• N/A	• N/A	• N/A
Moderate (Continue)	• N/A	• Elementary and Secondary School Prevention Programs	• N/A	• Self-Help Interventions
Uncertain at this time	• Regulation to Favour Electronic Cigarettes over Cigarettes • Litigation • Reducing Product Toxicity • Reduction of Nicotine Content in Cigarettes to Reduce Addictiveness	• Prevention in the Family Setting • Prevention in the Primary Care Setting	• Impacts of Post-Consumption Cigarette Waste	• Electronic Cigarettes • Enhancing Partner Support (+) (T) • Biomedical Risk Assessment • Acupuncture and Related Interventions • Combustible Products – Waterpipes • Smokeless Tobacco
Unsupported at this time	• N/A	• N/A	• N/A	• Hypnotherapy
Harmful	• N/A	• N/A	• N/A	• N/A

(+) = Demonstrated or potential positive equity (T) = Targeted

Equity Considerations

Health inequities are defined by the presence of unfair and avoidable differences in the prevalence of tobacco use, and tobacco-caused morbidity and mortality, across different population groups .[4-7] For example, in the Introduction and Cessation chapters we highlighted variation by individual factors such as age and ethnicity in tobacco use, utilization of cessation support services such as quit lines and successful quit attempts.

The SFO-SAC 2016 scientific consensus process specifically considered the equity impacts of each intervention in terms of positive equity and targeting. Positive equity impact means that an appropriately implemented intervention demonstrates reduction of, or the potential to reduce, differences in burden associated with tobacco use among specific populations.[8]

The following interventions were noted to have a demonstrated or potential positive equity impact either directly, or through reaching higher risk groups via specific settings: price and taxation, banning flavours in tobacco products, prevention-focussed mass media, reducing the availability of tobacco products, imposing a quota on tobacco product availability (i.e., sinking lid), and interventions that protect individuals from tobacco smoke exposure in the home environment, workplace, hospitality settings, institutional settings and vehicles. See Table 7.1 for interventions with (+) symbol.

As highlighted in the Industry, Prevention and Cessation chapters, price and tax increases can reduce demand for tobacco products, reduce initiation, and boost cessation efforts, including among lower-income groups. With regard to equity, tax increases (combined with messaging on the harms of tobacco use and associated burden) shows greater health impact for lower-income groups compared to the general population, especially when combined with other cessation interventions among those who have difficulty quitting.

Targeted interventions that are tailored, or adapted, to accommodate or engage specific populations may also improve health equity.[9] Within the evidence summarized for the SFO-SAC 2016 report, targeting to specific populations was noted for the following interventions: protection from tobacco smoke exposure in the home environment (e.g., multi-unit housing) and workplaces; prevention interventions using social marketing and eliminating onscreen tobacco use; and cessation interventions using financial incentives and enhancing partner support. See Table 7.1 for interventions with (T) symbol.

In the Cessation Chapter, there was a body of evidence regarding interventions tailored to specific population groups such as youth and young adults, Indigenous populations, individuals who identify as LGBT, low-income and other socially-disadvantaged groups. Cessation interventions that were tailored or culturally-adapted had overall 'promising' evidence of increasing smoking cessation in these populations. Of note, equity impacts were derived from the literature on the effectiveness of key interventions (rather than from population-specific searches) and there may be populations omitted or under-represented in the literature cited (e.g., those with HIV/AIDS) using this approach. Interventions

targeted to individuals suffering from specific medical conditions (e.g., cancer, COPD, cardiovascular disease and mental illness) were also shown to be effective to increase smoking cessation.

Reducing tobacco consumption and its associated burden, especially among individuals with the highest usage rates, exposure and associated health impacts, is an important way to reduce social inequalities in health. Comprehensive tobacco control can promote health equity and diminish tobacco-related health disparities through a combination of population-based and targeted approaches, provided that policy and programmatic initiatives are accessible to everyone, the approach is appropriate and proportionate to the degree of need, and the social environment overall is improved.[4,10]

Key System Enablers and Implementation

Key system enablers encompass a set of interrelated functions at a system level (i.e., within and between organizations and institutions) that support an overall comprehensive tobacco control strategy. Investment in key system enablers is critical for the effective management and implementation of a comprehensive tobacco control strategy. The *SFO-SAC 2010 Report* identified five system enablers, as informed by the *Primary Prevention for Chronic Diseases in Canada: Framework for Action* and the *Centers for Disease Control and Prevention Best Practices for Comprehensive Tobacco Control Programs — 2007,* among other relevant sources.[11,12] "These five system enablers are still relevant and have been endorsed/adopted by SFO-SAC 2016.

Key system enablers from SFO-SAC 2010 included:

1. Leadership, including partnership and coalition-building,
2. Support for development and implementation of policies, programs and social marketing
3. Funding
4. Capacity-building infrastructure, surveillance, evaluation and research as part of a comprehensive tobacco control learning system
5. Ontario's role within a regional and global tobacco control framework

Leadership at all levels has been shown to be instrumental in the development of relationships, communication, funding and strategic direction for chronic disease prevention.[6] An effective comprehensive tobacco control strategy involves leadership and "a whole government approach" at local, regional, provincial, national and international levels.[6] Non-government organizations have a critical role in supporting a strong research base, advocacy efforts, community mobilization and engagement, and multi-partisan political leadership.[6]

Through our extraction of implementation considerations for each intervention, the need for strong leadership was reiterated. For example, strong leadership is required to broker cooperation among various groups (e.g., governments, organizations and agencies) to address contraband[13,14] and to implement innovative strategies such as the sinking lid.[15] Similarly, addressing onscreen tobacco use

requires leadership to support coalition-building that includes advocacy targeted to entertainment providers, continued dialogue with key stakeholders in the entertainment industry and self-regulation by the movie industry.[16]

Certain supports are required to drive **policy development**, including the capacity to use available data, obtained through surveillance, evaluation, monitoring and research, to make informed decisions on policy needs while incorporating factors such as relative costs and feasibility.[6]

Sound policy development also depends on the readiness and willingness of governments to conduct demonstration projects to determine the potential effectiveness of innovative policies in real-world settings.[6] The development of strong, robust policies has been shown to be critical to tobacco control efforts, such as the effect that smoke-free policies have on shifting social norms. Anticipating and planning for industry reaction following the introduction of these policies are also important to manage potential criticism that the industry may attempt to use to counter these policies.[6]

Program development also relies on the capacity of program developers at all levels (i.e., municipal, provincial and federal) to use data obtained through surveillance and evaluation to identify gaps in existing programs and to review existing evidence to determine potential programs to fill those gaps.[6] Local context must be considered to identify mechanisms of change that have a higher likelihood of success.[6] Capacity is also needed to design, implement and evaluate programs to address any other gaps that emerge.[6]

As noted in the *SFO-SAC 2010 Report*, all four pillars of comprehensive tobacco control require some degree of **mass media and social marketing**, to raise awareness of tobacco control interventions and shift social norms.[6] Some key enablers for mass media and social marketing include sufficient and consistent funding, coordinated implementation of media and intervention efforts and evaluation of social marketing activities to determine how effective they are.[6]

Funding is a critical enabler for comprehensive tobacco control efforts and supports program and policy development at community and provincial levels. As discussed in the *SFO-SAC 2010 Report*, a 'dose-response' effect between funding levels and program outcomes was identified in multiple published reports.[6] Real-world examples have also shown that cuts to funding for comprehensive tobacco control have resulted in reduced effectiveness.[6]

A number of system enablers are critical to advance a comprehensive strategy and drive tobacco use reduction. Components include: **surveillance** to monitor intervention outcomes in the population, **evaluation** to inform decision-making on policies and programs, and **research** to make contributions to comprehensive tobacco control in Ontario and globally. **Capacity-building activities** such as training and the provision of technical assistance are required to plan, develop and implement evidence informed interventions. In Ontario, this support is provided by a capacity building infrastructure that includes OTRU, the Program Training and Consultation Centre (PTCC), Training Enhancement in Applied Cessation Counselling and Health (TEACH) and other resource centres. Together these components form the **Ontario Tobacco Control Learning System** – a comprehensive tobacco control enabling infrastructure that keeps comprehensive tobacco control in Ontario adaptive and resilient.[6]

It is also important to note **Ontario's role within a regional and global tobacco control framework**, contributing to Canada's obligations under the WHO FCTC as the country's largest province.[6] At a regional level, cross-border tobacco trafficking between Ontario, Quebec and New York State also warrants effort to strengthen collaboration between these jurisdictions to address the flow of contraband tobacco.[6]

For detailed information on key system enablers please refer to SFO-SAC 2010.

Optimizing Impact

Coordinated and Comprehensive Strategies

To further reduce tobacco use in the Ontario context, it is essential to maintain and build upon Ontario's current comprehensive strategy. To optimize intervention effectiveness, a coordinated and comprehensive approach is required. Coordinated refers to ensuring that various stakeholders (i.e., public health, education, law enforcement and levels of government) work well together, and comprehensive means using integrated educational, clinical, regulatory, economic and social strategies for tobacco control.[17]

Across all pillars of tobacco control, we found that interventions were more effective when implemented in a coordinated manner and as part of a comprehensive tobacco control strategy. A comprehensive strategy also includes a combination of population-wide interventions and more targeted interventions that can reduce smoking prevalence in the overall population and within specific vulnerable groups.[6,17]

For example, mass media interventions were shown to be more effective when implemented as part of a comprehensive tobacco control program. This applies to mass media interventions targeted to prevent smoking among youth and young adults,[18,19] educating about the dangers of secondhand smoke,[20] and smoking cessation.[21-23] The same was identified for tobacco advertising promotion and sponsorship bans, where the importance of a comprehensive strategy cannot be overemphasized. Bans on tobacco advertising, promotion and sponsorship need to be 'blanket'; otherwise, tobacco companies will move their advertising dollars to media and locations that are not restricted.[19,24]

The importance of a coordinated and comprehensive approach was observed across multiple intervention settings. This includes coordinated smoke-free policies in outdoor public places,[25] workplaces,[26] elementary schools,[27] campuses (e.g., colleges, universities, and trade schools),[28-31] institutions (e.g., psychiatric facilities and facilities for veterans, outdoor areas of, or around, hospitals, post-secondary campuses and prisons),[32] home environments[33] and in vehicles.[34]

Implementation coordination is a key factor to optimize impact. For example, in Australia, there was a synergistic effect created by implementing plain packaging legislation (larger health warning labels and a quitline number mandated at the same time on cigarette packaging) along with a national mass media public awareness campaign.[35,36]

We also found that smoking cessation interventions were more effective when implemented using a coordinated multi-component approach. Multi-component cessation interventions include: technology-based interventions (e.g., websites, computer programs, text messaging, smart phone applications, and other electronic aids),[37] behavioural interventions (e.g., the Smoking Treatment for Ontario Patients Program, the OMSC Program and the Ontario Pharmacy Smoking Cessation Program), self-help materials[38] and comprehensive insurance coverage for pharmacotherapy treatment.[39,40]

Finally, active enforcement was identified as an important component of coordinated and comprehensive implementation. Active enforcement is required to achieve impacts for policy interventions such as raising the minimum age.[22,41,42] Enforcement can enhance compliance with smoke-free policies.[28,43-46]

Endgame Framing

The endgame strategy is a vision of a tobacco free future. An endgame strategy, therefore, emphasizes (i) public policy commitment, (ii) the implementation of new interventions that bring transformative changes and (iii) thinking long-term toward a future tobacco-free endpoint, rather than incrementally.[47,48] SFO-SAC 2016 reviewed a number of interventions that were also discussed at the recent Canadian Summit;[47] the following interventions, categorized by SFO-SAC 2016 as 'innovative', could be considered endgame interventions (See Table 7.1):

- Raising the Minimum Purchase Age
- Tobacco-Free Generation
- Zoning Restrictions to Create Tobacco Retail-free Areas
- Retail Licenses set at levels that would decrease retail density
- Imposing a Quota on Tobacco Product Availability (Sinking Lid)
- Regulated Market Model curtailing price and distribution channels
- Non-Profit Enterprise with a Public Health Mandate
- Performance-Based Regulation requiring tobacco companies to achieve health-promoting goals

An endgame strategy aligns with the whole of government approach – where ministries come together and work in an integrated manner.[6,48] For example, working across ministries with multiple partners, government has levers to make change through support for efforts to study and document the contribution of existing policies and to develop new policies.[6] New regulatory regimes may be needed to address new products, and there may also be opportunities to align with regulations that are developing at this time (e.g., marijuana regulations).[47]

Final Comments

The *SFO-SAC 2016 Report* provides a current assessment of the body of evidence and the potential contribution of 56 key interventions reduce tobacco use and its associated burden in Ontario. There is strong evidence for a number of high- and innovative interventions to reduce tobacco use and associated burden and to transform the tobacco control landscape in Ontario.

Importantly, there is a commitment that the evidence and potential contribution be updated annually. Annual updating will provide tobacco control decision-makers and implementers access to best available research evidence and scientific consensus to progress towards an endgame goal. The effectiveness of these efforts will require maintaining tobacco use reduction as a priority. To achieve an endgame goal, a coordinated and comprehensive approach that draws on all pillars and is supported by an adequate enabling system is imperative. Overall, comprehensive tobacco control requires coordinated efforts at all levels to support reductions in tobacco-related disparities and promote health equity.[4,5,9] It is important to consider specific populations when designing and implementing tobacco control interventions to ensure these populations are reached and engaged. Likewise, the needs of various specific populations (such as youth and young adults) must also be considered when addressing new products (e.g., e-cigarettes). With implementation and equity considerations at the fore, and with a coordinated and energized set of system enablers in place, great strides will be made to reduce tobacco use as well as inequities related to tobacco use across the entire population.

References

1. Ontario. Ministry of Health and Long-term Care. Helping smokers quit Ontario's smoking cessation action plan: a smoke-free Ontario initiative [Internet]. Toronto, ON: Queen's Printer for Ontario; 2016 [updated 2016 May 31; cited 2016 Dec 13]. Available from: http://www.health.gov.on.ca/en/common/ministry/publications/reports/cessation/default.aspx

2. Statistics Canada. Canadian Tobacco, Alcohol and Drugs Survey, 2015 (updated) [Internet]. Ottawa, ON: Statistics Canada; 2017 [updated 2017 Feb 3; cited 2017 Mar 6]. Available from: http://www.statcan.gc.ca/daily-quotidien/161109/dq161109b-eng.htm

3. Puddy RW, Wilkins N. Understanding evidence part 1: best available research evidence. A guide to the continuum of evidence of effectiveness. [Internet]. Atlanta, GA: Centers for Disease Control and Prevention; 2011 [cited 2016 Dec 3]. Available from: https://www.cdc.gov/violenceprevention/pdf/understanding_evidence-a.pdf

4. Achieving health equity in tobacco control (version 1) [Internet]. Washington, DC: Truth Initiative; 2015 [cited 2016 Dec 2]. Available from: http://truthinitiative.org/sites/default/files/Achieving%20Health%20Equity%20in%20Tabacco%20Control%20-%20Version%201.pdf

5. Centers for Disease Control and Prevention (CDC). Best practices user guide: health equity in tobacco prevention and control [Internet]. Atlanta, GA: Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2015 [cited 2016 Dec 2]. Available from: http://www.cdc.gov/tobacco/stateandcommunity/best-practices-health-equity/pdfs/bp-health-equity.pdf

6. Smoke-Free Ontario Scientific Advisory Committee. Evidence to guide action: Comprehensive tobacco control in Ontario [Internet]. Toronto, ON: Ontario Agency for Health Protection and Promotion; 2010 [cited 2015 Jul 29]. Available from: http://www.publichealthontario.ca/en/eRepository/Evidence%20to%20Guide%20Action%20-%20CTC%20in%20Ontario%20SFO-SAC%202010E.PDF

7. National Collaborating Centre for Determinants of Health. Equity-integrated population health status reporting: action framework. Antigonish, NS: St. Francis Xavier University; 2015. Available from: http://www.nccph-ccnsp.ca/docs/PHSR%20Action%20Framework%20EN_final.pdf

8. Brown T, Platt S, Amos A. Equity impact of population-level interventions and policies to reduce smoking in adults: a systematic review. Drug Alcohol Depend. 2014;138:7-16.

9. Wong J. The next stage: delivering tobacco prevention and cessation knowledge through public health networks [Internet]. Ottawa, ON: Canadian Public Health Association (CPHA); 2010 [cited 2016 Dec 2]. Available from: http://www.cpha.ca/uploads/progs/substance/tobacco/gray_lit_review.pdf

10. National Collaborating Centre for Determinants of Health. Let's talk: universal and targeted approaches to health equity. [Internet]. Antigonish, NS: Francis Xavier University; 2013 [cited 2016 Dec 2]. Available from: http://nccdh.ca/images/uploads/Approaches_EN_Final.pdf

11. Garcia J, Riley B. Primary prevention of chronic diseases in Canada: a framework for action [Internet]. Ottawa, ON: Chronic Disease Prevention Alliance of Canada; 2008 [cited 2016 Dec 3]. Available from: http://www.cdpac.ca/media.php?mid=451

12. Centers for Disease Control and Prevention. Best practices for comprehensive tobacco control programs—2007 [Internet]. Atlanta, GA: Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2007 [cited 2016 Dec 3]. Available from: ftp://ftp.cdc.gov/pub/fda/fda/BestPractices_Complete.pdf

13. Sweeting J, Johnson T, Schwartz R. Anti-contraband policy measures: evidence for better practice - summary report [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2009 [cited 2016 Apr 21]. Available from: http://otru.org/wp-content/uploads/2012/06/special_anti_contraband_measures_summary.pdf

14. World Health Organization. WHO report on the global tobacco epidemic, 2015. Raising taxes on tobacco: executive summary [Internet]. Geneva, SZ: WHO Document Production Services; 2015 [cited 2015 Aug 24]. Available from: http://apps.who.int/iris/bitstream/10665/178577/1/WHO_NMH_PND_15.5_eng.pdf?ua=1

15. Wilson N, Thomson GW, Edwards R, Blakely T. Potential advantages and disadvantages of an endgame strategy: a 'sinking lid' on tobacco supply. Tob Control. 2013;22 Suppl 1:i18-21.

16. National Cancer Institute. The role of the media in promoting and reducing tobacco use. Tobacco Control Monograph No. 19 [Internet]. Bethesda, MD: U.S. Department of Health and Human Services; 2008 [cited 2016 Jun 10]. Available from: http://cancercontrol.cancer.gov/brp/tcrb/monographs/19/m19_complete.pdf

17. Centers for Disease Control and Prevention (CDC). Best practices for comprehensive tobacco control programs [Internet]. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2014 [cited 2015 Aug 24]. Available from: http://www.cdc.gov/tobacco/stateandcommunity/best_practices/pdfs/2014/comprehensive.pdf

18. U.S. Department of Health and Human Services. Preventing tobacco use among youth and young adults: a report of the surgeon general [Internet]. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2012 [cited 2016 Dec 3]. Available from: https://www.surgeongeneral.gov/library/reports/preventing-youth-tobacco-use/prevent_youth_by_section.html

19. U.S. Department of Health and Human Services. The health consequences of smoking: 50 years of progress [Internet]. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2014 [cited 2015 Dec 31]. Available from: https://www.surgeongeneral.gov/library/reports/50-years-of-progress/full-report.pdf

20. Thrasher JF, Huang L, Perez-Hernandez R, Niederdeppe J, Arillo-Santillan E, Alday J. Evaluation of a social marketing campaign to support Mexico City's comprehensive smoke-free law. Am J Public Health. 2011;101(2):328-35. Avaialable from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3020192/

21. Durkin S, Brennan E, Wakefield M. Mass media campaigns to promote smoking cessation among adults: an integrative review. Tob Control. 2012;21(2):127-38.

22. Hoffman SJ, Tan C. Overview of systematic reviews on the health-related effects of government tobacco control policies. BMC Public Health. 2015;15:744. Available from: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-015-2041-6

23. Bala MM, Strzeszynski L, Topor-Madry R, Cahill K. Mass media interventions for smoking cessation in adults. Cochrane Database Syst Rev. 2013(6):CD004704.

24. Wilson LM, Avila Tang E, Chander G, Hutton HE, Odelola OA, Elf JL, et al. Impact of tobacco control interventions on smoking initiation, cessation, and prevalence: a systematic review. J Environ Public Health. 2012;2012:1-36. Available from: https://www.hindawi.com/journals/jeph/2012/961724/

25. Azagba S. Effect of smoke-free patio policy of restaurants and bars on exposure to second-hand smoke. Prev Med. 2015;76:74-8. Available from: http://www.sciencedirect.com/science/article/pii/S009174351500119X

26. Kabir Z, Alpert HR, Goodman PG, Haw S, Behm I, Connolly G, N., et al. Effect of smoke-free home and workplace policies on second-hand smoke exposure levels in children: an evidence summary. Ped Health. 2010;4(4):391-403.

27. Bauld L, Brandling J, Tempelton L. Facilitators and barriers to the delivery of school-based interventions to prevent the uptake of smoking among children: a systematic review of qualitative research [Internet]. Bath, UK: UK Centre for Tobacco Control Studies; 2009 [cited 2016 Dec 3]. Available from: https://www.nice.org.uk/guidance/ph23/evidence/review-of-qualitative-literature-371532061

28. Rodgers KC. A review of multicomponent interventions to prevent and control tobacco use among college students. J Am Coll Health. 2012;60(3):257-61.

29. Andrews J, Kaufman P. Preventing young adult tobacco use: a literature update. Toronto, ON: Ontario Tobacco Research Unit; 2015.

30. Lupton JR, Townsend JL. A systematic review and meta-analysis of the acceptability and effectiveness of university smoke-free policies. J Am Coll Health. 2015;63(4):238-47.

31. Bresnahan MP, Sacks R, Farley SM, Mandel-Ricci J, Patterson T, Lamberson P. Going tobacco-free on 24 New York City university campuses: a public health agency's partnership with a large urban public university system. J Am Coll Health. 2016;64(4):343-7.

32. Kunyk D, Els C, Predy G, Haase M. Development and introduction of a comprehensive tobacco control policy in a Canadian regional health authority. Prev Chronic Dis. 2007;4(2):A30.

33. Smoke-free housing directory [Internet]. Toronto, ON : Smoke-free Housing Ontario; 2016 [updated 2016 Oct 1; cited 2016 Oct 12]. Available from: http://smokefreehousingon.ca/smoke-free-housing-directory/

34. Elton-Marshall T, Leatherdale ST, Driezen P, Azagba S, Burkhalter R. Do provincial policies banning smoking in cars when children are present impact youth exposure to secondhand smoke in cars? Prev Med. 2015;78:59-64.

35. Wakefield MA, Hayes L, Durkin S, Borland R. Introduction effects of the Australian plain packaging policy on adult smokers: a cross-sectional study. BMJ Open. 2013;3(7):e003175. Available from: http://bmjopen.bmj.com/content/3/7/e003175.long

36. Navarro C, Schwartz R. Evidence to support tobacco endgame policy measures. Toronto, ON: Ontario Tobacco Research Unit; 2014.

37. Baskerville NB, Azagba S, Norman C, McKeown K, Brown KS. Effect of a digital social media campaign on young adult smoking cessation. Nicotine Tob Res. 2015;18(3):351-60.

38. Suls JM, Luger TM, Curry SJ, Mermelstein RJ, Sporer AK, An LC. Efficacy of smoking-cessation interventions for young adults: a meta-analysis. Am J Prev Med. 2012;42(6):655-62.

39. White CM, Rynard VL, Reid JL, Ahmed R. Stop-smoking medication use, subsidization policies, and cessation in Canada. Am J Prev Med. 2015;49(2):188-98.

40. Reda AA, Kotz D, Evers SMAA, van Schayck CP. Healthcare financing systems for increasing the use of tobacco dependence treatment. Cochrane Database Syst Rev. 2012(6):CD004305.

41. DiFranza JR. Which interventions against the sale of tobacco to minors can be expected to reduce smoking? Tob Control. 2012;21(4):436-42.

42. Diemert L, Dubray JM, Babayan A, Schwartz R. Strategies affecting tobacco vendor compliance with youth access laws: a review of the literature [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2013 [cited 2016 Aug 16]. Available from: http://otru.org/wp-content/uploads/2013/10/special_vendor_compliance.pdf

43. Baillie L, Callaghan D, Smith M, Bottorff J, Bassett-Smith J, Budgen C, et al. A review of undergraduate university tobacco control policy process in Canada. Health Educ Res. 2009;24(6):922-9.

44. Okoli C, Johnson A, Pederson A, Adkins S, Rice W. Changes in smoking behaviours following a smokefree legislation in parks and on beaches: an observational study. BMJ Open. 2013;3:1-6. Available from: http://bmjopen.bmj.com/content/bmjopen/3/6/e002916.full.pdf

45. Galanti MR, Coppo A, Jonsson E, Bremberg S, Faggiano F. Anti-tobacco policy in schools: upcoming preventive strategy or prevention myth? A review of 31 studies. Tob Control. 2014;23(4):295-301.

46. Dubray J, Schwartz R, Kaufman P. Evaluation of the amended Toronto smoke-free bylaws: summary of the baseline and follow-up assessments [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2016 [cited 2016 Sept 6]. Available from: http://otru.org/wp-content/uploads/2016/08/special_TPH_FUP.pdf

47. A tobacco endgame for Canada: 2016 summit summary report [Internet]. Kingston, ON: Queen's University; 2017 [cited 2017 Feb 22]. Available from: http://oncology.queensu.ca/assets/TOBACCO_ENDGAME/Tobacco_Endgame_Summit_Summary_Report.pdf

48. Canadian Public Health Association. The winnable battle: ending tobacco use in Canada [Internet]. Ottawa, ON: Canadian Public Health Association; 2011 [cited 2016 Sep 9]. Available from: http://www.phans.ca/cmsAdmin/uploads/position-paper-tobacco_e_001.pdf

Glossary

Tobacco Related Terms

Abstinence: Abstinence refers to having stopped tobacco use for a period of time; abstinence may be defined in various ways.[1]

> **Continuous abstinence**: Also called 'sustained abstinence' or 'prolonged abstinence', is a measure of cessation often used in clinical trials that involve avoidance of all tobacco use (not even a puff) since a point in time (e.g., end of treatment or a quit date) until the time the assessment is made. The definition allows for occasional lapses. This is the most rigorous measure of abstinence.[1]
>
> **Point prevalence abstinence (PPA)**: A measure based on behaviour at a particular point in time, or during a relatively brief specified period. The most common point prevalence measure is no tobacco use (not even a puff) in the last seven days.[1]

'Cold Turkey': Quitting smoking abruptly, and/or quitting without behavioural or pharmaceutical support.[1]

Cross-border shopping: Purchasing tobacco in lower tax or tax-free jurisdictions can commonly occur across national borders, particularly where such border-crossing is freely or relatively easily done (as between the European Union Member States) or within a given country where there are significant differences in subnational taxes (as in Canada where provincial taxes differ, or in the United States where state and local taxes can vary considerably across jurisdictions). Within some countries, cross-border shopping also involves purchases in tax-exempt areas, such as Indigenous reserves in Canada and Native American reservations in the USA.[2]

Denormalization: A component of tobacco control strategies that aims to educate the public about the industry's role in promoting and maintaining tobacco addiction by exposing historical and ongoing unethical practices. This approach effectively reverses the 'normalization' of smoking promoted by the industry over decades, through general and targeted advertising.[3]

E-cigarettes: Battery-operated products that transform chemicals, including nicotine, into an aerosol form that is inhaled by the user.[4]

Harm reduction: Strategies to reduce harm caused by continued tobacco/nicotine use, such as reducing the number of cigarettes smoked, or switching to different brands or products, e.g., potentially reduced exposure products (PREPs), smokeless tobacco.[1]

Nicotine: An alkaloid derived from tobacco, responsible for the psychoactive and addictive effects of smoking.[1]

Nicotine Replacement Therapy (NRT): A smoking cessation treatment in which nicotine from tobacco is replaced for a limited period by pharmaceutical nicotine. This reduces the craving and withdrawal experienced during the initial period of abstinence, while users are adapting to being tobacco-free. The nicotine dose can be taken through the skin using patches, by inhaling a spray, or by mouth using gum or lozenges.[1]

Plain packaging: Standardized cigarette packaging that is devoid of the promotional elements that identify it with a specific tobacco brand or company, except for the brand name itself.[5]

Prevention: Policies and actions to eliminate a disease or minimize its effect; to reduce the incidence and/or prevalence of disease, disability and premature death; to reduce the prevalence of disease precursors and risk factors in the population; and, if none of these is feasible, to retard the progress of incurable disease.[6]

Policies and actions to "decrease the supply of new users and thus help ensure the elimination of tobacco use over time. It (prevention) maximizes benefits to individuals and society by promoting a lifetime of abstinence*."*[7]

Product regulation: Regulating the contents and emissions of tobacco products via testing, mandating the disclosure of the test results and regulating the packaging and labelling of tobacco products. Regulation is a pillar of any comprehensive tobacco control program.[8]

Protection: A term to describe a set of activities in public health, including drug safety and related activities that eliminate, as far as possible, the risk of adverse consequences to health attributable to environmental hazards (e.g., secondhand smoke). Protection also serves to make smoking less visible and 'normal', and reduces opportunities to smoke and also cues for smokers, especially those trying to quit. Smoke-free restrictions at work and at home decrease consumption and encourage quitting.[9,10]

Quit attempt: An activity by a tobacco user in which the person tries to stop using with the intention of never using again. Some surveys only classify periods of abstinence as quit attempts that last for > 24 hours.

*The definition is not universal across studies. There are variations in time period, and quit attempts are often self-reported.[11]

> **Number of recent**: The number of smokers who have made one or more quit attempts (stopped smoking for at least one day) in the past 12 months.
>
> **Incident**: A single attempt to quit smoking for at least one day in the last six months.
>
> **Planned**: A quit attempt that was planned ahead of time, perhaps by setting a quit date or obtaining treatment or assistive measures to support success in quitting.
>
> **Unplanned**: A sudden or abrupt decision not to smoke any more cigarettes including those that might be remaining in the current pack.

Aided/assisted: A quit attempt in which the smoker used pharmaceutical or behavioral interventions.[12]

Unaided/ unassisted: A quit attempt in which the smoker did not use assistance in the form of pharmaceutical or behavioral interventions. [12,13]

Successful quit attempt: No longer smoking for a quantified length of time (e.g., one year, three months, etc.), achieving some form of abstinence.[14]

Quit intentions: Quit intentions represent the overall motivation, willingness, want or desire to quit smoking. Quit intention is typically measured in reference to a specific time frame (i.e., over the next seven days, 30 days, six months).[15,16]

Quit lines: Telephone-based tobacco cessation counselling that offers a variety of services to help tobacco users quit.[17]

Quit rates: Proportion of smokers who are smoke-free for a given number of days at a given (time) follow-up.[18] e.g.,

1. Proportion of smokers smoke-free for seven days at six-month follow-up
2. Proportion of smokers smoke-free for 30 days at six-month follow-up
3. Proportion of smokers smoke-free for six months at six-month follow-up.

Relapse: A return to regular smoking after a period of abstinence. Terms sometimes used for a return to tobacco use after a period of abstinence, include a 'lapse' or 'slip', which might be defined as a puff or two on a cigarette. This may proceed to relapse, or abstinence may be regained. Some definitions of continuous, sustained or prolonged abstinence require complete abstinence, but some allow for a limited number or duration of slips. People who lapse are very likely to relapse, but some treatments may be effective to help people recover from a lapse.[1]

Secondhand smoke (SHS): Tobacco smoke inhaled by people who are not actively engaged in smoking, which consists of a mixture of exhaled mainstream smoke and side stream smoke released from a smouldering cigarette or other smoking device (cigar, pipe, bidi, etc.) and diluted with ambient air. Secondhand tobacco smoke is also referred to as "environmental" tobacco smoke (ETS).[8]

Self-efficacy: The belief that one will be able to change one's behaviour, e.g., to quit smoking.[1]

Smoker

Current: Someone who has smoked in the last 30 days and has smoked 100 or more cigarettes in their life.[18,19]

Daily: Someone who reports smoking cigarettes every day (does not take into account the number of cigarettes smoked).[20]

Heavy: 25 or more cigarettes per day; [20] 20 cigarettes or more per day.[21]

Moderate: 15 to 24 cigarettes per day;[20] 11-19 cigarettes per day.[21]

Light: 14 or fewer cigarettes per day;[20] 1-10 cigarettes per day.[21]

Ever: Someone who has ever tried a cigarette, even a few puffs.[22]

Experimental: Those who have smoked less than 100 cigarettes in their life and have either smoked a whole cigarette over 30 days ago or smoked in the last 30 days.[22]

Former: Smoked at least 100 cigarettes in his/her lifetime and has not smoked at all during the past 30 days.[22]

Never: Someone who has never tried a cigarette, not even a few puffs.[22]

Non: Former smokers and never-smokers combined.[20]

Nondaily Occasional: Proportion of smokers smoking at least once in the past 30 days – not every day (this includes former daily smokers who now smoke occasionally).[18,20]

Puffer: Someone who has just tried a few puffs of a cigarette, but has never smoked a whole cigarette.[22]

Smoke-free policies: Public-sector regulations and private-sector rules that prohibit smoking in indoor spaces, indoor workplaces and designated outdoor public areas.[23]

Smoking initiation: Beginning to smoke, smoking onset or the progression from non-smoker to experimental or regular smoker.[24,25]

Smokeless tobacco: Any finely cut, ground, powdered or leaf tobacco that is intended to be placed in the mouth.[26]

Smoking prevalence: The number of smokers in a specified group, divided by the total population of that group, expressed as a percentage. May also be referred to as the "smoking rate".[21]

Smoking progression/escalation: An increase in the frequency of smoking from baseline measure (e.g., progressing from smoking occasionally to smoking daily). Stages can include (a) non-susceptible non-smokers, (b) non-susceptible experimenters, (c) susceptible experimenters, (d) light smokers and (e) committed heavy smokers.[27,28]

Smoking reduction: Cutting down the number of cigarettes smoked per day (i.e., smoke two cigarettes fewer per day).[29]

Smoking susceptibility: The absence of a firm decision not to smoke.[30]

Smuggling[2]

> **Small-scale**: The purchase, by individuals or small groups, of tobacco products in low tax jurisdictions in amounts that exceed the limits set by customs regulations for the purpose of illegal transport and resale in higher-tax jurisdictions.
>
> **Large-scale**: The illegal purchase, import and sale of large quantities of tobacco products, conducted by criminal networks.

Social exposure: Social exposure includes the visual and sensory cues associated with the use of tobacco products. Elimination of social exposure may prevent initiation and relapse, reduce maintenance of tobacco use and motivate tobacco users to quit.[31,32]

System enablers/enabling factors: Key enabling capacities, or system enablers, encompass a set of interrelated functions that support an overall comprehensive tobacco control strategy.[33]

Tobacco tax: A direct tax on tobacco products that is payable by consumers. People who purchase or receive delivery of tobacco products for their consumption (or for someone else at their expense) are responsible for paying the tobacco tax. Tobacco products include cigarettes, cigars, fine cut tobacco and other tobacco products (e.g., pipe tobacco, chewing tobacco).[34]

Excise tax: A tax that increases with larger quantities of product purchased, or price per unit. For example, a tax per 100 cigarettes would be greater than that for 50 cigarettes, and even greater compared to only 10 cigarettes. Excise taxes are in contrast to value-added taxes that are applied to a percentage of prices, such as goods and service tax (GST) in Canada.[35]

Thirdhand smoke (THS): Tobacco residue from cigarettes, cigars or other tobacco products that lingers after smoking has stopped and is absorbed by surfaces (e.g., in rooms or on clothing) and exposes non-users, either by direct contact and dermal absorption and/or by off-gassing and inhalation. Thirdhand smoke may react with oxidants and other compounds in the environment to yield secondary pollutants.[36,37]

Tobacco cessation: The process of stopping the use of any tobacco product, with or without assistance, also called “quitting”.[1,38]

Tobacco control: Tobacco control refers to a comprehensive, broad-based strategy to regulate, reduce and, ultimately, eliminate tobacco use in a given jurisdiction. It requires simultaneous implementation of multiple components, from the population to the individual levels; these may include, but are not limited to: tobacco taxation and price increases, tobacco-free policies in public spaces, mass media campaigns to raise awareness of tobacco-related harms, and interventions such as pharmaceuticals, behavioural support and counselling for individuals.[6]

Tobacco harm reduction: A reduction in the harmful effects of tobacco through policies or programs that do not necessarily require total cessation of tobacco use.[39]

Tobacco industry: Consists of tobacco manufacturers, wholesale distributors and importers of tobacco products as well as industry allies and commissioned third parties who benefit from the sale of tobacco products or from tobacco sponsorship.[40]

Tobacco products: Any product made or derived from leaf tobacco that is intended for human consumption, including any component, part or accessory of a tobacco product, including: cigarettes, smokeless tobacco, cheroot, chew, cigars, cigarillos, loose tobacco, plug, scrap, snuff, snus, spit tobacco, tobacco stick and twist.[3,41,42]

Tobacco-related disparities: Health disparities, or inequities, among different population groups, due to or related to both tobacco use and tobacco control efforts. Disparities exist in smoking-related risk, exposure, incidence, morbidity and mortality, and cessation treatments or interventions can also have disparate effects and rates of success in different populations.[43]

Tobacco-related harms: Cigarette smoking harms nearly every organ of the body, causes many diseases and reduces the health of smokers in general. Smoking causes death and increases the risk of developing cardiovascular disease, respiratory disease, cancer and infertility.[44] (Also can be called harms of, or harmful effects of, SHS or THS, and harm due to tobacco smoke)

Tobacco use/consumption: Any habitual use of the tobacco plant leaf and its products. The predominant use of tobacco is by smoke inhalation of cigarettes, pipes and cigars.[45]

Waterpipe: Waterpipe is a traditional method of smoking tobacco (especially in the Eastern Mediterranean Region), in which smoke passes through a reservoir of water before being inhaled by the smoker. Other names include bong, hookah, hubble bubble, narguile, shisha.[46-48]

Statistical Measure Terms

Beta (β): Beta is a standardized regression coefficient. It measures how strongly each predictor variable influences the dependent variable. The beta is measured in units of standard deviation.[49]

Confidence interval (CI): Quantifies the uncertainty in measurement; usually reported as 95% CI, which is the range of values within which one can be 95% sure that the true value for the whole population lies.[50]

Credible intervals: The interval in the domain of a posterior probability distribution used for estimating the size of an interval (e.g., 95% CI means a 95% probability that the true value of the parameter lies in the value).[51]

Effect sizes: Measures the strength of the relationship between two variables, thereby providing information about the magnitude of the intervention effect.[52]

> **D+**: A pooled mean effect size estimate calculated using direct weights defined as the inverse of the variance of d for each study/stratum. An approximate confidence interval for d+ is given with a chi-square statistic and probability of this pooled effect size being equal to zero.[53]

Fourth quartile score: The score that is at the end of the list (e.g. highest score).[54]

Hazard ratio (HR): Describes how many times more (or less) likely a participant is to suffer the event at a particular point in time if they receive the experimental rather than the control intervention.[55]

Heaviness of smoking index (HSI): A test to measure the same construct by using two questions from the Tolerance Questionnaire and the Fagerstrom Test for Nicotine Dependence: time to first smoking in the morning and number of cigarettes per day.[56]

Heterogeneity (I^2): Identifies the extent to which results of studies (e.g., within a review) are consistent. The I^2 statistic assesses whether observed differences in results are due to chance alone. A low P value indicates heterogeneity of intervention effects (i.e., variation in effect estimates beyond chance). I^2=0% to 40% indicates that heterogeneity might not be important, 30% to 60% represents moderate heterogeneity, 50% to 90% represents substantial heterogeneity, and 75% to 100% represents considerable heterogeneity.[55]

Interquartile interval: The interval that contains 50% of the observations, and these observations are close to the centre of distribution.[57]

Interquartile range: A measure of dispersion that is the difference between the third quartile (75th percentile) and the first quartile (25th percentile).[58]

Odds ratio (OR): The ratio of the odds of an event.[55]

Percentage point change or absolute change/difference: Percentage point change was described by Hopkins 2010. Briefly, percentage point change (absolute difference) was calculated using the following

formula: (Ipost-Ipre) – (Cpost-Cpre) where Ipre is the pre-test measure for the group receiving the intervention (measurement closest to the start of the treatment), Ipost is the post-test measurement (measure most distal to the start of the intervention), Cpre is the pre-test measurement for the comparison group, and Cpost is the post-test measurement for the comparison group. If the study did not use a comparison group, the percentage point change was calculated as Ipost-Ipre, or if there was a comparison group but with no baseline measurements, the net intervention effect was calculated as Ipost-Cpost.[59]

Price elasticity: The percentage change in smoking outcome (e.g., cessation, demand, consumption) resulting from a percentage change in price (e.g., a price elasticity of -0.1 means a 10% increase in price results in a 1% decrease in smoking outcome, or 1% increase in price results in 0.1% decrease in smoking outcome, etc.).[60]

Probability: A quantitative description of the likely occurrence of a particular event.[61]

Relative percentage change (relative change; relative difference (RD)): Relative percentage change compares quantities while giving consideration to the total quantity of things being compared.[59,62]

Relative risk or Risk ratio (RR): A ratio or measure that tells how many times more likely it is that someone who is exposed to something will develop a certain disease or experience a particular health outcome than (or relative to) someone who is not exposed (e.g., a relative risk of 3.0 means that an individual is 3 times more likely to develop cancer if they are a smoker, compared to someone who is not a smoker).[54]

Statistical significance: If the confidence interval contains an odds ratio or relative risk of 1.00 or a mean difference of 0, the result is not significant. P values may also indicate significance, for example, a p value>0.05 means no statistical significance.[54]

Other Terms

Act: A bill which has been given first, second and third reading by the Legislature. It becomes law upon receiving the signature of the Lieutenant Governor, signifying Royal Assent.[63]

Addiction: Addiction is characterized by inability to consistently abstain, impairment in behavioural control, craving, diminished recognition of significant problems with one's behaviours and interpersonal relationships, and a dysfunctional emotional response. Like other chronic diseases, addiction often involves cycles of relapse and remission. Without treatment or engagement in recovery activities, addiction is progressive and can result in disability or premature death.[64]

Advertising: A paid public presentation and promotion of ideas, goods or services by a sponsor, which is intended to bring a product to the attention of consumers through a variety of media channels, such as broadcast and cable television, radio, print, billboards, the Internet or personal contact.[65]

Amendment: A proposal by a member of government that seeks to modify a motion, or section of a bill, to increase its acceptability or to present a different proposal. All amendments are in the form of a motion altering the text of the original motion.[63]

Bill: A bill is an idea written in legal language and presented for consideration by legislators (e.g., the Ontario legislature) and/or by a member of a government (e.g., Member of Provincial Parliament (MPP)). It may be a proposal to make a new law or laws, or a proposal to change existing laws. A bill must pass through all the stages prescribed by the legislature to become law.[63]

By-law (municipal): A law that applies locally, and that must be approved by a majority of city council members within the limits granted by the province under enabling legislation.[66]

Capacity building: Refers to the development, fostering and support of resources and relationships at individual, organizational, inter-organizational and systems levels (e.g., for chronic disease prevention). "The contemporary view of capacity building goes beyond the conventional perception of training. The central concerns of management – to manage change, to resolve conflict, to manage institutional pluralism, to enhance coordination, to foster communication, and to ensure that data and information are shared – require a broad and holistic view of capacity development. This definition covers both institutional and community-based capacity building. One of the key requirements in this regard is to recognize that the social whole is more than the sum of its individual components."[67]

Community: Community can refer to a neighborhood, village, or municipal or rural region, or to a social group with a unifying common interest or trait, which is organized into a recognizable unit. There is often a sense of belonging, mutual interest and perhaps collective activism on issues and problems of concern. Elected or otherwise identifiable community leaders may determine, represent or advocate for issues of importance to the community.[6]

Determinants of health: The range of personal, social, economic and environmental factors which determine the health status of individuals or populations. The factors that influence health are multiple and interactive. Health promotion is fundamentally concerned with action and advocacy to address the

full range of potentially modifiable determinants of health - not only those that are related to the actions of individuals, such as health behaviours and lifestyles, but also factors such as income and social status, education, employment and working conditions, access to appropriate health services, and physical environments. These, in combination, create different living conditions which impact on health. Changes in these lifestyles and living conditions, which determine health status, are considered to be intermediate health outcomes.[68]

Efficacy: The capacity to produce an effect. In clinical epidemiology, efficacy is the extent to which an intervention produces a beneficial result under ideal circumstances. In health care services, efficacy refers to the benefit, or utility, to an individual of a preventive or therapeutic regimen or service or a disease-control program.[6]

Environment: The external settings and conditions, apart from biological or genetic factors, that influence life and health; these may include the economic, social, behavioural, cultural and physical conditions that determine health and well-being.[6]

Evaluation: A scientific process to determine, as systematically and objectively as possible, the effectiveness and impact of health-related (and other) treatments or interventions in relation to their stated objectives.[6]

Evidence: Information or facts, from either qualitative or quantitative sources, that are systematically obtained (i.e., obtained in a way that is replicable, observable, credible, or verifiable).[69]

> **Grey literature**: Documentary material which is not commercially published or publicly available, such as technical reports or internal business documents.[70]
>
> **Meta-analysis**: The systematic, critical review and analysis of multiple studies of a causal relationship or a therapeutic or preventive regimen that yields a quantitative aggregate summary of all the results. The aim is to identify and evaluate the overall trend in the pooled results of all studies included in the meta-analysis. It is most often applied to sets of randomized controlled trials (RCTs), but is also used to pool the results of case control and cohort studies.[6]
>
> **Network meta-analysis**: A network meta-analysis is a systematic review in which three or more treatments are 1) compared with direct comparisons of interventions within randomized controlled trials and 2) compared with indirect comparisons between trials with a common comparison.[71]
>
> **Systematic review**: A review of a clearly-formulated question that uses systematic and explicit methods to identify, select and critically appraise relevant research and to collect and analyze data from the studies that are included in the review. Statistical methods (i.e., meta-analysis) may or may not be used to analyze and summarize the results of the included studies.[65]
>
> **Experiential evidence**: Based on the professional insight, understanding, skill and expertise that is accumulated over time and is often referred to as “intuitive” or “tacit” knowledge.[72]

Contextual evidence: Based on factors that address whether a strategy is useful, feasible to implement and accepted by a particular community.[72]

Family Health Teams (FHT): Family Health Teams include family physicians, nurse practitioners, registered nurses, social workers, dietitians and other professionals who work together to provide primary health care for their community, based on local needs.[73]

Health disparities: The difference between health indicators that are observed in a defined population group and those of the segment of the population with the highest health indicators. The observed differences in specific indicators of health status, e.g., life expectancy and disability-adjusted life years (DALYs), among different socio-economic groups or other categories of the population are generally used when assessing these disparities quantitatively.[6]

Health equity: The absence of systematic and potentially remediable differences in one or more aspects of health across populations, or population groups, defined socially, economically, demographically or geographically.[74]

Health inequality: Differences in health status or in the distribution of health determinants between different population groups. For example, differences in mobility between elderly people and younger populations or differences in mortality rates between people from different socio-economic groups.[75]

Health inequities: Differences in health that are not only avoidable, but in addition, are considered unfair and unjust; specifically those that are systematic, preventable or remediable and socially-produced.[75]

Hospital: An institution with facilities for diagnosis and treatment of medical and surgical conditions, with an organized professional staff of physicians, nurses, other health professionals and support personnel, offering inpatient care and often ambulatory care.[6]

Inpatient: Starts from formally being admitted to a hospital with a doctor's order. The day before discharge is the last inpatient day.[76]

Intervention: A general term covering any and all actions taken by health professionals aimed at preventing, curing or relieving a health problem.[6]

Jurisdiction: Relates to the geographic area, or territory, over which a court has the authority to decide cases.[77,78]

Legislation: The exercise of the power and function of making rules (as laws) that have the force of authority by virtue of their promulgation by an official organ of a state.[79]

Long-term care: Involves a variety of services designed to meet a person's health or personal care needs and help people live as independently and safely as possible when they can no longer perform everyday activities on their own. Most long-term care is provided at home by unpaid family members and friends

or by paid homecare workers. It can also be given in a facility, such as a nursing home, or in the community, for example, in an adult day care centre.[80]

Monitoring: Routine, often episodic measurement, performance analysis or supervision of a process, activity or function, with the aim to detect and correct change or deviation from desirable levels. Data are usually collected, analyzed and recorded. The monitor, or monitoring agent, may or may not have the role and responsibility to fine-tune the process, activity or function to correct departures from desired levels. The distinction between monitoring and surveillance is that the former is often episodic or intermittent, whereas the latter is ongoing and continuous, and implies a greater commitment to interpret and disseminate the information obtained.[6]

Non-government organization (NGO): A generic name for not-for-profit organizations or agencies that are separate and independent from government. Many provide health and social services. Some are partially supported by government funds.[6]

Outpatient: A patient who receives medical treatment without being admitted to a hospital by a doctor, such as emergency department services, observation services, outpatient surgery, lab tests, X-rays or any other hospital services. Settings include: acute care, dental, optometry, physiotherapy offices, pharmacies, psychiatry offices, cancer and heart disease facilities family health team and clinics.[5,76]

Policy: A course or principle of action adopted or proposed by a government, party, business or individual; the written or unwritten aims, objectives, targets, strategies, tactics and plans that guide the actions of a government or an organization. Policies have three interconnected and ideally, continually evolving stages: development, implementation and evaluation.[6]

Population health: An approach to health that aims to improve the health of the entire population and to reduce health inequities among population groups. To reach these objectives, population health looks at, and acts upon, the broad range of factors and conditions that influence health.[81]

Population health approach: Recognizes that health is a capacity, or resource, rather than a state, a definition that corresponds to the notion of being able to pursue one's goals, to acquire skills and education and to grow. This broader notion of health recognizes the range of social, economic and physical environmental factors that contribute to health. The best articulation of this concept of health is "the capacity of people to adapt to, respond to, or control life's challenges and changes."[81]

Prevalence: The number of persons in a defined population who have a specified disease or condition at a point in time.[82]

Price discrimination: The process by which firms with monopoly power segment their market and set lower prices for those consumers who are most price-sensitive.[83]

Program: An integrated set of planned strategies and activities that support clearly- stated goals and objectives that are designed to lead to desirable changes and improvements in the well-being of people, institutions or environments, or all of these. More formally, an outline of the way a system or service will function, with specifics such as roles and responsibilities, expected expenditures and outcomes. A

health program is generally long-term and often multifaceted, whereas a health project is a short-term and usually narrowly-focused activity.[6]

Public health: The science and art of promoting health, preventing disease and prolonging life through the organized efforts of society. Public health is a social and political concept that aims to improve health and quality of life and prolong life among whole populations through health promotion, disease prevention and other forms of health intervention. A distinction has been made in the health promotion literature between public health and "a new public health" to emphasize significantly different approaches to the description and analysis of the determinants of health and methods of solving public health problems. New public health is distinguished by its basis in a comprehensive understanding of the ways in which lifestyles and living conditions determine health status; it recognizes the need to mobilize resources and make sound investments in policies, programs and services which create, maintain and protect health by supporting healthy lifestyles and creating supportive environments for health.[68]

Reach: The percentage of a population that receives an intervention.[84]

Regulation: Regulations are a form of law, sometimes referred to as "subordinate legislation", which define the application and enforcement of legislation. Regulations are made under the authority of an Act, called an Enabling Act. Regulations are enacted by the body to whom the authority to make regulations has been delegated in the Enabling Act, such as the Governor in Council or a government minister.[79]

Surveillance: Systematic, ongoing collection, collation and analysis of health-related information that is communicated in a timely manner to all who need to know which health problems require action in their community. Surveillance is a central feature of epidemiological practice, and contributes to disease control.[6]

Specific population: In a health context, a group that has been identified as particularly at-risk for adverse health outcomes, compared to the general population; this risk may be attributed to, socio-economic status, gender, race, ethnicity, geographic location, sexual orientation or age.[85]

> **Indigenous peoples**: A collective name for the original peoples of North America and their descendants. The Canadian constitution recognizes three groups of Indigenous people: Indians (commonly referred to as First Nations), Métis and Inuit. These are three distinct peoples with unique histories, languages, cultural practices and spiritual beliefs.[86]
>
> **Persons with psychiatric illnesses**: Refers to people who are diagnosed with clinically-significant behavioural or psychological syndromes characterized by distressing symptoms, significant impairment of functioning or significant increased risk of death, pain or other disability. Examples of psychiatric illnesses include depression, anxiety disorders, schizophrenia, eating disorders and addictive behaviours.[87]
>
> **People of lower economic status**: Socio-economic status can be conceptualized as the social standing, or class, of an individual or group. It can be measured as a combination of education,

income and occupation. Individuals of lower economic status are people who are situated in the lower socio-economic quintile.[88]

Individuals with low literacy/limited proficiency: Individuals who demonstrate limited literacy proficiency (level 1 or 2 out of 5 levels) and generally perform below the average proficiencies of adults who graduated from high school.[89]

Pregnant woman: A woman who carries a developing embryo (later fetus) in her uterus for approximately nine months.[90]

Lesbian, gay, bisexual, trans-gendered and queer (LGBTQ): LGBTQ is an acronym that refers to communities who are identified or self-identify as sexual minorities, according to sexual preference or orientation and/or gender identity.[91]

Young adults: Persons between the ages of 18 and 29 years, inclusive (e.g., ages 18-24, 18-29, 18-36).[92]

Youth: The collective term for young persons, sometimes defined in the smoking literature as 12 to 17 years old, a group that is at risk for smoking initiation.[93]

Withdrawal: A variety of behavioural, affective, cognitive and physiological symptoms, usually transient, which occur after use of an addictive drug is reduced or stopped.[1]

References

1. Glossary [Internet]. London, UK: The Cochrane Collaboration; c2017 [cited 2015 Sept 4]. Available from: http://tobacco.cochrane.org/resources

2. International Agency for Research on Cancer. IARC handbooks of cancer prevention: tobacco control. Volume 14. Effectiveness of tax and price policies for tobacco control. Lyon, FR: International Agency for Research on Cancer; 2011. Available from: http://www.iarc.fr/en/publications/pdfs-online/prev/handbook14/handbook14.pdf

3. Mahood G. Telling the truth about the tobacco industry: a backgrounder on tobacco industry denormalization [Internet]. Toronto, ON: Non-Smokers' Rights Association (NSRA); 2002 [cited 2015 Jun 18]. Available from: http://www.nsra-adnf.ca/cms/file/files/pdf/denormbackgrounder.pdf

4. Electronic cigarettes (e-Cigarettes) [Internet]. Silver Spring, MD: U.S. Food and Drug Administration; 2015 [updated 2015 Jul 7; cited 2015 Jul 27]. Available from: http://www.fda.gov/NewsEvents/PublicHealthFocus/ucm172906.htm

5. Tilson M. Plain packaging of tobacco products [Internet]. Ottawa, ON: Non-Smokers' Rights Association (NSRA)/Smoking and Health Action Foundation (SHAF); 2008 [cited 2015 Jul 8]. Available from: https://www.nsra-adnf.ca/cms/file/files/Plain%20Pkg%20NSRA%20FINAL%20Aug08.pdf

6. Last J, editor. A dictionary of public health. New York: Oxford University Press; 2007.

7. Smoke-Free Ontario - Scientific Advisory Committee. Evidence to guide action: Comprehensive tobacco control in Ontario [Internet]. Toronto, ON: Ontario Agency for Health Protection and Promotion; 2010 [cited 2015 Jul 29]. Available from: http://www.publichealthontario.ca/en/eRepository/Evidence%20to%20Guide%20Action%20-%20CTC%20in%20Ontario%20SFO-SAC%202010E.PDF

8. Tobacco Free Initiative (TFI): second-hand tobacco smoke [Internet]. Geneva, SZ: World health Organization; 2015 [cited 2015 Jun 12]. Available from: http://www.who.int/tobacco/research/secondhand_smoke/en/

9. Shields M. The journey to quitting smoking. Health Rep. 2005;16(3):19-36.

10. Glossary of terms [Internet]. Ottawa, ON: Public Health Agency of Canada (PHAC); 2010 [updated 2010 Jul 21; cited 2015 Jun 12]. Available from: http://www.phac-aspc.gc.ca/php-psp/ccph-cesp/glos-eng.php

11. International Agency for Research on Cancer. IARC handbooks of cancer prevention: tobacco control. Volume 12. Methods for evaluating tobacco control policies [Internet]. Lyon, FR: World Health Organization (WHO); 2008 [cited 2016 Jun 6]. Available from: https://www.iarc.fr/en/publications/pdfs-online/prev/handbook12/Tobacco_vol12.pdf

12. Edwards SA, Bondy SJ, Callaghan RC, Mann RE. Prevalence of unassisted quit attempts in population-based studies: a systematic review of the literature. Addict Behav. 2014;39(3):512-9.

13. Smith AL, Chapman S, Dunlop SM. What do we know about unassisted smoking cessation in Australia? A systematic review, 2005-2012. Tob Control. 2013;24(1):18-27.

14. Berg CJ, Schauer GL, Buchanan TS, Sterling K, DeSisto C, Pinsker EA, et al. Perceptions of addiction, attempts to quit, and successful quitting in nondaily and daily smokers. Psychol Addict Behav. 2013;27(4):1059-67.

15. Rise J, Kovac V, Kraft P, Moan IS. Predicting the intention to quit smoking and quitting behaviour: extending the theory of planned behaviour. Br J Health Psychol. 2008;13(Pt 2):291-310.

16. Ajzen I. The theory of planned behavior. Organ Behav Hum Decis Process. 1991;50:179-211.

17. Smoker's Helpline. About Smokers' Helpline [Internet]. Toronto, ON: Canadian Cancer Society; 2012 [cited 2015 July 27]. Available from: http://www.smokershelpline.ca/about

18. Diemert L, Keller-Olaman S, Schwartz R, O'Connor S, Babayan A. Data standards for Smoke-Free Ontario smoking cessation service providers: core indicators and questions for intake and follow-up of adult respondents [Internet]. Toronto, ON: Ontario Tobacco Research Unit; 2013 [cited 2015 Jun 2]. Available from: http://otru.org/wp-content/uploads/2013/08/special_data_standards.pdf

19. Health topic data guide: smoking status [Internet]. Atlanta, GA: Centers for Disease Control and Prevention; 2014 [updated 2014 Nov 13; cited 2015 Jun 12]. Available from: http://dhds.cdc.gov/guides/healthtopics/indicator?i=smokingstatus

20. Statistics Canada. Health at a glance: current smoking trends [Internet]. Ottawa, ON: Government of Canada; 2012 [updated 2012 Jun 19; cited 2015 Jun 12]. Available from: http://www.statcan.gc.ca/pub/82-624-x/2012001/article/11676-eng.htm

21. Health concerns: terminology [Internet]. Ottawa, ON: Health Canada; 2008 [updated 2008 Nov 28; cited 2015 Jun 12]. Available from: http://www.hc-sc.gc.ca/hc-ps/tobac-tabac/research-recherche/stat/ctums-esutc_term-eng.php

22. Health concerns: terminology - Youth Smoking Survey (YSS) [Internet]. Ottawa, ON: Health Canada; 2014 [updated 2014 Jun 3; cited 2015 Jun 12]. Available from: http://www.hc-sc.gc.ca/hc-ps/tobac-tabac/research-recherche/stat/survey-sondage_term-eng.php

23. Community Preventive Services Task Force. Reducing tobacco use and secondhand smoke exposure: smoke-free policies [Internet]. Atlanta, GA: The Guide to Community Preventive Services; 2013 [cited 2015 Jun 3]. Available from: http://www.thecommunityguide.org/tobacco/RRsmokefreepolicies.html

24. Non-medical determinants of health [Internet]. Ottawa, ON: Statistics Canada; 2007 [updated 2007 Dec 12; cited 2015 July 9]. Available from: http://www.statcan.gc.ca/pub/82-221-x/2007002/defin/4063919-eng.htm

25. Freedman KS, Nelson NM, Feldman LL. Smoking initiation among young adults in the United States and Canada, 1998-2010: a systematic review. Prev Chronic Dis. 2012;9:E05. Available from: https://www.cdc.gov/pcd/issues/2012/11_0037.htm

26. Smoking & tobacco use: key terms and definitions [Internet]. Atlanta, GA: Centers for Disease Control and Prevention; 2009 [updated 2009 May 29; cited 2015 Jun 15]. Available from: http://www.cdc.gov/tobacco/basic_information/tobacco_industry/reporting/terms/

27. Flay B. Youth tobacco use: risks, patterns, and control. In: Slade JOCT, editor. Nicotine addiction: principles and management. New York, NY: Oxford University Press; 1993. p. 365-84.

28. Park S, June KJ. The importance of smoking definitions for the study of adolescent smoking behavior. J Korean Acad Nurs. 2006;36:612-620.

29. Smoking reduction [Internet]. Dorchester, UK: National Centre for Smoking Cessation and Training; 2012 [cited 2017 Feb 1]. Available from: http://www.ncsct.co.uk/usr/pub/Briefing%202.pdf

30. Pierce JP, Choi WS, Gilpin EA, Farkas AJ, Merritt RK. Validation of susceptibility as a predictor of which adolescents take up smoking in the United States. Health Psychol. 1996;15(5):355-61.

31. International Agency for Research on Cancer. IARC handbooks of cancer prevention: tobacco control. Volume 13. Evaluating the effectiveness of smoke-free policies. Lyon, FR: WHO Press; 2009. Available from: https://www.iarc.fr/en/publications/pdfs-online/prev/handbook13/handbook13-0.pdf

32. Institute of Medicine (IOM). Ending the tobacco problem: a blueprint for the nation. Washington, DC: National Academy Press; 2007. Available from: https://www2.aap.org/richmondcenter/pdfs/IOMReport_BlueprintforNation.pdf

33. Garcia J, Riley B. Primary prevention of chronic diseases in Canada: a framework for action [Internet]. Ottawa, ON: Chronic Disease Prevention Alliance of Canada; 2008 [cited 2016 Dec 3]. Available from: http://www.cdpac.ca/media.php?mid=451

34. Ontario. Ministry of Finance. Tobacco tax [Internet]. Toronto, ON: Queen's Printer for Ontario; 2016 [updated 2016 Dec 19; cited 2017 Jan 31]. Available from: http://www.fin.gov.on.ca/en/tax/tt/

35. Smart M, Bird RM. The economic incidence of replacing a retail sales tax with a value-added tax: evidence from Canadian experience. Canadian Public Policy. 2009;35(1):85-97.

36. Thirdhand smoke [Internet]. Berkeley, CA: Americans for Nonsmokers' Rights; 2015 [updated 2015 April 14; cited 2015 Jun 10]. Available from: http://www.no-smoke.org/learnmore.php?id=671

37. Thomas JL, Hecht SS, Luo X, Ming X, Ahluwalia JS, Carmella SG. Thirdhand tobacco smoke: a tobacco-specific lung carcinogen on surfaces in smokers' homes. Nicotine Tob Res. 2014;16(1):26-32.

38. Tobacco Free Initiative. Developing and improving national toll-free tobacco quit-line services. Geneva, SZ: World Health Organization; 2011. Available from: http://whqlibdoc.who.int/publications/2011/9789241502481_eng.pdf

39. CAMH and harm reduction: a background paper on its meaning and application for substance use issues [Internet]. Toronto, ON: Centre for Addiction and Mental Health (CAMH); 2002 [updated 2002 May; cited 2015 Jun 12]. Available from: http://www.camh.ca/en/hospital/about_camh/influencing_public_policy/public_policy_submissions/harm_reduction/Pages/harmreductionbackground.aspx

40. World Health Organization. Tobacco industry interference with tobacco control. Geneva, SZ: World Health Organization; 2008. Available from: http://www.who.int/tobacco/resources/publications/Tobacco%20Industry%20Interference-FINAL.pdf

41. Health topics: tobacco [Internet]. Geneva, SZ: World Health Organization; 2015 [cited 2015 Jun 12]. Available from: http://www.who.int/topics/tobacco/en/

42. What products are considered to be tobacco products as defined by the tobacco control act? [Internet]. Silver Spring, MD: U.S. Food and Drug Administration; 2015 [updated 2015 Jun 10; cited 2015 Jun 12]. Available from: http://www.fda.gov/AboutFDA/Transparency/Basics/ucm194443.htm

43. Fagan P, King G, Lawrence D, Petrucci SA, Robinson RG, Banks D, et al. Eliminating tobacco-related health disparities: directions for future research. Am J Public Health. 2004;94(2):211-7.

44. Health effects of cigarette smoking [Internet]. Atlanta, GA: Centers for Disease Control and Prevention (CDC); 2016 [updated 2016 Dec 1; cited 2017 Jan 31]. Available from: https://www.cdc.gov/tobacco/data_statistics/fact_sheets/health_effects/effects_cig_smoking/

45. Al-Ibrahim MS, Gross JY. Chapter 40: tobacco use. In: Walker HK, Hall WD, Hurst JW, editors. Clinical methods: the history, physical, and laboratory examinations. 3rd ed. Boston, MA: Butterworths; 1990. Al-Ibrahim MS, Gross JY. Tobacco use; p. 214-6.

46. WHO Study Group on Tobacco Product Regulation. Advisory note: waterpipe tobacco smoking: health effects, research needs and recommended actions by regulators [Internet]. Geneva, SZ: World Health Organization; 2005 [cited 2015 Jun 12]. Available from: http://www.who.int/tobacco/global_interaction/tobreg/Waterpipe%20recommendation_Final.pdf

47. City of Toronto. Prohibiting hookah (waterpipe) use in licensed establishments [Internet]. Toronto, ON: City of Toronto; 2015 [cited 2015 July 17]. Available from: http://www.toronto.ca/legdocs/mmis/2015/ls/bgrd/backgroundfile-81319.pdf

48. Maziak W., Jawad M., Jawad S., Ward K.D., Eissenberg T., Asfar T. Interventions for waterpipe smoking cessation. Cochrane Database Syst Rev. 2015; (7):CD005549. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD005549.pub3/full

49. Being. Correlarion coefficient r and beta (standardised regression coefficients) [Internet]. 2011 [updated 2011 Mar 27; cited 2016 Dec 3]. Available from: http://zencaroline.blogspot.ca/2011/03/correlation-coefficient-r.html

50. Glossary. Evid Based Nurs. 2009;12(4):128. Available from: http://ebn.bmj.com/content/12/4/128.2.full

51. Chan B. Biostatistics for epidemiology and public health using R. New York, NY: Springer Publishing Company, LLC; 2016.

52. Uman L. Systematic reviews and meta-analyses. J Can Acad Child Adolesc Psychiatry. 2011;20(1):57-59.

53. Hedges LV, Olkin I. Statistical methods for meta-analysis. Saint Louis, MO: Elsevier Science; 2014.

54. Field A. Discovering statistics using SPSS. Thousand Oaks, CA: Sage Publications; 2009.

55. Higgins J, Green S. Cochrane handbook for systematic reviews of interventions version 5.1.0 [Internet]. London, UK: The Cochrane Collaboration; 2011 [cited 2016 Dec 3]. Available from: http://handbook.cochrane.org/

56. Chaiton MO, Cohen JE, McDonald PW, Bondy SJ. The Heaviness of Smoking Index as a predictor of smoking cessation in Canada. Addict Behav. 2007;32(5):1031-42.

57. Dodge Y. The concise encyclopedia of statistics. Berlin, DE: Springer Science and Business Media; 2008.

58. Merrill R. Introduction to epidemiology. 7th ed. Sudbury, MA: Jones & Bartlett Publishers; 2015.

59. Hopkins DP, Razi S, Leeks KD, Priya Kalra G, Chattopadhyay SK, Soler RE, et al. Smokefree policies to reduce tobacco use. A systematic review. Am J Prev Med. 2010;38(2 Suppl):S275-89.

60. WHO Framework Convention on Tobacco Control. Guidelines for implementation of article 6 of the WHO FCTC: price and tax measures to reduce the demand for tobacco [Internet]. Geneva, SZ: World Health Organization; 2013 [cited 2015 July 14]. Available from: http://www.who.int/fctc/guidelines/adopted/Guidelines_article_6.pdf?ua=1

61. Statistics glossary - probability [Internet]. United Kingdom: UK Higher Education Funding; 1997 [updated 1997 Sept; cited 2016 April 27]. Available from: http://www.stats.gla.ac.uk/steps/glossary/probability.html

62. Mast M, Pawlak M. Absolute change and percentage change [Internet]. Boston, MA: Department of Mathematics University of Massachusetts Boston; 2005 [cited 2017 Feb 1]. Available from: http://www.math.umb.edu/~joan/MATHQ114/change.htm

63. Legislative Research Service. How an Ontario Bill becomes a law- a guide for legislators and the public [Internet]. Toronto, ON: Legislative Assembly of Ontario; 2011 [cited 2015 Jun 10]. Available from: http://www.ontla.on.ca/lao/en/media/laointernet/pdf/bills-and-lawmaking-background-documents/how-bills-become-law-en.pdf

64. Definition of addiction [Internet]. North Bethesda, MD: American Society of Addiction Medicine; 2011 [updated 2011 Apr 19; cited 2017 Feb 1]. Available from: http://www.asam.org/quality-practice/definition-of-addiction

65. Glickman D, Parker L, Sim LJ, Cook HDV, Miller EA. Accelerating progress in obesity prevention: solving the weight of the nation. Washington, DC: The National Academies Press; 2012

66. Municipal bylaws [Internet]. Toronto, ON: Non-Smokers` Rights Association (NSRA); 2012 [cited 2015 Jun 10]. Available from: http://www.nsra-adnf.ca/cms/page1459.cfm

67. CDPAC definitions [Internet]. Ottawa, ON: Chronic Disease Prevention Alliance of Canada (CDPAC); 1998 [cited 2015 April 26]. Available from: http://www.cdpac.ca/content.php?doc=9

68. World Health Organization. Health promotion glossary [Internet]. Geneva, SZ: World Health Organization (WHO); 1998 [cited 2015 Jun 12]. Available from: http://www.who.int/healthpromotion/about/HPR%20Glossary%201998.pdf

69. Scott-Findlay S, Pollock C. Commentary on evidence, research, knowledge: a call for conceptual clarity. Worldviews Evid Based Nurs. 2004;1(2):98-101.

70. World Health Organization. Interventions on diet and physical activity: what works. Summary report. Geneva, SZ: World Health Organization (WHO); 2009. Available from: http://www.who.int/dietphysicalactivity/summary-report-09.pdf

71. Li T, Puhan MA, Vedula SS, Singh S, Dickersin K; Ad Hoc Network Meta-analysis Methods Meeting Working Group. Network meta-analysis-highly attractive but more methodological research is needed. BMC Med. 2011;9:79-84. Available from: https://bmcmedicine.biomedcentral.com/articles/10.1186/1741-7015-9-79

72. Puddy RW, Wilkins N. Understanding evidence: part 1: best available research evidence. A guide to the continuum of evidence of effectiveness. [Internet]. Atlanta, GA: Center for Disease Control and Prevention; 2011 [cited 2016 Dec 3]. Available from: https://www.cdc.gov/violenceprevention/pdf/understanding_evidence-a.pdf

73. Ontario. Ministry of Health and Long-Term Care. Family health teams [Internet]. Toronto, ON: Queen's Printer for Ontario; 2014 [updated 2014 Dec 31; cited 2015 Sept 4]. Available from: http://www.health.gov.on.ca/en/pro/programs/fht/

74. Braveman P. Health disparities and health equity: concepts and measurements. Annu Rev Public Health. 2006;27:167-94.

75. Health Impact Assessment (HIA): glossary of terms used [Internet]. Geneva, SZ: World Health Organization (WHO); 2015 [cited 2015 Jun 12]. Available from: http://www.who.int/hia/about/glos/en/index1.html

76. Are you a hospital inpatient or outpatient? [Internet]. Missouri, US: Centers for Medicare & Medicaid Services; 2014 [updated 2014 May; cited 2015 Sept 4]. Available from: https://www.medicare.gov/Pubs/pdf/11435.pdf

77. Gooch G, Williams M. A dictionary of law enforcement. Oxford: Oxford University Press; 2007.

78. Business dictionary: jurisdiction [Internet]. Fairfax, VA: WebFinance Inc; 2017 [cited 2017 Feb 1]. Available from: http://www.businessdictionary.com/definition/jurisdiction.html

79. The basics of tobacco control pathway to change: glossary [Internet]. Atlanta, GA: Emory University, Tobacco Technical Assistance Consortium; 2006 [cited 2015 Jun 10]. Available from: http://www.ttac.org/services/botc/WebHelp/ttac_concept1.htm

80. NIH Senior Health. Long-term care [Internet]. Bethesda, MD: National Library of Medicine; 2015 [cited 2015 Sept 4]. Available from: http://nihseniorhealth.gov/longtermcare/whatislongtermcare/01.html

81. What is the population health approach? [Internet]. Ottawa, ON: Public Health Agency of Canada; 2012 [updated 2012 Feb 7; cited 2015 Jun 12]. Available from: http://www.phac-aspc.gc.ca/ph-sp/approach-approche/index-eng.php

82. Jekel J, Katz D, Elmore J, Wild D. Epidemiology, biostatistics, and preventive medicine. 3rd ed. Philadelphia, PA: Saunders Elsevier; 2007.

83. Golden SD, Smith MH, Feighery EC, Roeseler A, Rogers T, Ribisl KM. Beyond excise taxes: a systematic review of literature on non-tax policy approaches to raising tobacco product prices. Tob Control. 2016;25(4):377-85. Available from: http://tobaccocontrol.bmj.com/content/tobaccocontrol/25/4/377.full.pdf

84. Planas LG. Intervention design, implementation, and evaluation. Am J Health-Syst Pharm. 2008;65(19):1845-63.

85. Frohlich KL, Potvin L. Transcending the known in public health practice: the inequality paradox: the population approach and vulnerable populations. Am J Public Health. 2008;98(2):216-21.

86. Ontario. Ministry of Aboriginal Affairs. Aboriginal glossary of terms [Internet]. Toronto, ON: Queen's Printer for Ontario; 2014 [updated 2014 Aug 14; cited 2015 Jun 12]. Available from: http://www.ontario.ca/aboriginal/aboriginal-glossary-terms

87. Mental illness [Internet]. Atlanta, GA: Centers for Disease Control and Prevention; 2013 [updated 2013 Oct 4; cited 2015 July 27]. Available from: http://www.cdc.gov/mentalhealth/basics/mental-illness.htm

88. Socioeconomic status [Internet]. Washington, DC: American Psychological Association (APA); 2017 [cited 2015 Jul 27]. Available from: http://www.apa.org/topics/socioeconomic-status/

89. What your score means [Internet]. Princeton, NJ: Educational Testing Service; 2016 [cited 2015 Aug 27]. Available from: https://www.ets.org/literacy/scores/

90. Pregnancy [Internet]. Geneva, SZ: World Health Organization (WHO); 2015 [cited 2015 July 7]. Available from: http://www.who.int/topics/pregnancy/en/

91. Healthy relationships for LGBTTQ people [Internet]. Manitoba, ON: Manitoba Government [cited 2015 July 27]. Available from: http://www.gov.mb.ca/stoptheviolence/lgbttq.html

92. Grant JE, Potenza MN. Young adult mental health. New York, US: Oxford University Press; 2010. Introduction; p. 3.

93. Ontario. Ministry of Children and Youth Services Stepping up: a strategic framework to help Ontario's youth succeed [Internet]. Toronto, ON: Queen's Printer for Ontario; 2011 [updated 2011 Oct 16; cited 2015 July 9]. Available from: http://www.children.gov.on.ca/htdocs/English/topics/youthopportunities/steppingup/appendix.aspx

Appendices

Appendix 1: Summary Tables of Library Searches

Table A1: Summary Table of Library Searches for Industry

Topic	Research Question	Population	Intervention	Comparison	Outcome	Inclusion Criteria	Exclusion Criteria	Search Date	Databases Searched
Price and Taxation	• What is the impact of higher tobacco pricing on tobacco use and smoking cessation?	• All tobacco users (e.g., all ages, both genders, all SES levels).	• Any increase in price or tax on tobacco products (including cigarettes).	• Changes over time or comparison with other jurisdictions or settings where there are higher or lower pricing (e.g., Canadian provinces, municipalities or comparable international jurisdictions).	• Tobacco use (e.g., prevalence rates for cigarette use, cigarillos, hookah, smokeless) and related cessation outcomes (e.g., successful quits)	• Systematic reviews/ meta-analysis/reviews exploring the impacts of pricing on tobacco use and/or cessation outcomes(e.g., initiation, quit intentions and/or smoking cessation rates).Papers that describe the relationships between pricing, contraband and tobacco use • Papers that	• Exclude studies that do not focus on pricing and/or taxation as an intervention in the context of tobacco control	• November 25, 2015	• EBSCOhost EconLit •EBSCOhost Health Policy • Ovid MEDLINE • Embase • PsycINFO

Topic	Research Question	Population	Intervention	Comparison	Outcome	Inclusion Criteria	Exclusion Criteria	Search Date	Databases Searched
						detail the relationships between pricing, tobacco use, cessation and socio-economic status (SES) and/or gender and/or age. • Papers that describe how the tobacco industry uses pricing strategies to counterbalance the efforts by the government (for background)			
Retail	• What are the impacts of the following interventions, which affect the tobacco retail environment: (1) Retailer Related Restrictions,	• Retailers/merchants/ retail outlets/ vendors/ commercial organizations involved in tobacco product or cigarette sales, consumers or potential consumers of tobacco products (smokers and non-smokers of any age), and tobacco industry	• (1) Retailer Related Restrictions (e.g., age restrictions and restriction at retail point of sale) • (2) Zoning Tobacco Retail-Free	• No intervention or any other intervention	• Any outcomes (e.g., intervention uptake, sales of tobacco products, and smoking-related	• Papers describing any interventions (e.g. programs, initiatives, strategies or policies) affecting the retail environment of tobacco	• Papers describing solely marketing or advertisement bans	• April 19, 2016	• Embase • Medline

Topic	Research Question	Population	Intervention	Comparison	Outcome	Inclusion Criteria	Exclusion Criteria	Search Date	Databases Searched
	(2) Zoning Tobacco Retail-Free Areas/Restricting Product Availability, and (3) Retailer Licencing?		Areas/Restricting Product Availability and • (3) Retail Licencing		behaviour such as reduction in cigarette consumption, reduction in health-related consequences)	products (e.g., retailer related restrictions, zoning tobacco–retail free areas/restricting product availability, retail licensing)			
Product	• Are changes to the design and/or content to tobacco products effective at reducing health-related consequences and/or consumption and/or sales?	• Smokers (overall and subgroups)	• Changes to tobacco products (i.e. cigarettes) that reduce health-related consequences and/or consumption and/or sales.	• No changes to cigarettes (e.g., pre-post)	• Reduction in health-related consequences, reduction in consumption	• Studies describing the effects of changes to tobacco products to make them unappealing • Studies describing the effects of changes to cigarettes to reduce nicotine content to non-addicting levels • Studies describing the effects of changes to cigarettes to reduce product	• Exclude studies that focus on the effects of changes to product packaging (i.e. plain packaging, health warning labels)	• May 2, 2016	• Ovid • Medline

Topic	Research Question	Population	Intervention	Comparison	Outcome	Inclusion Criteria	Exclusion Criteria	Search Date	Databases Searched
						toxicity • Studies describing the effects of changes to policies and regulations to make clean nicotine products more appealing.			

Table A2: Summary Table of Library Searches for Prevention

Topic	Research Question	Population	Intervention	Comparison	Outcome	Inclusion Criteria	Exclusion Criteria	Search Date	Databases Searched
Specific Populations	• What impacts do tobacco prevention interventions have on preventing tobacco use, smoking initiation/smoking uptake, or transitioning/progressing to higher smoking intensities in high-risk populations?	•Population: High-risk (youth and young adults) (i.e., youth and young adults with mental illness, homeless and marginalized youth, low SES, Aboriginal, First Nations, Inuit, Metis, LGBTQ, co-morbid users, specific ethnicities, new immigrants, rural communities)	• Smoking prevention interventions; interventions to prevent transitioning to more intense smoking behaviour; tobacco prevention interventions	• No exposure to prevention interventions	• Smoking initiation • Smoking uptake •Intentions to use tobacco	• Review-level papers • Papers describing tobacco prevention interventions for high-risk populations and how they contribute/ relate to preventing smoking initiation/tobacco use/smoking uptake • Papers describing interventions to prevent transitioning to higher intensities of smoking among high-risk populations • Could include implementation considerations (facilitators and barriers), and equity	• Studies that do not focus on smoking prevention • Studies that are not focused on high-risk populations	• 1946 (OVID Medline), 1974 to present (June 2016)	• Ovid MEDLINE(R) • Embase •SocINDEX •Psychology and Behavioral Sciences Collection

Topic	Research Question	Population	Intervention	Comparison	Outcome	Inclusion Criteria	Exclusion Criteria	Search Date	Databases Searched
						considerations (unintended consequences, differential equity impacts)			

Table A3: Summary Table of Library Searches for Protection

Topic	Research Question	Population	Intervention	Comparison	Outcome	Inclusion Criteria	Exclusion Criteria	Search Date	Databases Searched
Mass media and social media campaigns for protection	• What is the role of mass media and/or social media campaigns on public support for tobacco control interventions that reduce social and physical exposure to tobacco products and e-cigarette use? •What is the role of mass media and/or social media campaigns to raise awareness of policy interventions and health effects of exposure to tobacco use and e-cigarette	• Whole Ontario population.	• Mass media and/or social media campaigns.	• No exposure to mass media and/or social media campaigns.	• Public's awareness of tobacco control interventions, policy interventions, or health effects from exposure to tobacco use and e-cigarette use, which are promoted by mass media and/or social media campaigns, and support for interventions/ policies.	• Papers describing any mass media and/or social media campaigns that promote awareness of: tobacco control interventions, policy interventions, or health effects from exposure to tobacco use and e-cigarette use; or support for interventions/ policies.	• Exclude studies that do not focus on mass media/or social media. campaigns • Exclude developing countries.	• January 28th, 2016	• Ovid MEDLINE • Ovid Embase

Topic	Research Question	Population	Intervention	Comparison	Outcome	Inclusion Criteria	Exclusion Criteria	Search Date	Databases Searched
	use?								
Impacts of post-consumer cigarette waste	• What environmental strategies and policies are most effective in reducing the environmental impact of tobacco products and by-products?	• Whole Ontario population.	• Strategies and/or policies to protect people from environmental impacts of tobacco products and by-products and e-cigarettes and by-products	• No strategies and/or policies to protect people from environmental impacts of tobacco products and by-products and e-cigarettes and by-products	• Reduced toxins in the watershed/ water system; no or less cigarette/ tobacco product waste (e.g., cigarette butts); etc. {add other relevant outcomes}	• Papers describing the impact of cigarette butts and their toxins in the environment (i.e., on the watershed and water system) • Papers describing how e-cigarette waste (e.g., e-waste, batteries) is disposed • Papers describing third hand smoke (THS) clean-up/decontamination	• Exclude studies that do not describe strategies and/or policies to protect people from environmental impacts of tobacco products and by-products and e-cigarettes and by-products • Exclude developing countries •Papers that describe the impact on those growing/ harvesting and manufacturing tobacco	• February 5th- 8th, 2016	• CINAHL Plus • Embase • MEDLINE

Table A4: Summary Table of Library Searches for Cessation

Topic	Research Question	Population	Intervention	Comparison	Outcome	Inclusion Criteria	Exclusion Criteria	Search Date	Databases Searched
Price and Taxation	• What is the impact of higher tobacco pricing on tobacco use and smoking cessation?	• All tobacco users (e.g., all ages, both genders, all SES levels).	• Any increase in price or tax on tobacco products (including cigarettes).	• Changes over time or comparison with other jurisdictions or settings where there are higher or lower pricing (e.g., Canadian provinces, municipalities or comparable international jurisdictions).	• Tobacco use (e.g., prevalence rates for cigarette use, cigarillos, hookah, smokeless) and related cessation outcomes (e.g., successful quits)	• Systematic reviews/ meta-analysis/reviews exploring the impacts of pricing on tobacco use and/or cessation outcomes(e.g., initiation, quit intentions and/or smoking cessation rates).Papers that describe the relationships between pricing, contraband and tobacco use • Papers that detail the relationships between pricing, tobacco use, cessation and socio-economic status (SES) and/or gender and/or age. • Papers that describe how the tobacco industry	• Exclude studies that do not focus on pricing and/or taxation as an intervention in the context of tobacco control	• November 25, 2015	• EBSCOhost EconLit • EBSCOhost Health Policy • Ovid MEDLINE • Embase • PsycINFO

Topic	Research Question	Population	Intervention	Comparison	Outcome	Inclusion Criteria	Exclusion Criteria	Search Date	Databases Searched
						uses pricing strategies to counterbalance the efforts by the government (for background)			
Financial Incentives	• What impact do financial incentives have on reducing tobacco use and smoking cessation among all smokers?	• All smokers	• Any financial incentives that promote smoking cessation	• No incentives or no intervention (control group) or itself (pre-post)	• Number of quit attempts • Number of sustained tobacco abstinence • Number of successful quits	• Research question is primary focus • Papers describing financial incentives & how they contribute/ relate to promoting smoking cessation • Papers that describe financial incentives directed at an overall audience (i.e. population in general, adults, youth/ children) • Could include analysis of cost effectiveness of financial incentives for smoking cessation	• Exclude studies that do not focus on some sort of financial incentives as a smoking cessation intervention/ programs • Exclude studies that combine financial incentives with other smoking cessation strategies (e.g., mass media campaigns) • Exclude studies that do not focus on smoking cessation • Exclude	• 2014 to present (July 28, 2015)	• MEDLINE • PsycINFO • Health Policy Reference Center

Topic	Research Question	Population	Intervention	Comparison	Outcome	Inclusion Criteria	Exclusion Criteria	Search Date	Databases Searched
							financial incentives for healthcare providers • Exclude developing countries		
Mass Media	• What impact do mass media and technology-based campaigns have on promoting quitting among all smokers?	• All smokers	• Exposure to mass media or technology-based campaigns that promote smoking cessation	• No exposure to mass media (control group)	• Number of quit attempts • Number of sustained tobacco abstinence • Increased number of calls to quitlines	• Papers describing mass media campaigns and how they contribute/ relate to promoting smoking cessation • Could include analysis of cost effectiveness of mass media smoking cessation campaigns	• Exclude studies that do not focus on some sort of mass media or social media campaign as a smoking cessation intervention • Exclude studies that do not focus on smoking cessation • Exclude studies that combine mass media with other smoking cessation strategies (e.g., smoking cessation aids) • Exclude	• 2013 to present (July 29, 2015)	• MEDLINE • PsycINFO • CINAHL

Topic	Research Question	Population	Intervention	Comparison	Outcome	Inclusion Criteria	Exclusion Criteria	Search Date	Databases Searched
							developing countries		
Campus-based	• What is the impact of campus-based interventions on tobacco use and cessation among college and university students?	• College/ University student smokers (i.e., young adults aged 18 – 29; adults 30+)	• Any campus-based intervention designed to promote smoking cessation	• No intervention (control group) or itself (pre-post)	• Number of quit attempts • Number of sustained tobacco abstinence • Number of successful quits	• Research question is primary focus • Papers describing campus-based interventions/ programs/ campaigns and how they contribute/ relate to promoting smoking cessation • Could include analysis of cost effectiveness of campus-based interventions/ programs/ campaigns	• Exclude studies that do not focus on campus-based interventions/ programs/ campaigns • Exclude studies that combine campus-based interventions/ programs/ campaigns with other settings (e.g., home-based interventions) • Exclude studies that do not demonstrate the effectiveness of campus-based interventions on smoking cessation • Exclude studies that do	• 2005 to present (July 27, 2015)	• MEDLINE • PsycINFO • Education Resources Information Center (ERIC)

Topic	Research Question	Population	Intervention	Comparison	Outcome	Inclusion Criteria	Exclusion Criteria	Search Date	Databases Searched
							not focus on smoking cessation • Exclude developing countries		
Relapse Prevention (in report title Cessation Maintenance)	• What is the impact of relapse prevention interventions on smokers to quit smoking and maintain their status as a 'former smoker'?	• All smokers	• Any relapse prevention programs	• No intervention (control group) or itself (pre-post)	• Proportion of recent quitters who return to smoking • Number of quit attempts • Number of sustained tobacco abstinence • Number of successful quit attempts	• Research question is primary focus • Papers describing relapse prevention programs and how they contribute/ relate to promoting smoking cessation • Could include analysis of cost effectiveness of smoking relapse prevention initiatives	• Exclude studies that do not focus on some sort of relapse prevention programs as a smoking cessation intervention/ programs • Exclude studies that combine relapse prevention programs with other smoking cessation strategies (e.g., mass media campaigns) • Exclude studies that do not focus on smoking	• 2013 to present (July 29, 2015)	• MEDLINE • PsycINFO • CINAHL

Topic	Research Question	Population	Intervention	Comparison	Outcome	Inclusion Criteria	Exclusion Criteria	Search Date	Databases Searched
							cessation • Exclude developing countries		
E-Cigarettes	• Do E-Cigarettes result in smoking cessation when used by current smokers? • Are E-Cigarettes non-inferior to other means of smoking cessation among current smokers?	• All smokers	E-cigarettes for smoking cessation	• Do e-cigarettes result in smoking cessation when used by current smokers? • Are e-cigarettes non-inferior to other means of smoking cessation among current smokers?	Quit rates (proportion of smokers who remain smoke-free) during study duration	Studies comparing e-cigarettes to any or all of the following smoking cessation tools: • Behavioural counselling • Pharma-cotherapy (first or second-line) • Alternative therapies • No intervention • Include e-cigarettes that do or do not contain nicotine	• Studies addressing relapse prevention • Non-English language • Exclude developing countries	• 1946 to present (17 Dec, 2015)	• Ovid Embase • CINAHL • Environ-ment Complete • PsycINFO

Appendix 1: Jurisdictions Banning Waterpipe Use Organized by Strength and Scope

Includes waterpipe tobacco smoking outdoors	Includes waterpipe tobacco smoking and/or other weeds and substances outdoors	Includes all waterpipe smoking outdoors with opt-in provisions for businesses	Includes all waterpipe smoking indoors	Includes all waterpipe smoking indoors and select outdoor locations
Hamilton (’12)	Cochrane (’14)	Chatham-Kent (’14)	Bradford West Gwillimbury (’13)	Orillia (’13)
Mississauga (’15)	Engelhart (’12)	Cobalt (’12)	Barrie (’13)	Peterborough (’12)
Niagara Region (’14)	Essex (’15)			Toronto (’16)
	Kirkland Lake (’13)			Ottawa (’16)
	Niagara Falls (’11)			Windsor (’16)
	St. Thomas (’09)			
	Tecumseh (’15)			
	LaSalle (’15)			

Adapted from: http://www.nsra-adnf.ca/cms/file/files/2016_Waterpipe_Bylaws_Update-FINAL.pdf

Appendix 3: List of Interventions by Chapter

Chapter 3: Industry

- Price and Taxation
- Tobacco Advertising Promotion and Sponsorship Bans
- Plain and Standardized Packaging
- Health Warning Labels
- Zoning Restrictions to Create Tobacco Retail-free Areas
- Retail Licenses
- Government-Controlled Outlets
- Anti-Contraband Measures
- Litigation
- Imposing a Quota on Tobacco Product Availability (Sinking Lid)
- Regulated Market Model
- Non-Profit Enterprise with a Public Health Mandate
- Performance-Based Regulation
- Reducing Product Toxicity
- Reduction of Nicotine Content in Cigarettes to Reduce Addictiveness
- Banning Flavours in Tobacco Products
- Regulation to Favour Electronic Cigarettes over Cigarettes

Chapter 4: Prevention

- Raising the Minimum Purchase Age
- Price and Taxation
- Bans on Point-of-Sale Displays
- Reducing the Availability of Tobacco Products
- Mass Media - Prevention
- Social Marketing
- Elementary and Secondary School Prevention Programs
- Elementary and Secondary School Tobacco Policies
- Campus-Based Tobacco Policies
- Onscreen Tobacco Use and Product Placement
- Prevention in the Family Setting
- Prevention in the Primary Care Setting
- Tailoring Interventions to Specific Populations
- Tobacco-Free Generation

Chapter 5: Protection

- Outdoor Public Spaces
- Home Environments
- Workplaces
- Hospitality Settings
- Institutional Settings
- Vehicles
- Electronic Cigarettes
- Waterpipe
- Mass Media - Protection
- Impacts of Post-Consumption Cigarette Waste

Chapter 6: Cessation

- Price and Taxation
- Smoke-Free Policies
- Mass Media - Cessation
- Technology-Based Interventions: Internet /Computer and Text Messaging
- Quitlines with Cessation Telephone Support
- Hospital-Based Cessation Interventions
- Other Health Care Setting Cessation Interventions
- Individuals with Cancer
- Women during Prenatal and Postpartum Periods
- Individuals with Chronic Obstructive Pulmonary Disease (COPD)
- Individuals with Cardiovascular Disease
- Individuals with Mental illness
- Individuals with Cerebrovascular Disease
- Individuals with Diabetes
- Individuals with Alcohol and Other Substance Abuse Issues
- Workplace-Based Interventions
- Campus-Based Interventions
- Pharmacotherapy
- Behavioural Interventions
- Cessation Maintenance
- Electronic Cigarettes
- Financial Incentives
- Self-Help Interventions
- Enhancing Partner Support
- Biomedical Risk Assessment
- Acupuncture and Related Interventions
- Hypnotherapy
- Youth and Young Adults
- Older Adults
- Sex and Gender Considerations
- Ethnic Minorities
- Indigenous Populations
- Individuals Who Identify as Lesbian, Gay, Bisexual or Transgender (LGBT)

- Low-Income & Other Socially-Disadvantaged Groups
- Combustible Products – Waterpipes
- Smokeless Tobacco

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