WHO-EM/TFI/155/E

EFFECTIVENESS OF LARGE PICTORIAL HEALTH WARNINGS ON TOBACCO PACKAGES

A review of the global evidence

World Health Organization
REGIONAL OFFICE FOR THE Eastern Mediterranean

WHO-EM/TFI/155/E

Effectiveness of large pictorial health warnings on tobacco packages

A review of the global evidence

World Health Organization
REGIONAL OFFICE FOR THE Eastern Mediterranean

WHO Library Cataloguing in Publication Data

World Health Organization. Regional Office for the Eastern Mediterranean
Effectiveness of large pictorial health warnings on tobacco packages: a review of the global evidence / World Health Organization. Regional Office for the Eastern Mediterranean
p.
WHO-EM/TFI/155/E
1. Tobacco Use - prevention & control 2. Health Promotion - methods 3. Health Knowledge, Attitudes, Practice 4. Smoking -prevention & control 5. Product Labeling - methods 6. Product Packaging - methods I. Title II. Regional Office for the Eastern Mediterranean
(NLM Classification: HV 5767)

Contents

Acknowledgements

This publication was written and revised by Janet Chung-Hall, Genevieve C. Sansone, Lorraine Craig, Anne C.K. Quah and Geoffrey T. Fong of the ITC Project, University of Waterloo, Waterloo, Ontario, Canada.

Introduction

Tobacco use is the greatest single cause of premature mortality, causing 6 million preventable deaths worldwide each year. If current trends continue, tobacco products will kill more than 8 million people each year, with the greatest burden of tobacco-related illness and death occurring in low- and middle-income countries (*1*–*3*).

Despite overwhelming evidence on the enormous range of devastating health effects of tobacco products, many smokers, particularly those from disadvantaged groups, lack knowledge of smoking-related health harms (*4*–*6*). As a result, smokers do not fully appreciate the huge risks that they face, both in terms of the likelihood that they will die of a smoking-related disease (about 50%), and the magnitude of the health threat that they may experience (average loss of about a decade of life) (*7*–*12*).

Given the tremendous disparity between the existence of facts about the harms of tobacco products and the public's poor knowledge of those facts, it is essential for nations to adopt proven methods for informing the population.

Prominent warnings on tobacco product packaging are a key method for communicating the health risks of tobacco use to consumers. Given that a pack-a-day smoker is potentially exposed to a cigarette pack over 7000 times per year, warning messages on packs are a cost–effective strategy for conveying accurate health information to large segments of the population (*13*–*15*).

Prominent and vivid pictorial warnings can also serve to combat a core strategy of the tobacco industry – marketing their products through attractive packaging (*16*–*18*). Promotion through packaging has intensified in response to restrictions or bans on advertising via mass media, billboards, newspapers and magazines.

Article 11 of the World Health Organization 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 50% or more, but not less than 30%, of the principal display areas (*19*). Guidelines for the implementation of Article 11 further recommend that warnings should cover 50% or more of the front and back principal display areas, include full colour pictures, and appear on plain packaging (*20*).

This report presents research evidence on the effectiveness of large pictorial warnings on tobacco product packaging. It is intended to assist policy-makers and key stakeholders in adopting strong, evidence-based tobacco product packaging and labelling measures, in accordance with Article 11 of the WHO FCTC and its guidelines.

Overview of pictorial health warnings

Pictorial health warnings are more effective than text-only warnings

Numerous studies conducted around the world have measured how smokers respond in countries where text-only warnings are switched to pictorial warnings in comparison to smokers in countries with text-only warnings. This research provides conclusive evidence that pictorial warnings are more effective than text-only warnings. Canada was the first country to implement pictorial warnings (in 2001) and therefore much of the research examines Canadian smokers' responses to pictorial warnings.

Pictorial health warnings capture the attention of smokers

A cross-country study showed that pictorial warnings (50% front and back) in Canada were more likely to be noticed by smokers than text-only warnings in the United States of America (USA), the United Kingdom (UK), and Australia (Fig. 1) (*21*). Canadian warnings were also more likely to be noticed by smokers and to make them think about the dangers of smoking and about quitting than text-only warnings (50% back) in Mexico (*22*).

Fig. 1. Examples of health warnings on cigarette packs

After text-only warnings (25% front, 33% back) were replaced with pictorial warnings (30% front, 90% back) in Australia (Fig. 2), there was a significant increase in smokers' self-reported noticing and reading of the warnings (*23*).

Fig. 2. Australian pictorial warning labels, 2006

Data from the International Tobacco Control Policy Evaluation Project show that across 20 countries, smokers were generally more likely to notice pictorial warnings than text-only warnings (Fig. 3). The proportion of male smokers who reported noticing warnings “often” was highest (83%) in Thailand (pictorial warnings on 55% of the front and back of the pack) and lowest (10%) in the Netherlands (with text-only warnings on the front and back of the pack).

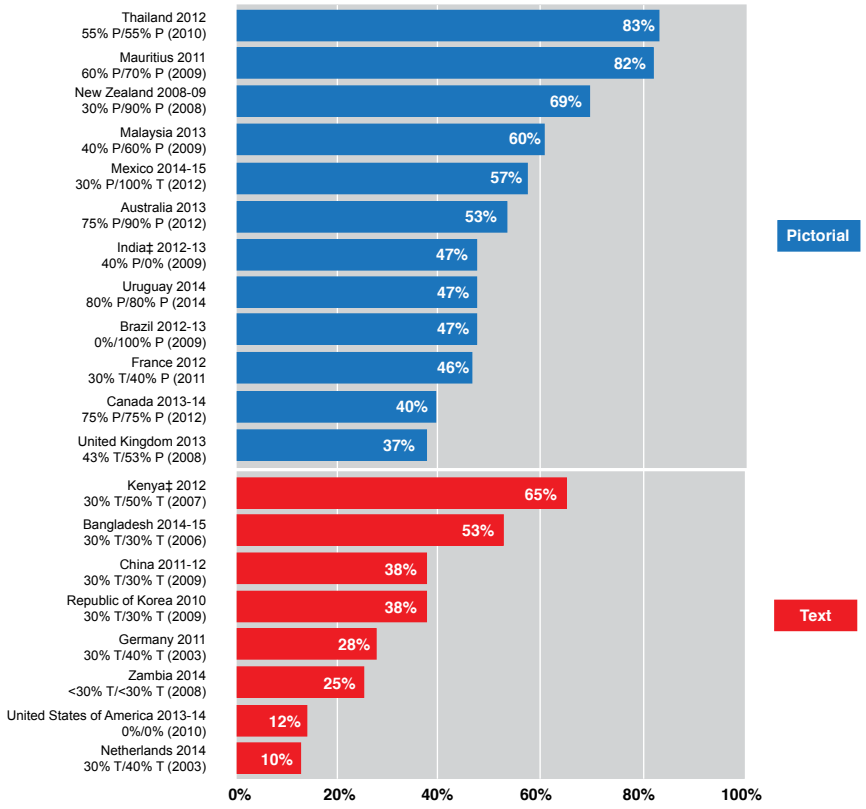


Fig. 3. Proportion of male smokers in 20 countries who “often” or “very often” noticed the warning labels on cigarette packs with pictorial or text-only health warnings

P = pictorial, T = text.

†“Smokers” refers to only cigarette users for all countries except Bangladesh, India, Zambia, and Kenya, where dual tobacco users (those users who reported smoking both cigarettes and bidis) and mixed tobacco users (those users who reported using both smoked tobacco and smokeless tobacco) were also included in the analysis.

‡In India and Kenya there was an extra filter that asked “As far as you know, do any smoked tobacco/cigarette packages in India/Kenya have warning labels?” If the respondent answered “no”, then noticing warning labels was set to “never”.

Results shown are for responses of “often” or “very often” except for the following: In Zambia, results are for responses of “often” or “regularly” In India and Kenya, results are for “often” or “whenever I smoke” In China, results are for “often” only as there was no “very often” option.

Pictorial health warnings encourage smokers to quit and help them to stay quit

- After pictorial warnings (50% front and back) were introduced in Canada in 2001, smokers who had read, thought about, and discussed the labels were more likely to have the intention to quit, and to have quit, made an attempt to quit or reduced their smoking at a three month follow-up (*24*). About one-third (31%) of former smokers reported that the warnings had motivated them to quit, and 27% reported that the warnings helped them to stay quit (*25*).
- After Thailand introduced pictorial warnings (50% front and back) in 2005, 53% of smokers reported that the warnings made them more likely to quit; this compares with 34% when warnings were text-only. There was no such increase in Malaysia, where warnings remained text-only over the same time period (Fig. 4). Thinking about the health risks of smoking, thinking about quitting, forgoing a cigarette and interest in quitting also predicted subsequent quit attempts in Thailand but not in Malaysia (*26,27*).

Fig. 4. Comparison of health warnings on cigarette packs in Malaysia and Thailand

Pictorial health warnings increase awareness of the harms of smoking

A study of smokers in Canada, the USA, the UK and Australia found that the large Canadian pictorial warnings (50% front and back) were more effective in informing smokers about the risks of smoking compared to the smaller text-only warnings in the other countries (*28*). Smokers in countries with warnings about specific health risks also had greater knowledge of those risks. A study of smokers in Australia, Canada and Mexico found that smokers had better knowledge of specific tobacco-related diseases that were included in pictorial warnings than diseases that were not included in the warnings (*29*).

Data from the Global Adult Tobacco Survey show that adults who noticed health warnings were more knowledgeable about the harms of smoking in 17 of 22 low- and middle-income countries (*30*). Adults in all 9 countries which used pictorial warnings had greater knowledge about tobacco-related diseases, compared to only 8 of 13 countries with text-only warnings.

Pictorial health warnings can prevent youth and young adults from starting to smoke

Studies from a number of countries have shown that pictorial health warnings are effective in discouraging youth from smoking. In a study on nonsmoking Canadian youth, between 20% and 67% reported that pictorial warnings (50% front and back) helped to prevent them from starting to smoke (*31*). Likewise, following the introduction of pictorial warnings (30% front, 90% back) in Australia, experimental and established youth smokers were more likely to attend to, and think and talk about the new warnings. Youth who talked about the warnings and gave up cigarettes also had less intention to smoke (*32*).

In a report from Greece, up to 84% of nonsmoking adolescents reported that proposed European Union pictorial warnings (43% front, 53% back) would be more effective in preventing them from initiating smoking than the existing text-only warnings (*33*). This is supported by the findings of an experimental study carried out in the USA, where 22 of the 36 pictorial warning labels proposed by the Food and Drug Administration in 2010 discouraged young adults from wanting to smoke more than the corresponding text-only labels (*34*).

Pictorial health warnings can help to reduce smoking prevalence and consumption

After the introduction of pictorial warnings (50% front and back) in Canada in 2001, there was a 12–20% reduction in adult smoking prevalence by 2009. It is estimated that if the USA had adopted similar pictorial warnings in 2012, there would have been a decrease of 5.3–8.6 million adult smokers in 2013 (*35*). In fact, pictorial warnings (50% front and back) in Canada significantly decreased the odds of being a smoker and significantly increased the odds of making a quit attempt (*36*). Following the introduction of pictorial warnings (50% front and back) in Singapore in 2004, 28% of smokers reported smoking fewer cigarettes as a result (*37*).

Global progress in implementing pictorial health warnings

Since September 2014, 77 countries/jurisdictions have passed laws requiring pictorial warnings on tobacco packages. This includes 23 countries/jurisdictions from the WHO European Region, 19 from the Region of the Americas, 14 from the Western Pacific Region, 12 from the Eastern Mediterranean Region, 5 from the South-East Asia Region, and 4 from the African Region (*38*).

A total of 54 countries/jurisdictions require that pictorial warnings cover at least 50% of the package front and back (on average), in line with Article 11 of the WHO FCTC. This includes:

- nearly half of all countries in the WHO Region of the Americas (49%) and the Eastern Mediterranean Region (45%);
- about one third of all countries in the WHO South-East Asia Region (36%) and the Western Pacific Region (32%);
- less than one fifth of all countries in the WHO European Region (13%) and the African Region (9%) (Table 1).

Table 1. Distribution of countries/jurisdictions within each WHO Region requiring pictorial health warnings that cover at least 50% of the package front and back (on average) (*38*)

WHO Region	Total no. of countries	Compliant with the 50% warnings	
		No	%
Americas	35	17	49
Eastern Mediterranean	22	10	45
South-East Asia	11	4	36
Western Pacific	37	12	32
European	53	7	13
African	47	4	9

Currently, Thailand and India have the world's largest pictorial warnings at 85% of the front and back of the pack, followed by Australia at 82.5% (75% front, 90% back), Uruguay and Sri Lanka at 80% front and back, and Brunei, Canada, Myanmar and Nepal at 75% front and back (*38–40*). Nepal has adopted legislation to increase the size of its pictorial warnings to 90% of the package front and back, but as of July 2016, this requirement has yet to be fully implemented. The Lao People's Democratic Republic has requirements for 75% front and back pictorial warnings that will be fully enforced in September 2016 (*41*). In 2017, Vanuatu will implement the world's largest pictorial warnings, covering 90% of the front and back of the pack (*42*).

In contrast, none of the 13 countries (of 22 countries in total) in the WHO Eastern Mediterranean Region that require pictorial warnings have gone beyond 50% of both the front and back principal display areas (Table 2), as recommended under Article 11 guidelines; seven countries require text-only warnings (six of these countries have text-only warnings that fail to meet the WHO FCTC minimum recommended size of 30% of the front and back principal display areas); and two countries do not require any health warnings (*38*).

Table 2. Status of health warnings in the Eastern Mediterranean Region (*38,89*).

Country	Date of WHO FCTC ratification/ accession	WHO implementation score (n = 5)[a]	Mandated health warnings	Size of health warnings (front, back)
Djibouti	31 Jul 2005	5	Pictorial	50%, 50%
Egypt	25 Feb 2005	5	Pictorial	50%, 50%
Iran (Islamic Republic of)	6 Nov 2005	5	Pictorial	50%, 50%
Bahrain[b]	20 Mar 2007	4	Pictorial	50%, 50%
Kuwait	12 May 2006	4	Pictorial	50%, 50%
Oman[b]	9 Nov 2005	4	Pictorial	50%, 50%
Qatar	23 Jul 2004	4	Pictorial	50%, 50%
Saudi Arabia	9 May 2005	4	Pictorial	50%, 50%
United Arab Emirates	7 Nov 2005	4	Pictorial	50%, 50%
Yemen	22 Feb 2007	4	Pictorial	50%, 50%
Pakistan	3 Nov 2004	4	Pictorial	40%, 40%
Jordan[c]	7 Dec 2005	3	Pictorial	40%, 40%
Lebanon[c]	19 Aug 2004	3	Text-only	40%, 40%
Iraq	17 Mar 2008	3	Pictorial	30%, 30%
Libya	7 Jun 2005	2	Text-only	50%, 0%
Sudan	31 Oct 2005	2	Text-only	30%, 0%
West Bank and Gaza Strip[d]	–	2	Text-only	20%, 0%
Morocco[e]	–	2	Text-only	0%, 10%
Syrian Arab Republic	22 Nov 2004	2	Text-only	–
Tunisia	7 Jun 2010	2	Text-only	–
Afghanistan	13 Aug 2010	2	None	–
Somalia[d]	–	2	None	–

FCTC = Framework Convention on Tobacco Control.

[a]Groupings for each country's achievement in the implementation of health warnings are calculated using the average percentage of the total cigarette pack surface covered by warnings in combination with the following appropriate warning characteristics: specific health warnings are mandated; appearing on individual packages as well as on any outside packaging and

labelling used in retail sale; describing specific harmful effects of tobacco use on health; are large, clear, visible and legible (e.g. specific colours and font style and sizes are mandated); rotate; include pictures or pictograms; and written in (all) the principal language(s) of the country. Grouping scores for the implementation of health warnings range from 1 to 5 as follows: 5 = large warnings (average front and back of the package is at least 50%) with all appropriate characteristics; 4 = medium size warnings (average of front and back of package is between 30% and 49%) with all appropriate characteristics OR large warnings missing some appropriate characteristics; 3 = medium size warnings missing some appropriate characteristics OR large warnings missing many appropriate characteristics; 2 = no warnings or small warnings (average of front and back of package is less than 30%); 1 = no data reported.

[b]Bahrain and Oman have not signed the WHO FCTC but have formally stated their consent to be bound by it through accession of the Treaty.

[c]The size of health warnings including a border is 43% front and back in Jordan and 45% front back in Lebanon.

[d]The West Bank and Gaza Strip and Somalia are not parties to the WHO FCTC.

[e]Morocco signed the WHO FCTC on 16 April 2004 but has yet to ratify the Treaty.

Industry interference with the implementation of pictorial health warnings

The tobacco industry continues to intimidate governments with litigation to obstruct, delay and weaken the implementation of large pictorial warnings on tobacco product packaging worldwide. However, governments in a growing number of countries have stood up to the industry and achieved legal victories. For example, the following countries have successfully defended their legislation to increase the size of pictorial warnings beyond the WHO FCTC minimum recommended size of 50%:

- Thailand: from 55% to 85% front and back (Box 1) (*43,44*),
- India: from 40% front-only to 85% front and back (*45,46*),
- Canada: from 50% to 75% front and back (*47*),
- Uruguay: from 50% to 80% front and back (Box 2) (*48*).

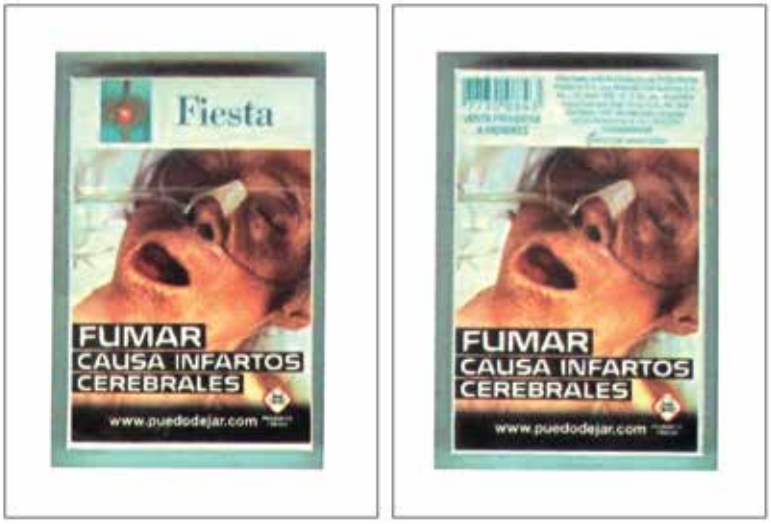
Box 1. Overcoming industry challenge to larger pictorial health warnings in Thailand

On 8 March 2013, the Ministry of Health in Thailand approved new regulations to increase the size of required pictorial warnings from 55% to 85% of the front and back of cigarette packs. The larger pictorial warnings were scheduled to come into force on 2 October 2013 but implementation was delayed after tobacco manufacturers initiated legal challenges against the new regulations. On 29 May 2014, the Supreme Administrative Court upheld the new regulations and reversed a lower court ruling that had temporarily suspended the implementation of the new, larger, pictorial warnings (*44,49–51*).

Thailand's 2014 pictorial health warnings (85% front, 85% back)

Box 2. Overcoming industry challenge to larger pictorial health warnings in Uruguay

On 8 July 2016, the Government of Uruguay achieved a landmark legal victory against Philip Morris International (PMI) to uphold legislation requiring 80% front and back pictorial warnings on tobacco product packaging and a ban on brand variants (eliminating brand families to address evidence that some variants can mislead consumers and falsely imply that some cigarettes are less harmful than others). The World Bank's International Centre for Settlement of Investment Disputes ruled in favour of Uruguay and rejected PMI's claim that the packaging and labelling measures were in violation of a bilateral investment treaty (BIT) between Uruguay and Switzerland, where PMI's corporate headquarters is located (*59,60*). This historic ruling reaffirms the right of countries to implement strong evidence-based policies to protect public health, and is expected to encourage governments around the world to stand up to industry tactics that aim to undermine global progress in tobacco control.



Uruguay's 2014 pictorial health warnings (80% front, 80% back)

Other countries have also overcome legal challenges to block the introduction of pictorial warnings: Sri Lanka (80% front and back) (*47,52*), Nepal (75% front and back) (*53*), and the Philippines (50% front back) (*54,55*).

Nevertheless, there have been some setbacks. For example, in February 2015 Pakistan announced new legislation that would increase the size of required pictorial warnings from 40% to 85% of the front and back of tobacco packages. The new regulations were scheduled to come into force on 30 March 2015, but tobacco industry lobbying has delayed their implementation (*56,57*). In August 2015, civil society groups issued a high court petition to prevent the Ministry of National Health Services, Regulation and Coordination from weakening the new legislation by reducing the size of the health warnings to 50% and adopting a phased approach to increasing the size of the warnings by 10% each year (*58*). The new warnings are still pending and have yet to be implemented in Pakistan.

Research evidence on effectiveness of large (> 50% front and back) pictorial health warnings

Large pictorial health warnings are more effective than smaller warnings

Experimental studies commissioned by Health Canada show that large pictorial warnings that exceed the WHO FCTC minimum recommended size of 50% of both the front and back principal display areas are more effective than smaller warnings, with maximum impact for warnings that are 90% or larger as the following examples from Canadian studies demonstrate.

- Increasing the size of pictorial warnings from 50% to 75%, 90% and 100% (both front and back) enhanced their impact. Larger warnings were rated by adult smokers, youth smokers, and youth nonsmokers as being more effective for communicating health risks, changing social attitudes towards smoking, reducing smoking initiation and helping smokers to quit. Pictorial warnings that covered at least 90% of the pack delivered the strongest impact (*61,62*).
- Pictorial warnings that covered 100% of both the front and back of cigarette packs were rated by Canadian adult and youth smokers as most effective in providing information about the health effects of tobacco and encouraging smokers to reduce tobacco use (*63,64*).

Plain/standardized packaging enhances the impact of large pictorial health warnings

Experimental studies provide evidence that the removal of branding elements through plain/standardized packaging can work in combination with large pictorial warnings to reduce brand appeal, demand for cigarettes and perceptions of positive pack characteristics among smokers. These studies show that:

- even when the front of the cigarette pack was covered with a 100% pictorial warning, branded packs had more brand appeal and were more likely to be purchased than plain packs (*65*);
- demand was significantly lower for both plain and branded packs with pictorial warnings (50% front and back) than branded packs with text-only warnings (side or 50% front and back) and demand was lowest for plain packs with pictorial warnings (*66*);
- progressive removal of brand elements such as colour, branded fonts and imagery from cigarette packs leads to lower brand appeal, less-positive attributions of the pack by a typical smoker, and more-negative expectations of cigarette taste among adolescents. Increasing the size of the pictorial warning from 30% to 80% of the front of the plainest pack further reduced perceptions of positive pack characteristics among adolescents who were established smokers, experimenters or susceptible nonsmokers (*67*).

Pictorial health warnings that cover at least 50% of the package are more effective than text-only warnings

Population-based studies show that replacing text-only warnings with pictorial warnings that cover at least 50% of the front and back of the package (on average) increases the salience of the warnings and cessation-related thoughts and behaviours, and also increases avoidance of the warnings, which has been shown to predict future quit attempts.

After text-only warnings were replaced with pictorial warnings (30% front, 90% back) (Fig. 5) in Australia in 2006, there was an increase in the proportion of adult smokers who noticed and read the warnings, had quit-related thoughts, gave up cigarettes and made efforts to avoid the warnings. The Australian (30% front, 90% back) and Canadian (50% front and back) pictorial warnings also

stimulated more thoughts of harm and quitting, and elicited greater avoidance among adult smokers compared to enhanced UK (30% front, 40% back) text-only warnings (*23*).

The new packs also prominently displayed the quitline number (Fig. 5), and after their introduction there was a sustained increase in the number of calls to the quitline, with the increase exceeding that explained by accompanying mass media campaigns alone (*68*).

Fig. 5. Example of Australia's 2006 pictorial health warnings (30% front, 90% back) including the quitline number

In February 2008, text-only warnings on cigarette packs in New Zealand were replaced with pictorial warnings (30% front, 90% back) that also included quitline information (Fig. 6). The percentage of new quitline callers increased from 12% to 27% over the first month after the introduction of the new packs, and remained steady up to 2011 (*69*).

Fig. 6 Example of New Zealand's 2008 pictorial health warnings (30% front, 90% back), including the quitline number

The introduction of pictorial warnings in Mauritius (60% front, 70% back) in 2009 resulted in more Mauritian smokers noticing the health warnings (from 56.4% of smokers before pictorial warnings to 83.8% after pictorial); thinking about the health risks of smoking, thinking about quitting smoking, giving up a cigarette and avoiding the warnings (Fig. 7) (*70*).

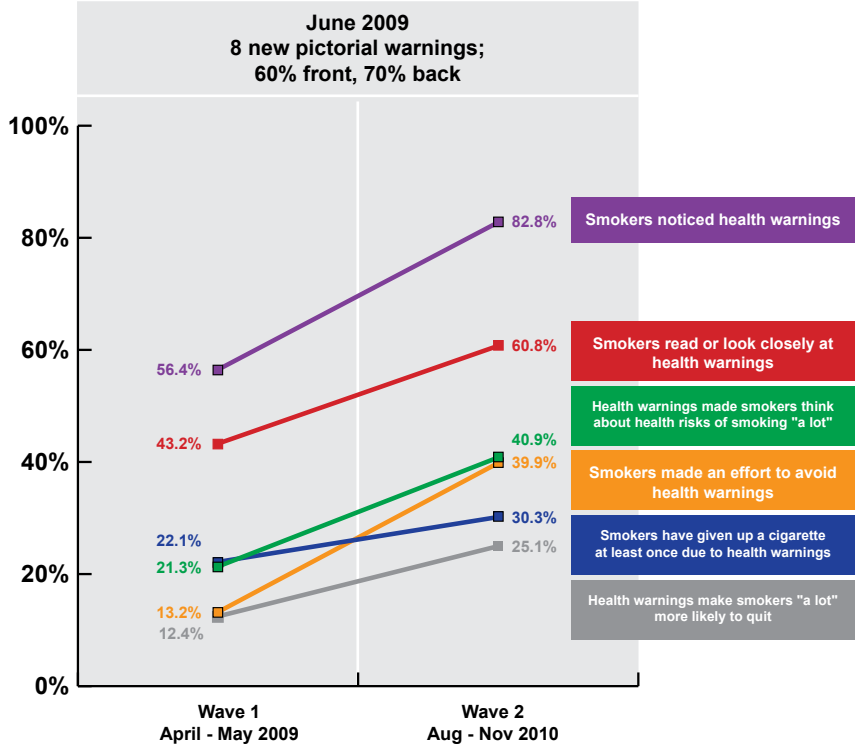


Fig. 7 Impact of switching from text-only warnings (Wave 1) to pictorial health warnings (Wave 2) in Mauritius (*70*)

Increasing the size of pictorial health warnings beyond 50% of the package further increases health warning impact

Recent evidence indicates that countries that have already implemented pictorial warnings covering 50% of the package front and back (on average) should increase the size of the warnings even further to maximize impact. However, the increases in size should be large in order to be most effective.

After Uruguay increased the size of their pictorial warnings from 50% to 80% of the front and back of the pack, there was a significant increase in the percentage of adult smokers who reported noticing the warnings, reading the warnings, thinking about the risks of smoking, thinking about quitting, avoiding the warnings and forgoing a cigarette (Fig. 8) (*71*).

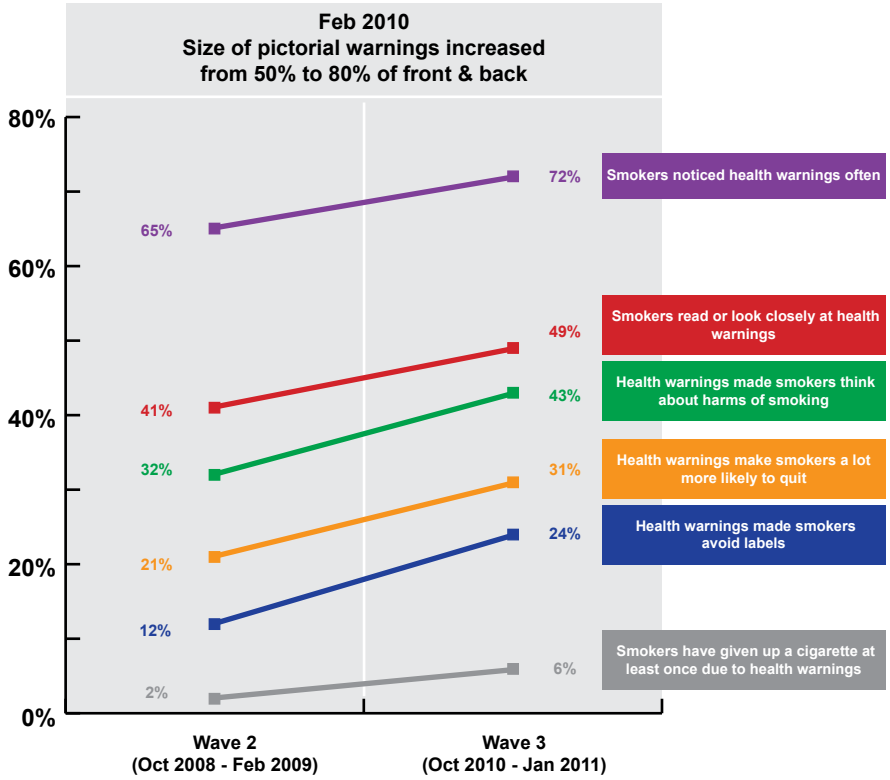


Fig. 8. Impact of the increase in pictorial health warning label size from 50% to 80% of the front and back of the pack in Uruguay (71)

In contrast, Thailand's minimal increase to the size of pictorial health warnings from 50% to 55% of the front and back of the pack in 2010 had no sustained impact on warning label effectiveness, including salience of the warnings, thinking about health risks, being more likely to quit, forgoing cigarettes and avoiding warnings (*72*). In 2014, Thailand introduced 85% front and back pictorial warnings, but the impact of these new, larger warnings has not yet been evaluated.

In 2012, after 10 years of having the same set of pictorial warnings on 50% of the pack, Canada introduced a new set of 75% front and back pictorial warnings (Fig.

9). Trends in warning label impact measures provide evidence that the new, larger warnings are more effective (Green AC, unpublished doctoral dissertation, 2016):

Fig. 9. Canada's lung cancer pictorial health warning in 2001 (50% front and back) compared to 2012 (75% front and back)

The Labels Impact Index, a composite measure that combines noticing warnings, thinking about health risks of smoking, thinking about quitting and forgoing a cigarette, showed an increase in overall warning label impact in 2013–2014, one–two years after the new warnings were implemented (Fig. 10). In this period, more smokers noticed the warnings, thought about the health risks of smoking and avoided the warnings (Fig. 11).

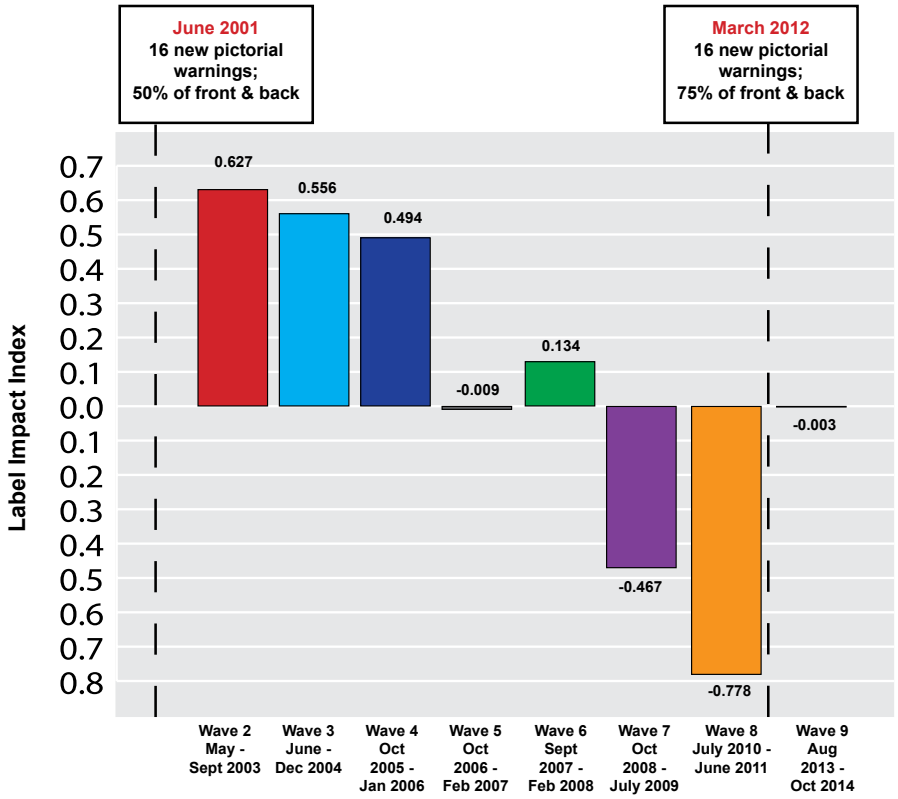


Fig. 10 Labels Impact Index as a measure of effectiveness of pictorial health warnings in Canada, 2003–2014

Note: Results are adjusted for age, sex, smoking status (daily/non-daily), and time-in-sample effects. The LII was calculated by normalizing scores on four measures of warning label impact (noticing warnings, thinking about harms and thinking about quitting because of warnings, and forgoing a cigarette because of warnings), and forming a weighted composite. Scores were then added together such that LII = (salience × 1) + (harm × 2) + (quitting × 2) + (forgo × 3). Higher scores on the LII represent greater warning label impact.

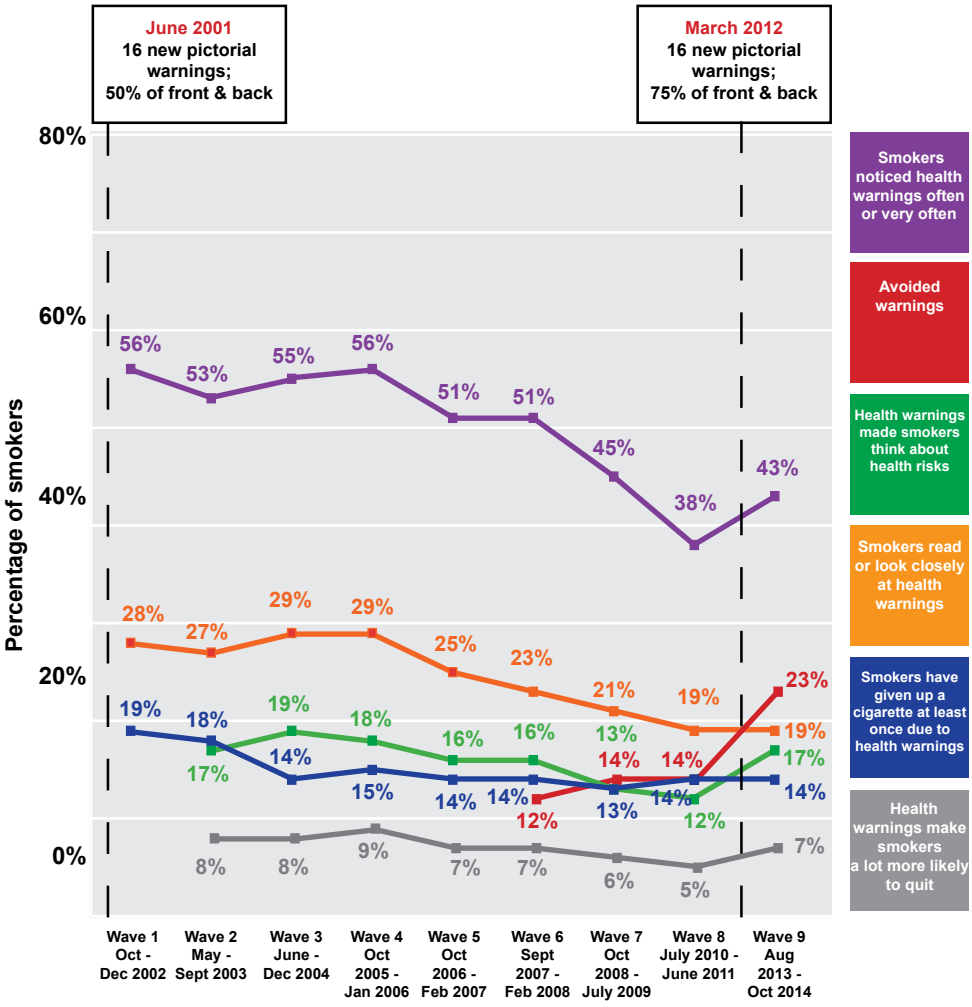


Fig. 11 Impact of pictorial health warnings on smokers' behaviours and cognitions after increasing the size of warnings from 50% to 75% of the front and back of the pack in Canada

*These questions were asked about the previous 30 days.

†This question was asked differently at waves 1–5, so results are shown only for waves 6–9.

‡Only those respondents who said they noticed warnings at least "rarely" in the last 30 days were asked this question.

The Canadian government has announced its commitment to moving forward with plain packaging. Based on Australia's experience, implementing plain packaging in combination with even larger pictorial warnings would offer the greatest public health impact.

Impact of large pictorial health warnings decreases over time

Article 11 guidelines recommend rotating warnings on a regular basis to prevent "wear-out" of the health warnings. There is evidence of wear-out effects in countries where the same set of pictorial warnings have appeared on cigarette packs for extended periods of time.

- There was initially a significant increase in warning label effectiveness, as measured by the Labels Impact Index score in the 10–12 month period after pictorial warnings (60% front, 70% back) were introduced in Mauritius. However, there was a subsequent decline in the Labels Impact Index score in the 20–21 month period after the same pictorial warnings had been in circulation (*73*).
- In Canada, there was a significant decline in the effectiveness of 50% front and back pictorial warnings that had been in place since 2001, as measured by the Labels Impact Index score over 7 survey waves from 2003–2011. The greatest degree of wear-out was found for smokers' self-reported noticing of the warnings (*74*).

Large pictorial health warnings are more effective when displayed on both the front and back of cigarette packs

A study of health warning labels in Brazil, Mexico and Uruguay found that warnings were the most salient in Uruguay, the only country with pictorial warnings covering both sides (50% front and back) of cigarette packs at the time of the survey. There was no difference in the salience of pictorial warnings covering 100% of the back of packs in Brazil and text-only warnings covering 50% of the back of packs in Mexico (*75*).

After pictorial warnings were introduced on 40% of the back of cigarette packs only in the UK in 2009 (no change to 30% text-only warning on the front of packs), there was no change in the percentage of smokers who reported noticing the warnings or giving up a cigarette (76), and after text-only warnings (30% front, 40% back) in France were replaced with pictorial warnings only on the back (40%) in 2011 (Fig. 12), there was actually a decrease in the percentage of smokers who reported thinking about the harms of smoking (from 76% to 71%), noticing the warnings (from 57% to 49%), forgoing a cigarette (from 25% to 19%) and thinking about quitting (from 23% to 20%) (*76*).

Fig. 12. France's 2011 health warning labels appeared on 30% of the front (text-only) and 40% of the back (pictorial) of cigarette packs

Introducing plain/standardized packaging enhances the impact of large pictorial health warnings

In December 2012, Australia became the first country in the world to implement plain/standardized packaging. A new set of larger pictorial warnings (75% front, 90% back) were also introduced to replace the first set of pictorial warnings (30% front, 90% back) that had been in circulation since 2006.

There is clear evidence that increasing the size of pictorial warnings on the front of the pack in conjunction with the implementation of plain/standardized packaging in Australia has been effective in:

- reducing the promotional appeal of tobacco packages (*77,78*);
- reducing the appeal of smoking (*79*);
- increasing support for plain/standardized packaging (*79*);
- increasing the salience of and attention orientation towards the health warnings (*77,80*);
- stimulating smoking harm-related thoughts (*80*);
- increasing avoidant behaviours toward the pack (*77,78,80,81*);
- increasing cessation-related cognitions and behaviours (*77–79,81,82*);
- reducing adult smoking prevalence from 15.1% to 12.8% in the second half of 2013, one year after plain/standardized packaging was first introduced (*83*).

A post-implementation review by the Australian Health Department in February 2016 concluded that tobacco plain/standardized packaging is achieving its primary objective of improving public health. There is strong evidence that the implementation of plain/standardized packaging has decreased the appeal of tobacco products, increased the effectiveness of health warnings and reduced the ability of tobacco product packaging to mislead consumers about the harmful effects of tobacco use. In addition, there was an estimated 0.55 percentage point reduction in smoking prevalence over the 34-month period after plain/standardized packaging was implemented (Fig. 13) (*84*).

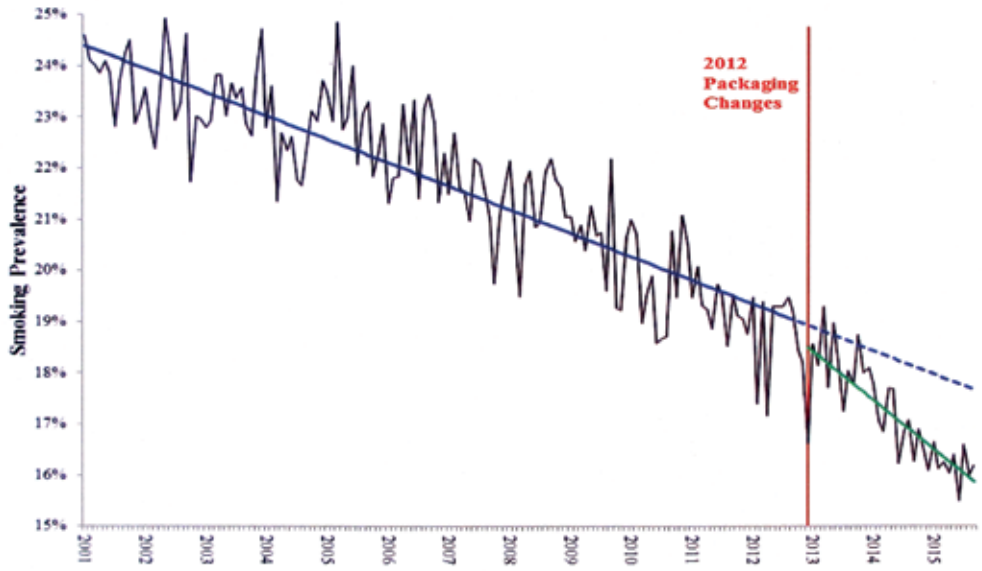


Fig. 13. Impact of plain/standardized packaging on smoking prevalence in Australia (January 2001–September 2015) (84)

Following Australia's lead, a growing number of countries have developed or implemented legislation for plain/standardized packaging.

- In 2015, France, Ireland and the UK adopted legislation for plain/standardized packaging. In France and the UK all cigarette packs manufactured after 20 May 2016 must be in plain/standardized packages. Compliance at the retail level will be required as of 1 January 2017 in France and 20 May 2017 in the UK. Ireland is awaiting a commencement date (*85,86*).
- On 20 May 2015, the European Union's 2014 Tobacco Products Directive came into force; this permits all 28 European Union member states to implement plain/standardized packaging (*87*).
- Plain/standardized packaging legislation is currently under formal consideration in a number of countries, including Belgium, Canada, Finland, Hungary, New Zealand, Norway, Singapore, Slovenia, South Africa and Sweden (*85*).
- Plain/standardized packaging legislation is under active consideration in several countries, including Burkina Faso, Chile, New Zealand, Panama and Turkey (*88*).

Waterpipe tobacco: global trends in use and implications for packaging and labelling policies

Waterpipe smoking has increased steadily in countries around the world, including many countries in the WHO Eastern Mediterranean Region, where the use of flavoured waterpipe tobacco has become increasingly popular among youth and females (*89–92*). Epidemiological studies have documented the growing use of waterpipe tobacco among youth in this region. For example, the prevalence of waterpipe smoking among youth has surpassed cigarette smoking as the most common form of tobacco use in the following countries: Bahrain, Iran (Islamic Republic of), Jordan, Kuwait, Lebanon, Oman, Qatar, Syrian Arab Republic, United Arab Emirates and Yemen (*93–97*).

Waterpipe smoking is highly addictive, and is associated with health harms, including pulmonary disease, coronary heart disease and pregnancy-related complications (*90,93,98–100*). Nevertheless, many users have low awareness of the adverse health risks associated with waterpipe smoking (*101–104*). There is also a widespread misperception among waterpipe users that that the passage of smoke through water prior to inhalation makes it cleaner and less harmful than cigarette smoking (*93,98,104–106*).

WHO Framework Convention on Tobacco Control Article 11 guidelines: policy actions for waterpipe tobacco

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 (*20*).

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. In addition to addressing existing gaps in research on all aspects of waterpipe smoking, TobReg also recommends that governments mandate health warnings on waterpipe devices, packaging and accessories in accordance with Article 11 of the WHO FCTC (*107*).

On 9 August 2011, the Gulf Cooperation Council adopted a standard for the labelling of tobacco product packaging, which includes a requirement for pictorial warnings covering 50% of both the front and back of all packages, including those for waterpipe tobacco. Since 9 August 2012, pictorial warnings have been required on cigarette packages in all six Gulf Cooperation Council member countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates). In 2014,

Bahrain, Oman, and Saudi Arabia reported that they were in the process of implementing pictorial warnings that meet all Gulf Cooperation Council standard requirements (*108*). On 10 May 2012, the Russian Federation also passed legislation mandating pictorial warnings (30% front, 50% back) on all tobacco product packaging, including those for waterpipe tobacco (*109,110*). A 2015 global review of waterpipe tobacco smoking legislation and policy enactment identified three countries (Israel, Lebanon, and Turkey) with waterpipe-specific laws on health warnings (*111*).

There is some evidence that existing waterpipe-specific health warnings do not align with Article 11 and its guidelines. For example, results of a 2010 study that evaluated health warnings on waterpipe tobacco products and related accessories that originated from 9 different countries (*112*) showed that:

- health warnings on all 74 waterpipe tobacco packages were text-only, and covered only 3.5% (on average) of the total surface of the package;
- only six of the 74 waterpipe products had health warnings on both the front and back of packs;
- of the 34 waterpipe-related accessories (filters, mouthpieces, aluminium foils, charcoal) that were collected, none of the aluminium foils, mouthpieces and charcoals included any warning labels, and only three of the eight filters had a generic health warning label that appeared on the side or back of packs.

Given that the majority of waterpipe smokers do not come into contact with product packs, extending waterpipe-specific health warnings beyond packaging is important (*113*). As of 2015, only one country, Turkey, requires the display of a composite warning that includes a pictorial warning and an accompanying text warning that covers at least 65% of both the front and back surfaces of waterpipe bottles (effective 12 July 2013) (Fig. 14) (*111,114*).

Fig. 14. Example of pictorial health warnings on waterpipes in Turkey (*115*)

Waterpipe-specific health warnings in Turkey have not been evaluated to date. However, a 2015 study suggests that comprehensive tobacco control policies that extend to all types of tobacco products, including waterpipe tobacco (e.g. pictorial and text health warnings on waterpipe bottles, ban on waterpipe smoking in cafés, ban on sale of waterpipe tobacco to minors), have successfully reduced overall smoking rates in Turkey. Specifically, the prevalence of waterpipe tobacco smoking decreased from 2.3% in 2008 to 0.8% in 2012, which represents a 65% relative decline. The prevalence of cigarette smoking also decreased from 2008 to 2012, but at a lower rate (13.5% relative decline) (*115*).

Conclusions

- Pictorial health warnings are more effective than text-only warnings for encouraging smoking cessation, increasing health knowledge, preventing the uptake of smoking among youth, and reducing smoking prevalence.
- Since the entry into force of the WHO FCTC in 2005, there has been considerable global progress in the implementation of effective tobacco health warnings. As of September 2014, a total of 54 countries/jurisdictions require pictorial health warnings covering at least 50% of both the front and back of the package (on average).
- Studies have consistently shown that pictorial health warnings have the greatest impact when they are large (cover 50% or more of the principal display areas), appear on both the front and back of tobacco product packaging, and are rotated on a regular basis.
- There is also emerging evidence for the effectiveness of pictorial health warnings that exceed the minimum size standards of the WHO FCTC. Recent studies from Australia have shown that following the implementation of plain/standardized packaging in conjunction with large pictorial health warnings (75% front, 90% back), there was a significant reduction in brand appeal and adult smoking prevalence along with an increase in smokers' self-reported noticing of the warnings and cessation-related cognitions and behaviours. Evidence from Uruguay has also shown that after the size of pictorial health warnings was increased from 50% to 80% of the front and back of the pack, there was a significant increase in the percentage of adult smokers who noticed and read the warnings, thought about the risks of smoking and quitting, avoided the warnings and gave up a cigarette.
- The tobacco industry continues to interfere with the implementation of effective pictorial health warnings. However, governments around the world are standing up to the industry, and domestic courts have upheld legislation mandating the implementation of pictorial health warnings that exceed the WHO FCTC minimum recommended size of 50% of the front and back principal display areas in several countries, including Canada (75% front and back), India (85% front and back), Nepal (75% front and back), Sri Lanka (80% front and back) and Thailand (85% front and back). The Government of Uruguay has also successfully defended their strong laws requiring pictorial health warnings on 80% of the front and back of tobacco product packaging and single brand presentation. On 8 July 2016, an international arbitration tribunal of the World Bank dismissed the claim by Philip Morris International that these two laws had breached the terms of a bilateral investment treaty between Uruguay and Switzerland. This landmark ruling sets an important precedent for the implementation of WHO FCTC-compliant tobacco packaging and labelling measures by other countries around the world.

- Over the last two decades, waterpipe smoking has steadily increased in all WHO regions, with particularly sharp increases among youth in the Eastern Mediterranean Region. Article 11 guidelines recommend the extension of health warnings and messages to all types of tobacco products. However, global progress in the implementation of waterpipe-specific policies has been slow, and existing health warnings on waterpipe tobacco packaging fail to comply with Article 11 and its guidelines (i.e. they are text-only, cover only 3.5% (on average) of packs, and most are displayed on the side of packs).

Recommendations

1. Pictorial health warnings should cover more than 50% of both the front and back of all tobacco product packaging.
2. Pictorial health warnings should cover as much of the front and back of tobacco product packs as possible, and should optimally aim to cover 100% of both the front and back of plain/standardized packs.
3. Multiple pictorial warnings and messages that are revised periodically should be used to prevent wear-out and maintain effectiveness.
4. Countries that currently require pictorial health warnings that comply with the WHO FCTC minimum recommended size of 50% of the package front and back should consider implementing significant increases to the size of existing pictorial warnings (as India, Thailand and Uruguay have done), and implementing larger pictorial warnings in conjunction with plain/standardized packaging (as Australia has done).
5. Countries should not be intimidated by the threat of litigation by the tobacco industry, and should stand together to support the implementation of effective tobacco packaging and labelling measures that prioritize the protection of public health.
6. Countries should take steps to develop, implement, and evaluate the impact of evidence-based packaging and labelling measures that apply specifically to waterpipe tobacco products, particularly in the WHO Eastern Mediterranean Region, where waterpipe smoking has steadily increased among youth over the past two decades.

References

1. Eriksen M, Mackay J, Schluger N, Islami F, Drope J. The tobacco atlas, 5th edn. Atlanta: American Cancer Society; 2015 (http://3pk43x313ggr4cy0lh3tctjh.wpengine.netdna-cdn.com/wp-content/uploads/2015/03/TA5_2015_WEB.pdf, accessed 4 July 2017).
2. WHO report on the global tobacco epidemic, 2011: warning about the dangers of tobacco. Geneva: World Health Organization; 2013 (http://www.who.int/tobacco/global_report/2011/en/, accessed 4 July 2017).
3. WHO global report: mortality attributable to tobacco. Geneva: World Health Organization; 2012 (http://apps.who.int/iris/bitstream/10665/44815/1/9789241564434_eng.pdf, accessed 4 July 2017).
4. Finney Rutten LJ, Augustson EM, Moser RP, Beckjord EB, Hesse BW. Smoking knowledge and behavior in the United States: sociodemographic, smoking status, and geographic patterns. Nicotine Tob Res. 2008 Oct;10(10):1559–70. DOI:10.1080/14622200802325873
5. Siahpush M, McNeill A, Hammond D, Fong GT. Socioeconomic and country variations in knowledge of health risks of tobacco smoking and toxic constituents of smoke: results from the 2002 International Tobacco Control (ITC) Four Country Survey. Tob Control. 2006 Jun;15(Suppl. 3):iii65–70. DOI:10.1136/tc.2005.013276
6. Weinstein N, Slovic P, Waters E, Gibson G. Public understanding of the illnesses caused by cigarette smoking. Nicotine Tob Res. 2004 Apr;6(2):349–55. DOI:10.1080/14622200410001676459
7. Strecher VJ, Kreuter MW, Kobrin SC. Do cigarette smokers have unrealistic perceptions of their heart attack, cancer, and stroke risks? J Behav Med. 1995;18(1):45–54.
8. Weinstein ND, Marcus SE, Moser RP. Smokers' unrealistic optimism about their risk. Tob Control. 2005 Feb;14(1):55–9. DOI:10.1136/tc.2004.008375
9. Borland R. What do people's estimates of smoking related risk mean? Psychol Health. 1997;12(4):513–21.
10. The health consequences of smoking—50 years of progress: a report of the Surgeon General. Atlanta (GA): Centers for Disease Control and Prevention; 2014:17.
11. Jha P, Ramasundarahettige C, Landsman V, Rostron B, Thun M, Anderson RN, et al. 21st-century hazards of smoking and benefits of cessation in the United States. N Engl J Med. 2013;368(4):341–50. DOI:10.1056/NEJMsa1211128
12. Doll R, Peto R, Boreham J, Sutherland I. Mortality in relation to smoking: 50 years' observations on male British doctors. BMJ. 2004 Jun;328(7455):1519. DOI:10.1136/bmj.38142.554479.AE

13. Hammond D. Health warning messages on tobacco products: a review. Tob Control. 2011 Sep;20(5):327–37. DOI:10.1136/tc.2010.037630

14. Brewer NT, Hall MG, Lee JG, Peebles K, Noar SM, Ribisl KM. Testing warning messages on smokers' cigarette packages: a standardised protocol. Tob Control. 2016 Mar;25(2):153–9. DOI:10.1136/tobaccocontrol-2014-051661

15. 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 May;25(3):341–54. DOI:10.1136/tobaccocontrol-2014-051978

16. Moodie C, Hastings G. Tobacco packaging as promotion. Tob Control. 2010 Apr;19(2):168–70.

17. Wakefield M, Morley C, Horan JK, Cummings KM. The cigarette pack as image: new evidence from tobacco industry documents. Tob Control. 2002 Mar;11(Suppl. 1):I73–80.

18. Slade J. Cover essay: the pack as advertisement. Tob Control. 1997;6:169–70.

19. WHO Framework Convention on Tobacco Control. Geneva: World Health Organization; 2005 (http://apps.who.int/iris/bitstream/10665/42811/1/9241591013.pdf, accessed 5 July 2016).

20. Guidelines for implementation of Article 11 of the WHO Framework Convention on Tobacco Control (packaging and labelling of tobacco products). Geneva: World Health Organization; 2008 (http://www.who.int/fctc/guidelines/adopted/article_11/en/, accessed 5 July 2016).

21. Hammond D, Fong GT, Borland R, Cummings KM, McNeill A, Driezen P. Text and graphic warnings on cigarette packages: findings from the international tobacco control four country study. Am J Prev Med. 2007;32(3):202–9. DOI:10.1016/j.amepre.2006.11.011

22. Thrasher JF, Hammond D, Fong GT, Arillo-Santillán E. Smokers' reactions to cigarette package warnings with graphic imagery and with only text: a comparison between Mexico and Canada. Salud Pública de Mexico. 2007;49:s233–40.

23. Borland R, Wilson N, Fong GT, Hammond D, Cummings KM, Yong HH, et al. Impact of graphic and text warnings on cigarette packs: findings from four countries over five years. Tob Control. 2009 Oct;18(5):358–64. DOI:10.1136/tc.2008.028043

24. Hammond D, Fong GT, McDonald PW, Cameron R, Brown KS. Impact of the graphic Canadian warning labels on adult smoking behaviour. Tob Control. 2003 Dec;12(4):391–5.

25. Hammond D, McDonald PW, Fong GT, Brown KS, Cameron R. The impact of cigarette warning labels and smoke-free bylaws on smoking cessation: evidence from former smokers. Can J Public Health. 2004;95(3):201–4.

26. International Tobacco Control Policy Evaluation Project. Tobacco warning labels: evidence and recommendations from the ITC project. Waterloo, Ontario, Canada: University of Waterloo; 2009 (FCTC Article 11; http://www.itcproject.org/files/ITC_Tobacco_Labels_Bro_V3.pdf, accessed 9 July 2016).

27. Fathelrahman AI, Li L, Borland R, Yong H, Omar M, Awang 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(1):1. DOI:10.1186/1617-9625-11-20

28. Hammond D, Fong GT, McNeill A, Borland R, Cummings KM. 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 Jun;15(Suppl. 3):iii19–25. DOI:10.1136/tc.2005.012294

29. Swayampakala K, Thrasher JF, Hammond D, Yong HH, Bansal-Travers M, Krugman D, et al. Pictorial health warning label content and smokers' understanding of smoking-related risks – a cross-country comparison. Health Educ Res. 2015 Feb;30(1):35–45. DOI:10.1093/her/cyu022

30. Chiosi JJ, Andes L, Asma S, Palipudi K, McAfee T, GATS Regional and Country Authors, et al. Warning about the harms of tobacco use in 22 countries: findings from a cross-sectional household survey. Tob Control. 2016 Jul;25(4):393–401. DOI:10.1136/tobaccocontrol-2014-052047

31. Wave 12 Surveys (prepared for Health Canada). The health effects of tobacco and health warning messages on cigarette packages – survey of youth. Toronto, Canada: Environics Research Group; 2007.

32. White V, Webster B, Wakefield M. Do graphic health warning labels have an impact on adolescents' smoking-related beliefs and behaviours? Addiction. 2008;103(9):1562–71. DOI:10.1111/j.1360-0443.2008.02294.x

33. Vardavas CI, Connolly G, Karamanolis K, Kafatos A. Adolescents perceived effectiveness of the proposed European graphic tobacco warning labels. Eur J Public Health. 2009 Apr;19(2):212–7. DOI:10.1093/eurpub/ckp015

34. Cameron LD, Pepper JK, Brewer NT. Responses of young adults to graphic warning labels for cigarette packages. Tob Control. 2015 Mar;24(e1):e14–22. DOI:10.1136/tobaccocontrol-2012-050645

35. Huang J, Chaloupka FJ, Fong GT. Cigarette graphic warning labels and smoking prevalence in Canada: a critical examination and reformulation of the FDA regulatory impact analysis. Tob Control. 2014 Mar;23(Suppl. 1):i7–12. DOI:10.1136/tobaccocontrol-2013-051170

36. Azagba S, Sharaf MF. The effect of graphic cigarette warning labels on smoking behavior: evidence from the Canadian experience. Nicotine Tob Res. 2013 Mar;15(3):708–17. doi:10.1093/ntr/nts194

37. Graphic health warnings on tobacco packaging inspire smokers to quit the habit. Singapore: Health Promotion Board; 2004.

38. Cigarette package health warnings: international status report, 4th edn. Toronto: Canadian Cancer Society; 2014 (http://www.cancer.ca/~/media/cancer.ca/CW/for%20media/Media%20releases/2014/Tobacco%20Warnings%20Oct%202014/CCS-international-package-warnings-report-2014-ENG.pdf, accessed 24 June 2016).

39. Proclamation No. 11/2016, 29 August 2016. Order of printing warning images and texts on the packaging of tobacco products. Nay Pyi Taw: Government of the Republic of the Union of Myanmar; 2016.

40. Department of Health and Family Welfare. Notification G.S.R. 727(E). New Delhi: Ministry of Health and Family Welfare; 2014 (http://apps.who.int/fctc/implementation/database/sites/implementation/files/documents/reports/00152_02_pack%20warning%20rules%202014%20%281%29.pdf, accessed 6 July 2017).

41. Tobacco Free Initiative. A landmark regulation on pictorial health warnings for The Lao People's Democratic Republic. Manila: World Health Organization Regional Office for the Western Pacific; 2016; (http://www.wpro.who.int/tobacco/wpro_lao_phw/en/, accessed 18 July 2016).

42. Tobacco Control (amendment) Regulation Order No.98 of 2016. Official Gazette 25 May 2016;35. Port Vila: Republic of Vanuatu; 2016.

43. Corben R. Tobacco industry challenges Thai government. Bonn: Deutsche Welle (DW); 2013.

44. JT International (Thailand) v. Minister of Public Health. Supreme Administrative Court, Order No. 269/2557, 29 May 2014.

45. The Tobacco Institute of India v. Union of India, W.A. No. 502/2016, 504/2016, 497–499/2016. High Court of Karnataka at Bangalore, 11 March 2016.

46. Supreme Court of India. Karnataka Beedi Industry Association and Anr. v. Union of India and Anr., Special Leave Petition (C) Nos. 10119–10121 of 2016. 4 May 2016.

47. Tobacco industry interference by litigation since COP4 (Nov 2010). Geneva: Framework Convention Alliance; 2010 (http://www.stopcorporateabuse.org/sites/default/files/resources/intimidation_by_litigation.pdf, accessed 5 July 2017).

48. International Centre for Settlement of Investment Disputes. Philip Morris Brands Sàrl, Philip Morris Products S.A. and Abal Hermanos S.A. v. Oriental Republic of Uruguay, ICSID Case No. ARB/10/7, 2 July 2013.

49. Central Administrative Court. Philip Morris (Thailand) Limited et al. v. Ministry of Public Health, Central Administrative Court, Black Case No. 1324/2556, 23 August 2013.

50. WHO Framework Convention on Tobacco Control. Thailand – new regulations on graphic warnings introduced. Geneva: World Health Organization; 2013 (http://www.who.int/fctc/implementation/news/news_thai/en/, accessed 18 July 2016).

51. WHO Framework Convention on Tobacco Control. Thailand – court decision paves the way to the resizing of graphic health warnings. Geneva: World Health Organization; 2014 (http://www.who.int/fctc/implementation/news/news_thai2/en/, accessed 18 July 2016).

52. WHO Framework Convention on Tobacco Control. Sri Lanka: Health warnings now cover 80% of pack surfaces. Geneva: World Health Organization; 2015 (http://apps.who.int/fctc/implementation/database/groups/sri-lanka-health-warnings-now-cover-80-pack-surfaces, accessed 19 July 2016).

53. Hefler M. Nepal: Supreme Court quashes tobacco industry appeal 2014. Tob Control. 2014;23(2):93–6.

54. The Philippines: advocates and government agencies work to combat industry interference. Washington (DC): Campaign for Tobacco-Free Kids; 2016 (http://global.tobaccofreekids.org/en/industry_watch/case_studies/the_philippines_advocates_and_government, accessed 6 July 2016).

55. WHO Representative Office Philippines. World No Tobacco Day 2016: Philippines gears up for full implementation of graphic health warning law, may consider plain packaging. Manila: World Health Organization WR Office, Philippines; 2016 (http://www.wpro.who.int/philippines/mediacentre/releases/20160530-phl-wntd2016/en/, accessed 5 July 2017).

56. Hopkinson NS, McKee M, Reddy KS. Tobacco industry lobbying undermines public health in Asia. BMJ. 2015 May 13;350:h2451. doi:10.1136/bmj.h2451

57. Kmietowicz Z. Doctors demand apology for UK diplomat's involvement in Pakistan tobacco meeting. BMJ. 2015 Apr 2;350:h1814. doi:10.1136/bmj.h1814.

58. International Union against Tuberculosis and Lung Disease. Tobacco control advocates take Pakistan government to court for reneging on 85% graphic health warnings. Edinburgh: The Union, Europe; 2015 (http://www.tobaccofreeunion.org/index.php/news-2/327-tobacco-control-advocates-take-pakistan-government-to-court-for-reneging-on-85-graphic-health-warnings, accessed 5 July 2017).

59. PAHO/WHO congratulates Uruguay for successfully defending tobacco control policies against tobacco industry challenges. Washington (DC): World Health Organization; 2016 (http://www.paho.org/hq/index.php?option=com_content&view=article&id=12273%3Apaho-congratulates-uruguay-for-defending-tobacco-control-policies-against-tobacco-industry&Itemid=1926&lang=en, accessed 5 July 2017).

60. Torjesen I. Tobacco giant loses legal action over Uruguay's tobacco packaging rules. BMJ. 2016 July 11;354:i3850. doi:10.1136/bmj.i3850

61. 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. Toronto: Health Canada; 2008.

62. Les Études De Marché Créatec. Quantitative study of Canadian adult smokers: effects of modified packaging through increasing the size of warnings on cigarette packages. Toronto: Health Canada; 2008.

63. Environics Research Group. Consumer research on the size of health warning messages – quantitative study of Canadian adult smokers. Toronto: Health Canada; 2008.

64. Environics Research Group. Consumer research on the size of health warning messages – quantitative study of Canadian youth. Toronto: Health Canada; 2008.

65. Wakefield M, Germain D, Durkin S, Hammond D, Goldberg M, Borland R. Do larger pictorial health warnings diminish the need for plain packaging of cigarettes? Addiction. 2012;107(6):1159–67. doi:10.1111/j.1360-0443.2012.03774.x.

66. Thrasher JF, Rousu MC, Hammond D, Navarro A, Corrigan JR. Estimating the impact of pictorial health warnings and “plain” cigarette packaging: evidence from experimental auctions among adult smokers in the United States. Health Policy. 2011;102(1):41–8. doi:10.1016/j.healthpol.2011.06.003

67. Germain D, Wakefield MA, Durkin SJ. Adolescents' perceptions of cigarette brand image: does plain packaging make a difference? J Adolesc Health. 2010;46(4):385–92. DOI:10.1016/j.jadohealth.2009.08.009

68. Miller CL, Hill DJ, Quester PG, Hiller JE. Impact on the Australian Quitline of new graphic cigarette pack warnings including the Quitline number. Tob Control. 2009 Jun;18(3):235–7. doi:10.1136/tc.2008.028290

69. Wilson N, Li J, Hoek J, Edwards R, Peace J. Long-term benefit of increasing the prominence of a quitline number on cigarette packaging: 3 years of Quitline call data. NZ Med J. 2010;123(109–11).

70. ITC Project. ITC Mauritius National Report: results of the Wave 2 Survey. Waterloo, Ontario: University of Waterloo & Mauritius Institute of Health; 2011.

71. Gravely S, Fong GT, Driezen P, McNally M, Thrasher JF, Thompson ME, et al. The impact of the 2009/2010 enhancement of cigarette health warning labels in Uruguay: longitudinal findings from the International Tobacco Control (ITC) Uruguay Survey. Tob Control. 2016 Jan;25(1):89–95. doi:10.1136/tobaccocontrol-2014-051742

72. Li L, Fathelrahman AI, Borland R, Omar M, Fong GT, Quah AC, et al. Impact of graphic pack warnings on adult smokers' quitting activities: findings from the ITC Southeast Asia Survey (2005–2014). J Smok Cessat. 2016;11(02):124–34. DOI:10.1017/jsc.2015.21

73. Green AC, Kaai SC, Fong GT, Driezen P, Quah AC, Burhoo P. Investigating the effectiveness of pictorial health warnings in Mauritius: findings from the ITC Mauritius survey. Nicotine Tob Res. 2014 Sep;16(9):1240–7. doi:10.1093/ntr/ntu062

74. Hitchman SC, Driezen P, Logel C, Hammond D, Fong GT. Changes in effectiveness of cigarette health warnings over time in Canada and the United States, 2002–2011. Nicotine Tob Res. 2014 May;16(5):536–43. doi:10.1093/ntr/ntt196

75. Thrasher JF, Villalobos V, Szklo A, Fong GT, Pérez C, Sebrié E, et al. Assessing the impact of cigarette package health warning labels: a cross-country comparison in Brazil, Uruguay and Mexico. Salud Pública de Mexico. 2010;52(Suppl. 2):S206–15.

76. ITC Project. Pictorial health warnings in India: Why larger warnings should be implemented without delay. Waterloo, Ontario: University of Waterloo; 2015 (http://www.itcproject.org/sites/default/files/India_WL_FactSheet_May26_FINALV2.pdf, accessed 4 July 2016).

77. Wakefield M, Coomber K, Zacher M, Durkin S, Brennan E, Scollo M. Australian adult smokers' responses to plain packaging with larger graphic health warnings 1 year after implementation: results from a national cross-sectional tracking survey. Tob Control. 2015;24(Suppl. 2):ii17–25. DOI:10.1136/tobaccocontrol-2014-052050

78. Dunlop SM, Dobbins T, Young JM, Perez D, Currow DC. Impact of Australia's introduction of tobacco plain packs on adult smokers' pack-related perceptions and responses: results from a continuous tracking survey. BMJ Open. 2014 Dec;4(12):e005836. doi:10.1136/bmjopen-2014-005836

79. 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 Jul;3(7):pii. Print 2013. DOI:10.1136/bmjopen-2013-003175

80. Yong HH, Borland R, Hammond D, Thrasher JF, Cummings KM, Fong GT. Smokers' reactions to the new larger health warning labels on plain cigarette packs in Australia: findings from the ITC Australia project. Tob Control. 2016 Mar;25(2):181–7. doi:10.1136/tobaccocontrol-2014-051979

81. Durkin S, Brennan E, Coomber K, Zacher M, Scollo M, Wakefield M. Short-term changes in quitting-related cognitions and behaviours after the implementation of plain packaging with larger health warnings: findings from a national cohort study with Australian adult smokers. Tob Control. 2015;24(Suppl. 2):ii26–32. doi:10.1136/tobaccocontrol-2014-052058

82. 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 Jan;200(1):29–32.

83. Kmietowicz Z. Australia sees large fall in smoking after introduction of standardised packs. BMJ. 2014 Jul 17;349:g4689. doi:10.1136/bmj.g4689

84. Post-implementation review tobacco plain packaging 2016. Canberra: Australian Government, Department of Health; 2016; (http://ris.pmc.gov.au/sites/default/files/posts/2016/02/Tobacco-Plain-Packaging-PIR.pdf, accessed 5 July 2017).

85. Plain packaging – an international overview. Toronto: Canadian Cancer Society; 2016 (http://ash.org.uk/information-and-resources/packaging-labelling-information-and-resources/standardised-plain-packaging/plain-packaging-an-international-overview/ accessed 5 July 2017).

86. France and UK join Australia as plain packaging leaders. Geneva: Framework Convention Alliance; 2016 (http://www.fctc.org/fca-news/opinion-pieces/1413-france-and-uk-join-australia-as-plain-packing-leaders, accessed 5 July 2017).

87. Directive 2014/40/EU of the European Parliament and of the Council of 3 April 2014 on the approximation of the laws, regulations and administrative provisions of the Member States concerning the manufacture, presentation and sale of tobacco and related products and repealing Directive 2001/37/EC. Brussels: European Parliament and Council of the European Union; 2014 (http://eur-lex.europa.eu/eli/dir/2014/40/oj, accessed 11 July 2016).

88. WHO report on the global tobacco epidemic, 2015: raising taxes on tobacco. Geneva: World Health Organization; 2015 (http://www.who.int/tobacco/global_report/2015/report/en/, accessed 5 July 2017).

89. Maziak W. The global epidemic of waterpipe smoking. Addict Behav. 2011;36(1):1–5. doi:10.1016/j.addbeh.2010.08.030

90. Maziak W. The waterpipe: time for action. Addiction. 2008;103(11):1763–7. doi:10.1111/j.1360-0443.2008.02327.x

91. Warren CW, Lea V, Lee J, Jones NR, Asma S, McKenna M. Change in tobacco use among 13–15 year olds between 1999 and 2008: findings from the Global Youth Tobacco Survey. Glob Health Promot. 2009 Sep;16(2 Suppl.):38–90. doi:10.1177/1757975909342192

92. Azab M, Khabour OF, Alkaraki AK, Eissenberg T, Alzoubi KH, Primack BA. Water pipe tobacco smoking among university students in Jordan. Nicotine Tob Res. 2010 Jun;12(6):606–12. doi:10.1093/ntr/ntq055

93. Akl EA, Gaddam S, Gunukula SK, Honeine R, Jaoude PA, Irani J. The effects of waterpipe tobacco smoking on health outcomes: a systematic review. Int J Epidemiol. 2010 Jun;39(3):834–57. doi:10.1093/ije/dyq002

94. Elawa F, Warren C, Jones N. Changes in tobacco use among 13–15-year-olds between 1999 and 2007: findings from the Eastern Mediterranean Region. East Mediterr Health J. 2010 Mar;16(3):266–73.

95. Moh'd Al-Mulla A, Abdou Helmy S, Al-Lawati J, Al Nasser S, Ali Abdel Rahman S, Almutawa A, 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(6):337–43. doi:10.1111/j.1746-1561.2008.00311.x

96. Global tobacco surveillance system data (GTSSData). Atlanta: Centers for Disease Control and Prevention; 2015 (http://www.cdc.gov/tobacco/global/gtss/, accessed 4 July 2016).

97. Mzayek F, Khader Y, Eissenberg T, Al Ali R, Ward KD, Maziak W. Patterns of water-pipe and cigarette smoking initiation in schoolchildren: Irbid longitudinal smoking study. Nicotine Tob Res. 2012 Apr;14(4):448–54. doi:10.1093/ntr/ntr234

98. Maziak W, Ward KD, Afifi Soweid RA, Eissenberg T. Tobacco smoking using a waterpipe: a re-emerging strain in a global epidemic. Tob Control. 2004 Dec;13(4):327–33. DOI:10.1136/tc.2004.008169

99. Raad D, Gaddam S, Schunemann HJ, Irani J, Jaoude PA, Honeine R, et al. Effects of water-pipe smoking on lung function: a systematic review and meta-analysis. Chest. 2011;139(4):764–74. doi:10.1378/chest.10-0991

100. WHO Study Group on Tobacco Product Regulation. Waterpipe tobacco smoking: health effects, research needs and recommended actions by regulators. Geneva: World Health Organization; 2005 (http://www.who.int/tobacco/global_interaction/tobreg/Waterpipe%20recommendation_Final.pdf, accessed 5 July 2017).

101. Maziak W, Taleb ZB, Bahelah R, Islam F, Jaber R, Auf R, et al. The global epidemiology of waterpipe smoking. Tob Control. 2015 Mar;24(Suppl. 1):i3–12. doi:10.1136/tobaccocontrol-2014-051903

102. Salloum RG, Thrasher JF, Kates FR, Maziak W. 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

103. Chaaya M, Jabbour S, El-Roueiheb Z, Chemaitelly H. Knowledge, attitudes, and practices of argileh (water pipe or hubble-bubble) and cigarette smoking among pregnant women in Lebanon. Addict Behav. 2004;29(9):1821–31. DOI:10.1016/j.addbeh.2004.04.008

104. Smith-Simone S, Maziak W, Ward KD, Eissenberg T. Waterpipe tobacco smoking: knowledge, attitudes, beliefs, and behavior in two U.S. samples. Nicotine Tob Res. 2008 Feb;10(2):393–8. doi:10.1080/14622200701825023

105. Maziak W, Eissenberg T, Rastam S, Hammal F, Asfar T, Bachir ME, et al. Beliefs and attitudes related to narghile (waterpipe) smoking among university students in Syria. Ann Epidemiol. 2004;14(9):646–54. DOI:10.1016/j.annepidem.2003.11.003

106. Kandela P. Nargile smoking keeps Arabs in Wonderland. Lancet. 2000;356(9236):1175.

107. Waterpipe tobacco smoking: health effects, research needs and recommended actions by regulators, 2nd ed. Geneva: World Health Organization; 2015 (http://www.who.int/tobacco/publications/prod_regulation/waterpipesecondedition/en/, accessed 5 July 2017).

108. WHO Convention Secretariat. 2014 Global progress report on implementation of the WHO Framework Convention on Tobacco Control. Geneva: World Health Organization; 2014 (http://www.who.int/fctc/reporting/2014globalprogressreport.pdf?ua=1, accessed 18 July 2016).

109. Order No. 490N 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" [translation]. Moscow: Ministry of Justice of the Russian Federation; 2012 (https://www.tobaccocontrollaws.org/files/live/Russia/Russia%20-%20Order%20No.%20490N.pdf, accessed 5 July 2017).

110. Convention Secretariat. Control and prevention of waterpipe tobacco products. Geneva: WHO Framework Convention on Tobacco Control; 2014 (FCTC/COP/6/11; http://apps.who.int/gb/fctc/PDF/cop6/FCTC_COP6_11-en.pdf, accessed 27 July 2016).

111. Jawad M, El Kadi L, Mugharbil S, Nakkash R. Waterpipe tobacco smoking legislation and policy enactment: a global analysis. Tob Control. 2015 Mar;24(Suppl.1):i60–5. doi:10.1136/tobaccocontrol-2014-051911

112. Nakkash R, Khalil J. Health warning labelling practices on narghile (shisha, hookah) waterpipe tobacco products and related accessories. Tob Control. 2010 Jun;19(3):235–9. doi:10.1136/tc.2009.031773.

113. Jawad M. Legislation enforcement of the waterpipe tobacco industry: a qualitative analysis of the London experience. Nicotine Tob Res. 2014 Jul;16(7):1000–8. doi:10.1093/ntr/ntu022

114. The law on prevention and control of hazards of tobacco products (Law No.4207) (Amendment 4/7/2012-6354 10. Art.) [translation]. Ankara: Government of Turkey; 2012 (http://www.tobaccocontrollaws.org/files/live/Turkey/Turkey%20-%20Law%20No.%204207.pdf, accessed 5 July 2016).

115. Erdöl C, Ergüder T, Morton J, Palipudi K, Gupta P, Asma S. Waterpipe tobacco smoking in Turkey: policy implications and trends from the Global Adult Tobacco Survey (GATS). Int J Environ Res Public Health. 2015;12(12):15559–66. DOI:10.3390/ijerph121215004