REVIEW ARTICLE

GLOBAL HEALTH

Global Effects of Smoking, of Quitting, and of Taxing Tobacco

Prabhat Jha, M.D., D.Phil., and Richard Peto, F.R.S.

From the Center for Global Health Research, St. Michael's Hospital and Dalla Lana School of Public Health, University of Toronto, Toronto (P.J.); and the Clinical Trial Service Unit and Epidemiological Studies Unit, Nuffield Department of Population Health, Richard Doll Building, University of Oxford, Oxford, United Kingdom (R.P.). Address reprint requests to Dr. Jha at prabhat.jha@utoronto.ca.

N Engl J Med 2014;370:60-8.
DOI: 10.1056/NEJMra1308383
Copyright © 2014 Massachusetts Medical Society.

On the basis of current smoking patterns, with a global average of about 50% of young men and 10% of young women becoming smokers and relatively few stopping, annual tobacco-attributable deaths will rise from about 5 million in 2010 to more than 10 million a few decades hence,[1-3] as the young smokers of today reach middle and old age. This increase is due partly to population growth and partly to the fact that, in some large populations, generations in which few people smoked substantial numbers of cigarettes throughout adult life are being succeeded by generations in which many people did so. There were about 100 million deaths from tobacco in the 20th century, most in developed countries.[2,3] If current smoking patterns persist, tobacco will kill about 1 billion people this century, mostly in low- and middle-income countries. About half of these deaths will occur before 70 years of age.[1-4]

The 2013 World Health Assembly called on governments to reduce the prevalence of smoking by about a third by 2025,[5] which would avoid more than 200 million deaths from tobacco during the remainder of the century.[2,3] Price is the key determinant of smoking uptake and cessation.[6-9] Worldwide, a reduction of about a third could be achieved by doubling the inflation-adjusted price of cigarettes, which in many low- and middle-income countries could be achieved by tripling the specific excise tax on tobacco. Other interventions recommended by the World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) and the WHO six-point MPOWER initiative[4] could also help reduce consumption[7,8] and could help make substantial increases in specific excise taxes on tobacco politically acceptable. Without large price increases, a reduction in smoking by a third would be difficult to achieve.

The WHO has also called for countries to achieve a 25% reduction between 2008 and 2025 in the probability of dying from noncommunicable disease between 30 and 70 years of age.[10] Widespread cessation of smoking is the most important way to help achieve this goal, because smoking throughout adulthood substantially increases mortality from several major noncommunicable diseases (and from tuberculosis).[1-3,11-19]

To help achieve a large reduction in smoking in the 2010s or 2020s, governments, health professionals, journalists, and other opinion leaders should appreciate the full eventual hazards of smoking cigarettes from early adulthood, the substantial benefits of stopping at various ages, the eventual magnitude of the epidemic of tobacco-attributable deaths if current smoking patterns persist, and the effectiveness of tax increases and other interventions to reduce cigarette consumption.

THREE KEY MESSAGES FOR SMOKERS IN THE 21ST CENTURY

First, the risk is big. Large studies in the United Kingdom, the United States, Japan, and India have examined the eventual effects on mortality in populations of men

The New England Journal of Medicine
Downloaded from nejm.org at UNIV OF NC/ACQ SRVCS on January 9, 2014. For personal use only. No other uses without permission.
Copyright © 2014 Massachusetts Medical Society. All rights reserved.

and of women in which many began to smoke in early adult life and did not quit.[11-16] All these studies showed that in middle age (about 30 to 69 years of age), mortality among cigarette smokers was two to three times the mortality among otherwise similar persons who had never smoked, leading to a reduction in life span by an average of about 10 years (Fig. 1). This average reduction combines zero loss for those not killed by tobacco with an average loss of well over a decade for those who are killed by it.

Second, many of those killed are still in middle age, losing many years of life. Some of those killed in middle age might have died soon anyway, but others might have lived on for decades. On average, those killed in middle age by smoking lose about 20 years of life expectancy as compared with persons who have never smoked.[1]

Third, stopping smoking works. Those who have smoked cigarettes since early adulthood but stop at 30, 40, or 50 years of age gain about 10, 9, and 6 years of life expectancy, respectively, as compared with those who continue smoking.

EVENTUAL HAZARDS OF SMOKING

Tobacco is the biggest external cause of noncommunicable disease and is responsible for even more deaths than adiposity both in high-income countries such as the United States[20] and globally.[21] The risks in middle age are much greater for smokers who started in early adulthood than for those who started later. This means that the ratio of mortality among smokers to that among persons who have never smoked is much more extreme now (Fig. 1, and the 50-year trends shown in the Supplementary Appendix, available with the full text of this article at NEJM.org) than it was half a century earlier, when the epidemic of smoking-attributable deaths was at an earlier stage.[11-15]

Cigarette smoking was uncommon throughout the world in 1900, but smoking rates increased substantially in many high-income countries during the first half of the 20th century, first among men and then, in some countries, among women.[22] By 1950 in the United States and the United Kingdom, substantial numbers not only of men but also of women smoked, and rates of lung cancer were increasing steeply, particularly among men.[1] In 1950, major studies in both countries[23,24] showed that smoking was a cause of most deaths from lung cancer, and subsequent reports showed that smoking caused even more deaths from other diseases than from lung cancer.[25,26]

After 1950, cigarette consumption continued to rise for some decades in high-income countries, and it has risen among men (though generally not among women) in many low- and middle-income countries. Although there has been widespread cessation in many high-income countries (in some, consumption per adult has been halved since the 1970s),[22] about 1.3 billion people worldwide now smoke, most in low- and middle-income countries where cessation is uncommon.[4] Two thirds of all smokers live (in descending order of numbers of smokers) in China, India, the European Union (in which central tobacco legislation can influence 28 countries), Indonesia, the United States, Russia, Japan, Brazil, Bangladesh, and Pakistan (Table 1).[27,28] In India, manufactured cigarettes are now displacing bidis (locally manufactured small cigarettes).[29] Cigarette consumption in China continues to rise steeply and now accounts for more than 2 trillion of a worldwide total of about 6 trillion cigarettes smoked per year.[30] A useful approximation suggested by studies in high-income countries is that 1 ton of tobacco yields about 1 million cigarettes and causes about 1 death, so just 1 trillion cigarettes consumed a year will eventually cause about 1 million deaths a year.

One reason why the mid-century evidence of hazard was not at first taken seriously, even in countries where it was generated, is the delay of about half a century between widespread adoption of smoking by young adults and the main effect on mortality in later life.[1-3] Among all U.S. adults, for example, cigarette consumption averaged 1, 4, and 10 per day in 1910, 1930, and 1950, respectively, after which it stabilized. The long-delayed result of this increase in consumption during the first half of the century was seen only in the second half of the century; tobacco caused about 12% of all U.S. deaths in middle age in 1950 but about 33% of such deaths in 1990.[1] A similar pattern was seen about 40 years later among Chinese men, who consumed about 1, 4, and 10 cigarettes per day in 1952, 1972, and 1992, respectively. In 1990, tobacco caused about 12% of all deaths among middle-aged Chinese men, and it could well cause about 33% in 2030.[31,32] (Tobacco causes few deaths in Chinese women, because less than 1% of Chinese women born in each decade since 1950 smoke.[27,31])

The New England Journal of Medicine
Downloaded from nejm.org at UNIV OF NC/ACQ SRVCS on January 9, 2014. For personal use only. No other uses without permission.
Copyright © 2014 Massachusetts Medical Society. All rights reserved.

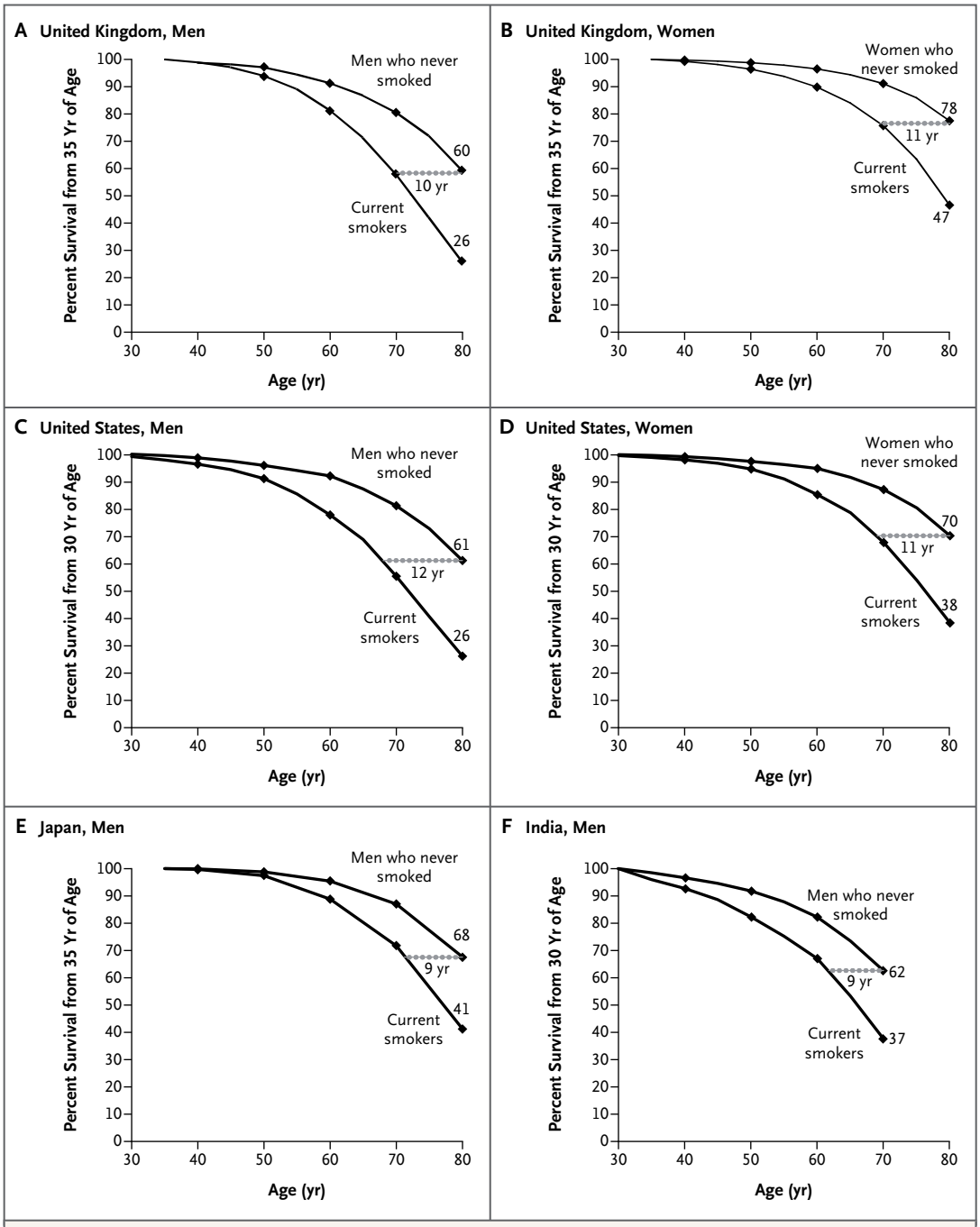

Figure 1. Loss of a Decade of Life Expectancy from Smoking Cigarettes throughout Adulthood.
Shown are probabilities of survival from 30 or 35 years of age (current smokers vs. persons who never smoked, linked by dots representing 1 year each) among U.K. men[11] and women,[12] U.S. men and women,[13] Japanese men,[15] and Indian men.[16]

Because men started smoking before women, the effects in middle-aged men are now apparent in most high-income countries. The full eventual effects of persistent smoking in women, however, can be assessed directly in only a few countries (e.g., the United States and the United Kingdom) and only in the present (21st) century. The ratio of mortality from lung cancer

The New England Journal of Medicine
Downloaded from nejm.org at UNIV OF NC/ACQ SRVCS on January 9, 2014. For personal use only. No other uses without permission.
Copyright © 2014 Massachusetts Medical Society. All rights reserved.

Table 1. Current and Former Smokers in Selected Areas, 2008–2012.*

Region or Country	≥15 Yr of Age		45–64 Yr of Age		
	Current Smokers	Former Smokers	Current Smokers	Former Smokers	Stopped Smoking†
	no. in millions		*no. in millions*		%
European Union	115	83	37	36	49
United States	50	54	18	22	55
Japan	28	14	9	5	36
Low- and middle-income countries‡					
China	317	42	115	21	15
India	122	15	46	7	13
Indonesia	115	6	17	2	11
Russia	47	10	15	4	21
Brazil	26	21	9	10	53
Bangladesh	25	5	7	2	22

* Data are from Giovino et al.[27] and Zatoński and Mańczuk,[28] combined with United Nations population estimates for 2012.
† The percentage of persons who have stopped smoking is calculated as former smokers divided by the sum of current smokers and former smokers.
‡ There are approximately 25 million current smokers in Pakistan[4] but no standardized surveys.[27]

among U.S. women who currently smoke to the (constant) mortality among women who have never smoked has increased greatly during the past half-century: it was only 3 in the 1960s, but it was 13 in the 1980s and 26 (similar to that among men) in the 2000s.[14] The reason for the jump from a ratio of 3 to a ratio of 26 is that in the 2000s many U.S. women in their 60s who were smokers had smoked ever since early adulthood, whereas in the 1960s few women in their 60s who were smokers had done so.

Even though mortality from lung cancer among U.S. women was still low in the 1960s, women who were then in their 20s and who continued to smoke without quitting faced substantial hazards 40 years later.[13,14] Similarly, among men in low- and middle-income countries where many smoke but the death rates in middle age from smoking are not yet substantial, a full decade of life expectancy will eventually be lost by young adults who continue to smoke. Tobacco already accounts for about 12 to 25% of deaths among men in low- and middle-income countries such as China,[31,32] India,[16-18] Bangladesh,[33] and South Africa[34]; given current smoking patterns, these proportions are likely to increase. Worldwide, about half a billion of the children and adults younger than 35 years of age already smoke or will do so if current uptake rates persist, and given current cessation patterns, relatively few will quit.[27] In all countries, young adults who smoke face about a decade of life lost if they continue and hence have much to gain by stopping.

RAPID BENEFITS OF STOPPING

Whereas tobacco-attributable mortality increases slowly after the uptake of smoking, the effects of cessation emerge more rapidly.[11-15] Persons who began smoking in early adulthood but stopped before 40 years of age avoid more than 90% of the excess risk during their next few decades of life, as compared with those who continue to smoke, and even those who stop at 50 years of age avoid more than half the excess risk, although substantial hazards persist (Fig. 2).[11-15]

The ratio of former smokers to current smokers in middle age is a useful measure of the success of tobacco control. Among persons 45 to 64 years of age in the European Union and the United States, there are now about as many former smokers as current smokers[28,35]; by contrast, in most low- and middle-income countries (with the notable exception of Brazil), there are far fewer former smokers than current smokers (Table 1). Cessation is the only practicable way to avoid a substantial proportion of tobacco-attributable

The New England Journal of Medicine
Downloaded from nejm.org at UNIV OF NC/ACQ SRVCS on January 9, 2014. For personal use only. No other uses without permission.
Copyright © 2014 Massachusetts Medical Society. All rights reserved.

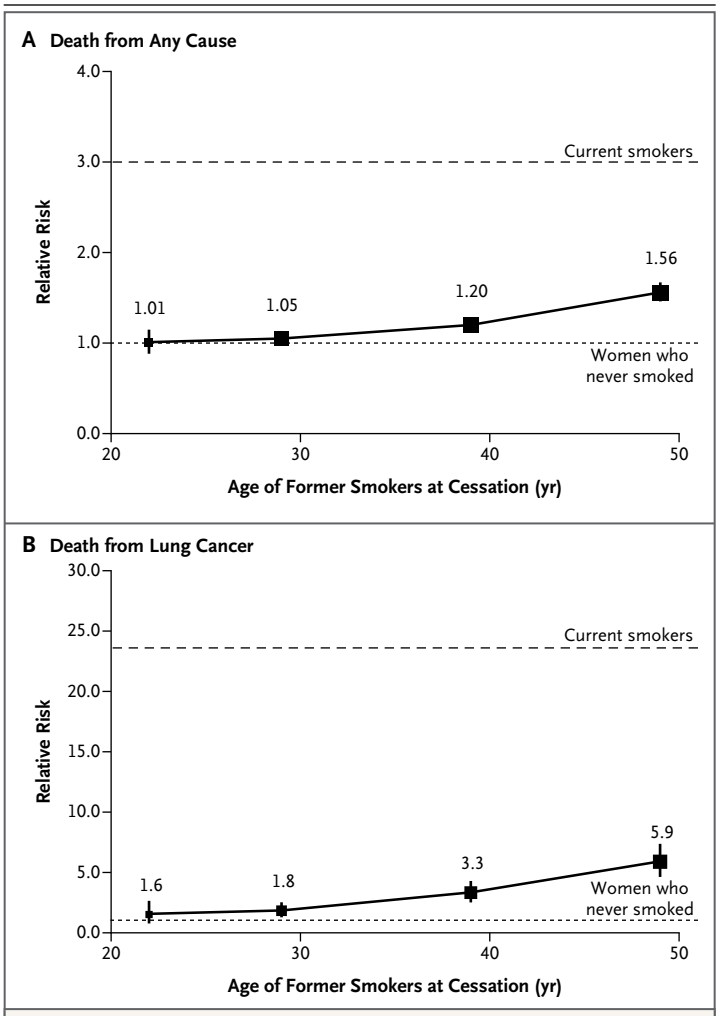

Figure 2. Benefits of Stopping Smoking at about 30, 40, or 50 Years of Age in the United Kingdom Million Women Study.

Shown are multivariate-adjusted relative risks of death among former smokers according to age at which they stopped and among current smokers. (Persons who never smoked had a relative risk of 1.0.) Both former smokers and current smokers had on average begun to smoke at 19 years of age, and the number of cigarettes smoked per day was similar in the two groups. Vertical bars represent 95% confidence intervals. Data are from Pirie et al.[12]

deaths before 2050, because a substantial reduction by 2025 in uptake by adolescents will have its main effect on mortality only after 2050.[2,3]

EFFECTS OF INCREASING CIGARETTE PRICES

Comprehensive tobacco-control programs using several price and nonprice interventions can substantially raise smoking-cessation rates and decrease initiation of smoking.[4] Uruguay implemented most of the FCTC provisions and reduced consumption more rapidly than otherwise similar Argentina, which implemented only a few of the provisions.[36] Large increases in specific excise taxes on tobacco are particularly important, because they can have a substantial and rapid effect on consumption.[6-9] Reviews of comprehensive control programs in various U.S. states[37,38] and other high-income areas[39] concur that higher prices account for much, but not all, of the decline in smoking.

Similarly, an International Agency for Research on Cancer review of more than 100 econometric studies confirmed that tobacco taxes and consumption are strongly inversely related.[9] It concluded that a 50% increase in inflation-adjusted tobacco prices reduces consumption by about 20% in both high-income countries and low- and middle-income countries,[6-9] corresponding to a price elasticity (percent consumption change per 1% price change) of about −0.4. Hence, doubling inflation-adjusted prices should reduce consumption by about one third (in which case revenues would increase, because the effect of reduced demand would be outweighed by the extra revenue per pack). Some of the effect among adults is due to quitting (or not starting), and some is due to reduced consumption per smoker.[9] Higher taxes are particularly effective in poorer or less educated groups[6-9,39] and help prevent young people who are experimenting with smoking from becoming regular smokers.[40]

The two major types of tobacco tax are specific excise taxes (which, being based on quantity or weight, are difficult for the industry to manipulate) and ad valorem taxes (which are based on manufacturer-defined price and can be manipulated more easily). In many high-income countries, about 50 to 60% of the retail price of the most-sold brand is a specific excise tax on tobacco or some variation of it (as in the European Union), but in low- and middle-income countries, this proportion is typically only about 35 to 40% (Fig. 3).[4,6] A low specific excise tax on tobacco is the main reason that cigarettes are about 70% cheaper (even after adjustment for purchasing power) in many low-income countries than in high-income countries. Moreover, rapid income growth in many low- and middle-income countries is making the lower-priced tobacco products more affordable[41] and helping cigarettes to displace bidis in India.[29]

The New England Journal of Medicine
Downloaded from nejm.org at UNIV OF NC/ACQ SRVCS on January 9, 2014. For personal use only. No other uses without permission.
Copyright © 2014 Massachusetts Medical Society. All rights reserved.

A low reliance on specific excise taxes on tobacco by China,[42] India,[29] Indonesia,[43] and most low- and middle-income countries[4,6] means that the prices of commonly sold cigarette brands vary greatly within each country (by a factor of more than 10 in China, as compared with a factor of only about 2 in the United Kingdom and the United States), and this continued availability of low-cost brands discourages smoking cessation. In contrast, high specific excise taxes on tobacco of all brands encourage cessation rather than switching (by narrowing the price gap between the most and least expensive cigarettes), are easier to administer than ad valorem taxes, and produce a steadier revenue stream.[9] In many low- and middle-income countries, although specific excise taxes on tobacco account for less than half the total retail price of cigarettes, tripling them approximately doubles the retail price, partly by triggering smaller increases in other taxes (e.g., sales tax) and markup. In most high-income countries, specific excise taxes on tobacco already account for more than half the retail price, so even just doubling them would approximately double prices.

The United States and the United Kingdom took more than 30 years to halve cigarette consumption per adult.[22] With the use of large tax increases, however, France and South Africa halved consumption in less than 15 years (Fig. 4).[3,44,45] From 1990 to 2005, France tripled inflation-adjusted cigarette prices by raising taxes 5% or more every year in excess of inflation, halved cigarette consumption, and doubled inflation-adjusted tobacco revenues. Today, the ratio of former smokers to current smokers in France comfortably exceeds the European average.[28,35] Over a similar period, South Africa also tripled the inflation-adjusted price of cigarettes, halved cigarette consumption, and doubled tobacco revenues.[45] Additional revenue can be used to fund tobacco-control programs or broader health efforts; much of the revenue from the 2009 U.S. taxation increase of 53 cents per pack of 20 cigarettes is allocated to expand children's health insurance.[46]

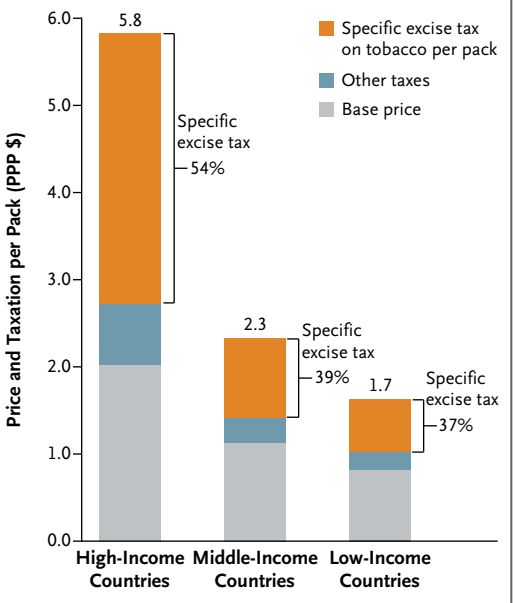

Figure 3. Contributions of Specific Excise Taxes on Tobacco and Other Taxes to the Total Cost per Pack of the Most-Sold Brand of Cigarettes in High-, Middle-, and Low-Income Countries.

Prices are expressed in dollars adjusted for purchasing-power parity (PPP). In low- and middle-income countries, tripling specific excise taxes on tobacco would approximately double street prices, because nonexcise taxes (e.g., sales tax) and retailer markup would also rise. In the European Union, more complex variations on specific excise taxes on tobacco are used. Data, which are from the World Health Organization, are for 48 high-income countries, 95 middle-income countries, and 30 low-income countries.[4]

OTHER EFFECTIVE INTERVENTIONS

Though tobacco advertising is banned throughout the European Union, China, and some other countries, cigarettes are still among the most heavily advertised and promoted products in the world, with spending on tobacco marketing reaching $8.6 billion annually in the United States alone.[47] In 2011 Australia, which had already banned advertising, introduced plain packaging for tobacco products, removing all brand imagery. The brand is printed only in small standard lettering below a pictorial warning. Recent evidence suggests that plain packaging increases cessation attempts.[48,49] New Zealand will introduce plain packaging in 2014, and the United Kingdom is considering it. Plain packaging goes beyond the prominent, rotating pictorial warning labels on tobacco products that have helped increase cessation attempts in Canada, Thailand, and elsewhere.[50] Pictorial warnings can reach even illiterate persons, and half the deaths from tobacco in India occur among the illiterate.[29]

The New England Journal of Medicine
Downloaded from nejm.org at UNIV OF NC/ACQ SRVCS on January 9, 2014. For personal use only. No other uses without permission.
Copyright © 2014 Massachusetts Medical Society. All rights reserved.

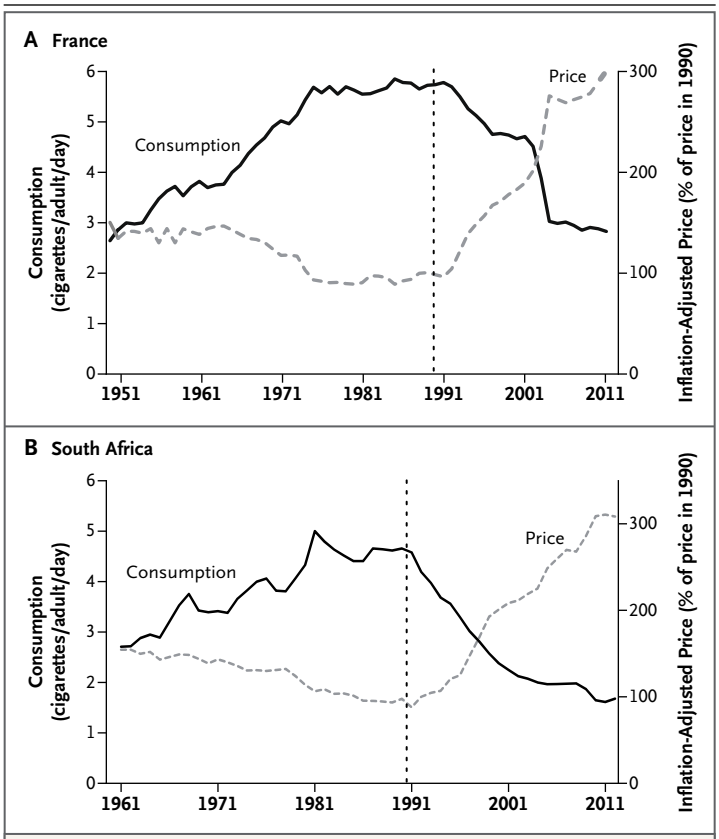

Figure 4. Changes in the Inflation-Adjusted Price of Cigarettes and in Cigarette Consumption in France and South Africa.

Prices in both countries are scaled to be 100 in the baseline year of 1990.[44,45] Consumption is expressed as the number of cigarettes per adult per day and takes into account growth in the population.

In the United States and the United Kingdom, bans on tobacco advertising on television coincided with the start of the long-term downturn in sales,[51] although these partial bans on advertising allowed the industry to shift to other forms of advertising or promotion. More comprehensive bans on all direct and indirect advertising or promotion of any tobacco goods or trademarks further help to reduce consumption[52,53] and have the advantage of severing any dependence of the media on the tobacco industry. Bans on smoking in public places reduce nonsmokers' exposure to tobacco smoke and can also help decrease overall consumption,[54,55] as can mass-media campaigns.[51,56] In populations with many long-term smokers, low-cost epidemiologic studies of various types that monitor the changing extent to which tobacco is causing premature death help to raise political awareness of tobacco hazards and to provide information for the individual smoker.[1,16,33,34]

Throughout the world, most former smokers managed to quit unaided, but physician support or telephone-based or Internet-based counseling and support can increase the likelihood of success.[57] In motivated persons, pharmacologic treatments or electronic cigarettes, or e-cigarettes, can also increase quit rates.[57,58] The eventual role of e-cigarettes remains uncertain, however, particularly if the tobacco industry controls the marketing of both traditional and e-cigarettes.

DEATH AND TAXES

The WHO reports[4] that although many countries now use nonprice interventions, only a few (including Mauritius, Mexico, the Philippines, Poland, and Turkey) have been using large increases in specific excise taxes on tobacco to reduce smoking.[6] A large increase in inflation-adjusted price is, however, a key component of any realistic strategy to reduce smoking substantially during the 2010s or 2020s. The Bill and Melinda Gates Foundation, Bloomberg Philanthropies, the World Bank, and the Asian Development Bank are therefore providing technical advice for some ministries of finance to counter misleading tax advice from the tobacco industry.[29,42,43,59] Manufacturers' worldwide profits of about $50 billion in 2012[60] (approximately $10,000 per tobacco-attributable death) yield enormous political influence that is used, among other things, to try to prevent large tax increases.

Smuggling is a concern when tobacco taxes rise; about 10% of all cigarettes manufactured worldwide are already untaxed.[61] Use of specific excise taxes on tobacco (rather than ad valorem taxes), stronger tax administration, and practicable controls on organized smuggling can, however, limit the problem.[62] Even with some smuggling, large tax increases can substantially reduce consumption and increase revenue (Fig. 4), especially if supported by better tax enforcement.[61]

Tripling inflation-adjusted specific excise taxes on tobacco would, in many low- and middle-income countries, approximately double the average price of cigarettes (and more than double prices of cheaper brands), which would reduce consumption by about a third and actually increase tobacco revenues by about a third. In countries in which the government owns most

The New England Journal of Medicine
Downloaded from nejm.org at UNIV OF NC/ACQ SRVCS on January 9, 2014. For personal use only. No other uses without permission.
Copyright © 2014 Massachusetts Medical Society. All rights reserved.

of the industry, as in China, the distinction between taxes and profit is fairly arbitrary, but doubling the average prices would still substantially reduce consumption and increase revenue. Worldwide, raising specific excise taxes on tobacco to double prices would raise about another $100 billion (in U.S. dollars) per year in tobacco revenues, in addition to the approximately $300 billion that the WHO estimates governments already collect on tobacco.[4] Conversely, if a decrease in smoking by about a third were somehow achieved without increasing the inflation-adjusted price, tobacco tax revenues would decrease by about $100 billion.[6]

The main argument for reducing smoking is, however, the hundreds of millions of tobacco-related deaths if current smoking patterns persist. Indeed, in reviewing options to achieve a grand convergence by 2035 among the risks of premature death in low-, middle-, and high-income countries, the *Lancet* Commission on Investing in Health[63] recently identified a substantial increase in specific excise taxes on tobacco as the single most important intervention against noncommunicable diseases, as did the 2013 World Health Assembly.[5] Losses or gains in tobacco revenue are of secondary importance; indeed, tobacco taxes are a small percentage of overall revenue in most countries (except China), and money not spent on tobacco is spent on other taxable goods or services.[7] Attainment of the WHO target of a decrease of about a third in the prevalence of smoking by 2025, involving major decreases not only in high-income countries but also in populous low- and middle-income countries, would prevent several tens of millions of tobacco-attributable deaths during the next few decades[2,3,63] and about 200 million tobacco-attributable deaths during the century as a whole, mostly among people who are already alive, both by helping smokers to quit and by helping adolescents not to start.

No potential conflict of interest relevant to this article was reported.

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

We thank Jillian Boreham and Hong-Chao Pan for the Supplementary Appendix on 50-year smoking-attributed mortality trends in the United Kingdom, United States, and Poland; Judith MacKay for comments and Cathy Harwood, Leslie Newcombe, and Joy Pader for editorial assistance on an earlier draft of the manuscript; Catherine Hill and Corne van Walbeek for French and South African data; and Ayda Yurekli for WHO tax-revenue estimates.

REFERENCES

1. Peto R, Lopez AD, Boreham J, Thun M. Mortality from smoking in developed countries, 1950–2010. Oxford, United Kingdom: Clinical Trial Service Unit and Epidemiological Studies Unit, March 2012 (http://www.ctsu.ox.ac.uk/~tobacco).

2. Peto R, Lopez AD. The future worldwide health effects of current smoking patterns. In: Koop E, Pearson CE, Schwarz MR, eds. Critical issues in global health. San Francisco: Jossey-Bass, 2001:154-61.

3. Jha P. Avoidable global cancer deaths and total deaths from smoking. Nat Rev Cancer 2009;9:655-64.

4. WHO report on the global tobacco epidemic, 2013: enforcing bans on tobacco advertising, promotion and sponsorship. Geneva: World Health Organization, 2013.

5. Draft action plan for the prevention and control of non-communicable diseases 2013–2020. Geneva: World Health Assembly, World Health Organization, 2013.

6. WHO technical manual on tobacco tax administration. Geneva: World Health Organization, 2010.

7. Jha P, Chaloupka FJ. Curbing the epidemic: governments and the economics of tobacco control. Washington DC: World Bank, 1999.

8. Jha P, Chaloupka FJ, Moore J, et al. Tobacco addiction: In: Jamison DT, Breman JG, Measham AR, et al., eds. Disease control priorities in developing countries. 2nd ed. Washington, DC: World Bank and Oxford University Press, 2006:869-86.

9. International Agency for Research on Cancer. Effectiveness of tax and price policies for tobacco control: IARC handbook of cancer prevention, vol. 14. Lyon, France: IARC, 2011.

10. Draft: comprehensive global monitoring framework and targets for the prevention and control of non-communicable diseases. Geneva: World Health Organization, 2013.

11. Doll R, Peto R, Boreham J, Sutherland I. Mortality in relation to smoking: 50 years' observations on male British doctors. BMJ 2004;328:1519-33.

12. Pirie K, Peto R, Reeves GK, Green J, Beral V. The 21st century hazards of smoking and benefits of stopping: a prospective study of one million women in the UK. Lancet 2013;381:133-41.

13. Jha P, Ramasundarahettige C, Landsman V, Rostron B, Thun P, Peto R. 21st-Century hazards of smoking and benefits of cessation in the United States. N Engl J Med 2013;368:341-50.

14. Thun MJ, Carter BD, Feskanich D, et al. 50-Year trends in smoking-related mortality in the United States. N Engl J Med 2013;368:351-64.

15. Sakata R, McGale P, Grant EJ, Ozasa K, Peto R, Darby SC. Impact of smoking on mortality and life expectancy in Japanese smokers: a prospective cohort study. BMJ 2012;345:e7093.

16. Jha P, Jacob B, Gajalakshmi V, et al. A nationally representative case–control study of smoking and death in India. N Engl J Med 2008;358:1137-47.

17. Gupta PC, Pednekar MS, Parkin DM, Sankaranarayanan R. Tobacco associated mortality in Mumbai (Bombay) India: results of the Bombay Cohort Study. Int J Epidemiol 2005;34:1395-402.

18. Gajalakshmi V, Peto R, Kanaka TS, Jha P. Smoking and mortality from tuberculosis and other diseases in India: retrospective study of 43 000 adult male deaths and 35 000 controls. Lancet 2003; 362:507-15.

19. Jha P, Mony P, Moore JA, Zatonski W. Avoidance of worldwide vascular deaths and total deaths from smoking. In: Yusuf S, Cairns JA, Camm AJ, Gallen EL, Gersh BJ, eds. Evidence-based cardiology. Oxford, United Kingdom: Oxford University Press, 2010:111-24.

20. Peto R, Whitlock G, Jha P. Effects of

The New England Journal of Medicine
Downloaded from nejm.org at UNIV OF NC/ACQ SRVCS on January 9, 2014. For personal use only. No other uses without permission.
Copyright © 2014 Massachusetts Medical Society. All rights reserved.

obesity and smoking on U.S. life expectancy. N Engl J Med 2010;362:855-6.
21. Finucane MM, Stevens GA, Cowan MJ, et al. National, regional, and global trends in body-mass index since 1980: systematic analysis of health examination surveys and epidemiological studies with 960 country-years and 9.1 million participants. Lancet 2011;377:557-67.
22. Forey B, Hamling J, Hamling J, Thornton A, Lee PN. International smoking statistics: Web edition. Sutton, United Kingdom: PN Lee Statistics & Computing, 2013 (http://www.pnlee.co.uk/ISS3.htm).
23. Wynder EL, Graham EA. Tobacco smoking as a possible etiologic factor in bronchogenic carcinoma: a study of 684 proved cases. JAMA 1950;143:329-36.
24. Doll R, Hill AB. Smoking and carcinoma of the lung; preliminary report. Br Med J 1950;2:739-48.
25. Smoking and health: summary and report of the Royal College of Physicians of London on smoking in relation to cancer of the lung and other diseases. London: Pitman Publishing, 1962.
26. Smoking and health: report of the Advisory Committee to the Surgeon-General of the Public Health Service. Washington, DC: Department of Health, Education, and Welfare, 1964.
27. Giovino GA, Mirza SA, Samet JM, et al. Tobacco use in 3 billion individuals from 16 countries: an analysis of nationally representative cross-sectional household surveys. Lancet 2012;380:668-79. [Errata, Lancet 2012;380:1908, 2013;382:128.]
28. Zatoński WA, Mańczuk M. Tobacco smoking and tobacco-related harm in the European Union, with special attention to the new EU member states. In: Boyle P, Gray N, Henningfield J, Seffrin J, Zatoński WA, eds. Tobacco: science, policy, and public health. Oxford, United Kingdom: Oxford University Press, 2010:134-55.
29. Jha P, Guindon E, Joseph RA, et al. A rational taxation system of bidis and cigarettes to reduce smoking deaths in India. Econ Polit Wkly 2011;42:44-51.
30. Market research for the tobacco industry: cigarettes. London: Euromonitor International, 2012 (http://www.euromonitor.com/tobacco).
31. Liu BQ, Peto R, Chen ZM, et al. Emerging tobacco hazards in China: 1. Retrospective proportional mortality study of one million deaths. BMJ 1998;317:1411-22.
32. Gu D, Kelly TN, Wu X, et al. Mortality attributable to smoking in China. N Engl J Med 2009;360:150-9. [Erratum, N Engl J Med 2010;363:2272.]
33. Alam DS, Jha P, Ramasundarahettige C, et al. Smoking-attributable mortality in Bangladesh: proportional mortality study. Bull World Health Organ 2013;91:757-64.
34. Sitas F, Egger S, Bradshaw D, et al. Differences among the coloured, white, black, and other South African populations in smoking-attributed mortality at ages 35-74 years: a case-control study of 481,640 deaths. Lancet 2013;382:685-93.
35. Jha P. The 21st century benefits of smoking cessation in Europe. Eur J Epidemiol 2013;28:617-9.
36. Abascal W, Esteves E, Goja B, et al. Tobacco control campaign in Uruguay: a population-based trend analysis. Lancet 2012;380:1575-82.
37. Decline in cigarette consumption following implementation of a comprehensive tobacco prevention and education program — Oregon, 1996–1998. MMWR Morb Mortal Wkly Rep 1999;48:140-3.
38. Levy DT, Hyland A, Higbee C, Remer L, Compton C. The role of public policies in reducing smoking prevalence in California: results from the California tobacco policy simulation model. Health Policy 2007;82:167-85.
39. Chaloupka FJ, Hu T-W, Warner KE, Jacobs R, Yurekli A. The taxation of tobacco products. In: Jha P, Chaloupka FJ, eds. Tobacco control in developing countries. Oxford, United Kingdom: Oxford University Press, 2000:237-72.
40. Kostova D, Ross H, Blecher E, Markowitz S. Is youth smoking responsive to cigarette prices? Evidence from low- and middle-income countries. Tob Control 2011; 20:419-24. [Erratum, Tob Control 2012; 21:64.]
41. Blecher E. Targeting the affordability of cigarettes: a new benchmark for taxation policy in low-income and middle-income countries. Tob Control 2010;19:325-30.
42. Hu TW, Mao Z, Shi J, Chen W. Tobacco taxation and its potential impact in China. Paris: International Union Against Tuberculosis and Lung Disease, 2008.
43. Barber S, Adioetomo SM, Ahsan A, Setyonaluri D. Tobacco economics in Indonesia. Paris: International Union Against Tuberculosis and Lung Disease, 2008.
44. Hill C. Impact de l'augmentation des prix sur la consummation de tabac. Paris: Institut Gustave Roussy, 2013 (http://www.igr.fr/doc/cancer/pdf/prevention/prixtab2013.pdf).
45. Van Walbeek CP. Industry responses to the tobacco excise tax increases in South Africa. S Afr J Econ 2006;74:110-22.
46. Baumgardner JR, Bilheimer LT, Booth MB, Carrington WJ, Duchovny NJ, Werble EC. Cigarette taxes and the federal budget — report from the CBO. N Engl J Med 2012;367:2068-70.
47. Federal Trade Commission. Cigarette report for 2011. Washington, DC: FTC, 2013 (http://www.ftc.gov/os/2013/05/130521cigarettereport.pdf).
48. Wakefield MA, Hayes L, Durkin S, Borland R. Introduction effects of the Australian plain packaging policy on adult smokers: a cross-sectional study. BMJ Open 2013;3:e003175.
49. Cancer Research UK. The answer is plain — campaign for plain cigarette packaging (http://www.youtube.com/watch?feature=player_embedded&v=c_z-4S8iicc).
50. Hammond D. "Plain packaging" regulations for tobacco products: the impact of standardizing the color and design of cigarette packs. Salud Publica Mex 2010; 52:Suppl 2:S226-S232.
51. Kenkel D, Chen L. Consumer information and tobacco use. In: Jha P, Chaloupka FJ, eds. Tobacco control in developing countries. Oxford, United Kingdom: Oxford University Press, 2000:177-214.
52. Saffer H. Tobacco advertising and promotion. In: Jha P, Chaloupka FJ, eds. Tobacco control in developing countries. Oxford, United Kingdom: Oxford University Press, 2000:215-36.
53. Blecher E. The impact of tobacco advertising bans on consumption in developing countries. J Health Econ 2008;27: 930-42.
54. Callinan JE, Clarke A, Doherty K, Kelleher C. Legislative smoking bans for reducing secondhand smoke exposure, smoking prevalence and tobacco consumption. Cochrane Database Syst Rev 2010;4:CD005992.
55. Fichtenberg CM, Glantz SA. Effect of smoke-free workplaces on smoking behaviour: systematic review. BMJ 2002;325: 188-99.
56. Bala MM, Strzeszynski L, Topor-Madry R, Cahill K. Mass media interventions for smoking cessation in adults. Cochrane Database Syst Rev 2013;6:CD004704.
57. Hartmann-Boyce J, Stead LF, Cahill K, Lancaster T. Efficacy of interventions to combat tobacco addiction: Cochrane update of 2012 reviews. Addiction 2013;108: 1711-21.
58. Bullen C, Howe C, Laugesen M, et al. Electronic cigarettes for smoking cessation: a randomised controlled trial. Lancet 2013;382:1629-37.
59. Jha P, Joseph RC, Moser P, et al. Tobacco taxes: a win–win measure for fiscal space and health. Manila, Philippines: Asian Development Bank, 2012 (http://www.adb.org/publications/tobacco-taxes-win-win-measure-fiscal-space-and-health).
60. Eriksen M, Mackay J, Ross H. The tobacco atlas. American Cancer Society and World Lung Foundation, 2012 (http://www.TobaccoAtlas.org).
61. Yürekli A, Sayginosoy Ö. Worldwide organized cigarette smuggling: an empirical analysis. Appl Econ 2010;42:545-61.
62. Joossens L, Merriman D, Ross H, Raw M. How eliminating the global illicit cigarette trade would increase tax revenue and save lives. Paris: International Union Against Tuberculosis and Lung Disease, 2009.
63. Jamison DT, Summers LH, Alleyne G, et al. Global health 2035: a world converging within a generation. Lancet 2013 December 3 (Epub ahead of print).

Copyright © 2014 Massachusetts Medical Society.

The New England Journal of Medicine
Downloaded from nejm.org at UNIV OF NC/ACQ SRVCS on January 9, 2014. For personal use only. No other uses without permission.
Copyright © 2014 Massachusetts Medical Society. All rights reserved.