

APPENDIX E

Literature Review on the Impact of Health Warnings on Children

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Literature Review: Impact of Health Warnings on Children

Summary

1. Most smokers begin smoking before they are 18 years of age, and many young people who begin smoking early in life are likely to become lifelong smokers.
2. Health warnings are a cost-effective strategy to inform smokers about the health risks of smoking, encourage smokers to quit, and prevent non-smokers from starting to smoke.
3. In comparison to the large body of research on adults' responses to health warnings on cigarette packages, few studies have examined the impact of health warnings on children.
4. Health warnings are especially important in LMICs, where youth are likely to have low exposure to mass media campaigns, limited access to accurate health information, low literacy, and high exposure to tobacco marketing and promotion.
5. Real-world studies of youth in Canada and Australia show that pictorial health warnings are more effective for capturing attention, communicating health information, discouraging smoking, promoting quitting, and reducing the appeal of smoking than text-only warnings.
6. Experimental studies show that pictorial health warnings are more effective for preventing youth from starting to smoke than text-only warnings, particularly when they feature graphic depictions of smoking-related diseases and when they cover more than 50% of the front and back of cigarette packs.
7. Over the last decade, use of other types of tobacco products among youth, including waterpipe and smokeless tobacco, has increased worldwide.
8. The growing popularity of waterpipe and smokeless tobacco among young people is driven by tobacco industry marketing strategies, such as the use of appealing flavors, aggressive youth-oriented advertising campaigns, low pricing, and product innovation.
9. Waterpipe and smokeless tobacco contain many of the same toxic chemicals found in cigarettes, and are not a less harmful alternative to smoking cigarettes. In fact, use of these waterpipe and smokeless tobacco can lead to addiction, as well as a number of adverse health effects, including respiratory diseases, oral cancer, low birthweight, and cardiovascular disease.
10. There is a strong need to implement effective health warnings for waterpipe and smokeless tobacco, as recommended under FCTC Article 11 guidelines, particularly in LMICs where rates of use are high among adolescents and young adults.

Background

Health warnings on tobacco product packaging are a universal and cost-effective strategy to convey accurate information on smoking-related health risks to smokers, encourage quitting, and prevent initiation. Article 11 of the WHO Framework Convention on Tobacco Control (WHO FCTC) obligates Parties, within three years after entry into force, to implement health warnings on tobacco product packaging that cover at least 50% and no less than 30% of the principal display areas. Guidelines for the implementation of Article 11 further recommend that warnings should cover more than 50% of the front and back principal display areas, include full colour pictures, and appear on plain packaging.

There is a large body of evidence showing that health warnings on cigarette packages can increase health knowledge about the harms of smoking [1], prevent smoking relapse [2], deter

smoking uptake [3], increase quit intentions and attempts [4,5], and reduce the appeal of packs among adults in HICs [6]. However, few studies have examined the impact of health warnings on tobacco product packages on children, including those in LMICs where tobacco control policies may be less stringent and poorly enforced.

Nearly 90% of adult smokers begin smoking before the age of 18 years [7,8], and youth are especially vulnerable to becoming addicted to nicotine at much lower levels of consumption than adults [8,9]. Young people who begin smoking early in life are also more likely to become lifelong smokers. In fact, adolescents who try just a single cigarette at 11 years of age are twice as likely to become a smoker at 14 years than those who never tried a cigarette — even after a gap of up to 3 years of not smoking [10].

GYTS data across 61 countries from 2012 to 2015 indicates that more than 10% of children aged 13 to 15 years use tobacco worldwide [11]. Although a considerable proportion of children still take up smoking or continue to smoke each year in HICs, smoking rates among youth have decreased by at least half over the last two decades in countries such as Australia (7% in 2013 vs. 3% in 2015), the UK (10% in 2000 vs. 3% in 2014), and the US (16% in 2011 vs. 8% in 2016) [12–14]. In sharp contrast, prevalence of tobacco use among youth has increased in a number of LMICs, with higher rates of tobacco use among youth than adults in countries such as Senegal and Nigeria [15]. Providing young people with information on the harms of smoking through effective health warnings is particularly important in LMICs, where there are few anti-tobacco mass media campaigns, less stringent regulatory environments, and rapid expansion of tobacco industry marketing and promotion strategies.

Pictorial warnings are more effective than text-only warnings

A large number of studies from HICs show that pictorial warnings are more effective than text-only warnings among adults. For example, pictorial warnings are more likely to be noticed by adult smokers [16–18], increase their motivation to quit or cut down on smoking [4,19], and increase their awareness of the health risks of smoking [1,20]. Similarly, a few studies from LMICs show that pictorial warnings are more effective than text-only warnings for increasing quitting and knowledge about tobacco-related diseases among adults [21–23].

In contrast with the large body of evidence for the impact of pictorial warnings on adults, very little research has examined responses to pictorial warnings among youth. Real-world studies evaluating the impact of pictorial health warnings on youth in Australia and Canada show that pictorial warnings are more effective than text-only warnings.

- In Australia, the implementation of pictorial health warnings had an immediate and long-term impact on youth. Specifically, youth were more likely to notice, recall, and talk about pictorial health warnings in the 6 month period and 2 years after the warnings were introduced on cigarette packs. Pictorial warnings were also rated as being more effective for communicating health effects of smoking, discouraging smoking initiation, encouraging thoughts about quitting, and helping to prevent relapse after quitting than previous text-only warnings [3,24].
- About 6 years after pictorial warnings were introduced on cigarette packs in Canada, more than 90% of youth agreed that the warnings had provided them with information on health effects of smoking, were accurate, and made smoking less attractive [25].

Pictorial health warnings deter youth from smoking

Experimental studies consistently show that young people consider pictorial warnings to be more effective for prevention of smoking uptake than text-only warnings.

- A study of the effectiveness of four pictorial health warnings from the galleries of the WHO found that 45% to 77% of Nigerian students aged 13 to 17 years perceived that the warnings would be effective at preventing adolescents from initiating smoking [26].
- Up to 84% of non-smoking adolescents (aged 12 to 18 years) in Greece reported that proposed EU pictorial warning labels would be much more effective in preventing them from initiating smoking in comparison to existing EU text-only warning labels [27].
- Youth in Mexico (aged 16 to 18 years) perceived pictorial warnings as being more effective overall than text-only warnings, with the stronger effects for “graphic” depictions of disease than symbolic images or depictions of human suffering [28].
- A study based on GYTS data from Lebanon showed that school (aged 13 to 18 years) and university students (aged 18 to 25 years) perceived pictorial warnings as more effective for increasing intentions to quit and preventing young people from starting to smoke than existing text-only warnings [29].

Pictorial warnings may encourage youth smokers to consider quitting

Experimental studies provide mixed findings on the effectiveness of pictorial warnings for promoting smoking cessation among youth.

- Compared to cigarette packs with “low” graphic level or no pictorial warnings, those with “high” and “medium” graphic level pictorial warnings were significantly associated with decreased cigarette cravings along with increased thoughts of quitting among adolescent smokers (aged 13 to 18 years) in the US, Spain, and France [30].
- A study in the US found that cigarette packs with pictorial warnings did elicit strong expectations of being less likely to be smoking one year later among youth (average age ~16 years) [31].
- Pictorial warning labels were effective at lowering smoking intentions among adolescents (aged 12 to 20 years) in Canada, but not for adolescents in the US [32].

Bigger is better: large pictorial health warnings are perceived as more effective by youth

Experimental studies conducted among youth prior to the implementation of pictorial health warnings in Canada and Australia found that warnings were likely to be more effective when they covered a larger surface area of cigarette packs.

- Experimental studies commissioned by the Canadian government showed that large pictorial warnings that cover 75%, 90%, and 100% of the front and back of cigarette packs were more effective in eliciting negative perceptions and communicating information on the health risks of smoking to adolescent smokers and vulnerable non-smokers (aged 14 to 17 years) than warnings that cover 50% of packs [33,34].
- Cigarette packs with larger pictorial warnings were rated as less appealing by Australian adolescents (aged 14 to 17 years) who were established smokers, experimenters, and non-smokers [35].

Highly graphic warnings are more effective than symbolic abstract warnings

Studies show that both adults and youth tend to rate the same types of health warnings as effective, with no differences by education level [36,28]. Pictorial warnings that feature “graphic” depictions of the physical effects of smoking are typically perceived by young people as being more effective than warnings that feature abstract symbolic images.

- In a study conducted in Lebanon, students aged 13 to 18 years rated the pictorial warning of a diseased lung as most effective for inducing feelings of fear and worry, increasing self-efficacy and intention to remain a non-smoker, and increasing intention to advise family and friends not to smoke. Pictorial warnings on tooth decay and death due to smoking were also highly ranked [29]. All pictorial warnings were rated as more effective than existing text-only warnings.
- Pictorial warning that “Smoking causes fatal lung cancer” was rated as the most effective for preventing smoking, and increasing thoughts about effects of smoking on health by Greek adolescents aged 12 to 18 years. Although pictorial warnings on “skin ageing” and “impotence” were generally rated as being least effective, they were still rated higher than text-only warnings [27].
- A study conducted among adults and youth in Mexico found that pictorial warnings that featured “graphic” depictions of disease were perceived by both youth and adults as more effective than symbolic images or experiences of human suffering [28].

Impact of health warnings on other tobacco products

Waterpipe tobacco

Rise in popularity of waterpipe tobacco smoking among youth and young adults

Waterpipe smoking has increased worldwide over the last decade, particularly among adolescents and young adults [37]. The prevalence of waterpipe smoking among youth has surpassed cigarette smoking as the most common form of tobacco use in several LMICs (Jordan, Lebanon, Syria, Iran (Islamic Republic of), and Yemen) and HICs (Bahrain, Oman, Kuwait, Qatar, United Arab Emirates) in the Eastern Mediterranean region [38–41]. The use of waterpipe has also become increasingly popular among young adults in Western countries, such as Great Britain [42,43] and the US [44–46].

There is strong global evidence that waterpipe smoking may be particularly appealing to young people because of the wide range of flavored products that are available, the fact that these products can be used in cafes and lounges that are often exempt from smoke-free laws, and misperceptions of reduced harm relative to cigarette smoking [37,47–50].

Waterpipe smoking leads to serious health harms

Waterpipe smoking is an important public health concern. A 2015 scientific advisory note on waterpipe tobacco smoking by the WHO Study Group on Tobacco Product Regulation (TobReg) concluded that waterpipe tobacco smoking is associated with many of the same health risks as cigarette smoking [51]. A 2016 systematic review of 50 studies found significant associations between waterpipe smoking and a number of health outcomes, such as respiratory diseases, bronchitis, oral cancer, lung cancer, low birthweight, and cardiovascular disease [52]. However, many users are not aware of the health risks associated with waterpipe smoking [53,54], and

incorrectly believe that waterpipe smoking is less harmful than cigarette smoking because smoke is “filtered” as it passes through water before it is inhaled [38,55,56].

Evidence shows that waterpipe tobacco smoke contains many of the same toxic chemicals found in cigarette smoke that are known to cause smoking-related diseases and addiction [57,58]. Importantly, waterpipe use may be associated with increased toxicant exposure due to the fact that a single session lasts about 45 minutes. In fact, it is estimated that a single waterpipe session exposes the user to 50 to 100 times the smoke volume, 3 to 9 times the level of carbon monoxide, and nearly 2 times the level of nicotine as smoking a single cigarette [59–63].

Policies to reduce use of waterpipe tobacco among young people

FCTC Article 11 guidelines recommend that Parties consider requiring health warnings and messages on tobacco product packaging that focus on the specific health effects related to the use of different types of products, including waterpipe tobacco. The guidelines also recommend that Parties consider requiring the display of health warnings and messages on innovative locations, including instruments that are used for waterpipe smoking.

Legislation that requires pictorial health warnings on waterpipe tobacco packaging has been adopted by several countries, including Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates, the Russian Federation, Israel, Lebanon, Turkey, and England [64–68]. However, young people typically use waterpipe in establishments such as hookah lounges or cafes, where they are not exposed to product packaging. As a result, health warnings that are displayed on waterpipe packages may not reach large numbers of users. Currently, only Turkey requires the display of a composite warning on waterpipe devices that includes a pictorial warning and an accompanying text warning that covers at least 65% of both the front and back surfaces [67,69].

A few experimental studies suggest that while health warnings on waterpipe devices may be effective to prevent and reduce waterpipe smoking among users, the format (text vs. pictorial), message content, and placement of these warnings needs to be considered. For example:

- A study of university students in the US found that text-only and pictorial warnings about the harms of waterpipe smoke to children were most effective for motivating them to quit. There were no differences in the noticeability of warnings placed on the base, mouthpiece, or stem of waterpipe devices [70].

Smokeless tobacco

Growing use of smokeless tobacco use among youth

Over the last decade, the use of smokeless tobacco (SLT) has steadily increased among young people worldwide. GYTS data collected from 2008 to 2016 show that up to nearly one-quarter of youth aged 13 to 15 years in countries located in the Western Pacific (range: 1% to 28%), Southeast Asian (range: 2% to 22%), and African (range: 2% to 22%) regions currently used SLT [71]. A 2017 study of SLT prevalence among youth in 106 countries based on national youth surveys (GYTS, National Youth Tobacco Survey, Global School Health Survey) found that overall 6.6% of male adolescents (range: 0% in Costa Rica to 26.4% in Federated States of Micronesia) and 3.6% of female adolescents (range: 0.1% in the Netherlands to 21.7% in

Federates States of Micronesia) reported current use of SLT, with higher prevalence among adolescents in LMICs [72].

The tobacco industry uses various strategies to market SLT products to young people, such as the use of candy and fruit flavors, youth-oriented advertising and event sponsorship, low pricing, and novel products (e.g., dissolvable strips/orbs/sticks, snus) [8].

Smokeless tobacco use is hazardous to health

Although there is less research on the health harms of SLT than cigarettes, there is strong evidence that SLT use is not a safer alternative to smoking cigarettes. It is well established that use of SLT leads to nicotine addiction; causes mouth, esophageal and pancreatic cancers, gum disease and tooth decay, and nicotine poisoning in children; and is linked to increased risk for death from heart disease and stroke, and early delivery and stillbirth among pregnant women [73–77].

There is mixed evidence on youth perceptions of the harmfulness of SLT products, with some data from the US suggesting that risk perceptions may depend on whether youth are asked about relative versus direct harms of SLT use.

- Study of use and perceptions of harm for different types of SLT products found that approximately half of youth (average age ~17 years) in India (47.7%) and Bangladesh (53.9%) reported that they used SLT because it was “less harmful to health” than other types of tobacco [78].
- A 2011 study from the US found that 58.2% of young adults (aged 18 to 34 years) reported that SLT had “about the same” risk as cigarettes, 31.8% reported that it was “more risky” than cigarettes, and only 7.1% reported that ST was “less risky” than cigarettes [79].
- National survey data from the US showed that 20% of middle and high school students believed that smokeless tobacco is less harmful than cigarettes in 2014 [80].
- A study from the US found that 29.7% of youth rated SLT as less harmful than cigarettes when asked “Is using smokeless tobacco less harmful, about the same, or more harmful than smoking cigarettes?”, compared to 11.7% of youth who were asked “How much do you think people harm themselves when they use smokeless tobacco?”[81].

Policies to reduce use of smokeless tobacco among youth

FCTC Article 11 guidelines recommend that Parties consider requiring health warnings and messages on tobacco product packaging that focus on the specific health effects related to the use of different types of products, including SLT.

Implementation of pictorial health warnings that communicate the health risks of SLT is particularly important in LMICs, where youth are likely to have limited access to health information, low literacy levels, and easy access to highly affordable SLT products. However, few countries require health warnings on SLT packages — as of 2016, only 36 (20%) FCTC Parties have adopted legislation that requires pictorial health warnings on SLT packages [82].

A few studies from two HICs (the US and Canada) have assessed young people’s responses to pictorial health warnings on SLT product packaging.

- A study conducted in the US found that university students who viewed pictorial health warnings for oral tobacco rated the product as less appealing, trustworthy, and safe; and reported that they were less interested in trying and purchasing the product [83].
- Another study from the US found that youth (aged 14 to 17 years), young adults (aged 18 to 25 years), and older adults (aged 26 to 65 years) all rated SLT packages with pictorial health warnings as less appealing and more likely to elicit higher concern for health risks than text-only warnings, with the strongest impact seen among youth and young adults [84].
- A study of young adult smokers (aged 18 to 30 years) in Canada showed that pictorial health warnings on SLT product packages were effective for reducing product appeal, and increasing perceived risks of product use [85].

References

- 1 Hammond D, Fong GT, McNeill A, *et al.* Effectiveness of cigarette warning labels in informing smokers about the risks of smoking: findings from the International Tobacco Control (ITC) Four Country Survey. *Tob Control* 2006;**15 Suppl 3**:iii19–25. doi:10.1136/tc.2005.012294
- 2 Partos TR, Borland R, Yong H-H, *et al.* Cigarette packet warning labels can prevent relapse: findings from the International Tobacco Control 4-Country policy evaluation cohort study. *Tob Control* 2013;**22**:e43–50. doi:10.1136/tobaccocontrol-2011-050254
- 3 Shanahan P, Elliott D. Evaluation of the effectiveness of graphic health warnings on tobacco product packaging 2008 - Executive summary, Australian Government Department of Health and Ageing. Canberra: 2009. <http://www.tobaccolabels.ca/wp/wp-content/uploads/2013/12/Australia-2009-Evaluation-of-the-Effectiveness-of-the-Graphic-Health-Warnings...Executive-Summary-Govt-Report.pdf>
- 4 Hammond D, Fong GT, McDonald PW, *et al.* Impact of the graphic Canadian warning labels on adult smoking behaviour. *Tob Control* 2003;**12**:391–5.
- 5 Azagba S, Sharaf MF. The effect of graphic cigarette warning labels on smoking behavior: evidence from the Canadian experience. *Nicotine Tob Res* 2013;**15**:708–17. doi:10.1093/ntr/nts194
- 6 Hoek J, Wong C, Gendall P, *et al.* Effects of dissuasive packaging on young adult smokers. *Tob Control* 2011;**20**:183–8. doi:10.1136/tc.2010.037861
- 7 Kessler DA, Natanblut SL, Wilkenfeld JP, *et al.* Nicotine addiction: a pediatric disease. *J Pediatr* 1997;**130**:518–24.
- 8 U.S. Department of Health and Human Services. Preventing tobacco use among youth and young adults. Atlanta: 2012. <https://www.surgeongeneral.gov/library/reports/preventing-youth-tobacco-use/full-report.pdf>
- 9 DiFranza JR, Savageau JA, Fletcher K, *et al.* Symptoms of tobacco dependence after brief intermittent use. *Arch Pediatr Adolesc Med* 2007;**161**:704. doi:10.1001/archpedi.161.7.704
- 10 Fidler JA, Wardle J, Brodersen NH, *et al.* Vulnerability to smoking after trying a single cigarette can lie dormant for three years or more. *Tob Control* 2006;**15**:205–9. doi:10.1136/tc.2005.014894
- 11 Arrazola RA, Ahluwalia IB, Pun E, *et al.* Current tobacco smoking and desire to quit smoking among students aged 13–15 Years — Global Youth Tobacco Survey, 61 countries, 2012–2015. *MMWR Morb Mortal Wkly Rep* 2017;**66**:533–7. doi:10.15585/mmwr.mm6620a3
- 12 The Australian Institute of Health and Welfare. National Drug Strategy Household Survey 2016—key findings. 2017. <https://www.aihw.gov.au/getmedia/89c0f030-65a1-4863-9846-969d995fb138/aihw-ndshs-2016-key-findings-tables-RSEs-MOEs.xlsx.aspx>
- 13 Cancer Research UK. Childhood smoking statistics. 2015. <http://www.cancerresearchuk.org/health-professional/cancer-statistics/risk/childhood-smoking>

- 14 Jamal A, Gentzke A, Hu SS, *et al.* Tobacco use among middle and high school students — United States, 2011–2016. *MMWR Morb Mortal Wkly Rep* 2017;**66**:597–603. doi:10.15585/mmwr.mm6623a1
- 15 World Health Organization. WHO report on the global tobacco epidemic, 2017. Monitoring tobacco use and prevention policies. Geneva: 2017. <http://apps.who.int/iris/bitstream/10665/255874/1/9789241512824-eng.pdf?ua=1&ua=1>
- 16 Hammond D, Fong GT, Borland R, *et al.* Text and graphic warnings on cigarette packages. *Am J Prev Med* 2007;**32**:202–9. doi:10.1016/j.amepre.2006.11.011
- 17 Thrasher JF, Hammond D, Fong GT, *et al.* Smokers' reactions to cigarette package warnings with graphic imagery and with only text: a comparison between Mexico and Canada. *Salud Publica Mex* 2007;**49 Suppl 2**:S233–40.
- 18 Borland R, Wilson N, Fong GT, *et al.* Impact of graphic and text warnings on cigarette packs: findings from four countries over five years. *Tob Control* 2009;**18**:358–64. doi:10.1136/tc.2008.028043
- 19 Hammond D, McDonald PW, Fong GT, *et al.* The impact of cigarette warning labels and smoke-free bylaws on smoking cessation: evidence from former smokers. *Can J Public Health*;**95**:201–4.
- 20 Swayampakala K, Thrasher JF, Hammond D, *et al.* Pictorial health warning label content and smokers' understanding of smoking-related risks —a cross-country comparison. *Health Educ Res* 2015;**30**:35–45. doi:10.1093/her/cyu022
- 21 ITC Project. FCTC Article 11 tobacco warning labels: evidence and recommendations from the ITC Project. Waterloo: 2009. http://www.itcproject.org/files/ITC_Tobacco_Labels_Bro_V3.pdf
- 22 Fathelrahman AI, Li L, Borland R, *et al.* Stronger pack warnings predict quitting more than weaker ones: finding from the ITC Malaysia and Thailand surveys. *Tob Induc Dis* 2013;**11**:20. doi:10.1186/1617-9625-11-20
- 23 Chiosi JJ, Andes L, Asma S, *et al.* Warning about the harms of tobacco use in 22 countries: findings from a cross-sectional household survey. *Tob Control* 2016;**25**:393–401. doi:10.1136/tobaccocontrol-2014-052047
- 24 White V, Webster B, Wakefield M. Do graphic health warning labels have an impact on adolescents' smoking-related beliefs and behaviours? *Addiction* 2008;**103**:1562–71. doi:10.1111/j.1360-0443.2008.02294.x
- 25 Environics Research Group. The health effects of tobacco and health warning messages on cigarette packages - survey of youth: Wave 12 Surveys. Prepared for Health Canada. Toronto: 2007.
- 26 Adebisi AO, Uchendu OC, Bamgboye E, *et al.* Perceived effectiveness of graphic health warnings as a deterrent for smoking initiation among adolescents in selected schools in southwest Nigeria. *Tob Induc Dis* 2016;**14**:7. doi:10.1186/s12971-016-0074-y
- 27 Vardavas CI, Connolly G, Karamanolis K, *et al.* Adolescents perceived effectiveness of the proposed European graphic tobacco warning labels. *Eur J Public Health* 2009;**19**:212–7. doi:10.1093/eurpub/ckp015
- 28 Hammond D, Thrasher J, Reid JL, *et al.* Perceived effectiveness of pictorial health

- warnings among Mexican youth and adults: a population-level intervention with potential to reduce tobacco-related inequities. *Cancer Causes Control* 2012;**23**:57–67. doi:10.1007/s10552-012-9902-4
- 29 Alaouie H, Afifi RA, Haddad P, *et al.* Effectiveness of pictorial health warnings on cigarette packs among Lebanese school and university students. *Tob Control* 2015;**24**:e72–80. doi:10.1136/tobaccocontrol-2012-050745
- 30 Andrews JC, Netemeyer RG, Burton S, *et al.* Effects of plain package branding and graphic health warnings on adolescent smokers in the USA, Spain and France. *Tob Control* 2016;**25**:e120–6. doi:10.1136/tobaccocontrol-2015-052583
- 31 Nonnemaker J, Farrelly M, Kamyab K, *et al.* Experimental study of graphic cigarette warning labels. Final results report. Prepared for Center for Tobacco Products Food and Drug Administration. Rockville: 2010. <http://www.tobaccolabels.ca/wp/wp-content/uploads/2013/12/USA-2010-Experimental-Study-of-Graphic-Cigarette-Warning-Labels-Final-Results-Report-FDA.pdf>
- 32 SABBANE LI, LOWREY TM, CHEBAT J-C. The Effectiveness of Cigarette Warning Label Threats on Nonsmoking Adolescents. *J Consum Aff* 2009;**43**:332–45. doi:10.1111/j.1745-6606.2009.01142.x
- 33 Les Études de Marché Créatec. Quantitative study of Canadian youth smokers and vulnerable non-smokers: effects of modified packaging through increasing the size of warnings on cigarette packages. Prepared for Health Canada. Ottawa: 2008. <http://www.tobaccolabels.ca/healt/canada2008~3>
- 34 Les Études de Marché Créatec. Effects of modified packaging through increasing the size of warnings on cigarette packages: quantitative study of Canadian youth smokers and vulnerable nonsmokers. HC POR-07-47. Ottawa: 2008. <http://www.smoke-free.ca/warnings/WarningsResearch/report-modified-packaging-youth.pdf>
- 35 Germain D, Wakefield MA, Durkin SJ. Adolescents' perceptions of cigarette brand image: does plain packaging make a difference? *J Adolesc Health* 2010;**46**:385–92. doi:10.1016/j.jadohealth.2009.08.009
- 36 Hammond D. Health warning messages o tobacco products: a review. *Tob Control* 2011;**20**:327–37. doi:10.1136/tc.2010.037630
- 37 Maziak W. The global epidemic of waterpipe smoking. *Addict Behav* 2011;**36**:1–5. doi:10.1016/j.addbeh.2010.08.030
- 38 Akl EA, Gaddam S, Gunukula SK, *et al.* The effects of waterpipe tobacco smoking on health outcomes: a systematic review. *Int J Epidemiol* 2010;**39**:834–57. doi:10.1093/ije/dyq002
- 39 El-Awa F, Warren CW, Jones NR. Changes in tobacco use among 13-15-year-olds between 1999 and 2007: findings from the Eastern Mediterranean Region. *East Mediterr Health J* 2010;**16**:266–73.
- 40 Moh'd Al-Mulla A, Abdou Helmy S, Al-Lawati J, *et al.* Prevalence of tobacco use among students aged 13-15 years in Health Ministers' Council/Gulf Cooperation Council Member States, 2001-2004. *J Sch Health* 2008;**78**:337–43. doi:10.1111/j.1746-1561.2008.00311.x
- 41 Mzayek F, Khader Y, Eissenberg T, *et al.* Patterns of water-pipe and cigarette smoking

- initiation in schoolchildren: Irbid longitudinal smoking study. *Nicotine Tob Res* 2012;**14**:448–54. doi:10.1093/ntr/ntr234
- 42 Grant A, Morrison R, Dockrell MJ. Prevalence of waterpipe (shisha, narghille, hookah) use among adults in Great Britain and factors associated with waterpipe use: data from cross-sectional online surveys in 2012 and 2013. *Nicotine Tob Res* 2014;**16**:931–8. doi:10.1093/ntr/ntu015
- 43 Jackson D, Aveyard P. Waterpipe smoking in students: Prevalence, risk factors, symptoms of addiction, and smoke intake. Evidence from one British university. *BMC Public Health* 2008;**8**:174. doi:10.1186/1471-2458-8-174
- 44 Primack BA, Shensa A, Kim KH, *et al.* Waterpipe smoking among U.S. university students. *Nicotine Tob Res* 2013;**15**:29–35. doi:10.1093/ntr/nts076
- 45 Barnett TE, Smith T, He Y, *et al.* Evidence of emerging hookah use among university students: a cross-sectional comparison between hookah and cigarette use. *BMC Public Health* 2013;**13**:302. doi:10.1186/1471-2458-13-302
- 46 Rahman S, Chang L, Hadgu S, *et al.* Prevalence, knowledge, and practices of hookah smoking among university students, Florida, 2012. *Prev Chronic Dis* 2014;**11**:E214. doi:10.5888/pcd11.140099
- 47 Al-Naggar RA, Saghir FSA. Water pipe (shisha) smoking and associated factors among Malaysian university students. *Asian Pac J Cancer Prev* 2011;**12**:3041–7.
- 48 Amin TT, Amr MAM, Zaza BO, *et al.* Harm perception, attitudes and predictors of waterpipe (shisha) smoking among secondary school adolescents in Al-Hassa, Saudi Arabia. *Asian Pac J Cancer Prev* 2010;**11**:293–301.
- 49 Kakodkar P V, Bansal SS. Hookah smoking: characteristics, behavior and perceptions of youth smokers in pune, India. *Asian Pac J Cancer Prev* 2013;**14**:4319–23.
- 50 Ambrose BK, Day HR, Rostron B, *et al.* Flavored tobacco product use among US youth aged 12-17 Years, 2013-2014. *JAMA* 2015;**314**:1871. doi:10.1001/jama.2015.13802
- 51 WHO Study Group on Tobacco Product Regulation (TobReg). Advisory note. Waterpipe tobacco smoking: health effects, research needs and recommended actions by regulators. Geneva: 2015.
http://www.who.int/tobacco/publications/prod_regulation/waterpipesecondedition/en/
- 52 Waziry R, Jawad M, Ballout RA, *et al.* The effects of waterpipe tobacco smoking on health outcomes: an updated systematic review and meta-analysis: Table 1. *Int J Epidemiol* 2016;**46**:dyw021. doi:10.1093/ije/dyw021
- 53 Maziak W, Taleb Z Ben, Bahelah R, *et al.* The global epidemiology of waterpipe smoking. *Tob Control* 2015;**24 Suppl 1**:i3–12. doi:10.1136/tobaccocontrol-2014-051903
- 54 Salloum RG, Thrasher JF, Kates FR, *et al.* Water pipe tobacco smoking in the United States: Findings from the National Adult Tobacco Survey. *Prev Med* 2015;**71**:88–93. doi:10.1016/j.ypmed.2014.12.012
- 55 Maziak W, Eissenberg T, Rastam S, *et al.* Beliefs and attitudes related to narghile (waterpipe) smoking among university students in Syria. *Ann Epidemiol* 2004;**14**:646–54. doi:10.1016/j.annepidem.2003.11.003

- 56 Kandela P. Nargile smoking keeps Arabs in Wonderland. *Lancet*2000;**356**:1175.
- 57 Radwan G, Hecht SS, Carmella SG, *et al.* Tobacco-specific nitrosamine exposures in smokers and nonsmokers exposed to cigarette or waterpipe tobacco smoke. *Nicotine Tob Res* 2013;**15**:130–8. doi:10.1093/ntr/nts099
- 58 Shihadeh A, Saleh R. Polycyclic aromatic hydrocarbons, carbon monoxide, tar, and nicotine in the mainstream smoke aerosol of the narghile water pipe. *Food Chem Toxicol* 2005;**43**:655–61. doi:10.1016/j.fct.2004.12.013
- 59 Lipkus IM, Eissenberg T, Schwartz-Bloom RD, *et al.* Affecting perceptions of harm and addiction among college waterpipe tobacco smokers. *Nicotine Tob Res* 2011;**13**:599–610. doi:10.1093/ntr/ntr049
- 60 Rastam S, Eissenberg T, Ibrahim I, *et al.* Comparative analysis of waterpipe and cigarette suppression of abstinence and craving symptoms. *Addict Behav* 2011;**36**:555–9. doi:10.1016/j.addbeh.2011.01.021
- 61 Abdalla AM, Saeed AA, Abdulrahman BM, *et al.* Effect of tobacco advertisements on smoking habits among adolescents in Saudi Arabia. *Med J Cairo Univ* 2012;**80**:111–9.
- 62 Eissenberg T, Shihadeh A. Waterpipe tobacco and cigarette smoking. *Am J Prev Med* 2009;**37**:518–23. doi:10.1016/j.amepre.2009.07.014
- 63 Maziak W, Rzehak P, Keil U, *et al.* Smoking among adolescents in Muenster, Germany: increase in prevalence (1995-2000) and relation to tobacco advertising. 2003;**36**:172–6. doi:10.1016/S0091-7435(02)00020-8
- 64 WHO Convention Secretariat. 2014 Global progress report on implementation of the WHO Framework Convention on Tobacco Control. Geneva: 2014. <http://www.who.int/fctc/reporting/2014globalprogressreport.pdf?ua=1>
- 65 Ministry of Justice of the Russian Federation. Order No. 290N of the Ministry of Health Care and Social Development of the Russian Federation of May 5, 2012; On Approval of Warning Labels on the Danger of Smoking, Accompanied by Illustrations; 2012.
- 66 WHO Convention Secretariat. Control and prevention of waterpipe tobacco products. Report by the Convention Secretariat (FCTC/COP/6/11). 2014. http://apps.who.int/gb/fctc/PDF/cop6/FCTC_COP6_11-en.pdf
- 67 Jawad M, El Kadi L, Mugharbil S, *et al.* Waterpipe tobacco smoking legislation and policy enactment: a global analysis. *Tob Control* 2015;**24**:i60–5. doi:10.1136/tobaccocontrol-2014-051911
- 68 Department of Health. Consumer Protection, The Tobacco Products (Manufacture, Presentation and Sale) (Safety) (Amendment) Regulations 2007 (S.I. 2007 No. 2473). 2007. <https://www.tobaccocontrollaws.org/files/live/England/England - Amdt. to Tobacco Products Regs - national.pdf>
- 69 Government of Turkey. The law on prevention and control of hazards of tobacco products (Law No.4207). Amendment 4/7/2012-6354 10. Art.). 2012. <http://www.tobaccocontrollaws.org/files/live/Turkey/Turkey - Law No. 4207.pdf>
- 70 Islam F, Salloum RG, Nakkash R, *et al.* Effectiveness of health warnings for waterpipe tobacco smoking among college students. *Int J Public Health* 2016;**61**:709–15. doi:10.1007/s00038-016-0805-0

- 71 Drope J, Schluger N, Cahn Z, *et al.* The tobacco atlas. 6th edition. Atlanta: 2018. <https://tobaccoatlas.org/>
- 72 Sinha DN, Kumar A, Bhartiya D, *et al.* Smokeless tobacco use among adolescents in global perspective. *Nicotine Tob Res* 2017;**19**:1395–6. doi:10.1093/ntr/ntx004
- 73 World Health Organization, International Agency for Research on Cancer. IARC monographs on the evaluation of carcinogenic risks to humans. Volume 89: smokeless tobacco and some tobacco-specific N-nitrosamines. Lyon: 2007. <http://monographs.iarc.fr/ENG/Monographs/vol89/mono89.pdf>
- 74 US Department of Health and Human Services. The health consequences of smoking—50 years of progress. A report of the Surgeon General. Atlanta: 2014. <https://www.surgeongeneral.gov/library/reports/50-years-of-progress/full-report.pdf>
- 75 Piano MR, Benowitz NL, Fitzgerald GA, *et al.* Impact of smokeless tobacco products on cardiovascular disease: implications for policy, prevention, and treatment: a policy statement from the American Heart Association. *Circulation* 2010;**122**:1520–44. doi:10.1161/CIR.0b013e3181f432c3
- 76 Connolly GN, Richter P, Aleguas A, *et al.* Unintentional child poisonings through ingestion of conventional and novel tobacco products. *Pediatrics* 2010;**125**:896–9. doi:10.1542/peds.2009-2835
- 77 Critchley JA, Unal B. Health effects associated with smokeless tobacco: a systematic review. *Thorax* 2003;**58**:435–43.
- 78 Mutti S, Reid JL, Gupta PC, *et al.* Patterns of use and perceptions of harm of smokeless tobacco in Navi Mumbai, India and Dhaka, Bangladesh. *Indian J Community Med* 2016;**41**:280–7. doi:10.4103/0970-0218.193337
- 79 Wackowski OA, Delnevo CD. Young adults' risk perceptions of various tobacco products relative to cigarettes. *Health Educ Behav* 2016; **43**:328-36. doi:10.1177/1090198115599988
- 80 Randolph CC. Perceptions of e-cigarettes and noncigarette tobacco products among US youth. *Pediatrics* 2017;**140**:S187.2–S188. doi:10.1542/peds.2017-2475BB
- 81 Persoskie A, O'Brien EK, Nguyen AB, *et al.* Measuring youth beliefs about the harms of e-cigarettes and smokeless tobacco compared to cigarettes. *Addict Behav* 2017;**70**:7–13. doi:10.1016/J.ADDBEH.2017.01.033
- 82 Mehrotra R, Sinha D, Szilagyi T. Global smokeless tobacco control policies and their implementation. Noida: 2017. <http://untobaccocontrol.org/kh/smokeless-tobacco/wp-content/uploads/sites/6/2018/04/Global-smokeless-NICPR-19418-1.pdf>
- 83 Stark E, Kim A, Miller C, *et al.* Effects of including a graphic warning label in advertisements for reduced-exposure products: implications for persuasion and policy. *J Appl Soc Psychol* 2008;**38**:281–93. doi:10.1111/j.1559-1816.2007.00305.x
- 84 Adkison SE, Bansal-Travers M, Smith DM, *et al.* Impact of smokeless tobacco packaging on perceptions and beliefs among youth, young adults, and adults in the U.S: findings from an internet-based cross-sectional survey. *Harm Reduct J* 2014;**11**:2. doi:10.1186/1477-7517-11-2
- 85 Callery WE, Hammond D, O'Connor RJ, *et al.* The appeal of smokeless tobacco products

among young Canadian smokers: the impact of pictorial health warnings and relative risk messages. *Nicotine Tob Res* 2011;**13**:373–83. doi:10.1093/ntr/ntr013