

Banishing Tobacco

William U. Chandler

Tobacco causes more death and suffering among adults than any other toxic material in the environment. This has long been known, but now it is feared that involuntary exposure to cigarette smoke causes more cancer deaths than any other pollutant. Protecting non-smokers from cigarette smoke will require a marked change in society's treatment of tobacco, one that could also help eliminate its direct threat to users.

No country is yet taking action against tobacco commensurate with the cost it imposes. The global use of tobacco has grown nearly 75 percent over the past two decades. In China, use has doubled. In only four countries are fewer cigarettes smoked now than in 1964. In the United States, the percentage of adults who smoke has fallen from 43 to 32 percent, but 20 percent more tobacco is used than when an antismoking campaign began in 1964, and the country still ranks third in the world in per capita cigarette use. The direct health costs, the health risks to passive smokers, and the economic costs have grown proportionally.

The worldwide cost in lives now approaches 2.5 million per year, almost 5 percent of all deaths. Tobacco kills thirteen times as many Americans as hard drugs do, and eight times as many as automobile accidents. Passive smokers (those who must inhale the smoke of others' cigarettes) are three times likelier to die of lung cancer than they would be otherwise. The smoking of mothers diminishes the physical and mental capabilities of their children, and in many countries more than one-fifth of children are exposed to smoke in this way. These statistics add up to a cost that is increasingly viewed—in countries in which the information is available, at least—not only as unnecessary, but intolerable.

The health consequences of tobacco are now well known, but policies to avoid them lag far behind. Most efforts to control tobacco are merely attempts to control or color information about the product. Governments sometimes warn people that tobacco is unhealthy, forbid its advertisement, or restrict its use in theaters or buses. Often the effort is no stronger than the Japanese cigarette package warning: "For your health, let's be careful not to smoke too much." No national tobacco control effort has been launched with the vigor of antidrug campaigns, or even of campaigns against toxic chemicals, although hard drugs and chemicals claim far fewer victims than tobacco.

Health leaders in government, international organizations, and public interest groups have also failed in this flight—partly because tobacco is tenaciously addictive, partly because both governments and industry promote tobacco, but partly because the leadership of health and environmental authorities has been weak. This conclusion is borne out not only by the continued high levels of tobacco use in industrial countries, but by the explosive growth of cigarette smoking in Eastern-bloc countries and in China. The informational campaigns of concerned health leaders have at least succeeded in getting many analysts to recognize that tobacco is a high priority, worldwide public health problem—and one that needs stronger medicine.

Worldwide Epidemic

Smoking is an epidemic growing at 2.1 percent per year, faster than the world population. Growth in tobacco use slowed briefly in the early eighties, primarily for economic reasons, but is resuming its rapid increase. Over a billion people now smoke, consuming almost 5 trillion cigarettes per year, an average of more than half a pack a day. Even in the United States, where smoking prevalence—the portion of a population who smoke—has declined, the 20 percent increase in tobacco use since 1964 indicates that those who smoke now smoke more heavily.

Greece leads the world in per capita cigarette consumption. Japanese, Americans, Canadians, Yugoslavs, and Poles follow close behind. Eastern-bloc residents in general smoke more heavily than Westerners and twice as much as people in the Third World. Half of all cigarettes are smoked in developing countries, where three-fourths of the world lives. Chinese men smoke almost as much as Western men do, although the negligible amount of smoking by Chinese women results in that country not ranking very high in overall per capita consumption. Nevertheless, China uses a quarter of the world's tobacco.

Tobacco is increasingly grown near where it is consumed. China is the world's leading producer, using all that it grows. The United States, India, the Soviet Union, and Brazil rank second through fifth, with all but the Soviet Union being major exporters. Other major Third World exporters include Zimbabwe and Malawi.

Change in tobacco use can be measured in two ways: changes in the use of tobacco products, in absolute or per

capita terms, and changes in smoking prevalence. Measuring the latter is often preferred by health educators as a sign of progress toward their primary goal, which is to get smokers to quit and nonsmokers not to start. Prevalence also provides an index of a key goal of tobacco control policy: to make smoking socially unacceptable.

The absolute quantity of tobacco used provides an essential measure of total health costs that a society must bear. Indeed, the total number of cigarettes smoked over a lifetime is a more important health index than cigarettes used per day at any given time. Health risks increase in proportion to total amount of tobacco used. The quantity of cigarettes smoked, when considered along with smoker-nonsmoker interaction and room ventilation

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rates, provides a measure of passive smoking. In sixty-three countries, total cigarette use increased between 1975 and 1985. Half the global increase in tobacco use in the last decade has occurred in China, even though the Chinese represent only one-fifth the world's people. The rest of the Third World, 54 percent of all humans, accounted for a little less than a third of the increase. Consumption in the West and in Eastern-bloc nations increased in rough proportion to their shares of the world population.

In the second measure of change in use—smoking prevalence—Western nations have seen encouraging reductions during the last decade. In the United Kingdom, the percentage of males who smoke dropped by more than 25 percent. In the Netherlands and the United States, the equivalent reductions were more than a third. In Norway, a nation often cited as having a model tobacco policy because it completely bans advertising, a one-fifth reduction in smoking among men with some higher education has been reported, although 42 percent of men still smoke. In fact, smoking rates remain high among men all around the world. In Bangladesh, two-thirds of men smoke, spending on average 5 percent of their household income on tobacco. In Czechoslovakia, the prevalence figure is 57 percent; in south-central European Russia, two-thirds of adult males smoke. Smoking among women, on the other hand, remains very low in many countries, including China, Bangladesh, and most of the Third World. Teenage girls in the United States, however, now smoke more than boys do.

One ironic result of campaigns to reduce smoking in the absence of a more general effort to control tobacco has been the marked increase in the use of smokeless tobacco. The use of chew or snuff in the United States has increased by over 40 percent in the last two decades.

Much of the new interest in these forms of tobacco comes from teenage boys who like the stimulus of the nicotine, perhaps feel grown-up when they try it, and believe that it is safer than smoking. Surveys in some localities show that 20 to 40 percent of high school boys chew tobacco or use snuff. Unfortunately, these forms of tobacco are strongly linked to oral cancer, an effect seen in India, where chewing—and oral cancer—is common.

Smoking prevalence among young people is changing, sometimes for the better, other times not. Although American, British, Norwegian, and Swedish children appear to be starting this habit later in life as well as being less likely to smoke, this is not the case elsewhere. More young people than adults smoke in Eastern-bloc countries, Canada, and Egypt. In some schools surveyed in Santiago, Chile, two-thirds of the students smoked. Even in developing societies—among Polynesians, for example—smoking rates reach levels exceeding 50 percent in children. In France, 43 percent of smokers begin before age twelve. Ironically, in the United Kingdom, a quarter of the children surveyed in one study reported being given their first cigarette by their parents, or at least smoking it in their presence, before age twelve.

Measuring smoking by educational level also reveals trends with important implications for policymaking. There is an inverse relationship between educational level and smoking in the United States, the Soviet Union, and elsewhere. Over 60 percent of United States adult males with only a primary education smoke, while less than 20 percent of men with an advanced degree are smokers. This relationship appears to hold in most of Western and Eastern Europe. It is true for women as well, at least in the United States, with the exception that women who have only a grade-school education seldom smoke. In these countries, at least, smoking no longer symbolizes fashion, status, and upward mobility; it suggests the opposite.

High Cost of Addiction

No avoidable condition claims more adult lives than tobacco addiction. Between 2 million and 2.5 million smokers die worldwide each year from heart disease, lung cancer, and emphysema—smokers' disease, as it is called—caused by their addiction. Additional thousands die as a result of fires caused by cigarettes and from cancers caused by tobacco consumed as snuff or chew. Almost one-fifth of all United States deaths can be traced to the use of tobacco.

Spanish settlers discovered 450 years ago that tobacco was "impossible to give up," even when they were reproached for "a disgusting habit." Despite common knowledge that smokers have "nicotine fits," scientific understanding of the addictive power of tobacco has progressed slowly. Much more remains to be known, but it seems certain that nicotine is the addictive agent in tobacco, although oral stimulation and the physical manipulation of smoking materials are also habituating to some degree. The addictiveness of tobacco, in any case, is beyond question. British scientists A.C. McKennell and

R.K. Thomas found in 1967 that only 15 percent of teenagers who experimented with tobacco were later able to quit. Others, notably W.A. Hunt and J.D. Matunazzo, have found that 75 percent who do quit smoking start again within six months. Quitters very often crave tobacco, probably nicotine, even several years after quitting. There is a withdrawal period of about two weeks, during which unpleasant physical symptoms arise as a result, it seems, of the brain's chemical dependence on nicotine. Withdrawal from tobacco differs from that of heroin only quantitatively, and it is satisfaction with the addiction itself that leads some smokers to believe that tobacco makes them more alert and clearer thinkers. It is more immediately rewarding than caffeine, for example, which takes almost 30 minutes to reach the brain when ingested as coffee. The effect of tobacco reaches the brain in 30 seconds.

Cigarette smoke contains, in addition to addictive nicotine, hundreds of mutagens, carcinogens, and cocarcinogens, some 4,000 other chemical compounds, and simple carbon monoxide. These chemicals, including radioactive polonium, not only attack the lungs but reach the bloodstream—where they circulate, causing or accelerating atherosclerosis (clogging of the arteries) and cancer in internal organs. Heavy smoking can precipitate heart attacks when inhaled carbon monoxide displaces oxygen in the blood. Concentrations of up to 10 percent carbon monoxide in blood hemoglobin can, when coupled with reduced blood flow in heart arteries as a result of atherosclerosis, starve the heart muscle of oxygen and damage or destroy it—that is, cause a heart attack. The risk is serious at any age, but it is so clearly responsible for most heart attacks in young men that some scientists have called it a disease of smokers. The risk of heart attack among young men who smoke more than two packs per day is more than seven times higher than for nonsmokers. Fortunately, the risk diminishes rapidly in exsmokers, approaching that of nonsmokers within one year after they quit.

Fifteen to 30 percent of all heart attacks in the United States and about a third in the United Kingdom are caused by smoking. Smoking is also the leading cause of death from cardiovascular disease for those middle-aged or younger in West Germany, Scandinavian countries, and Australia. An estimate of such deaths worldwide that were due to smoking cannot be made reliably because of the complicating factors of diet and life-style. This constraint may lead to an underestimate of overall mortality resulting from tobacco use. A related cardiovascular disease caused by smoking is arteriosclerosis of the peripheral arteries. As in heart attack and stroke, smoking accelerates or precipitates blockage of arteries. Blockages in the limbs reduce blood supply to muscles and can cause gangrene, sometimes necessitating amputation of victims' legs. Peripheral vascular disease is also an important cause of death resulting from blood clots moving to the heart.

Smoking carries special risks for young women. One study of women under age fifty found the risk of heart attack to be ten times greater in women who smoked two packs per day. The authors attributed two-thirds of the heart attacks in the group to smoking. A Canadian study found that females who smoked heavily were seven to thirty-four times more likely to have a heart attack. Significantly, it also found that women who both smoked heavily and took birth control pills were eight to thirty-nine times more likely than nonsmokers to have heart

Several studies show an increased risk of lung cancer for nonsmokers whose spouses smoke.

attacks. The authors concluded that women under thirty-five could safely take the pill without additional risk of heart attack, but only if they did not smoke. A review of the epidemiology of heart attacks in women found that female heart attack victims die on average nineteen years earlier than other women. Unfortunately, young women are the group in industrial nations whose rate of smoking is increasing fastest.

Some observers have suggested that because carbon monoxide seems to play a role both in the development of atherosclerosis and in the precipitation of heart attacks, safer cigarettes can be developed by reducing their carbon monoxide production. Studies have demonstrated, however, that most cigarettes deliver similar levels of carbon monoxide, even when advertised (as required in a few European countries) as lower in carbon monoxide. Worse still, low tar and nicotine cigarettes may cause many people to smoke more cigarettes to satisfy their addiction, leading to even greater carbon monoxide inhalation.

Lung cancer is predominantly a disease of smoking. Active smoking habits account for an estimated 85 percent of lung cancer. The claims of the tobacco industry that some types of people are predisposed to lung cancer and that some unknown mechanism unrelated to smoking habits causes this condition are unlikely to prove true because different rates of smoking in men and women over different periods of time produce different rates of lung cancer. When women in the United States did not smoke, for example, they rarely developed lung cancer. As they took up the habit, lung cancer increased proportionally, after the lag of twenty years that it takes for cancer to develop following exposure to mutagens. In 1981, for the first time, lung cancer was as prevalent as breast cancer in American women over age fifty-five.

International comparisons of lung cancer rates and earlier smoking habits show a strong correlation. Nonin-

dustrial societies with high smoking rates have high lung cancer rates; Polynesians and New Zealanders have little industry, smoke heavily, and have high rates of lung cancer. Trends such as these across varied sections of the world population also tend to implicate smoking over industrial air pollutants as the cause of lung cancer. Smoking may even explain much of the lung cancer in nonsmokers. Lung cancer, it should be noted, is a function of lifetime smoking habits, not just the use of cigarettes at one given point in time. Cancer of the bladder, pancreas, lip, mouth, esophagus, and pharynx can also be traced to the use of tobacco, although alcohol plays a strong role in the last two types. The use of tobacco may also be linked with cervical cancer and stomach cancer, although these connections are less clear.

Smoking causes two other serious lung diseases—bronchitis and emphysema, referred to together as Chronic Obstructive Lung Disease. Bronchitis is a condition of secretions in the large air passages of the lung system that reduces the lungs' ability to expel germs and can lead to infection. In emphysema, the air sacs in the lungs coalesce and become less efficient in absorbing oxygen and releasing carbon dioxide. Smoking kills 52,000 Americans each year through Chronic Obstructive Lung Disease.

The link between tobacco and other causes of death must not be overlooked. Fires caused by cigarettes kill between 2,000 and 4,000 Americans each year. Passive smoking may cause 5,000 lung cancer deaths each year in the United States alone. Altogether, smoking causes 10 to 25 percent of deaths in Europe and the United States.

Several nations have attempted to estimate the direct economic cost of smoking. A major item is health care. In the United States, smoking's toll amounts to \$12 billion to \$35 billion per year—3 to 9 percent of all health care costs. Smoking claims a similar proportion of the total health care expenditures in Australia, Canada, Switzerland, and the United Kingdom. But the cost of smoking extends beyond health care expenditures. Lost income resulting from death and lost work resulting from illness cost the United States \$27 billion to \$65 billion a year. Health expenditures plus economic losses in this country range from \$38 billion to \$95 billion, or \$1.27 to \$3.17 per pack. These totals do not include the cost of tobacco itself—about \$30 billion per year. Nor do they include the suffering and emotional losses of victims and their families.

The economic costs of smoking have generated considerable attention and controversy. Policymakers concerned with budget deficits sometimes view the billions of dollars spent on publicly funded health care for dying smokers as an unnecessary expense. Some economists argue that these are merely financial costs that would be incurred anyway if smokers lived longer, became infirm, and needed medical care. This may be true financially, but from a benefit/cost point of view, smoking imposes unnecessary costs.

If smokers did not smoke, they would live longer and probably enjoy a better quality of life. These are the benefits of policies that reduce and prevent smoking. The improvements in health are benefits in their own right, even if they do not lead to reduced health care costs. Some economists also argue that the jobs and incomes created by the tobacco business must be counted as benefits. Even if other uses of land were not available, tobacco's economic costs alone would exceed its "benefits" by more than two-to-one. These costs do not include the environmental and agricultural costs of tobacco production. Tobacco curing consumes 1 to 2 percent of all wood burned each year in Kenya and Tanzania, and one-third of all wood harvested in Malawi, where harvesting far exceeds sustainable yields. Many agricultural countries, including Brazil, China, India, Pakistan, and Zimbabwe, dedicate the equivalent of between 0.5 and 7 percent of cropland to tobacco, with the United States and China using slightly less than 1 percent in this way. These percentages are small relative to global resources of land and firewood, but in some countries they become significant. If planted in grain, the land would be sufficient to feed 10 to 20 million people—assuming that production and marketing conditions could be created to encourage food production on tobacco land.

Tragically, the cost in lives and money can only be expected to grow. Seventy-three percent more tobacco is consumed now than twenty years ago; without a sudden

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of tobacco.**

drop in smoking, lung cancer deaths, for example, will almost certainly increase by 50 percent by the turn of the century. Many such losses will occur in nations totally unprepared to deal with the new epidemic. Even in the West, where billions of dollars are spent in a fight to control lung cancer, fewer than 10 percent of such patients are cured of their disease. The prospects of surviving for even one year are dismal. Fortunately, the relative risk of lung cancer for exsmokers, compared with people who never smoked, diminishes to below detectable levels 10 to 30 years after a smoker quits. Thus, if tobacco use could be halted, this projection would not materialize. It follows, too, that the incidence of bronchitis and emphysema will grow as tobacco use grows. At the current rate, the next twenty years would also witness an increase of 50 percent in these diseases. Heart disease is far more complicated to

predict, for it is tied to hypertension, diet, and other factors.

Assuming current trends, the already devastating cost of tobacco is certain to increase over the next few decades. Ironically, it may take the growing realization of this habit's high costs for passive smokers to actually bring about effective action. For no matter how convincing the direct costs may be to rational thinkers, smokers—being addicted—may not be able to act rationally to solve the problem of smoking.

Victims of Others' Smoke

Sidestream smoke—which wafts from a smoker's cigarette to an involuntary smoker—puts into the surrounding air fifty times the amount of carcinogens inhaled by the user. It contains several thousand other compounds, many of which cause irritation and allergic reactions in the eyes and nose. Cigarette contamination of indoor air has been linked to increased risk of lung cancer in non-smoking spouses and to respiratory disease in infants. The scale of these effects has only recently attracted attention, and much more work is urgently needed to define their total impact.

Passive smoking has been correlated with lung cancer in nonsmoking spouses of smokers in more than ten studies. One particularly important study was derived from other research designed to track lung cancer in smokers in Japan. This work lent itself to a consideration of passive smoking because careful records were kept of spousal smoking habits. Wives who did not smoke but who lived with heavy smokers were found to be three times more likely to die of lung cancer than wives of men who did not smoke. A parallel study in Greece yielded similar results. Lung cancer occurred more than twice as often as expected among nonsmoking wives of Greek smokers. Several United States studies have now also shown such increased risk of lung cancer for nonsmokers whose spouses smoke. In West Germany, a report on passive smoking risks showed that nonsmoking women with lung cancer were three times more likely than average to have husbands who smoke. A careful examination of their workplaces showed they had not been exposed to carcinogens on the job.

Ambient tobacco smoke clearly carries a risk of cancer in nonsmokers. One recent effort to quantify this risk estimated that passive smoking in the United States causes more cancer deaths than all regulated industrial air pollutants combined. The cost in lives may be as high as 5,000 nonsmokers per year, or one-third the cases of lung cancer not already directly attributable to smoking. Nonsmokers are likely to have no choice about breathing tobacco smoke. In the United States, people typically spend 90 percent of their time indoors. On the job, some 63 percent of United States workers are exposed to tobacco smoke, while at home over 60 percent of all households have at least one smoker. Altogether, only 14 percent of Americans escape being exposed to tobacco smoke in the

home or at the workplace. The rest involuntarily “smoke” on average the equivalent of almost one cigarette per day. Some people—a musician, for example, who plays in smoky bars and lives with a chain-smoker—passively smoke the equivalent of fourteen cigarettes a day.

Protecting the public from the carcinogens in passive cigarette smoke requires urgent action. Increasing the ventilation in a building appears to be impractical because it is prohibitively expensive. Reducing the risk of cancer that is due to cigarette smoke would require replacing the volume of air in the living space about 250 times more often than is currently the norm—and use 250 times the heating, cooling, and pumping. The only certain way to make indoor air safe from cigarettes is to eliminate the source.

Children at Risk

Tobacco's effects on children—beginning with exposure before they are born—deserve special attention. Passive smoking places unborn children at serious risk. Nicotine, numerous toxic chemicals, and radioactive polonium may all interfere with fetal development, and the fetus can receive these substances through the mother's blood whether she smokes or chews tobacco. Studies in both industrial and developing countries show that smoking by pregnant women reduces infants' weight at birth by roughly one tenth. In one United States survey, smokers gave birth to underweight babies twice as often as other women did. Research has found a strong, inverse relationship between birth weight and levels of cigarette residue (thiocyanate) in infants' umbilical cords. Low birth weight has also been associated with tobacco chewing in India, where 39 percent of women chew tobacco. Because birth weight is a key factor in infant mortality, tobacco use seriously endangers infants' lives.

Nicotine also may be the culprit in spontaneous abortions among women who smoke. Epidemiologist R.T. Ravenholt estimates that smoking causes 50,000 miscarriages in the United States each year. This connection has been observed in Italy as well, where women who smoke miscarry in the first month of pregnancy at a rate of 2.4 percent, compared with 0.9 percent for nonsmokers. Smoking can also cause premature delivery. Nineteen percent of the firstborn infants of Italian women who smoke were premature, twice the rate for nonsmokers. The rate of premature delivery in the Italian study declined by almost 25 percent for the secondborn children of nonsmokers, but it increased slightly for smokers. Unfortunately, women in many countries are smoking in record numbers, even while pregnant. Surveys in the United Kingdom suggest that about 40 percent of pregnant women smoke. A compilation by Ravenholt of surveys showed that in nations as disparate as Sweden and Chile over a quarter of pregnant women smoked. Each year, at least 3 million newborn—the estimated number of live births to women who smoke—are thus potentially handicapped by their mothers.

Children with parents who smoke experience much higher rates of respiratory illness, including colds, influenza, bronchitis, asthma, and pneumonia. One British study published almost ten years ago showed that children under age one whose mothers smoke more than one pack a day are twice as likely to get bronchitis and pneumonia. This finding has since been repeatedly corroborated. In addition, the evidence indicates that parental smoking retards child development. One study found that lung capacity in boys was reduced by 7 percent by their mothers' smoking. If the teenage boys also smoked, their lung capacity was reduced by 25 percent. The effect of passive smoking in children can last a lifetime because it delays physical and intellectual development, and because the longer people are exposed to carcinogens the more likely they are to develop lung cancer. Parents who smoke may also reduce the intellectual development of their children. One study in Italy found that children whose mothers smoked learned to read more slowly than those of nonsmokers. In the United States, the learning ability of eleven-year-olds whose mothers smoke has been shown to lag by six months.

Antismoking Action and Nonaction

When Alan Blum, editorializing in the *New York State Journal of Medicine*, rhetorically asked "What if smoking killed baby seals?" he was making the point that environmental and health activists do not accord tobacco the priority it deserves. He suggested that "perhaps the entire antismoking campaign be turned over to Greenpeace." Health and environmental organizations have not moved to protect their constituents' well-being with the same vigor that the tobacco industry protects its pecuniary interests. Nor have governments assumed their traditional role in protecting public health by acting decisively to reduce tobacco's threat. They move swiftly to remove unsafe medicines from the market. They conduct paramilitary operations to destroy fields of marijuana or opium, but not tobacco, a far deadlier crop. They pay for expensive cleanup operations to remove toxic chemicals from the human environment. Not only do they fail to take these actions for tobacco, which is often more deadly to both users and innocent—or passive—victims, they even support efforts to stabilize the tobacco industry. This sad state of affairs is possible both because the tobacco industry is so strong and because the opposition to tobacco is so weak. Health advocates in general have not insisted that governments take appropriate action. They have relied on informational programs alone to solve the problem.

Equating smokers with baby seals—as victims rather than willing participants—helps to clarify some confusion that contributes to inaction on tobacco. Many people assume it is enough to warn tobacco users, through the media and with labels on tobacco products, of the risks they take and then leave to them the responsibility for their own health. They argue that if users choose to

take tobacco's risk, in return for the pleasure or stimulation that it provides, that is their prerogative. To some extent this is true; but the independence and voluntary nature of this choice can be called into question on three counts. First, tobacco is strongly addictive. Studies have shown that only 15 to 30 percent of children who try more than one cigarette ever succeed in quitting. People begin to smoke because of social pressure, curiosity, or a desire to feel grown-up. Pharmacologically, tobacco acts like

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heroin in hooking its victims. They rapidly become dependent on nicotine and then smoke to satisfy their addiction. Second, smoke harms more than just the smoker. Children of smokers get sick with respiratory illness twice as often as those of nonsmokers. Their growth and intellectual development as well as lung capacity can be stunted. Exposed for decades to others' smoke, their risk of lung cancer is at least tripled. Similarly, spouses and coworkers of smokers are at higher risk of lung cancer because of smokers' addictions. Third, when governments act inconsistently in their management of tobacco with respect to other, less dangerous products that they ban, they confuse tobacco users. Asbestos, heroin, and DDT are banned to protect public health; tobacco is not. This implicitly signals that those responsible for health consider tobacco to be different and normal to use. Thus, teenagers can be forgiven for not taking seriously a tiny health warning on shiny new packs of cigarettes. The problem is made worse when governments actively encourage the production of tobacco.

The point at which society decides to take action on dangerous products is sometimes arbitrary, but it can be based consistently on estimates of risk. It is the overall risk carried by addictive products rather than their capacity to cause addiction per se that—along with economic interest, attitudes, and chance—decides society's treatment of them. Coffee, for example, is addictive but the evidence that it causes cancer or heart disease is mixed. Some studies have estimated that coffee can double the risk of pancreatic cancer; others have found no increased risk at all. Alcohol is addictive and carries heavy costs for society, although these are at most half as costly as tobacco. Having one drink a day can be tolerated without instilling dependency in most people, so society permits its use. Alcohol, at least, does not quickly addict the majority of those who experiment with it, as do heroin and tobacco. Similarly, nonaddictive products that are car-

cinogens may be sufficiently low in overall risk to be permitted. Some artificial sweeteners, for example, fall above the level of acceptable risk, while others do not; but they may both be carcinogenic.

Most United States federal regulatory agencies draw this arbitrary line at a level of risk of 1 death in 100,000 or, alternatively, 1 in 1 million people over a lifetime of exposure. The risks from passive smoking probably exceed this by a factor of 250. Active smoking exceeds the lower level by 100,000 because it causes cancer in 1 of 10—some would say 1 in 5—users. Forbidding the sale of tobacco would be consistent with the prohibition of the sale of addictive drugs that harm the user and others. Banning tobacco would also be consistent with the control of strong carcinogens with very high risk factors.

Some people argue that individuals should be able to do whatever they want in the privacy of their own homes. This is an acceptable, even admirable attitude that favors civil liberties. But the limit to one person's pursuit of happiness begins at the point where it clearly harms others. If smokers are to be permitted to harm themselves but forbidden to harm their children, spouses, and co-workers, they will have to smoke in their backyards. Because control of tobacco use in private homes is both politically and practically unacceptable, the only realistic way to protect children—if parents fail to do so—is to control the product itself.

Societies urgently need to examine how to better control tobacco use, for the current strategy of informational campaigns is not working well. The basis of antitobacco action since the mid-sixties has been information aimed at educating smokers about their health risks and discouraging nonsmokers from starting. The campaign seeks through media coverage of scientific studies to persuade smokers to quit and children never to start. It tries to change society's attitude from a view of smoking as glamorous to one that sees the habit as socially unacceptable. This approach has been tested in a few countries such as Finland, Norway, Sweden, and, to a lesser extent, in the Netherlands, the United States, and the United Kingdom. It has been practiced *de facto* in many Eastern-bloc countries and in China. The results are mixed.

Absolute cigarette consumption has fallen over the last ten years in only a dozen countries. Of these, only four had moderate to strong antismoking policies, while eight had weak ones. Reduction in countries with weak policies can be attributed to economic decline, specifically to higher costs of imported cigarettes and reduced per capita income. Overall, income and cigarette price seem to have much more influence on consumption than the current generation of antismoking policies. A dozen countries have had strong antismoking measures—by today's standards—but have experienced strong growth in tobacco use. Tobacco advertising is prohibited in Poland, and restrictions are placed on smoking in public, yet that nation has the fifth highest per capita cigarette consumption in the world. Advertising bans and other antismoking policies

exist in China, East Germany, and the Soviet Union, but smoking nevertheless continues at very high levels, at least among men. Finland, Norway, and Sweden, in contrast, have imposed advertising bans and required strong warnings on tobacco labels, and they have experienced better results. Norway's antismoking policy is exceeded in strength by only four other countries, and tobacco consumption has declined by almost 20 percent since the imposition of that policy. Sweden's policy has been weaker than those of other Scandinavian countries, but consumption is down about 3 percent since 1974, about

There is an inverse relationship between educational level and smoking in the United States.

the time its policy was initiated. Bulgaria, Hungary, and the Soviet Union have the strongest policies in the world. Bulgarians now smoke 2 percent fewer cigarettes than ten years ago, while the Soviets and the Hungarians use 8 and 4 percent more, respectively.

Countries with weaker policies but better results include Belgium, the Netherlands, and the United Kingdom. These governments permit advertising in print but forbid it on electronic media. They have negotiated voluntary warnings on tobacco products with the tobacco industry. Most importantly, they have conducted vigorous antismoking educational campaigns. Cigarette consumption has declined 20 percent or more over the last ten years in these nations. The per capita consumption level in each is below the average for industrial countries, although well above the mean for the world. Only in the United Kingdom is consumption lower than twenty years ago. Some countries have had dramatic declines in cigarette consumption without even trying. Drops in consumption by 7 to 32 percent in Bolivia, Chile, and Zaire can be attributed to their economic difficulties: their antismoking policies are among the weakest in the world. Changes in income do affect tobacco consumption, although the strength of the income effect depends on a country's stage of development. A statistical analysis of thirty industrial and developing countries suggested that, overall, cigarette consumption increases about 3 percent for every 10 percent rise in income. This relation does not apparently hold for industrial countries. Consumption seems more related to price and social attractiveness in countries such as the United States, where price increases of 10 percent appear to reduce consumption by 3 to 4 percent. The largest decline ever in United States cigarette

use occurred in 1983 when the government imposed a tax of about 8 percent of the retail price.

This analysis also reveals that the strength of a nation's tobacco information policy does not appear to reduce consumption, if income and price are taken into account. The result suggests that the stronger the antitobacco policy, the greater the consumption and the higher the rate of increase in consumption. This "nonsense" result, of course, can be explained simply. Countries that have had a problem with cigarette consumption are more likely to have taken steps that they believe will reduce that problem. Unfortunately, the steps taken to date have been too weak to achieve the desired results. Lack of time to take effect could also be a factor, although most policies have been in place for almost a decade.

Stronger Medicine

Health advocates have generally dismissed stronger medicine for dealing with smoking and tobacco. The United Kingdom Royal College of Physicians, for example, the first governmental body in the world to launch a campaign to save the health of smokers, has conceded that banning tobacco is impractical. The physicians compared such a move to prohibition, and expressed fear that it not only would be unenforceable, but would lead to criminality. Yet there are a few effective ways to strengthen tobacco control policies without an outright ban. The policy questions are how to prevent the young and the naive from beginning to smoke, how to persuade smokers to quit, and how to protect the health of passive or involuntary smokers in the interim. When naive smokers first light up without understanding the life-threatening implications of their careless experimentation, they can become addicted and, in effect, involuntary smokers themselves. Psychology and medicine currently do not know how to help these addicts, other than to recommend that they quit cold turkey.

This dilemma may be unique in medicine: a dangerous drug clearly should—but cannot—be banned. The economic strength of the tobacco industry is so great that it can exploit for its own purposes the safeguards built into democracies to protect legitimate minorities. In non-democracies, governments may lack the credibility, and the motivation, to tackle so insidious and pernicious a habit. Under both systems the social conditioning and chemical habituation characteristic of tobacco make banning the product a formidable task, one that would take a long time. Yet the current informational campaign to control tobacco is falling behind as worldwide use increases faster than population.

An alternative approach is inherent in a new movement to protect passive smokers: banishing tobacco. This campaign, which stops short of an outright ban of tobacco sales, includes either the prohibition of smoking in the workplace and in public buildings or the strict limitation of smoking to specified areas. The movement may be the single greatest success of the informational campaign

against tobacco. Its leaders insist that despite the continued sale, advertising, and use of tobacco, non-smokers—the majority in most societies—have every right not to be exposed to the carcinogens, carbon monoxide, and irritants in tobacco smoke. Such a campaign can make three important contributions. First, by banishing tobacco use from places in which innocent people will be exposed and placed at risk, thousands of lives may be saved. Second, forcing smokers to give up their habit while in the presence of nonsmokers will provide them with an added impetus to quit. If smokers must get through working days without smoking, then they are more likely to be able to quit completely. This has been the result of bans in Minnesota and California. In any case, their total dosage of carcinogens and carbon monoxide should decline. Third, by stigmatizing tobacco use as dangerous and antisocial, the passive smokers' rights movement can accomplish a goal of all antismoking informational campaigns: to make smoking socially unattractive. This should reduce the attraction of smoking for children.

The passive smoker's rights campaign focuses on the workplace, public gathering places, and public transportation. Many countries now prohibit smoking on public transportation and in theaters and auditoriums, although the impetus for these restrictions has usually been conventional safety concerns. A few areas, such as the state of

Parental smoking retards child development.

Minnesota and the cities of San Francisco and Los Angeles, now prohibit smoking in public buildings (except in restricted areas) and require protection of nonsmokers in restaurants and on the job.

Nonsmokers have an important ally in the workplace—employers. Companies, at least in the United States, are rapidly realizing two things: most of their employees do not smoke and do not like to breathe the smoke of others; and smokers cost employers money. Surveys indicate that the combination of inefficiency and ill health as a result of smoking wastes about 7 percent of a smoker's working time. They also suggest that smokers cost employers at least \$650 each per year. Smokers add to insurance and cleanup costs, and they reduce nonsmoker employee morale. American industry is responding rapidly to the nonsmoker movement. A number of well-known industries have prohibited smoking on the job for most employees. A few even refuse to hire smokers, but the predominant trend is toward banishing the practice from the workplace. In 1984, the rate of increase in adoption of

policies against smoking for the publishing, insurance, finance, pharmaceuticals, and scientific equipment industries in the United States was between 10 and 25 percent; that is, one-tenth to one-quarter of the top 1,000 businesses in this group of five industries implemented new policies that year to banish smoking.

A particular difficulty in banishing tobacco is the role of government in promoting tobacco use. This schizophrenic state of affairs persists not just in the market-oriented West, but also in centralized economies. Governments most often own the tobacco industries in these areas. China, the Soviet Union, and India, for example,

China uses a quarter of the world's tobacco.

grow their own tobacco; they are not victims of some cabal of multinational companies. The state-owned tobacco industry in China is being carefully nurtured and expanded rapidly even as another part of the government is telling the Chinese that smoking is bad for them. These incompatible policies are also in place in the West. In the United States, the U.S. Department of Agriculture administers a price-support system to protect tobacco producers. Western European nations subsidize tobacco farmers with about \$660 million in price supports each year. Ironically, the systems protect small, inefficient farmers who earn higher prices than they would obtain without the subsidy. More efficient producers, who could underprice the small farmers, are not allowed to compete fully. The ironic result is that tobacco costs the user more than it would without the system. As tobacco use varies negatively in response to price, smoking is being directly reduced by price supports.

There is an even more subtle effect. The tobacco industry, although it loses the right to compete with small-scale farmers for more of the profit of growing tobacco, gains the powerful political support of the small farmer. The

added political clout helps counter antismoking forces. It retains the appealing appearance of official tolerance and even endorsement of the use of tobacco, which in turn diminishes the effectiveness of the informational campaign in reducing the social acceptability of tobacco. Any child about to start smoking must be inclined to think that the United States government sees tobacco use as desirable. This is the implicit position of any government that promotes tobacco production. Failing to excise this subsidy, however perverse for the industry, sends a signal both to the young and to other governments that tobacco is not so bad after all.

The overall situation of antismoking efforts is at best a standoff in industrial countries and a rout in developing ones. At the current rate, Western countries will not see a major improvement in the health effects of smoking for many decades, but Eastern and developing countries will see a rapid worsening. It falls to world health leaders to bolster their antismoking efforts. Unfortunately, one leading agency, the World Health Organization of the United Nations, allots less than 1 percent of its budget to this problem, although it calls smoking "the most important preventable health problem in the world." Its current budget for the mid-eighties has no funds for actively reducing tobacco's toll.

Now that informational campaigns exist, at least in some countries, it is time to build on them with more stringent measures. New measures will not assure that smokers will be persuaded to quit; nor will they guarantee that innocent young people do not become addicted before they realize their new habit eventually kills one out of four users. Without more responsible efforts on the part of the health professions and public interest organizations, effective new efforts will be held in abeyance. □

William U. Chandler is senior researcher at the Worldwatch Institute in Washington, D.C. He has served as director of the Energy Conservation Project of the Environmental Policy Institute and as senior research associate at the University of Tennessee Energy, Environment, and Resources Center. He is coauthor of Energy: The Conservation Revolution and author of The Myth of TVA: Conservation and Development in the Tennessee Valley, 1933-83. This article is adapted from State of the World 1986, edited by Linda Starke and published by W. W. Norton and Co.

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