

CHAPTER 4

Measures to Reduce the Demand for Tobacco

COUNTRIES with successful tobacco control policies employ a mix of approaches. We now discuss each in turn, summarizing the evidence for their effectiveness.

Raising cigarette taxes

For centuries, tobacco has been considered an ideal consumer good for taxation: it is not a necessity, it is consumed widely, and demand for it is relatively inelastic, so it is likely to be a reliable and easily administered source of government revenue. Adam Smith, writing in *Wealth of Nations* in 1776, suggested that, through such a tax, the poor “might be relieved from some of the most burdensome taxes; from those which are imposed either upon the necessaries of life, or upon the materials of manufacture.” A tobacco tax, Smith argued, would allow poor people to “live better, work cheaper, and to send their goods cheaper to market.”¹ Demand for their work would increase, in turn raising the incomes of poor people and benefiting the entire economy.

Two centuries later, almost all governments tax tobacco, sometimes heavily, by a variety of different methods. Their motives have almost always been to generate revenue, but in more recent years taxes have also reflected an increasing concern with the need to minimize the health damage of smoking.

This section reviews the evidence on how increased taxation affects the demand for cigarettes and other tobacco products. It concludes that raising taxes does significantly reduce the consumption of tobacco. Importantly, the impact of higher taxes is likely to be greatest on young people, who are more responsive to price rises than older people. Equally important, the discussion concludes that higher taxes will reduce the demand for tobacco most sharply in low- and middle-income countries where smokers are more responsive to price increases than in the high-income countries. Even with this reduced demand, however, governments' revenues need not be harmed. Indeed, as we shall show in chapter 8, higher taxes may bring substantially higher revenues in the short to medium term.

Here, we briefly summarize the types of tobacco tax used by most governments and assess how price increases affect demand. The evidence from low- and middle-income countries is compared with that from high-income countries. The implications for policy are discussed.

Types of tobacco tax

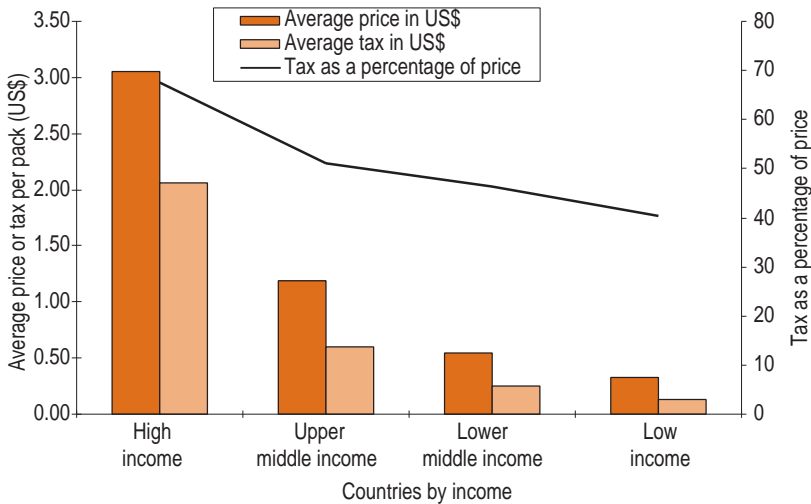
Tobacco taxes can take several forms. *Specific* tobacco taxes, added as a fixed amount to the price of cigarettes, allow the greatest flexibility and allow governments to raise the tax with less risk that the industry will respond with actions that keep low the real amount charged. *Ad valorem* taxes, such as value-added taxes or sales taxes, are a percentage of the base price and are imposed by virtually all countries—often on top of the specific excise tax. *Ad valorem* taxes may be imposed at the point of sale or, as in many African countries, on the wholesale price. Taxes may vary according to the place of manufacture or the type of product; for example, some governments impose higher taxes on cigarettes produced abroad than on domestically produced ones, or on high-tar cigarettes compared with low tar. An increasing number of countries now earmark taxes raised on tobacco for antismoking activities or other specific activities. For example, one of China's largest cities, Chongqing, and several U.S. states earmark part of the revenue from tobacco taxes for education about tobacco's effects, counter-advertising, and other control activities. Other countries use earmarked tobacco taxes to support health services.

The amount of tax charged varies from country to country (Figure 4.1). In the high-income countries, taxes amount to two-thirds or more of the retail price of a pack of cigarettes. In contrast, in the lower-income countries, taxes amount to not more than half the retail price of a pack of cigarettes.

The effect of raising taxes on cigarette consumption

A basic law of economics states that as the price of a commodity rises, the quantity demanded of that product will fall. In the past, researchers have ar-

FIGURE 4.1 AVERAGE CIGARETTE PRICE, TAX, AND PERCENTAGE OF TAX SHARE PER PACK, BY WORLD BANK INCOME GROUPS, 1996



Source: Authors' calculations.

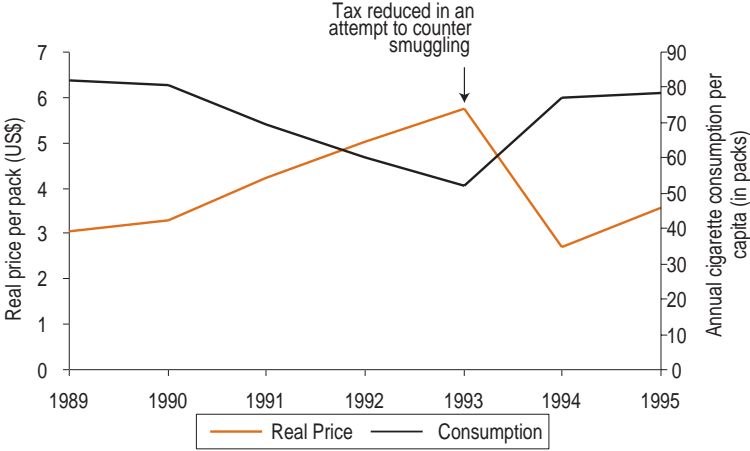
gued that tobacco's addictive nature would make it an exception to this rule: smokers, according to this argument, are sufficiently addicted to smoking that they will pay any price and continue to smoke the same number of cigarettes to satisfy their needs. However, a growing volume of research now shows that this argument is wrong and that smokers' demand for tobacco, while inelastic, is nevertheless strongly affected by its price. For example, tax increases in Canada between 1982 and 1992 led to a steep increase in the real price of cigarettes, and consumption fell substantially (Figure 4.2a). Similarly, higher taxes have reduced cigarette consumption in South Africa (Figure 4.2b), the United Kingdom, and a number of other countries. Researchers have consistently found that price increases encourage some people to stop smoking, that they prevent others from starting in the first place, and that they reduce the number of ex-smokers who resume the habit.

How addiction affects the response to higher prices

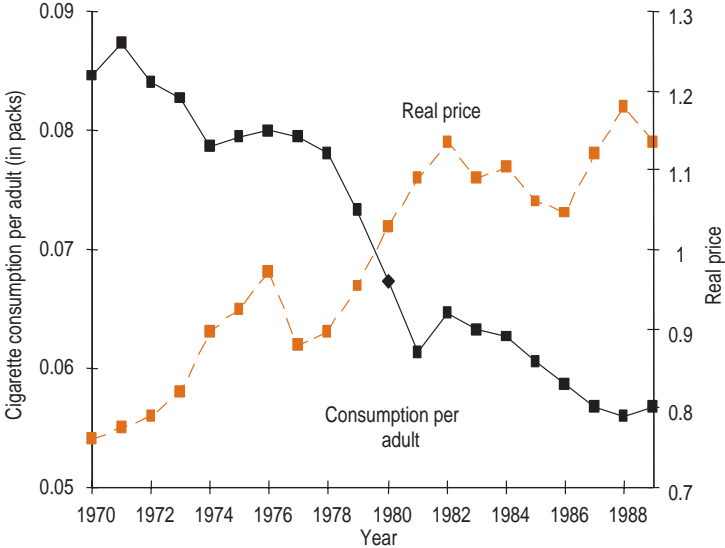
Models that attempt to assess the impact of nicotine addiction on the effects of price increases make varying assumptions about whether smokers

FIGURE 4.2 AS CIGARETTE PRICE RISES, CONSUMPTION FALLS

4.2a Real price of cigarettes and annual cigarette consumption per capita, Canada, 1989–1995



4.2b Real price of cigarettes and annual cigarette consumption per adult (15 years of age and above), South Africa, 1970–1989



Note: Consumption is derived from sales data.
 Sources: 4.2a: Authors' calculations. 4.2b: Saloojee, Yussuf. 1995. "Price and Income Elasticity of Demand for Cigarettes in South Africa." In Slama, K. ed., *Tobacco and Health*. New York, NY: Plenum Press; and Townsend, Joy. 1998. "The Role of Taxation Policy in Tobacco Control." In Abedian, I., and others, eds. *The Economics of Tobacco Control*. Cape Town, South Africa: Applied Fiscal Research Centre, University of Cape Town.

look ahead at the consequences of their actions or not. However, all models agree that, for an addictive substance such as nicotine, an individual's current consumption levels will be determined by his or her past consumption levels as well as by the current price of the good. This relationship between past consumption and current consumption has important implications for modeling the impact of price rises on demand for tobacco. If smokers are addicted, they will respond relatively slowly to price increases, but their response will be greater in the long term. The economics literature suggests that a real and permanent price increase will have approximately twice as great an impact on demand in the long run as in the short run.

Differing responses to price increases in low-income and high-income countries

When the price of a good rises, people on low incomes are in general more likely to cut back their consumption of that good than people on high incomes; and, conversely, when the price falls, they are more likely to increase their consumption. The extent to which consumers' demand for a good changes in response to a price change is known as the price elasticity of demand. For example, if a price rise of 10 percent causes the quantity demanded to fall by 5 percent, the elasticity of demand is -0.5. The more price-responsive consumers are, the greater is the elasticity of demand.

Estimates of elasticity vary from study to study, but there is reasonable evidence that in middle-income and low-income countries, elasticity of demand is greater than in high-income countries. In the United States, for example, researchers have found that a price rise of 10 percent for a pack of cigarettes decreases demand by about 4 percent (an elasticity of -0.4). Studies in China have concluded that a price rise of 10 percent reduces demand by more than in high-income countries; depending on the study, the elasticity estimates range between about -0.6 and -1.0. Studies in Brazil and South Africa have produced results in the same range. For low- and middle-income countries as a whole, then, a reasonable estimate of the average elasticity of demand would be -0.8, based on current data.

There are further reasons why people in low-income countries are more likely to respond to cigarette price rises than people in high-income countries. The age structure of most low-income countries' populations is generally younger and research from the high-income countries suggests that, on the whole, young people are more price-responsive than older people. This is partly because they have lower disposable incomes, partly because some may, as yet, be less heavily addicted to nicotine, partly because of their more present-oriented behavior, and partly because they are more susceptible to peer influences. Thus, if one young person stops smoking because he or she can no

longer afford to do it, friends are more likely to follow suit than amongst older age groups. A study by the U.S. Centers for Disease Control and Prevention found that demand elasticity among young adults aged between 18 and 24 in the United States was -0.6, higher than for smokers overall. Researchers conclude that when prices are high, not only are existing young smokers more likely to quit, but that fewer potential young smokers will take up the habit.

Based on the evidence currently available, we can therefore draw two clear conclusions. First, that tax increases are a highly effective way to reduce tobacco consumption in low- and middle-income countries, where most smokers now live; and, second, that the effect of such tax increases will be more marked in these countries than in high-income countries.

The potential impact of tax increases on global demand for tobacco

For the purposes of this report, researchers have modeled the potential impact of a range of tax increases on demand for cigarettes worldwide. The design of the model and its inputs are described in Box 4.1. The assumptions on which the model is based, concerning price elasticity, health impact, and other variables, are highly conservative. Thus the results are likely to be underestimates of the potential. The model reveals that even modest price increases could have a striking impact on the prevalence of smoking and on the number of tobacco-related premature deaths among those alive in 1995. The researchers calculate that if there were a sustained real rise in the price of cigarettes of 10 percent over the average estimated price in each region, 40 million people worldwide would quit smoking, and many more who would otherwise have taken up smoking would be deterred from doing so. Given that not all quitters would avoid death, the number of premature deaths avoided is still extraordinary by any standards—10 million, or 3 percent of all tobacco-related deaths—from this price increase alone. Nine million of the premature deaths avoided would be in developing countries, of which 4 million would be in East Asia and the Pacific (Table 4.1).

Difficulties in computing an optimal tax level for cigarettes

There have been various attempts to decide what the “right” level of tax on cigarettes should be. To decide that level, the policymaker needs to have certain empirical facts, some of which may not yet be available, such as the scale of the costs to nonsmokers. The level also depends on incomes and assumptions on the basis of values that differ from one society to another. For example, some societies would place greater importance on the need to protect children than others.

TABLE 4.1 POTENTIAL NUMBER OF SMOKERS PERSUADED TO QUIT, AND LIVES SAVED, BY A PRICE INCREASE OF 10 PERCENT
Impact on smokers alive in 1995, by World Bank region
(millions)

<i>Region</i>	<i>Change in number of smokers</i>	<i>Change in number of deaths</i>
East Asia and Pacific	-16	-4
Eastern Europe and Central Asia	-6	-1.5
Latin America and the Caribbean	-4	-1.0
Middle East and North Africa	-2	-0.4
South Asia (cigarettes)	-3	-0.7
South Asia (<i>bidis</i>)	-2	-0.4
Sub-Saharan Africa	-3	-0.7
Low/Middle Income	-36	-9
High Income	-4	-1
World	-40	-10

Note: Numbers have been rounded.

Source: Ranson, Kent, P. Jha, F. Chaloupka, and A Yurekli. *Effectiveness and Cost-effectiveness of Price Increases and Other Tobacco Control Policy Interventions*. Background paper.

BOX 4.1 ESTIMATING THE IMPACT OF CONTROL MEASURES ON GLOBAL TOBACCO CONSUMPTION: THE INPUTS TO THE MODEL

First, the researchers took estimates of the population in each region, with breakdown by age groups and gender, using standard World Bank population projections for the seven World Bank regions (see Appendix C). Second, they estimated the prevalence of smoking, by gender, for each of the seven regions, using a compiled set of more than 80 studies from individual countries used by the World Health Organization (the data are shown in chapter 1, Table 1.1). In the case of India, where *bidis* are a widespread alternative to cigarettes, the prevalence of both types of smoking was derived from local studies. Third, using the available

data, the team estimated the age profile of smokers in each region, extrapolating from large-scale individual country studies, and estimated the ratio of adult smokers to youth smokers. Fourth, the total number of smokers and the predicted number of deaths attributable to tobacco were estimated by region, gender, and age. In this step, the researchers assumed that only one in three smokers in developed countries eventually die of their habit. This assumption is conservative, given studies from the United Kingdom, the United States, and elsewhere suggesting that the actual figure is one in two, and is likely to be an under-

(continued on next page)

BOX 4.1 (CONTINUED)

estimate, as recent research from China indicates that the proportion of smokers killed by tobacco will soon equal that found in the West.

Next, the researchers estimated the number of cigarettes or *bidis* smoked each day by each smoker in every region, using WHO figures and various published epidemiological studies. They also made estimates of the number smoked by adults and by youths in each region to arrive at a ratio of adult-to-youth daily smoking rate.

The researchers then attempted to gauge the price elasticity of demand for cigarettes in each region, using data from more than 60 studies. Where more than one study had been done in any given country the resulting figures were averaged. The researchers combined the figures to arrive at averages for low- and high-income regions. These figures were also weighted by age, since young people are more price-responsive than older people. The short-run price elasticity for high-income countries was calculated to be relatively

low, that is -0.4 , whereas for low-income countries it was calculated to be -0.8 .

The researchers assumed that, in line with one major study, half of the effect of a price increase would be on the number of people who smoke, and half would be on the number of cigarettes smoked by those who continued. Also in line with other research evidence, they assumed that younger quitters would be more likely to avoid tobacco-related deaths than older quitters, and that the risks of tobacco-related death would persist for all continuing smokers, despite a reduction in the number of cigarettes smoked.

All of the variables in the model were subjected to a sensitivity analysis to allow for uncertainty, with ranges of 75 percent to 125 percent of the baseline values used in the calculations. It should be stressed that the assumptions on which the model has been based are all conservative ones, so that the results are likely to err on the low rather than the high side.

In economic terms the optimal tax would be one that equates the marginal social cost of the last cigarette consumed with its marginal social benefits. However, as we saw in the previous chapter, the magnitude of those social costs and benefits is unknown, nearly impossible to measure, and the subject of considerable ongoing controversy. Few doubt that smokers impose physical costs on nonsmokers who are obliged to inhale their smoke, with the

biggest burden of passive smoking borne by the children and spouses of smokers. Yet, since some economists consider the family to be the basic decisionmaking unit in society, they regard spouses' and children's exposure to tobacco smoke as an internal cost that is taken into account in the family's decisions about smoking, rather than an external cost imposed by smokers on others. Meanwhile, the scale of other costs, such as those from publicly financed healthcare for treating smoking-related diseases, is difficult to judge, as we have seen. Studies from the United States that attempt to compute the economically optimal tax produce a wide range of estimates, from a few cents to several dollars.

Another approach to setting tax levels is to select a rate that would achieve a specific reduction in cigarette consumption and hence meet a specific public health target, rather than one that will cover the social costs of smoking. Yet another objective would be to set tax levels to maximize the revenues generated from these relatively efficient taxes.

Rather than attempt to suggest an optimal tax level, this report proposes a more pragmatic approach: to observe the tax levels adopted by countries with comprehensive and effective tobacco control policies. In such countries, the tax component of the price of a pack of cigarettes is between two-thirds and four-fifths of the total retail cost. These levels can be used as a yardstick for proportionate increases in prices elsewhere.²

Nonprice measures to reduce demand: consumer information, bans on advertising and promotion, and smoking restrictions

There is extensive evidence from the high-income countries that the provision of information to adult consumers about the addictive nature of tobacco and its burden of fatal and disabling diseases can help to reduce their consumption of cigarettes. In this section, we review what is known about the effectiveness of a range of types of such information, including publicized research into the health consequences of smoking; warnings on cigarette packs and on advertisements; and counter-advertising. We shall also summarize what is known about the effects of the tobacco advertising and promotion activities, and what happens when these activities are banned. Because the different types of information are often available to consumers concurrently, it is difficult to disaggregate their individual effects, but the growing body of research and experience in high-income countries suggests that each can have a significant impact. Importantly, the impact appears to vary across different social groups. In general, young people appear to be less responsive to information about the health effects of tobacco than older adults, and more educated people respond more quickly to new information than those with no or

minimal education. An awareness of these differences is useful for policymakers when planning a mix of interventions that is tailored to the particular needs of their own country.

Publicized findings of research on the health effects of smoking

The long-term downward trend in smoking prevalence in most high-income countries over the past three decades has coincided with a long-term upward trend in people's levels of knowledge about the harmful effects of smoking. In 1950, in the United States, only 45 percent of adults identified smoking as a cause of lung cancer. By 1990, 95 percent did so. Over approximately the same period, the proportion of the U.S. population that smoked fell from more than 40 percent to about 25 percent.

On many occasions in the high-income countries, the public has been exposed to "information shocks" about the health effects of smoking, such as the publication of official reports on the subject that receive wide media coverage. The impact of these has been studied in such diverse countries as Finland, Greece, Switzerland, Turkey, the United Kingdom, the United States, and South Africa. In general, the impact is greatest, and most sustained, at a relatively early stage in a population's epidemic of tobacco-related disease, when general awareness of the health risks of smoking are low. As knowledge increases, new information shocks become less effective.

An analysis in the United States, based on times-series data between the 1930s and the late 1970s, suggests that three information shocks, including an influential report of the Surgeon General in 1964, together reduced consumption by as much as 30 percent over the period. In more recent decades, studies from several high-income countries have concluded that publicized information about the health effects of tobacco has been responsible for a sustained decline in consumption. For example, between 1960 and 1994 in the United States, parents decreased their consumption of cigarettes much more rapidly than single adults living without children. Researchers have concluded that parents' increasing awareness of the hazards of passive smoking for their children has deterred them from smoking.

In low-income and middle-income countries to date, there has been little research to monitor the impact of information shocks. However, smoking trends in China are being monitored following the recent publication of major studies of the health effects of smoking there. Clearly, a prerequisite for publicizing data that portray the health consequences of smoking is to collect those data in the first place. Recent moves in South Africa and India to "count the tobacco dead" through the inexpensive method of noting individuals' smoking status on their death certificates should help to provide data that are needed to describe the shape and size of the tobacco epidemic in each region.

Warning labels

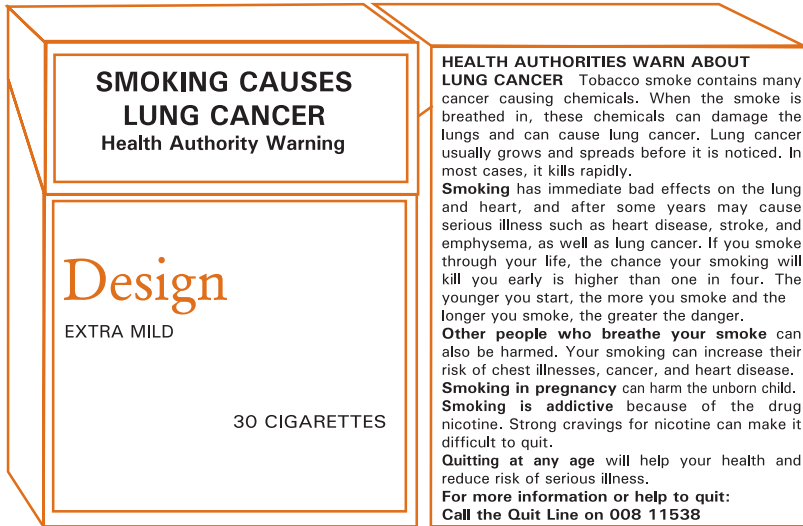
Even in countries where consumers have had reasonable access to information about the health effects of smoking, the evidence suggests that there are widespread misperceptions about these effects, due, in part, to cigarette packaging and labeling. For example, in the past two decades, many manufacturers have labeled certain classes of cigarette as “low tar” and “low nicotine.” Many smokers in high-income countries believe that these brands are safer than other cigarettes, although the research literature concludes that no cigarettes are safe. Studies suggest that many consumers are confused about the constituents of tobacco smoke, and that packaging fails to give them adequate information about the products they are buying.

Since the early 1960s a growing number of governments have required cigarette manufacturers to print health warnings on their products. By 1991, 77 countries required such warnings, although very few of these countries insisted on strong warnings with rotating messages, such as the one illustrated in Figure 4.3.

A study from Turkey suggests that health warnings caused consumption there to fall by about 8 percent over six years. In South Africa, when serious warning labels were introduced in 1994, there was a significant fall in consumption. More than half (58 percent) of smokers questioned for that study said they were motivated by the warning labels to quit or reduce their smoking. However, one key weakness of warning labels is that they will not reach some poorer individuals, particularly children and adolescents, in low-income countries. Among such consumers, it is common to buy cigarettes singly rather than in packs.

It has sometimes been argued that, in the more informed populations where smoking has been widespread for many decades, smoking prevalence is unlikely to fall much lower than it has already as a result of cigarette pack warning labels. However, evidence from Australia, Canada, and Poland suggests that such labels can still be effective, provided that they are large, prominent, and contain hard-hitting and specific factual information. In Poland in the late 1990s, new warning labels that occupy 30 percent of each of the two largest sides on the cigarette pack have been found to be strongly linked with smokers' decisions to quit or cut down their smoking. Among Polish male smokers, 3 percent said they had quit following the introduction of the labels; an additional 16 percent said they had tried quitting, and a further 14 percent said they understood the health effects of smoking better because of the warnings. Among women, the effects were similar. In Australia, warning labels were strengthened in 1995. The impact appears to have been greater in inducing smokers to quit than when the older, less strongly worded labels were used. In Canada, a survey

FIGURE 4.3 A STRONG WARNING LABEL
Proposed prototype of plain packaging for cigarettes in Australia



Source: Institute of Medicine. *Growing Up Tobacco Free: Preventing Nicotine Addiction in Children and Youths*. 1994. National Academy Press. Washington, D.C.

in 1996 suggested that half of smokers intending to quit or cut back their consumption were motivated by what they had read on their cigarette packs.

Mass media counter-advertising

There have been a number of studies to analyze the impact of negative messages about smoking on cigarette consumption. These negative messages, or counter-advertising, are disseminated by governments and health-promotion agencies, and they have been consistently found to reduce overall consumption, according to studies at both national and local levels from North America, Australia, Europe, and Israel. Swiss researchers concluded from a study of adult tobacco consumption conducted between 1954 and 1981 that antismoking publicity in the mass media permanently reduced consumption by 11 percent over the period. In Finland and Turkey, anti-smoking campaigns are also judged to have contributed to declines in consumption.

School antismoking educational programs

School antismoking programs are widespread, particularly in the high-income countries. However, they appear to be less effective than many other types of information dissemination. Even programs that have initially reduced the uptake of smoking appear to have only a temporary effect; they can somewhat delay the initiation of smoking but not prevent it. The apparent weakness of school-based programs may have less to do with their nature than with the audience at which they are targeted. As we have seen, adolescent responses to information about the long-term consequences of an action on their health are not the same as adult responses, partly because of more present-oriented behavior and partly because adolescents tend to rebel against adults' advice.

Cigarette advertising and promotion

Policymakers who are interested in controlling tobacco need to know whether cigarette advertising and promotion affect consumption. The answer is that they almost certainly do, although the data are not straightforward. The key conclusion is that bans on advertising and promotion prove effective, but only if they are comprehensive, covering all media and all uses of brand names and logos. We discuss the evidence briefly here.

There is a vigorous debate about the impact of cigarette advertising on consumers. On the one hand, public health advocates argue that such advertising does increase consumption. In contrast, the tobacco industry has argued that its advertising does not recruit new smokers but merely encourages confirmed smokers to stay with, or switch to, a particular brand. On the face of it, empirical studies of the relationship between advertising and sales have tended to conclude either that advertising has no positive effect on consumption, or that it shows only a very modest positive effect. However, these studies may be misleading, for the following reasons. First, economic theory suggests that advertising will have a diminishing marginal impact on demand; that is, when advertising for a product increases, consumers will gradually respond less and less to additional advertising, and, ultimately, increased advertising will stop making any impact on them at all. Advertising in the tobacco industry is at a relatively high level, around 6 percent of sales revenues, about 50 percent higher than the average industry. Thus, any increased consumption that may result from increased advertising is likely to be very small and difficult to detect. This does not mean that, in the absence of advertising, consumption would necessarily be as high as it is in the presence of advertising—only that the marginal impact of an increase in advertising is negligible. Second, data that record the impact of advertising on sales are usually highly aggregated for relatively long time periods, for all advertisers, in all media, and often over large populations.

Any subtle changes that might be apparent at a more disaggregated level of analysis are therefore obscured. In studies that use less aggregated data, researchers find more evidence of a positive effect of advertising on consumption, but such studies are expensive and time-consuming and, therefore, rare.

Given the problems with these approaches, researchers have turned instead to studying what happens when tobacco advertising and promotion are banned as an indirect means of gauging their effect on consumption.

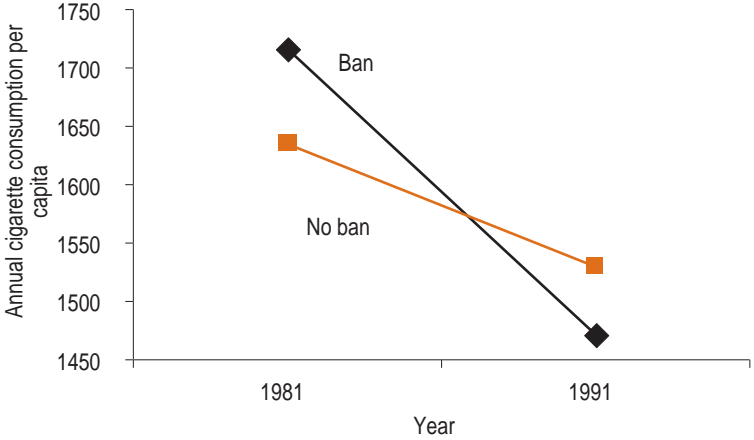
The impact of advertising bans

When governments ban tobacco advertising in one medium, such as television, the industry can substitute advertising in other media with little or no effect on overall marketing expenditures. Accordingly, studies that have examined the effect of partial cigarette advertising bans have found little or no effect on smoking. However, where there are multiple restrictions on advertising in all media and on promotional activities, there are relatively few alternative outlets for the industry. Since 1972, most high-income countries have introduced stronger restrictions across more media and on various forms of sponsorship. A recent study of 22 high-income countries based on data from 1970 to 1992 concluded that comprehensive bans on cigarette advertising and promotion can reduce smoking, but more limited partial bans have little or no effect. If the most comprehensive restrictions were in place, the study concluded, tobacco consumption would fall by more than 6 percent in high-income countries. Modeling based on these estimates suggests that the European Union's ban on advertising (see Box 4.2) could reduce cigarette consumption within the European Union by nearly 7 percent. Another study of 100 countries compared consumption trends over time in those with relatively complete bans on advertising and promotion and those with no such bans. In the countries with nearly complete bans, the downward trend in consumption was much steeper (Figure 4.4). It is important to note that, in this study, other factors may also have contributed to the decline in consumption in some countries.

Beyond the economic literature, meanwhile, there are other types of research, such as surveys of children's recall of advertising messages, that conclude that advertising and promotion do indeed affect demand for cigarettes and attract new recruits. Children's attention is attracted by such advertising, and they remember its messages. There is also growing evidence that the industry is directing increasing shares of its advertising and promotion activity toward markets where there is judged to be growth or potential for growth, including some youth markets and specific minority groups among whom smoking has until recently been uncommon. This noneconomic body of research may be of particular interest to policymakers concerned about smoking trends within specific groups in the population.

FIGURE 4.4 COMPREHENSIVE ADVERTISING BANS REDUCE CIGARETTE CONSUMPTION

Trends in weighted cigarette consumption per capita in countries with a comprehensive ban compared with countries with no ban



Note: The analysis covers 102 countries, with or without a comprehensive ban on tobacco advertising, in relation to changes in cigarette consumption data per adult aged 15 to 64, weighted by population, between 1980–82 and 1990–92. Countries with comprehensive bans start at a higher consumption level than the nonban group, but end the period with a lower consumption rate. The change is due to a higher rate of decrease in consumption for the ban group than the nonban group.

Source: Saffer, Henry. *The Control of Tobacco Advertising and Promotion*. Background paper.

Restrictions on smoking in public and workplaces

A growing number of countries and states are now implementing restrictions on smoking in public places such as restaurants and transport facilities. In some countries, such as the United States, some workplaces are also covered by public restrictions. The most obvious benefit of these restrictions is clearly to nonsmokers, who are spared exposure to the health risks and nuisance of environmental tobacco smoke. But, as we have seen, most nonsmokers' exposure to others' smoke is not in public places or workplaces, but in the home. These restrictions therefore represent only a partial means of addressing the needs of nonsmokers.

A second effect of smoking restrictions is that they reduce some smokers' consumption of cigarettes and induce some to quit. In the United States, such

BOX 4.2 THE EUROPEAN UNION'S BAN ON TOBACCO ADVERTISING AND PROMOTION

In 1989, as part of a wider initiative against cancer, the European Commission proposed a directive to restrict the advertising of tobacco products in the press and by means of billboards and posters. The European Parliament amended the Commission's proposal in 1990 and voted for an advertising ban.

The Commission observed that it could only secure agreement for a partial ban at the time, but added that a new proposal for a total ban might be made, depending on progress achieved by individual member states. In June 1991 the Commission introduced a modified proposal for a directive on tobacco.

In the period between 1992 and 1996 no progress was made in implementing the proposal because of opposition from at least three member states, Germany, the Netherlands, and the United Kingdom. However, opposition in the United Kingdom collapsed in 1997, when the Labour Party won the general election, with a manifesto commitment to introduce a tobacco advertising ban. The text of the proposed directive was finally adopted by the Commission in June 1998. The directive stipulates that all direct and indirect advertising (including sponsorship) of tobacco products will be banned within the European

Union, with full and final enforcement of all provisions by October 2006. Its key points are as follows:

- All member states of the European Union must introduce national legislation not later than 30 July 2001.
- All advertisements in the print media must cease within one further year.
- Sponsorship (with the exception of events or activities organized at a global level) must cease within two further years.
- Tobacco sponsorship of world events, such as Formula One motor racing, may continue for a further three years, but must end by 1 October 2006. During this period of phaseout, there must be a reduction in overall sponsorship support as well as voluntary restraint on tobacco publicity surrounding these events.
- Product information is allowed at points of sale.
- Tobacco trade publications may carry tobacco advertising.
- Third-country publications, not intended specifically for the European Union market, are not affected by the ban.

This directive is now under implementation.

restrictions have reduced tobacco consumption by between 4 and 10 percent, according to various estimates. For such restrictions to work, it appears that there must be a general level of social support for them, and an awareness of the health consequences of exposure to environmental tobacco smoke. Outside the United States, there are comparatively few data on the effectiveness of indoor smoking restrictions.

The potential impact of nonprice measures on global demand for tobacco

We have described the evidence for the effectiveness of a number of nonprice measures, including information for consumers, dissemination of scientific reports and research, warning labels, counter-advertising, comprehensive bans on advertising and promotion, and smoking restrictions. As part of the background work for this report, the model described in Box 4.1 was used to assess the potential impact of a comprehensive package of these nonprice measures on cigarette consumption worldwide. Because until now there have been few attempts to estimate the aggregate impact of these measures, the model was constructed on conservative assumptions. It assumes, on the basis of the existing measures of effectiveness for individual nonprice measures, that their combined impact would be to persuade between 2 and 10 percent of consumers to quit. To be conservative, the model assumes that the measures would have no impact on the numbers of cigarettes smoked daily by those who do not stop.

Based on these assumptions, a package of nonprice measures could reduce the number of smokers alive in 1995 by 23 million worldwide, even at the lower end of the estimate—that is, if packages implemented worldwide reduced the number of consumers by only 2 percent (see Table 4.2). Using the previous assumptions about the number of quitters who would avoid death, the model suggests that 5 million lives could be saved.

Nicotine replacement therapy and other cessation interventions

In addition to higher taxes and nonprice measures, there is a third set of measures to help reduce tobacco consumption. These are cessation treatments and programs of various types, including individual training, hospital treatment, counseling programs, and the growing range of pharmacological products designed to aid cessation, such as nicotine replacement therapy (NRT) products and an antidepressant drug with the generic name bupropion. NRT products, in the form of patches, gums, sprays, and inhalators deliver low doses of nicotine without delivering the other harmful constituents of tobacco smoke. Used properly, NRT is regarded as safe and effective by major medical organizations in the high-income countries. A large body of research concludes that it

TABLE 4.2: POTENTIAL NUMBER OF SMOKERS PERSUADED TO QUIT, AND LIVES SAVED, BY A PACKAGE OF NONPRICE MEASURES (Millions)
For smokers alive in 1995

Region	Change in number of smokers if package reduces the prevalence of smoking by:		Change in number of deaths if package reduces the prevalence of smoking by:	
	2 percent	10 percent	2 percent	10 percent
East Asia and Pacific	-8	-40	-2	-10
Eastern Europe and Central Asia	-3	-15	-0.7	-3
Latin America and Caribbean	-2	-10	-0.5	-2
Middle East and North Africa	-0.8	-4	-0.2	-1
South Asia (cigarettes)	-2	-9	-0.3	-2
South Asia (<i>bidis</i>)	-2	-10	-0.4	-2
Sub-Saharan Africa	-1	-7	-0.4	-2
Low/Middle Income	-19	-93	-4	-22
High Income	-4	-21	-1	-5
World	-23	-114	-5	-27

Note: Numbers have been rounded.

Source: Ranson, Kent, P. Jha, F. Chaloupka, and A. Yurekli. *Effectiveness and Cost-effectiveness of Price Increases and Other Tobacco Control Policy Interventions*. Background paper.

doubles the success rates of other cessation efforts, whether or not other interventions are used in parallel (Table 4.3). Bupropion has also been shown to be effective in trials in the United States. A key advantage of NRT is that it can be self-administered. This enhances its practical potential to smokers who wish to quit in countries where there are limited resources for intensive support by health professionals.

NRT is prescribed solely for treating the symptoms of nicotine withdrawal in smokers who are trying to quit. NRT products have not, to date, been linked with any cardiovascular or respiratory disease, and there is consensus that they are a much safer source of nicotine than tobacco. Nicotine does, of course, produce physiological effects, including raising blood pressure. However, compared with cigarettes, the doses of nicotine delivered by NRT products are smaller, and they are delivered more slowly. NRT represents a means of reducing the costs of quitting in regular smokers.

The availability of NRT varies from country to country. In some high-income countries, products are sold over the counter, while in others they are available only through prescription. Models based on data from the United States suggest that, if NRT were made available over the counter, significantly

TABLE 4.3 EFFECTIVENESS OF VARIOUS CESSATION APPROACHES

<i>Intervention and comparison</i>	<i>Increase in percentage of smokers abstaining for 6 months or more</i>
Brief advice to stop (3 to 10 minutes)	
by clinician versus no advice	2 to 3
Adding NRT to brief advice versus	
brief advice alone or brief advice plus placebo	6
Intensive support (for example, smokers' clinic) plus NRT versus intensive support	
or intensive support plus placebo	8

Source: Raw, Martin, and others. 1999. Data are from the Agency for Health Care Policy and Research, and the Cochrane Library.

more people would quit and more lives would be saved than if NRT were available only through prescription. Over five years, the model predicts, almost 3,000 lives would be saved in the United States alone. There is also evidence that smokers want this type of help: in the United States, sales of NRT products increased by 150 percent between 1996, when products were first sold over the counter, and 1998.

Outside the high-income countries, the availability of NRT in any form is patchy; for example, NRT products are sold in Argentina, Brazil, Indonesia, Malaysia, Mexico, the Philippines, South Africa, and Thailand, but in some of these countries supplies are restricted to a few major urban areas. In some middle-income countries and many low-income countries, NRT products are not available at all. A day's supply of NRT products costs about the same as the average daily dose of tobacco, but because they are usually sold as a whole course, they require a comparatively large single payment. Compared with cigarettes, the sale of NRT products is highly regulated.

Given the evidence, many policymakers might consider widening access to NRT as a valuable component of tobacco control policies. One option would be to reduce the regulation on sales of these products, for example, by increasing the range of outlets and the hours of sale of such products, and reducing restrictions on packaging.

Another option, given the evidence that NRT would help to reduce the costs of quitting, would be to consider making NRT available at subsidized prices, or free, for limited periods to smokers on low incomes who wish to quit. This approach is already being tested in some settings. In the United Kingdom, for example, there are proposals for the poorest smokers to be made eligible for limited free supply of NRT if they decide to quit. Targeting such services to the poor is a challenge in all countries.

Clearly, any decision to widen access to NRT must be considered carefully. Most societies would wish to avoid promoting the sale of any addictive good to children. However, the consensus of health professionals in high-income countries is that NRT, used effectively, is beneficial and should be encouraged for adult smokers who want to quit. The cost-effectiveness of nicotine replacement therapy has not been studied widely, especially in the low-income and middle-income countries where most smokers live. It is clear that more information on cost-effectiveness would be useful for policymakers at local levels, both in determining whether these devices should have a claim on limited public funds, and in giving policymakers a firmer basis on which to act.

As background work to this report, the potential impact of more widely available NRT was modeled using the same methods as above. To be conservative, it was assumed that the effectiveness of the therapy might be lower than the available studies from high-income countries suggest. With the conservative assumption that quit rates among users of NRTs would be double that of nonusers, but that only about 6 percent of smokers would use NRTs to quit, we estimate that the 6 million smokers alive in 1995 could be enabled to quit, and 1 million deaths could be averted. If, on the other hand, 25 percent of smokers used NRT, we find that 29 million smokers alive in 1995 would be enabled to quit, and 7 million deaths could be averted.

Notes

1. Smith, Adam. *Wealth of Nations*. 1776. Version edited by Edwin Canaan, 1976. University of Chicago Press, Chicago.
2. For example, if tax is to account for four-fifths of the retail price, this requires prices to be increased by four times the manufacturer's (untaxed) price per pack. Thus, for instance, if a nontax price is equal to \$0.50, then the tax rate would be $0.5 \times 4 = \$2$. Retail price would be equal to \$2 (tax) + \$0.50 (manufacturing price) = \$2.50. The impact on retail price would, of course, vary between countries, depending on retail factors such as the wholesale price, but broadly, an increase of this order would raise the population-weighted price by between 80 and 100 percent in low- and middle-income countries.