

**Section 4**  
**Non-Price Determinants of Demand**

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**Chapter 8**  
**The Impact of Information on the  
Demand for Tobacco Products**

## Chapter 8

# The Impact of Information on the Demand for Tobacco Products

Information failures in the tobacco marketplace provide an economic rationale for governments to intervene in the tobacco market using a variety of measures. This chapter explores the impact of information on the demand for tobacco products, including:

- Consumers' limited awareness of the risks of tobacco use, and differences in awareness by country income group
- The role of tobacco industry disinformation practices in consumers' uptake and continued use of tobacco
- Information interventions—including anti-tobacco mass media campaigns, school-based tobacco education programs, health warning labels, and interventions focused on tobacco product packaging—and their impact on the demand for tobacco products.

Research shows that consumers, especially youth, do not appreciate the magnitude of the risks of tobacco use and tend not to personalize these risks, and that these information failures are generally greater in low- and middle-income countries than in high-income countries. For this reason, programmatic interventions and policies to raise awareness of the harms of tobacco use and the addictive properties of nicotine, and to counter tobacco industry marketing and disinformation efforts are necessary to help reduce tobacco use.

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## Introduction

Information on the effects of tobacco use on health can decrease aggregate tobacco demand by discouraging nonusers from initiating tobacco use, encouraging current users to quit or cut down, and discouraging relapse among former smokers.<sup>1</sup> However, as this chapter will describe, evidence from both high-income countries (HICs) and low- and middle-income countries (LMICs) indicates that consumers' knowledge of the health risks of tobacco use is often poor or inadequate. Lack of information about the harms caused by tobacco use and the addictiveness of tobacco products can lead tobacco users to underestimate the health risks of tobacco use and overestimate their ability to quit. These information failures provide an economic rationale for governments to intervene in the tobacco market using a variety of measures—among these, the active dissemination of health information to consumers and the regulation of industry information sources (i.e., product packaging, advertising, and marketing practices). This chapter focuses on how individuals obtain and process information about tobacco products and their health effects, and how this information affects demand for tobacco products. Much of the data presented in this chapter are based on the experiences of HICs because considerably less data on the role of information in tobacco demand are available for LMICs. However, for most of the topics covered in this review, the research conducted in HICs is also largely applicable to LMICs.

### Health Risks Associated With Tobacco Use: Awareness in High-Income Countries

The evidence indicates that most cigarette smokers in HICs are informed at least at a superficial level about the major health consequences of smoking. For example, the International Tobacco Control Policy Evaluation (ITC) Project surveyed a representative sample of adult smokers in the United States between 2002 and 2011 and found high levels of awareness about some but not all health risks. They reported high levels of awareness that smoking causes lung cancer (94%), heart disease (88%), lung cancer in nonsmokers (84%), and stroke (77%), but far lower awareness that smoking causes impotence (40%) and that tobacco smoke contains the harmful constituents arsenic (57%) and cyanide (52%).<sup>2</sup> Similarly, in analyses of data from ITC surveys of smokers in the United States, Canada, Australia, and the United Kingdom of Great Britain and Northern Ireland, Siahpush and colleagues<sup>3</sup> found generally high levels of awareness that smoking causes lung cancer (>90%) and heart disease (>85%), but lower levels of awareness that smoking causes stroke (>70%); higher education and income were associated with substantially higher awareness of the health harms of smoking. However, awareness beyond a superficial level is often lacking. For example, a national survey conducted in the United States in 2001 found that although 94% of smokers considered themselves adequately informed about the health risks of smoking, a large proportion of respondents were unable to correctly answer questions about the health risks of smoking (39%), contents of cigarette smoke (53%), safety of nicotine (52%), low-tar cigarettes and filtered cigarettes (65%), additives in cigarettes (56%), and nicotine replacement products (56%).<sup>4</sup>

Other studies have documented that smokers often hold mistaken beliefs about the relative harms of cigarette brands with low machine-measured levels of tar and nicotine—so-called “light,” “mild,” or “low-tar” brands. As described in *Risks Associated with Smoking Cigarettes with Low Machine-Measured Yields of Tar and Nicotine*, Smoking and Tobacco Control Monograph 13 by the National Cancer Institute (NCI) of the National Institutes of Health (an agency of the U.S. Department of Health and Human Services), these cigarettes do not have lower health risks and do not facilitate quitting, but many smokers believe they do.<sup>5</sup> This finding has been confirmed and extended to other countries over time. For example, ITC surveys of adult smokers in Australia, Canada, the United Kingdom, and the United States found that many smokers (40–70%, depending on the country) held at least one false

belief about the health effects of “light” cigarettes compared to regular cigarettes.<sup>6</sup> Despite bans on use of these misleading descriptors, misperceptions remain widespread among smokers in many countries.<sup>7,8</sup>

Virtually all smokers underestimate the severity and magnitude of the risks of smoking and display strong “optimistic bias” about the risks of smoking—that is, they tend to see their own personal health risk as being lower than that of other smokers.<sup>9</sup> For example, a U.S. study found that among smokers, the majority (81% of adults and 71% of youth) agreed that “most people who smoke for a few years become addicted and can’t stop.” Despite this, 60% of youth smokers and 48% of adult smokers surveyed agreed with the statement that “I could smoke for a few years and then quit if I wanted to.”<sup>10</sup> Similarly, data from NCI’s Health Information National Trends Survey, a nationally representative cross-sectional survey of U.S. adults, demonstrate that smokers underestimate their risk of lung cancer, relative to both other smokers and to nonsmokers, and have many other serious knowledge gaps.<sup>11</sup>

The information failures described above are compounded by the fact that nearly all tobacco use is initiated during adolescence. Young consumers are particularly likely to discount information about the risks of tobacco experimentation and use, in part because they fail to appreciate the highly addictive nature of tobacco products and thus do not expect to become long-term smokers.<sup>12–15</sup> For example, two U.S. surveys found that youth smokers generally believe they would have less difficulty quitting than other smokers and believe they are less addicted than the average smoker. Adult smokers, in contrast, tend to say they are not different from other smokers in their level of addiction or their ability to quit. Nonetheless, the researchers concluded that virtually all smokers are overly optimistic about their chances of cessation.<sup>16</sup>

### **Health Risks Associated With Tobacco Use: Awareness in Low- and Middle-Income Countries**

More than 80% of the world’s smokers live in LMICs, where knowledge of the health harms of smoking and tobacco use is generally thought to be lower than in HICs.<sup>17</sup> The Global Adult Tobacco Survey (GATS), a component of the Global Tobacco Surveillance System that is primarily conducted in LMICs, measures a broad range of tobacco control indicators including beliefs about smoking as a cause of major diseases and conditions.<sup>18</sup> As shown in Table 8.1, knowledge that smoking causes lung cancer was generally high across the 22 GATS countries (73.0–98.6%), while knowledge that smoking causes heart attack (38.7–95.0%) and stroke (27.2–89.2%) was substantially lower. Knowledge that secondhand smoke (SHS) causes serious illness in nonsmokers varied between 64.3% and 96.3% across the 22 GATS countries. In addition, an analysis of data from the ITC Project and GATS documented major gaps in smokers’ knowledge of the cardiovascular disease risks of smoking and in both smokers’ and nonsmokers’ knowledge of the cardiovascular disease risks of SHS exposure.<sup>19</sup>

Other studies provide more detailed information on knowledge of the health harms of smoking in individual LMICs or among different population groups within LMICs. For example, Cheng and colleagues<sup>20</sup> analyzed data from the 2010 GATS People’s Republic of China survey to focus on the relationship between knowledge of health hazards and smoking status. Their study found that although most respondents knew that smoking causes lung cancer (53.7–84.7%), less than half knew that smoking causes heart attacks and stroke, and only a low proportion (3.6–21.2%) knew that low-tar cigarettes are not less harmful than other cigarettes. Additionally, a study conducted in Zambia and the Democratic Republic of the Congo found that pregnant women’s knowledge of the harms of smoking and SHS exposure was extremely limited.<sup>21</sup> In both HICs and LMICs, information failures are more pronounced

**Table 8.1 Knowledge About the Harms of Smoking Among Adults Age 15 and Over in 22 Countries, 2008–2013**

Country (year)	Believes smoking causes lung cancer (%)	Believes smoking causes heart attack (%)	Believes smoking causes stroke (%)	Believes SHS causes serious illness (%)
<b>Region of the Americas</b>				
Argentina (2012)	98.6	91.0	73.6	92.6
Brazil (2008)	96.2	87.0	74.3	91.4
Mexico (2009)	96.7	79.7	60.4	95.6
Panama (2013)	97.0	83.5	73.5	87.5
Uruguay (2009)	96.8	92.0	76.5	93.8
<b>European Region</b>				
Greece (2013)	96.3	91.2	76.6	84.9
Poland (2009-2010)	92.6	79.9	61.8	81.4
Romania (2011)	98.3	90.0	89.2	94.2
Russian Federation (2009)	91.2	71.0	67.3	81.9
Turkey (2008)	96.1	93.6	82.1	95.5
Ukraine (2010)	91.2	79.3	77.9	86.3
<b>African Region</b>				
Nigeria (2010)	73.0	76.8	51.4	74.5
<b>Eastern Mediterranean Region</b>				
Egypt (2009)	96.2	95.0	88.6	96.3
Qatar (2013)	96.4	93.7	79.5	95.1
<b>South-East Asia Region</b>				
Bangladesh (2009)	91.5	85.9	81.6	93.4
India (2009-2010)	84.9	63.9	49.4	82.9
Indonesia (2011)	84.7	81.5	45.5	73.7
Thailand (2009)	97.5	75.7	79.6	94.9
<b>Western Pacific Region</b>				
China (2010)	77.5	38.7	27.2	64.3
Malaysia (2011)	93.7	88.8	80.7	85.8
Philippines (2009)	92.8	78.9	73.3	91.6
Viet Nam (2010)	95.6	62.7	70.3	87.0

Note: SHS = secondhand smoke.

Sources: Chiosi et al. 2015<sup>18</sup> and Global Adult Tobacco Survey Fact Sheets and Reports, 2008–2013.<sup>174</sup>

among some populations (i.e., low-education, low-income), which contributes to persistent social inequalities in tobacco-related morbidity and mortality. To date, in the only study of the impact of banning “light” and “mild” descriptors in LMICs, Siahpush and colleagues<sup>22</sup> found that removal of “light” descriptors on cigarette packages in Thailand led to a decrease in the belief that “light” cigarettes are less harmful, particularly among individuals in lower income and education groups. However, the authors note that even after the descriptors’ removal, the belief that “light” cigarettes are less harmful remained more widely held in Thailand than in some other countries.

### Additional ITC Project Survey Findings

Data from the ITC Project enable researchers to examine differences across countries of various income levels on measures of adult smokers’ knowledge and beliefs. Table 8.2 presents a summary of ITC survey results showing percentages of respondents (adult smokers and former smokers) who did not know or believe the health impacts of smoking and SHS exposure for specific diseases. Countries vary considerably in the level of knowledge/belief about the harms of smoking and tobacco use, with respondents in HICs being more knowledgeable than those in LMICs in some areas but not others. The knowledge/belief that smoking causes lung cancer was the most consistently observed across all countries surveyed. The knowledge/belief that smoking causes heart disease and stroke was far less widely held. Even lower levels of knowledge/belief were observed about the health harms (lung cancer and heart attack/heart disease among nonsmokers) caused by SHS exposure.

### Tobacco Industry Efforts to Limit and Distort Public Knowledge

The peer-reviewed literature, internal tobacco industry documents, and findings of litigation have conclusively shown that the tobacco industry has for many decades engaged repeatedly and consistently in a pattern of withholding, denying, and distorting information so that the hazards of their products would not be known—or if known, minimized in the minds of consumers.<sup>23–29</sup> These practices have directly contributed to the information failures associated with consumers’ knowledge of the risks of disease and addiction, and thus provide sufficient grounds for government action to enhance consumers’ knowledge and awareness of the health harms of tobacco use and SHS exposure. Tobacco industry strategies to limit and distort public knowledge have included:

- Denying and distorting evidence (1) on the health harms of smoking and SHS exposure, (2) that cigarette smoking is addictive, and (3) that cigarettes are designed to maximize addiction
- Marketing cigarettes in ways designed to assuage consumers’ fears about smoking and disease
- Falsely promoting filtered, “light,” “low-tar,” and “mild” cigarettes (i.e., with low machine-measured amounts of tar and nicotine) as less hazardous than other cigarettes
- Funding and publicizing research aimed at denying, distorting, and/or distracting the public from the health effects of smoking and SHS exposure
- Influencing media coverage of smoking and health so as to limit public knowledge of the health effects of smoking and SHS exposure.



**Table 8.2 Percentages of Current and Former Adult Smokers Who Did Not Know About or Believe Specific Risks of Smoking and Secondhand Smoke Exposure, 2008–2014**

Country (year)	That smoking causes lung cancer in smokers (%)	That smoking causes heart disease (%)	That smoking causes stroke (%)	That SHS causes lung cancer in nonsmokers (%)	That SHS causes heart attack/heart disease in nonsmokers (%)
Australia (2013)	—	—	15.1	24.9*	59.6
Bangladesh (2011-2012)	4.7	18.4	11.8	13.4	21.7
Brazil (2012-2013)	6.5	7.0	16.0	20.4	—
Canada (2013-2014)	—	—	13.5	17.0*	47.2
China (2011-2012)	12.4	35.2	62.8	21.3	43.0
France (2012)	1.1	3.1	11.5	9.1	—
Germany (2011)	1.1	4.3	7.4	21.9	—
India (2010-2011)	12.2	21.7	32.1	25.4	32.7
Kenya (2012)	11.2	31.1	50.6	32.5	47.7
Malaysia (2013)	—	9.6	18.4	16.2	18.8
Mauritius (2011)	6.2	13.9	22.7	11.9	—
Mexico (2012)	3.1	12.6	26.5	6.7	17.4
Netherlands (2014)	11.2	21.4	37.2	43.1	57.5
New Zealand (2008-2009)	—	—	17.4	22.0	—
Republic of Korea (2010)	—	—	43.6	19.5†	43.9
Thailand (2012)	—	24.4	15.1	2.6	14.6
United Kingdom (2013)	—	—	21.6	22.2*	54.4
United States (2013-2014)	—	—	23.5	26.5*	52.5
Uruguay (2014)	3.9	10.6	33.8	18.7	28.3
Zambia (2014)	21.7	27.2	53.4	34.0	36.8

\*Data are from 2008-2009.

†Data are from 2008.

Note: SHS = secondhand smoke.

Sources: Unpublished data from the ITC Project, 2008–2014.<sup>175</sup>

The World Health Organization (WHO) Framework Convention on Tobacco Control (WHO FCTC) recognizes that Parties to the WHO FCTC “need to be alert to any efforts by the tobacco industry to undermine or subvert tobacco control efforts and the need to be informed of activities of the tobacco industry that have a negative impact on tobacco control efforts.”<sup>30,p.1</sup> Article 5.3 of the WHO FCTC requires that “in setting and implementing their public health policies with respect to tobacco control, Parties shall act to protect these policies from commercial and other vested interests of the tobacco industry in accordance with national law.”<sup>30,p.1</sup> The WHO FCTC Conference of Parties has adopted guidelines for Article 5.3, with specific recommendations to be implemented without prejudice to the sovereign right of the Parties to determine and establish their tobacco control policies to the extent possible, in accordance with their national law.<sup>30</sup> Raising awareness about the addictive and harmful

nature of tobacco products and about tobacco industry interference with Parties' tobacco control policies is one of the key recommendations of the guidelines.

### Denying and Distorting Evidence on Health Effects

For many decades, the U.S. cigarette industry consistently refused to acknowledge the health effects of tobacco use, arguing that the links between smoking and disease were not proven, and sought to create doubt about scientific evidence of adverse health effects.<sup>23,24</sup> A very public example of the U.S. industry's strategy occurred at a 1994 Congressional hearing convened by the House Energy and Commerce Subcommittee on Health and the Environment, where executives of the seven major U.S. tobacco companies stated under oath that they did not believe nicotine was addictive and that the evidence linking cigarettes to diseases such as lung cancer was not conclusive.<sup>31</sup> In 2006, the trial judge in *United States of America v. Philip Morris USA, Inc.* ruled, and the U.S. Court of Appeals for the District of Columbia Circuit affirmed on appeal in 2009, that the major U.S. cigarette manufacturers had engaged in a decades-long effort to deliberately deceive the American public about the health hazards of smoking and SHS exposure (see Box 8.1 below).<sup>26,p.852</sup> This strategy was widespread in the tobacco industry. British American Tobacco (BAT), based in the United Kingdom, adopted a strategy to publicly deny claims about smoking's adverse health effects, which the company acknowledged in private, in order to discourage and delay legislative action by governments.<sup>32</sup> The evidence indicates that, despite their long-standing denials to the contrary, the major international tobacco companies have understood for many decades the addictive nature of nicotine.<sup>33</sup>

The tobacco industry has consistently raised spurious objections to the findings of individual scientists as well as major government reports linking smoking to disease. As Brandt notes, the industry's response to the landmark 1964 Surgeon General's report, *Smoking and Health: Report of the Advisory Committee of the Surgeon General of the Public Health Service*, was to "maintain the strategy it had adopted in 1953: insist that there is no proof that tobacco causes disease; disparage and attack all studies indicating such a relationship; support basic research on cancer largely unrelated to the hypothesis that smoking and cancer are linked; and support research on alternative theories of carcinogenesis."<sup>28,p.230</sup> For example, in 1971, the Surgeon General's report, *The Health Consequences of Smoking*, found that smoking during pregnancy increased stillbirths and neonatal deaths.<sup>34</sup> In response, the Tobacco Institute—the trade and lobbying association for the U.S. tobacco industry until it was dissolved in 1999—responded that the Surgeon General was "endeavoring to scare pregnant women."<sup>26,p.306</sup>

In 1998, the International Agency for Research on Cancer (IARC) published what was then the largest European epidemiological study on lung cancer and SHS exposure, which found an increased risk of lung cancer among nonsmoking spouses of smokers and among nonsmokers exposed in the workplace.<sup>35</sup> In response, as described by Ong and Glantz,<sup>36</sup> the tobacco industry launched a coordinated, well-funded, multifaceted effort to discredit the study, relying heavily on third parties so as not to reveal the extent of the tobacco industry's involvement. These authors showed that Philip Morris worked with its public relations firms and lawyers to develop what the company called a "sound science" program in the United States and Europe which sought to shape the standards of epidemiology; in this way, the company's efforts went "beyond 'creating doubt' and 'controversy' ... to attempting to change the scientific standards of proof" in order to dispute the link between SHS and disease.<sup>37,p.1753</sup>

In 1997, the world's major tobacco companies created the International Committee on Smoking Issues to promote spurious "controversy" about smoking and disease.<sup>38</sup> The tobacco industry sought to impede the Australian National Health and Medical Research Council's review of the health effects of SHS by criticizing the science, attacking scientists working on the report, and through other means.<sup>39</sup>

### Box 8.1: Findings from *United States of America v. Philip Morris USA, Inc.*

In 1999, the U.S. Department of Justice (DOJ) initiated a lawsuit against the major U.S. cigarette manufacturers alleging, among other things, that the companies had conspired to deceive the American public about the health risks of smoking and secondhand smoke exposure in violation of the Racketeer Influenced and Corrupt Organizations Act. In 2006, U.S. District Judge Gladys Kessler ruled in favor of the DOJ, concluding that the major domestic cigarette manufacturers had conspired to deny, distort, and minimize the hazards of cigarette smoking to the public. The judge's findings of fact support the government's long-voiced claims that:

- The companies deceived the American public about
  - ♦ The health effects of smoking and secondhand smoke exposure
  - ♦ The lack of significant health benefit from smoking "low-tar," "light," "ultralight," "mild," and "natural" cigarettes
  - ♦ The addictiveness of smoking and nicotine.
- The companies endangered public health by
  - ♦ Intentionally designing cigarettes to ensure optimum nicotine delivery to create and sustain addiction
  - ♦ Marketing their lethal products to youth.<sup>26,p.854-866</sup>

Judge Kessler's opinion noted that this case:

is about an industry, and in particular these Defendants, that survives, and profits, from selling a highly addictive product which causes diseases that lead to a staggering number of deaths per year, an immeasurable amount of human suffering and economic loss, and a profound burden on our national health care system. Defendants have known these facts for at least 50 years or more. Despite that knowledge, they have consistently, repeatedly, and with enormous skill and sophistication, denied these facts to the public, to the Government, and to the public health community. . . . In short, Defendants have marketed and sold their lethal products with zeal, with deception, with a single-minded focus on their financial success, and without regard for the human tragedy or social costs that success exacted.<sup>26,p.28</sup>

On appeal, the Court's decision was affirmed in relevant part, and in 2010, the U.S. Supreme Court denied all sides' petitions for further review.<sup>26</sup>

### Marketing Cigarettes to Assuage Consumers' Fears

As early as the 1930s and 1940s, evidence had begun to appear implicating smoking as a cause of lung cancer.<sup>29</sup> The U.S. tobacco industry responded to rising concerns about smoking's health effects with advertisements aimed at reassuring smokers, for example, by depicting physicians as smokers. As Brandt has noted, "from the early 1930s to the early 1950s...tobacco companies competed to portray their cigarettes as the most healthy while utilizing physicians to counteract any fears of serious health risks."<sup>28,p.106</sup> But by the early 1950s, in the face of new scientific findings and increased public attention

to studies linking smoking to cancer, industry references to “health claims” were seen as counterproductive and more likely to increase concerns than to allay them.<sup>40</sup>

As additional scientific evidence mounted in the 1950s and 1960s about the adverse health consequences of tobacco use, the industry responded with extensive marketing campaigns typically focused on three themes: satisfaction (freshness, mildness, and strength); anxiety reduction (filters, low-tar, and low nicotine); and desirable associations (associating smoking with people, places, activities, and ideas desired by the target group).<sup>41</sup> Indeed, as noted in NCI Monograph 19, *The Role of the Media in Promoting and Reducing Tobacco Use*, “The tobacco industry has mastered and dominated nearly all forms of communication media during the past 100 years.”<sup>41,p.100</sup>

U.S. tobacco companies disclose information on domestic sales and advertising and promotional activities to the U.S. Federal Trade Commission, which has issued periodic reports for both cigarettes (since 1967) and smokeless tobacco (since 1987).<sup>42</sup> Between 1940 and 2005, the U.S. tobacco industry spent approximately US\$ 250 billion on cigarette advertising and promotion, or about US\$ 10 million per day on average.<sup>41</sup> In 2013 alone, the U.S. cigarette industry spent US\$ 8.95 billion on cigarette advertising and promotion.<sup>43</sup> Estimates of global tobacco marketing expenditures are not available.

### Falsely Promoting “Light” and “Low-Tar” Cigarettes as Less Hazardous

In the United States and elsewhere, the tobacco industry falsely marketed “light” and “low-tar” cigarettes as less hazardous than regular cigarettes, implying that they deliver lower levels of tar and nicotine to the user. For decades, cigarette manufacturers produced cigarettes with low levels of machine-measured tar and nicotine, but smokers could obtain much higher levels of tar and nicotine by altering their puff patterns (compensation) and by blocking “ventilation holes” in the filter. This cigarette design was a conscious strategy; as noted in NCI Monograph 13, the “dichotomy of delivery between smokers and machines was the intended result of the engineering effort to design elasticity of delivery into [‘low-tar’] cigarettes.”<sup>5,p.6</sup> These cigarettes were marketed with terms such as “light” and “ultralight,” and their advertising was intended to reassure smokers and to present these cigarettes as an alternative to quitting.<sup>5,44</sup> Additionally, the sensory impression of smoking “light” and “ultralight cigarettes”—that these brands are milder and less harsh to smoke—contributes to smokers’ misconceptions about these products.<sup>45,46</sup> Studies from the United States suggest that these efforts were successful, and that some smokers switched who might have otherwise quit, thus continuing to harm their health.<sup>47,48</sup>

These strategies were replicated in many countries around the world, and research indicates that erroneous beliefs that “light” and “low-tar” cigarettes are less hazardous than conventional cigarettes are still common.<sup>49</sup> The deception inherent in marketing low machine-measured cigarettes is now widely recognized, and as described later in this chapter, the WHO FCTC obliges Parties to ban the use of misleading descriptors.

### Funding Research to Deny, Distort, and Distract the Public About Health Effects

Research has been crucial to improving scientific and public understanding of the health effects of tobacco use and SHS exposure, and thus was seen as a threat by the industry. Beginning in 1954, the U.S. tobacco industry provided substantial funding for research through the Council for Tobacco Research (CTR), and from 1988 onward through the Center for Indoor Air Research (CIAR). The CTR, previously known as the Tobacco Industry Research Committee, was founded with the stated purpose of

“providing financial support for research by independent scientists into tobacco use and health.”<sup>50</sup> However, the vast majority of studies supported by the tobacco industry were focused on basic science research, rather than on understanding the effects of smoking on health.<sup>51</sup> Indeed, the actual goals of the CTR were to lend credibility to the idea that there remained a “scientific debate about the smoking-and-health controversy,” to allow the tobacco industry to “create doubt about the health charge without actually denying it,” and to bolster industry’s public claim that it “remains committed to advancing scientific inquiry.”<sup>52,p.839</sup> The CTR and the CIAR, dissolved in 1998 under the Master Settlement Agreement between the nations’ major cigarette manufacturers and the attorneys general of 46 states,<sup>53</sup> were falsely represented to the public as operating independently of the tobacco industry; in fact, both were closely controlled by industry scientists and lawyers.<sup>54</sup> Since these organizations were closed, individual tobacco companies have sponsored research through other entities, although the ties to industry have often been downplayed or concealed.<sup>54</sup>

Scientific findings and public knowledge of the health harms of SHS exposure were of special concern to the industry because of the potential for smoking bans to broadly change social norms and reduce smoking rates. Using previously internal tobacco industry documents, Drope and Chapman<sup>55</sup> showed that the industry developed a large global network of scientists to disseminate the industry’s message that SHS was an insignificant health risk. The industry relied on lawyers to identify and fund scientists sympathetic to industry’s position, and trained and sent scientists to conferences (which were sometimes organized by the tobacco companies themselves), among other tactics.<sup>55</sup>

Muggli and colleagues<sup>56</sup> provide further insight into the broad-ranging activities of the tobacco industry’s international scientific consultant program focused on protecting the industry from the international threat of smoking restrictions. In Germany, for example, the tobacco industry created the Verband der Cigarettenindustrie (VdC, or Association of Cigarette Industries of Germany), made up of German and Austrian tobacco companies and the German branches of three multinational firms (Philip Morris, R.J. Reynolds, and BAT), to advance their interests by funding pro-industry research. Links between scientists and the VdC were blurred, sources of funding were not cited, and the research produced under its guidance was heavily controlled. As with other industry efforts, the VdC has been geared toward the industry’s goals such as playing down the harms of SHS exposure.<sup>57,58</sup>

In Latin America, Philip Morris and BAT put in place a network of scientific consultants coordinated by a Washington, D.C., law firm to deter potential future action on SHS; these consultants were to be perceived as independent scientists but would conduct and publish scientific studies on SHS that were favorable to industry.<sup>59</sup>

The tobacco industry also helped develop a scientific society, the International Society of the Built Environment, which published a journal, *Indoor and Built Environment*<sup>60</sup> to provide a forum for its funded research. The society and the journal’s editorial board were dominated by individuals with undisclosed financial ties to the tobacco industry. More than 60% of the journal’s papers related to SHS reached conclusions favorable to industry; of these, 90% included one or more authors with financial ties to the industry.<sup>60</sup>

As noted by WHO, “the history of tobacco industry involvement in research has shown that the results are often manipulated, suppressed or used incorrectly by non-scientists to suit the needs of the tobacco industry,” and “the documented history of scientific misconduct has led a growing number of academic institutions to introduce a policy not to accept tobacco industry funding.”<sup>61,p.10</sup>

### Influencing Media Coverage of Smoking and Health

In 1989, the U.S. Surgeon General noted that “media dependence on advertising revenues from the tobacco companies may discourage full and open discussion of the hazards of tobacco use. Reduced media attention may reduce the extent of public understanding of the health hazards.”<sup>62,p.502</sup> Strong evidence indicates a negative association between magazine revenue from tobacco advertising and publication of tobacco-related content.<sup>41</sup> For example, Warner and colleagues<sup>63</sup> analyzed data from 99 magazines published over 25 years and concluded that magazines with substantial tobacco advertising revenue were less likely to publish negative information about smoking. Studies of women’s magazines in Europe reached similar conclusions.<sup>41</sup> A study exploring the relationship between the tobacco companies and the African American press concluded that a “quid pro quo” existed between the two: In exchange for advertising dollars and other forms of support for the African American press, dating from the 1940s, the tobacco industry both expected and received support for the industry’s positions on tobacco taxes, smoke-free policies, and other policies.<sup>64</sup>

### Information Interventions to Reduce Demand for Tobacco

A large body of evidence from HICs, as well as some studies from LMICs, demonstrates that providing information to adult consumers about the addictive and harmful nature of tobacco products can help reduce consumption of these products.<sup>41,65</sup> Governments may disseminate information about the health hazards of tobacco use in a variety of ways, including published reports, anti-tobacco mass media campaigns, school-based anti-tobacco education programs, and health warnings on tobacco packages. Warning people about the dangers of tobacco use through large pictorial warnings and hard-hitting anti-tobacco mass media campaigns are two of the most cost-effective measures for reducing tobacco use.<sup>27</sup>

The WHO FCTC, an international treaty with 180 Parties (179 countries and the European Union, as of November 25, 2015), legally binds Parties to implement measures that inform the public about the harms of tobacco. Article 10 obligates Parties to implement effective measures for public disclosure of information about the toxic contents of tobacco products and the emissions they produce. Article 11 obligates Parties to adopt and implement effective measures to ensure that tobacco packaging carry health warnings describing the harmful effects of tobacco use. Article 12 obligates Parties to adopt and implement effective measures including comprehensive education and public awareness programs. In addition, the WHO FCTC obligates Parties to prohibit misleading industry information practices through regulation of advertising, promotion, and product packaging. Parties are obligated to prohibit industry promotion of tobacco products that is false, misleading, or deceptive or likely to create an erroneous impression about the characteristics, health effects, hazards, or emissions of tobacco products, whether on packaging (Article 11) or via other mediums (Article 13).

### Information Shocks

In many HICs, “information shocks,” such as new publications on the health consequences of tobacco or the introduction of prominent warning labels, have led to measurable and sustained reductions in the demand for tobacco. Of major historical significance are the information shocks caused by two publications that conclusively linked smoking to lung cancer—the 1962 Royal College of Physicians report in the United Kingdom<sup>66</sup> and the U.S. Surgeon General’s report of 1964.<sup>67</sup> These reports helped lead to significant reductions in cigarette smoking, with initial declines of 4% to 9% and longer term cumulative declines of 15% to 30%.<sup>1,68</sup>

Information shocks have the greatest impact at a relatively early stage in a population's epidemic of tobacco-related disease, when public knowledge of the health risks of smoking is low.<sup>69</sup> In a number of LMICs, the level of knowledge and awareness about the harms of tobacco use is very low, and governments have not yet engaged in efforts to increase knowledge and awareness. These countries have the potential to experience sharp reductions in tobacco use. To date, a limited amount of research has been conducted on the impact of information shocks in LMICs. Research on this issue can be expected to increase in the future, thanks to the emergence of high-quality data on public knowledge, attitudes, and behaviors regarding tobacco use and government actions implementing the WHO FCTC.

### Anti-Tobacco Mass Media Campaigns

Anti-tobacco mass media campaigns involve the use of one or more forms of media (e.g., print, radio, billboards, television, social media) to inform the public about the health risks of tobacco, discourage tobacco use, promote anti-tobacco social norms, and provide resources for cessation assistance.<sup>41</sup> Campaigns may also attempt to reduce demand for tobacco indirectly by generating public support for various tobacco control policies, such as new tax initiatives or clean indoor air laws. Mass media campaigns can efficiently reach large populations of both smokers and nonsmokers repeatedly, over time, and at a relatively low cost per person.<sup>41,70</sup>

### Evidence From High-Income Countries

Extensive evidence from HICs documents that well-funded mass media campaigns, especially when implemented as part of a comprehensive tobacco control program, can lead to reduced tobacco use among both youth and adults.<sup>41,71–76</sup> NCI Monograph 19 reviewed the available evidence on such campaigns in a number of HICs published between 1970 and May 2007 and discussed anti-tobacco mass media interventions in detail, tracing their evolution and describing elements of effective campaigns and targeting/tailoring strategies.<sup>41</sup> This report concluded that mass media campaigns designed specifically to discourage tobacco use in adults can also change youth attitudes about tobacco use, curb smoking initiation, and encourage adult cessation, and that the effects of campaigns are greater when combined with school- and/or community-based programming.

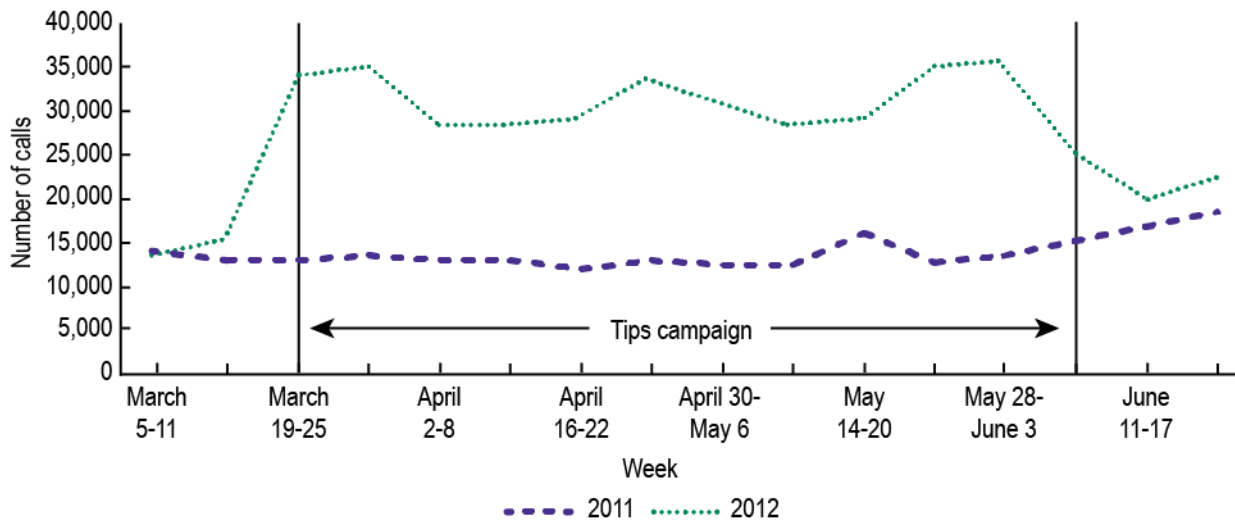
The 2012 report by the U.S. Surgeon General, *Preventing Tobacco Use Among Youth and Young Adults*, concluded that anti-tobacco media campaigns can prevent the initiation of tobacco use and reduce the prevalence of tobacco use among youth.<sup>72</sup> Since the publication of these key reports, additional evidence has accumulated to support the effectiveness of anti-tobacco media campaigns in high-income countries; selected studies are presented below.

A systematic review by Wakefield and colleagues<sup>70</sup> examined the effectiveness of mass media campaigns to improve health behaviors, including campaigns to prevent/reduce tobacco use. Their review cited the 121 studies on mass media campaigns examined by NCI (including 25 controlled field experiments on youth and 40 on adults, as well as 57 population-based state and national mass media campaigns) and the Cochrane review by Bala and colleagues<sup>74</sup> of 11 adult-focused studies of mass media campaigns with control groups or interrupted time series designs. Wakefield and colleagues asserted that there is “a substantial body of support for the conclusion that mass media campaigns can change population health behaviors”<sup>70,p.1271</sup> and that the evidence in support of anti-tobacco mass media campaigns is strong.

In another systematic review, Durkin and colleagues<sup>71</sup> studied the ability of mass media campaigns to promote smoking cessation among adult smokers. This review updated and synthesized findings from previous reviews<sup>41,74</sup> with 26 additional empirical studies. The authors concluded that the evidence in support of mass media campaigns to promote smoking cessation has strengthened over time, and such campaigns are an important investment as part of a comprehensive tobacco control program. These campaigns “educate about the harms of smoking, set the agenda for discussion, change smoking attitudes and beliefs, increase quitting intentions and quit attempts, and reduce adult smoking prevalence.”<sup>71,p.127</sup>

In 2012, the U.S. Centers for Disease Control and Prevention (CDC; an agency of the U.S. Department of Health and Human Services) launched “Tips From Former Smokers” (Tips), the first federally funded, national-level tobacco education mass media campaign in the United States. Tips aimed to increase public awareness of the health effects of smoking and exposure to SHS, encourage quitting, and motivate nonsmokers to talk with family and friends about the hazards of smoking. The campaign featured testimonials from former smokers who described in graphic and emotional terms the consequences of living with diseases caused by smoking. Campaign messages were presented through national and local cable television, local radio, online media, billboards, movie theaters, transit venues, and print media (see Figure 8.3 for examples of advertisements). Tips promoted a national quitline portal (1-800-QUIT-NOW) and a national smoking cessation website (<http://www.smokefree.gov/>), and the campaign was found to increase calls to the quitline portal and visitors to the smoking cessation website (Figures 8.1 and 8.2).<sup>77</sup> An analysis of the Tips campaign found that it succeeded in reducing smoking-attributable morbidity and mortality, and overall, was a highly cost-effective mass media intervention.<sup>78</sup>

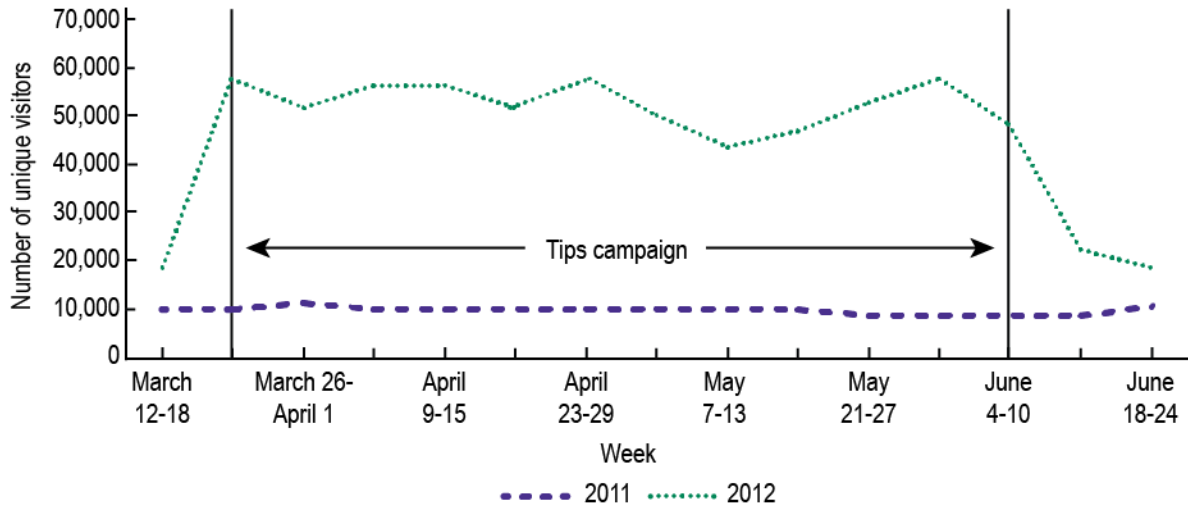
**Figure 8.1** Number of Weekly Telephone Calls to the National Quitline Portal Around the Airing of the Centers for Disease Control and Prevention’s Tips From Former Smokers Campaign



Notes: The Tips campaign ran from March 19 to June 10, 2012. Data for May 30 to June 19, 2011, were imputed using straight-line regression. Source: Centers for Disease Control and Prevention 2012.<sup>77</sup>



**Figure 8.2** Number of Weekly Unique Visitors to the National Cancer Institute’s Smokefree.gov Around the Airing of the Centers for Disease Control and Prevention’s Tips From Former Smokers Campaign



Notes: The Tips campaign ran from March 19 to June 10, 2012. Data for 2011 and 2012 were collected by Google Analytics. Source: Centers for Disease Control and Prevention 2012.<sup>77</sup>

The U.S. Food and Drug Administration (FDA), an agency of the U.S. Department of Health and Human Services, launched a national mass media campaign targeting youth prevention in February 2014.<sup>79</sup> Titled “The Real Cost,” the campaign targets youth ages 12–17 at risk for cigarette smoking. Key messages, which are targeted specifically toward a high-risk teen audience, include: addiction leads to loss of control, cigarette smoke contains a toxic mix of chemicals, and every cigarette comes with a “cost” to health. Examples of advertisements from both the CDC Tips campaign and the FDA Real Cost campaign are shown in Figure 8.3.

**Figure 8.3** Advertisements From the Tips From Former Smokers Campaign (CDC) and the Real Cost Campaign (FDA)



Sources: Centers for Disease Control and Prevention 2015<sup>176</sup> and Food and Drug Administration 2014.<sup>79</sup>

### Evidence From Low- and Middle-Income Countries

In recent years, many LMICs have increased their implementation of anti-tobacco mass media campaigns, including campaigns that can reach rural and low-income areas and can operate via Internet and mobile technologies which are increasingly available in LMICs.<sup>80</sup> The emerging use of media campaigns in LMICs has been recognized as an important tobacco control intervention,<sup>70,81</sup> particularly in countries where bans or restrictions on tobacco advertising and promotion as obliged by the WHO FCTC are not yet in place or not effectively enforced. Although research on campaigns conducted in LMICs is limited, existing studies suggest that anti-tobacco media campaigns can be effective at preventing smoking and promoting cessation in LMICs, as described below.

In India, smokeless tobacco use is more prevalent than cigarette smoking and thus poses a significantly greater threat to population health than it does in other countries.<sup>82,83</sup> Murukutla and colleagues<sup>81</sup> examined the effects of the first national mass media campaign implemented by the Indian Government (in collaboration with the World Lung Foundation and other organizations) to raise awareness, increase knowledge, and improve perceptions of the health consequences of smokeless tobacco use. A 30-second public service announcement (PSA) depicting the illnesses and disfigurement resulting from surgery performed to treat cancers caused by smokeless tobacco use ran for 6 weeks in 2009 on state-owned national and regional television channels and on privately owned cable and satellite channels. A post-intervention evaluation of a nationally representative household survey of smokeless-only users, smokers-only, and dual users, who reported having watched television or listened to radio during the time of the campaign demonstrated high recall of the campaign advertisement (63% of smokeless-only users and 72% of dual users). More than 70% of those aware of the campaign reported that the PSA had made them “stop and think,” and said that it was relevant to their lives and gave them new information. There was also a significant association between campaign awareness and campaign-relevant knowledge, attitudes, and behaviors among smokeless-only users. The authors concluded that the study supports the feasibility and efficacy of mass media social marketing campaigns targeted at rural populations and those of low socioeconomic status in India.

In another study conducted in India, Anantha and colleagues<sup>84</sup> examined the effectiveness of an anti-tobacco community education program in the Kolar District of Karnataka. The program components included distribution of tobacco information flyers, display of cards with graphic pictures of cancers, and screenings of films about tobacco use in the villages. This program was tested in one experimental area and compared to two control areas. Measures of prevalence, quitting, and initiation were taken at baseline and 2 years and 3 years later, using face-to-face surveys. Sample sizes varied across waves, but included 13,833 respondents from the experimental area, 18,509 from control area 1, and 9,437 from control area 2 across the three waves. This study found that the prevalence rate of tobacco use declined more in the experimental than in the control communities, and that a greater number of tobacco users quit in the experimental area compared with the control areas.

Other research from India has shown that various communication strategies for motivating tobacco users to quit can be effective, even among rural populations with high rates of illiteracy. For example, an intervention study conducted over a period of 10 years in three rural areas of India was well understood and well received by villagers. Various communication methods were used, including films, posters, folk-drama, radio programs, and newspaper articles. The method most preferred by the population was personal communication. Overall, the intervention led to tobacco cessation in 14% of the sample.<sup>85</sup>

In 2004, Malaysia implemented the Tak Nak (“Just say no”) campaign—the first media campaign in the country designed to increase awareness of the health hazards of smoking. An evaluation of the campaign was conducted by Fong and colleagues<sup>86</sup> as part of the ITC Malaysia Survey. Waves 1 through 4 of this survey (conducted from 2005 through 2009) included face-to-face and telephone surveys of cohorts of about 2,000 adult smokers and 1,000 youth smokers and nonsmokers; waves 1 through 3 also surveyed 1,500 adult nonsmokers. The survey measured awareness of the campaign, self-reported effects of the campaign, current knowledge of tobacco’s health risks, and effects of the campaign on discussion of tobacco-related health concerns in the respondent’s household. The survey found that at least 93% of smokers had heard of the campaign at each wave. In wave 4 (2009), 61% and 53% of smokers said that the campaign had led to discussions about smoking and health with their family and friends, respectively. In addition, almost three-fourths of smokers indicated that the campaign made smoking less socially desirable, and nearly half (43%) of smokers and quitters indicated that the campaign made them more likely to quit or to stay quit.

An ITC Project evaluation of the Tak Nak campaign by Lee and colleagues<sup>87</sup> found that smokers who reported being most affected by the campaign were more likely to report stronger intentions to quit. Further analyses showed that the impact of the campaign was strongest among smokers who showed the most cognitive and affective reactions to the campaign, specifically those who thought more about the harms of smoking, perceived greater societal disapproval of smoking, and/or exhibited a higher level of fear arousal after the campaign. The authors concluded that their findings support the effectiveness of including both cognitive and affective components in health communication messages.

A mass media campaign to reduce the common Chinese practice of giving cigarettes as gifts was evaluated using ITC China Survey data, specifically focusing on the impact of this campaign on Chinese smokers’ knowledge of smoking-related harms and attitudes toward gifting cigarettes.<sup>88</sup> Disagreeing that cigarettes are good gifts was more common in the four ITC cities where the anti-gifting television advertisement was presented (Beijing, Shenyang, Shanghai, Guangzhou) compared to the two cities where it was not (Yinchuan, Changsha).

In 2009, a mass media campaign was developed in Moscow, Russian Federation, with the aim of educating the public about the harms of tobacco.<sup>89</sup> The campaign, which ran on television, radio, newspapers, billboards, and posters in the Metro, bars, and restaurants, was adapted from the Australian “Sponge” PSA campaign already shown to be effective in HICs. A post-campaign evaluation survey found that the campaign accomplished its objectives of “making smokers think more about the health harms of smoking, creating concern about smoking, and increasing knowledge and encouraging discussion about the harms of smoking at home—all precursors to quitting.”<sup>89,p.440</sup> The success of the campaign was then used as support for the smoke-free Moscow initiative by the Moscow Duma Health Committee.

In South Africa, Abedian<sup>90</sup> explored the effect of anti-smoking advertising, using data on real per capita domestic consumption of cigarettes from 1970 to 1993. He examined the decline in per capita consumption and assessed whether it could be explained by changes in price, income, and advertising, or by anti-smoking campaigns. Because this decline could not be explained by the first three factors alone, the author argued that anti-smoking publicity contributed to the decline.

In Mauritius, Azagba and colleagues<sup>91</sup> used longitudinal data from the ITC Mauritius Survey and found that the combination of a cigarette tax increase and an adapted version of the Australian “Sponge” campaign led to significant decrease in smoking prevalence and consumption among adults.

In Turkey, Tansel<sup>92</sup> used annual time series data on the number of cigarettes consumed per person age 15 and over between 1960 and 1988 to estimate the effects of: (1) health warnings after 1981, (2) a 1986 anti-smoking campaign by a national newspaper, and (3) a short-term anti-smoking campaign in 1988 (consisting mainly of displaying anti-smoking posters in public places) initiated by the Turkish Ministry of Health. The study found that the 1982 health warning and both the 1986 and 1988 anti-smoking campaigns had a significant negative effect on demand for cigarettes; the average decline was about 8% for the period 1982–1988. The author argues that public education “exerts its primary effect on the smoking behaviour of the less educated who are currently less well informed about the health consequences of smoking.”<sup>92,p.527</sup>

Several studies from LMICs have evaluated anti-tobacco mass media campaigns aimed at increasing knowledge of the health effects of SHS exposure and increasing support for smoke-free laws. Thrasher and colleagues<sup>93</sup> conducted a pre–post cohort design study of a two-month social marketing campaign intended to support Mexico City’s comprehensive smoke-free law. The campaign, which used ads on television, radio, and billboards and in print, was conducted from early September to mid-December 2008. It aimed to increase knowledge of the toxic constituents of SHS, support for and compliance with the new legislation, and awareness of the positive outcomes associated with smoke-free environments. The study found high recall of the campaign (69%), and that greater exposure to the campaign was associated with greater knowledge of the presence of toxic components (ammonia and arsenic) in SHS. The Mexico City campaign was also associated with increased support for and perceived benefits of the new law.

Two television campaigns that ran in São Paulo, Brazil, during the implementation of a smoke-free law in 2009 were evaluated to assess their effectiveness in changing attitudes and creating support for the law.<sup>94</sup> The first campaign featured a well-known physician providing information about the law; the second focused on a graphic and hard-hitting manner on the harms of SHS exposure. Compared with the first campaign, the second was rated as significantly more persuasive, personally relevant, and convincing, and smokers rated this campaign as significantly more likely to make them want to quit. These results are consistent with evidence from HICs that anti-tobacco media campaigns which evoke strong negative emotional responses are more effective than those that evoke low levels of negative emotion or positive emotions such as humor.<sup>72,95-98</sup>

Kosir and Gutierrez<sup>99</sup> reviewed more than 30 mass media campaigns on SHS conducted between 1998 and 2008 in countries around the world, including several LMICs (India, Mexico, the Philippines, Poland, Turkey, Uruguay, and Viet Nam). These campaigns included one or more of the following objectives: changing individual smoking behavior; building support for smoke-free environments; announcing an upcoming smoke-free policy and/or preparing the public for one; and/or encouraging compliance with existing smoke-free laws. Increasing knowledge of the health effects of SHS exposure, especially exposure of children, was an integral part of many campaigns. This review highlights many lessons learned regarding the process and content of the campaigns that are applicable to both HICs and LMICs. The authors’ key observations include: (1) research and evaluation of many campaigns was limited, thanks largely to lack of funding, time, and knowledge of how to conduct research and evaluation activities, and (2) advertisements developed in one country can be effectively adapted to

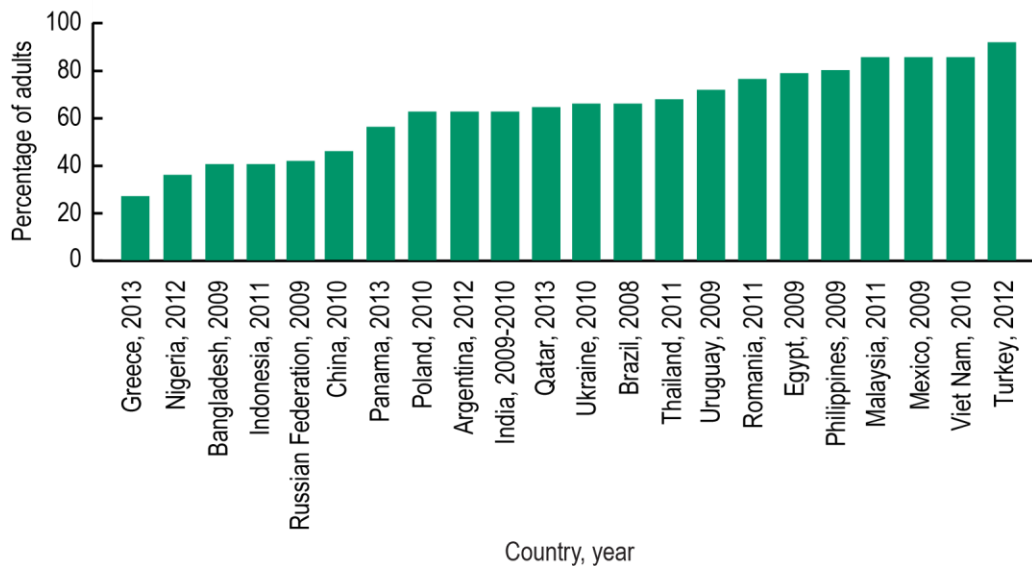
other countries as long as the process includes adequate local target audience research, pretesting of draft materials, and appropriate adaptation based on the research findings.<sup>99</sup>

### Implementation of Anti-Tobacco Mass Media Campaigns

In their comprehensive review of the literature, Hammond and colleagues<sup>100</sup> identified key factors to consider when implementing mass media campaigns, including campaign reach and intensity and durability of campaign effects—that is, the extent to which effects last after a campaign ends. Research has demonstrated that withdrawal of anti-tobacco media campaigns is associated with a decline in beneficial effects, which indicates the utility of investing in longer, better-funded campaigns.<sup>41,70,101,102</sup> Television advertising, the most commonly employed medium for anti-tobacco mass media campaigns, is the most efficient method for reaching smokers in most countries.<sup>40,103</sup> Evidence from HICs suggests that online advertising may be a highly cost-effective channel for low-budget anti-tobacco media campaigns.<sup>104</sup>

High-quality anti-tobacco mass media campaigns can be expensive to produce and broadcast, and require both research and marketing expertise to increase the likelihood that they will be effective.<sup>105</sup> One successful strategy for LMICs has been to adapt existing evidence-based anti-tobacco mass media campaigns from other countries.<sup>103,105</sup> Adapting television campaigns can involve simply changing the end-frame to represent local sponsors (low-level adaptation) or reproducing the advertisement to better represent the target population (high-level adaptation).<sup>105</sup> For example, Australia’s “Sponge” campaign graphically depicts the damage to the lungs each time a smoker inhales a cigarette by showing tar squeezed from a lung like a sponge. The advertisement has been adapted by 10 other countries, including China, the Russian Federation, Bangladesh, and India. Perl and colleagues<sup>89</sup> describe how the Sponge campaign was adapted for use in the Russian Federation. Cotter and colleagues<sup>106</sup> describe how the Sponge campaign was modernized. Similarly, an Australian advertisement that depicts fatty deposits being squeezed out of an artery (“Artery”) has since been adapted by over 40 countries.

WHO reports that more than half of the world’s population live in countries that have aired at least one national anti-tobacco mass media campaign (with all appropriate characteristics) on television and/or radio for at least 3 weeks in duration in the past 2 years.<sup>17</sup> People living in low-income countries are least likely to be exposed to anti-tobacco mass media; 65% of low-income countries have not run any national anti-tobacco media campaign in the past 2 years.<sup>17</sup> The effectiveness of anti-tobacco media campaigns can vary, based on advertisement content, the percentage of the target population that can access television or radio, the amount of play ads receive on television or radio, and other factors. As shown in Figure 8.4, the percentage of adults who noticed anti-smoking information on either television or radio varies greatly by country.

**Figure 8.4** Percentage of Adults Who Noticed Anti-Smoking Information on Television or Radio, 2008–2013

Source: Eriksen et al. 2015.<sup>177</sup>

### School-Based Tobacco Education Programs

School settings are another venue in which information can be disseminated to raise awareness of the health effects of tobacco use. School-based education programs have considerable appeal because they represent an efficient means of reaching youth at the ages when most smoking begins.<sup>72</sup> The nature and content of effective school-based tobacco education curricula have been described in detail elsewhere.<sup>72,107</sup> The U.S. Surgeon General has stated that to be effective, school-based programs “should be comprehensive, interactive, start early, be sustained, incorporate an appropriate number of lessons, and be integrated into a community-wide approach.”<sup>72,p.792</sup> Additionally, as described below, programs designed, conducted, or funded by the tobacco industry have been found to be ineffective or, in some cases, counter-productive.

### Evidence From High-Income Countries

Evidence regarding the effectiveness of school-based tobacco education programs is mixed but suggests that these programs have a role to play in preventing youth smoking. The 2012 Surgeon General’s report stated that “the evidence is sufficient to conclude that school-based programs with evidence of effectiveness, containing specific components, can produce at least short-term effects and reduce the prevalence of tobacco use among school-aged youth.”<sup>72,p.812</sup> School-based programs that are implemented as part of comprehensive tobacco control programs are more successful than school-based interventions alone.<sup>72,108</sup>

### Evidence From Low- and Middle-Income Countries

Few studies have evaluated school-based tobacco education programs conducted in LMICs. In many LMICs, there is little anti-tobacco information from other sources, so the marginal impact of information from school-based tobacco education programs may be greater than in HICs. However, despite recent

improvements in access to education, fewer youth in LMICs are in school compared with youth in HICs, which may reduce the potential efficacy of this strategy.

Project MYTRI (Mobilizing Youth for Tobacco-Related Initiatives), a partnership between researchers in the United States and India, was a group-randomized trial designed to assess a multicomponent intervention to prevent tobacco use (cigarettes, bidis, and smokeless tobacco) among Indian adolescents. The researchers assessed factors predictive of tobacco use among youth in urban India, developed the intervention program and measurement methods, assessed baseline and first-year follow-up data, and evaluated the final project outcome.<sup>109,110</sup> The intervention consisted of classroom curricula, school posters, and both a parental involvement and peer-led activism component. The findings showed that, compared with students in the control group, students in the intervention group were significantly less likely to increase their use of cigarettes or bidis over the 2-year study period, and were less likely to intend to use tobacco products in the future. Because of the robust research design and the number of adolescents involved, the project provides strong evidence that a multicomponent school-based program can be an effective tobacco control tool in LMICs.

Three different school smoking prevention approaches were tested in 36 public high schools in the Western Cape and KwaZulu-Natal, South Africa.<sup>111</sup> The 5,266 students attending these schools were randomly assigned to one of three programs: the school's usual tobacco education program (comparison), a harm minimization program developed and tested in Australia (KEEP LEFT), and a social skills/peer resistance program from the United States (Life Skills Training). No differences were found in past 30-day smoking among students in the three groups.

Several smaller scale studies have evaluated school-based tobacco education programs in Malawi,<sup>112</sup> the Russian Federation,<sup>113</sup> and Thailand.<sup>114</sup> Studies of the programs conducted with Thai and Russian adolescents showed positive effects, but the study among Malawian adolescents found no positive effects for the school-based program.

Overall, the limited evidence available from LMICs suggests that school-based tobacco education programs can improve students' knowledge, contribute to denormalizing tobacco use, and help prevent tobacco use in the short term. Given the generally lower levels of awareness of tobacco's health effects in LMICs, these programs may have a greater impact in these countries than in HICs, where health effects are generally better known. School-based tobacco education programs in LMICs represent an area for further research and study.

### Evidence on Tobacco Industry Programs

In the United States, tobacco companies have funded or conducted programs since the 1980s with the stated purpose of preventing smoking among youth. These efforts have included school-based smoking prevention programs as well as family involvement self-help booklets, mass media campaigns, and community-based youth smoking prevention activities.<sup>115</sup> Similar programs have been implemented in countries around the world.<sup>116</sup> In contrast to strategies known to be effective, these programs focus largely on parental and peer influences and decision-making and life skills, and ignore the influence of tobacco advertising and promotion on youth initiation, the importance of parents' promoting a nonsmoking norm for themselves and their children, the addictive nature of tobacco products, and the serious harm that tobacco use causes. These programs have also tended to present smoking as an "adult choice," thus minimizing the addictive nature of tobacco products and capturing the interest of

adolescents eager to enter the adult world. The U.S. Surgeon General, the courts, and research studies analyzing previously internal tobacco industry documents have generally concluded that the actual purpose of the industry programs is to discourage legislation, regulation, and programming to effectively reduce youth tobacco use; to improve the tobacco industry's public image; to generate partnerships with youth-serving organizations; and to limit the threat of litigation.<sup>26,72,116</sup>

## Health Warning Labels

Health warning labels constitute a potentially powerful information intervention<sup>103,118–120</sup> and are typically the most visible health information intervention presented to smokers. An individual who smokes a pack of 20 cigarettes a day is potentially exposed to the warning label 7,300 times a year, simply by taking a cigarette out of the pack to smoke. Second, the time and circumstances of the exposure are advantageous for stimulating change in behavior because they are proximal to the decision to use the product—that is, when buying a pack of cigarettes or when taking a cigarette out of the pack.

Not only do warnings convey information to smokers, but nonsmokers, including children and youth, also report high exposure to and awareness of health warnings on packages.<sup>121</sup> When smokers from representative national samples in Canada, the United States, the United Kingdom, and Australia were asked to list where they had seen anti-smoking information, their overall responses mentioned warning labels just slightly less often than television.<sup>122</sup>

In addition, compared to other information interventions such as mass media campaigns, health warning labels are a very low-cost intervention because the tobacco companies bear the costs of printing and distributing them. Thus, warning labels on tobacco packaging can be implemented at virtually no cost to governments.

Studies have assessed the ability of health warnings to reduce differences in knowledge and smoking behaviors between population subgroups, particularly between advantaged and disadvantaged groups within countries. In general, these studies indicate that pictorial warning messages have very wide reach, and can be a broadly effective tool in improving knowledge and reducing health disparities.<sup>119</sup> For example, a study comparing the impact of pictorial warning labels with text-only labels among U.S. adult smokers found that the pictorial warnings were more effective across diverse racial/ethnic and socioeconomic groups, concluding that “pictorial health warning labels may be one of the few tobacco control policies that have the potential to reduce communication inequalities across groups.”<sup>123,p.1</sup> Similarly, a study of the perceived effectiveness of pictorial health warnings with different content among Mexican youth and adults found that youth and adults, smokers and nonsmokers, and adults of varying education levels rated pictorial health warnings in a generally consistent manner.<sup>124</sup>

In the United States, cigarette warning messages have been required since 1966 as a result of the Federal Cigarette Labeling and Advertising Act of 1965.<sup>62,p.482</sup> By 1991, 77 countries required health warnings on cigarette packages, but many were considered weak.<sup>125</sup> Over time, various measures to increase the effectiveness of health warnings have been taken, including increasing their size, strengthening their texts, and requiring rotation of different messages. In 1985, Iceland became the first country to require the rotation of pictorial warnings, as opposed to the “text-only” messages that were standard at the time.<sup>62</sup> In 2000, Canada became the first country to mandate rotation of hard-hitting, full-color pictorial warnings which took up 50% of the principal surfaces (front and back) of the pack.<sup>126</sup> Today, a strong body of research demonstrates that pictorial warnings are more effective than text-only warnings.<sup>127</sup>

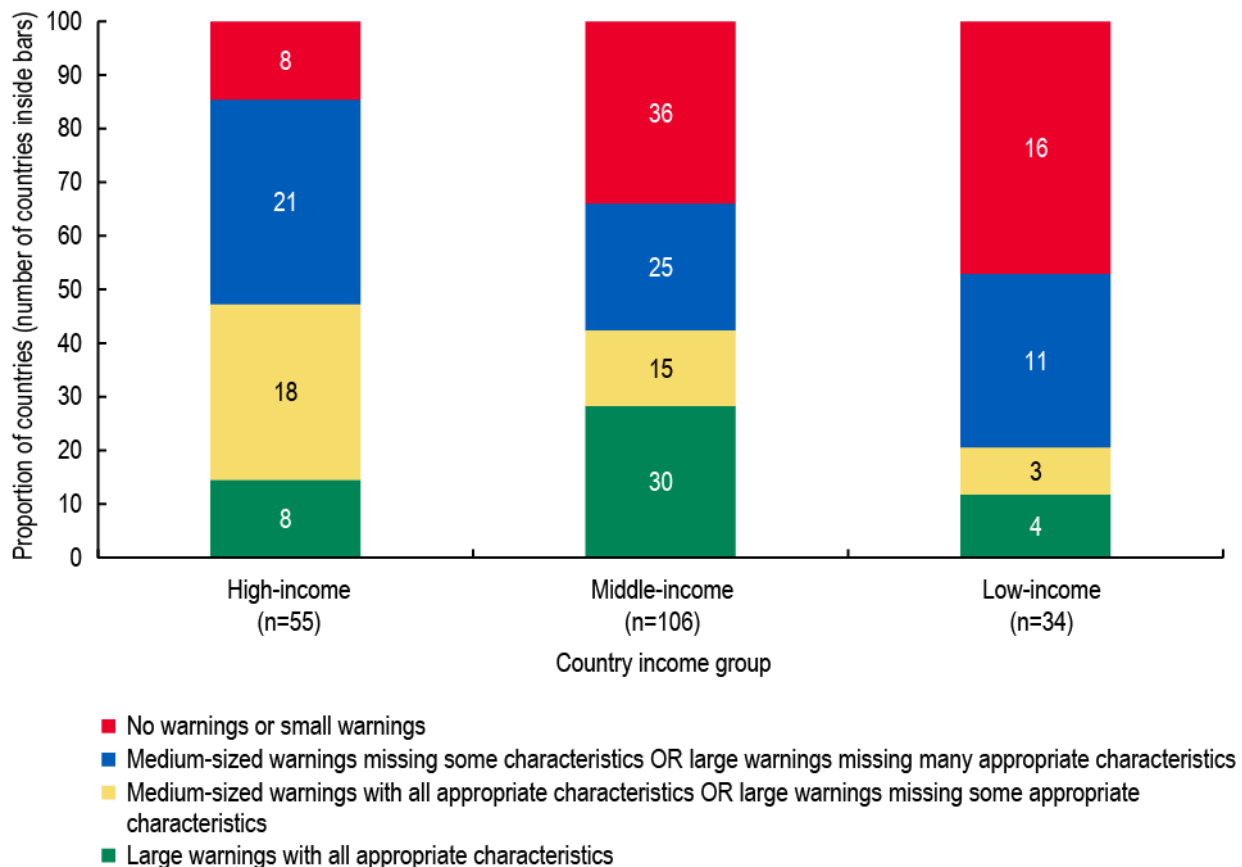


And, as Hammond has noted, “a wide variety of research has demonstrated the effectiveness of using pictures and imagery in health communications.”<sup>119,p.329</sup>

Article 11 of the WHO FCTC requires prominent health warning labels on all tobacco packaging and obligates Parties to adopt strong packaging and labeling regulations requiring tobacco producers to print rotating health warning labels covering 50% or more of the principal surfaces, but no less than 30%, on all tobacco packages.<sup>128</sup> In 2008, the Conference of Parties adopted evidence- and best practice-based guidelines for implementing Article 11 which recommend that Parties consider using health warnings that cover more than 50% of the principal display areas of tobacco packs and aim to cover as much of the principal display area as possible.<sup>129</sup>

National labeling requirements vary considerably around the world, ranging from large pictorial warnings that take up most of the front and back of the pack to small text warnings on the side of the pack. More than 85% of countries mandate at least some labeling, but many have not yet implemented best-practice warning labels. Nearly 20% of the world’s population living in 42 countries (about 1.4 billion people) was protected by strong pack warnings in 2014, an increase from 14% in 2012.<sup>17</sup> Low-income countries are the least likely to have implemented strong health warnings. About 30% of countries, including half of low-income countries, have either no warnings or only small warnings (Figure 8.5).

**Figure 8.5 Types of Health Warning Labels in Use Around the World, by Country Income Group, 2014**

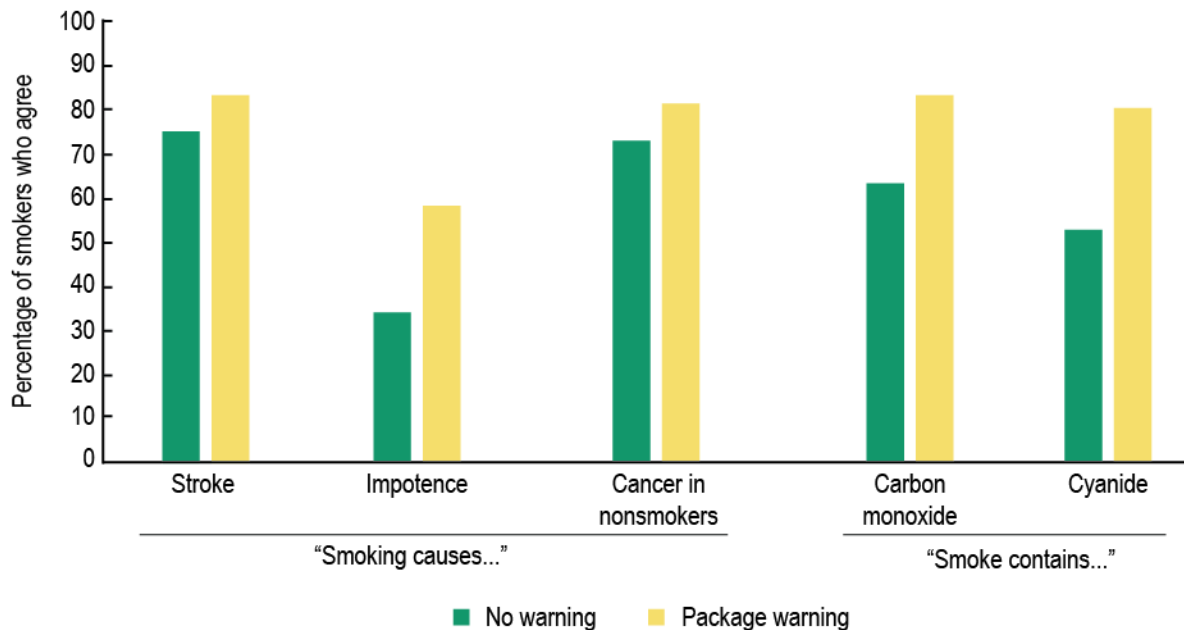


Source: World Health Organization 2015.<sup>17</sup>

### Impact of Health Warning Labels

Health warning messages on tobacco packages are now widespread, although they vary greatly in content, format, size, and whether they include graphics and other features.<sup>103</sup> People who live in countries where informative health warning labels are required are more knowledgeable about the harms of tobacco use than people in countries where health warning labels are not required.<sup>72,103,130,131</sup> As shown in Figure 8.6, knowledge about the harms of tobacco is greater in countries that implement tobacco warning labels.

**Figure 8.6 Knowledge About the Harms of Tobacco Use: Comparison of Countries With and Without Health Warning Labels on Particular Topics**



Sources: World Health Organization 2011,<sup>103</sup> based on data from Hammond et al. 2006.<sup>122</sup>

### Evidence From High-Income Countries

In HICs, the introduction of strong health warning labels has successfully reduced consumption and prevalence of tobacco use among adult smokers. Following the 2001 introduction of large pictorial warning labels in Canada, smokers who had read, thought about, and discussed the labels were more likely to have quit, made a quit attempt, or reduced their smoking.<sup>126</sup> About 3 in 10 former smokers reported that the labels had motivated them to quit and more than one-fourth said that labels helped them remain abstinent.<sup>132</sup> In another Canadian study, about one-fifth of smokers reported reducing their consumption as a result of seeing the pack warning labels.<sup>133</sup>

The 2006 introduction of pictorial health warnings in Australia caused more than half of smokers to believe that they had an increased risk of dying from smoking-related illness, with 38% feeling motivated to quit.<sup>134</sup>

Health warning labels have been shown to increase positive moves toward cessation such as calling a quitline, particularly when quitline information is included as part of the warning message. For example, a link between such warning messages and increased calls to a quitline has been found in studies from

the Netherlands,<sup>135</sup> Australia,<sup>136</sup> and New Zealand.<sup>137</sup> Another study showed that smokers exposed to a pictorial warning had a higher likelihood of reducing smoking, calling a telephone quitline, and quitting than smokers exposed to the text-only warning.<sup>138</sup> In Singapore, quitline calls tripled when new pictorial labels were introduced.<sup>139</sup>

Other studies measuring behavioral outcomes have shown a link between improved warning labels and reduced tobacco use. An ITC survey of 616 randomly selected adult smokers showed that smokers who had read, thought about, and discussed the new labels were more likely to have quit 3 months later.<sup>126</sup> Two self-report surveys of youth, in Canada<sup>140</sup> and in Australia,<sup>141</sup> also showed a link between warning labels and decreased initiation, with between one-fifth and two-thirds of nonsmokers reporting that warning labels had helped prevent them from initiating smoking. Additional studies conducted in Canada, Australia, and the United Kingdom also found that warning labels have successfully discouraged youths, including the most vulnerable youths, from initiating smoking.<sup>119</sup> In the Singapore survey mentioned above, 28% of smokers surveyed smoked fewer cigarettes because of the warnings.<sup>139</sup> And in a study of 191 former smokers in Canada, 27% of former smokers reported that warning labels helped them remain abstinent from tobacco.<sup>132</sup>

Huang, Chaloupka, and Fong<sup>142</sup> conducted a difference-in-difference (quasi-experimental) analysis of the impact of pictorial warnings in Canada, using the United States as the control. Controlling for price, Huang and colleagues found that the introduction of pictorial warnings reduced smoking rates by 2.9% to 4.7%, a relative decrease of 12.1% to 19.6%. Their findings suggest that if the United States had adopted Canadian graphic warnings in 2012, the number of adult smokers in the United States would have decreased by 5.3 million to 8.6 million in 2013. Similarly, Azagba and Sharaf,<sup>143</sup> based on their analysis of data from the 1998–2008 Canadian National Population Health Survey, found that Canada's pictorial warnings reduced smoking prevalence and increased quit attempts among smokers.

As with all communications, in health or otherwise, the same communication tends to lose its effectiveness over time, a phenomenon known as *wear-out*. Thus, it can be expected that health warnings will need to be revised on a regular basis. Hitchman and colleagues<sup>144</sup> analyzed ITC Survey data in Canada and the United States from 2002 to 2011, examining trends for six indicators of cigarette health warning label effectiveness. The effectiveness of both countries' warnings declined over the 9-year period of study. The magnitude of wear-out was larger in Canada (likely due to the fact that the Canadian warnings were very new when the study began) than in the United States, but was evident even for the U.S. warnings, which had been in place for 17 years at the outset of the study. Wear-out of health warnings has also been documented in a study conducted by the ITC Project in Mauritius.<sup>145</sup>

### Evidence From Low- and Middle-Income Countries

While evidence of the effectiveness of large text and pictorial warnings in HICs is well established, evidence from LMICs has only recently begun to emerge. Tobacco warning labels are especially crucial for communicating health risks in LMICs, where there are fewer sources of information about tobacco's health risks, and well-funded public information campaigns on the harms of tobacco are likely to be rare.<sup>146</sup>

A report from the U.S. Centers for Disease Control and Prevention<sup>147</sup> used 2008–2010 data from the Global Adult Tobacco Survey conducted in 14 countries to examine the effects of cigarette package health warnings on interest in quitting among smokers 15 years of age or older. Most smokers noticed

the health warnings, and among those who did, the percentage who reported thinking about quitting because of the warning was 25% or more in all countries except Poland.<sup>147</sup>

The enhancement of warning labels in Thailand in 2006 from 30% text-only to 50% pictorial greatly increased their effectiveness. After implementation of these new warnings, the percentage of smokers stating that the labels made them think about the health risks “a lot” increased from 34% to 53%, and the percentage stating that the labels made them “a lot” more likely to quit increased from 31% to 44%. By comparison, the ITC Malaysia Survey, conducted at the same time, showed no such increases; their labels did not change during that time.<sup>118,146</sup>

Gravelly and colleagues<sup>148</sup> conducted a pre–post evaluation of the impact of Uruguay’s 2009–2010 enhancement in warnings, including an increase of warning size from 50% to 80%, finding that this enhancement led to significant increases in all six indicators of warning effectiveness among adult smokers. This study demonstrates that increasing warning size beyond 50% leads to greater increases in effectiveness.

In 2009, Mauritius became the first nation in the African Region to implement pictorial warnings—a set of eight rotating images that were, at the time, among the largest in the world (70% of the back of the pack in English and 60% of the front in French). Images included graphic depictions of mouth cancer, diseased lungs, open heart surgery, as well as images such as a “limp” lit cigarette. An evaluation of the new warnings conducted before and approximately 14 to 15 months after implementation provides compelling evidence for the effectiveness of pictorial warning labels across several indicators, compared with the former text-only labels. Significant increases in awareness of health effects corresponded to the topics addressed in the new warnings. Also noted were increases in noticing the labels (27%), reading or looking closely at the labels (18%), thinking about the health risks (20%), avoiding the labels (27%), forgoing a cigarette (8%), and likelihood of quitting (29%). After the new warning labels were implemented, there was a 32% increase in the number of smokers who said that labels were a reason to quit. While the pictorial warnings evoked emotional alarm and unpleasant feelings among most smokers, the labels were not considered unrealistic or too sensational. More than half of Mauritian smokers wanted more information on cigarette packages.<sup>145</sup>

Evidence from an evaluation of warning labels in three Latin American countries also confirms that health warning labels have the most impact when they are prominent (i.e., the front and back of the package) and include emotionally engaging imagery that illustrates negative bodily impacts and human suffering due to smoking. This evaluation also suggests that text-only warnings may be less effective with more socioeconomically disadvantaged smokers.<sup>149</sup> This study compared health warning labels in Uruguay (2008) (4 different abstract images on 50% front/50% back) with warning labels in Brazil (2009) (10 different images of diseased organs, human suffering, and abstract imagery on 100% of the back) and Mexico’s text-only labels (50% of the back). Uruguay’s warning labels using abstract imagery, had higher salience than either Brazilian or Mexican warning labels. People at higher levels of educational attainment in Mexico were more likely to read the text-only labels, whereas education was not associated with salience in Brazil or Uruguay. Brazil’s strategy of depicting human suffering and gruesome health effects had greater cognitive and behavioral impacts than the abstract imagery used in Uruguay or Mexico’s text-only format. These cognitive impacts were strongest among smokers with low educational attainment.<sup>149</sup>

An investigation of the impact of warning labels on quit intentions among Malaysian smokers suggests that Malaysian smokers' responses to warning labels are comparable to those of people in HICs (e.g., Australia, Canada).<sup>150</sup> Responses of 2,006 adult smokers surveyed in the ITC Malaysia study in 2005 showed that warning labels have a clear relationship with interest in quitting, specifically insofar as the warnings stimulated thoughts about quitting and then led the person to forgo cigarettes. Given that Malaysia had only small and non-prominent warnings on the side of the pack at the time of the study, the findings attest to the potential impact of enhancing warning labels to meet or exceed the guidelines for Article 11 to stimulate quitting.

Experimental research conducted in Mexico, China, and Malaysia has demonstrated that pictorial warnings are rated by smokers as more effective than text-only warnings. In an experimental auction study in Mexico, adult smokers (n=89) placed separate bids on two packs of cigarettes, one with a text-only warning label and the other with a warning label that included text and graphic images. The study showed that the pack with the graphic image had a mean attributed value which was 17% lower (3.21 pesos) than the pack with the text-only warning. This lower perceived value was relatively consistent across socioeconomic status, cigarettes per day, number of prior quit attempts, and levels of perceived risk of smoking. This lower perceived value suggests that pictorial warnings are likely to reduce cigarette demand, resulting in a significant reduction in tobacco consumption.<sup>151</sup>

In October 2008, China enhanced its warning labels from small warnings on the side of the pack to larger text warnings on 30% of the front and 30% of the back of the pack. An ITC experimental study conducted in 2009 among 1,169 adult smokers, adult nonsmokers, and youth in four cities (Beijing, Shanghai, Kunming, and Yinchuan) found that the newly enhanced text-only Chinese warnings were much lower in effectiveness than labels that included pictorial-plus-text warnings.<sup>152</sup> The old warnings (with text on the side of the pack) and newly enhanced Chinese text-only warnings—along with eight alternative warnings that were created on Chinese packs using pictorial-plus-text warnings from Canada; Singapore; China, Hong Kong Special Administrative Region (SAR); and the European Union—were ranked and rated by respondents on a number of dimensions, including perceived effectiveness in motivating smokers to quit and in convincing youth not to start smoking. The results were remarkably consistent across adult smokers, adult nonsmokers, and youth for all four cities, and for males and females. All four pictorial-plus-text warnings were rated and ranked highest on effectiveness in motivating smokers to quit and convincing youth not to start smoking. The text-only versions of the four pictorial warnings were rated in the middle. The actual newly enhanced Chinese text warnings (on 30% of the front and back) were rated at the bottom of the set of 10 warnings, just above the old Chinese text warnings that had appeared on the side of the pack.

Fathelrahman and colleagues<sup>153</sup> conducted an experimental study to evaluate the new pictorial warnings in Malaysia before their implementation among adult male smokers (n=140). A two-group randomized design was used to compare the impact of the new pictorial warnings against the original text-only warning on the side of the pack. Nine pictorial warning mock-up packs were prepared to resemble the new warning labels proposed by the Malaysian government for implementation in January 2009. The warning label images included graphic depictions of mouth and throat cancer, diseased lungs, and gangrene. Exposure to the pictorial warnings resulted in a significantly increased awareness of the risks of smoking, thinking about the harm of smoking, interest in quitting smoking, avoiding looking at or thinking about the pack warnings, and forgoing having a cigarette. Based on these experimental findings and the results of population-based studies in other LMICs, the new Malaysian pictorial warnings can be

expected to improve awareness of the harms of tobacco and stimulate emotional responses that will lead to quit attempts.

In 2008, China and Malaysia had U.S.-style warning labels—text-only and only on the side of the pack. In 2009, both countries changed their warning labels, China to the 30% text-only warnings described above, and Malaysia to pictorial warnings occupying 50% of the top of the front and back of the pack. These changes made it possible to examine the difference in impact from a common starting point. Using pre–post data from the ITC surveys in China and Malaysia, Elton-Marshall and colleagues<sup>154</sup> found that the size of the effect of Malaysia’s larger pictorial warnings was significantly greater on all six indicators of warning effectiveness than the effect size of the change to text-only warnings in China. Elton-Marshall and colleagues<sup>154</sup> also computed the estimated impact of China’s failure to implement graphic warnings by taking the difference in the effect sizes and multiplying by the number of smokers in China. The text-only revision in China led to an increase of 3.1% in the number of smokers who reported often noticing the warnings, but the pictorial revision in Malaysia led to an increase of 12.6%, for a net difference of 9.5%. Multiplying this by 300 million Chinese smokers led the researchers to estimate that 28.5 million Chinese smokers would have noticed the warnings if China had implemented pictorial warnings rather than text-only warnings. Using the same method, Elton-Marshall and colleagues<sup>154</sup> estimated that if China had implemented Malaysia-style pictorial warnings, 25.2 million more Chinese smokers would have read the warnings, 13.2 million more smokers would have reported that the warnings made them think about the health risks of smoking, 23.1 million more smokers would have reported that the warnings made them think about quitting, and 52.8 million more smokers would have reported that the warnings stopped them from smoking a cigarette at least once. These findings demonstrate the enormous potential impact of population-level interventions to raise awareness and inform consumers about the harms of smoking—an impact that is either realized or lost, depending on the strength of the intervention.

### Tobacco Packaging: Banning Misleading Descriptors and Requiring Plain Packaging

The cigarette package represents an important marketing vehicle, serving to transmit information about the desirable characteristics of the product and the brand to both current and potential consumers.<sup>155</sup> Packaging has become an increasingly prominent form of marketing in countries with comprehensive restrictions on traditional advertising channels.<sup>100,156</sup> Governments seeking to limit the industry’s use of this information channel may employ policy measures to regulate the retail packaging and appearance of tobacco products, ranging from bans on misleading terms or descriptors, to legislatively mandated plain packaging (also known as standardized packaging) restrictions. As described in the guidelines for WHO FCTC Article 11, plain packaging refers to “measures to restrict or prohibit the use of logos, colours, brand images or promotional information on packaging other than brand names and product names displayed in a standard colour and font style.”<sup>129,p.8</sup> Plain packages use a standard background color with the brand name printed in a mandated size, font, and position.<sup>72</sup>

Article 11 of the WHO FCTC requires the Parties to implement effective measures to ensure that tobacco packaging does not promote a tobacco product by false or deceptive means. Parties are also obligated to prevent packaging and labeling from misleading the public about the product’s characteristics, health effects, or emissions, including the use of any term or element that “creates the false impression that a particular tobacco product is less harmful than others”<sup>129</sup> (e.g., “light,” “low-tar,” “mild”). As of 2014, 114 WHO Member States had banned misleading descriptive terms such as “light” and “mild” for manufactured cigarettes, and 94 countries prohibited them for smokeless products.<sup>17</sup>

In the United States, a provision of the Family Smoking Prevention and Tobacco Control Act (2009) bans use of the terms “light,” “mild,” or “low,” or similar descriptors, without a marketing authorization from the FDA.<sup>72</sup> The court in *United States of America v. Philip Morris USA, Inc.* also prohibited the defendants and other covered persons and entities from using misleading descriptors such as “low-tar,” “light,” “mild,” and “natural.”<sup>26,p.938;157</sup>

Guidelines for implementation of Articles 11 and 13 of the WHO FCTC recommend that Parties consider adopting plain packaging. Guidelines for implementation of Article 11 state that plain packaging may “increase the noticeability and effectiveness of health warnings and messages, prevent the package from detracting attention from them, and address industry package design techniques that may suggest that some products are less harmful than others.”<sup>129,p.8</sup> Guidelines for implementation of Article 13 acknowledge the advertising and promotional importance of packaging, noting the use of pack or product features to attract consumers, promote products, and establish brand identity (e.g., through use of colors, pictures, shapes, logos, etc., on packs or on individual cigarettes or other tobacco products). The Article 13 guidelines also recognize that “the effect of advertising or promotion on packaging can be eliminated by requiring plain packaging.”<sup>158,p.4</sup>

### Plain Packaging Laws: The Example of Australia

In December 2012, Australia became the first country in the world to implement plain packaging for all tobacco products. Under Australia’s law,<sup>159</sup> the Tobacco Plain Packaging Act 2011 and Tobacco Plain Packaging Regulations 2011, all tobacco products must be sold in a standardized “drab dark brown” package, with the brand name and any variant name shown in standard font, style, and size on the front of the package (Figure 8.7). The appearance and color of the tobacco products were also standardized, and pictorial health warnings increased in size by, for example, requiring them to cover at least 75% of the front and 90% of the back of the cigarette packages.<sup>160</sup>

### Evidence on the Effect of Australia’s Plain Packaging Law

Studies have been conducted to assess the impact of Australia’s plain packaging legislation since its introduction in 2012. For example, a study conducted during the roll-out phase of the legislation compared attitudes and intentions of smokers using the new cigarette packages (plain and with larger pictorial health warnings) to those of smokers still using the “fully branded” packages (with smaller warning messages).<sup>161</sup> Compared with those smoking cigarettes from “branded” packs, those smoking cigarettes from plain packs rated their cigarettes as lower in quality and less satisfying than 1 year ago, were more likely to think about quitting, and rated quitting as a higher priority.

Kmietowicz<sup>162</sup> conducted an interrupted time series analysis to examine the relationship between the implementation of plain packaging and the number of calls to the Australian national “stop smoking” helpline. The number of calls to the helpline increased 78% following the initial appearance of plain packaging, and this increase was sustained for at least 43 weeks. Dunlop and colleagues<sup>163</sup> found that 2–3 months after the introduction of plain packaging, there was a significant increase in the absolute proportion of smokers having strong cognitive (9.8% increase,  $p=0.005$ ), emotional (8.6% increase,  $p=0.01$ ), and avoidant (9.8% increase,  $p=0.0005$ ) responses to on-pack health warnings.

Figure 8.7 An Example of Australia’s Plain Packaging, Showing Requirements for the Front and Back of the Cigarette Pack

### CIGARETTE PACK – FRONT

**NOTE:**  
The graphic and warning statement must:

- cover at least **75%** of the front surface
- join without space between them

- BRAND AND VARIANT NAME:**
- horizontal and centred
  - no larger than maximum sizes
  - in Lucida Sans font
  - in Pantone Cool Gray 2C colour
  - in specified capitalisation

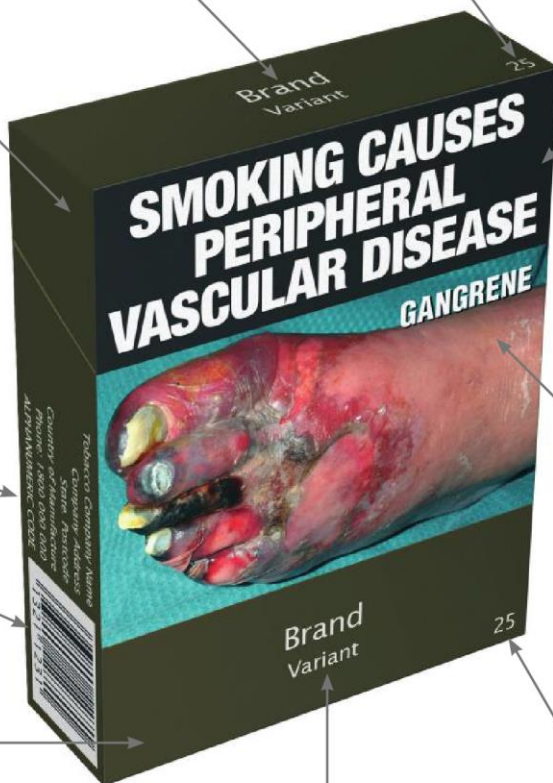
- MEASUREMENT MARK:**
- no larger than required size
  - in Lucida Sans font
  - in Pantone Cool Gray 2C colour

- PACK FORMAT:**
- made of rigid cardboard
  - no embellishments
  - flip top lid

- OTHER MARKINGS:**
- name and address, country of manufacture, contact number, alphanumeric code
  - in Lucida Sans font
  - no larger than 10 points in size
  - in specified colours

- BAR CODE:**
- rectangular
  - black and white, or Pantone 448C and white

- PACK SURFACE:**
- colour is Pantone 448C (a drab dark brown)
  - matt finish



- WARNING STATEMENT:**
- background fills front of flip top lid – extends to edges of surface
  - text fills background
  - in bold upper case Helvetica font
  - white text on black background

- GRAPHIC:**
- not distorted
  - extends to edges of surface

- BRAND AND VARIANT NAME:**
- centred below health warning
  - no larger than maximum sizes
  - in Lucida Sans font
  - in Pantone Cool Gray 2C colour
  - in specified capitalisation

- MEASUREMENT MARK:**
- no larger than required size
  - in Lucida Sans font
  - in Pantone Cool Gray 2C colour



Figure 8.7 (continued)

## CIGARETTE PACK – BACK

**NOTE:**

- The warning statement, graphic and explanatory message must:
- cover at least **90%** of the back surface
  - join without space between them

**PACK FORMAT:**

- made of rigid cardboard
- no embellishments
- flip top lid

**INFORMATION MESSAGE:**

- background extends to edges of surface
- text fills background
- in Helvetica font
- in specified size, capitalisation and weighting
- black text on yellow background

**PACK SURFACE:**

- colour is Pantone 448C (a drab dark brown)
- matt finish

**BRAND AND VARIANT NAME:**

- horizontal and centred
- no larger than maximum sizes
- in Lucida Sans font
- in Pantone Cool Gray 2C colour
- in specified capitalisation

**FIRE RISK STATEMENT:**

- below health warning
- no larger than 10 points in size
- in upper case Lucida Sans font
- in Pantone Cool Gray 2C colour

**WARNING STATEMENT:**

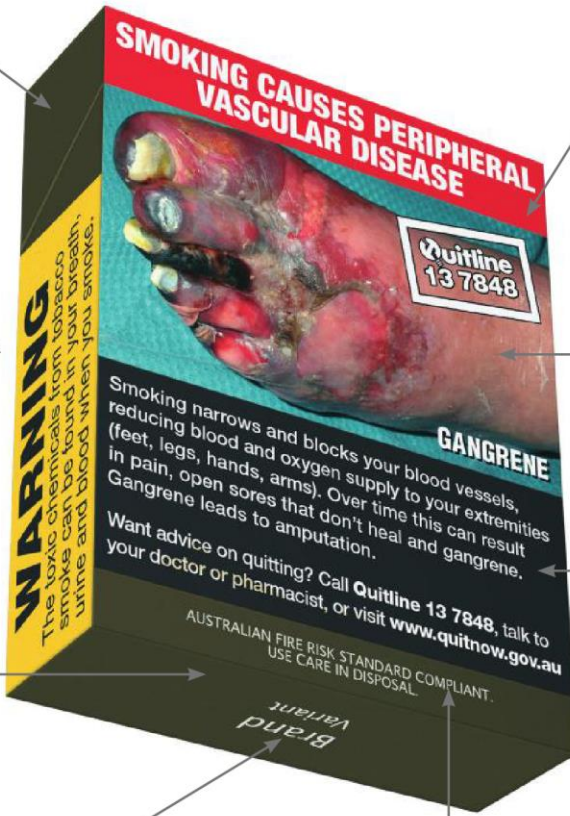
- background fills area above fold line of lid – extends to edges of surface
- text fills background
- in bold upper case Helvetica font
- white text on red background

**GRAPHIC:**

- not distorted
- extends to edges of surface
- includes Quitline logo

**EXPLANATORY MESSAGE:**

- background extends to edges of surface
- text fills background
- in Helvetica font
- in specified capitalisation and weighting
- white text on black background



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Source: Australian Government 2014.<sup>178</sup>

Durkin and colleagues<sup>164</sup> examined the short-term changes in quitting-related cognitions and behaviors among a nationally representative sample of Australian adult smokers 1 year after the legislation (plain packaging with larger pictorial health warnings) went into effect. These authors found that implementation of the legislation was associated with increased intentions to quit, quit attempts, pack concealment, and prematurely “stopping out” cigarettes among smokers.<sup>164</sup> In addition, a study using data from the ITC cohort of Australian smokers found that after implementation of plain packaging, smokers preferentially attended to and noticed the larger warnings, which also stimulated more thoughts about health risks.<sup>165</sup> The larger warnings also stimulated more avoidance behaviors than the previous warnings, but a small number of smokers appear to have learned to systematically avoid the warnings, thus lessening their impact.

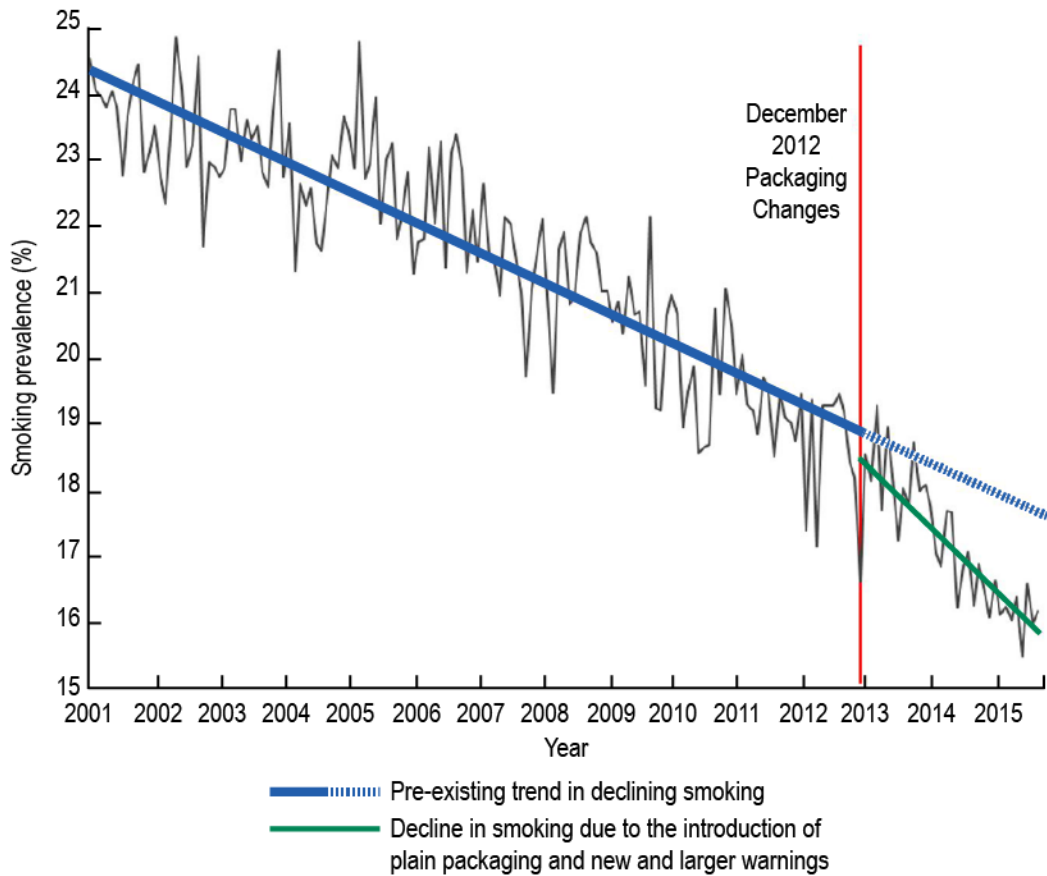
These studies support the conclusion of earlier experimental research conducted to inform Australia and other countries considering implementing plain packaging. Moodie and colleagues,<sup>166</sup> in their systematic review to inform the possible United Kingdom tobacco control plan, found that there was strong evidence that plain packaging will reduce the attractiveness and appeal of tobacco products, increase the noticeability and effectiveness of health warnings, and reduce the use of techniques that may mislead consumers about the harmfulness of tobacco products. Similarly, Hammond<sup>167</sup> concluded that plain packaging increases the effectiveness of health warnings, reduces false health beliefs about cigarettes, and reduces brand appeal among younger smokers. A systematic review of the limited literature on the impact of plain packaging in LMICs and in low-income settings within HICs, found “early evidence that tobacco products in plain packaging have less appeal, increase the salience of health warnings and may reduce the initiation of smoking in LMICs.”<sup>168,p.8-9</sup>

Australia’s official post-implementation review of plain packaging is consistent with the earlier studies and experimental research, which recognizes that plain packaging has begun to achieve its objectives.<sup>169</sup> Specifically, an expert analysis conducted as part of Australia’s review found that introduction of plain packaging together with introduction of larger pictorial health warnings and new warnings had reduced smoking prevalence in Australia beyond the pre-existing downward trend (Figure 8.8). The report concluded that there was a total decline in average prevalence before and after the 2012 packaging changes of 2.2 percentage points; and that “the [2012] packaging changes should be credited with about 0.55 percentage points (or about 25 percent) of that 2.2 percentage point.”<sup>169,p.35,170</sup> According to the model, average smoking prevalence in the post-implementation period would have been 17.77%; instead, with the changes to packaging it was 17.21%. The report also indicates that the effect on smoking prevalence may be an underestimate, and that the effect is likely to grow over time.

### **Implementation of Plain Packaging Policy Measures**

Australia’s experience is being closely observed by other countries. As of September 2016, France, Hungary, Ireland, New Zealand, and the United Kingdom have passed laws to implement plain packaging, and France and the United Kingdom have implemented the measures. Plain packaging is under formal consideration in Norway, Slovenia, Canada, Singapore, Belgium, and South Africa.<sup>171</sup>

Australia’s introduction of plain packaging has been the subject of multiple World Trade Organization (WTO) disputes, as well as a dispute brought by Philip Morris Asia against Australia under the 1993 bilateral investment treaty between Australia and China, Hong Kong SAR.<sup>172</sup> The investment treaty challenge was resolved on jurisdictional grounds in Australia’s favor in December 2015; as of July 2016, the WTO dispute was unresolved.<sup>173</sup>

**Figure 8.8 Overall Monthly Smoking Prevalence, Australia, January 2001–September 2015**


Note: The law took effect in December 2012.

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Source: Australian Government 2016.<sup>169,170</sup>

## Summary

Information failures provide an economic rationale for governments to intervene to increase public knowledge about the health harms of tobacco products. Studies conducted in HICs find that although most smokers demonstrate awareness of the major health consequences of cigarette smoking, significant knowledge gaps remain, and smokers tend to underestimate the magnitude of the risks of smoking and tend not to personalize these risks. Adolescent smokers are especially likely to underestimate or discount the health risks. In general, knowledge of the health risks of tobacco products is thought to be less widespread in LMICs, where limited government resources and often weak tobacco control environments make informing the public a greater challenge than in HICs. The tobacco industry's decades-long global effort to deny and distort the scientific evidence on smoking and health has contributed to the public's limited and inadequate understanding and awareness of the health consequences of tobacco use and SHS exposure.

Measures that increase public awareness of the risks of tobacco use are important tobacco control strategies. Indeed, studies conducted in both HICs and LMICs show that various types of interventions aimed at increasing public knowledge help reduce tobacco consumption. The WHO FCTC requires Parties to the treaty to adopt a variety of evidence-based measures, including warning labels on tobacco

packages, and to prohibit misleading industry practices, such as the use of “light” and “low-tar” descriptors on packages. Many countries have implemented anti-tobacco mass media campaigns, and numerous scientific studies document that these campaigns can reduce smoking prevalence among both youth and adults. School-based tobacco education campaigns that are implemented as part of comprehensive tobacco control programs can help reduce tobacco use among youth; these may be especially useful in countries with low public knowledge about smoking and health. However, youth-focused campaigns conducted or funded by the tobacco industry have been shown to be ineffective at reducing youth’s tobacco use or may subvert this goal. Indeed, research has shown that the actual purpose of these programs is to serve industry’s interests at the cost of the public interest. Large pictorial health warning messages on tobacco products have now been implemented in many countries around the world and have been shown to inform smokers and help reduce tobacco use. Among other groups, pictorial health warnings have the ability to inform both youth and poorly literate adult populations. Their low cost makes them particularly attractive to governments with limited resources, e.g., LMICs.

In 2012, Australia pioneered the use of plain (standardized) packaging, which requires tobacco products to be sold in a standardized “drab dark brown” package, with the brand name and any variant name shown in a (small) standard font, style, and size. This requirement limits the value of the tobacco package as a marketing vehicle and increases the prominence of the health warning message carried on the package. Early studies of Australia’s experience already show that the measure is contributing to a decline in tobacco use by reducing the appeal of tobacco products, reducing the potential for tobacco packaging to mislead consumers, and enhancing the effectiveness of pictorial health warnings. These effects are expected to become stronger over time. Despite concerted tobacco industry opposition, a few countries have passed laws to implement plain packaging, and several other countries have announced their intention to implement or are considering doing so.

## **Research Needs**

Research is needed to better understand public knowledge of the health hazards of tobacco use and SHS exposure, including knowledge of vulnerable subpopulations such as youth, the poor, and those with low or no literacy; these issues are especially important to study in LMICs, where the majority of the world’s tobacco users now reside. Studies are needed to evaluate the impact of “information shocks” and of measures to increase public knowledge of the health effects of tobacco use as these are rolled out in LMICs. It will also be important to assess the ability of school-based health education efforts in LMICs, especially when incorporated into broader tobacco control efforts, to both increase knowledge of tobacco’s hazards and to reduce tobacco use. To date, most studies of the public’s knowledge have focused on cigarettes; given the diversity of smoked and smokeless products used around the world, and the entry of products such as Electronic Nicotine Delivery Systems to the market, research should also examine public knowledge of the health effects of these products.

Research is also needed to assess the impact of policies designed to increase public knowledge, implemented in response to the WHO FCTC, and to determine what additional policies are needed to expand and maintain public knowledge. As more countries adopt plain packaging, it will be important to assess the impact of this measure and how it is influenced by different approaches and implementation conditions. Finally, continued study of tobacco industry strategies to undermine public knowledge is also needed, especially in LMICs and among vulnerable populations in HICs.

## Conclusions

1. Imperfect understanding of the impact of cigarette smoking and other tobacco use on health, particularly in low- and middle-income countries, provides an economic rationale for interventions to disseminate information about the addictive and harmful nature of tobacco products.
2. Tobacco industry disinformation practices have directly contributed to the information failures associated with consumers' imperfect knowledge of the risks of disease and addiction.
3. Well-designed and -implemented anti-tobacco mass media campaigns are effective in improving understanding about the health consequences of tobacco use, building support for tobacco control policies, strengthening social norms against tobacco use, and reducing tobacco consumption among youth and adults.
4. School-based tobacco education programs, when implemented as part of comprehensive tobacco control programs, can improve knowledge, contribute to denormalizing tobacco use, and help prevent tobacco use. Emerging evidence suggests that school-based programs can be as or more effective in reducing tobacco use among young people in low- and middle-income countries, where knowledge of the hazards of tobacco use is lower compared with high-income countries.
5. Large pictorial health warning labels on tobacco packages are effective in increasing smokers' knowledge, stimulating their interest in quitting, and reducing smoking prevalence. These warnings may be an especially effective tool to inform children and youth and low literacy populations about the health consequences of smoking.
6. Plain (standardized) packaging (i.e., devoid of logos, stylized fonts, colors, designs or images, or any additional descriptive language) reduces the appeal of tobacco products, enhances the salience of health warnings, minimizes consumers' misunderstanding of the harms of tobacco, and has contributed to a decline in tobacco use in Australia, the first country to implement plain packaging.
7. The stock of information about the harms of tobacco use is subject to potential erosion over time (wear-out) and needs to be replenished and maintained.

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