



SECTION ONE



A REVIEW OF THE FIELD

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Tobacco Policy Research: Insights and Contributions to Public Health Policy

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Prior to the twentieth century, life was often short and brutish. Average life expectancy totaled only 21 years in Boston in 1840–1845 and 20 in New York. By the beginning of the twentieth century, Americans' life expectancy had risen to 47 years. By its end, it had soared to 77 years, the result of dramatic improvements in sanitation, nutrition, health care (especially the advent of antibiotics), and the twin engines of public health, the emergence of universal education, and dramatically increasing affluence.

Despite this remarkable progress, Americans have not transcended illness. To the contrary, while most of us live relatively unburdened by the scourge of infectious disease, our longer lives, and our greater affluence, have permitted us to become victims of our own indulgences. Thanks in part to the large quantities of fat-laden food we eat, the sedentary nature of information-age jobs, the alcohol we so often abuse, incautious sexual behavior, and the tobacco smoke with which we coat our lungs, we have entered an era of chronic disease. Historically unprecedented, this new epidemic challenges health in the middle and later years of life and threatens to sap the resources of our increasingly sophisticated—and increasingly expensive—health care system.

Cigarette smoking is the prototypical behavior in this nexus between our more easily indulged appetites and our health. Yet public health professionals interested in reducing the disease burden imposed by smoking confront an anomalous challenge. Unlike most other legal consumer products ingested into the body, cigarettes and other tobacco products are subject to virtually no

product regulation whatsoever.^{1,2} As is often observed, if one were to invent the cigarette *de novo*—a product that addicted the vast majority of its users, killed half of life-long users, and offered modest benefits at best (primarily relief of withdrawal symptoms)—regulatory authorities would never permit its marketing. The very existence of a legal cigarette market reflects a unique confluence of historical accident and regulatory exception. Historically, smoking diffused into widespread use decades before science had explicated its dangers. By the time such knowledge was available, tens of millions of Americans were already addicted. Experience with Prohibition in the 1930s, and indeed with failed attempts to prohibit smoking in several states early in the twentieth century,³ ruled out a ban on smoking.

Congress has passed approximately a dozen health and safety laws pertaining to regulation of consumer products and toxic substances that, were the laws applied to cigarettes, would require that cigarettes be banned or at least heavily regulated. Yet in each case, Congress specifically exempted tobacco products from the purview of the law; or, when agency officials attempted to regulate cigarettes under the law, Congress amended it to exempt tobacco products.¹ The source of this extraordinary record of regulatory exception is not hard to find. The size and geographic concentration of the tobacco industry created an economically grounded political base of support virtually unrivaled in American history. That political powerhouse persists today, vastly disproportionate to the true contemporary economic importance of tobacco.⁴

Lacking an explicit regulatory authority, health professionals have been forced to pursue policy alternatives to product regulation as a means of stemming the toll of tobacco. Toward that end, they have enlisted, or themselves undertaken, a wide variety of studies to assess the effects of a diverse set of tobacco control policy measures. Twenty years ago, such research was purely a labor of love, engaged in by only a handful of dedicated scholars who found financial support for their work in the nooks and crannies of the biomedical and public health research establishment. Then, in 1992, the Robert Wood Johnson Foundation announced a call for proposals to the newly established Tobacco Policy Research and Evaluation Program, two years later expanded into the current Substance Abuse Policy Research Program. For the first time, a national research program was devoted exclusively to issues pertaining to tobacco policy (and subsequently other substance abuse policy).⁵

The impact was rapid and substantial. In its first two rounds of grants (the only two in its tobacco-only incarnation), the program awarded 55 grants. The program encouraged both new researchers and established scholars to turn their attention to what is arguably the nation's preeminent public health problem (and unarguably the leading cause of preventable illness and premature death). Other foundations and government agencies entered the field, and RWJF greatly expanded

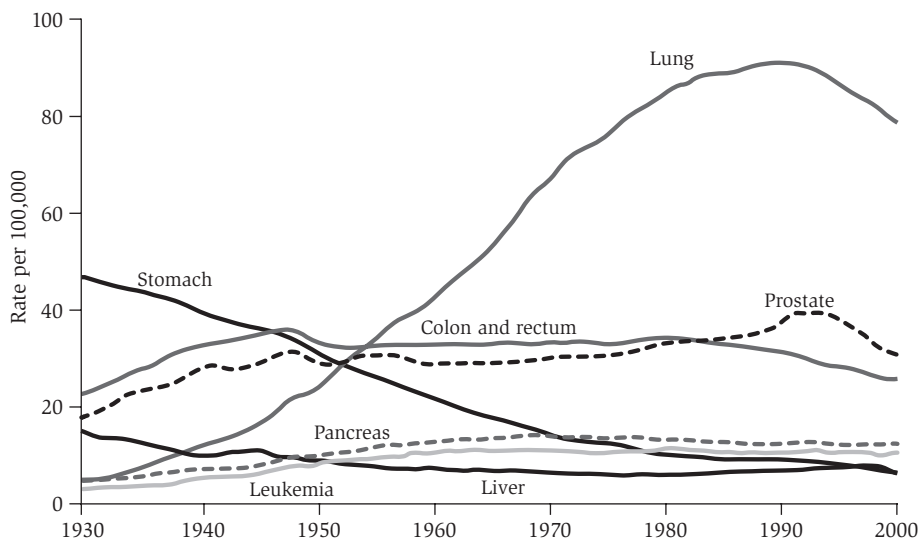
its tobacco control funding through important agenda-defining conferences⁶ and additional programs, many relevant to policy research. As a consequence, the field of tobacco policy research has grown dramatically and matured, attracting some of the best minds that the fields of social science, statistics, and epidemiology have to offer. The result is a body of policy research that now serves to inform, and often directly influence, tobacco and health policy making.

The terrain of tobacco control policy and policy research is vast and intellectually diverse. This chapter provides a broad overview of the nature and findings of the literature that has emerged from tobacco policy research, examining both what has been learned and what has been applied in the real world of policy from knowledge gleaned. Emphasis within the chapter is on research produced in and pertaining to tobacco control in the United States. The review is organized according to a policy typology intended to lend logical coherence to discussion of the numerous and varied forms of policy. Before turning to the contributions of policy research to tobacco control, the chapter opens with a “primer” on the health consequences of tobacco. This is followed by a brief history of tobacco control policy prior to the contemporary period. Such background will set the stage for understanding the contributions of policy research.

THE HEALTH CONSEQUENCES OF TOBACCO

In the early 1900s, lung cancer was such a rare disease that when physician-educator Alton Ochsner encountered a case, he corralled all available medical students to see it. At the time, he thought they might never see another case.⁷ One of the fathers of today’s tobacco control movement, Dr. Ochsner erred rather dramatically in his assumption. From the 1930s on, lung cancer grew at an astonishing rate to become the leading cause of cancer death in both men and women, responsible today for 32% of cancer deaths in men and 25% in women. In the period from 1995 to 1999, a total of 125,000 lung cancer deaths per year were caused by smoking.⁸ Indeed, for both genders, lung cancer was the only major source of cancer mortality to exhibit substantial growth in age-adjusted death rates over the entire twentieth century. (See Figures 1.1a and 1.1b.) Both directly and indirectly (for example, from second-hand smoking), cigarette smoking is responsible for 90% of our most important, and most preventable, cancer killer.¹

Lung cancer is not the only nor, numerically, even the most important tobacco-produced disease cause of death. Tobacco-related cardiovascular diseases claimed the lives of more smokers, killing 149,000 Americans each year during the same period. Tobacco-induced respiratory diseases, primarily including chronic airway obstruction, emphysema and chronic bronchitis,

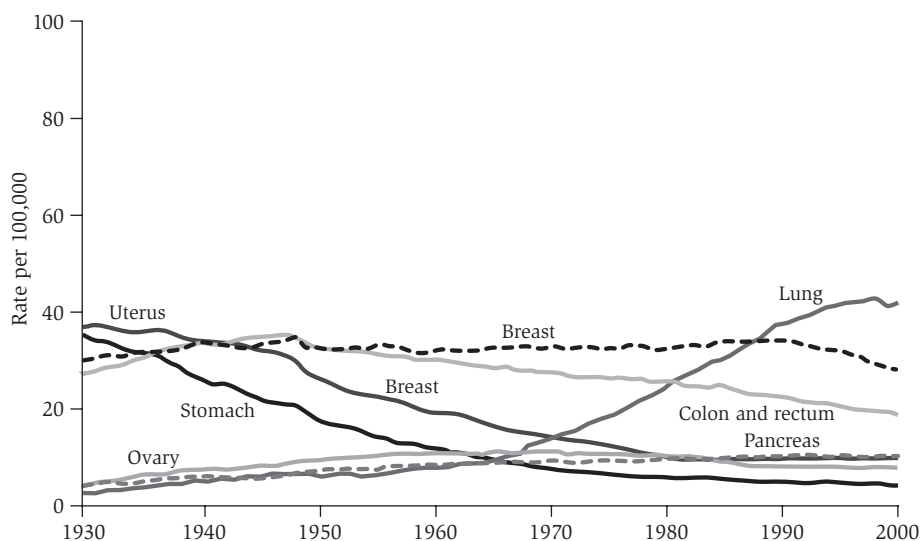
Figure 1.1a. Cancer Death Rates,^a Males, U.S., 1930–2000.

^aAge-adjusted to the 2000 U.S. standard population.

Source: U.S. Mortality Public Use Data Tapes 1960–2000, U.S. Mortality Volumes 1930–1959, National Center for Health Statistics, Centers for Disease Control and Prevention; 2003. From Cancer Statistics 2004. A presentation from the American Cancer Society.

and pneumonia, felled an additional 98,000 Americans annually and inflicted immeasurable suffering on hundreds of thousands of others living with the diseases. Adding other causes of death, including those attributable to second-hand smoke exposure, smoking was credited with 442,000 deaths per year, close to one-fifth of all deaths. In the productive years of middle age, from 40 to 65, smoking accounted for a third of all deaths. The victims of smoking each year lost 5.6 million years of life as a consequence of their smoking-produced premature deaths.⁸

The mortality toll is the most consequential of the adverse outcomes of smoking but far from the only important one. Quite possibly, death is not even the greatest source of human misery associated with the behavior. For every one person killed by tobacco each year, another 20 suffer smoking-produced illness or disability.⁹ More than 8 million Americans live with tobacco-related disease every year. For some, the duration of illness is a matter of months (for example, lung cancer). Others, such as those suffering from smoking-produced emphysema or heart disease, will live with the consequences of their smoking for years. While half of life-long smokers escape a smoking-related death, few avoid the ravages of smoking-generated emphysema. For these smokers and former smokers, every breath of air becomes a challenge; for many, an oxygen tank replaces their cigarette pack as their new life-long companion.

Figure 1.1b. Cancer Death Rates,^a Females, U.S., 1930–2000.

^aAge-adjusted to the 2000 U.S. standard population.

Source: U.S. Mortality Public Use Data Tapes 1960–2000, U.S. Mortality Volumes 1930–1959, National Center for Health Statistics, Centers for Disease Control and Prevention; 2003. From Cancer Statistics 2004. A presentation from the American Cancer Society.

Other consequences are smaller in magnitude but no less dramatic. Notably, cigarettes are the leading cause of burn deaths in the United States, responsible for nearly 1,000 fatalities.⁸ The systemic nature of the distribution of the more than 4,000 chemicals in cigarette smoke—systemic because components of smoke travel throughout the body via the bloodstream—means that smoking affects a remarkably high percentage of human organs and biological functions. Smoking increases the risk of impotence in men, increases healing time after surgeries, and adversely affects eyesight.¹⁰ Recent research on the health consequences of exposure to other people's cigarette smoke (passive, involuntary, or second-hand smoking) indicates that environmental tobacco smoke likely constitutes the most dangerous environmental exposure confronted by the average American.¹¹ The Centers for Disease Control and Prevention (CDC) estimates that secondhand smoke killed 38,000 Americans annually from 1995 to 1999.⁸

Smoking exacts an economic toll as well. Smoking causes more avoidable illness and work absenteeism than any other behavior¹ and accounts for 6–10% of all health care costs.¹² Productivity losses due to smokers' absenteeism and premature mortality add a comparable burden to the economic calculus of smoking. Combined, the CDC estimate that smoking exacted an annual economic toll of \$157 billion from 1995 to 1999.⁸

The toll smoking takes in America is merely the tip of the iceberg of the global burden of tobacco. Currently, the World Health Organization (WHO) estimates tobacco claims 4.9 million lives each year. By the year 2030, WHO projects the toll will reach 10 million annually. Approximately *500 million* people alive today will die as a direct consequence of tobacco use. During the course of the twentieth century, tobacco claimed 100 million lives around the world. During the present century, the toll will rise by an order of magnitude: fully *1 billion* people will succumb to tobacco-produced disease. Two to two-and-a-half decades hence, tobacco will become the world's leading cause of death. Seventy percent of those deaths will occur in developing countries. Just a few years ago, 70% of smoking's deaths were in the developed nations. Long the scourge of the developed world, cigarette smoking will replace infectious diseases as the twenty-first century plague afflicting peoples in the poor nations.¹³

An Explanation of the Disease Toll

What accounts for the enormity of the disease burden of smoking? Two factors combine to produce a simple answer: the prevalence of the behavior and the lethality of the chemical stew that constitutes cigarette smoke. Today, close to a billion of the globe's male citizens smoke, including 35% of men living in developed countries and 50% in developing countries. Approximately 250 million women smoke, 22% of women in affluent nations and 9% in poorer countries.¹⁴ In the United States in 2004, with more effective tobacco control than in the average developed country, the comparable figures for adults 18 and older were 23.4% and 18.5%, respectively.¹⁵

The lethality of the mix of chemicals in smoke reflects both the chemicals themselves (and possibly the ways in which they interact) and the frequency with which the lungs, and hence the bloodstream, are exposed to them. Cigarette smoke includes over 4,000 chemical compounds, over 40 of which have been identified as human carcinogens. Among the compounds found in cigarette smoke are ammonia, formaldehyde, naphthalene, nitrosamines, carbon monoxide, hydrogen cyanide, arsenic, benzo[*a*]-pyrene, and radioactive polonium-210.¹ Consider that a pack-a-day smoker inhales these chemicals over 200 times per day (10 or more puffs on each of 20 cigarettes). Over a year, the pack-a-day smoker takes some 75,000 "hits" on 7,300 cigarettes. Over a typical smoking "career" of 50 years, the smoker inhales this chemical stew *3.75 million* times, consuming over *a third of a million* cigarettes. When one considers the nature of this remarkable chemical assault on the body, it may seem amazing that anyone survives it. Indeed, the fact that half of life-long smokers do not expire as a result of their smoking may qualify as the single most impressive testimony to the strength of the human organism.

The mix of chemicals is not hard to understand: processed tobacco itself contains over 2,500 chemical compounds, and combustion of pretty much anything produces additional compounds. More perplexing is the widespread prevalence of smoking. Inhaling smoke is not easy at first; one must struggle to learn how to do it without gagging. Financing a smoking habit commands a not insignificant amount of many smokers' discretionary resources. Today, smoking is frowned upon in many social circles, viewed as a sign of individual weakness if not outright social pathology. In many developed countries in particular, laws and institutions repeatedly remind smokers of the antisocial nature of the behavior by prohibiting smoking in public buildings. And as smokers age, they become aware of the physical toll of the behavior, most noticeably at first, for many, in the form of coughing or shortened breath.

Were smoking nothing more than this constellation of influences, it is doubtful that 1.2 billion people would engage in the behavior. The reason they do, of course, is that smoking represents much more. Initially it is a rite of passage, a means for the rebellious element of every child to partake in the forbidden fruit of "adult pleasures."¹⁶ Experimentation is fostered by peer pressure, role modeling (parents, actors, musicians), and seductive tobacco industry imagery. In the United States, two-thirds of children try smoking and half of them go on to become regular smokers.¹⁷ In developing countries, smoking is often viewed as one of the few affordable "luxuries" in life, one that is aggressively promoted as such by the multinational tobacco companies.¹⁸

Addiction replaces experimentation for a large proportion of smokers, with the time from initial experimentation to full-fledged addiction variously estimated at anywhere from a few days for unlucky young people to many months for others.¹⁹ Tobacco addiction ranks as tenacious as addiction to heroin and cocaine.¹ Precisely due to the fact that smoking is not disorienting, as is much illicit drug use (and alcohol abuse), smokers can reinforce their dependence by dosing themselves throughout the day. As such, many people addicted to both smoking and illegal drugs report the former a more difficult addiction to break.²⁰

Although tobacco's opponents often argue that smoking confers no benefits on users, this is clearly incorrect. For many, the principal benefit may be relief of withdrawal symptoms. For others, smoking serves to reduce stress in some situations, increase mental focus, and enhance self image, the last fostered by the creative sales job of cigarette advertisers and the on-screen portrayal of smoking movie stars as more manly men and more sexy women. Nicotine itself may be useful in mitigating the effects of a number of medical conditions, including Alzheimer's Disease, Parkinson's Disease, and attention deficit disorder.²¹ Enthusiasts have waxed eloquent about the many pleasures derived from the sensual features associated with smoking, and have derided the assault on

smokers by paternalistic public health professionals.²² Clearly, smoking has its attractions. It is precisely those attractions—among them the pleasurable sensation of nicotine acting on the brain—that keep smokers coming back for more.

It is fashionable within the field of tobacco control to blame the smoking epidemic on the tobacco industry. Without its aggressive and avaricious marketing, many advocates seem to believe the epidemic would be substantially tamed. As we turn to an examination of tobacco control policy and what research has taught us about it, it seems fitting to close this introductory section by observing that tobacco has been around for millennia. Well before multinational tobacco companies roamed the globe, there were tribes of natives of the Americas in which males smoked tobacco frequently every day.²³ Well before the blandishments of modern advertising, large numbers of Turks engaged in the then-illicit behavior of smoking, risking death to do so (as described in the next section).³

The point is a simple but essential one: smoking is not simply the result of an evil and seemingly all-powerful industry, but its extent is clearly influenced by that industry. Without major companies with enormous market power, without advertising and promotion, smoking would lose much of its glamour and with it, many of its adherents. Research can estimate how much advertising expands the market.²⁴ This exemplifies the kind of contribution that research can make toward understanding the determinants of smoking, and the potential impacts of policies intended to discourage it. But the reality that widespread addiction to tobacco predates “Big Tobacco” should serve as a sobering reminder that the demise of the industry, were that possible, would not produce “the” solution to the devastating diseases wrought by tobacco. That solution—if it exists—lies in fundamental change in social norms resulting, in no small part, from the adoption and implementation of a constellation of effective tobacco control policies.

EARLY TOBACCO CONTROL POLICY

To provide context for this chapter’s consideration of contemporary policy, it is instructive to briefly contemplate the history of tobacco control policy. Inherently interesting, that history offers insights on the nature and effectiveness of policy, and also indicates limits on the ability of policy to define how a society employs tobacco. Unless otherwise noted, this section relies on material presented in Goodman,²³ Wagner,²⁵ and the 1992 Surgeon General’s report on smoking and health.²⁶ Readers interested in the history of tobacco use and policy are advised to consult these and other excellent histories (for example, Kluger²⁷).

The very earliest history of tobacco use—and control over it—is unrecorded. We know that natives of the Americas were using tobacco hundreds and even thousands of years ago, and for a remarkable diversity of purposes. Natives consumed tobacco by smoking it, chewing tobacco leaves, drinking tobacco liquid, employing it as a suppository, and rubbing it on abraded skin. Tobacco was used to invoke the spirit world, heal the sick, predict a good growing season, seal treaties, ensure fertility, suppress hunger, dull the pain of toothaches, strengthen warriors, forecast the weather, and share friendship. The amount and purpose of tobacco consumption varied dramatically from one tribe to another. In many tribes, all but the shaman were proscribed from using tobacco. The shaman employed tobacco in his role as chief healer and spiritual leader. In other tribes, men smoked tobacco daily for purposes ranging from appetite suppression to social conviviality. The great variation in use across the tribes illustrates the crucial role of social control in defining the nature and extent of tobacco consumption.

The history of tobacco outside of the Americas, as well as the history of tobacco policy, begins with the importation of tobacco from the Americas to Europe in the sixteenth century. Tobacco's popularity burgeoned in many countries, often despite official discouragement and, in many quarters, social disapprobation. Toward the end of the century, Sultan Murad IV of Turkey became, in a literal sense, the first person to prove that smoking was hazardous to health, declaring its sale or use in public punishable by death.³ The fact that smoking persisted in Turkey, despite this rather draconian tobacco control policy, illustrates the attraction, and the unrelenting grip, of tobacco on its users.

A few years later, in 1604, King James I of England pronounced his disgust with the new practice of smoking, labeling it, "a custom loathsome to the eye, hateful to the nose, harmful to the brain, dangerous to the lungs, and in the black, stinking fume thereof, nearest resembling the horrible Stygian smoke of the pit that is bottomless."²⁸ The King imposed a 400% tariff on tobacco, but the tax reportedly had little impact on consumption, largely because tobacco was then used primarily by the affluent. According to some scholars, the revenues generated by the tax converted King James from an opponent to a supporter of tobacco. By 1614, some 7,000 establishments sold tobacco in London alone.

Back in the "New World," officials in New Haven, Connecticut, imposed a sixpence fine on anyone caught smoking in public in 1646. The following year the Connecticut general court ruled smoking and chewing permissible if a citizen had a license from the court or a doctor's prescription. Over the next two centuries, tobacco's popularity spread dramatically despite constant opposition in some circles—primarily related to considerations of morality—and sporadic attempts to stop its use.

Later in this chapter we discuss the “grandparent” of all tobacco policy research: studies establishing that cigarette consumption varies inversely with price, which can be affected by tax. Predicated on research produced during the second half of the twentieth century, primarily since the 1980s, knowledge of this relationship can be gleaned from tax rate and revenue data from the Civil War era in the United States. These data demonstrate that tobacco consumption responded directly to price, and also that substitution among types of tobacco products resulted from differential taxation policies.

Short of the capital punishment approach to controlling tobacco use, attempted by Sultan Murad IV, the most restrictive policy is an outright ban on possession and use. Few such bans exist worldwide today (the Kingdom of Bhutan being the one notable exception). At present, however, most countries, and all of the U.S. states, ban possession, use, or purchase of tobacco by minors. Little appreciated are the precursors to these laws, which include prohibitions against use by children (for example, a New York State ban on public smoking by youth under 16) and a concerted movement to ban cigarette smoking altogether. An antismoking movement that emerged in the second half of the nineteenth century culminated in bans beginning at the turn of the twentieth century. In 1901, New Hampshire prohibited manufacture, sale, and smoking of cigarettes. By the end of the decade, a dozen more states prohibited or limited cigarette smoking, and many cities adopted ordinances on their own. Indeed, various forms of anticigarette legislation were adopted in every state except Louisiana and Wyoming.

The state bans were short-lived, with most rescinded by the end of the 1920s. Instructive is the response of the cigarette manufacturers to the bans, which generally applied specifically to manufactured cigarettes. Several companies sold the ingredients for roll-your-own cigarettes—tobacco and papers—since only “cigarettes” were banned. In states in which sale of cigarettes was banned, but not smoking per se, companies encouraged vendors to provide cigarettes for “free” when customers purchased matches to ignite them. Of course, illegal sales occurred, and cigarettes were smuggled from states in which they were legal to those where they were not.

The late 1800s and early 1900s also saw adoption of other tobacco control policies that have a contemporary ring to them. In 1897, the federal government prohibited the inclusion of coupons and cards in tobacco packs. A year later, the government doubled the cigarette tax from 50 cents to \$1 per thousand.

The essential message of this brief review of the history of tobacco control policy is that the circumstances that surround tobacco use today are not the exclusive product of contemporary times. The early history demonstrates the now-timeless characteristics of tobacco and tobacco control: the tenacious attraction of tobacco, the fact that controversy invariably has surrounded its use, the

idea that conditions of tobacco use can be affected by explicit policy measures, and the reality that ever-resourceful tobacco companies find creative ways to circumvent many of the policies intended to curtail cigarette consumption.

THE RELATIONSHIPS BETWEEN TOBACCO POLICY RESEARCH AND POLICY PRACTICE

At the beginning of this chapter, we described the terrain of tobacco control policy and policy research as vast and intellectually diverse. The borders of that terrain are not always clear. Certainly, some of the most policy-influential research ever produced has been the basic epidemiology that established smoking is a cause of disease. As described later, the Federal Trade Commission and the U.S. Congress kicked into policy action immediately following publication of the first Surgeon General's report on smoking and health.²⁹ Relying on the science published to that point, that report definitively labeled smoking as a cause of lung cancer in men, and associated smoking with a wide variety of other diseases in both men and women. More recently, research linking involuntary smoke exposure to illness in both children and adults¹¹ has intensified the clean indoor air movement, particularly in its current incarnation in which communities and states are banning smoking entirely in all workplaces, including restaurants and bars.

Although the epidemiological research on the effects of smoking, both direct and involuntary, has been enormously influential in the genesis and adoption of policies, this review limits consideration to research directly motivated by concern with policy. Thus, the research reviewed here addresses the question of what a given policy option might be expected to accomplish, or it evaluates what that option, once implemented, has accomplished. It also considers analyses explicitly focused on forces facilitating or impeding policy adoption.

A critical issue for this review is whether, and how, research has influenced tobacco control policy in practice. In virtually all fields of research, it verges on the impossible to assess with any precision the overall contribution of the research enterprise to the domain of the practical world it attempts to inform. At the same time, it is often possible to attribute specific alterations in the real-world landscape to specific bodies of research. Tobacco policy research is typical in this regard. Because the research focuses so closely on an applied interest, however, one finds a more direct link between research and practice than one might attribute to, for example, basic scientific research.

The connections between research and policy are many and varied. As just noted, research not explicitly oriented toward policy nevertheless can have a profound impact on the policy environment ever after. Such was certainly the

case with the original epidemiological research linking smoking to lung cancer in the 1950s.³⁰⁻³⁴ Motivated exclusively by an interest in the cause of a chronic disease epidemic of unprecedented proportions, that work continues to serve as the foundation for the entire tobacco control movement.¹

Research that is more explicitly policy-oriented—the subject of this review—exhibits three very different substantive relationships to actual policy, each illustrated in detail in the pages that follow: (1) In some instances, research directly informs and transforms the policy environment, bringing new policies into being or blocking others from adoption or continuation. Health-motivated tobacco tax increases are likely the most important example. (2) In other instances, research supports policy actions that are already occurring, or that would have occurred even in the absence of the research. In such cases, the research may serve to rationalize the policy adoption; proponents may use it in their advocacy efforts. Research on the health effects of involuntary smoke exposure and on the impact of tobacco advertising bans serve as examples. (3) Finally, research results may have little or no influence on policy. Motivated by considerations other than those addressed in the research, policy may end up diametrically opposed to that which the research would recommend. Research on the effects of school tobacco-health-education programs exemplifies this situation, as does the limited body of work on the effects of youth possession, use, and purchases (PUP) laws.

Clearly, the relationship between research and policy can “migrate” over time. An example from another field closely related to tobacco illustrates this point perfectly. For years, dozens of studies on the impact of the nation’s multimillion dollar per year Drug Abuse Resistance Education (DARE) program for young children consistently demonstrated no impact on children’s drug using behavior.³⁵ The officials who ran the program ignored the evidence. Recently, the program’s administrators finally admitted that, as then constituted, the program was a failure. They announced a major revamping of the effort to take advantage of the science. They have developed new curriculum and extended it to reach middle school and high school students.³⁶

Time itself is another dimension of the research–policy relationship worthy of mention. Sometimes research completely precedes policy adoption, an instance in which science has a greater opportunity to influence policy outcomes. On other occasions, research (often in the form of evaluation studies) follows policy implementation with the objective of informing future decisions about the continuation or precise nature of an existing policy. With relatively few exceptions, most tobacco policy research follows the implementation of policies, but often with the intent of producing early evaluations that can guide subsequent policy debates in other jurisdictions. Recent work on the effects of smoking bans on restaurant and bar revenues and tourism more generally illus-

trates this case vividly. A few communities adopted complete bans, initially just in restaurants. Restaurateurs and others in the hospitality industry argued vigorously that such bans would damage business in the communities in which they were adopted, causing people to take their dollars to communities with less draconian restrictions on smoking. Researchers set out to determine whether the fears were warranted. Drawing on the sales experience of establishments in the ban communities compared with similar communities without bans, their research found no deleterious effect of the ban, and sometimes found a salutary boost in revenues. This research, described below, is cited regularly in contemporary debates on the wisdom of adopting a ban on smoking in restaurants and bars at both the town and state level. Since the early research was published, scores of communities and several states have adopted complete bans, with no let up in sight.

CONTEMPORARY TOBACCO CONTROL POLICY: A TYPOLOGY

To provide structure to a review of tobacco policy research, it is helpful to organize policies by type. In the first consideration of tobacco control policies in the long history of Surgeon General's reports, the 1989 report¹ relied on a policy classification scheme first proposed by Walsh and Gordon.³⁷ That scheme classified tobacco policies as falling into three categories: (1) education and efforts to inform or persuade, (2) economic incentives, and (3) direct restraints on product use, manufacture, or sale, typically constituted as laws or regulations. In 1990, Warner and colleagues³⁸ modified this simple typology as seen in Figure 1.2. This more complicated typology recognizes that a given policy may fall into one category from the perspective of the tobacco consumer (the end user) and a different category from the perspective of the producer or seller of the product (or yet another institution upon which the policy is imposed). For example, health warning labels on cigarette packs represent a legal requirement for manufacturers. From the perspective of a smoker, however, the labels represent information intended to educate or persuade the individual not to smoke.

Whether a policy is viewed as education, incentive, or regulation often depends on idiosyncratic characteristics of the policy or the debate that surrounds its adoption. For example, the just-mentioned health warnings are likely viewed nearly universally as efforts to educate or persuade smokers to quit. The ban on broadcast advertising of cigarette ads, adopted in the Public Health Cigarette Smoking Act of 1969, is probably considered primarily as a law restricting the behavior of cigarette companies and broadcasters. Yet in both cases, federal laws imposed requirements on manufacturers, and in both cases the motivation was to influence consumers' and potential consumers'

Figure 1.2. A Policy Typology.

	End User		
	Information/Persuasion	Economic incentive	Law/Regulation
Direct	<ul style="list-style-type: none">• Government-financed anti-smoking media campaign not mandated by law		<ul style="list-style-type: none">• Minimum age of possession• Complete ban on use• A school or school system's voluntarily requiring health education on smoking• <i>Homeowners banning smoking in their homes</i>• <i>Companies banning smoking in the workplace</i>
Indirect	Information/ Persuasion		
	Economic incentive	<ul style="list-style-type: none">• Farm subsidies/price supports• <i>Litigation with effect of raising tobacco product prices (for example, due to industry payments as part of a settlement)</i>	
	Law/ Regulation	<ul style="list-style-type: none">• Warning labels (packages; ads)• Other packaging and labeling standards (for example, plain packaging)• Disclosure of product constituents• Regulatory agency requirement on companies to take remedial action for past deceptions• FDA or FTC regulation (with regard to information)	

Note: Italicized entries are policies of nongovernmental organizations (for example, a business firm's decision—not required by law—to ban smoking in its workplace).

End User

	Information/Persuasion	Economic incentive	Law/Regulation
Information/ Persuasion	<ul style="list-style-type: none"> • <i>Voluntarily broadcast public service announcements</i> • <i>Government-issued clinical practice guidelines to physicians on cessation treatment</i> 	<ul style="list-style-type: none"> • <i>Coverage of NRT by MCOs encouraged by report cards</i> 	
Economic incentive			
Law/ Regulation	<ul style="list-style-type: none"> • Ad ban • Mandated counter-advertising (for example, Fairness Doctrine ads 1967–1970) • Government tobacco control programs (can be reg. effect on end user) 	<ul style="list-style-type: none"> • Insurance premiums • Required coverage of NRT by MCOs 	<ul style="list-style-type: none"> • Mandated school health education on smoking • Clean indoor air laws at all levels, local through federal • Legal workplace restrictions

Indirect
Other Intermediary

Note: Italicized entries are policies of nongovernmental organizations (for example, a business firm's decision—not required by law—to ban smoking in its workplace).

views of the desirability of smoking. Thus, one point of the more complicated typology presented in the figure is to demonstrate the multiple dimensions and mechanisms of many policies.

The typology demonstrates several additional features of tobacco control policy. First, there are many policies of each of the three types. As the balance of the entries in the figure suggests, from the perspective of the end user policies are (roughly) evenly divided among information/persuasion, economic incentives, and laws and regulations. From the perspective of the supply side, however, the largest number of policies represents legal or regulatory requirements imposed on institutions.

Second, relatively few policies are imposed directly on tobacco users (or prospective users). That is, to become a policy, most measures are imposed by an agency of government (local, state, or national) on some institution involved in tobacco production, distribution, or sale (the tobacco supply chain) or on another institution given responsibility for effecting a tobacco control policy (for example, a business required to ban smoking on its premises). There are exceptions to this rule. If a government voluntarily chooses to spend money on an antismoking media campaign, the resultant campaign is categorized as a direct attempt to inform or influence the public. There is no mandate for the government to spend its resources in this way, and the vehicle for getting the antismoking message to consumers—the media—faces no special incentive or requirement to facilitate the information transfer. They are simply selling advertising space or time as they would for any other product or service. Similarly, school health education is found twice in the typology, once under Direct, Law/Regulation from the perspective of the end user; and once under Indirect, Other Intermediary, Law/Regulation (also Law/Regulation from the end user's viewpoint). The latter represents the case of a mandated program in which all schools must participate (hence Law/Regulation from the school's perspective). The former results from a school's voluntarily offering health education on smoking.

This specific example illustrates another feature of the typology: there is a significant degree of arbitrariness as to how certain policies are classified. From the perspective of the end user—the student—a required health education class might be considered either Information/Persuasion, or Law/Regulation, or both for that matter. Law/Regulation reflects the fact that the class is a mandatory component of the student's curriculum. Readers should appreciate, therefore, that the occasionally arbitrary quality of placement of policies within the typology may mean that they will disagree with certain policies' classifications. The essential point of the typology is to appreciate the dimensions of tobacco control policies, with the specific classifications being far less important.

Implicit in the schema is an index of the degree of coercion associated with the three policy types. In concept, the least coercive policies are those designed to inform or persuade. Most coercive are laws and regulations, requirements

as to what must be done (or not done). Economic incentives fall in between: imposition of a cigarette excise tax imposes a genuine burden on the smoker, but that burden is accepted “voluntarily.” In contrast, the obligation imposed by a law or regulation is not accepted (or rejected) voluntarily. In practice, however, some economic incentives may prove to be far more coercive than some laws. In a few countries (and in New York City), cigarettes now cost \$6–8 per pack, the result of substantial excise taxes. A smoker, especially a poor one, may well view this as a highly coercive policy measure. In contrast, a law requiring a very modest smoking component of a school health education curriculum may not be considered especially coercive by school systems that have already implemented comprehensive health education programs, nor by students required to sit through a class or two on the dangers of smoking.

Tobacco control policies can be and are implemented by any number of nongovernmental organizations, and even by individuals, as well by units of government. This is illustrated in Figure 1.2 by the italicized entries. For example, under Direct, Law/Regulation (the upper righthand corner), there are two entries referring, respectively, to individual and nongovernmental organization policies. Many homeowners explicitly forbid cigarette smoking within their homes. This is their personal policy (one that appears to facilitate quitting among residents who are smokers at the time the policy is adopted³⁹). Similarly, many business firms impose a ban on smoking in their workplace in the absence of a legal mandate to do so. This is a company policy, presumably with sanctions for noncompliant workers. Legally required workplace bans, now in force in many governmental jurisdictions, are found in the lower righthand corner under Indirect, Other Intermediary, Law/Regulation. In this case, a unit of government has decreed a ban on smoking in the workplace within a given jurisdiction. The legal obligation rests with the affected businesses, but workers in those businesses must comply as well. Thus Law/Regulation applies both to the organization on which the law is imposed and the employee of that organization. Unless otherwise specified, this review will focus exclusively on official governmental policies.

The next three sections of this chapter are organized according to policy type as perceived by the end user, the tobacco consumer, or the potential consumer. We begin with policies intended to inform or persuade people to avoid smoking, an area in which there is limited research, with the exception of the impact of counteradvertising and bans on advertising and promotion. We turn then to economic incentives. The oldest and strongest tradition of tobacco policy research derives from the work of economists examining the effects of cigarette tax and price on smoking behavior. Finally, we cover laws and regulations, the domain of the most extensive and intensive recent tobacco policy research.

Given the breadth and variety of tobacco control policies, no single chapter can hope to cover all policies in depth. Rather, this review necessarily will focus

on policies commonly viewed as important and for which there is a significant body of relevant research. We will conclude by noting a few additional areas of policy, simply to portray the full range of tobacco policy research. Topics omitted from the review include the following:

- Except in instances in which there is a direct link to a policy issue under consideration, the review will not cover certain subjects with varying degrees of policy relevance, such as analyses of the health care costs of smoking,¹² messages conveyed to smokers by cigarette pack design,⁴⁰ and recent attempts by the tobacco industry to target young adults.⁴¹⁻⁴³
- The review omits a number of policy issues that, while possibly important, have been the subject of relatively little formal analytical research. A notable example is the state-level clean indoor air preemption law, a law that ostensibly protects nonsmokers while often actually protecting the tobacco industry. It achieves the latter by imposing weak restrictions on indoor smoking while prohibiting lower levels of government (counties and municipalities) from adopting more stringent laws of their own.^{44,45}
- The chapter does not consider the more philosophical or reflective debates about tobacco control policy that have captured the time and attention of the tobacco control community on more than one occasion. One example is the sometimes fractious debate about the wisdom of developing a distinct youth-oriented emphasis in tobacco control.⁴⁶ Another is the constantly fractious debate about how the tobacco control community should respond to the so-called “global settlement” concerning lawsuits against the tobacco industry.⁴⁷⁻⁴⁹
- Despite the growing importance of international tobacco control, reflected in the World Health Assembly’s recent adoption of the Framework Convention on Tobacco Control,⁵⁰ this chapter focuses exclusively on domestic tobacco policy issues and draws primarily on research by American scholars.

One more exclusion from this chapter’s presentation deserves special mention. Litigation, especially lawsuits against the tobacco companies brought by governmental entities (especially the states), is increasingly included in discussions of tobacco control policy even though it is not itself a policy. Litigation has achieved certain tobacco control policy goals that have not thus far been attainable through conventional policy channels. The 1998 Master Settlement Agreement (MSA) between the states and the tobacco industry⁵¹—settling the states’ claims against the industry for excess Medicaid expenditures—contained provisions of a public health policy character. These included the end to a number of industry marketing techniques aimed at (or at least reaching) children,

including sporting events advertising, distribution of brand-labeled “gear,” and billboard advertising. As well, a major impact of the settlement was to increase the price of cigarettes by 45 cents, the result of payments to the states totaling \$206 billion over a 25-year period. A few researchers have evaluated diverse impacts of the MSA.⁵²⁻⁵⁹ At present, interest is also focused on a Justice Department lawsuit against the tobacco industry.⁶⁰

Whether or not one views litigation as a desirable “end run” around the policy system is a philosophical as well as pragmatic matter.⁶¹⁻⁶⁴ But the fact remains that litigation increasingly influences the tobacco control environment and indeed creates much of it.

POLICIES INTENDED TO INFORM OR PERSUADE

Publication of Surgeon Generals’ Reports

Students of tobacco and health consider publication of the landmark Surgeon General’s report of 1964²⁹ the beginning of the national antismoking campaign.⁶⁵ Subsequent to that report, the Public Health Service has published over two dozen Surgeon General’s reports, all but one focusing on cigarette smoking. (A 1986 report addressed the hazards associated with smokeless tobacco.⁶⁶) After the success of the first report, Congress mandated publication of the reports in the ensuing years. As such, the reports are themselves an outcome of federal policy.

There appears to be a widespread and long-standing consensus that the reports, and publicity surrounding their release, have had an important impact on informing the public about the dangers of smoking, thereby contributing to the sea change in smoking attitudes and behavior over the past four decades. With one exception, however, there is no empirical evidence on the attitudinal or behavioral impacts of the reports *per se*. The exception is a series of studies that, treating the year 1964 as a dummy variable in regression analyses, concluded that the highly publicized release of the first report on January 11 depressed adult per capita cigarette consumption that year. Warner^{65,67,68} and Schneider and colleagues⁶⁹ placed the magnitude of the decrease attributable to report publicity at approximately 5%. Per capita consumption actually fell nearly 15% during the first three months after the report’s issuance, but relapses by smokers who had quit mitigated that decline the rest of the year. Per capita consumption had been rising steadily, without interruption, throughout the preceding decade. (See Figure 1.3.) The drop in 1964 constituted the turning point in United States cigarette consumption, with 1963 per capita consumption representing the high-water mark for smoking. (Adult per capita cigarette consumption, defined as total cigarette consumption divided by the population over age 17, was 4,286 in 1963 and

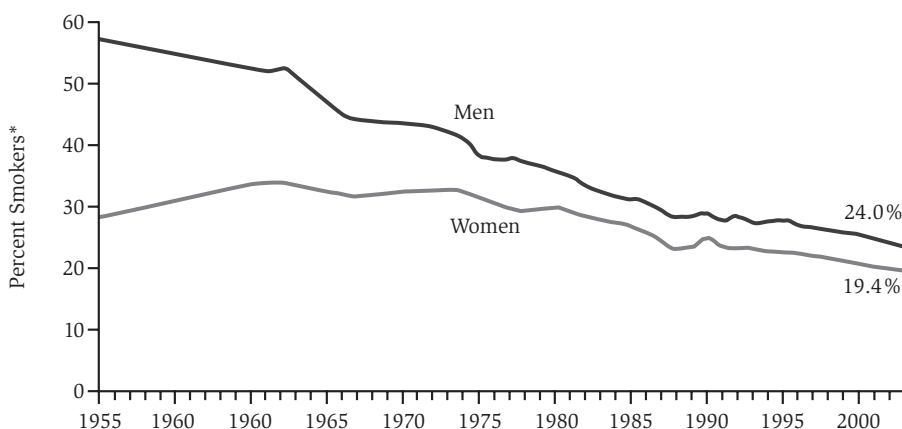
Figure 1.3. Adult Per Capita Cigarette Consumption and Major Smoking-Control Events, U.S., 1900–2001



Source: U.S. Department of Agriculture

fell to 4,143 in 1964. With a few exceptions, it has fallen annually since then, dropping to less than 2,000 at present.)

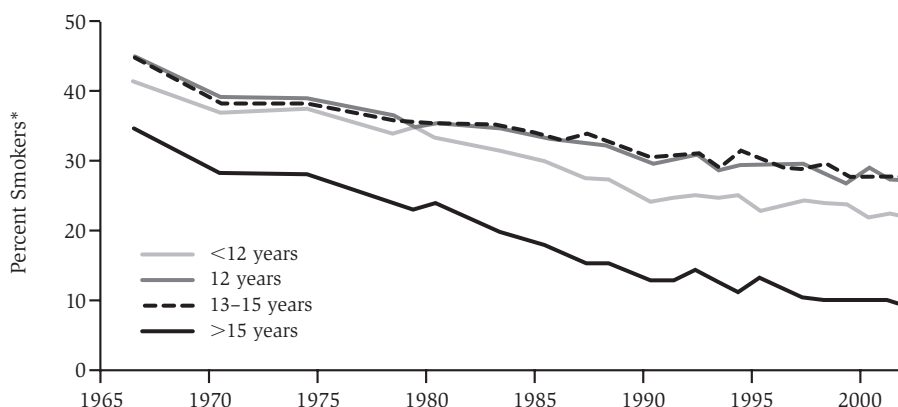
In general, there is little sound empirical evidence on the impact of tobacco and health education and information *per se*. As is discussed below, a few forms of information transmission have been studied, most notably including media counteradvertising campaigns. But measuring actual education and information transmission poses an enormous challenge. Consider the aftermath of the first Surgeon General's report. Information was transmitted through news coverage of the report's findings in the weeks after its release,¹ information campaigns mounted by the major health voluntary agencies, such as the American Cancer Society, increasing attention paid to smoking in school health education, and, in 1966 the first warning labels on cigarettes. Measuring "information" conveyed to the public in any single metric appears impossible. At the same time, the upward trend in smoking ceased, abruptly and permanently. In relatively short order, smoking prevalence began to fall, primarily among men at first, especially among the most highly educated. (See Figures 1.4 and 1.5.) Logically, there seems to be little room for doubt that information transmission played a significant and likely substantial role in altering, in order, knowledge about, attitudes toward, and behavior regarding smoking, especially among the more educated members of society. Information transmission was the workhorse of the antismoking campaign during its first phase, roughly corresponding to the decade follow-

Figure 1.4. Adult Smoking Prevalence by Gender, U.S., 1955–2003.

*Before 1992, current smokers were defined as persons having smoked ≥ 100 cigarettes and who currently smoked. Since 1992, current smokers were defined as persons having smoked ≥ 100 cigarettes during their lifetime and who reported now smoking every day or some days. 2003 estimate is for January–June. Adults are defined as age ≥ 18 years.

Source: 1955 Current Population Survey; 1965–2003 National Health Interview Surveys

ing publication of the first Surgeon General's report. A creative and sound assessment of the role of information transmission, segmented into its component parts, would represent an enormous contribution to policy science.

Figure 1.5. Adult Smoking Prevalence by Educational Attainment, U.S., 1965–2002.

*Before 1992, current smokers were defined as persons having smoked ≥ 100 cigarettes and who currently smoked. Since 1992, current smokers were defined as persons having smoked ≥ 100 cigarettes during their lifetime and who reported now smoking every day or some days. 2003 estimate is for January–June. Adults are defined as age ≥ 18 years.

Source: Various National Health Surveys by National Center for Health Statistics from 1965 to 2002

Warning Labels

One of the first formal tobacco control policies was the requirement that cigarette packs bear a warning label. Almost immediately after the Surgeon General's report release, the Federal Trade Commission (FTC) proposed warning labels for cigarette packs and advertisements. After a comment period, the FTC issued a final rule, with warning labels required in place by the following year, 1965. The FTC's action was preempted by Congress's passage of the Federal Cigarette Labeling and Advertising Act of 1965. That act required a warning label on cigarette packs but not on ads, with the wording toned down compared to that suggested by the FTC. The first label, reading "Caution: Cigarette Smoking May Be Hazardous to Your Health," appeared on packs in 1966.

Required by the act to report to Congress on the effectiveness of the label, the FTC recommended a substantially strengthened label in 1967, one that would have explicitly mentioned diseases that smoking could cause. Again, the FTC recommendation was preempted by a new congressional law, the aforementioned Public Health Cigarette Smoking Act of 1969. This act strengthened the label, but not to the extent advocated by the FTC. An FTC consent order in 1972 extended the warning label to cigarette ads.

In 1981 the FTC issued a staff report to Congress⁷⁰ that concluded that the warning label was no longer effective as a result of overexposure and its failure to convey disease-specific information. The FTC recommended changing the format of the warning (to a circle-and-arrow format), increasing the size of the warning, and replacing it with rotating, disease-specific warnings. In 1984, the Comprehensive Smoking Education Act introduced rotating warning labels, with four specific warnings, but did not change the format. Three rotating labels were placed on smokeless tobacco products as the result of the Comprehensive Smokeless Tobacco Health Education Act of 1986. Somewhat ironically, these warning labels did employ the circle-and-arrow format.¹

Evidence on the effectiveness of cigarette warning labels is very limited. In the early days of the labels, when they were novel, they may have drawn more attention from smokers than they do today. With regard to cigarette pack warnings, their small size, location (on the sides of packs, rather than the front or back), uninteresting style (basic lettering on a contrasting background, within a framed rectangle), and sheer familiarity appear to make them of little utility in increasing consumer knowledge of the dangers of smoking.⁷¹ Much the same held for cigarette ads; on billboards (where cigarette ads no longer appear), the tiny lettering permitted made the warnings virtually unreadable from a passing automobile. Studies by the FTC and others^{1,72} have found little reason to believe that the warnings are serving their espoused purpose. Ironically, the labels have served to protect the cigarette manufacturers in many lawsuits, since they could argue that since 1966 smokers and potential smokers

were adequately warned, and they have spared the industry from the expense and possible loss of business that might have resulted from state regulations on cigarette labeling or advertising. The federal laws have explicitly preempted state regulation of cigarette advertising based on health concerns.¹

Until recently, it seems fair to say that interest in labeling as a mechanism of effectively educating consumers had largely evaporated. Interest has reemerged, however, as a result of bold new labels, far larger and more graphic, on cigarette packs in Canada, Brazil, Australia, New Zealand, and Poland. Cigarette packs in these countries now bear warning labels that occupy up to half the space of both the front and back of packs, with graphic pictures depicting diseased lungs, limp cigarettes (associated with a warning about impotence), and so on. Evidence suggests that smokers take note of the labels and are disturbed by them; many claim that they will quit smoking as a result.⁷³⁻⁷⁵ One recent study found that smokers who pay attention to the new graphic labels do have a higher probability of quitting, although the increase is modest (OR 1.07).⁷⁵

Historically, warning labels have represented the principal (often only) method by which cigarette manufacturers have communicated the dangers of their products to their consumers, and one of governments' principal approaches as well. Manufacturers have appealed to warning labels in court as a defense against product liability charges, claiming that consumers have been adequately informed of the dangers for years. In a provocative new essay, Chapman and Liberman⁷⁶ evaluate not only how poorly the industry has performed in informing consumers, but how they could go beyond warning labels to do a far better job. They go so far as to suggest the possibility of a system of licensing smokers based on their adequate appreciation of the dangers posed by smoking.

Ad Bans

One set of information/persuasion policies is intended to make consumers better informed about the consequences of smoking by *restricting* their access to information, specifically pro-tobacco content provided by tobacco product manufacturers. Tobacco control proponents seek bans on advertising and other promotional techniques in the belief that these marketing methods entice children to try tobacco and maintain adult smoking by distorting smokers' understanding of the true consequences of smoking. As is discussed below, research findings are mixed on these hypothesized direct impacts of tobacco marketing, with a preponderance of the research supporting the proposition that advertising does increase the market for tobacco products. From the perspective of the end user in the Figure 1.2 typology, banning advertising and promotion is best viewed as an Information/Persuasion policy intervention.

There is one, albeit indirect, mechanism by which a ban on tobacco advertising could increase consumers' access to accurate information on the health

consequences of smoking. One analysis demonstrated that magazines that do not receive cigarette ad revenues have been 40% more likely to cover the dangers of smoking than magazines that do receive cigarette ad revenues. This study controlled for the magazines' propensity to provide coverage of health issues in general.⁷⁷ Dollar for dollar, the effect was far more substantial for women's magazines, with those not receiving cigarette ad revenues fully 230% more likely to discuss the risks of smoking.

This research suggests that a ban on advertising would increase the flow of information on, and consequently knowledge about, the health consequences of tobacco use. One might respond that, today, all Americans possess a strong understanding of those consequences. The evidence is to the contrary. While the vast majority of Americans recognize that smoking causes lung cancer and heart disease, most do not appreciate many of the subtle yet deadly effects of smoking.¹⁰ Further, they do not appreciate the extent of the risk posed by smoking in general⁷⁸ and by smoking low tar and nicotine (t/n) cigarettes in particular. Smokers of low t/n or "light" cigarettes believe that they are subjected to less risk than smokers of "full-strength" cigarettes.⁷⁹ Yet the evidence shows that the risks are essentially comparable, the result of nicotine regulation or compensation (low t/n smokers' tendency to find means of extracting more nicotine from their cigarettes).⁷⁹ These means include drawing harder on the cigarette, puffing more frequently, blocking air vents on the filter tip designed to dilute t/n delivery, and simply smoking more cigarettes. One consequence of these adaptive behaviors has been the discovery of new lung cancers further down inside the lung.⁸⁰

The importance of public education on the hazards of smoking was effectively illustrated by a 2001 survey of American women's knowledge of risks to their health produced by the American Legacy Foundation. When asked to identify the leading cause of cancer death in women, fully 80% answered breast cancer. Only a small minority appreciated that lung cancer kills more women than breast cancer.⁸¹ Lung cancer surpassed breast cancer as the leading cancer killer among women in the mid-1980s, nearly two decades ago. Today, lung cancer kills two-thirds more women than does breast cancer.⁸² Women's magazines' silence on the dangers of smoking,^{77,83} until recently, is likely responsible for at least a portion of this remarkable degree of ignorance.

Whether cigarette advertising directly increases cigarette consumption, among children specifically and among the population as a whole, has been the subject of numerous research studies. Much of the correlational evidence seems compelling. Researchers have demonstrated that cigarette advertising campaigns target, and effectively reach, children,⁸⁴⁻⁸⁶ even very young children,⁸⁷ and that smoking among females has increased specifically when marketing campaigns targeted women.⁸⁸ Methods employed in this body of research vary

widely, from focus group studies of children's responses to ads, to econometric analyses of the relationship between aggregate spending on cigarette advertising and cigarette consumption. Collectively, the combination of the empirical and logical evidence creates a strong presumption that the relationship between advertising and consumption is causal and significant, if not necessarily substantial.^{1,89} To date, however, this body of research has yet to definitively indict or clear advertising as a major cause of smoking, either of its initiation (by children) or maintenance (among adults). In this respect, this literature is less useful to policy makers than is that pertaining to such policy interventions as cigarette taxation, bans on smoking in public places, and enforcement of sales-to-minors laws (discussed below). In large part, the lack of a research "smoking gun" reflects the innate difficulty, perhaps even impossibility, of the task, for a wide variety of reasons, including the following:

- While research can establish a link between children's interest in cigarette advertising or promotional items and their current or future propensity to smoke,^{17,90-96} these studies are unable to evaluate the potential endogeneity between an interest in smoking and the behavior itself.
- The quantity of advertising is difficult to measure, both conceptually and quantitatively, thus hampering empirical studies. The conventional approach, measuring advertising expenditures, assumes a degree of homogeneity across advertising modes (and indeed among ads of a single type) and over time that may not be warranted.⁹⁷
- Little existing theory clarifies whether one should investigate contemporaneous advertising or past advertising (or both). Does the stock of past advertising matter? If so, how?⁴
- There is no effective mechanism for disentangling the multiple pathways through which advertising might influence consumption. Directly, there are at least four such pathways: (1) enticing children to experiment with and initiate smoking; (2) reducing smokers' readiness to quit; (3) increasing smokers' daily consumption by serving as a cue to smoke; and (4) inducing former smokers to relapse. Indirectly, advertising can (1) discourage media dependent on cigarette ad revenues from discussing the dangers of smoking, as noted above; (2) create a social environment that enhances the social acceptability of smoking, or reduces its unacceptability; and (3) create a political constituency for tobacco among institutions receiving tobacco industry ad or promotional revenues that opposes the development of tobacco control policies.^{1,89} Note that it is not necessary to separate these mechanisms to evaluate the overall impact of advertising, but it is essential to do so if one

wishes to understand the nature of the relationship between advertising and consumption.

- Properly controlling for potentially confounding factors in the “busy” world of tobacco control poses a distinct challenge. This may be especially true in the case of counteradvertising and industry advertising responses to it.
- By its nature, regression analysis of aggregate data uncovers marginal impacts, while the true variable of interest here is likely the entirety of advertising expenditure. For a variety of reasons, impacts on the margin may be expected to be small to nonexistent, while the presence or absence of all advertising might have a significant effect.²⁴

Certainly one of the most compelling reasons to ban tobacco advertising and promotion is the widespread belief that these marketing techniques seduce young people into lives of nicotine addiction. Years ago, researchers demonstrated that the Joe Camel cartoon character was as familiar to 6-year-olds as Mickey Mouse.⁸⁷ The Old Joe ad campaign succeeded in reversing fortunes for the Camel brand, converting it from a brand smoked almost exclusively by elderly males (unfiltered) to one of the top brands smoked by kids. The industry response to charges that campaigns like this one entice kids to smoke is that these are kids who would have smoked anyway, for other (nonadvertising-related) reasons.⁹⁸ This does not explain children’s preference for the most heavily advertised brands.

In more recent years, numerous studies have examined children’s recognition of and interest in cigarette ads and promotional items and their current or subsequent plans to experiment with smoking. Strong positive correlations have been found consistently.⁹⁰⁻⁹⁶ Despite trying to control for several potentially confounding social and personality variables, however, these studies cannot exclude the possibility of endogeneity or reverse causality: interest in smoking itself, whether conscious or not, could generate interest in ads and promotional items. Reviewing the entirety of the evidence, however, Lovato and colleagues⁹⁹ concluded that it was persuasive based on the strength of the association, the consistency of findings across studies, the temporal relationship between exposure and later smoking behavior, and theoretical plausibility.

Only one econometric study, published over two decades ago, has examined the relationship between advertising exposures and youths’ propensity to smoke. That study concluded that televised cigarette advertising, now illegal, had increased smoking among children.¹⁰⁰

Most of the econometric literature on the effectiveness of cigarette advertising has focused on adult smoking, or overall consumption. This is literature with a long tradition, dating back to the work of Schmalensee¹⁰¹ over three decades ago. Research findings have been decidedly mixed, ranging from a siz-

able number of studies that have found no evidence of a significant relationship between aggregate advertising expenditure and aggregate cigarette consumption, to a comparable number that have found a statistically significant, but typically small, relationship.⁴ The complexity involved in these analyses, and the mixed results, has led different reviewers of the literature to reach opposite conclusions regarding the bottom line. Andrews and Franke¹⁰² interpreted the literature as supporting a significant but small relationship, while Duffy¹⁰³ read it as implying no significant relationship.

For reasons given previously, the nature of regression analysis findings may miss the essential question: Does advertising as a whole influence smoking? More instructive therefore, and more to the point, is a large group of studies asking whether bans on cigarette advertising—partial or total—reduce consumption. Within the United States, interest has focused on the banning of cigarette advertising on the broadcast media, which took effect in 1971. Until recently, this was the only significant restriction on cigarette advertising. Now cigarette ads have been removed from billboards and, ostensibly, from magazines with large youth readerships, the result of the 1998 Master Settlement Agreement between the states and the tobacco industry. In the immediate aftermath of the settlement, however, the industry actually increased its advertising spending in magazines with youth readerships, although it subsequently reduced such spending in response to public pressure.^{104,105} Further, it increased point-of-purchase advertising substantially, quite possibly in response to the loss of billboards as a venue for advertising.¹⁰⁶

Most of the studies on the broadcast-ad ban found no effect on smoking.⁴ However, analyzing that question—especially in the early years of the ban—confronted a unique challenge: the ad ban eliminated the need for broadcasters to donate time to antismoking counteradvertising messages, required under the Federal Communication Commission's Fairness Doctrine.¹⁰⁷ Several studies (discussed below) had found that the counterads were more effective in reducing smoking than the pro-smoking ads were in increasing it, a phenomenon quite possibly attributable to the novelty of the former and familiarity with the latter. As a consequence, both Hamilton¹⁰⁸ and Warner¹⁰⁷ posited that, on balance, the broadcast-ad ban actually increased smoking by virtue of eliminating the highly effective counterads. Schneider and colleagues⁶⁹ supported this view, concluding that the ad ban was associated with a 5% increase in per capita tobacco consumption, attributable in part to a price reduction associated with lower costs in an era in which TV advertising was not permitted.

Analysis of various broadcast-ad bans in the United Kingdom,^{109,110} Australia,^{111,112} Finland,¹¹³ and Spain¹¹⁴ produced mixed findings, with a general conclusion that the bans reduced smoking in the short run but had little long-run impact. A series of cross-country studies, examining the relationship between cigarette demand and various restrictions and bans, also produced

mixed results. Hamilton¹¹⁵ found no evidence of an impact in 11 countries studied for the period 1948–1973, years when, it should be noted, there were few major restrictions on advertising. Cox and Smith¹¹⁶ addressed the relative impact of legislative versus voluntary strategies to reduce smoking in 15 Organisation for Economic Co-operation and Development (OECD) countries and found demand more responsive to legislative approaches; advertising restrictions tended to represent a legislative approach. In a prominent study in 1991, Laugesen and Meads¹¹⁷ developed an advertising restriction index varying from 0 for no restrictions to 10 for a complete ban on all forms of advertising and sponsorship. Pooling data from 22 OECD countries for 1960–1986, the authors concluded that cigarette consumption would be approximately 6% lower in countries with a complete ban than in one with no restrictions whatsoever. Complicating their conclusion was their finding of a positive relationship between bans and consumption during the first half of the period (for example, consumption rising when bans took effect), which they attributed to the industry's ability to substitute alternative forms of promotion when confronted with relatively weak restrictions. The anticipated, and overall, relationship emerged thereafter when, the authors concluded, the industry had fewer opportunities to substitute as restrictions became more stringent.

Stewart¹¹⁸ criticized the study by Laugesen and Meads, citing concerns about errors in variables for both the dependent and several independent variables, as well as the authors' failure to account for unmeasured country-specific variables. Laugesen and Meads¹¹⁹ claimed that the indicated corrections did not alter their fundamental conclusion; but they did not present revised findings in their response to Stewart. Stewart¹²⁰ himself undertook a study of 22 OECD countries from 1964–1990 and found a small but nonsignificant impact of a ban on televised advertising of cigarettes. His study failed to consider other forms of tobacco advertising and promotion, however, and did not permit adjustment for increasing restrictions over time.

Around the same time, a U.K. Department of Health report¹²¹ concluded that ad bans did lead to reductions in smoking, based in part on two then-new econometric studies of ad restrictions in Norway and Canada. This report had its critics as well, however.^{122,123} Most recently, Saffer¹²⁴ and Saffer and Chaloupka²⁴ have developed a sophisticated argument, derived from theory as well as empirical analysis of the experience of many countries. These authors have concluded that partial bans likely achieve little in that they permit the industry to substitute alternative forms of promotion. Complete bans, however, can be effective. Like Laugesen and Meads, Saffer and Chaloupka concluded that compared to no ban, a complete ban could reduce smoking by about 6%.

The complexity of achieving complete bans has been illustrated by experience in the United States in the present decade when, despite severe (although not complete) restrictions on advertising and promotion (due to the Master

Settlement Agreement, discussed below), the industry is spending record levels on advertising and promotion.¹²⁵ Several researchers have evaluated how the industry has restructured its marketing efforts in response to the new restrictions, and with what intent.¹²⁶⁻¹²⁸

An information/persuasion policy intervention from the perspective of consumers, an ad ban is clearly a legal/regulatory intervention from the point of view of both the Congress, which would have to legislate it into effect, and the industries affected (most directly, the tobacco and advertising industries and the media). One of the principal constraints on realization of an ad ban is the belief of many that constitutional protections for commercial free speech would make a ban illegal. This has been debated extensively since the notion of a comprehensive ad ban was first raised seriously in the 1980s.^{129,130} It is the one domain of tobacco control policy in which constitutional considerations figure centrally and hence one of the principal issues in which legal analyses play a major role in tobacco control policy analysis.

Based on the fairly extensive body of literature on the relationship between cigarette advertising and smoking (including much not reviewed here), one can conclude that advertising and promotion likely do affect cigarette consumption, and a comprehensive ban on all such marketing techniques could have a significant impact on smoking and its sequelae: illness, death, and social costs.¹³¹ Still, although the tobacco control community views legal cigarette advertising as the *bête noir* of tobacco policy, its abolition likely would not dramatically reduce cigarette smoking. A ban would appear to represent an important component of a comprehensive tobacco control program, one drawing on policies in each of the three domains of the policy typology in Figure 1.2. But it might well prove to be less of an answer than its advocates believe.

Counteradvertising

If an ad ban would represent restriction of information, antismoking counteradvertising, or social marketing, offers the opportunity to provide consumers with constructive information to compete with the tobacco industry's message and image. Counteradvertising has found its way onto the nation's airwaves through three methods: (1) PSAs (public service announcements) on the broadcast media (free airtime granted by broadcasters to public interest causes, including tobacco control); (2) mandated donated time from 1967 to 1970, the result of application of the Fairness Doctrine to the case of smoking;¹⁰⁷ and (3) paid airtime, bought just as ads are for conventional commercial products.

By their very nature, relying on PSAs to create an effective presence in the minds of television viewers and radio listeners cannot work. PSA airtime for all causes is scarce, and tobacco control is but one of innumerable competing worthy causes.

In contrast, tobacco counteradvertising flourished in the late 1960s during the era of the Fairness Doctrine antismoking ads (mid-1967 through 1970). The Federal Communications Commission (FCC) developed the Fairness Doctrine to create balance in discussions on the broadcast media of important, controversial social issues. The intent was to require broadcasters to donate airtime to alternative viewpoints when single views were expressed through paid airtime. The Doctrine was not originally conceived of as a mechanism to balance commercial speech. However, responding to a petition, the FCC agreed that smoking was a controversial subject and that, as such, broadcasters should be required to donate airtime to the antismoking cause, to balance the substantial time devoted to the promotion of smoking through cigarette ads.

During the first years of the application of the Fairness Doctrine to smoking, stations devoted no more than one minute of donated time for every 8–12 minutes of purchased cigarette advertising, with the latter concentrated in prime time and the former during off hours. Nonetheless, the antismoking messages—often amateurish—hit the mark: consumers noticed them and cigarette consumption declined. Dissatisfied with the limited exposure the counterads were receiving, however, the Commission notified broadcasters that they had to increase their presence. At its peak thereafter, the antismoking media campaign commanded one minute for every three minutes of cigarette ads. In today's dollars, the donated airtime was worth approximately \$350 million per year.¹⁰⁷

The counterad campaign came to an end on January 2, 1971, the date on which broadcast advertising of cigarettes was required to cease according to the Public Health Cigarette Smoking Act of 1969. With the demise of cigarette ads, the necessity of donated time to balance them had ended as well. Although bitterly opposed by the nation's broadcasters due to the revenue loss it implied, the 1969 legislation was quietly supported by the cigarette industry. They had come to believe that the antismoking ads were hurting sales more than their pro-smoking ads were boosting them, a conclusion supported in subsequent analysis by policy researchers.^{107,108} Indeed, Fritschler and Hoefler¹³² report that prior to passage of the act, the cigarette manufacturers had offered to voluntarily remove their ads from TV and radio in order to remove the need for the Fairness Doctrine ads. To do so, Congress would have had to grant the manufacturers an exemption from antitrust laws as the companies would have needed to collude to effect the removal of all ads. Congress balked at the antitrust exemption, but then granted the industry its wish by adopting the new law.

It remains debatable whether this major policy initiative represented a public health triumph, as it was widely hailed. It had, after all, removed all cigarette advertising from the broadcast airwaves. An alternative view is that it constituted a victory for the industry by virtue of putting an end to the highly effective antismoking messages. Per capita cigarette consumption fell all four years

of the Fairness Doctrine ads, the first time in the twentieth century it had fallen more than two consecutive years. Following the ad ban, and the demise of the Fairness Doctrine ads, however, per capita consumption rose three consecutive years. (It began to fall again, virtually every year, after 1973, corresponding to the era of emerging concern with nonsmokers' rights.) It seems logical—and has been supported by empirical analysis⁶⁹—that the loss of the combination of cigarette and antismoking ads hurt the antismoking cause in the short run. The impact over the longer run cannot be assessed, however. Certainly the success of the antismoking ads in the late 1960s reflected in part their novelty. One would have expected their effectiveness to erode over time as they became a familiar part of the landscape, much as cigarette ads themselves had.^{24,124} On the other hand, the sustained absence of seductive cigarette advertising on the nation's television screens may well have eased the transition in public attitudes toward opposition to smoking.¹⁰⁷

Since the Fairness Doctrine ads, a number of state-level antismoking media campaigns have emerged, some sustained over several years, while others survived only briefly. Most notable among these have been the campaigns produced in California and Massachusetts, each supported by cigarette excise tax revenues generated from successful ballot initiatives, and Florida's truth campaign, an aggressive anti-industry campaign targeting children. Research has found that each of these campaigns successfully contributed to reducing smoking in the respective states' populations.¹³³⁻¹³⁷ In each case, however, media campaigns represented components of more comprehensive statewide tobacco control programs (discussed below). Thus, analytical challenges have confronted researchers attempting to disentangle the effects of the media campaigns *per se*. Still, the approaches taken—ranging from focus groups to regression analyses—have indicated an independent impact of the campaigns.

Most recently, a major national youth-oriented media campaign, also dubbed the truth campaign, resulted from the Master Settlement Agreement (MSA) between the states and the tobacco companies.¹³⁸ As part of the MSA, the industry was required to pay over \$250 million annually into a national public education fund, intended to discourage kids from smoking, as well as help adults to quit. The fund is administered by the American Legacy Foundation, also established by the MSA. In its early years, the truth campaign represented a \$100-million-per-year paid advertising investment in tobacco control that is unprecedented in its magnitude. Recent research has concluded that the campaign has effectively grabbed the attention of its target audience (ages 12–17) and altered attitudes toward smoking in the future.^{139,140} One study found a dose-response effect on smoking behavior: The more children were exposed to the truth campaign, the less likely they were to smoke.¹⁴¹

Truth has been part of the social landscape in recent years, but that landscape has been somewhat cluttered. Concurrent with the first years of the truth

campaign was a media effort entitled “Think, Don’t Smoke,” produced by Philip Morris, representing the lion’s share of the company’s avowed effort to reduce youth smoking. The same research that concluded that youth were attracted to and convinced by the truth campaign found that “Think, Don’t Smoke” had less appeal to youth and may even have had the effect of increasing interest in smoking among open-to-smoking young people.¹³⁹ Other tobacco companies have mounted youth tobacco control campaigns of their own, although they are tiny compared with that of Philip Morris.

Research has yet to definitively determine which of several alternative approaches to media campaigns works best.¹⁴² Most controversial are the aggressive anti-industry campaigns, made famous initially by California and subsequently by Florida. The success of both the Florida and national truth campaigns supports an approach for youth that relies on edgy ads, aimed at risk-taking youth and emphasizing industry efforts to seduce people into smoking.¹⁴³ Recently, Hersey et al.¹⁴⁴ developed empirical evidence that young people residing in states with anti-industry campaigns have more negative attitudes toward the tobacco industry and are less likely to progress “along a continuum of smoking intentions and behavior.” Yet Thrasher and colleagues¹⁴⁵ have demonstrated that kids in tobacco-growing states are as responsive to antismoking messages as children in nontobacco states.

For the adult population, California researchers have interpreted the literature as favoring the aggressive anti-industry approach, such as that employed in their own state,¹⁴⁶ while activists in Massachusetts argue that well-designed health messages work at least equally well, as they have in that state. It is certainly plausible that multiple themes can work well, and that variation among them over time may prove desirable. Crucial characteristics seem to include professionally designed campaigns of significant size and duration.^{143,147}

Not all of the evidence on media campaigns is positive.^{148,149} Further, some scholars believe that there is plenty of room to exploit knowledge of the social dynamics of smoking to significantly improve the next generation of media campaigns.¹⁵⁰ Still, the apparent success of these state and national media campaigns has placed media social marketing high on the tobacco control agenda. Research even suggests that media campaigns may compare favorably with other highly cost-effective tobacco control interventions.¹⁵¹ It is now widely accepted that a comprehensive state-based tobacco control program should have a strong media component. Unfortunately, this conclusion, supported by much evidence, is unlikely to be sufficient to sustain such campaigns, much less extend them to other states. The state budget crises of the early 2000s have led many states to rescind funding for tobacco control, targeting it instead to deficit reduction or other purposes viewed by state legislatures as more pressing. In Massachusetts, for example, the tobacco control program has been decimated, its budget cut by more than 90%. At the national level, what many

consider a loophole in the MSA resulted in the public education fund payments—the lion’s share of total payments to the foundation—ceasing after the first five years. Because this was foreseeable, the Legacy Foundation set aside some of each year’s payment to build a corpus for future years’ use. Nevertheless, unless the loophole is closed, future years’ investment in a national youth tobacco control campaign necessarily will be far smaller than the effort to date.

Research supports counteradvertising as a method of reducing tobacco use. Budget deficits and MSA language are pointing away from use of that method.

ECONOMIC INCENTIVES

Taxation

Of all tobacco policies, likely none has been studied as thoroughly as cigarette taxation. (For detailed reviews, see Chaloupka and Warner⁴ and Chaloupka et al.¹⁵²) The body of contemporary research relating tax to price and price to consumption dates from the early 1980s,¹⁵³ although Gallet and List¹⁵⁴ identified studies on the demand for cigarettes dating back to 1930s and ’40s. (Reporting in 2003, Gallet and List found a total of 86 studies that report specific estimates of the price elasticity of demand for cigarettes, a technical measure of consumers’ price responsiveness defined below.)

Likely the most influential of the studies undertaken during the modern era were two papers by Eugene Lewit and his colleagues.^{100,155} Performed by economists, relying on a variety of time-series and cross-sectional data sets and employing sophisticated econometric techniques, this research has formed the basis for one of the great transitions in the history of tobacco control policy. Prior to the 1980s, the notion of relying on economic incentives to alter health-damaging behaviors was widely regarded within the public health community as heretical. Many public health professionals considered such reliance inappropriate, if not repulsive, preferring appeals to more intrinsic values. Further, in the case of an addictive behavior like smoking, price incentives were nearly universally assumed to be ineffective. The then-new research demonstrated that, consistent with the universal law of demand, cigarette consumption did respond to price increases. The law of demand is so universal, in fact, that it transcends species: addicted laboratory animals will decrease their self-administration of drugs when the “price” of a dose—measured in effort to get it, such as the number of presses on a lever—is raised. The animals’ response-cost curves, analogous to humans’ demand curves, exhibit price responsiveness very similar to that of humans addicted to drugs.¹⁵⁶

Important to conveying the utility of taxation was research that translated the esoteric econometric studies into impacts on smoking and mortality that

could be understood by the lay public.¹⁵⁷ Over a period of years, this body of economic research eventually convinced the public health community that pursuit of cigarette tax increases was a pragmatic, if not necessarily noble, tobacco control strategy.¹⁵⁸ Additional work demonstrated that cigarette tax increases raised government revenues at the same time that they reduced smoking.^{152,159} This work contributed to pursuit of higher taxes as a First Principle of modern tobacco control policy.¹⁶⁰

There are at least four reasons that research on cigarette tax and price quickly converted the nonbelievers:

1. The impacts of price increases on smoking are substantial and they are realized quickly.¹⁶¹
2. The revenue bonus from taxation creates a politically receptive audience of legislators hungry for new revenues.
3. Although differing in approach, the studies have produced a quite consistent set of findings. Virtually all of the contributions to this body of research have found that smoking declines in response to price increases, with the elasticity of demand (the economist's standard measure of price responsiveness) typically placed at $-.3$ to $-.5$ for adults.^{152,162} This means that a 10% increase in the price of cigarettes will decrease total cigarettes demanded by 3–5%. Much of the research indicates that this total impact is divided approximately evenly between price-induced quits and nonstarts on the one hand, and reductions in daily consumption among continuing smokers on the other. There are exceptions to this division, with one recent study finding no impact of a major price increase on smoking prevalence. The study did find a substantial impact on continuing smokers' consumption, however.¹⁶³
4. Although the results are less consistent from one study to another, the research on price-responsiveness by young people indicates that they are far more price-responsive than adults, as would be expected for a number of reasons.¹⁶⁴ Estimates often place kids' price elasticity of demand at two to three times that of adults.^{4,152}

Thus, raising taxes offers legislators the opportunity to do well while doing good: they can do well by the public treasury and at the same time contribute to an improvement in public health. The latter will be observable quickly in data showing reduced cigarette sales. The implication is a significant reduction in the mortality burden associated with smoking.^{159,165,166} Further, the public generally supports cigarette tax increases, especially when a portion of revenues is earmarked for tobacco control (particularly for attempts to prevent youth smoking).¹⁶⁷

A flurry of attention to the early tobacco tax research, its invocation by legislators interested in raising cigarette taxes, and the availability of new sources of research support contributed to a booming research enterprise in the area. Much of the newer research has focused on the implications of the “rational addiction model,” a model that posits that, due to addiction, smokers respond not only to current cigarette prices but also to expected future prices.¹⁶⁸⁻¹⁷² This perspective indicates that smokers are even more price responsive (their demand is more elastic) than the traditional myopic models would lead us to believe, especially in the longer run. One prominent study¹⁶⁹ concluded that long-run price response is approximately twice that realized in the short run. This is good news from a public health point of view, if less so from the perspective of government officials seeking a revenue bonanza. Nevertheless, the rational addiction model remains controversial and has been the subject of many criticisms and modifications.¹⁷³⁻¹⁷⁵ Chaloupka and Warner⁴ review the growing literature on rational addiction as it has been applied to cigarette smoking.

Yet another area of research spurred by the burgeoning interest in this subject has been assessment of the relationship between tax increases and prices. The layperson likely expects a one-to-one correspondence, with, for example, a 25-cent increase in the tax per pack leading to a 25-cent increase in wholesale (and ultimately retail) price. In 1987, Harris¹⁷⁶ demonstrated that the cigarette manufacturers’ response to the 1983 federal cigarette excise tax of 8 cents was to increase wholesale prices by much more. He concluded that the oligopolistic manufacturers were taking advantage of the opportunity to raise price, to generate more revenue, while leaving consumers with the impression that the increase was the government’s fault. Gruber¹⁷⁷ drew the same conclusion about the industry’s ability to manipulate price in reviewing the same data, as well as a similar disparity in 1991, when the federal cigarette tax rose 4 cents a pack while retail price increased by 20 cents.

Keeler and colleagues¹⁷⁸ studied the same tax-price relationship in the context of a state tax increase. Manufacturers presumably have less opportunity to increase wholesale prices in a single state due to the relative ease of smuggling of lower-priced cigarettes from nearby states. The authors concluded that the manufacturers did take advantage of the tax increase to pass along an additional wholesale price increase, but it was very modest by comparison with the national experience. Gruber and Koszegi¹⁷⁹ found similar results.

Cigarette smuggling is itself an issue of considerable policy research interest, but with more attention focused at present on international smuggling.¹⁸⁰⁻¹⁸² Although contemporary research examines the impact of interstate smuggling within the United States,¹⁸³ domestic interest in the subject was greater a couple of decades ago when legal barriers to interstate smuggling were less substantial than they are today.¹⁸⁴ Recent research pertaining to smuggling in North America has focused on the situation in Canada.¹⁸⁵ Large tax-induced

price discrepancies between cigarettes sold in Canada and those sold in the United States created a flourishing market for smuggled cigarettes, ironically Canadian cigarettes exported to the United States (without the burden of the Canadian tax) and then smuggled back into Canada.

If most of the research that followed the early-1980s work of Lewit and colleagues focused on the same issue—the relationship between cigarette price and consumption—the more recent literature reveals a number of studies examining novel concerns. Illustrative is a study by Evans and Farrelly¹⁸⁶ that examined whether price increases led smokers who continued to smoke to switch to higher tar and nicotine cigarettes. The notion was that smokers would seek their desired level of nicotine from fewer cigarettes. The research supported the hypothesis and found it especially relevant for young people, smokers who might well be more price sensitive as well as less invested in a single brand of cigarettes. This compensation phenomenon was not sufficient to negate the positive behavioral and health effects of the increased tax, however. Still, as Farrelly et al.¹⁸⁷ observe in a more recent study that arrived at the same conclusion, these results suggest that cigarette taxation is an imperfect public policy and that alternatives to conventional taxation, including taxing tar yields (discussed below), ought to be considered. In a similar vein, Hyland and colleagues^{188,189} have found that tax increases lead smokers to seek out lower-priced cigarettes, including discount brands and cigarettes sold tax-free on Indian reservations.

Most of the research on tax and price has focused on adult smoking behavior in general, often distinguishing between the price responsiveness of men and women. Some more recent studies have examined a very specific group of adults, however: pregnant women.^{190,191} This group's price responsiveness is especially important, given the deleterious effects of smoking on the fetus. Recently, Coleman and colleagues¹⁹² concluded that pregnant women who smoke are highly responsive to price changes, much more so than women in general. They argue that direct financial incentives should be considered to encourage pregnant smokers to stop, as well as postpartum mothers to remain abstinent. This may be especially sound advice in light of the fact that women who continue to smoke during pregnancy—a distinct minority of pregnant women—appear to perceive that they derive substantial personal benefits from smoking. As such, efforts to persuade these women to quit, without explicit financial incentives, may confront significant barriers to success.¹⁹³

Emphasis on adult price responsiveness likely reflects the widespread availability of data with which to study the phenomenon. The behavior of children in response to price changes is of special interest, however, in part because tax increases are seen as an effective deterrent to the initiation of smoking. Indeed, a group of health economists, many of whom had worked on the issue of price and smoking, concluded that discouraging kids from smoking was the single

most important rationale for increasing cigarette taxes.¹⁶² Most of the published research supports the conclusion that children are especially price sensitive. More generally, the research finds an inverse relationship between age and price sensitivity; thus, in these studies, children are the most price sensitive smokers, with young adults more price sensitive than older adults. (See Chaloupka and Warner⁴ for a summary of the literature. Ross and Chaloupka¹⁹⁴ illustrate new research on the subject.) The logic underlying this finding is quite compelling: children are less addicted than adult smokers and hence should be more price responsive; children may have greater income constraints; children are more subject to the influence of peer behavior, and thus a price increase that discourages some kids from smoking may have ripple effects to other kids.¹⁶⁴ Not all research concludes that children are more price responsive than adults, however. In fact, an important, if relatively small, group of studies has reached the opposite conclusion, finding little evidence of a significant response of youth smoking to price or tax increases,¹⁹⁵ with conceptual rationales offered for this finding as well.¹⁹⁶

The controversy in the literature, and the inherent interest in and importance of the subject, have prompted a growing body of new research targeting not only the relationship between price and youth smoking but also the mechanism: Do higher prices discourage youths from starting to smoke? Do they interrupt the progression from initiation to regular smoking? Do they encourage quitting among established youth smokers? Using the National Education Longitudinal Survey of 1988, DeCicca and colleagues¹⁹⁶ found little evidence that tax deters either the initiation of smoking between eighth and twelfth grades or the onset of heavy smoking during the same period. Earlier studies had arrived at the same conclusion concerning initiation.^{197,198} So, too, did Gruber and Zinman¹⁹⁹ who found younger adolescents not price responsive, while older youth (twelfth graders) were. They concluded that the former were experimenting with smoking, often not buying cigarettes themselves, a finding produced in other studies as well.²⁰⁰ Similarly, Emery et al.²⁰¹ found youthful experimentation unrelated to price, while both the consumption of cigarettes among regular smokers and the probability of being a regular smoker were affected. Given the effects on older teens alone, Gruber²⁰² considers taxation the most important policy determinant of youth smoking.

In apparent contrast, recent studies employing longer panels that controlled for unobserved state or individual influences on demand have produced results consistent with the conventional wisdom that price affects initiation.^{203,204} Similarly, Tauras and colleagues²⁰⁵ concluded that proper control for other influences led to the clear outcome that price reduces youth initiation. In a large cohort study, Thomson et al.²⁰⁶ found evidence that higher taxes discouraged youth experimentation. In part, resolution of this issue will require agreement on a consistent definition of initiation.

Glied^{207,208} recently produced intriguing evidence that, whatever deterrence effect high taxes might have initially on youth smoking, most of the impact is lost over time as young people move, often from a high- to a low-tax state. Taxes, she concluded, may defer initiation without preventing it. This is a controversial finding, derived using a relatively small data set. Although further research along similar lines is needed to confirm or reject Glied's conclusion, this work does raise troubling questions.

The standard conclusion that youth are more price responsive than adults has been extended to consideration of how young adults react to price increases, in contrast with older adults. Young adults, defined as ages 18–24, are increasingly targeted by the tobacco industry, now that the industry's ability to target underage potential smokers has been limited.^{41–43} Research finds substantial price effects on young adults, as well as children, with the degree of price responsiveness in between that of children and older adults, as one might logically expect.^{209–211}

The logic supporting the notion that young people should be more price responsive than older adults also applies to differences associated with education and socioeconomic status. Several studies have found that less educated people²¹² and those with lower income or in lower socioeconomic classes^{213,214} are indeed more price responsive than the average smoker. This research is highly relevant to addressing one of the principal arguments against raising cigarette taxes, namely that they are regressive; that is, precisely because lower-income people are more likely to smoke, they bear a disproportionate burden of cigarette taxes. They pay a far larger share of their income in cigarette taxes than do high-income individuals. Thus, critics argue, raising cigarette taxes amounts to a tax on the poor. The principal response, relying on this literature, is that because low-income smokers are more price-responsive, a tax *increase* may not have a regressive distribution (in contrast with the effect of the total tax). And it will have a progressive impact on health, helping to reduce the disparity in the disease burden of smoking by encouraging many more poor than rich people to quit smoking.²¹⁵ The complexity of the determinants of smoking and the regressivity issue is vividly illustrated by a recent article by Gruber and Koszegi.²¹⁶ The authors conclude that, in a time-inconsistent model of smoking, cigarette taxes are actually far less regressive than previously assumed and may even be progressive under various assumptions.

Relatively uncommon are studies of the effects of differential tobacco taxation: taxing different types of tobacco products differently or taxing different types of cigarettes differentially. Ohsfeldt and colleagues^{217–219} and Chaloupka et al.²²⁰ have produced some of the very few analyses of the impact of both smokeless tobacco and cigarette price increases on the use of smokeless tobacco. These studies consistently find that, like all other goods, the consumption of smokeless tobacco by youth is sensitive to its price. Further, the

research demonstrates that smokeless tobacco and cigarettes are substitutes in that raising the price of cigarettes is associated with an increase in the demand for smokeless tobacco. Similarly, Delnevo and colleagues²²¹ recently reported that cigarette price increases led to an increase in the consumption of cigars, which are themselves price-responsive among youth.²²²

Interest in the substitutability of smokeless tobacco for cigarette smoking has intensified of late as tobacco control researchers struggle with the issue of tobacco harm reduction²²³ (discussed more fully below). Of particular interest is the question of whether inveterate cigarette smokers—those who either cannot or will not quit—might be induced to switch to low-nitrosamine smokeless tobacco products. If so, they would greatly reduce their risk of tobacco-related disease, given that smokeless, especially the newer low-nitrosamine varieties, is dramatically less dangerous than cigarette smoking,^{224,225} although it is clearly not safe.^{226,227} Great controversy swirls around the potential and desirability of encouraging such a switch, as well as whether it would be desirable.^{224,228} Much of the debate focuses on the Swedish experience, where a large percentage of males have been using snus, a moist snuff, for decades, while Swedish male smoking prevalence is among the lowest in the world. The Swedish male lung cancer rate is similarly among the lowest found among developed countries. The question is whether Swedish men have switched from cigarette smoking to snus and achieved significant harm reduction. Undeniable is the fact that cigarettes are taxed far more heavily than is snus, and this almost certainly accounts for much of the shift among men from cigarettes to snus.

Knowledge of the cross elasticity of demand for smokeless—the proportionate increase in the demand for smokeless associated with a given percentage increase in the price of cigarettes—has policy relevance for at least two reasons. One is the just-discussed question of whether inveterate cigarette smokers could be converted into smokeless users, thereby reducing their disease risk, in part by taxing cigarettes much more highly than smokeless. On the opposite end of the spectrum is the concern that increases in cigarette taxes, unmatched with increases in taxes on other tobacco products, would lead to a switch toward the nonsmoked forms rather than quitting, with deleterious effects on health. The latter concern has led many states to attempt to equalize their taxes across tobacco product types, to discourage substitution rather than quitting. Obviously, the two approaches have diametrically opposite goals, keeping smokeless taxes low to encourage cigarette smokers to switch to smokeless, on the one hand, and raising taxes on smokeless to discourage use, on the other. Use of smokeless instead of smoking cigarettes definitely would reduce risk. But use of smokeless instead of quitting smoking, or instead of never starting to smoke, would increase harm.²²³

Research in other countries²²⁹⁻²³¹ has found that increases in the price of manufactured cigarettes induce increases in the consumption of other tobacco

products, including especially roll-your-own cigarettes, a less expensive, and often lower-taxed, means of smoking cigarettes.

Differential taxation has been considered in the context of varying taxes on cigarettes depending on various characteristics of individual brands. A quarter century ago, Harris²³² examined the idea of taxing cigarettes differentially depending on their tar and nicotine (t/n) content. His notion was a simple one: taxing the more toxic cigarettes more heavily would lead smokers to switch to less toxic cigarettes. At the time, the prevailing medical view was that low t/n cigarettes were indeed less toxic.²³³ Evidence accumulated since then has strongly contradicted this perception, indicating that smokers compensate for lower yields by smoking more cigarettes, inhaling deeper in the lung, and so on.⁷⁹ As such, the call for differential taxation of cigarettes by tar and nicotine yields has largely been abandoned. Nevertheless, the notion of using differential taxation of tobacco products, based on their relative toxicity, has resurfaced in the form of the debate over smokeless tobacco.²³⁴ With regard to cigarettes alone, Farrelly et al.¹⁸⁷ have also raised the issue again.

The relationships among tax, price, and cigarette consumption are proving to be far more complicated than was suggested by the early research. Appreciation of this complexity has grown out of increasing understanding of the relationship between smoking and illness, greater sophistication in the relevant econometric research, and change and expansion in the range of cigarette products, such as the emergence of “light” and “ultralight” cigarettes. The complexity of the relationships among tax, price, and smoking does not suggest that policy makers should read the state of the art as implying doubt about the overall impact of price on smoking. There is no credible argument that higher prices do not deter smoking in the aggregate. Further, any adverse consequences of price increases, such as continuing smokers’ shifting to higher t/n cigarettes, surely do not compensate more than partially for the health benefits derived from higher prices. The research-based policy conclusion that tax increases will decrease smoking, while concurrently increasing government revenues, stands unchallenged in the entirety of the research literature.

The nuances of the relationship do deserve more and better research, however. For example, Keeler and colleagues²³⁵ recently concluded that most studies’ failure to control for antismoking sentiment in states introduces a substantial upward bias in estimates of actual price responsiveness. Clearly, this needs to be explored further. Particularly compelling is the need to resolve the issue of the relationship between price and youth smoking, specifically how price increases decrease youth smoking (for example, by discouraging experimentation, reducing initiation [however it is defined, itself a problem], or decreasing smoking among youth with established smoking habits). The complexity of this issue has been demonstrated recently by Cawley et al.²³⁶ in an analysis of the effects of price on youth initiation that takes into account the

use of cigarettes by girls to control weight. The authors found that higher prices reduced initiation among boys but not girls. It is safe to say that development of a research-based consensus on the effects of tax and price on youth smoking must await further research. This is recognized by the federal government: the 2000 Surgeon General's report² called for more research on the subject.

Insurance Premiums Differentiated by Smoking Status

Figure 1.2 includes several other policies that create economic incentives for people to reduce or avoid smoking. Few of these have been the subject of more than a handful of studies, if that many. Differential insurance premiums, for life and health insurance (and occasionally automobile insurance), are often cited as one such economic incentive. Although the differential can be substantial (with smokers' age-gender-specific life insurance premiums frequently twice those of nonsmokers), there is little if any empirical evidence regarding the effect of insurance premium differentials on smoking behavior.¹

Subsidizing Cessation Attempts

Of greater interest recently has been the incentive effect of subsidizing smoking cessation treatment, either behavioral plus nicotine replacement therapy (NRT) or NRT alone. (The FDA has also approved one non-nicotine pharmaceutical, bupropion, as a prescription medicine for smoking cessation.) This has direct relevance to policy making as decision makers for Medicare, state-based Medicaid programs, and private insurance contemplate whether to cover cessation treatment. Concerning private coverage, state insurance commissioners could mandate that cessation treatment be included as a member benefit in state-licensed health care plans not covered by the Employee Retirement Income Security Act. With regard to public programs, recently Halpin and colleagues²³⁷ reported that 36 Medicaid programs provided some coverage for smoking cessation counseling or pharmaceuticals in 2001, but only a single state covered all of the counseling and drug therapies recommended by the Public Health Service guideline on smoking cessation.²³⁸

Curry et al.²³⁹ set up a randomized trial of different coverage modalities in a large health maintenance organization. The authors found that participation in cessation treatment was highly sensitive to the patient's out-of-pocket costs, with four times as many fully subsidized patients participating (10%) as for the case in which only 50% of the cost of counseling and pharmacotherapy was covered (2.4% participating). As might be expected, the quit rate was higher for the more highly motivated full-pay patients; but the effect on participation dominated that on quit success, meaning that the full subsidization group produced more quitters. Qualitatively similar results have been reported by Schauffler et al.²⁴⁰ In contrast, Boyle and colleagues²⁴¹ found no impact of coverage on either use of cessation pharmaceuticals or quitting. The latter findings are not consistent with

expectations regarding the utilization of discretionary services under variable price regimes: decreased costs to the patient should increase demand for the relevant services.²⁴² Recently, reviewing half a dozen published studies, Kaper and colleagues²⁴³ concluded that complete coverage can increase self-reported prolonged abstinence rates and do so at relatively low costs.

Relying on the Curry et al. findings regarding the impact of coverage on service utilization, Warner and colleagues²⁴⁴ used a simulation model to evaluate the return on investment to managed care organizations (MCOs) of covering cessation services. This study concluded that, while providing such coverage would not on balance save the MCOs money, it would cost them little. And it would reduce mortality in a highly cost-effective manner. Also relying on a simulation model, Halpern et al.²⁴⁵ concluded that MCO coverage of bupropion would be cost-saving to the organization. While discrepancies exist across these studies concerning the net financial benefits of coverage, there is virtually universal agreement that smoking cessation is among the most cost-effective interventions in the medical armamentarium.²⁴⁶⁻²⁴⁸ Indeed, a leading researcher has declared smoking cessation “the gold standard” of health care cost-effectiveness.²⁴⁹

While smoking cessation will not necessarily reduce health care costs for individual health care payers, the evidence suggests that, on balance, smoking does add to the nation’s aggregate expenditures on health care.¹² And as smoking imposes other costs in addition to health care costs, net savings from smoking cessation may be anticipated in specific settings. In the context of a workplace, for example, smoking cessation may well generate net savings for the firm, because firms benefit not only from decreases in health care spending but also reductions in absenteeism, lost on-the-job productivity, and life insurance payments.^{245,250}

Tauras and Chaloupka²⁵¹ used pooled cross-sectional time-series scanner data from 50 major metropolitan areas in the United States to evaluate consumers’ price responsiveness in the purchase of two nicotine replacement products: one a patch, the other nicotine gum. The authors found demand to be highly responsive to NRT price changes, with price elasticities of -2.33 and -2.46 for patch and gum, respectively. This means that a 10% price reduction would increase the demand for patch or gum by 23.3% or 24.6%. The cross-elasticity of demand (the responsiveness of demand for NRT to changes in cigarette prices) was substantial too, at 0.772 and 0.764 respectively. This means that a 10% cigarette price increase would increase the demand for the NRT products by 7.72% and 7.64% respectively. Both sets of findings suggest that making cigarettes more expensive and/or reducing the cost of NRT would increase the demand for NRT products considerably.²⁵² Currently, NRT products are relatively expensive, the result in part of the costs of research required to get the products

approved for marketing by the Food and Drug Administration. (In contrast, the development and marketing of new cigarettes involves no such expense.) As well, they are sold in quantities requiring a commitment to trying to quit. Today, if consumers have \$3.50 for a day's supply of nicotine, their only option is a tobacco product.

Another approach to cessation has garnered increasing attention in recent years: development and use of telephone smoking quitlines. While several states have operated quitlines for years, the idea received special prominence following the recommendation of a national quitline by a government-convened task force, charged with determining how to greatly increase the rate of smoking cessation in the United States.²⁵³ Evidence supports the feasibility, effectiveness, and cost-effectiveness of quitlines²⁵⁴⁻²⁵⁶ and cessation experts have recently been touting their potential to significantly increase the rate of quitting.²⁵⁷ Following the task force's recommendation, the Secretary of Health and Human Services announced a new national quitline in February 2004.²⁵⁸ Support of quitlines by states and the federal government constitutes a direct subsidization of quit attempts.

Most of the research on cessation has not related directly to policies. Rather, it has focused on the efficacy of various treatments in reducing smoking. Although efficacy varies from one treatment modality to another (and from one study to another within a given modality), a variety of behavioral and pharmacological treatments have been demonstrated to double or triple quit rates.²³⁸ Work on the efficacy of cessation treatment, as well as the cost-effectiveness literature referenced above, illustrates research that, while not itself policy research, has clear implications for policy. The collective body of research suggests that officials responsible for making health care funding decisions—from Medicare and Medicaid, to state insurance commissioners, to individual health care delivery organizations—ought to be considering implementing policies that would require coverage of cessation treatment.

The Tobacco “Subsidy”

The tobacco “subsidy” has long irritated the public health community. It makes no sense, detractors maintain, for the agricultural arm of the United States government to subsidize tobacco growing, while the health arm attempts to discourage Americans from smoking cigarettes. In point of fact, with the exception of a very minor component, the tobacco agricultural support system is not a subsidy system *per se* (unlike its counterparts elsewhere, including in Europe). Rather, it entails restrictions on who can produce (requiring “allotments” to grow, originally developed and allocated during the Great Depression) and determination of the minimum price they will receive for their tobacco (“price support”).

The system has been changed frequently, including the adoption by Congress of a no-net-cost approach in 1982 designed to remove the last vestiges of taxpayer subsidization.²⁵⁹ Contrary to the conventional wisdom, research demonstrates that, if anything, the direct effect of the system is to *decrease* cigarette consumption by raising the price of cigarettes. Years ago, Sumner and Alston²⁶⁰ estimated that eliminating the tobacco price support and supply limitation system would have reduced the price of American tobacco by 20–30%, ultimately reducing the retail price of cigarettes by no more than 3%. That reflected the fact that, at the time, United States tobacco constituted only a tenth of the retail price of cigarettes. Assuming a price elasticity of demand of -0.3 , the authors concluded that the system likely decreased the demand for cigarettes by about 1%. A decade later, U.S. Department of Agriculture economists drew similar conclusions, estimating that the price support system raised U.S. tobacco prices by 30–40%, with a net impact on cigarette prices of an increase of 1–2%.²⁶¹

Still more recently, researchers at the Office on Smoking and Health in CDC concluded that the price support program increased tobacco prices by 18–23%.²⁶² By the early 1990s, however, domestic tobacco accounted for only 3% of retail cigarette price. The decrease in the importance of domestic tobacco in retail cigarette price reflected three developments: (1) substantial declines in the amount of tobacco used to manufacture a cigarette reflecting reduced wastage, new manufacturing techniques, and a shift toward cigarettes with smaller diameters; (2) increases in the proportion of imported tobaccos in the manufacture of American cigarettes; and (3) modest increases in the price of domestic tobacco compared to much more substantial price increases in the manufactured final product.

Incorporating the reduced significance of domestic tobacco in the cost of cigarettes, Zhang and colleagues²⁶² concluded that the tobacco program likely increased the retail price of cigarettes by no more than 1%. This price impact, they surmised, decreased the number of smokers by 0.14%, a very modest effect. Combined with the earlier studies, this research leads to the consistent finding that while the direct impact of the tobacco program is to decrease smoking, that impact is very slight, as are its implications for public health.

Still, this result will cause tobacco control proponents to scratch their heads in confusion. It implies that the “subsidy” is not a subsidy after all and the allotment/price support system raises the price of cigarettes and reduces smoking. Actually, they were almost certainly correct in their first interpretation of the impact of the system. The principal effect of the system is to create an entrenched economic interest, heavily concentrated in the six-state tobacco bloc, which has translated into political power for the tobacco industry disproportionate to its economic importance. This political influence, which has muted tobacco control policy at the federal level for decades, almost certainly

outweighs the miniscule impact of the allotment/price support system on price-induced consumption declines.^{132,259,263}

The influence of the tobacco industry in the politics of the tobacco states and in Congress is quite remarkable in light of the fact that, according to data from the U.S. Department of Agriculture, the tobacco states have little economic dependency on tobacco, the conventional wisdom notwithstanding. The USDA classifies a county as “farm dependent” if earnings from all farming (not just tobacco) constitute a fifth or more of the county’s total earnings. USDA research shows that among the nation’s 424 tobacco counties (counties in which tobacco is grown for commercial purposes), only 27 qualify as farm dependent. Indeed, the share of income from all farming in tobacco counties is well under 2% today. Perhaps most striking is the fact that among the 27 farm-dependent tobacco counties, only a single county derives a majority of its farm receipts from tobacco. Of the farm-dependent tobacco counties, 22 of the 27 each receive less than 5% of their farm earnings from the sale of tobacco. This is not to suggest that tobacco does not play a significant role in farm sales anywhere in the country. To the contrary, there are several counties on the North Carolina-Virginia border and in eastern Kentucky in which tobacco accounts for more than 70% of total farm sales. Rather, it suggests that farming in general, and tobacco specifically, are rarely of great economic significance in their respective counties.^{264,265}

LAW AND REGULATION

The number and variety of legal and regulatory policies relating to smoking are quite striking, as illustrated in the rightmost column of Figure 1.2. Few of these have been subjected to research, however. Of those that have, prohibition of smoking in public places and the workplace appears to make the most difference in smoking behavior. Youth possession, use, and purchase (PUP) laws, enforcement of laws restricting sales to minors, and mandated school health education have each been the subject of numerous studies, with varying conclusions about their efficacy and effectiveness. What has been learned about each of these four policies is examined here. Nothing is said about the other entries in the law/regulation column of Figure 1.2, simply because there is little research to report.

Prohibition of Smoking in Public Places and the Workplace

Legal restrictions on smoking in public places date from the early 1970s when the first state “clean indoor-air” laws were passed, motivated, at the time, by concerns for the comfort of nonsmokers.¹ Since then, nearly all of the states,

and large numbers of cities and counties within them, have restricted or banned smoking in public buildings, with the health of nonsmokers the preeminent concern. The extent of coverage and degree of restriction have increased over time.^{2,266} Public buildings encompass everything from government buildings to private places of business frequented by the public; restaurants constitute the most prominent example of the latter. An attractive feature of clean indoor-air laws is that voluntary compliance is generally quite high,²⁶⁷ at least in the United States and similar countries in which there is a substantial base of public support for the laws.²⁶⁸

Likely the most important such restrictions, and certainly the most researched, pertain to workplaces, discussed immediately below. Ever since clean indoor-air laws began to define the social environment concerning smoking in public, researchers have attempted to assess not only whether such laws in fact protected nonsmokers, but also whether they decrease smoking.

One frequent approach to address the second issue is statistical analysis of the relationship between smoking prevalence and the existence of such laws, often modified by their degree of restriction (typically utilizing an index based on the extent of coverage). A number of studies have found that the presence of laws is associated with decreased smoking, but a challenge is to infer the direction of causality: it is plausible that a correlation reflects the relative ease of legislatures' adopting such laws in jurisdictions in which antismoking sentiment is highest and smoking has declined the most. Several studies have concluded that, even controlling for this effect, clean indoor-air laws do reduce smoking.^{4,219,269} Wasserman et al.¹⁹⁵ estimated that comprehensive restriction of smoking in public places would reduce per capita cigarette consumption by nearly 6%.

Logically, restrictions on smoking in the workplace might be expected to affect smoking, and nonsmokers' exposure to smoke, more than other public place restrictions, simply because a large proportion of the population spends much of its day in workplaces. Workplace restrictions result either from state or local policies requiring them or from self-determined company policies. Based on state and municipal laws, the American Nonsmoker's Rights Foundation estimates that, as of October 2005, nearly a quarter of the United States population resided in a jurisdiction in which smoking is banned completely in workplaces. Smoking in the workplace has been banned by 11 states and 225 municipalities and counties.²⁶⁶ Shopland et al.²⁷⁰ concluded that during 1998–1999, 69% of all United States workers working indoors outside their homes were employed in smoke-free workplaces, the result of either laws or company policies. This represented a substantial increase in a period of a few years.²⁷¹ Surely the figure has risen since then.

Workplace bans are intended to protect workers from exposure to second-hand smoke, demonstrated to cause lung cancer in otherwise healthy nonsmok-

ers and implicated in heart disease deaths as well.¹¹ The risks associated with secondhand exposure are greatest for employees in confined areas, especially those in which a great deal of smoking occurs. It is not surprising, therefore, that the first major workplace to go smoke free was airplane cabins, where flight attendants were exposed throughout much of their work day. The relative ease with which bans on smoking during flights were mandated reflected the clear case of substantial exposure, effective lobbying by the nation's flight attendants, and the fact that one of the nation's principal groups of nonsmoking frequent fliers—senators and congressional representatives—controlled the decision. As well, airline customers in general come from a higher socioeconomic background and hence have lower smoking rates than the general public. Given the social disapprobation of smoking in this segment of the society, vocal opposition to banning smoking in flight was minimal. Bans on smoking on domestic flights of less than two hours were first implemented in 1988. Congress adopted a law banning smoking on all U.S. flights the following year, and subsequently eliminated smoking on international flights originating or ending in the United States. Currently, most international flights and many countries' domestic flights are completely smoke free.

The most recent workplace to be going smoke free also involves exceedingly high levels of exposure for workers: bars. Unlike the case of airline cabins, however, the clientele of bars has a higher than average prevalence of smoking, often viewing bars as places to go to for the express purpose of drinking and smoking in an environment in which such behaviors are not subject to social disapprobation. The spread of state and local laws banning smoking in bars, and their generally successful implementation, has thus come as something of a surprise to many observers of the tobacco control policy scene. Several states and over 100 municipalities have completely banned smoking in all bars and restaurants, with the growth in restaurant and bar bans exponential over the past decade.²⁶⁶ Legislative action has shifted recently from cities to states. California was the first to ban smoking in all workplaces, in 1995.

Policy research pertaining to workplace smoking bans has focused on four issues, with two more epidemiologic in nature. Several studies have evaluated actual reductions in worker exposure to cigarette smoke through methods varying from self-report on surveys, to testing blood or urine for cotinine, to measuring exposure by having employees wear monitors (or having monitors positioned in the workplace). These studies have consistently documented significant declines in exposure.^{272,273} So, too, have studies evaluating customers' exposure.²⁷⁴ A second group of studies has assessed workers' (and others') satisfaction with bans on smoking in workplaces and public places. In general, these studies find high levels of support, even among smokers.^{275,276}

A third group of studies has examined the effects of workplace bans on smoking prevalence and daily smoking among continuing smokers. Research

demonstrates that workplace bans encourage quitting and that continuing smokers do decrease their cigarette consumption, for the obvious reason that their ability to smoke is hampered by their presence in the workplace eight hours a day.²⁷⁷⁻²⁸⁴ In a review of 26 empirical studies, Fichtenberg and Glantz²⁸⁵ concluded that smoking prevalence is 3.8% lower in totally smoke-free workplaces and that the daily consumption of continuing smokers drops by 3.1 cigarettes. The reduced likelihood of smoking appears to apply to youth who work in smoke-free establishments as well.^{286,287} The reduction in continuing adult smokers' daily consumption appears to include some partial compensation for the period of deprivation at work: smokers consume more cigarettes during the nonwork hours than they did previously, when they were able to smoke in the workplace as well. Further, one longer-term follow-up study found that reductions in daily consumption receded to some extent in the later months and years following initial adoption of the workplace ban.²⁸⁸ This finding notwithstanding, Fichtenberg and Glantz²⁸⁵ conclude that workplace bans are one of the most effective policies available for reducing smoking, likening the decrease associated with smoke-free workplaces to that which would result from large tax increases (\$0.76 to \$3.05 in their analysis).

Several years ago, Glasgow et al.²⁸⁹ concluded that if all workplaces in the United States went smoke free, 178,000 smokers would quit smoking and aggregate consumption among continuing smokers would decline 10 billion cigarettes per year. Chapman and colleagues²⁹⁰ estimated the reduction in cigarette consumption at 21 billion. They attributed fully an eighth of the decline in cigarette consumption in the United States from 1988 to 1994 to the adoption of smoke-free workplace laws and policies. Even Philip Morris privately estimated that a complete ban on smoking in the workplace would reduce total cigarette consumption by about 10%.²⁹¹ The health effects could be significant. Ong and Glantz concluded that thousands of deaths from heart disease and stroke would be avoided if all U.S. workplaces were smoke free.²⁹² Levy et al.²⁹³ have estimated the range of benefits, in terms of smoking cessation and reductions in premature deaths, that adoption of smoke-free workplaces might produce. These researchers, and others,²⁹⁴ have demonstrated that partial bans—those that permit smoking in designated areas—affect smoking behavior much less than complete bans.

In part, the association between workplace smoking bans and lower smoking could be spurious, reflecting a higher propensity for nonsmokers to choose to work in nonsmoking workplaces. Evidence suggests this is not the case, however.²¹⁰ Farkas and colleagues²⁹⁵ concluded that workplace restrictions (and household bans as well) were associated with more cessation attempts by adults, with relapse less likely. Similarly, Longo et al.²⁹⁶ found cessation rates among employees of firms with bans more than double those of employees of firms without bans six years following the bans in the former. Interpreting

the collective evidence, Levy and Friend²⁹⁷ concluded that smoking restrictions impact daily consumption immediately following their implementation, while full effects on cessation grow over the subsequent years. The Surgeon General has suggested that the change in social norms associated with widespread adoption of smoke-free workplaces ought to be reflected in reduced smoking.¹⁷

The fourth group of policy studies pertaining to workplace smoking bans considers the impact of bans not on the workers themselves, but rather on the economic health of the institutions in question. These studies emerged in response to political opposition to bans on smoking in restaurants and subsequently bars, typically led by state or local associations of restaurateurs and bar owners. Identified by the tobacco control community as either fronts for or naïve tools of the tobacco industry,^{298,299} these associations argued passionately that smoking bans would cause customers to flee to neighboring jurisdictions with more smoker-friendly laws. In addition to losing revenues for the owners of the affected establishments, such outcomes would decrease employment and tax revenues in the relevant jurisdiction. In support of their position, these associations cited evidence from surveys of the expectations of their members, as well as surveys of similar proprietors in jurisdictions that had adopted bans.³⁰⁰

The past decade has witnessed the production of approximately 100 studies of the effects of bans on smoking in restaurants and bars. Inaugurated by a prominent study by Glantz and Smith in 1994,³⁰¹ most of the research that has relied on objective sales data and has been subjected to peer review has concluded that bans do not harm business, and in some cases may actually help it. Typically, these studies either compare restaurant or bar sales or tax receipt data before and after implementation of a smoke-free law, or compare such data for establishments located in communities with bans with establishments in nearby jurisdictions not subject to a ban. Some of the research controls for general economic conditions as well. As a whole, the objective peer-reviewed evidence makes a compelling case that smoking bans do not inflict economic damage on restaurants and bars, nor on other community businesses (for example, hotels).³⁰² (For other instances of the effects on restaurants, see Sciacca and Ratliff,³⁰³ Hyland, Cummings, and Nauenberg,³⁰⁴ and Bartosch and Pope.)³⁰⁵ The next frontier—indeed, it may be the last frontier—is gambling establishments, especially casinos and bingo halls. The early research also indicates no economic damage from smoking bans in these establishments.^{306,307}

In contrast, Scollo and colleagues report,³⁰⁰ most of the papers that conclude that bans harm business derive from subjective data, have rarely been subjected to peer review, and were supported by the tobacco industry. Similar conclusions have been reported regarding research on the health effects of environmental tobacco smoke, where objective, peer-reviewed analyses find adverse health effects, while many of the publications reporting no adverse effects have been sponsored by the tobacco industry and never subjected to peer review.³⁰⁸

The studies on the effects of workplace smoking bans serve as an excellent example of action-oriented tobacco policy research that has truly informed the debate. Although it is always difficult to assess the role of research in policy decision making, this would appear to be an area in which the probability of a significant contribution is great.

Youth Possession, Use, and Purchase (PUP) Laws

Youth possession, use, and purchase laws have emerged as popular measures intended to discourage, or punish, youth use of tobacco. By early 2001, 44 states had PUP laws on the books,³⁰⁹ with scores of municipalities having ordinances of their own. More than two-thirds of the state laws authorize penalties in addition to monetary fines, ranging from court appearances to school suspension to denial of a driver's license. A few states schedule court sessions exclusively for trying PUP violations by minors.^{310,311}

Evidence on the effectiveness of these laws is sparse and mixed.³¹²⁻³¹⁶ Even though some of the research suggests a slight association between the existence of PUP laws and reductions in illegal sales to minors,³¹⁷ reduced illegal sales may not reduce youth smoking, because youth acquire cigarettes from other sources such as older friends and family.^{318,319} Further, focus group analysis has found that teens are often unaware of the existence of the laws.³²⁰ As well, the laws are difficult to enforce.³²¹ Little solid research exists to support an expectation of a high level of effectiveness.

In a recent review of the subject, Wakefield and Giovino³²² argue that PUP laws are undesirable for both theoretical and practical reasons related to principles of behavior change. In addition, they worry that the existence of such laws implicitly deflects attention from the tobacco industry's responsibility for youth smoking through its marketing techniques,³²³ as well as from retailers' responsibility not to sell to minors.^{324,325} For example, Forster and colleagues³²⁶ found that Minnesota cities were dramatically more likely to warn or prosecute minors for PUP violations than they were retailers selling cigarettes to kids. Similar findings pertain to enforcement of alcohol laws,³²⁷ an experience from which the tobacco control field could have learned.

Wakefield and Giovino conclude, however, that PUP laws are likely to remain a part of the tobacco control landscape for years to come, given their popularity with the public. A battle to rescind them, the authors observe, would lack public support and divert resources from other, more productive tobacco control efforts.

Sales to Minors (STM) Laws

Another punitive approach to addressing youth smoking focuses on the vendors of tobacco products: enforcement of minimum-age-of-purchase laws at retail outlets. Over the years, evidence accumulated from many states that minimum

age laws were being widely ignored, with underage youths in most jurisdictions finding it easy to buy cigarettes.³²⁸ In 1991, U.S. Public Law 102-321, generally referred to as the Synar Amendment, sought to reverse that situation by requiring states to prohibit sale or distribution of tobacco products to minors. The amendment required enforcement of the state laws, including annual random, unannounced inspections of retail establishments and a state plan to achieve a failure rate under 20%. The Synar Amendment itself had mixed effects, undoubtedly causing laws to be passed and enforcement efforts to pick up,^{267,329} but not quickly achieving high levels of compliance in most states.^{330,331} Compliance rates have risen over time, however. DiFranza and Dussault³³² credit the amendment with finally achieving universal adoption of laws and nearly universal enforcement, with a concomitant dramatic reduction in violation rates. They note, however, that implementation proceeded slowly due to a lack of serious effort in many states and the Department of Health and Human Services's decision not to require states to penalize merchants failing to comply with the law.

Research in this area has concentrated on the effectiveness of enforcement efforts in reducing illegal sales to minors and on the impact of reduced sales on youth smoking. Most studies find that enforcement does reduce illegal sales; the evidence of the impact of reduced sales on youth tobacco use is mixed. In one prominent study, Rigotti and colleagues³³³ reported significant improvement in retailer compliance in three Massachusetts communities in which STM laws were actively enforced, compared to three communities in which they were not enforced. Nevertheless, surveys of high school students revealed no difference in smoking rates in the intervention and control communities. The authors concluded that enforcement of STM laws can increase compliance, while not necessarily affecting youths' access to or use of tobacco. A telephone survey of adolescents in Massachusetts also found no consistent associations between youth access ordinances and kids' perceived access to tobacco, their purchase attempts, or their smoking prevalence.³³⁴ Another study involving randomized communities in California reported findings similar to those reported by Rigotti et al.³³⁵ Other research has demonstrated the feasibility of increasing enforcement, without focusing on the implications for smoking behavior.^{336,337}

A few econometric studies^{195,220,338} have studied the impact of STM laws on youth smoking but without examining enforcement. They have found little impact of the laws on smoking. Chaloupka and Grossman³³⁸ suspected that the lack of effect was attributable to the absence of enforcement. In an econometric study that did consider retailer compliance with the law,³³⁹ the authors found that when laws are aggressively enforced, and when compliance is high as a consequence, youth smoking does decline.

This is the same conclusion reached by Jason et al.³⁴⁰ in a prominent study of an extraordinary experience in the community of Woodridge, Illinois. A year and a half after adoption of an ordinance, and thanks to particularly aggressive

enforcement efforts by one police officer, the town saw compliance rise from 30% to 95%. Surveys of local students indicated that both experimentation with and regular use of cigarettes dropped by half. Seven-year follow up of Woodridge and other communities indicated sustained effects over time.³⁴¹ Forster and colleagues³⁴² reported significant declines in youth smoking in a trial in Minnesota in communities randomized to mobilize the citizenry in a comprehensive fight against youth access. The effort included enforcement of STM laws. In contrast with the other studies, the authors found a modest nonsignificant increase in students' self-reported ability to purchase cigarettes at the same time that smoking fell. Siegel et al.³⁴³ reported a decrease in youth smoking initiation in communities with local STM laws, but their respondents also did not report a reduction in perceived access to cigarettes. Dent and Biglan³⁴⁴ found a small association between a community's rate of sales to minors and smoking prevalence among eleventh graders.

The majority of studies have not found statistically significant impacts of STM enforcement efforts on youth smoking.^{345,346} Relying on a simulation analysis, Levy and Friend³⁴⁷ demonstrated that extraordinarily high compliance rates, like those achieved in Woodridge, would be essential to reduce youth smoking. Kids quickly learn which retail outlets remain sources of cigarettes, and they have alternative sources of cigarettes as well, including older friends and siblings and even parents.³⁴⁸⁻³⁵² The question thus becomes whether enforcement is worth the effort, and indeed whether achieving very high rates is possible in large, complex communities. Fichtenberg and Glantz³⁴⁵ argue that the evidence recommends abandoning youth access programs, while Jason and colleagues³⁵³ respond that it is premature to do so.

Employing a range of assumptions about the effectiveness of STM programs in reducing smoking, one study concluded that investments in enforcement, which cost relatively little, would prove far more cost-effective in saving lives than are widely accepted cancer screening measures, including mammography and colorectal cancer screening.³⁵⁴ The authors observed that a federal tax of one cent per pack of cigarettes could fully fund enforcement nationwide. The ultimate impact on youth smoking *per se* need not be the only reason to pursue STM laws, however. They might be desired simply as a statement of community values.

Mandated School Health Education

One of the earliest and still most popular responses to the problem of smoking is for state or local education authorities to mandate school health education programs that include tobacco and health. As noted earlier, the end users of health ed programming—students—might quite reasonably interpret such educational programming as an inform/persuade intervention. It is classified here

as law/regulation because, technically, it is a mandated intervention, required by policy makers. Whether students are informed or not, they are required to attend the classes. This said, one could still make a strong case for including it in the inform/persuade category from the point of view of the end user.

There is a rich tradition of developing and evaluating a wide variety of health education curricula, including education on tobacco and health.^{2,17,311,355} Many of the best designed and conscientiously followed curricula have significant effects on students' knowledge and attitudes toward tobacco use, as well as their behavior, at least during the years the educational program reaches them and up to four years thereafter. Although early health education efforts emphasized the dangers of smoking, subsequent research has demonstrated that content-specific curricula are not necessarily the best approach to behavior-related health education, including smoking. Meta-analyses have concluded that the "social influence resistance model" is the most effective approach to educating students as to how to deal with the issue of smoking.³⁵⁶⁻³⁵⁹ This approach emphasizes environmental influences on smoking (and other) decisions, aiming to help students develop skills to resist such influences as advertising and peer pressure.

School health education cannot be rated as an effective intervention, however, for two reasons: first, the behavioral achievements of several of the most successful interventions erode once the curriculum no longer covers tobacco and health³⁵⁵ and, in many instances, no significant effects are demonstrated.³⁶⁰ Booster programs in later years may help, but no one knows how to best structure such programs, nor when to present them.^{361,362} Second, relatively few schools have the resources and the trained teachers necessary to implement the state-of-the-art versions of the curricula introduced by their developers. As a consequence, the effectiveness of the intervention in practice generally falls far short of its efficacy under optimal research conditions. As implemented, few tobacco education curricula (or substance abuse curricula more generally) have demonstrated any sustained impact on smoking behavior.^{311,355,363,364}

While promising research continues in this area, it is safe to say that, to date, no single approach has demonstrated high levels of sustained behavior change. When one considers the substantial investment made in tobacco and health education in school health ed curricula, one must ask whether continued emphasis would represent a cost-effective use of scarce tobacco control resources. CDC³⁶⁵ recommends inclusion of social influences education in comprehensive state programs, as does the Surgeon General.² There is some evidence that health ed efforts work more effectively in communities experiencing other, active tobacco control initiatives.^{355,366} Still, the research-based evidence does not recommend that tobacco-specific school health education constitute a high priority in a state's or community's tobacco control program.

OTHER POLICIES

Comprehensive State Tobacco Control Programs

A handful of tobacco control policies do not fit neatly into the typology. The most important of these is the comprehensive state-based tobacco control program. It is important because evidence from the states that have adopted the most comprehensive programs—most notably, California^{367,368} and Massachusetts^{369,370}—as well as from national studies indicates that such programs can impact smoking significantly. The lack of fit of comprehensive programs within the typology results from their multidimensional nature, which can include everything from media campaigns to cessation programs to lobbying for higher taxes.

The progenitor of the comprehensive state-based program is the comprehensive community intervention, with several such programs tested in randomized trials in which a set of communities is assigned a multicomponent intervention, while a group of matched communities serves as the control. Some community intervention trials have been aimed at reducing youth smoking, while others have targeted adults. Interventions attempt to utilize multiple resources within the communities, ranging from health care professionals to schools, churches to the media, and so on. The objective is to alter community norms concerning smoking and, in the process, the smoking behavior of individuals.

In general, the studies targeting youth smoking have reported statistically significant reductions in smoking, at least during the period of follow up.³⁷¹⁻³⁷⁴ The Community Intervention Trial for Smoking Cessation (COMMIT) program involving 22 towns, which was funded by the National Cancer Institute (NCI), reported positive impacts on youth,³⁷⁵ although the principal target of the intervention was adult smokers. In that regard, COMMIT was not much of a success, failing to achieve its principal goal of reducing smoking among adult heavy smokers. It was associated with a small decrease in light to moderate smokers, however.^{376,377} COMMIT was followed by the American Stop Smoking Intervention Study (ASSIST), a large state-level demonstration project developed by NCI and the American Cancer Society. While research on the impacts of ASSIST has been limited, both an early (interim)³⁷⁸ and a final analysis³⁷⁹ reported statistically significant, if not large, impacts of ASSIST on smoking.

The Centers for Disease Control and Prevention enthusiastically supports comprehensive state tobacco control programs.³⁶⁵ The Institute of Medicine has also endorsed the comprehensive approach,³⁸⁰ as has The Robert Wood Johnson Foundation, through its programming (the Smokeless States program) and the written word.³⁸¹ CDC identifies nine program elements of an optimal state program: community programs to reduce tobacco use, chronic disease

programs to reduce the burden of tobacco-produced diseases, school programs, enforcement, statewide programs, countermarketing, cessation programs, surveillance and evaluation, and administration and management. Combined, CDC estimates, the best-practices package can be implemented at a per capita cost (in 1999 dollars) of from \$7 to \$20 in smaller states (population less than 3 million), \$6 to \$17 in medium-sized states (3–7 million population), and \$5 to \$16 in larger states (population over 7 million). To put these figures in perspective, Chaloupka and colleagues³⁸² observe that at the highest recommended spending levels, annual funding for all states combined would total less than 1% of what the nation spends each year on public funding of health care.

CDC, and most of the tobacco control community, hoped that program spending at least equaling the CDC minima would emerge from the 1998 Master Settlement Agreement between the states and the tobacco industry. The reality is that few of the settlement dollars have been devoted to tobacco control. Only four states are spending at CDC's minimum level and only 11 others are devoting even half the minimum to their tobacco control efforts.³⁸³

The policy analytic evidence supporting comprehensive state programs consists of two types. First is the evaluated experience of California, Massachusetts, and a few other states that have implemented comprehensive programs.^{384,385} These states have achieved significantly lower levels of cigarette smoking than the rest of the nation, with the incremental impacts attributed to their comprehensive approach to tobacco control. Both Pierce and colleagues³⁶⁷ and Siegel et al.³⁸⁶ have demonstrated that California's comprehensive program dramatically increased the rate of decline in smoking over that experienced in the rest of the nation during the early years of the program. Biener et al.³⁸⁷ demonstrated the same type of success in reducing smoking in Massachusetts. Recent research has demonstrated significantly larger decreases in heart disease³⁸⁸ and lung cancer³⁸⁹ in California than elsewhere in the nation. From 1988 to 1997, the incidence of lung cancer fell by 14% in the state, compared to less than 3% for the rest of the country.

The second type of evidence is an emerging body of research linking state expenditures to tobacco control success (measured in terms such as decreases in smoking prevalence). Still in its infancy, this research is finding a statistically significant association between expenditures and reductions in smoking.^{390,391} The degree of responsiveness is not large, but analyses like these confront at least two very challenging problems. One is the need to isolate the effects of such programming (for example, controlling for national influences, as well as those of states sharing a border). The second relates to the difficulty of developing a homogeneous index of effort (for example, a dollar spent in one state is not necessarily identical in terms of effectiveness to a dollar spent in another).

Collectively, the limited evidence on comprehensive programs supports their effectiveness and cost-effectiveness. Disentangling the contributions of

the various interventions in comprehensive programs, and assessing whether synergies derive from their concurrent presence, remains a research challenge of great difficulty, and also considerable importance.

Tobacco Harm Reduction

Another example of a policy—or more accurately, a possible policy—concerns how the introduction and marketing of “harm-reduction products” will be regulated. A very controversial subject,^{223,392-395} harm reduction has produced one element of consensus within the tobacco control community: so-called tobacco harm-reduction products³⁹⁶ must be subject to federal regulation.^{397,398} The precise method or nature of such regulation is unresolved, with opinions as to what can be accomplished, and how, varying quite dramatically. An Institute of Medicine committee declared regulation essential, and recommended that all marketing claims be subject to approval by a federal regulatory authority based on scientific evidence establishing the credibility of the claim.³⁹³ Others wish to see explicit regulation of the right to bring new products to market.^{397,398}

It is impossible to place tobacco harm reduction within the policy typology precisely because, to date, no one knows what type of policy, if any, will emerge. One can imagine policies that would fall into all three of the end-user categories in Figure 1.2.³⁹⁹ For example, regulatory control over advertising and labeling claims would constitute an inform/persuade intervention from the point of view of the consumer. A policy that applied differential taxation to new and old products, with the size of a product-specific tax proportionate to the estimated relative harm associated with each product, would constitute an economic incentive affecting end users. A policy that prohibited the marketing of novel products not demonstrated to meet some minimum exposure reduction criteria would fall into the law/regulation category. Presumably, comprehensive regulation of novel products could produce all three types of intervention.

The contemporary debate over harm reduction focuses attention on the issue of tobacco product regulation more generally. Clearly an area of immense interest within the field of tobacco control,⁴⁰⁰⁻⁴⁰³ and one of great policy relevance, product regulation has not yet become the subject of much policy research. The Food and Drug Administration’s (FDA) attempted foray into the area,^{404,405} and now the issue of harm reduction, could change that in the next few years.

Others

There are many other tobacco control policies that either can be or have been informed by policy research. Having reviewed the major policies, we will merely illustrate this observation with two examples. One involves the policy decision, addressed several years ago by the FDA, of whether nicotine replacement

products, specifically (then) patch and gum, should be sold over the counter (OTC). At stake in converting NRT products from prescription to OTC are such issues as whether the ready availability of the pharmaceuticals would increase utilization and possibly quit attempts, whether purchase of NRT products without physician guidance would result in less effective use of the products, and whether removal of the requirement of a prescription would reduce physician involvement in encouraging patients to attempt to stop smoking. Although the FDA's decision did not rest on such considerations (rather, it focused on safety), a number of analysts have tackled this multifaceted question in an attempt to estimate whether making patch and gum OTC would increase or decrease quitting. Suffice it here to say that these analysts have not arrived at a consistent conclusion, although the majority of studies has found that the move to OTC increased product use and cessation.⁴⁰⁶⁻⁴¹⁴ To date, we do not have a definitive answer as to whether this policy change has improved tobacco control. In any case, given the limited use of NRT in either mode—prescription or OTC—the impact likely has not been substantial in either direction.⁴¹⁵

A second and more contemporary concern relates to the depiction of smoking in movies. Strikingly, while smoking in society has declined substantially over the past five decades, smoking in the movies has not.⁴¹⁶ A number of studies have examined the relationship between adolescents' viewing of movies with smoking and their subsequent propensity to smoke. Much of this literature finds that depiction of smoking in films does increase youth smoking, and tobacco control activists have been taking on the domestic film industry in the hope of persuading its leaders to reduce the use of cigarettes in movies.⁴¹⁷⁻⁴²⁶ Recommendations have varied from voluntary restrictions on the portrayal of smoking, to requirement of antismoking ads preceding movies with smoking in them, to requirement of an R rating for movies with substantial smoking. Although the policy resolution of the issue remains to be seen, Congress has shown a willingness in the past at least to debate controls on producers of film, music videos, and other popular media.

CONCLUSION

Tobacco remains this nation's leading cause of preventable premature mortality and will retain this dubious distinction for the foreseeable future. At the same time, interventions to combat tobacco use since the mid-1960s have constituted the single most productive public health effort of the past half century. The antismoking campaign likely can claim credit for having averted the premature deaths of more than 3 million Americans (author's estimate, updating Warner⁶⁸). Each of those beneficiaries of the campaign has gained an average of 15 years of life.

The “antismoking campaign” is, in actuality, an uncoordinated collection of diverse interventions implemented by voluntary health organizations, schools, businesses, health care organizations, and governments. Tobacco control policies have constituted a central component of the campaign, one that has grown in relative importance over the years. Policies have emerged from the ideas and passions of many individuals and organizations. Determining which of those policies most matter, and which do not, has been the contribution, and often the passion, of scores of tobacco policy researchers.⁴²⁷

In general, the link between research and practice is often nebulous. The link between policy research and policy practice is less so. As this review has indicated, although policy making is not always consistent with the dictates of policy research, the contributions of research to tobacco control policy making are often clear and substantial. A notable example, discussed in detail above, concerns tobacco taxation, an area in which research informed and then transformed practice. Research linking price changes to changes in demand for cigarettes,^{100,155} translated for a public health audience,^{157,428} played an apparently direct role in sustaining the federal cigarette excise tax in 1986.¹⁵⁸ Since then, the public health community’s view of using taxation to combat smoking has undergone a sea change, converting taxation from a pariah to a mainstay of tobacco control. The message has successfully circled the globe. There is no serious discussion of tobacco control policy in any country on the planet that does not consider tax increases an essential component.^{50,152}

Other domains of tobacco policy have benefited similarly from sound research. The nonsmokers’ rights movement, culminating in scores of clean indoor-air laws at the state and local level, received support in its early years from the then-emerging evidence that exposure to environmental tobacco smoke posed a serious health risk for children and adults alike.^{11,429} Soon thereafter, empirical evidence accrued showing that, in addition to protecting nonsmokers, workplace smoking bans increased the smoking cessation rate of workers.²⁸⁵ This added to the impetus to get rid of environmental smoke, producing a remarkably rapid transformation of the American workplace. More recently, the more explicitly policy-focused research on the economic impact of bans on smoking in public places has provided powerful ammunition to deflate opponents’ arguments against such bans, especially in restaurants and bars.³⁰⁰⁻³⁰⁷

Some policy research has offered support to proponents of measures that seem like “the right thing to do,” almost independent of their direct impact on smoking. The tobacco control community has long sought a ban on all forms of tobacco advertising and promotion. The research on the effectiveness of such bans in reducing smoking rates is decidedly mixed, with no smoking gun to create a strong evidence-based argument in support of bans. Collectively, however, the evidence leans strongly in the direction of concluding that advertising and promotion do affect overall consumption.¹ Saffer and Chaloupka²⁴ have

presented a compelling argument that a truly comprehensive ban on all forms of promotion would diminish smoking by approximately 6%. In contrast, they concluded, partial bans were unlikely to affect smoking much if at all. Cited frequently, that work now provides an intellectual underpinning for the call in many countries for a comprehensive ban.

Research findings do not always support the conventional wisdom. When that “wisdom” is backed by a strong philosophical position as well, evidence derived from research may prove irrelevant to subsequent action on a policy. A notable example in tobacco control is the enthusiastic support of the public for youth possession, use, and purchase prohibitions (PUP laws), backed by penalties for offenders. Despite little evidence that such laws have an impact on smoking,³²² their popularity continues unabated. That popularity has led some researchers to conclude that we are simply stuck with these laws, their lack of effectiveness notwithstanding.

If not all tobacco policy research plays a significant role in the real world of policy making, at least enough of it does to consider the investment in research well worthwhile. The tobacco policy research enterprise almost certainly more than pays its own way. The direct investment itself is modest, on the order of a few million dollars per year. The contributions of research to the determination of cost-effective expenditure of scarce tobacco control resources alone may more than justify its existence. After all, estimates of the costs of smoking in the United States run into the many tens of billions of dollars per year.¹² A small research-induced dent in that total would readily justify a great deal more research funding than is being expended at present.

Tobacco policy research has made contributions to the real world of policy making for at least two decades now. The early contributions derived from the efforts of a relatively small number of researchers, drawing on a small pool of available resources. The advent of The Robert Wood Johnson Foundation’s Tobacco Policy Research Program, and its successor, the Substance Abuse Policy Research Program, produced an explosion of interest in tobacco policy, one that drew the attention of both established scholars and new researchers. The result has been a profusion of new research, much of it strikingly innovative, all of it either extending the findings of earlier work or delving into previously unexamined issues. With the expanded base of support has come new understanding, typically far more sophisticated than that which existed in the early 1980s. This new understanding has lent insight into difficult policy issues, while spawning a new generation of questions as well. As a consequence of the cornucopia of new studies, few tobacco policy debates occur today without the input of what research has taught us. Dramatically magnifying the public health benefit of research insights is the fact that so much of the understanding developed through this work is diffusing to scores of countries around the world.

The collective enterprise has produced one other benefit as well: the creation of an intellectually vibrant group of scholars who can support and challenge each other. It is from this group that will come the next generation of policy insights. In turn, the new social and policy problems posed by the old scourge of tobacco will define the next set of questions that tobacco control policy scholars will scrutinize.

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