ALASKA LEGISLATURE COMMITTEE FILES 1993-1994 8672
8407 SENATE LABOR & COMMERCE

## HIGHER CIGARETTE TAXES WILL SIGNIFICANTLY REDUCE SMOKING

A fundamental economic concept holds that the demand for a product goes down as its price goes up. This relationship between demand and price is true for cigarettes as well as other products. As a result of numerous studies over the past decade, economists have reached a general consensus on the following points:

* The price elasticity of demand[6] for cigarettes is in the range of -0.3 to -0.5. That means that a 10 percent increase in the price of cigarettes is expected to cause a 3 to 5 percent decline in cigarette consumption. Most economists accept -0.4 as a reasonable mid-range price elasticity of demand estimate for cigarettes.

* Teenagers are at least as responsive to changes in price as adults. There is some evidence that teenagers are significantly more responsive to price changes than adults.[7]

* The price elasticity of demand for large price increases is expected to be at least as large as for small increases.[8]

* The consumption reduction in response to price increases is largely due to a decrease in smoking prevalence rather than a decrease in the number of cigarettes smoked by each smoker. This is significant because it means that price increases have the desired effect from a public health perspective: they discourage teenagers from starting and encourage current smokers to quit.[9]

Figure 2 illustrates the significant reductions in cigarette consumption that would result from major tax increases.

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[6] According to the 1992 Surgeon General's report, "Price elasticity of demand measures the degree of responsiveness of demand to changes in price; it is the percent change in the quantity of a good demanded, divided by the percent change in price that caused the demand change." Smoking and Health in the Americas, U.S. Department of Health and Human Services, DHHS Pub. No. (CDC) 92-8419, p. 129.

[7] One study has estimated that the price elasticity of demand for cigarettes among teenagers is in the range of -1.44, more than three times the elasticity figure for adults. Lewit, Coate and Grossman, "The Effects of Government Regulation on Teenage Smoking," Journal of Law and Economics, vol. 24, pp. 545-569, December, 1981.

[8] Consensus statement adopted by the "Tobacco Tax Working Group" convened by the National Cancer Institute, November 11, 1992.

[9] Smoking and Health in the Americas, U.S. Department of Health and Human Services, DHHS Pub. No. (CDC) 92-8419, p. 129-131.

# Projected 1993 Consumption of Cigarettes At Alternative Tax Levels

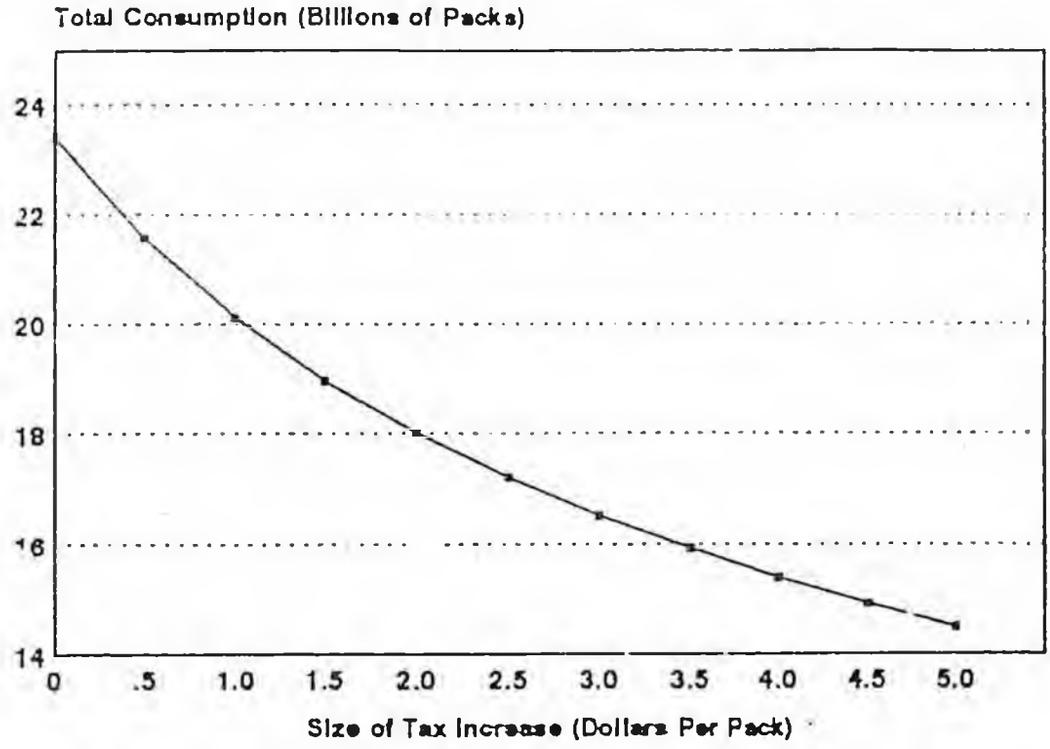


Figure 2

NOTE:
Figure 2 projects total 1993 U.S. cigarette consumption based on the following assumptions: (1) estimated price elasticity of demand for cigarettes of -0.4; (2) estimated average 1993 price per pack of $2.16 in the absence of major tax increases, based on historical trends; (3) estimated 1993 cigarette consumption of 23.418 billion packs in the absence of major tax increases, based on historical trends. For purposes of this illustration, no assumptions were made regarding pricing decisions by manufacturers,wholesalers and retailers in response to tax increases; such decisions could have a significant effect on price and consumption.

## HIGHER CIGARETTE TAXES COULD SAVE MILLIONS OF LIVES

Cigarette taxes have an enormous potential to rapidly and significantly reduce smoking by discouraging young people from beginning to smoke and encouraging some current smokers to quit. Over time, major cigarette tax increases could save millions of lives. A proposal to raise cigarette taxes is therefore, first and foremost, a public health measure.

The table below provides conservative, lower-bound estimates of the number of people who would avoid or break free of tobacco addiction as a direct tesult of cigarete tax increases.

HEALTH BENEFITS OF CIGARETTE TAX INCREASES[10]

| Amount of Tax Increase | Number Fewer Smokers |
|---|---|
| $ .50 | 2.5 million |
| $1.00 | 4.5 million |
| $2.00 | 7.6 million |
| $3.00 | 9.8 million |
| $4.00 | 11.5 million |
| $5.00 | 12.8 million |

The number of premature deaths that would be averted by major tax increases cannot be predicted with precision, but may be estimated. For example, if one out of four of those discouraged from smoking avoids dying prematurely as a result, then:

* A $1 per pack tax increase, maintained in real terms, would save about **1.1 million lives** over time -- preventing more deaths than have been caused by illicit drugs throughout U.S. history.

* A $2 per pack tax increase, maintained in real terms, would save about **1.9 million lives** over time -- preventing more American deaths than have been caused by all wars in which the U.S. has participated combined.

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[10] All estimates are based on hypothetical tax increases taking effect in 1993, and are based on the following assumptions: (1) Tax increases are maintained in real terms over time; (2) A price elasticity estimate for smoking participation of -0.26; that is, a 10 percent increase in price is expected to result in approximately a 2.6 percent decrease in the total number of smokers in the population. This estimate is supported by research by Lewit and Coate (1982), as cited in Smoking and Health in the Americas, U.S. Department of Health and Human Services, Office on Smoking and Health, DHHS Publication No. (CDC) 92-8419, p. 131; (3) Projected average price per pack of cigarettes in 1993 of $2.16 in the absence of major tax increases, based on historical trends; (4) A 1993 smoking population of 46 million; (5) A conservative estimate that one of three long-term smokers will die of disease caused by smoking.

## REVENUE POTENTIAL OF HIGHER CIGARETTE TAXES

A major cigarette tax increase will dramatically improve the health of Americans and raise tens of billions of dollars to address other state and national priorities.

Federal, state and local governments collected about $11 billion in cigarette excise taxes in 1991.[1] That is a fraction of the revenue that could be generated if the health benefits of raising cigarette taxes were raised substantially for health reasons.

Figure 3 shows that cigarette tax revenue would jump from about $15 to almost $50 billion if cigarette taxes were raised by $2 per pack, a revenue gain of nearly $35 billion. A $1 per pack increase would generate nearly $20 billion in new revenue.

New revenue generated from substantially increasing cigarette taxes may be used to help meet pressing needs at the state and federal levels, including:

* **Deficit reduction**
* **Health care reform**
* **Health promotion, education and research**
* **Minority and urban health care**
* **Tobacco control**

The ability of cigarette tax revenues to address these critical budget needs provides an enormous "fringe benefit" of a cigarette tax policy that also is justified on health and economic grounds.

[1] The Tax Burden on Tobacco, The Tobacco Institute, Washington, DC, 1991, vol. 26.

# Projected 1993 Cigarette Tax Revenue At Alternative Tax Levels

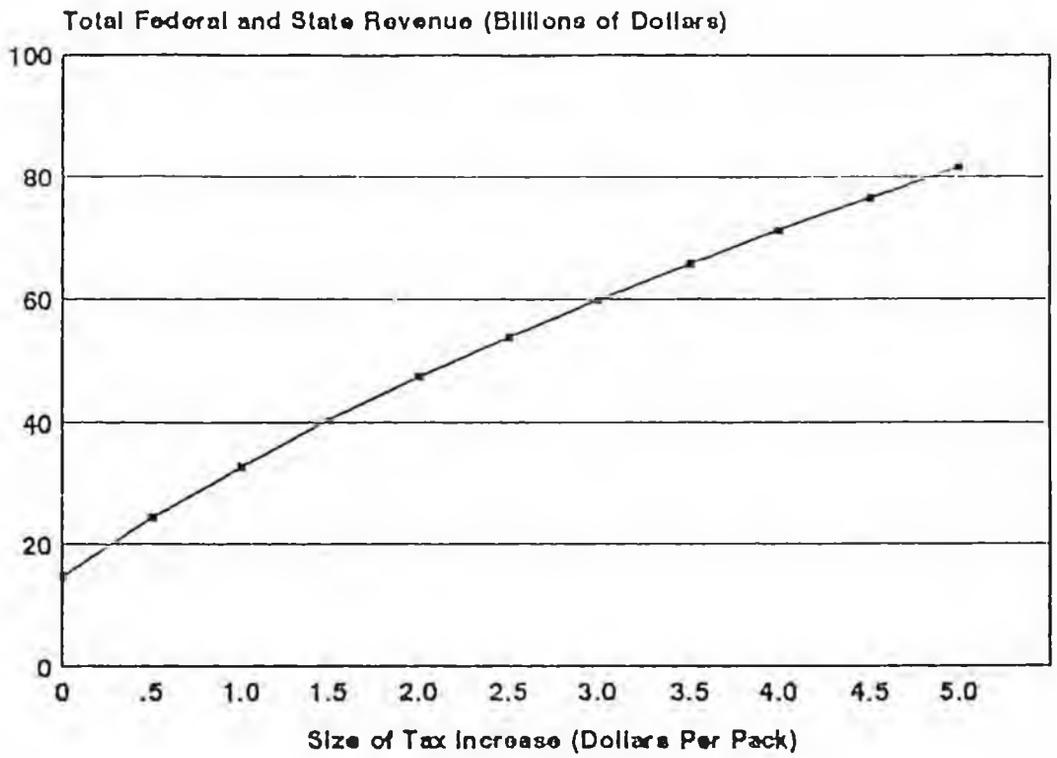


Figure 3

NOTE:
Figure 3 projects combined federal and state revenue in 1993 uollars based on the following assumptions: (1) estimated price elasticity of demand for cigarettes of -0.4; (2) estimated average 1993 price per pack of $2.16 in the absence of major tax increases, based on historical trends; (3) estimated 1993 cigarette consumption of 23.418 billion packs in the absence of major tax increases, based on historical trends. For purposes of this illustration, no assumptions were made regarding pricing decisions by manufacturers, wholesalers and retailers in response to tax increases; such decisions could have a significant effect on price and consumption.

## HIGHER TOBACCO TAXES BENEFIT FEDERAL AND STATE GOVERNMENTS

Federal and state governments would gain significant new revenue if tobacco taxes were raised dramatically.

Because today's rates are relatively low, higher tax rates would result in declining smoking rates while still allowing large increases in revenue. State governments may be net winners even if only the federal government increases cigarette taxes significantly, assuming that the states are able to negotiate an equitable revenue sharing formula that returns a portion of federal cigarette tax revenue to the states. Nevertheless, tobacco tax increases at all levels of government would provide the greatest health and economic benefits.

Concerns that higher cigarette taxes will soon lead to declining revenue due to lower smoking rates are not warranted. Higher cigarette taxes will result in higher government revenue even at the highest estimates of the price elasticity of demand for cigarettes. This fact has been proven repeatedly by no greater authority than the tobacco industry itself. It has consistently increased prices by 10-12 percent per year, thereby increasing the cost of cigarettes. As a result, cigarette company profits continue to skyrocket despite reduced consumption.

To ensure that tobacco taxes do not decline in real terms, tobacco taxes must be indexed (i.e. automatically adjusted) to keep pace with rapid increases in the price of cigarettes imposed by the tobacco industry. This is a critical point currently overlooked by state and federal governments alike.

## PAYING FOR THE DAMAGE CAUSED BY SMOKING

Cigarette taxes may be viewed as compensation for the burden of death, disease, health care costs, fires, and lost productivity that smoking imposes on society.

The costs associated with smoking are enormous by any measure. They include:

* An estimated $501 billion in excess lifetime health care costs for current and former smokers. That number grows by approximately $9-10 billion annually due to the additional excess lifetime health care costs of the one million teenagers who take up smoking each year.[12]

* An estimated $65 billion in health care costs and lost productivity in 1985, or $2.17 per pack of cigarettes sold that year.[13]

By focusing on easily quantifiable costs, these estimates exclude intangible costs such as the pain and suffering of people with tobacco-caused diseases, and of their families and friends. These costs may be as great or greater than the already enormous health care costs. Moreover, this backward-looking approach assigns no value to the millions of lives higher cigarette taxes would save in the future by discouraging teenagers from beginning to smoke in the first place. These factors also should be considered in establishing an adequate cigarette tax.

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[12] Hodgson, Thomas A., "Cigarette Smoking and Lifetime Medical Expenditures," The Milbank Quarterly, Vol. 70, No. 1, 1992, pp. 81-125. Hodgson's estimates project lifetime health care costs for smokers 25 and older in 1985, based on current smoking trends. Estimates are expressed in 1990 dollars with future costs discounted at 3 percent.

[13] Office of Technology Assessment, U.S. Congress, "Smoking-Related Deaths and Financial Costs," September 1985 (Staff Memorandum).

## CIGARETTE TAXES ARE FAIR

Despite overwhelming evidence of the health and economic benefits of higher cigarette taxes, the cigarette industry argues that such taxes are unfair to poor people, the elderly and tobacco farmers. None of these charges withstands scrutiny.

**Low income Americans.** Low income Americans are targeted by cigarette industry advertising campaigns, have higher smoking rates than many other groups, and suffer disproportionately from smoking-related diseases. At the same time, they are least able to afford the added health care costs, and least likely to have access to health care, health education programs, or smoking cessation services. Under these circumstances, inexpensive cigarettes should be viewed not as a "benefit" to be protected, but as a cause of higher rates of smoking, disease and highe health care costs. Research conducted in the United Kingdom[14] shows that lower socio-economic groups are more responsive to changes in cigarette prices than other groups, an thus are more likely to successfully quit smoking in response to tax increases. Assuming that this find ng applies in the United States, higher cigarette prices will result in greater long-term health and economic benefits to persons with low incomes than to other socioeconomic groups. These benefits would be even greater if tobacco tax revenues are used to fund programs that serve the poor.

**The elderly.** Only 11.5 percent of women and 14.6 percent of men over the age of 65 smoke.[15] These are the lowest rates of all age groups. Therefore the elderly will be least affected -- positively or negatively – by major cigarette tax increases.

**Tobacco farmers.** The tobacco industry argues that higher taxes harm tobacco farmers. The truth is that tobacco farmers now earn only 3 cents of every dollar in cigarette sales, while 73 cents goes to manufacturers, wholesalers and retailers.[16] In the case of a $2 per pack increase in the federal cigarette excise tax, tobacco farmers would lose only about $1 due to decreased smoking for every $100 in new revenue raised by higher tobacco taxes. To put it another way, the government would have to forego $100 dollars in revenue for every $1 it "saves" for the tobacco farmer -- an absurdly inefficient subsidy program by any standard.

Another important point is that reduced demand for U.S. tobacco is only partly due to falling consumption in the United States. A greater cause is that U.S. cigarette companies are increasing imports of tobacco grown outside the United States. More than 36 percent of all tobacco in U.S.-made cigarettes was imported in 1991, compared to 13 percent in 1969.[17]

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[14] Townsend, Joy L., "Cigarette Tax, Economic Welfare and Social Class Patterns of Smoking," Applied Economics, 1987, 19, 355-365.

[15] CDC, "Cigarette Smoking Among Adults, United States, 1990," MMWR, vol 41, pp. 354-362, May 22, 1992.

[16] USDA, "The Cigarette User's Dollar," Tobacco Situation and Outlook Report, June, 1992.

[17] United States Department of Agriculture, Tobacco Situation and Outlook Report, September, 1992, p. 37.

For these reasons, the answer to challenges facing U.S. tobacco farmers is not to encourage Americans to smoke by keeping taxes low or to promote smoking abroad. A better solution would be to use a small portion of cigarette tax revenues to pay for programs to assist tobacco farmers in substituting alternative crops or finding other employment. Such programs have been used successfully in Canada and New Zealand.

## REVERSING THE DECLINE IN U.S. CIGARETTE TAX RATES

It is a bitter irony that, alone among developed countries, the U.S. has allowed cigarette taxes to fall significantly in real terms since the dangers of smoking were first revealed in the 1950s.

The decline in cigarette taxes is even more dramatic when expressed as a percentage of the price of a pack of cigarettes. (See Figure 4.)

In order to restore overall (state and federal) taxes to their 1965 level of 50 percent of pack price, current taxes would, at a minimum, need to be tripled from the 1992 average (federal and state) of approximately 50 cents to about $1.50.

Of course the goal should not be to restore taxes to their level before the health risks of smoking were known, but to raise them substantially for health and economic reasons.

The reason tobacco taxes expressed as a percentage of pack price have fallen so dramatically is that the cigarette industry has raised wholesale prices at three times the rate of inflation in recent years, or about 12 percent per year. (See Figure 5.)

The combination of low tobacco taxes and sharp price increases has resulted in huge profits for the tobacco industry. Philip Morris, for example, enjoyed profits on its domestic cigarette sales of more than 40 percent in 1991.[18] That is more than eight times the average profit on other nondurable manufactured products in 1991.[19]

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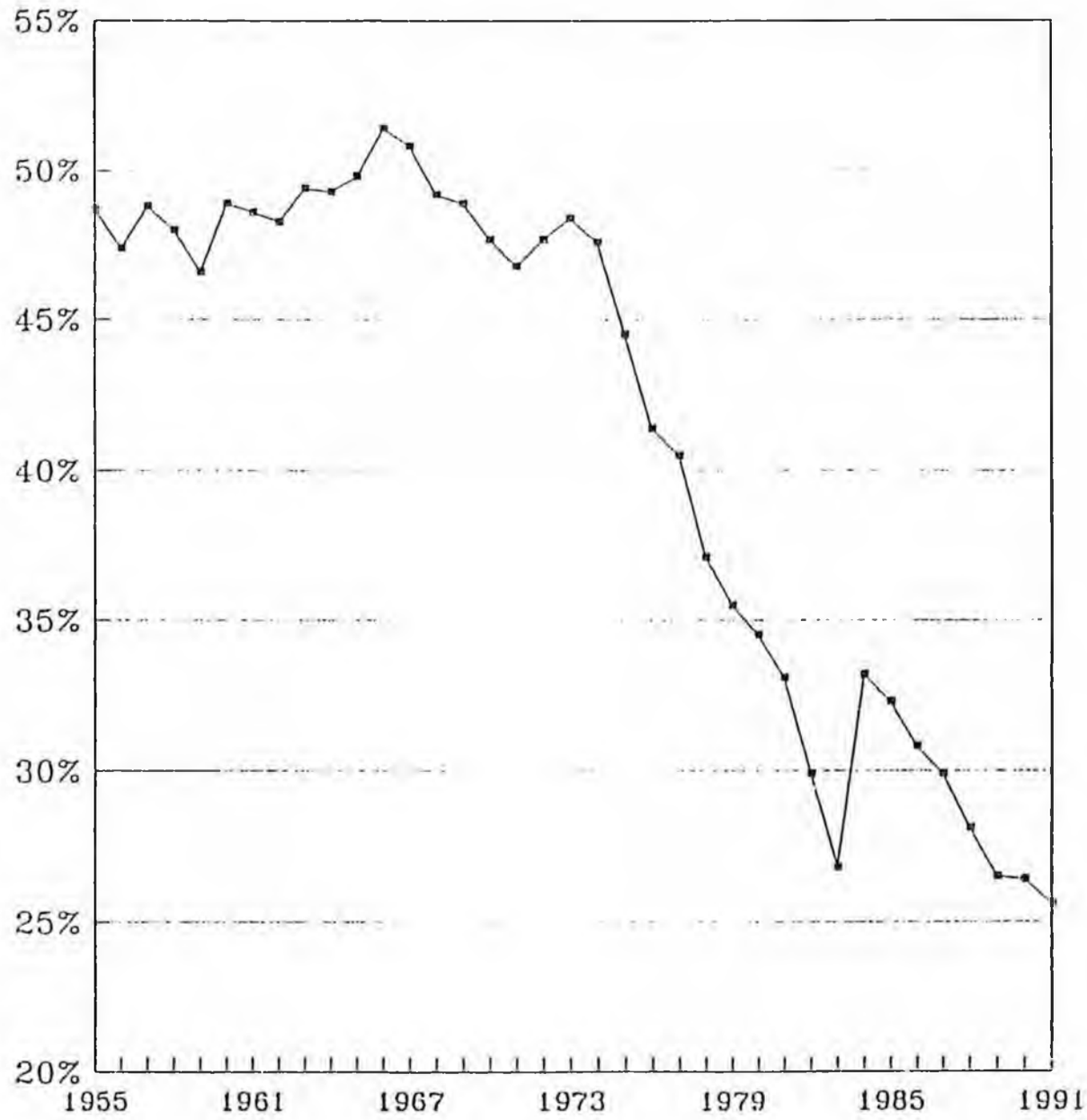
[18] Operating profits divided by operating revenue, Philip Morris Companies Inc. Annual Report, 1991.

[19] Quarterly reports of average profits by nondurable manufacturers ranged from 3 percent to 5 percent in 1991, according to data provided by the Bureau of Labor Statistics, U.S. department of Labor.

Figure 4

# TOBACCO TAXATION IN THE UNITED STATES

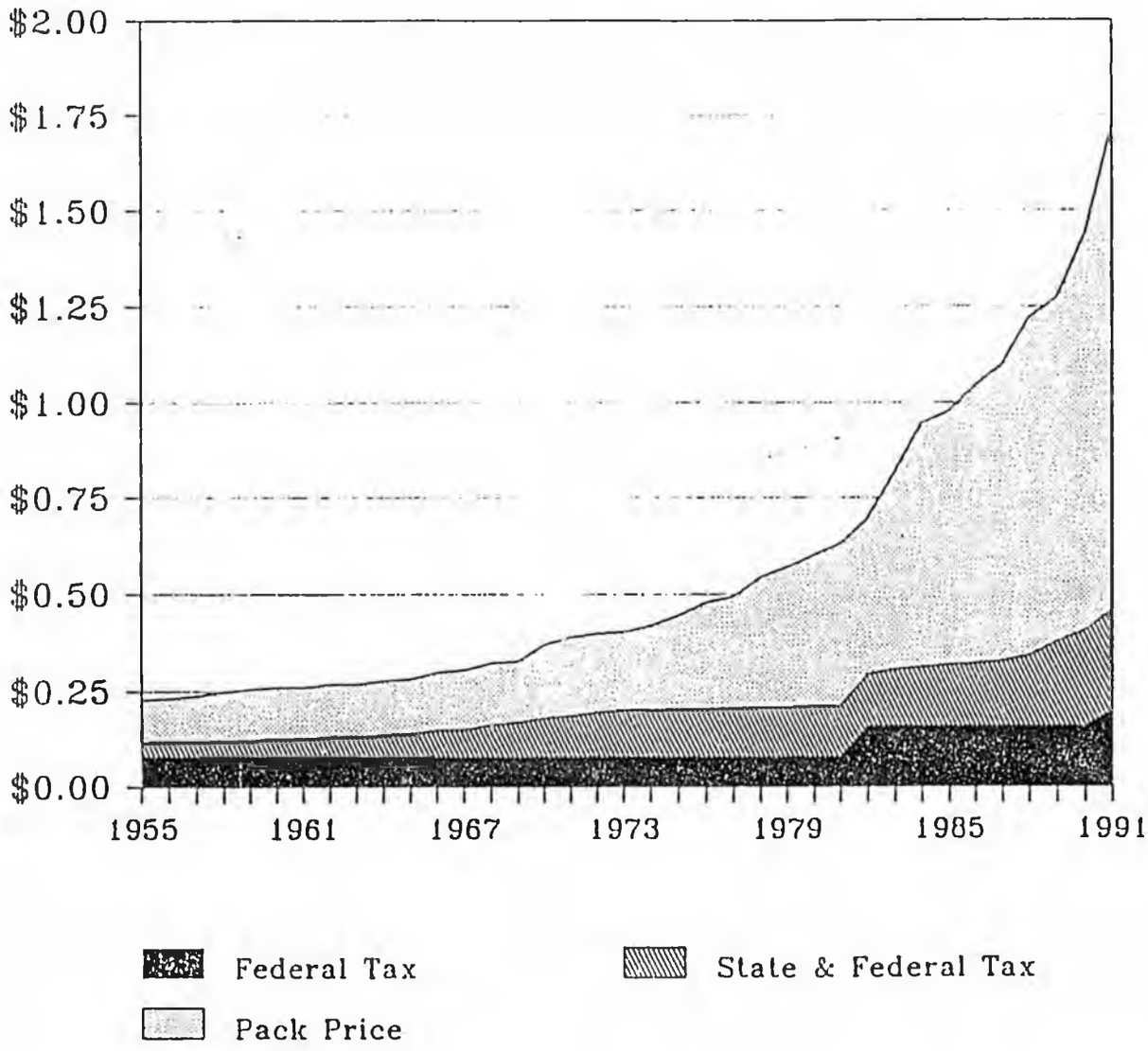
## AVERAGE CIGARETTE TAX AS A PERCENTAGE OF RETAIL PRICE




Source: The Tax Burden on Tobacco,
The Tobacco Institute,
Volume 26, 1991, p. 230

Figure 5

# U.S. Tobacco Taxes Versus Pack Price 1955–1991




Source: The Tax Burden on Tobacco,
The Tobacco Institute
Volume 26, 1991, p. 230

## THE PUBLIC SUPPORTS HIGHER CIGARETTE TAXES

Surveys conducted over the past several years consistently show that higher cigarette taxes are an acceptable method of raising revenue and reducing deficits.

- A December, 1992 national poll by Louis Harris and Associates found that 76 percent of voters support higher cigarette and liquor taxes to pay for health care reform.[20]

- An April, 1992 national poll conducted by Peter Hart & Associates showed 76 percent of the public believes that raising cigarette and liquor taxes would be a good (46 percent) or acceptable (30 percent) way to fund a national health insurance plan.[21]

- A 1989 national poll found that 76 percent of the public either favors or strongly favors an increase of the cigarette excise tax as a means of reducing the federal budget deficit.[22]

- A September, 1992 Michigan poll found that more than twice as many voters would vote for a candidate for the state legislature who supported a 25-cent increase in the state's tobacco tax (58 percent) than would vote for a candidate who opposed the tax increase (27 percent).[23]

- A 1992 poll in Massachusetts found 70 percent of the state s public favored a 25-cent increase in the state's cigarette excise tax. Support remained strong (68 percent) even after respondents were told that the increase would give Massachusetts the highest cigarette tax in the nation.[24]

This strong support for higher cigarette taxes has proven resilient in the face of aggressive tobacco industry media campaigns. Californians approved higher cigarette taxes by a 16 point margin in a 1988 referendum, despite a tobacco industry media blitz that outspent health groups by more than 13 to 1. More recently, Massachusetts voters approved a 25-cent increase by a 10 point margin despite an even higher rate of industry spending. In contrast, other revenue-raising options face formidable public opinion barriers. The 1992 Peter Hart & Associates survey showed that cigarette and liquor taxes are more than twice as acceptable to Americans as higher payroll, gasoline, estate or across-the-board income taxes.

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[20] Henry J. Kaiser Family Foundation, Harvard University, Louis Harris and Associates, cited in Robert J. Blendon, et. al., "The Implications of the 1992 Presidential Election for Health Care Reform," Journal of the American Medical Association, Vol. 268, pp. 3371-3375.

[21] "Financing National Health Care: A Nationwide Survey of Voters' Opinions," The Mildred and Claude Pepper Foundation, May 15, 1992, p. 29.

[22] "The People, the Press and Politics: Public Opinion About Economic Issues," A Times-Mirror Survey, March, 1989.

[23] "Cigarette Taxes and 1992 State Elections," American Lung Association - Michigan, September 1992.

[24] "A Study of Attitudes Among Voters in Massachusetts," May 20, 1992.

## PUTTING HIGHER CIGARETTE TAXES TO WORK: EXAMPLES FROM THE U.S. AND ABROAD

The health and economic benefits of higher cigarette taxes are not merely theoretical. They already have been achieved in some developed countries and, to a lesser extent, in some U.S. states. The states and nations that have successfully raised cigarette taxes provide useful models for the United States and proof that higher cigarette taxes work.

### California

In 1988, California voters approved Proposition 99, which raised state cigarette taxes from 10 to 35 cents, the second lowest rate in the nation at that time. Health and economic benefits have been substantial:

* Cigarette smoking dropped 17 percent between 1989 and 1991, about twice the U.S. average.[25]
* Regression analysis shows that a 5 and 7 percent decline in consumption during the first year of the tax is due to the tax increase alone. [26]
* Revenue raised by the tobacco tax has been used to fund medical care for the indigent, tobacco control programs and research, parks and wildlife programs and firefighting services.

### Canada

Canada provides the clearest example. Combined federal and provincial cigarette taxes there were raised from an average of 46 cents in 1980 to $3.27 in 1991. The sharpest increases came in the late 1980s, as government explicitly adopted a pro-health approach to tobacco taxation. Canada's policy has paid off handsomely:

* Teen smoking has been reduced by approximately two-thirds since 1980, according to the Non-Smokers' Rights Association. This decline in smoking is expected to save hundreds of thousands of lives over time.
* Total cigarette consumption is falling faster than in any major industrialized nation; The rate of decline is more than twice that of the United States. (See Figure 6.)
* Cigarette tax revenue has grown from about $1 billion in 1981 to more than $7 billion in 1991.

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[25] Burns, D. Pierce, J.P., Tobacco Use in California 1980-1991, California Department of Health Services, 1992, p. 31.

[26] Flewelling et al., "First Year Impact of the 1989 California Cigarette Tax Increase on Cigarette Consumption," American Journal of Public Health, June 1992, Vol. 82, No. 6, p. 867-869.

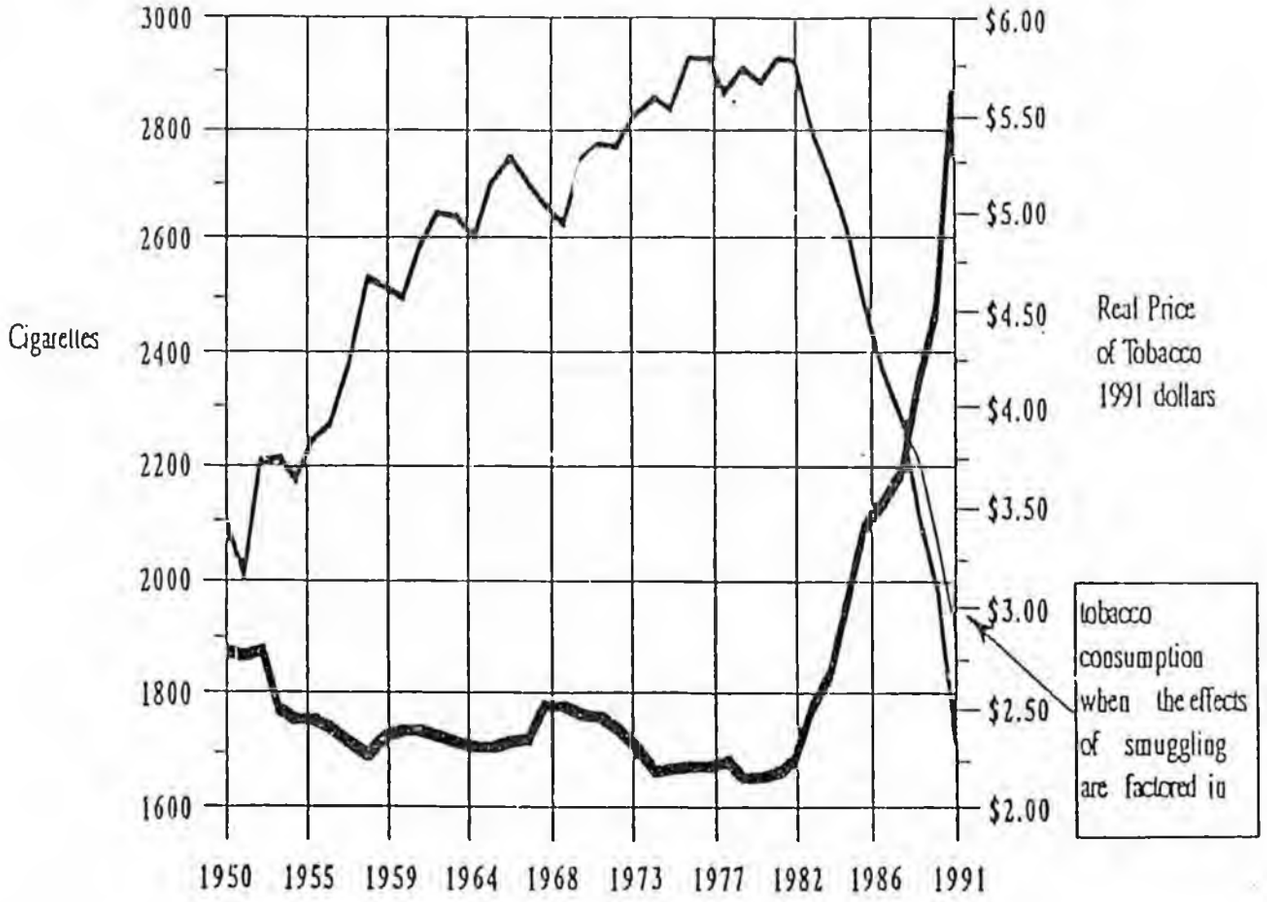
While other factors, such as Canada's ban on cigarette advertising, also contributed to Canada's success, experts agree that the tax increases have been the most important component of Canada's comprehensive tobacco control program.

Other Countries

Other countries, including Australia, New Zealand, the United Kingdom, Ireland and Hong Kong also have raised cigarette taxes substantially on health grounds. In contrast, the steady decline in U.S. cigarette taxes (in real terms) has left the United States with the lowest cigarette tax of the major industrialized nations. (See figure 7.)

Figure 6

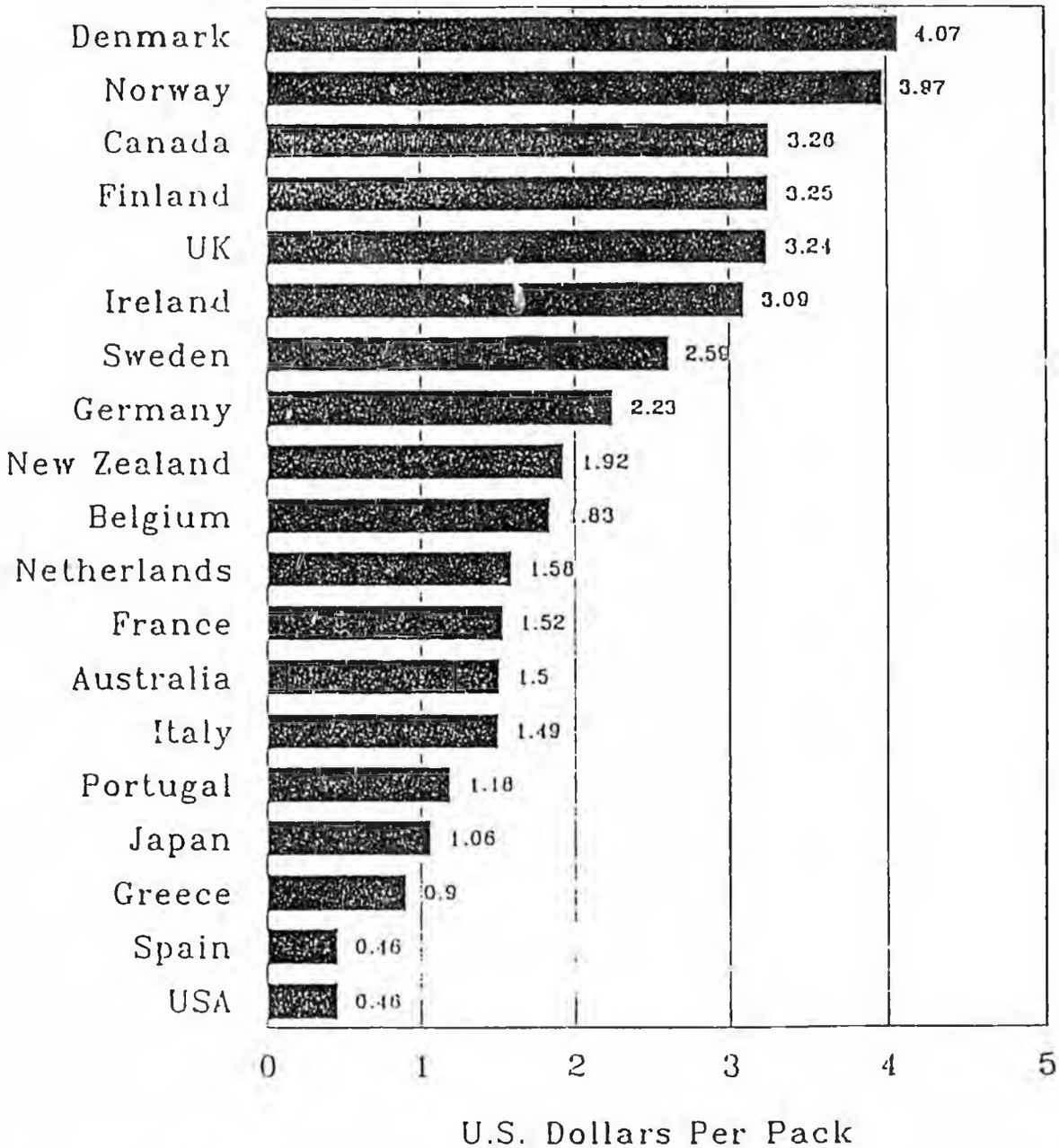
ANNUAL PER CAPITA CONSUMPTION OF CIGARETTES
AND REAL PRICE OF TOBACCO (per 20 cigarettes)
CANADA 1950 - 1991




Note: Cigarettes include fine-cut equivalents. Chart provided courtesy of the Non-Smokers' Rights Association, Ottawa, Canada.

Figure 7

# Cigarette Taxes in Developed Nations
## Data from 1991 & 1992




Notes:

1. Foreign taxes expressed in U.S. dollars are approximate due to currency fluctuations.
2. Data provided by the Non-Smokers' Rights Association of Canada; analysis by Public Citizens' Health Research Group; chart produced by the Coalition on Smoking OR Health.

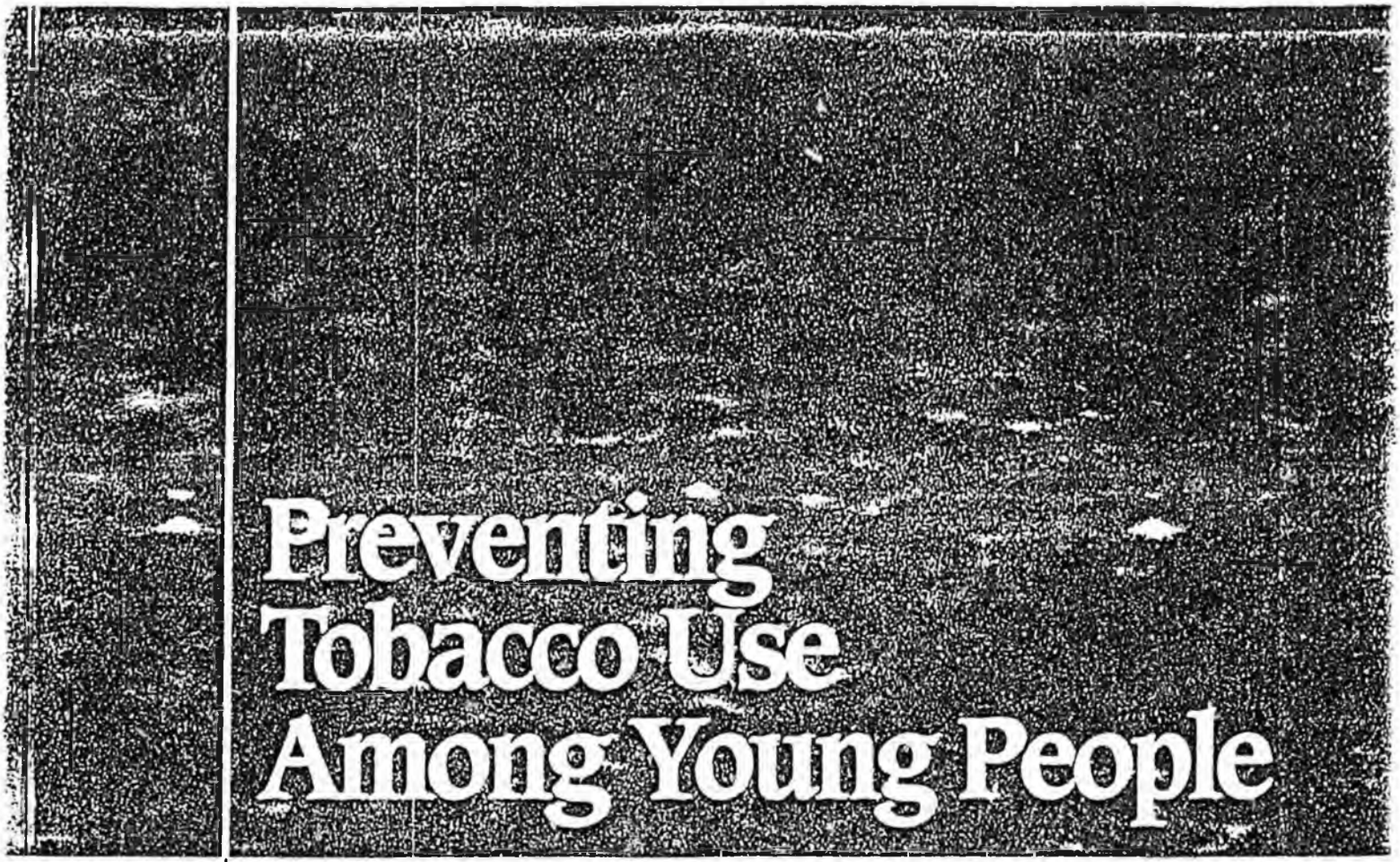
## POLICY RECOMMENDATIONS

On the basis of the information set forth in this document, the American Cancer Society, American Heart Association and American Lung Association, united as the Coalition on Smoking OR Health, have adopted the following policy positions with respect to the taxation of tobacco products:

1. The time has come for the United States to enact major increases in state and federal cigarette taxes in order to reduce teen smoking, save lives, and offset the costs of smoking by raising significant new revenue.

2. Federal and state cigarette taxes should be indexed to the average wholesale or retail price of cigarettes, or to a comparable measure that will ensure that cigarette taxes will, at a minimum, keep pace with rising cigarette prices.

3. All other tobacco products, including snuff, chewing tobacco, rolling tobacco, pipe tobacco and cigars, should be taxed in proportion to the rate imposed on cigarettes.



# Preventing Tobacco Use Among Young People

# A Report of the Surgeon General

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control and Prevention
National Center for Chronic Disease Prevention and Health Promotion
Office on Smoking and Health

By contrast, subjects could almost always read the brand names and identify the advertisement's notable imagery.

Despite the negligible attention and poor readability reported across these studies, there is some evidence that consumers have moderate awareness of the current four warning messages. Using a warning recognition test (rather than a test of the prominence or strength of the message) to assess basic awareness and attention, Lieberman Research (unpublished data) found that one-half of smokers (but fewer than one-half of nonsmokers) were able to correctly recall one of the rotational warnings. Nearly all recalled the single pre-1985 warning. However, Fischer et al. (1989) obtained different results in their masked recall test with adolescents. After adolescents viewed a series of ads, the researchers covered up the advertisement headings, all specific references to cigarette brand names, and the Surgeon General's warning. Three fourths of participants could identify the masked warning as a health message, but only 19 percent could recall even the general theme of the warning. These data may suggest that adolescents are generally aware of the presence of warning labels in tobacco ads but are far less informed than adults are of the specific health messages. Similarly low levels of warning recall among young adults were found for the smokeless tobacco warnings (Popper and Murray 1989).

Research in communication effectiveness (Day 1973) suggests that when viewers actually attend and read them, warnings do more than merely provide information. Warnings can also produce potentially affective and behavioral impacts (Beltramini 1988). Analyses of the wording and format of mandated health warnings have suggested reasons for the limited affective and behavioral impact that can occur even under optimal conditions of attention and processing. For example, use of any conditional words such as *can* and *may* can dramatically reduce the effect of the entire warning (Linthwaite 1985). Since two of the current rotational warnings include the word *may* (see Table 12), consumers may minimize the inherent health warnings of these messages (Dumas 1992). Furthermore, although the information presented in the current warnings is more detailed and more absolute than the pre-1985 single warning, it is also presented in a more impersonal manner. Readers may be more likely to believe, learn from, and act on warnings that are personally relevant than on warnings that are abstract and technical (Fishbein 1977).

Analysis of the general public's knowledge of the health risks of smoking could provide some evidence of the impact of warnings. Although such knowledge has clearly increased since 1966, when the first health warning label was required, the effect of the warnings cannot be isolated from a number of other information sources, such as reports of the Surgeon General or reported research in the news (FTC 1974; Murphy 1980; USDHHS 1987a). Similarly, it is impossible to determine any independent effects of health warnings on aggregate cigarette sales (FTC 1967, 1969b) or to isolate the independent effects of advertising on those aggregate sales. Indeed, the two effects counter one another and therefore confound research. However, a recent and extensive discussion of the issues in the Australian publication *Health Warnings and Contents Labelling on Tobacco Products* reports formative data on providing more noticeable and informative labels to consumers and assembles a compendium of warnings worldwide (Centre for Behavioural Research in Cancer 1992).

Perhaps the most powerful indirect indicator of the effect of cigarette warnings is the number of smokers and consumers who remain unaware of the health risks of smoking. After a comprehensive review of studies on health-risk awareness, including publicly generated studies and those conducted by the tobacco industry, the FTC concluded that significant numbers of consumers and still higher numbers of smokers were unaware of even the most rudimentary risk information about smoking (FTC 1981). It was this lack of consumer awareness that led the FTC in 1981 to call for a larger and more attention-demanding format and for expanded (16 different) rotational warnings for cigarettes.

## Effect of Tobacco Taxation

### Introduction

Tobacco is taxed in a variety of ways by federal, state, and local government. The most important of these taxes are the federal and state excise taxes on cigarettes and the general state sales tax applied to tobacco products in most states. Historically, these taxes have been seen as an effective way to generate revenues, as with taxes on alcohol. However, in recent years, increased taxation of tobacco products has been supported as a public health measure aimed at discouraging smoking and other tobacco use.

### History of Tobacco Taxation

#### Federal Tobacco Taxes

During the late eighteenth and early nineteenth centuries, the federal government experimented with excise taxes on tobacco products. However, because of opposition from both producers and consumers, the taxes imposed in 1794, 1812, 1816, and during the Civil War were repealed and finally reduced to one cent per pack. During the first half of the twentieth century, federal taxes were, as before the Civil War, increased to help

Table 12. Health warnings required on tobacco packages and advertisements in the United States, 1966–1993

| Health warnings | Effective dates | Packages | Advertisements |
|---|---|---|---|
| **Cigarettes** | | | |
| CAUTION: Cigarette Smoking May Be Hazardous to Your Health. | January 1, 1966–October 31, 1970 | X | |
| WARNING: The Surgeon General Has Determined That Cigarette Smoking Is Dangerous to Your Health. | November 1, 1970–October 11, 1985 | X | |
| | March 30, 1972–October 11, 1985 | | X* |
| SURGEON GENERAL'S WARNING: Smoking Causes Lung Cancer, Heart Disease, Emphysema, and May Complicate Pregnancy. | October 12, 1985–present | X | X† |
| SURGEON GENERAL'S WARNING: Quitting Smoking Now Greatly Reduces Serious Risks to Your Health. | October 12, 1985–present | X | X† |
| SURGEON GENERAL'S WARNING: Smoking by Pregnant Women May Result in Fetal Injury, Premature Birth and Low Birth Weight. | October 12, 1985–present | X | X† |
| SURGEON GENERAL'S WARNING: Cigarette Smoke Contains Carbon Monoxide. | October 12, 1985–present | X | X† |
| **Smokeless tobacco** | | | |
| WARNING: This product may cause mouth cancer. | February 27, 1987–present | X | X‡ |
| WARNING: This product may cause gum disease and tooth loss. | February 27, 1987–present | X | X‡ |
| WARNING: This product is not a safe alternative to cigarettes. | February 27, 1987–present | X | X‡ |

Source: Federal Trade Commission (1981).

*Required by Federal Trade Commission consent order. All other warnings required by federal legislation.

†The four warnings mandated for cigarette advertisements on outdoor billboards are slightly shorter versions of the same messages.

‡The warnings on advertisements must appear in a circle-and-arrow format (see Figure 5). No warnings are required on outdoor billboards.

finance U.S. military involvement. The last of a series of increases took place on November 1, 1951, during the Korean War, when the tax was increased from seven to eight cents per pack. The tax remained at that level for the next 30 years.

Over the past decade, however, the federal tax on cigarettes has been increased significantly. These recent increases were motivated by a different goal—the need to raise revenues to deal with the increasing federal budget deficit. The first of these deficit-motivated increases occurred on March 1, 1983, as part of the Tax Equity and Fiscal Responsibility Act of 1982, when the tax was doubled to 16 cents per pack. This increase was intended as a temporary measure that would be repealed by October 1, 1985. However, after being extended several times, the doubling of the tax was made permanent in 1986.

As part of the Omnibus Budget Reconciliation Act of 1985, a tax of 24 cents per pound was levied on snuff, a tax of 8 cents per pound was imposed on chewing tobacco, and a tax of 45 cents per pound was applied to pipe tobacco. The Omnibus Budget Reconciliation Act of 1990 further increased federal taxes on cigarettes from 16 cents to 20 cents per pack on January 1, 1991; a scheduled additional increase of 4 cents per pack was levied on January 1, 1993. As of 1993, federal taxes on other tobacco products are 36 cents per pound for snuff, 12 cents for chewing tobacco, and 67.5 cents for pipe tobacco. This represents a tax of less than 3 cents per can of snuff or pouch of chew; the tax on a pack of cigarettes is 24 cents. Yet even though federal taxes on tobacco have increased recently, they have become a less important source of revenue for the federal government. In 1950, tobacco excise taxes accounted for 3.36 percent of all federal revenues; by 1989, they accounted for only 0.44 percent of revenues (Congressional Budget Office [CBO] 1990).

### State and Local Tobacco Taxes

In 1921, Iowa became the first state to impose an excise tax on cigarettes, followed in 1923 by Georgia, South Carolina, South Dakota, and Utah. By the end of the 1920s, six additional states had enacted a cigarette excise tax. By 1940, more than half of all states levied taxes on cigarettes, and by 1950, only a handful of states were not imposing an excise tax. In 1969, North Carolina became the last state to enact an excise tax on cigarettes. As with the federal government, the imposition of, and increases in, state cigarette taxes have partly represented attempts to raise revenue rather than to lower smoking prevalence. Warner (1981) argues that this financial motive is especially clear in the history of excise taxes on cigarettes in the six major tobacco-producing states. The average date when these states instituted a cigarette excise tax was 1939—one year earlier than the average for the remaining states, and many years before the widespread publicity on the health hazards of smoking. Just before the negative publicity, the average tax rate for these six states was 2.5 cents per pack, a figure only slightly less than the other states' average of 2.9 cents per pack. As is discussed later, the difference has increased greatly since then.

Some evidence suggests that state governments have recently used cigarette excise taxes as a major part of antismoking campaigns. This conclusion can be drawn from reviewing the number of increases in state excise tax rates after the mid-1950s release of the first scientific studies that linked smoking to poor health, and particularly after the 1964 release of the initial Surgeon General's report on smoking and health (PHS 1964). For instance, during the latter half of the 1950s, more than eight tax increases occurred per year among the states, whereas fewer than three per year occurred each year in the early 1950s. Similarly, in the year after the 1964 Surgeon General's report, there were a record 22 increases in state excise taxes on cigarettes.

The established pattern of tax increases continued during the period when the Fairness Doctrine permitted antismoking messages on television and radio, and again after the 1971 ban on television and radio advertising (Warner 1981). Moreover, as Warner (1981) notes, the once negligible difference between the tax rates in the tobacco-producing states and in the remaining states widened significantly over this period. This difference has continued to widen since 1981. By January 1, 1992, the average tax rate in the tobacco-producing states was 7 cents per pack, whereas the average tax rate in the remaining 44 states and Washington, D.C., was 26 cents per pack.

The active use of cigarette and other tobacco taxes to discourage tobacco use in some states and the relative inaction in others results in large differences in taxes and, consequently, in cigarette prices among states. For example, the cigarette excise tax ranges from less than 3 cents per pack in Virginia to 60 cents per pack in Hawaii (see Table 13). When local taxes are added, the differences become even larger in some locations. The differences in taxes and prices create incentives for the casual smuggling (i.e., involving relatively small quantities, generally for personal use) and organized smuggling (i.e., involving large quantities, generally for resale) of cigarettes from low-tax localities to high-tax localities and create incentives for other tax-evasion activities.

The relative ease of transporting cigarettes across localities has encouraged some people to profit from this activity (Advisory Commission on Intergovernmental Relations [ACIR] 1977, 1985). Although casual smuggling

Table 13. State* cigarette taxes, July 1, 1993

| State | Excise tax rate (cents per 20-cigarette pack) | Sales tax† (cents per pack) | Total state tax (cents per pack) |
|---|---|---|---|
| Alabama | 16.5 | 7 | 23.5 |
| Alaska | 29.0 | 0 | 29.0 |
| Arizona | 18.0 | 9 | 27.0 |
| Arkansas | 31.5 | 9 | 40.5 |
| California | 35.0 | 15 | 50.0 |
| Colorado | 20.0 | 0 | 20.0 |
| Connecticut | 47.0 | 12 | 59.0 |
| Delaware | 24.0 | 0 | 24.0 |
| District of Columbia | 65.0 | 13 | 78.0 |
| Florida | 33.9 | 12 | 45.9 |
| Georgia | 12.0 | 6 | 18.0 |
| Hawaii | 60.0 | 9 | 69.0 |
| Idaho | 18.0 | 9 | 27.0 |
| Illinois | 30.0 | 13 | 43.0 |
| Indiana | 15.5 | 9 | 24.5 |
| Iowa | 36.0 | 11 | 47.0 |
| Kansas | 24.0 | 9 | 33.0 |
| Kentucky | 3.0 | 9 | 12.0 |
| Louisiana | 20.0 | 8 | 28.0 |
| Maine | 37.0 | 11 | 48.0 |
| Maryland | 36.0 | 10 | 46.0 |
| Massachusetts | 51.0 | 9 | 60.0 |
| Michigan | 25.0 | 7 | 32.0 |
| Minnesota | 48.0 | 14 | 62.0 |
| Mississippi | 18.0 | 11 | 29.0 |
| Missouri | 13.0 | 7 | 20.0 |
| Montana | 19.3 | 0 | 19.3 |
| Nebraska | 34.0 | 9 | 43.0 |
| Nevada | 35.0 | 13 | 48.0 |
| New Hampshire | 25.0 | 0 | 25.0 |
| New Jersey | 40.0 | 12 | 52.0 |
| New Mexico | 21.0 | 9 | 30.0 |
| New York | 56.0 | 8 | 64.0 |
| North Carolina | 5.0 | 6 | 11.0 |
| North Dakota | 44.0 | 11 | 55.0 |
| Ohio | 24.0 | 8 | 32.0 |
| Oklahoma | 23.0 | 8 | 31.0 |
| Oregon | 28.0 | 0 | 28.0 |
| Pennsylvania | 31.0 | 11 | 42.0 |
| Rhode Island | 37.0 | 14 | 51.0 |
| South Carolina | 7.0 | 8 | 15.0 |
| South Dakota | 23.0 | 7 | 30.0 |
| Tennessee | 13.0 | 14 | 27.0 |
| Texas | 41.0 | 13 | 54.0 |
| Utah | 26.5 | 9 | 35.5 |
| Vermont | 20.0 | 9 | 29.0 |
| Virginia | 2.5 | 7 | 9.5 |
| Washington | 54.0 | 13 | 67.0 |
| West Virginia | 17.0 | 10 | 27.0 |
| Wisconsin | 38.0 | 10 | 48.0 |
| Wyoming | 12.0 | 0 | 12.0 |

Sources: Tobacco Institute (1992); Action on Smoking and Health (1993).
*Includes the District of Columbia.
†Sales tax information is for November 1, 1992.

had long been a problem, states reported that organized smuggling increased significantly after the tax increases of the mid- to late-1960s. Some states were discouraged from adding further taxes that would motivate increased smuggling and result in a net loss of revenues generated by cigarette taxes. In 1978, in response to pressure from states with high cigarette taxes, the Federal Contraband Cigarette Act (Public Law 95-575) was enacted. This act prohibited the single-transaction transport, receipt, shipment, possession, distribution, or purchase of more than 60,000 cigarettes not bearing the tax indicia of the state in which the cigarettes were initially sold. The act dealt only with the organized smuggling of cigarettes, described by the ACIR as the major problem, and ignored the less problematic casual smuggling (Kleine 1993). The ACIR (1985) suggests, however, that the law was even more effective than its proponents would have predicted.

California and Massachusetts recently enacted two large increases in their excise taxes on tobacco. In November 1988, California voters passed Proposition 99, which went into effect in January 1989. This law increased California's state excise tax on cigarettes from 10 cents per pack to 35 cents per pack. As was mentioned earlier, one of the notable features of Proposition 99 is that 20 percent of the additional revenue raised from the tax increase is earmarked for the state's antismoking activities. Legislation similar to Proposition 99 was passed in Massachusetts in November 1992. This measure, which took effect on January 1, 1993, includes a 25-cent increase in the state excise tax and a 25 percent increase in the tax on chewing tobacco.

Besides the specific taxes applied to cigarettes, 45 states and Washington, D.C., have general sales-taxes that apply to cigarettes. In all but four of these states, the sales-tax base includes the excise tax. This arrangement adds an additional 5 to 14 cents per pack to the price of cigarettes in these states (see Table 13).

State taxes on other tobacco products have also become more widespread. By January 1, 1992, a total of 37 states had imposed a tax on at least some tobacco products other than cigarettes; only 14 states were collecting such taxes in 1964. The same time period witnessed similar activity at the local level. By fiscal year 1991, 373 cities had imposed additional taxes on cigarettes, and 49 cities were levying taxes on other tobacco products. In addition, 38 counties were charging their own cigarette taxes, and 29 counties were assessing additional taxes on other tobacco products. The largest of these local cigarette taxes are those imposed in New York City (8 additional cents per pack) and in Chicago (24 additional cents per pack, including city and county excise taxes).

### Cigarette Tax Increases and Cigarette Prices

After scientific evidence of the harmful health consequences of cigarette smoking appeared in the mid-1950s, states began to increase cigarette excise taxes not only to raise revenues but to discourage people from smoking. Because the combined federal and state taxes accounted for almost half of the average retail price of cigarettes, these state tax increases resulted in increases in the real price of cigarettes (i.e., the price of cigarettes relative to the price of all goods and services, as measured by the National Consumer Price Index) (Table 14). The relative price of cigarettes also rose as a result of the state tax increases. This trend was accelerated after the 1964 release of the first Surgeon General's report on smoking and health. The result was that between 1955 and 1971, the nominal price of cigarettes had risen by over 70 percent (almost half of this increase was attributed to the state tax increases), and the real price of cigarettes had risen by over 13 percent.

These increases in real cigarette prices were short-lived. The rapid inflation of the 1970s, coupled with the relative stability of state excise taxes on cigarettes, led to a sharp drop in real cigarette prices between 1971 and 1981. Federal taxes remained fixed at 8 cents per pack during this period. As was discussed earlier, the emergence of organized smuggling in response to the growing differences in state and local taxes discouraged states from continuing to increase cigarette taxes. Combined federal and state taxes, as a percentage of retail cigarette prices, fell from 47 percent at the beginning of this period to 33 percent in 1981. The absolute cost of producing cigarettes fell throughout this period, largely because of a decrease in the average quantity of tobacco per cigarette as the market share for "low tar" cigarettes increased (Harris 1987). The overall result was that between 1971 and 1981, the real price of cigarettes declined by almost 28 percent.

Beginning in 1982, this downward trend in real cigarette prices was reversed as state taxes rose in anticipation of the doubling of the federal excise tax on cigarettes that was scheduled for January 1, 1983. These combined tax increases led to the largest single-year jump in prices (from 1982 to 1983). However, Harris (1987) argues that the main cause of the increase in the real price of cigarettes from 1981 through 1986 was not the increase in either the federal tax or state taxes, but rather the increases in the wholesale prices of cigarettes because of markups by manufacturers. He contends that most of these markups were not justified by increases in the cost of production. Instead, he suggests that markups were the result of a coordinated price increase by the six firms that dominate the tobacco industry. More recent data lend support to Harris's argument: although state and

Table 14. Cigarette taxes and cigarette prices per pack, 1955–1991

| Year | Average state tax (cents) | Average federal tax (cents) | Average cigarette price (cents) | Taxes as percentage of average price* | Real† average state tax‡ (cents) | Real† average federal tax (cents) | Real† average cigarette price (cents) |
|---|---|---|---|---|---|---|---|
| 1955 | 3.5 | 8.0 | 22.7 | 48.7 | 13.1 | 29.9 | 84.7 |
| 1956 | 3.8 | 8.0 | 23.2 | 47.4 | 14.0 | 29.9 | 85.3 |
| 1957 | 3.9 | 8.0 | 23.8 | 48.8 | 13.9 | 28.5 | 84.7 |
| 1958 | 4.0 | 8.0 | 25.0 | 48.0 | 13.8 | 27.7 | 86.5 |
| 1959 | 4.2 | 8.0 | 25.6 | 46.6 | 14.4 | 27.5 | 88.0 |
| 1960 | 4.7 | 8.0 | 26.1 | 48.9 | 15.9 | 27.0 | 88.2 |
| 1961 | 4.7 | 8.0 | 26.1 | 48.6 | 15.7 | 26.8 | 87.3 |
| 1962 | 5.1 | 8.0 | 26.9 | 48.3 | 16.9 | 26.5 | 89.1 |
| 1963 | 5.2 | 8.0 | 26.8 | 49.4 | 17.0 | 26.1 | 87.6 |
| 1964 | 5.6 | 8.0 | 27.9 | 49.3 | 18.1 | 25.8 | 90.0 |
| 1965 | 5.9 | 8.0 | 28.2 | 49.8 | 18.7 | 25.4 | 89.5 |
| 1966 | 6.9 | 8.0 | 30.0 | 51.4 | 21.3 | 24.7 | 92.6 |
| 1967 | 7.1 | 8.0 | 30.5 | 50.8 | 21.3 | 24.0 | 91.3 |
| 1968 | 8.4 | 8.0 | 32.3 | 49.2 | 24.1 | 23.0 | 92.8 |
| 1969 | 9.1 | 8.0 | 32.8 | 48.9 | 24.8 | 21.8 | 89.4 |
| 1970 | 10.2 | 8.0 | 37.1 | 47.7 | 26.3 | 20.6 | 95.6 |
| 1971 | 10.7 | 8.0 | 38.9 | 46.8 | 26.4 | 19.8 | 96.0 |
| 1972 | 11.6 | 8.0 | 40.0 | 47.7 | 27.8 | 19.1 | 95.7 |
| 1973 | 12.1 | 8.0 | 40.3 | 48.4 | 27.3 | 18.0 | 90.8 |
| 1974 | 12.1 | 8.0 | 41.8 | 47.6 | 24.5 | 16.2 | 84.8 |
| 1975 | 12.2 | 8.0 | 44.5 | 44.5 | 22.7 | 14.9 | 82.7 |
| 1976 | 12.4 | 8.0 | 47.9 | 41.4 | 21.8 | 14.1 | 84.2 |
| 1977 | 12.5 | 8.0 | 49.2 | 40.5 | 20.6 | 13.2 | 81.2 |
| 1978 | 12.9 | 8.0 | 54.3 | 37.1 | 19.8 | 12.3 | 83.3 |
| 1979 | 12.9 | 8.0 | 56.8 | 35.5 | 17.8 | 11.0 | 78.2 |
| 1980 | 13.1 | 8.0 | 60.0 | 34.5 | 15.9 | 9.7 | 72.8 |
| 1981 | 13.2 | 8.0 | 63.0 | 33.1 | 14.5 | 8.8 | 69.3 |
| 1982 | 13.5 | 8.0 | 69.7 | 29.9 | 14.0 | 8.3 | 72.2 |
| 1983 | 14.7 | 12.0 | 81.9 | 26.8 | 14.8 | 12.0 | 82.2 |
| 1984 | 15.3 | 16.0 | 94.7 | 33.2 | 14.7 | 15.4 | 91.1 |
| 1985 | 15.9 | 16.0 | 97.8 | 32.3 | 14.8 | 14.9 | 90.9 |
| 1986 | 16.2 | 16.0 | 104.5 | 30.8 | 14.8 | 14.6 | 95.3 |
| 1987 | 16.9 | 16.0 | 110.0 | 29.9 | 14.9 | 14.1 | 96.8 |
| 1988 | 18.2 | 16.0 | 122.2 | 28.1 | 15.4 | 13.5 | 103.3 |
| 1989 | 21.8 | 16.0 | 127.5 | 26.5 | 17.6 | 12.9 | 102.8 |
| 1990 | 24.7 | 16.0 | 144.1 | 26.4 | 18.9 | 12.2 | 110.3 |
| 1991 | 25.9 | 20.0 | 153.3 | 25.6 | 19.0 | 11.7 | 112.6 |

Source: Tobacco Institute (1992).

*Percentages cannot be calculated directly from the tax and price information, since taxes are weighted average taxes for the entire fiscal year, whereas prices and percentages are generally as of November 1.

†Real taxes and prices are obtained by dividing the actual taxes and prices by the National Consumer Price Index, with the average of 1982–1984 being the benchmark. All data are for the fiscal year ending June 20.

‡State taxes are a weighted average of the tax in taxing states, including Washington, D.C. (42 in 1955, 51 in 1970 and after). Price refers to the median retail price in all taxing states.

federal taxes have increased since the late 1980s, the percentage of the retail price of cigarettes accounted for by these taxes actually fell from 33 percent in 1981 to 26 percent in 1991 (Tobacco Institute 1992). The combined effect of increases in federal and state taxes and in manufacturer's price resulted in the real price of cigarettes increasing by over 60 percent between 1981 and 1991. This upward trend in real cigarette prices is expected to continue at least through 1993, as the federal tax increases to 24 cents per pack as part of the 1990 deficit-reduction agreement. Therefore, although taxes accounted for a smaller percentage of the increased retail price of cigarettes from 1981 to 1991, the increased taxes, along with manufacturers' price increases, were still passed on to consumers, and the real price of cigarettes increased.

### Effect of Excise Taxes on Tobacco Use

One of the fundamental principles of economics, illustrated by a downward-sloping demand curve, states that as the real price of any commodity rises, consumption of that commodity falls. Some researchers have speculated that the consumption of an addictive product, such as cigarettes, might be an exception to this rule. However, numerous econometric studies, including several recent studies that explicitly model the addictive aspects of cigarette smoking, confirm that this fundamental economic principle does indeed apply to cigarettes. Thus, since increases in cigarette excise taxes generally result in increased cigarette prices, these tax increases may be effective in reducing cigarette consumption.

Economists use the concept of price elasticity of demand to describe the sensitivity of consumption to changes in price. The price elasticity of demand is defined as the percentage change in consumption that results from a 1 percent increase in price. For example, a price elasticity of -0.5 implies that a 10 percent increase in price would reduce consumption by five percent. A brief review of recent U.S. studies of cigarette demand follows.

### Aggregate Data Studies

One set of recent studies of cigarette demand used aggregate data. Price elasticity estimates obtained from these studies ranged from -0.14 to -1.23; the majority of these estimates fell within the narrower range from -0.20 to -0.50. All but two of the estimates were obtained from econometric studies that besides examining the effect of price, used income, demographic variables, and other policy-related variables to explain differences in cigarette consumption. Failing to include such potentially important determinants of demand could lead to biased estimates of the effects of price and other policies on cigarette smoking. Several of these studies made theoretical and empirical attempts to model the addictive aspects of cigarette consumption. In contrast with the econometric analyses, Peterson et al. (1992) used an epidemiologic approach similar to the quasi-experimental approach of Baltagi and Goel (1987). Both studies obtained estimates of the price elasticity of demand that were consistent with those obtained from econometric studies.

Differences in the estimates obtained from these studies partly resulted from differences in theoretical and empirical modeling methods. For example, the studies that used a pooled time series of state cross-sections might provide estimates of the price elasticity that exceed the true value of the elasticity if cigarette smuggling is ignored, since studies based on aggregate data use state cigarette sales figures as their measure of consumption. That is, states with relatively low cigarette taxes and prices may sell a substantial number of cigarettes to residents of nearby states where prices are higher. Thus, the sales figures from the states with lower cigarette taxes and prices will overstate cigarette consumption within those states, whereas those with higher taxes and prices will understate consumption. Many of the most recent studies, however, including those by Baltagi and Levin (1986), Becker, Grossman, and Murphy (1992), and Chaloupka and Saffer (1992), have controlled for this problem. Similarly, if the addictive aspects of consumption are ignored, the estimated price elasticity may be biased. Again, many of these recent studies, including Baltagi and Levin (1986), Becker, Grossman, and Murphy (1992), and Keeler et al. (1992) estimated demand equations that explicitly model the addictive aspects of consumption. In addition, at the aggregate level, cigarette prices and quantity are simultaneously determined by the interaction of cigarette supply and demand. Ignoring this simultaneity would lead to biased estimates of the effects of cigarette prices on demand. Bishop and Yoo (1985) and Porter (1986) explicitly modeled this relationship and estimated price elasticities of demand that fell within the -0.20 to -0.50 range generally found in other studies based on aggregate data. Finally, two of these studies, Keeler et al. (1992) and Flewelling et al. (1992), considered the effects of the relatively large change in the California cigarette excise tax. Their estimated price elasticities suggest that the impact of price on demand is independent of the level of price.

Even with the differences in data, theoretical modeling, and estimation techniques, one general conclusion can be drawn from these aggregate studies—increases in cigarette prices will reduce cigarette consumption. At least part of this reduction is likely due to adolescents' quitting smoking, reducing the amount they smoke, or not taking up smoking in the first place (USDHHS 1991).

Microlevel Data Studies

Another set of recent studies of cigarette demand include those that used microlevel data—that is, data from groups of individuals instead of aggregate data sets. As with the studies that used aggregate data, these studies consistently indicated that cigarette smoking is affected negatively by price. Each of the studies carefully dealt with the smuggling problem that could bias the estimates of the price elasticities. Because they were based on microlevel data, the studies also avoided the simultaneity problems that arise when working with aggregate data. That is, no individual smoker consumes enough cigarettes to affect market price, so prices could be appropriately treated as exogenous in these studies.

Many of these studies, however, examined issues that cannot be addressed when using aggregate data. Studies that use microlevel data can assess the effect of prices and other policies, not only on average cigarette consumption (the focus of aggregate studies), but also on the probability that an individual smokes and on average consumption among smokers. Similarly, the effects of policy variables on smoking initiation and cessation can be explored. Microlevel data can be used to consider the differential effects of increased cigarette excise taxes and other policies on alternative demographic groups (by age or by gender, for example).

Lewit and Coate (1982) took advantage of cross-sectional survey data not only to estimate equations of the demand for cigarettes, but also to determine smoking prevalence and patterns of smoking participation. In addition, this study estimated separate demand equations for different age groups (20–25 years, 26–35 years, and 36–74 years) and for men and women. These investigators found that a price increase appeared to effect the decision to become a smoker rather than the decision to smoke less frequently. They also found that the smoking behavior of young adults (20 to 25 years old) was more sensitive to price changes than that of older individuals. Finally, they found that male smokers, particularly those aged 20 to 35 years, were quite responsive to price, whereas female smokers were essentially unaffected by price.

Mullahy (1985) introduced myopic addiction (i.e., the concept that addiction outweighs an individual's foresight or concern for future well-being) into his theoretical model of cigarette smoking. This model implies that at any given time, smoking initiation, regular use, and the amount of cigarettes smoked depend on an individual's smoking history. This model and other studies that formally model the addictive aspects of smoking incorporate the concepts of tolerance, reinforcement, and withdrawal that distinguish addictive consumption from nonaddictive consumption. Treating smokers as myopic, however, implies that the future consequences of their smoking are ignored when they make current decisions. Mullahy estimated separate demand equations for men and women and found that both the decision to smoke and the quantity of cigarettes consumed by smokers were negatively related to cigarette prices for each gender. As in the Lewit and Coate study, Mullahy found that cigarette prices had a greater impact on the decision to smoke than they do on cigarette consumption. Similarly, he found that men were somewhat more responsive to price than women (average elasticities of -0.56 and -0.39, respectively).

Chaloupka (1990, 1991a, b) applied the Becker and Murphy (1988) model of rational addictive behavior to cigarette smoking. As in the Mullahy model, addiction is accounted for by recognizing that current smoking decisions depend on past smoking, whereas rationality implies that the future consequences of an individual's past and current smoking behavior are considered when making current choices. Chaloupka found both that cigarette smoking is addictive—that is, it depends on past smoking—and that individuals who smoke also consider future consequences. He found that increases in cigarette prices reduce average cigarette consumption significantly and that the effects of price increases on consumption are understated if the addictive aspects of consumption are ignored. In contrast with the findings of Lewit and Coate, Chaloupka found that adolescents and young adults (aged 17 through 24 years) were less responsive to price than are older age groups. Chaloupka also found, like Lewit and Coate, that women were much less responsive to price than men.

Wasserman et al. (1991) used several of the Health Interview Surveys conducted during the 1970s and 1980s to estimate the effects that taxes and regulations restricting smoking in public places have on adult cigarette demand. These investigators also examined whether the price elasticity of demand has changed over time. Using a generalized linear model, they found that the negative impact of cigarette prices on demand has increased over time. The estimated price elasticity of demand in 1970 (0.06) suggested that increases in cigarette excise taxes would not discourage cigarette smoking. However, the authors estimated an increasingly negative effect of cigarette prices on demand from 1974 (-0.17) through 1985 (-0.23). They estimated that by 1988, the price elasticity of demand would increase (in absolute value) to -0.28. This finding that the price elasticity of demand is becoming more negative over time contradicts the findings of the studies based on aggregate data by Baltagi and Goel. The estimated elasticities of Wasserman et al. were approximately half those estimated by Lewit and Coate, who used the same data. Wasserman et al. attributed these relatively low estimates to their including an index that

measured state-level antismoking regulations and was highly correlated with price. When this index was omitted, the effects of price on demand were overstated, since they included the true price effect as well as the effect of the omitted regulations. The findings of Wasserman et al. for youth will be discussed in detail in the next section.

The implications of these studies on older adolescents' and young adults' responsiveness to price are not conclusive. Lewit and Coate's examination of individuals 20 years old and older concluded that upward price elasticity is increasingly negative (and thereby has a stronger effect) for younger age groups. The addictive model that Chaloupka used, however, suggested that less addicted smokers (those who have a shorter history of smoking, for example) will be less responsive to price than their more addicted counterparts. His estimated long-run price elasticities of demand for older adolescents and young adults were consistent with this hypothesis. The following section addresses more specifically the effect of price on the smoking behavior of young people.

### Price Responsiveness of Adolescent Smokers

A third set of recent econometric studies focused on youth. Each of these studies, as with the studies of adult smoking that employ microlevel data, carefully controlled for cigarette smuggling. Besides including cigarette prices and other determinants of demand employed in the studies of adult smoking, these youth studies included parental characteristics (such as education level and income) as proxies for parental smoking practices, which have been shown to be associated with youth smoking.

The first comprehensive studies of the price responsiveness of cigarette smoking among youth were completed in the early 1980s. Lewit, Coate, and Grossman (1981) used Cycle III of the Health Examination Survey (HES-III), which was conducted from March 1966 through March 1970, to look at the effects of cigarette prices, of the negative cigarette advertising broadcast under the Fairness Doctrine, and of various socioeconomic and demographic factors affecting cigarette smoking by youth (persons 12 through 17 years old). Besides examining average cigarette consumption among all youth, the authors also estimated equations for smoking participation for all youth as well as equations for cigarette demand for young smokers. This methodology, similar to that used by Lewit and Coate, allowed the authors to distinguish the effect of price on the decision to smoke from its effect on smokers' consumption of cigarettes. The authors found that most of the impact of prices on cigarette smoking was on the decision to smoke rather than on smokers' average consumption of cigarettes: estimated price elasticity was -1.20 for smoking participation and -0.25 for cigarette demand. Furthermore, the estimated price elasticity of demand among youth in this study (-1.44) was more than three times as high as the estimate for adults in Lewit and Coate's study and nearly two times as high as that study's estimate for young adults (persons aged 20 through 25 years).

These findings were mostly confirmed in a related study by Grossman et al. (1983). This study used data from the 1974, 1976, 1977, and 1979 National Household Surveys on Drug Abuse. The surveys were analyzed separately because of differences in the definition of smoking. As the authors noted, the estimates from this study should be interpreted cautiously, since the sample sizes were much smaller than those of the study based on the HES-III. In general, Grossman et al. found that the decision to smoke was negatively related to the price of cigarettes; their summary estimate of this elasticity was -0.76. Again, this estimate was substantially higher, in absolute value, than that obtained for adults by Lewit and Coate, and it implies that young people's decision to smoke is much more responsive to price than the comparable decision for adults. However, Grossman et al. found that once the decision to smoke has been made, average consumption decisions by young smokers were virtually unresponsive to price.

Warner (1985, 1986) used the age-specific price elasticities of participation and demand from Lewit and Coate to obtain comparable estimates of price elasticity for teenagers (persons aged 12 through 17 and 18 through 19). He used these age-specific data to estimate that the doubling of the federal excise tax in 1983 reduced the number of teenage smokers by 800,000, assuming that average cigarette prices increased by the 8 cents that the tax increased. These estimates form the basis for a U.S. General Accounting Office (GAO) report, which concluded that raising the federal tax further by 20 cents per pack would have reduced the number of teenage smokers by an additional 500,000 in 1989 (GAO 1989). The GAO predicted a subsequent reduction of 125,000 smoking-related deaths for this age group as a result of the proposed 20-cent tax increase.

Similarly, Harris (1987) used the Lewit, Coate, and Grossman estimates, among others, to examine the effects that the 1983 doubling of the federal excise tax on cigarettes had on cigarette smoking and health. He concluded that the tax increase and the coordinated price increases it induced kept 600,000 teenagers (persons aged 12 through 17 years) from starting to smoke. Basing his findings on epidemiologic studies of the 1950s, 1960s, and 1970s, Harris concluded that 54,000 more teenagers would live to age 65 as a result of this tax.

The recent study by Wasserman et al. (1991) contradicted the general conclusion of Lewit and Coate that teenage cigarette smoking is more responsive than adult smoking to changes in cigarette prices. Wasserman et al. used the Second National Health and Nutrition Examination Survey (1976–1980) (NHANES-II) to estimate the effects of cigarette prices and antismoking regulations on cigarette smoking by youth aged 12 through 17. In both the generalized linear models and the two-part models they estimated, the authors found a statistically insignificant effect of cigarette prices on average cigarette consumption among all youth, on smoking participation rates among all youth, and on cigarette consumption by young smokers. Given the range of estimates obtained, the investigators could not reject the hypothesis that the price elasticity of demand for teenagers was statistically different from their estimate of -0.23 for adults. Their estimates for youth were consistent with Chaloupka's (1991b) young adult estimates, which also employed NHANES-II data. As was discussed earlier, Wasserman et al. suggested that one of the reasons for their relatively low estimated price elasticity of demand was their including an index that captured antismoking regulations as a determinant of demand. Thus, they concluded that the price effects estimated in other studies may have been biased upwards, since prices alone were being credited with the effects of various contemporaneous antismoking regulations that likely played an important role in discouraging young people from smoking.

Grossman (1991) noted, however, that the study by Wasserman et al., while a valuable contribution to the empirical literature on cigarette demand, should not be considered as offering the definitive estimates of the price elasticity of demand, particularly for youth. Others, including Chaloupka (1988) and Chaloupka and Saffer (1992), did not find that the estimated price elasticity of demand was sensitive to the inclusion of measures of antismoking regulations, although these other studies used smaller sample sizes than did Wasserman et al. Furthermore, including the regulation index may be less relevant in a teenage sample, since the index assumes its highest value in states that restrict smoking in private worksites. If the regulations themselves have no direct impact on smoking, but are instead proxies for antismoking sentiment, then enacting very restrictive measures may not necessarily reduce youth smoking. For example, during the 1980s, restrictions on public smoking were enacted across the United States, yet smoking onset rates among young people did not decline significantly (see "Trends in Cigarette Smoking" in Chapter 3). Finally, the Wasserman et al. (1991) findings for a relatively small sample of youth (N = 1,891) should be interpreted cautiously when compared with those obtained by Lewit, Coate, and Grossman (1981) (N = 5,308).

## Discussion

The large amount of empirical literature on the relationship between cigarette prices and cigarette smoking suggests that increased excise taxes on cigarettes would significantly reduce overall rates of cigarette smoking. Much of the impact of higher prices would come from encouraging cessation among current smokers and discouraging initiation among young smokers. The price responsiveness of adolescents is at least as high, if not significantly higher, than that of adults—a finding that suggests that an increase in cigarette taxes would result in large reductions in smoking prevalence and cigarette consumption among teenagers.

Although numerous studies of aggregate cigarette demand and several studies of cigarette smoking among youth have been completed in recent years, the relationship between other tobacco taxes and the use of tobacco products other than cigarettes has not been examined.

## Tax Policies Under Consideration

Increased taxes on cigarette and other tobacco products have been widely used in recent years as a source of federal, state, and local revenue. These taxes also are seen as a way to improve public health by discouraging cigarette smoking. Two proposals discussed in the 1989 Surgeon General's report on smoking and health (USDHHS 1989) have received the most attention. The first proposal is to increase tobacco taxes in general and to change the way in which these taxes are calculated. The second proposal would earmark the revenue generated by tobacco taxes to pay for tobacco-control programs or the health care costs related to smoking. Most of the proposals discussed below concern cigarette taxes; similar policies could be adopted for taxes on other tobacco products as well.

## Increasing Tobacco Taxes

An increase in the federal excise tax on cigarettes is the most widely supported tax policy proposal. Proponents—which include a number of public health groups, such as the American Lung Association, the AMA, the ACS, the American Heart Association, and the American Public Health Association—argue that the cigarette tax should be increased, because even after recent increases, the real value of the tax is still well below what it was in 1951. Also suggested is the repeal of the federally approved exemption for state taxes of cigarette sales on military bases and Native American reservations.

Similarly, despite recent increases in state excise taxes on cigarettes, the average state's real excise tax on cigarettes is at about the same level as it was shortly after the release of the first Surgeon General's report on smoking and health. In several states (notably the large

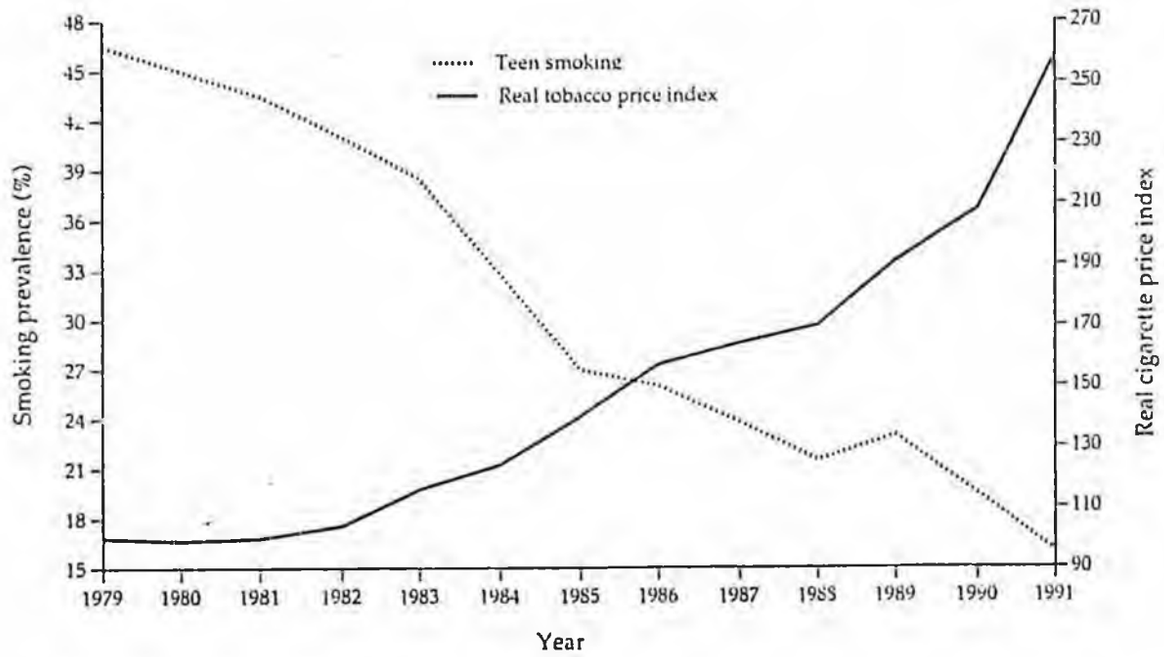
tobacco-producing states), the effects of inflation have been allowed to substantially reduce the values of these taxes. Although additional tax increases in states that have continually raised their cigarette excise taxes over time could spur a return to the organized smuggling of the 1970s, this problem possibly could be solved by levying larger tax increases in the states that have relatively low cigarette taxes and by instituting a tax in the four states that currently exclude cigarettes from the in-state sales tax.

These tax increases would raise cigarette prices in the short run; without continued increases, however, the real value of the tax would be reduced by inflation over time. Given the importance of taxes in cigarette prices, the real cigarette price could even decline, as it did from 1971 to 1981. An alternative might be to replace the excise tax with an ad valorem tax, which would increase proportionately as the nontaxed price of cigarettes increases. The federal government imposes an ad valorem tax on large cigars only, and most states levy ad valorem taxes on tobacco products other than cigarettes.

An ad valorem tax, however, may have an unintended consequence of lulling the public's awareness of a tax increase, since ad valorem taxes may be perceived—and accepted—as part of overall inflation. Periodic increases in excise taxes, on the other hand, may be publicized each time they occur and thus may stimulate public discussion of the health effects of smoking. Canada's experience with ad valorem taxes suggests that any mechanism that raises cigarette prices will be effective in reducing cigarette smoking.

To offset declines in real revenues due to inflation, Canada switched to an ad valorem tax on cigarettes at both the federal and provincial levels in the 1980s. These ad valorem taxes were partly responsible for a 25 percent increase in real cigarette prices, which was accompanied by a 10 percent decline in adult consumption of cigarettes (Sweanor 1991). In 1984, however, the ad valorem tax system was dropped after heavy lobbying by the tobacco industry and a lack of support from public health groups. Since then, there have been large increases in both federal and provincial excise taxes. By June 1, 1991, the average total tax on a pack of 20 cigarettes in Canada was $3.72, more than eight times what it was in 1980 and approximately seven times the average in the United States. The large increases in Canadian taxes since 1985 are estimated to have reduced adult consumption by 35 percent and teenage consumption by 62 percent. These data included tobacco imported from the United States (Sweanor 1991; see Figure 6). Canada's experience in the 1980s provides a nationwide example of the effect of a tax increase on cigarette smoking among young people.

Figure 6. Real* cigarette prices and cigarette smoking prevalence among Canadians aged 15–19 years, 1979–1991




Sources: Health and Welfare Canada (1991); Sweanor (1992).

*The price of cigarettes relative to the price of all goods and services in Canada, adjusted for inflation with 1979–1980 being the benchmark years.

Related proposals include indexing the federal cigarette excise tax to the rate of inflation or to some measure of cigarette prices. Each of these proposals would have the benefit of offsetting the effects of inflation on the value of the taxes and tax revenue over time, and each would be only slightly more cumbersome to administer than current tax structures.

Opponents of these tax changes argue that increases would place an unfair burden on the poor. In general, excise taxes and other consumption taxes are regressive, in that they require lower-income individuals to pay a greater share of their incomes in taxes. The CBO estimates that increased cigarette excise taxes would most affect individuals in the lowest income categories (CBO 1990). However, as the CBO also explains, alternative tax and transfer policies could offset the regressiveness of a tax increase. Proponents of these tax changes point out that lung cancer and other smoking-related diseases also disproportionately affect the poor; moreover, if the tax revenues are earmarked to programs directed to the poor, then the overall policy is not regressive.

Another side effect of an increase in the federal tax on cigarettes would be the reduction of state and local cigarette tax collections as cigarette consumption falls. On the other hand, if state taxes on cigarettes increase with federal taxes, state revenues could increase as well, as occurred in 1983. Lastly, opponents of tax changes argue that increases in taxes would also increase incentives to evade taxes. The CBO estimates, however, that any resulting increases in tax evasion would be relatively minor.

### Earmarking Taxes

The apparent success of Proposition 99 in California has increased interest in adopting similar policies elsewhere. Of the revenues generated from the tax increase of 25 cents per pack, 20 percent are dedicated to antismoking education, 5 percent to research, 5 percent to environmental and other specified programs, and 70 percent to medical care for the poor. Recent attempts by the governor to redirect some of these revenues to other purposes were stopped by the state courts. Similar earmarking of part of the state excise on cigarettes takes place in Nebraska (for its cancer and smoking research program), Minnesota (for the state public health fund), Utah (for its tobacco-control programs), and Indiana (for subsidizing of child care). Earmarking the revenues from tobacco taxes to tobacco-control programs reinforces the impact that increased tobacco taxes have on tobacco consumption. Early evidence from California (Flewelling et al. 1992; Keeler et al. 1992) indicates that the combined impact of the increased excise tax on cigarettes and the increased tobacco-control activities funded by these tax increases has resulted in reduced cigarette consumption.

On its November 1992 ballot, Massachusetts passed a measure similar to Proposition 99. This measure institutes a state excise tax increase of 25 cents per cigarette pack and a 25 percent increase in the tax on chewing tobacco. Some of the revenue from the increases may be dedicated to tobacco-control programs. Public health professionals in Colorado, Nebraska, Arkansas, Michigan, and Oregon are advocating similar measures. These types of large increases in cigarette excise taxes, where at least part of the increased revenues is earmarked for other antismoking activities, have the added advantage of stimulating the discussion of the health consequences of smoking. As a result, reductions in smoking may be larger than anticipated.

## Conclusions

This chapter reviewed a large body of literature concerning programs and policies to prevent tobacco use among young people. These measures, from education to taxation, are strongly supported by the United States public. Given the number of young people who continue to initiate use during adolescence, and given the strong role of the social environment in the process of initiation, efforts to prevent the onset of tobacco use may need multiple, complementary components, including those described in this chapter, and may need to be implemented at the national, state, and community levels to have long-term impact.

1. Most of the American public strongly favor policies that might prevent tobacco use among young people. These policies include tobacco education in the schools, restrictions on tobacco advertising and promotions, a complete ban on smoking by anyone on school grounds, prohibition of the sale of tobacco products to minors, and earmarked tax increases on tobacco products.
2. School-based smoking-prevention programs that identify social influences to smoke and teach skills to resist those influences have demonstrated consistent and significant reductions in adolescent smoking

prevalence, and program effects have lasted one to three years. Programs to prevent smokeless tobacco use that are based on the same model have also demonstrated modest reductions in the initiation of smokeless tobacco use.

3. The effectiveness of school-based smoking-prevention programs appears to be enhanced and sustained by comprehensive school health education and by communitywide programs that involve parents, mass media, community organizations, or other elements of an adolescent's social environment.
4. Smoking-cessation programs tend to have low success rates. Recruiting and retaining adolescents in formal cessation programs are difficult.
5. Illegal sales of tobacco products are common. Active enforcement of age-at-sale policies by public officials and community members appears necessary to prevent minors' access to tobacco.
6. Econometric and other studies indicate that increases in the real price of cigarettes significantly reduce cigarette smoking; young people are at least as responsive as adults to such price changes. Maintaining higher real prices of cigarettes depends on further tax increases to offset the effects of inflation.

# Preventing Tobacco Use Among Young People

## A Report of the Surgeon General

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control and Prevention
National Center for Chronic Disease Prevention and Health Promotion
Office on Smoking and Health

By contrast, subjects could almost always read the brand names and identify the advertisement's notable imagery.

Despite the negligible attention and poor readability reported across these studies, there is some evidence that consumers have moderate awareness of the current four warning messages. Using a warning recognition test (rather than a test of the prominence or strength of the message) to assess basic awareness and attention, Lieberman Research (unpublished data) found that one-half of smokers (but fewer than one-half of nonsmokers) were able to correctly recall one of the rotational warnings. Nearly all recalled the single pre-1985 warning. However, Fischer et al. (1989) obtained different results in their masked recall test with adolescents. After adolescents viewed a series of ads, the researchers covered up the advertisement headings, all specific references to cigarette brand names, and the Surgeon General's warning. Three-fourths of participants could identify the masked warning as a health message, but only 19 percent could recall even the general theme of the warning. These data may suggest that adolescents are generally aware of the presence of warning labels in tobacco ads but are far less informed than adults are of the specific health messages. Similarly low levels of warning recall among young adults were found for the smokeless tobacco warnings (Popper and Murray 1989).

Research in communication effectiveness (Day 1973) suggests that when viewers actually attend and read them, warnings do more than merely provide information. Warnings can also produce potentially affective and behavioral impacts (Beltramini 1988). Analyses of the wording and format of mandated health warnings have suggested reasons for the limited affective and behavioral impact that can occur even under optimal conditions of attention and processing. For example, use of any conditional words such as *can* and *may* can dramatically reduce the effect of the entire warning (Linthwaite 1985). Since two of the current rotational warnings include the word *may* (see Table 12), consumers may minimize the inherent health warnings of these messages (Dumas 1992). Furthermore, although the information presented in the current warnings is more detailed and more absolute than the pre-1985 single warning, it is also presented in a more impersonal manner. Readers may be more likely to believe, learn from, and act on warnings that are personally relevant than on warnings that are abstract and technical (Fishbein 1977).

Analysis of the general public's knowledge of the health risks of smoking could provide some evidence of the impact of warnings. Although such knowledge has clearly increased since 1966, when the first health warning label was required, the effect of the warnings cannot be isolated from a number of other information sources, such as reports of the Surgeon General or reported research in the news (FTC 1974; Murphy 1980; USDHHS 1987a). Similarly, it is impossible to determine any independent effects of health warnings on aggregate cigarette sales (FTC 1967, 1969b) or to isolate the independent effects of advertising on those aggregate sales. Indeed, the two effects counter one another and therefore confound research. However, a recent and extensive discussion of the issues in the Australian publication *Health Warnings and Contents Labelling on Tobacco Products* reports formative data on providing more noticeable and informative labels to consumers and assembles a compendium of warnings worldwide (Centre for Behavioural Research in Cancer 1992).

Perhaps the most powerful indirect indicator of the effect of cigarette warnings is the number of smokers and consumers who remain unaware of the health risks of smoking. After a comprehensive review of studies on health-risk awareness, including publicly generated studies and those conducted by the tobacco industry, the FTC concluded that significant numbers of consumers and still higher numbers of smokers were unaware of even the most rudimentary risk information about smoking (FTC 1981). It was this lack of consumer awareness that led the FTC in 1981 to call for a larger and more attention-demanding format and for expanded (16 different) rotational warnings for cigarettes.

## Effect of Tobacco Taxation

### Introduction

Tobacco is taxed in a variety of ways by federal, state, and local government. The most important of these taxes are the federal and state excise taxes on cigarettes and the general state sales tax applied to tobacco products in most states. Historically, these taxes have been seen as an effective way to generate revenues, as with taxes on alcohol. However, in recent years, increased taxation of tobacco products has been supported as a public health measure aimed at discouraging smoking and other tobacco use.

### History of Tobacco Taxation

#### Federal Tobacco Taxes

During the late eighteenth and early nineteenth centuries, the federal government experimented with excise taxes on tobacco products. However, because of opposition from both producers and consumers, the taxes imposed in 1794, 1812, 1816, and during the Civil War were repealed and finally reduced to one cent per pack. During the first half of the twentieth century, federal taxes were, as before the Civil War, increased to help

Table 12. Health warnings required on tobacco packages and advertisements in the United States, 1966–1993

| Health warnings | Effective dates | Packages | Advertisements |
|---|---|---|---|
| **Cigarettes** | | | |
| CAUTION: Cigarette Smoking May Be Hazardous to Your Health. | January 1, 1966–October 31, 1970 | X | |
| WARNING: The Surgeon General Has Determined That Cigarette Smoking Is Dangerous to Your Health. | November 1, 1970–October 11, 1985 | X | |
| | March 30, 1972–October 11, 1985 | | X* |
| SURGEON GENERAL'S WARNING: Smoking Causes Lung Cancer, Heart Disease, Emphysema, and May Complicate Pregnancy. | October 12, 1985–present | X | X† |
| SURGEON GENERAL'S WARNING: Quitting Smoking Now Greatly Reduces Serious Risks to Your Health. | October 12, 1985–present | X | X† |
| SURGEON GENERAL'S WARNING: Smoking by Pregnant Women May Result in Fetal Injury, Premature Birth and Low Birth Weight. | October 12, 1985–present | X | X† |
| SURGEON GENERAL'S WARNING: Cigarette Smoke Contains Carbon Monoxide. | October 12, 1985–present | X | X† |
| **Smokeless tobacco** | | | |
| WARNING: This product may cause mouth cancer. | February 27, 1987–present | X | X‡ |
| WARNING: This product may cause gum disease and tooth loss. | February 27, 1987–present | X | X‡ |
| WARNING: This product is not a safe alternative to cigarettes. | February 27, 1987–present | X | X‡ |

Source: Federal Trade Commission (1981).

*Required by Federal Trade Commission consent order. All other warnings required by federal legislation.

†The four warnings mandated for cigarette advertisements on outdoor billboards are slightly shorter versions of the same messages.

‡The warnings on advertisements must appear in a circle-and-arrow format (see Figure 5). No warnings are required on outdoor billboards.

finance U.S. military involvement. The last of a series of increases took place on November 1, 1951, during the Korean War, when the tax was increased from seven to eight cents per pack. The tax remained at that level for the next 30 years.

Over the past decade, however, the federal tax on cigarettes has been increased significantly. These recent increases were motivated by a different goal—the need to raise revenues to deal with the increasing federal budget deficit. The first of these deficit-motivated increases occurred on March 1, 1983, as part of the Tax Equity and Fiscal Responsibility Act of 1982, when the tax was doubled to 16 cents per pack. This increase was intended as a temporary measure that would be repealed by October 1, 1985. However, after being extended several times, the doubling of the tax was made permanent in 1986.

As part of the Omnibus Budget Reconciliation Act of 1985, a tax of 24 cents per pound was levied on snuff, a tax of 8 cents per pound was imposed on chewing tobacco, and a tax of 45 cents per pound was applied to pipe tobacco. The Omnibus Budget Reconciliation Act of 1990 further increased federal taxes on cigarettes from 16 cents to 20 cents per pack on January 1, 1991; a scheduled additional increase of 4 cents per pack was levied on January 1, 1993. As of 1993, federal taxes on other tobacco products are 36 cents per pound for snuff, 12 cents for chewing tobacco, and 67.5 cents for pipe tobacco. This represents a tax of less than 3 cents per can of snuff or pouch of chew; the tax on a pack of cigarettes is 24 cents. Yet even though federal taxes on tobacco have increased recently, they have become a less important source of revenue for the federal government. In 1950, tobacco excise taxes accounted for 3.36 percent of all federal revenues; by 1989, they accounted for only 0.44 percent of revenues (Congressional Budget Office [CBO] 1990).

### State and Local Tobacco Taxes

In 1921, Iowa became the first state to impose an excise tax on cigarettes, followed in 1923 by Georgia, South Carolina, South Dakota, and Utah. By the end of the 1920s, six additional states had enacted a cigarette excise tax. By 1940, more than half of all states levied taxes on cigarettes, and by 1950, only a handful of states were not imposing an excise tax. In 1969, North Carolina became the last state to enact an excise tax on cigarettes. As with the federal government, the imposition of, and increases in, state cigarette taxes have partly represented attempts to raise revenue rather than to lower smoking prevalence. Warner (1981) argues that this financial motive is especially clear in the history of excise taxes on cigarettes in the six major tobacco-producing states. The average date when these states instituted a cigarette excise tax was 1939—one year earlier than the average for the remaining states, and many years before the widespread publicity on the health hazards of smoking. Just before the negative publicity, the average tax rate for these six states was 2.5 cents per pack, a figure only slightly less than the other states' average of 2.9 cents per pack. As is discussed later, the difference has increased greatly since then.

Some evidence suggests that state governments have recently used cigarette excise taxes as a major part of antismoking campaigns. This conclusion can be drawn from reviewing the number of increases in state excise tax rates after the mid-1950s release of the first scientific studies that linked smoking to poor health, and particularly after the 1964 release of the initial Surgeon General's report on smoking and health (PHS 1964). For instance, during the latter half of the 1950s, more than eight tax increases occurred per year among the states, whereas fewer than three per year occurred each year in the early 1950s. Similarly, in the year after the 1964 Surgeon General's report, there were a record 22 increases in state excise taxes on cigarettes.

The established pattern of tax increases continued during the period when the Fairness Doctrine permitted antismoking messages on television and radio, and again after the 1971 ban on television and radio advertising (Warner 1981). Moreover, as Warner (1981) notes, the once negligible difference between the tax rates in the tobacco-producing states and in the remaining states widened significantly over this period. This difference has continued to widen since 1981. By January 1, 1992, the average tax rate in the tobacco-producing states was 7 cents per pack, whereas the average tax rate in the remaining 44 states and Washington, D.C., was 26 cents per pack.

The active use of cigarette and other tobacco taxes to discourage tobacco use in some states and the relative inaction in others results in large differences in taxes and, consequently, in cigarette prices among states. For example, the cigarette excise tax ranges from less than 3 cents per pack in Virginia to 60 cents per pack in Hawaii (see Table 13). When local taxes are added, the differences become even larger in some locations. The differences in taxes and prices create incentives for the casual smuggling (i.e., involving relatively small quantities, generally for personal use) and organized smuggling (i.e., involving large quantities, generally for resale) of cigarettes from low-tax localities to high-tax localities and create incentives for other tax-evasion activities.

The relative ease of transporting cigarettes across localities has encouraged some people to profit from this activity (Advisory Commission on Intergovernmental Relations [ACIR] 1977, 1985). Although casual smuggling

Table 13. State* cigarette taxes, July 1, 1993

| State | Excise tax rate (cents per 20-cigarette pack) | Sales tax† (cents per pack) | Total state tax (cents per pack) |
|---|---|---|---|
| Alabama | 16.5 | 7 | 23.5 |
| Alaska | 29.0 | 0 | 29.0 |
| Arizona | 18.0 | 9 | 27.0 |
| Arkansas | 31.5 | 9 | 40.5 |
| California | 35.0 | 15 | 50.0 |
| Colorado | 20.0 | 0 | 20.0 |
| Connecticut | 47.0 | 12 | 59.0 |
| Delaware | 24.0 | 0 | 24.0 |
| District of Columbia | 65.0 | 13 | 78.0 |
| Florida | 33.9 | 12 | 45.9 |
| Georgia | 12.0 | 6 | 18.0 |
| Hawaii | 60.0 | 9 | 69.0 |
| Idaho | 18.0 | 9 | 27.0 |
| Illinois | 30.0 | 13 | 43.0 |
| Indiana | 15.5 | 9 | 24.5 |
| Iowa | 36.0 | 11 | 47.0 |
| Kansas | 24.0 | 9 | 33.0 |
| Kentucky | 3.0 | 9 | 12.0 |
| Louisiana | 20.0 | 8 | 28.0 |
| Maine | 37.0 | 11 | 48.0 |
| Maryland | 36.0 | 10 | 46.0 |
| Massachusetts | 51.0 | 9 | 60.0 |
| Michigan | 25.0 | 7 | 32.0 |
| Minnesota | 48.0 | 14 | 62.0 |
| Mississippi | 18.0 | 11 | 29.0 |
| Missouri | 13.0 | 7 | 20.0 |
| Montana | 19.3 | 0 | 19.3 |
| Nebraska | 34.0 | 9 | 43.0 |
| Nevada | 35.0 | 13 | 48.0 |
| New Hampshire | 25.0 | 0 | 25.0 |
| New Jersey | 40.0 | 12 | 52.0 |
| New Mexico | 21.0 | 9 | 30.0 |
| New York | 56.0 | 8 | 64.0 |
| North Carolina | 5.0 | 6 | 11.0 |
| North Dakota | 44.0 | 11 | 55.0 |
| Ohio | 24.0 | 8 | 32.0 |
| Oklahoma | 23.0 | 8 | 31.0 |
| Oregon | 28.0 | 0 | 28.0 |
| Pennsylvania | 31.0 | 11 | 42.0 |
| Rhode Island | 37.0 | 14 | 51.0 |
| South Carolina | 7.0 | 8 | 15.0 |
| South Dakota | 23.0 | 7 | 30.0 |
| Tennessee | 13.0 | 14 | 27.0 |
| Texas | 41.0 | 13 | 54.0 |
| Utah | 26.5 | 9 | 35.5 |
| Vermont | 20.0 | 9 | 29.0 |
| Virginia | 2.5 | 7 | 9.5 |
| Washington | 54.0 | 13 | 67.0 |
| West Virginia | 17.0 | 10 | 27.0 |
| Wisconsin | 38.0 | 10 | 48.0 |
| Wyoming | 12.0 | 0 | 12.0 |

Sources: Tobacco Institute (1992); Action on Smoking and Health (1993).
*Includes the District of Columbia.
†Sales tax information is for November 1, 1992.

had long been a problem, states reported that organized smuggling increased significantly after the tax increases of the mid- to late-1960s. Some states were discouraged from adding further taxes that would motivate increased smuggling and result in a net loss of revenues generated by cigarette taxes. In 1978, in response to pressure from states with high cigarette taxes, the Federal Contraband Cigarette Act (Public Law 95-575) was enacted. This act prohibited the single-transaction transport, receipt, shipment, possession, distribution, or purchase of more than 60,000 cigarettes not bearing the tax indicia of the state in which the cigarettes were initially sold. The act dealt only with the organized smuggling of cigarettes, described by the ACIR as the major problem, and ignored the less problematic casual smuggling (Kleine 1993). The ACIR (1985) suggests, however, that the law was even more effective than its proponents would have predicted.

California and Massachusetts recently enacted two large increases in their excise taxes on tobacco. In November 1988, California voters passed Proposition 99, which went into effect in January 1989. This law increased California's state excise tax on cigarettes from 10 cents per pack to 35 cents per pack. As was mentioned earlier, one of the notable features of Proposition 99 is that 20 percent of the additional revenue raised from the tax increase is earmarked for the state's antismoking activities. Legislation similar to Proposition 99 was passed in Massachusetts in November 1992. This measure, which took effect on January 1, 1993, includes a 25-cent increase in the state excise tax and a 25 percent increase in the tax on chewing tobacco.

Besides the specific taxes applied to cigarettes, 45 states and Washington, D.C., have general sales-taxes that apply to cigarettes. In all but four of these states, the sales-tax base includes the excise tax. This arrangement adds an additional 5 to 14 cents per pack to the price of cigarettes in these states (see Table 13).

State taxes on other tobacco products have also become more widespread. By January 1, 1992, a total of 37 states had imposed a tax on at least some tobacco products other than cigarettes; only 14 states were collecting such taxes in 1964. The same time period witnessed similar activity at the local level. By fiscal year 1991, 373 cities had imposed additional taxes on cigarettes, and 49 cities were levying taxes on other tobacco products. In addition, 38 counties were charging their own cigarette taxes, and 29 counties were assessing additional taxes on other tobacco products. The largest of these local cigarette taxes are those imposed in New York City (8 additional cents per pack) and in Chicago (24 additional cents per pack, including city and county excise taxes).

### Cigarette Tax Increases and Cigarette Prices

After scientific evidence of the harmful health consequences of cigarette smoking appeared in the mid-1950s, states began to increase cigarette excise taxes not only to raise revenues but to discourage people from smoking. Because the combined federal and state taxes accounted for almost half of the average retail price of cigarettes, these state tax increases resulted in increases in the real price of cigarettes (i.e., the price of cigarettes relative to the price of all goods and services, as measured by the National Consumer Price Index) (Table 14). The relative price of cigarettes also rose as a result of the state tax increases. This trend was accelerated after the 1964 release of the first Surgeon General's report on smoking and health. The result was that between 1955 and 1971, the nominal price of cigarettes had risen by over 70 percent (almost half of this increase was attributed to the state tax increases), and the real price of cigarettes had risen by over 13 percent.

These increases in real cigarette prices were short-lived. The rapid inflation of the 1970s, coupled with the relative stability of state excise taxes on cigarettes, led to a sharp drop in real cigarette prices between 1971 and 1981. Federal taxes remained fixed at 8 cents per pack during this period. As was discussed earlier, the emergence of organized smuggling in response to the growing differences in state and local taxes discouraged states from continuing to increase cigarette taxes. Combined federal and state taxes, as a percentage of retail cigarette prices, fell from 47 percent at the beginning of this period to 33 percent in 1981. The absolute cost of producing cigarettes fell throughout this period, largely because of a decrease in the average quantity of tobacco per cigarette as the market share for "low tar" cigarettes increased (Harris 1987). The overall result was that between 1971 and 1981, the real price of cigarettes declined by almost 28 percent.

Beginning in 1982, this downward trend in real cigarette prices was reversed as state taxes rose in anticipation of the doubling of the federal excise tax on cigarettes that was scheduled for January 1, 1983. These combined tax increases led to the largest single-year jump in prices (from 1982 to 1983). However, Harris (1987) argues that the main cause of the increase in the real price of cigarettes from 1981 through 1986 was not the increase in either the federal tax or state taxes, but rather the increases in the wholesale prices of cigarettes because of markups by manufacturers. He contends that most of these markups were not justified by increases in the cost of production. Instead, he suggests that markups were the result of a coordinated price increase by the six firms that dominate the tobacco industry. More recent data lend support to Harris's argument: although state and

Table 14. Cigarette taxes and cigarette prices per pack, 1955–1991

| Year | Average state tax (cents) | Average federal tax (cents) | Average cigarette price (cents) | Taxes as percentage of average price* | Real† average state tax‡ (cents) | Real† average federal tax (cents) | Real† average cigarette price (cents) |
|---|---|---|---|---|---|---|---|
| 1955 | 3.5 | 8.0 | 22.7 | 48.7 | 13.1 | 29.9 | 84.7 |
| 1956 | 3.8 | 8.0 | 23.2 | 47.4 | 14.0 | 29.9 | 85.3 |
| 1957 | 3.9 | 8.0 | 23.8 | 48.8 | 13.9 | 28.5 | 84.7 |
| 1958 | 4.0 | 8.0 | 25.0 | 48.0 | 13.8 | 27.7 | 86.5 |
| 1959 | 4.2 | 8.0 | 25.6 | 46.6 | 14.4 | 27.5 | 88.0 |
| 1960 | 4.7 | 8.0 | 26.1 | 48.9 | 15.9 | 27.0 | 88.2 |
| 1961 | 4.7 | 8.0 | 26.1 | 48.6 | 15.7 | 26.8 | 87.3 |
| 1962 | 5.1 | 8.0 | 26.9 | 48.3 | 16.9 | 26.5 | 89.1 |
| 1963 | 5.2 | 8.0 | 26.8 | 49.4 | 17.0 | 26.1 | 87.6 |
| 1964 | 5.6 | 8.0 | 27.9 | 49.3 | 18.1 | 25.8 | 90.0 |
| 1965 | 5.9 | 8.0 | 28.2 | 49.8 | 18.7 | 25.4 | 89.5 |
| 1966 | 6.9 | 8.0 | 30.0 | 51.4 | 21.3 | 24.7 | 92.6 |
| 1967 | 7.1 | 8.0 | 30.5 | 50.8 | 21.3 | 24.0 | 91.3 |
| 1968 | 8.4 | 8.0 | 32.3 | 49.2 | 24.1 | 23.0 | 92.8 |
| 1969 | 9.1 | 8.0 | 32.8 | 48.9 | 24.8 | 21.8 | 89.4 |
| 1970 | 10.2 | 8.0 | 37.1 | 47.7 | 26.3 | 20.6 | 95.6 |
| 1971 | 10.7 | 8.0 | 38.9 | 46.8 | 26.4 | 19.8 | 96.0 |
| 1972 | 11.6 | 8.0 | 40.0 | 47.7 | 27.8 | 19.1 | 95.7 |
| 1973 | 12.1 | 8.0 | 40.3 | 48.4 | 27.3 | 18.0 | 90.8 |
| 1974 | 12.1 | 8.0 | 41.8 | 47.6 | 24.5 | 16.2 | 84.8 |
| 1975 | 12.2 | 8.0 | 44.5 | 44.5 | 22.7 | 14.9 | 82.7 |
| 1976 | 12.4 | 8.0 | 47.9 | 41.4 | 21.8 | 14.1 | 84.2 |
| 1977 | 12.5 | 8.0 | 49.2 | 40.5 | 20.6 | 13.2 | 81.2 |
| 1978 | 12.9 | 8.0 | 54.3 | 37.1 | 19.8 | 12.3 | 83.3 |
| 1979 | 12.9 | 8.0 | 56.8 | 35.5 | 17.8 | 11.0 | 78.2 |
| 1980 | 13.1 | 8.0 | 60.0 | 34.5 | 15.9 | 9.7 | 72.8 |
| 1981 | 13.2 | 8.0 | 63.0 | 33.1 | 14.5 | 8.8 | 69.3 |
| 1982 | 13.5 | 8.0 | 69.7 | 29.9 | 14.0 | 8.3 | 72.2 |
| 1983 | 14.7 | 12.0 | 81.9 | 26.8 | 14.8 | 12.0 | 82.2 |
| 1984 | 15.3 | 16.0 | 94.7 | 33.2 | 14.7 | 15.4 | 91.1 |
| 1985 | 15.9 | 16.0 | 97.8 | 32.3 | 14.8 | 14.9 | 90.9 |
| 1986 | 16.2 | 16.0 | 104.5 | 30.8 | 14.8 | 14.6 | 95.3 |
| 1987 | 16.9 | 16.0 | 110.0 | 29.9 | 14.9 | 14.1 | 96.8 |
| 1988 | 18.2 | 16.0 | 122.2 | 28.1 | 15.4 | 13.5 | 103.3 |
| 1989 | 21.8 | 16.0 | 127.5 | 26.5 | 17.6 | 12.9 | 102.8 |
| 1990 | 24.7 | 16.0 | 144.1 | 26.4 | 18.9 | 12.2 | 110.3 |
| 1991 | 25.9 | 20.0 | 153.3 | 25.6 | 19.0 | 11.7 | 112.6 |

Source: Tobacco Institute (1992).

*Percentages cannot be calculated directly from the tax and price information, since taxes are weighted average taxes for the entire fiscal year, whereas prices and percentages are generally as of November 1.

†Real taxes and prices are obtained by dividing the actual taxes and prices by the National Consumer Price Index, with the average of 1982–1984 being the benchmark. All data are for the fiscal year ending June 20.

‡State taxes are a weighted average of the tax in taxing states, including Washington, D.C. (42 in 1955, 51 in 1970 and after). Price refers to the median retail price in all taxing states.

federal taxes have increased since the late 1980s, the percentage of the retail price of cigarettes accounted for by these taxes actually fell from 33 percent in 1981 to 26 percent in 1991 (Tobacco Institute 1992). The combined effect of increases in federal and state taxes and in manufacturer's price resulted in the real price of cigarettes increasing by over 60 percent between 1981 and 1991. This upward trend in real cigarette prices is expected to continue at least through 1993, as the federal tax increases to 24 cents per pack as part of the 1990 deficit-reduction agreement. Therefore, although taxes accounted for a smaller percentage of the increased retail price of cigarettes from 1981 to 1991, the increased taxes, along with manufacturers' price increases, were still passed on to consumers, and the real price of cigarettes increased.

### Effect of Excise Taxes on Tobacco Use

One of the fundamental principles of economics, illustrated by a downward-sloping demand curve, states that as the real price of any commodity rises, consumption of that commodity falls. Some researchers have speculated that the consumption of an addictive product, such as cigarettes, might be an exception to this rule. However, numerous econometric studies, including several recent studies that explicitly model the addictive aspects of cigarette smoking, confirm that this fundamental economic principle does indeed apply to cigarettes. Thus, since increases in cigarette excise taxes generally result in increased cigarette prices, these tax increases may be effective in reducing cigarette consumption.

Economists use the concept of price elasticity of demand to describe the sensitivity of consumption to changes in price. The price elasticity of demand is defined as the percentage change in consumption that results from a 1 percent increase in price. For example, a price elasticity of -0.5 implies that a 10 percent increase in price would reduce consumption by five percent. A brief review of recent U.S. studies of cigarette demand follows.

#### Aggregate Data Studies

One set of recent studies of cigarette demand used aggregate data. Price elasticity estimates obtained from these studies ranged from -0.14 to -1.23; the majority of these estimates fell within the narrower range from -0.20 to -0.50. All but two of the estimates were obtained from econometric studies that besides examining the effect of price, used income, demographic variables, and other policy-related variables to explain differences in cigarette consumption. Failing to include such potentially important determinants of demand could lead to biased estimates of the effects of price and other policies on cigarette smoking. Several of these studies made theoretical and empirical attempts to model the addictive aspects of cigarette consumption. In contrast with the econometric analyses, Peterson et al. (1992) used an epidemiologic approach similar to the quasi-experimental approach of Baltagi and Goel (1987). Both studies obtained estimates of the price elasticity of demand that were consistent with those obtained from econometric studies.

Differences in the estimates obtained from these studies partly resulted from differences in theoretical and empirical modeling methods. For example, the studies that used a pooled time series of state cross-sections might provide estimates of the price elasticity that exceed the true value of the elasticity if cigarette smuggling is ignored, since studies based on aggregate data use state cigarette sales figures as their measure of consumption. That is, states with relatively low cigarette taxes and prices may sell a substantial number of cigarettes to residents of nearby states where prices are higher. Thus, the sales figures from the states with lower cigarette taxes and prices will overstate cigarette consumption within those states, whereas those with higher taxes and prices will understate consumption. Many of the most recent studies, however, including those by Baltagi and Levin (1986), Becker, Grossman, and Murphy (1992), and Chaloupka and Saffer (1992), have controlled for this problem. Similarly, if the addictive aspects of consumption are ignored, the estimated price elasticity may be biased. Again, many of these recent studies, including Baltagi and Levin (1986), Becker, Grossman, and Murphy (1992), and Keeler et al. (1992) estimated demand equations that explicitly model the addictive aspects of consumption. In addition, at the aggregate level, cigarette prices and quantity are simultaneously determined by the interaction of cigarette supply and demand. Ignoring this simultaneity would lead to biased estimates of the effects of cigarette prices on demand. Bishop and Yoo (1985) and Porter (1986) explicitly modeled this relationship and estimated price elasticities of demand that fell within the -0.20 to -0.50 range generally found in other studies based on aggregate data. Finally, two of these studies, Keeler et al. (1992) and Flewelling et al. (1992), considered the effects of the relatively large change in the California cigarette excise tax. Their estimated price elasticities suggest that the impact of price on demand is independent of the level of price.

Even with the differences in data, theoretical modeling, and estimation techniques, one general conclusion can be drawn from these aggregate studies—increases in cigarette prices will reduce cigarette consumption. At least part of this reduction is likely due to adolescents' quitting smoking, reducing the amount they smoke, or not taking up smoking in the first place (USDHHS 1991).

Microlevel Data Studies

Another set of recent studies of cigarette demand include those that used microlevel data—that is, data from groups of individuals instead of aggregate data sets. As with the studies that used aggregate data, these studies consistently indicated that cigarette smoking is affected negatively by price. Each of the studies carefully dealt with the smuggling problem that could bias the estimates of the price elasticities. Because they were based on microlevel data, the studies also avoided the simultaneity problems that arise when working with aggregate data. That is, no individual smoker consumes enough cigarettes to affect market price, so prices could be appropriately treated as exogenous in these studies.

Many of these studies, however, examined issues that cannot be addressed when using aggregate data. Studies that use microlevel data can assess the effect of prices and other policies, not only on average cigarette consumption (the focus of aggregate studies), but also on the probability that an individual smokes and on average consumption among smokers. Similarly, the effects of policy variables on smoking initiation and cessation can be explored. Microlevel data can be used to consider the differential effects of increased cigarette excise taxes and other policies on alternative demographic groups (by age or by gender, for example).

Lewit and Coate (1982) took advantage of cross-sectional survey data not only to estimate equations of the demand for cigarettes, but also to determine smoking prevalence and patterns of smoking participation. In addition, this study estimated separate demand equations for different age groups (20–25 years, 26–35 years, and 36–74 years) and for men and women. These investigators found that a price increase appeared to effect the decision to become a smoker rather than the decision to smoke less frequently. They also found that the smoking behavior of young adults (20 to 25 years old) was more sensitive to price changes than that of older individuals. Finally, they found that male smokers, particularly those aged 20 to 35 years, were quite responsive to price, whereas female smokers were essentially unaffected by price.

Mullahy (1985) introduced myopic addiction (i.e., the concept that addiction outweighs an individual's foresight or concern for future well-being) into his theoretical model of cigarette smoking. This model implies that at any given time, smoking initiation, regular use, and the amount of cigarettes smoked depend on an individual's smoking history. This model and other studies that formally model the addictive aspects of smoking incorporate the concepts of tolerance, reinforcement, and withdrawal that distinguish addictive consumption from nonaddictive consumption. Treating smokers as myopic, however, implies that the future consequences of their smoking are ignored when they make current decisions. Mullahy estimated separate demand equations for men and women and found that both the decision to smoke and the quantity of cigarette consumed by smokers were negatively related to cigarette prices for each gender. As in the Lewit and Coate study, Mullahy found that cigarette prices had a greater impact on the decision to smoke than they do on cigarette consumption. Similarly, he found that men were somewhat more responsive to price than women (average elasticities of -0.56 and -0.39, respectively).

Chaloupka (1990, 1991a, b) applied the Becker and Murphy (1988) model of rational addictive behavior to cigarette smoking. As in the Mullahy model, addiction is accounted for by recognizing that current smoking decisions depend on past smoking, whereas rationality implies that the future consequences of an individual's past and current smoking behavior are considered when making current choices. Chaloupka found both that cigarette smoking is addictive—that is, it depends on past smoking—and that individuals who smoke also consider future consequences. He found that increases in cigarette prices reduce average cigarette consumption significantly and that the effects of price increases on consumption are understated if the addictive aspects of consumption are ignored. In contrast with the findings of Lewit and Coate, Chaloupka found that adolescents and young adults (aged 17 through 24 years) were less responsive to price than are older age groups. Chaloupka also found, like Lewit and Coate, that women were much less responsive to price than men.

Wasserman et al. (1991) used several of the Health Interview Surveys conducted during the 1970s and 1980s to estimate the effects that taxes and regulations restricting smoking in public places have on adult cigarette demand. These investigators also examined whether the price elasticity of demand has changed over time. Using a generalized linear model, they found that the negative impact of cigarette prices on demand has increased over time. The estimated price elasticity of demand in 1970 (0.06) suggested that increases in cigarette excise taxes would not discourage cigarette smoking. However, the authors estimated an increasingly negative effect of cigarette prices on demand from 1974 (-0.17) through 1985 (-0.23). They estimated that by 1988, the price elasticity of demand would increase (in absolute value) to -0.28. This finding that the price elasticity of demand is becoming more negative over time contradicts the findings of the studies based on aggregate data by Baltagi and Goel. The estimated elasticities of Wasserman et al. were approximately half those estimated by Lewit and Coate, who used the same data. Wasserman et al. attributed these relatively low estimates to their including an index that

measured state-level antismoking regulations and was highly correlated with price. When this index was omitted, the effects of price on demand were overstated, since they included the true price effect as well as the effect of the omitted regulations. The findings of Wasserman et al. for youth will be discussed in detail in the next section.

The implications of these studies on older adolescents' and young adults' responsiveness to price are not conclusive. Lewit and Coate's examination of individuals 20 years old and older concluded that upward price elasticity is increasingly negative (and thereby has a stronger effect) for younger age groups. The addictive model that Chaloupka used, however, suggested that less addicted smokers (those who have a shorter history of smoking, for example) will be less responsive to price than their more addicted counterparts. His estimated long-run price elasticities of demand for older adolescents and young adults were consistent with this hypothesis. The following section addresses more specifically the effect of price on the smoking behavior of young people.

### Price Responsiveness of Adolescent Smokers

A third set of recent econometric studies focused on youth. Each of these studies, as with the studies of adult smoking that employ microlevel data, carefully controlled for cigarette smuggling. Besides including cigarette prices and other determinants of demand employed in the studies of adult smoking, these youth studies included parental characteristics (such as education level and income) as proxies for parental smoking practices, which have been shown to be associated with youth smoking.

The first comprehensive studies of the price responsiveness of cigarette smoking among youth were completed in the early 1980s. Lewit, Coate, and Grossman (1981) used Cycle III of the Health Examination Survey (HES-III), which was conducted from March 1966 through March 1970, to look at the effects of cigarette prices, of the negative cigarette advertising broadcast under the Fairness Doctrine, and of various socioeconomic and demographic factors affecting cigarette smoking by youth (persons 12 through 17 years old). Besides examining average cigarette consumption among all youth, the authors also estimated equations for smoking participation for all youth as well as equations for cigarette demand for young smokers. This methodology, similar to that used by Lewit and Coate, allowed the authors to distinguish the effect of price on the decision to smoke from its effect on smokers' consumption of cigarettes. The authors found that most of the impact of prices on cigarette smoking was on the decision to smoke rather than on smokers' average consumption of cigarettes: estimated price elasticity was -1.20 for smoking participation and -0.25 for cigarette demand. Furthermore, the estimated price elasticity of demand among youth in this study (-1.44) was more than three times as high as the estimate for adults in Lewit and Coate's study and nearly two times as high as that study's estimate for young adults (persons aged 20 through 25 years).

These findings were mostly confirmed in a related study by Grossman et al. (1983). This study used data from the 1974, 1976, 1977, and 1979 National Household Surveys on Drug Abuse. The surveys were analyzed separately because of differences in the definition of smoking. As the authors noted, the estimates from this study should be interpreted cautiously, since the sample sizes were much smaller than those of the study based on the HES-III. In general, Grossman et al. found that the decision to smoke was negatively related to the price of cigarettes; their summary estimate of this elasticity was -0.76. Again, this estimate was substantially higher, in absolute value, than that obtained for adults by Lewit and Coate, and it implies that young people's decision to smoke is much more responsive to price than the comparable decision for adults. However, Grossman et al. found that once the decision to smoke has been made, average consumption decisions by young smokers were virtually unresponsive to price.

Warner (1985, 1986) used the age-specific price elasticities of participation and demand from Lewit and Coate to obtain comparable estimates of price elasticity for teenagers (persons aged 12 through 17 and 18 through 19). He used these age-specific data to estimate that the doubling of the federal excise tax in 1983 reduced the number of teenage smokers by 800,000, assuming that average cigarette prices increased by the 8 cents that the tax increased. These estimates form the basis for a U.S. General Accounting Office (GAO) report, which concluded that raising the federal tax further by 20 cents per pack would have reduced the number of teenage smokers by an additional 500,000 in 1989 (GAO 1989). The GAO predicted a subsequent reduction of 125,000 smoking-related deaths for this age group as a result of the proposed 20-cent tax increase.

Similarly, Harris (1987) used the Lewit, Coate, and Grossman estimates, among others, to examine the effects that the 1983 doubling of the federal excise tax on cigarettes had on cigarette smoking and health. He concluded that the tax increase and the coordinated price increases it induced kept 600,000 teenagers (persons aged 12 through 17 years) from starting to smoke. Basing his findings on epidemiologic studies of the 1950s, 1960s, and 1970s, Harris concluded that 54,000 more teenagers would live to age 65 as a result of this tax.

The recent study by Wasserman et al. (1991) contradicted the general conclusion of Lewit and Coate that teenage cigarette smoking is more responsive than adult smoking to changes in cigarette prices. Wasserman et al. used the Second National Health and Nutrition Examination Survey (1976–1980) (NHANES-II) to estimate the effects of cigarette prices and antismoking regulations on cigarette smoking by youth aged 12 through 17. In both the generalized linear models and the two-part models they estimated, the authors found a statistically insignificant effect of cigarette prices on average cigarette consumption among all youth, on smoking participation rates among all youth, and on cigarette consumption by young smokers. Given the range of estimates obtained, the investigators could not reject the hypothesis that the price elasticity of demand for teenagers was statistically different from their estimate of -0.23 for adults. Their estimates for youth were consistent with Chaloupka's (1991b) young adult estimates, which also employed NHANES-II data. As was discussed earlier, Wasserman et al. suggested that one of the reasons for their relatively low estimated price elasticity of demand was their including an index that captured antismoking regulations as a determinant of demand. Thus, they concluded that the price effects estimated in other studies may have been biased upwards, since prices alone were being credited with the effects of various contemporaneous antismoking regulations that likely played an important role in discouraging young people from smoking.

Grossman (1991) noted, however, that the study by Wasserman et al., while a valuable contribution to the empirical literature on cigarette demand, should not be considered as offering the definitive estimates of the price elasticity of demand, particularly for youth. Others, including Chaloupka (1988) and Chaloupka and Saffer (1992), did not find that the estimated price elasticity of demand was sensitive to the inclusion of measures of antismoking regulations, although these other studies used smaller sample sizes than did Wasserman et al. Furthermore, including the regulation index may be less relevant in a teenage sample, since the index assumes its highest value in states that restrict smoking in private worksites. If the regulations themselves have no direct impact on smoking, but are instead proxies for antismoking sentiment, then enacting very restrictive measures may not necessarily reduce youth smoking. For example, during the 1980s, restrictions on public smoking were enacted across the United States, yet smoking onset rates among young people did not decline significantly (see "Trends in Cigarette Smoking" in Chapter 3). Finally, the Wasserman et al. (1991) findings for a relatively small sample of youth (N = 1,891) should be interpreted cautiously when compared with those obtained by Lewit, Coate, and Grossman (1981) (N = 5,308).

### Discussion

The large amount of empirical literature on the relationship between cigarette prices and cigarette smoking suggests that increased excise taxes on cigarettes would significantly reduce overall rates of cigarette smoking. Much of the impact of higher prices would come from encouraging cessation among current smokers and discouraging initiation among young smokers. The price responsiveness of adolescents is at least as high, if not significantly higher, than that of adults—a finding that suggests that an increase in cigarette taxes would result in large reductions in smoking prevalence and cigarette consumption among teenagers.

Although numerous studies of aggregate cigarette demand and several studies of cigarette smoking among youth have been completed in recent years, the relationship between other tobacco taxes and the use of tobacco products other than cigarettes has not been examined.

## Tax Policies Under Consideration

Increased taxes on cigarette and other tobacco products have been widely used in recent years as a source of federal, state, and local revenue. These taxes also are seen as a way to improve public health by discouraging cigarette smoking. Two proposals discussed in the 1989 Surgeon General's report on smoking and health (USDHHS 1989) have received the most attention. The first proposal is to increase tobacco taxes in general and to change the way in which these taxes are calculated. The second proposal would earmark the revenue generated by tobacco taxes to pay for tobacco-control programs or the health care costs related to smoking. Most of the proposals discussed below concern cigarette taxes; similar policies could be adopted for taxes on other tobacco products as well.

### Increasing Tobacco Taxes

An increase in the federal excise tax on cigarettes is the most widely supported tax policy proposal. Proponents—which include a number of public health groups, such as the American Lung Association, the AMA, the ACS, the American Heart Association, and the American Public Health Association—argue that the cigarette tax should be increased, because even after recent increases, the real value of the tax is still well below what it was in 1951. Also suggested is the repeal of the federally approved exemption for state taxes of cigarette sales on military bases and Native American reservations.

Similarly, despite recent increases in state excise taxes on cigarettes, the average state's real excise tax on cigarettes is at about the same level as it was shortly after the release of the first Surgeon General's report on smoking and health. In several states (notably the large

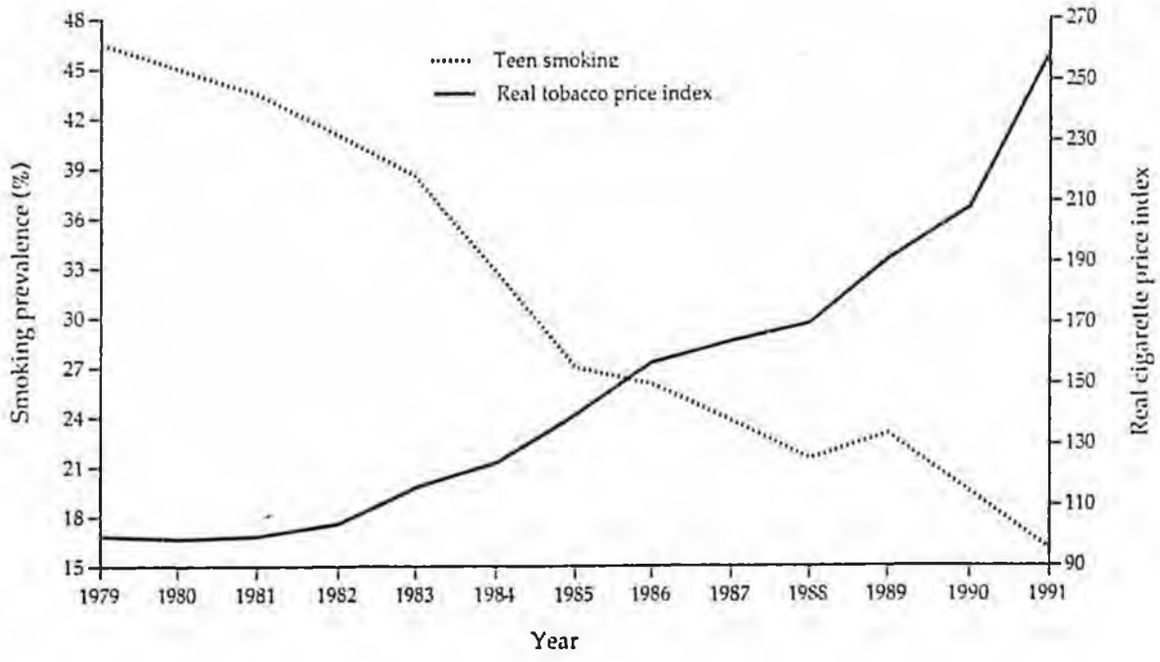
tobacco-producing states), the effects of inflation have been allowed to substantially reduce the values of these taxes. Although additional tax increases in states that have continually raised their cigarette excise taxes over time could spur a return to the organized smuggling of the 1970s, this problem possibly could be solved by levying larger tax increases in the states that have relatively low cigarette taxes and by instituting a tax in the four states that currently exclude cigarettes from the in-state sales tax.

These tax increases would raise cigarette prices in the short run; without continued increases, however, the real value of the tax would be reduced by inflation over time. Given the importance of taxes in cigarette prices, the real cigarette price could even decline, as it did from 1971 to 1981. An alternative might be to replace the excise tax with an ad valorem tax, which would increase proportionately as the nontaxed price of cigarettes increases. The federal government imposes an ad valorem tax on large cigars only, and most states levy ad valorem taxes on tobacco products other than cigarettes.

An ad valorem tax, however, may have an unintended consequence of lulling the public's awareness of a tax increase, since ad valorem taxes may be perceived—and accepted—as part of overall inflation. Periodic increases in excise taxes, on the other hand, may be publicized each time they occur and thus may stimulate public discussion of the health effects of smoking. Canada's experience with ad valorem taxes suggests that any mechanism that raises cigarette prices will be effective in reducing cigarette smoking.

To offset declines in real revenues due to inflation, Canada switched to an ad valorem tax on cigarettes at both the federal and provincial levels in the 1980s. These ad valorem taxes were partly responsible for a 25 percent increase in real cigarette prices, which was accompanied by a 10 percent decline in adult consumption of cigarettes (Sweanor 1991). In 1984, however, the ad valorem tax system was dropped after heavy lobbying by the tobacco industry and a lack of support from public health groups. Since then, there have been large increases in both federal and provincial excise taxes. By June 1, 1991, the average total tax on a pack of 20 cigarettes in Canada was $3.72, more than eight times what it was in 1980 and approximately seven times the average in the United States. The large increases in Canadian taxes since 1985 are estimated to have reduced adult consumption by 35 percent and teenage consumption by 62 percent. These data included tobacco imported from the United States (Sweanor 1991; see Figure 6). Canada's experience in the 1980s provides a nationwide example of the effect of a tax increase on cigarette smoking among young people.

Figure 6. Real* cigarette prices and cigarette smoking prevalence among Canadians aged 15–19 years, 1979–1991




Sources: Health and Welfare Canada (1991); Sweanor (1992).
*The price of cigarettes relative to the price of all goods and services in Canada, adjusted for inflation with 1979–1980 being the benchmark years.

Related proposals include indexing the federal cigarette excise tax to the rate of inflation or to some measure of cigarette prices. Each of these proposals would have the benefit of offsetting the effects of inflation on the value of the taxes and tax revenue over time, and each would be only slightly more cumbersome to administer than current tax structures.

Opponents of these tax changes argue that increases would place an unfair burden on the poor. In general, excise taxes and other consumption taxes are regressive, in that they require lower-income individuals to pay a greater share of their incomes in taxes. The CBO estimates that increased cigarette excise taxes would most affect individuals in the lowest income categories (CBO 1990). However, as the CBO also explains, alternative tax and transfer policies could offset the regressiveness of a tax increase. Proponents of these tax changes point out that lung cancer and other smoking-related diseases also disproportionately affect the poor; moreover, if the tax revenues are earmarked to programs directed to the poor, then the overall policy is not regressive.

Another side effect of an increase in the federal tax on cigarettes would be the reduction of state and local cigarette tax collections as cigarette consumption falls. On the other hand, if state taxes on cigarettes increase with federal taxes, state revenues could increase as well, as occurred in 1983. Lastly, opponents of tax changes argue that increases in taxes would also increase incentives to evade taxes. The CBO estimates, however, that any resulting increases in tax evasion would be relatively minor.

### Earmarking Taxes

The apparent success of Proposition 99 in California has increased interest in adopting similar policies elsewhere. Of the revenues generated from the tax increase of 25 cents per pack, 20 percent are dedicated to antismoking education, 5 percent to research, 5 percent to environmental and other specified programs, and 70 percent to medical care for the poor. Recent attempts by the governor to redirect some of these revenues to other purposes were stopped by the state courts. Similar earmarking of part of the state excise on cigarettes takes place in Nebraska (for its cancer and smoking research program), Minnesota (for the state public health fund), Utah (for its tobacco-control programs), and Indiana (for subsidizing of child care). Earmarking the revenues from tobacco taxes to tobacco-control programs reinforces the impact that increased tobacco taxes have on tobacco consumption. Early evidence from California (Flewelling et al. 1992; Keeler et al. 1992) indicates that the combined impact of the increased excise tax on cigarettes and the increased tobacco-control activities funded by these tax increases has resulted in reduced cigarette consumption.

On its November 1992 ballot, Massachusetts passed a measure similar to Proposition 99. This measure institutes a state excise tax increase of 25 cents per cigarette pack and a 25 percent increase in the tax on chewing tobacco. Some of the revenue from the increases may be dedicated to tobacco-control programs. Public health professionals in Colorado, Nebraska, Arkansas, Michigan, and Oregon are advocating similar measures. These types of large increases in cigarette excise taxes, where at least part of the increased revenues is earmarked for other antismoking activities, have the added advantage of stimulating the discussion of the health consequences of smoking. As a result, reductions in smoking may be larger than anticipated.

## Conclusions

This chapter reviewed a large body of literature concerning programs and policies to prevent tobacco use among young people. These measures, from education to taxation, are strongly supported by the United States public. Given the number of young people who continue to initiate use during adolescence, and given the strong role of the social environment in the process of initiation, efforts to prevent the onset of tobacco use may need multiple, complementary components, including those described in this chapter, and may need to be implemented at the national, state, and community levels to have long-term impact.

1. Most of the American public strongly favor policies that might prevent tobacco use among young people. These policies include tobacco education in the schools, restrictions on tobacco advertising and promotions, a complete ban on smoking by anyone on school grounds, prohibition of the sale of tobacco products to minors, and earmarked tax increases on tobacco products.
2. School-based smoking-prevention programs that identify social influences to smoke and teach skills to resist those influences have demonstrated consistent and significant reductions in adolescent smoking

prevalence, and program effects have lasted one to three years. Programs to prevent smokeless tobacco use that are based on the same model have also demonstrated modest reductions in the initiation of smokeless tobacco use.

3. The effectiveness of school-based smoking-prevention programs appears to be enhanced and sustained by comprehensive school health education and by communitywide programs that involve parents, mass media, community organizations, or other elements of an adolescent's social environment.
4. Smoking-cessation programs tend to have low success rates. Recruiting and retaining adolescents in formal cessation programs are difficult.
5. Illegal sales of tobacco products are common. Active enforcement of age-at-sale policies by public officials and community members appears necessary to prevent minors' access to tobacco.
6. Econometric and other studies indicate that increases in the real price of cigarettes significantly reduce cigarette smoking; young people are at least as responsive as adults to such price changes. Maintaining higher real prices of cigarettes depends on further tax increases to offset the effects of inflation.

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# Report Cites Teenagers' Tobacco Use
## Rise in Smoking Noted By Surgeon General

By John Schwartz
Washington Post Staff Writer

Surgeon General Joycelyn Elders strongly criticized cigarette advertising yesterday and warned of the dangers of smoking for young people.

Elders delivered a report, "Preventing Tobacco Use Among Young People," the 23rd on smoking and health from the surgeons general in a 30-year anti smoking crusade. This is first such report to focus exclusively on the dangers of smoking for young people.

Sounding like the sternest school principal in the country, Elders said that it is time for Americans to stop deluding themselves about the dangers of smoking for teenagers, and to issue "a warning to our young people that tobacco is addicting and that tobacco kills."

Elders said that teenagers come to believe that smoking will help them join what she called the "5-S club: slim, sexy, sociable, sophisticated, successful."

Regular repetition of the anti-smoking message has shown some success in getting adults to kick the habit. David Satcher, director of the Centers for Disease Control and Prevention, said that "2 million lives have been spared from premature death" since 1964, when then Surgeon General Luther Terry first attacked tobacco.

But the same message has not been as successful in reaching young people. Recent surveys cited at the news conference show a disconcerting rise in smoking among high-school-aged youngsters since 1992. More than 3 million adolescents smoke, and more than 1 million male adolescents use smokeless tobacco.

Nearly 35 percent of white high school seniors were regular smokers in 1992, down from nearly 40 percent in 1976. Among black high school seniors, however, smoking declined sharply in the same period, dropping from 40 percent to less than 10 percent of the group. Public health officials could not explain the disparity.

If youngsters can be kept from smoking in their high school years, Elders said, "most will never smoke." Virtually all smokers pick up the habit during adolescence - and their addiction can begin with as few as five cigarettes, Elders said.

Elders sharply attacked cigarette advertising that she said appealed directly to young people, especially RJR Nabisco's popular "Joe Camel" character. The makers of Camel cigarettes have recently introduced a second character, "Josephine Camel," to broaden the appeal to female smokers.

The surgeon general called for a nationwide effort to educate young people

about the dangers of smoking, and she suggested that higher excise taxes on cigarettes also could cut down on smoking. But Elders stopped short of calling for a ban on print cigarette advertising or on eliminating the tax breaks for tobacco companies' advertising costs.

Calling tobacco use one of the major "risk factors" associated with other social problems - including drinking, drug abuse, unsafe sex and teenage suicide - Elders said that cutting down on smoking "might have a big impact on preventing or delaying" other bad behavior.

Jack E. Henningfield, chief of the Clinical Pharmacology Branch of the National Institute on Drug Abuse, said that such risk factors are not proven causes of other unhealthy practices. "There is no study that shows if you smoke a cigarette, you'll run down the street and shoot heroin." But Henningfield said that cigarette use is "one of the most compelling risk factors."

Previous surgeons general applauded the new report. Antonia C. Novello suggested that cigarettes be put under the jurisdiction of the Food and Drug Administration, which ensures that foods and drugs are safe and effective. "The time for more studies is over. The time for action," Novello said, "is today."

In a statement, former surgeon general C. Everett Koop said, "In the whole anti-smoking effort, nothing is more important than strategies to prevent the addiction of young people to nicotine."

A representative of the tobacco industry said that Elders's report, while correct on some points, is misguided in others. "Clearly there is evidence that links cigarette smoking as a risk factor with lung cancer, emphesyma and heart disease," said Tom Lauria, a spokesman for the Washington-based Tobacco Institute.

Lauria criticized the call for an excise tax: "Hitting 50 million adult

"In the whole anti-smoking effort, nothing is more important than strategies to prevent the addiction of young people to nicotine."

-former surgeon general C. Everett Koop

smokers in the wallet will not address the problems of youth smoking," Lauria said. He also denied that advertising is aimed at recruiting young smokers, pointing out that 40 percent of the $48 billion adult smokers market changes brands each year.

The new report means more bad news for an already-besieged tobacco industry. The Environmnetal Protection Agency, which last year classified secondhand smoke a cancer agent more dangerous than radon, went further last week when EPA Administrator Carol M. Browner testified in favor of legislation banning smoking in public buildings. McDonald's Corp. announced this week that it would ban smoking at all of its 1,400 company-owned restaurants. Also, research released this week showed that pregnant women who are exposed to secondhand smoke pass inhaled nicotine along to the fetus, with possible increased risk of slightly lowered intelligence and speech abilities. Prior research links smoking by pregnant women to low birth weight, premature birth and other health effects.

Elders went from the news conference directly to a question-and-answer session with Washington-area schoolchildren who have signed a nonsmoking pledge.

"How can you tell people to stop smoking if they won't listen?" asked one of the schoolchildren.

"You just keep trying to find a message that they will listen to," Elders responded.

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# APPARENT CONSUMPTION OF DISTILLED SPIRITS BY STATE, TOTAL AND PER CAPITA 1a

| Resident Population | | | % of Total Consumption | | | Consumption 12 Months Ending Jun. | | | | | Per Capita Consumption 12 Months Endin | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 12 Months Ending Jun. | | | 000 Gallons | | Rank | | % | Gallons | | Rank | | |
| (000) | Rank of Total | % of 1992 | 1993 | 1992 | STATE | 1993 | 1992 | 1993 | 1992 | Change | 1993 | 1992 | 1993 | 1992 | Ch |
| | | | | | LICENSE STATES | | | | | | | | | | |
| 567 | 49 | 0.23 | 0.33 | 0.34 | Alaska | 1,162 | 1,187 | 46 | 45 | -2.9 | 1.96 | 2.08 | 4 | 4 | - |
| 3,832 | 23 | 1.60 | 1.68 | 1.65 | Arizona | 5,646 | 5,771 | 21 | 21 | 1.3 | 1.53 | 1.64 | 17 | 19 | -0 |
| 2,399 | 33 | 0.94 | 0.84 | 0.82 | Arkansas | 2,929 | 2,855 | 33 | 33 | 2.6 | 1.22 | 1.20 | 35 | 35 | 1. |
| 30,867 | 1 | 12.10 | 12.32 | 12.65 | California | 42,813 | 44,274 | 1 | 1 | -3.3 | 1.39 | 1.46 | 27 | 22 | -4.8 |
| 3,470 | 26 | 1.36 | 1.48 | 1.50 | Colorado | 5,131 | 5,607 | 25 | 24 | -8.5 | 1.48 | 1.66 | 20 | 14 | -10.9 |
| 3,281 | 27 | 1.29 | 1.60 | 1.63 | Connecticut | 5,564 | 5,718 | 23 | 23 | -2.9 | 1.69 | 1.74 | 9 | 7 | -2.6 |
| 669 | 46 | 0.27 | 0.37 | 0.37 | Delaware | 1,282 | 1,269 | 44 | 44 | -0.5 | 1.86 | 1.90 | 6 | 6 | -1.8 |
| 509 | 48 | 0.23 | 0.58 | 0.63 | Dist. of Columbia | 2,016 | 2,208 | 37 | 36 | -8.7 | 3.42 | 3.69 | 2 | 2 | -7.3 |
| 13,486 | 4 | 5.29 | 7.60 | 7.34 | Florida | 26,414 | 25,701 | 2 | 2 | 2.8 | 1.96 | 1.94 | 5 | 5 | 1.2 |
| 6,751 | 11 | 2.65 | 3.02 | 3.04 | Georgia | 10,478 | 10,658 | 10 | 10 | -1.7 | 1.55 | 1.61 | 15 | 17 | -3.6 |
| 1,160 | 40 | 0.45 | 0.44 | 0.46 | Hawaii | 1,513 | 1,572 | 40 | 40 | -3.7 | 1.30 | 1.38 | 29 | 29 | -5.8 |
| 11,631 | 6 | 4.56 | 4.70 | 4.73 | Illinois | 16,314 | 16,574 | 5 | 5 | -1.6 | 1.40 | 1.44 | 24 | 23 | -2.9 |
| 5,662 | 14 | 2.22 | 1.84 | 1.84 | Indiana | 6,379 | 6,427 | 19 | 19 | -0.7 | 1.13 | 1.15 | 40 | 40 | -1.7 |
| 2,523 | 32 | 0.99 | 0.77 | 0.75 | Kansas | 2,675 | 2,616 | 34 | 34 | 2.3 | 1.06 | 1.05 | 44 | 45 | 1.1 |
| 3,755 | 24 | 1.47 | 1.25 | 1.17 | Kentucky | 4,343 | 4,105 | 27 | 29 | 5.8 | 1.16 | 1.11 | 38 | 42 | 4.6 |
| 4,287 | 21 | 1.68 | 1.71 | 1.72 | Louisiana | 5,954 | 6,022 | 20 | 20 | -1.1 | 1.39 | 1.42 | 26 | 27 | -1.9 |
| 4,908 | 19 | 1.92 | 2.29 | 2.39 | Maryland | 7,948 | 8,379 | 13 | 13 | -5.1 | 1.62 | 1.72 | 13 | 10 | -6.1 |
| 5,998 | 13 | 2.35 | 2.91 | 2.97 | Massachusetts | 10,112 | 10,386 | 11 | 11 | -2.6 | 1.69 | 1.73 | 10 | 9 | -2.7 |
| 4,480 | 20 | 1.76 | 2.13 | 2.12 | Minnesota | 7,385 | 7,436 | 15 | 15 | -0.7 | 1.65 | 1.68 | 11 | 12 | -1.7 |
| 5,193 | 15 | 2.04 | 1.84 | 1.84 | Missouri | 6,409 | 6,428. | 18 | 18 | -0.3 | 1.23 | 1.25 | 33 | 32 | -1.0 |
| 1,606 | 36 | 0.63 | 0.55 | 0.53 | Nebraska | 1,905 | 1,853 | 38 | 39 | 2.2 | 1.19 | 1.17 | 36 | 37 | 1.4 |
| 1,327 | 38 | 0.52 | 1.20 | 1.22 | Nevada | 4,163 | 4,275 | 29 | 27 | -2.6 | 3.14 | 3.33 | 3 | 3 | -5.8 |
| 7,789 | 9 | 3.06 | 3.69 | 3.64 | New Jersey | 12,821 | 12,754 | 7 | 7 | 0.5 | 1.65 | 1.64 | 12 | 15 | 0.1 |
| 1,661 | 37 | 0.62 | 0.59 | 0.55 | New Mexico | 2,043 | 1,927 | 36 | 37 | 6.0 | 1.29 | 1.24 | 32 | 33 | 3.8 |
| 18,119 | 2 | 7.10 | 6.75 | 6.62 | New York | 23,456 | 23,163 | 3 | 3 | 1.3 | 1.29 | 1.28 | 31 | 31 | 0.9 |
| 636 | 47 | 0.25 | 0.30 | 0.30 | North Dakota | 1,026 | 1,059 | 48 | 48 | -3.2 | 1.61 | 1.67 | 14 | 13 | -3.3 |
| 3,212 | 28 | 1.26 | 0.97 | 0.97 | Oklahoma | 3,371 | 3,402 | 31 | 31 | -0.9 | 1.05 | 1.07 | 45 | 44 | -2.1 |
| 1,005 | 43 | 0.39 | 0.42 | 0.41 | Rhode Island | 1,467 | 1,429 | 42 | 42 | 2.0 | 1.45 | 1.42 | 22 | 26 | 1.9 |
| 3,603 | 25 | 1.41 | 1.60 | 1.64 | South Carolina | 5,560 | 5,734 | 22 | 22 | -3.0 | 1.54 | 1.61 | 16 | 16 | -4.2 |
| 711 | 45 | 0.28 | 0.26 | 0.29 | South Dakota | 974 | 1,006 | 49 | 49 | -3.2 | 1.37 | 1.43 | 28 | 26 | -4.3 |
| 5,024 | 17 | 1.97 | 1.58 | 1.57 | Tennessee | 5,484 | 5,497 | 24 | 25 | -0.2 | 1.09 | 1.11 | 42 | 41 | -1.6 |
| 17,656 | 3 | 6.92 | 5.30 | 5.14 | Texas | 16,408 | 16,007 | 4 | 4 | 2.2 | 1.04 | 1.04 | 46 | 46 | 0.5 |
| 5,007 | 18 | 1.96 | 2.51 | 2.43 | Wisconsin | 8,726 | 8,503 | 12 | 12 | 2.6 | 1.74 | 1.72 | 7 | 11 | 1.6 |
| 182,826 | | 71.67 | 75.42 | 75.36 | LICENSE TOTAL | 262,039 | 263,830 | | | -0.7 | 1.43 | 1.46 | | | -1.8 |
| | | | | | CONTROL STATES | | | | | | | | | | |
| 4,136 | 22 | 1.62 | 1.34 | 1.35 | Alabama | 4,668 | 4,717 | 26 | 26 | -1.0 | 1.13 | 1.15 | 39 | 38 | -2.2 |
| 1,067 | 42 | 0.42 | 0.33 | 0.32 | Idaho | 1,162 | 1,119 | 47 | 47 | 2.9 | 1.08 | 1.06 | 43 | 43 | 0.2 |
| 2,812 | 30 | 1.10 | 0.72 | 0.74 | Iowa | 2,491 | 2,574 | 35 | 35 | -3.2 | 0.89 | 0.92 | 49 | 49 | -3.8 |
| 1,235 | 39 | 0.48 | 0.64 | 0.63 | Maine | 1,875 | 1,869 | 39 | 38 | 0.3 | 1.52 | 1.51 | 18 | 20 | 0.3 |
| 9,437 | 8 | 3.70 | 3.95 | 3.83 | Michigan | 13,731 | 13,420 | 6 | 6 | 2.3 | 1.46 | 1.43 | 21 | 24 | 1.8 |
| 2,614 | 31 | 1.02 | 0.92 | 0.90 | Mississippi | 3,209 | 3,158 | 32 | 32 | 1.6 | 1.23 | 1.22 | 34 | 34 | 0.8 |
| 824 | 44 | 0.32 | 0.34 | 0.34 | Montana | 1,181 | 1,182 | 45 | 46 | -0.2 | 1.43 | 1.46 | 23 | 21 | -2.1 |
| 1,111 | 41 | 0.44 | 1.23 | 1.21 | New Hampshire | 4,285 | 4,228 | 28 | 28 | 1.4 | 3.86 | 3.83 | 1 | 1 | 0.8 |
| 6,843 | 10 | 2.68 | 2.28 | 2.31 | North Carolina | 7,930 | 8,098 | 14 | 14 | -2.1 | 1.16 | 1.20 | 37 | 36 | -3.6 |
| 11,016 | 7 | 4.32 | 3.02 | 3.10 | Ohio | 10,509 | 10,857 | 9 | 9 | -3.2 | 0.95 | 0.99 | 48 | 48 | -3.9 |
| 2,977 | 29 | 1.17 | 1.11 | 1.10 | Oregon | 3,869 | 3,865 | 30 | 30 | 0.3 | 1.30 | 1.32 | 30 | 30 | -1.5 |
| 12,009 | 5 | 4.71 | 3.39 | 3.53 | Pennsylvania | 11,792 | 12,342 | 8 | 8 | -4.5 | 0.98 | 1.03 | 47 | 47 | -4.8 |
| 1,813 | 34 | 0.71 | 0.39 | 0.38 | Utah | 1,346 | 1,324 | 43 | 43 | 1.6 | 0.74 | 0.75 | 51 | 51 | -0.8 |
| 570 | 50 | 0.22 | 0.26 | 0.25 | Vermont | 852 | 888 | 50 | 50 | -4.0 | 1.49 | 1.57 | 19 | 18 | -4.5 |
| 6,377 | 12 | 2.50 | 2.03 | 2.07 | Virginia | 7,044 | 7,236 | 17 | 16 | -2.7 | 1.10 | 1.15 | 41 | 39 | -4.0 |
| 5,136 | 16 | 2.01 | 2.07 | 2.03 | Washington | 7,183 | 7,107 | 16 | 17 | 1.1 | 1.40 | 1.42 | 25 | 28 | -1.2 |
| 1,812 | 35 | 0.71 | 0.43 | 0.42 | West Virginia | 1,477 | 1,486 | 41 | 41 | -0.5 | 0.82 | 0.82 | 50 | 50 | -1.1 |
| 466 | 51 | 0.18 | 0.23 | 0.23 | Wyoming | 793 | 798 | 51 | 51 | -0.6 | 1.70 | 1.73 | 8 | 8 | -1.8 |
| 72,256 | | 28.33 | 24.58 | 24.64 | CONTROL TOTAL | 85,387 | 86,256 | | | -1.0 | 1.18 | 1.21 | | | -2.1 |
| 255,082 | | 100.00 | 100.00 | 100.00 | U.S. TOTAL | 347,426 | 350,086 | | | -0.8 | 1.36 | 1.39 | | | -1.9 |

NOTE: Because of rounding, detail may not add to total.

1a Because 1993 population estimates are not available, the 1992 and 1991 figures are used for current and previous years, respectively.

SOUCE: Distilled Spirits Council of the U.S., Inc.; National Alcohol Beverage Control Association; Bureau of Census, U.S. Department of Commerce.

DISTILLED SPIRITS COUNCIL OF THE UNITED STATES, INC. - 12/03/93

# Booze getting a boost

## Researcher says it can be healthy

By ALANNA MITCHELL
Toronto Globe and Mail

TORONTO – It is healthier to drink alcohol – up to as much as 26 drinks a week – than abstain, a leading alcohol researcher told an international conference this week.

Martin Plant, director of the Alcohol Research Group at the University of Edinburgh, said the vast and impressive body of research proving this point has been "almost a dark secret" until recently.

"There has been little attempt either to acknowledge the importance of this evidence or to integrate it into the more general information about alcohol and its effects," he said. "This failure is curious and clearly warrants rectification."

Plant's contention is controversial. Norman Giesbrecht, senior scientist at the Addiction Research Foundation in Toronto, said he doesn't believe the scientific evidence has been suppressed. Rather, he said, some studies have shown that the benefits apply to a relatively small group of people. These include men who are prone to heart disease. Drinking does not necessarily benefit menopausal women, he said.

FROM THE ANCHORAGE DAILY NEWS ON WEDNESDAY THE 9th OF MARCH 1994

# BOOZE: Researcher sees good in it

Continued from Page A-1

But in his talk at the conference, Plant said the high levels of emotion and ideology that surround alcohol research have helped to prevent the public from recognizing the benefits of drinking. And alcohol studies, by definition, tend to catalog alcohol problems that abound among heavy drinkers.

The studies also have tended to reinforce various governments' policies that all drinkers ought to cut back. But a growing body of evidence tells a different story.

"Study after study (has) supported the view that drinking does have tangible health benefits," Plant told the conference, which is studying strategies for reducing the harm caused by risky human behavior. He also said "evidence on the apparent beneficial effects of moderate drinking deserves acknowledgment and serious attention."

He said the traditional view that "all of us would be better off if everyone drank a bit less" may be inappropriate.

Plant has been a leading international expert on alcohol-related issues for more than a decade. He has done surveys on alcohol damage and the use of alcohol, Giesbrecht said.

Plant cited 13 different studies showing that various forms of heart disease are less common among light or moderate drinkers than among abstainers and heavy drinkers.

Other reputable studies show that people who drink light or moderate amounts are less at risk of any kind of death.

Plant speculated that this may be because alcohol stimulates the body's production of so-called "good cholesterol" or high-density lipoprotein.

Some of the implications of Plant's stance are explosive. For instance, if abstainers are more prone to ill health, it makes no sense to try to encourage moderate drinkers to abstain. In fact, he said, such a policy might raise mortality rates. As well, current models of "appropriate" levels of drinking may have to be reconsidered, he said.

He cited a recent Danish study that said the lowest mortality risk was among those who had one to six alcoholic drinks a week. This remained fairly constant up to the level of 26 drinks a week.

Plant's evidence also may seriously undermine the public-health policies of many governments. These tend to work on the premise that if everybody drank less – or even quit drinking altogether – alcohol-related problems would subside.

Eric Single of the Canadian Center on Substance Abuse in Ottawa, told the conference that those who drink sparingly much of the time and then have an isolated episode of heavy drinking show a preponderance of health problems. He also said public support for curtailing the availability of alcohol will erode as people begin to understand the evidence that Plant presented.

While Plant said more studies need to be done to see whether there are other negative consequences of drinking alcohol, it is possible that the benefits of drinking moderately at least equal the medical toll of heavy drinking.

Giesbrecht, however, pointed to the policy statement from an International Symposium on Moderate Drinking and Health held last year in Toronto. It said that, in general, no one should drink more than two drinks a day.

# Study links tobacco ads to rise in young girls' smoking

By JANE E. BRODY 2/23/94
The New York Times

A new study has linked a sharp increase in smoking by teen-age girls in the late 1960s and early '70s to soaring sales of widely advertised cigarettes for women.

The study's authors say their findings provide the strongest evidence to date that cigarette advertising, despite industry assertions to the contrary, lures children into starting smoking.

The study, published in today's issue of The Journal of the American Medical Association, showed the sales and advertising drive for women's cigarettes in the late 1960s and early '70s coincided with a major increase in the numbers of teen-age girls who took up smoking, at the same time that smoking among boys was on the decline.

The study linked advertising campaigns for Virginia Slims, Silva Thins and Eve cigarettes, all of which were aimed at women, with striking increases in the start of smoking by young girls.

During a six-year period from 1967 to

Please see Back Page, SMOKING

## SMOKING: Study finds ads had effect

Continued from Page A-1

1973, when sales of women's cigarettes skyrocketed, there was a 110 percent increase in the rate of 12-year-old girls who started smoking, a 55 percent increase among 13-year-olds, a 70 percent increase among 14-year-olds, a 75 percent increase among 15-year-olds, a 55 percent increase among 16-year-olds and a 35 percent increase among 17-year-old girls.

R.J. Reynolds Tobacco Co. said Tuesday that a company-sponsored survey of 1,100 youngsters conducted last November showed that Joe Camel was no more recognizable to children from 10 to 17 than any other advertising character, and that such recognition did not influence the youngsters' smoking behavior.

Thomas Lauria, a spokesman for the Tobacco Institute, the industry's lobby group, said "peer pressure, not advertising, is what influences smoking rates."

He attributed the increase in smoking by young girls in the late 1960s to the women's liberation movement, "the time when bra-burning women were abandoning traditional roles."

From the end of World War II to 1967, there had been only a slight increase in the start of smoking by teen-age girls, the authors noted. But in 1967, when sales of women's cigarettes took off, the rate of starting to smoke rose sharply among girls younger than 17, peaking in 1973 when sales of such cigarettes reached a record $16 billion.

After 1973, when sales of women's cigarettes began to drop off, so did the rate of starting to smoke for teen-age girls, the study found.

During the same six-year period, the study showed, smoking initiation rates among boys from 12 through 17 declined. By 1975, the percentage of boys and girls starting to smoke had evened out.

The new study, which is believed to provide the strongest link yet between tobacco advertising and smoking behavior by teen-agers, was based on national health surveys conducted among 102,626 adults who had been regular smokers.

The study, directed by John Pierce of the University of California San Diego Cancer Center, examined when these adults took up smoking. It also showed that girls who did not go on to college were more likely than collegebound girls to start smoking at the time of the sales peak for women's cigarettes.

The finding runs counter to the tobacco industry's assertion that its marketing is not aimed at children.

# McD's goes smoke-free

## Chain-restaurant owners ask Congress for ban

By PHILIP J. HILTS 2/24/94
The New York Times

WASHINGTON — McDonald's Corp. said Wednesday that all its 1,400 wholly owned restaurants would ban smoking immediately. At the same time, the association representing 90,000 chain restaurants backed a bill to end smoking in all restaurants and other buildings used by the public.

The announcements were prompted by the increasing numbers and outspokenness of nonsmokers who have demanded freedom from smoke in restaurants, said Terrie Dort, executive director of the trade association, the National Council of Chain Restaurants.

She said 30,000 of the nation's chain restaurants already have banned smoking, and the proposed law "provides a level playing field that our industry needs to reach the 100 percent mark."

Until now, restaurant managers have been afraid to ban smoking for fear that their smoking customers would rebel, giving their competitors an advantage.

Dort said Wednesday that "the only way to resolve this issue fairly" was for Congress to ban smoking in all buildings in one stroke.

Brennan Dawson, a spokeswoman for the Tobacco Institute, which represents the major tobacco companies in Washington, said of the restaurant group, "These people really have overstepped their bounds, and are trying to decide what is best for everybody, from the bingo halls to every workplace in the United States."

She said that if smoking was banned in all restaurants, smokers would not be the only ones to suffer. She said a ban would hurt restaurateurs. She cited polls by the tobacco industry in which smokers have said that they might go to fast-food restaurants less often if smoking is banned there.

The council of chain restaurants and McDonald's both said they would support the Smoke-Free Environment Act of 1993, sponsored by Rep. Henry Waxman, D-Calif., who is chairman of the House Health and Environment Subcommittee.

Last week, the bill was endorsed by the Clinton administration and six former surgeons general.

McDonald's is the nation's largest fast-food chain, and Wednesday's announcement brings to about 3,600 the number of its restaurants that prohibit smoking, said Rebecca Caruso, a spokeswoman.

That is about 40 percent of the 9,100 McDonald's restaurants.

The restaurants in the chain that have not banned smoking are franchise operations and cannot be ordered by McDonald's to halt smoking.

But Ed Rensi, president and chief executive of McDonald's U.S.A., said the company would "continue to actively encourage our franchises to make their restaurants smoke-free, and more are voluntarily doing so every day."

The Environmental Protection Agency has said secondhand smoke is a carcinogen that kills about 3,000 nonsmokers a year from lung cancer and is responsible for up to 300,000 cases of bronchitis and pneumonia in children. It is supporting federal anti-smoking legislation.

McDonald's move, effective immediately, comes one week after the Texas attorney general sued the restaurant chain and four others, demanding they either make their restaurants smoke-free, ventilate them better or post signs warning of the dangers of secondhand smoke.

Ron Dusek, a spokesman for Texas Attorney General Dan Morales, praised McDonald's "for its good corporate citizenship."

McDonald's spokeswoman Terri Capatosto said the idea began with a test in 40 restaurants and had nothing to do with the Texas lawsuit.

"If you look back, the fact that we started the test a year ago means . . . we think this issue is important," she said.

The bill pending in Congress would ban smoking in every building regularly entered by 10 or more people at least one day a week, not including residences.

It would permit building owners to have special smoking rooms in public buildings if they were not used for anything else and were ventilated so that air went directly outside.

The bill would also ban smoking within the immediate vicinity of the entrance to the buildings.

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☐ **The Associated Press contributed to this story.**

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**IN ANCHORAGE**

McDonald's of Jewel Lake, one of Anchorage's three franchises, according to manager Duane Clausen, already has 80 percent of its seating area smoke-free. The restaurant likely will be smoke-free within six months, he said. "We just want to provide the best customer environment that we can." The franchise owners of Anchorage's other McDonald's restaurants could not be reached Wednesday. Those restaurants also have 80 percent of the seating smoke-free, their managers said.

### Smoke-free fast food

McDonald's smoking ban in its company-owned restaurants in the U.S. is part of an emerging trend.

**Fast-food smoking policies:**

- **McDonald's:** Banned smoking Wednesday in its 1,400 company-owned restaurants. Including franchised restaurants, 3,600 out of 9,100 U.S. McDonald's are now smoke-free.
- **Burger King:** Roughly 600 of 5,289 franchised restaurants are smoke-free; all 707 company-owned stores have non smoking sections.
- **Arby's:** Banned smoking last month in its 257 company-owned stores; urged 1,991 franchise restaurants to do likewise.
- **Wendy's:** About 100 franchised restaurants are smoke-free. Wendy's has 3,700 restaurants in U.S., with 1,110 company-owned.

Source: companies

TOM HOLMES / The Associated Press

American Medical Association
Physicians dedicated to the health of America

# News Release

EMBARGOED FOR RELEASE: 11:15 a.m. (ET) TUESDAY, FEBRUARY 22, 1994

Media Advisory: To contact Chrisoula Eliopoulos, BSc, or Gideon Koren, MD, call Judy Irwin at 416/813-6380.

## PASSIVE CIGARETTE SMOKE FOUND IN FETAL HAIR

Study provides first biochemical evidence that infants of passive smokers are exposed to nicotine

NEW YORK--For the first time, there is biochemical evidence that the toxic elements of passive cigarette smoke can affect the fetus of a non-smoking mother, according to an article in this week's *Journal of the American Medical Association.*

A team led by Gideon Koren, MD, at the Hospital for Sick Children, Toronto, and colleagues, conducted a study to describe the distribution characteristics of nicotine and its major metabolite, cotinine, in maternal and neonatal hair.

Dr. Koren, director of the hospital's Division of Pharmacology/Toxicology, presented the study at a media briefing sponsored here today by the AMA and The Robert Wood Johnson Foundation.

The researchers say that their data indicate that pregnant women exposed to passive smoke and their infants accumulated nicotine and cotinine to measurable levels."

The researchers measured maternal and neonatal hair concentrations of nicotine and cotinine in 94 mother-infant pairs in two newborn nurseries in Toronto, Ontario, one to three days after delivery. Mothers who were active smokers, non-smokers, and passive smokers, and their infants were included.

--more--

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(HAIR)

The study says: "Maternal cigarette smoking during pregnancy has long been associated with increased risks for low birth weight, prematurity, spontaneous abortion, perinatal mortality, and the sudden infant death syndrome. Moreover, during the last decade, evidence has accumulated for long-term neurotoxicity affecting neurobehavioral development."

All active smoking women participating in the study (36) reported a steady number of cigarettes used daily; they smoked between one and 40 cigarettes per day. They had high hair concentrations of 19.2 ng/mg for nicotine and 6.3 ng/mg for cotinine. There was a significant correlation between the concentration of nicotine and its metabolite. Infants of smokers had mean hair concentrations of 2.4 ng/mg for nicotine and 2.8 ng/mg for cotinine.

Thirty-five non-smoking mothers participated in the study. Their mean hair concentrations of nicotine (1.2) and cotinine (0.3) were significantly lower than in smoking mothers. Similarly, neonatal hair concentrations of nicotine (0.4 ng/mg) and cotinine (0.26 ng/mg) were significantly lower in infants of smokers.

Twenty-three passive smoking mothers and their infants participated in the study. Their concentrations of nicotine (3.2 ng/mg for mothers and 0.28 ng/mg for infants) and cotinine (0.9 ng/mg for mothers and 0.6 ng/mg for infants) were intermediate and significantly different from those of both the smokers and nonsmokers.

They also say: "This is the first biochemical evidence that infants of passive smokers are at risk of measurable exposure to cigarette smoke. Hair accumulation of cigarette smoke constituents reflects long-term systemic exposure to these toxins and therefore may be well correlated with perinatal risks."

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**For more information: contact the AMA's Ray McNally at 312/464-4843.**

# Smokers hooked as adolescents, surgeon general asserts in report

The Associated Press 3/25/94

WASHINGTON — Surgeon General Joycelyn Elders labeled smoking an adolescent addiction Thursday and accused the tobacco industry of trying to convince teen-agers that cigarettes will make them sexy and successful.

Elders, unveiling the latest surgeon general's report on smoking, also urged the Federal Trade Commission to draw the curtain on R.J. Reynolds Tobacco's Joe Camel cartoon ads, which have just added a Josephine Camel to the cast of characters.

"Smoking is not just an adult habit. It is an adolescent addiction," said Elders, whose 314-page report was devoted entirely to the topic of why adolescents smoke, the harm it does and how it can be prevented.

The report also chronicled the marketing practices of the tobacco industry, from the chocolate cigarettes of yore to the Marlboro man to sponsoring race cars and peddling lighters, T-shirts, beach blankets and camping gear emblazoned with tobacco brands.

PATSY LYNCH / The Associated Press

Joycelyn Elders speaks against smoking Thursday.

Elders said teen-agers who smoke run higher risks of experimenting with alcohol and drugs, doing poorly in school, fighting, engaging in unsafe sex and even attempting suicide.

Her report, compiled by government scientists and academic researchers, said the average age when smokers tried their first cigarette is 14.5 years, and more than 70 percent of those who become daily smokers acquired that habit by age 18.

Elders said the nearly $4 billion the tobacco industry spends on advertising and promotions helps convince kids they are joining "the 5-S club — that they're slim, they're sexy, they're sociable, they're sophisticated, and successful."

"The teen-ager gets an image, the tobacco companies get an addict," said Elders. "We must fight back."

R.J. Reynolds said that peer influence and parental example "are the reasons why youth smoke, not advertising."

The Tobacco Institute agreed that young people should not smoke.

State of Alaska

*DEPARTMENT OF REVENUE*
*Income and Excise Audit Division*


# OPERATIONS ANNUAL REPORT

## For the Fiscal Year Ended June 30, 1993

The Honorable Walter J. Hickel, Governor
Darrel J. Rexwinkel, Commissioner

Alaska Department of Revenue
Income and Excise Audit Division
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Alaska Department of Revenue
Income and Excise Audit Division
OPERATIONS ANNUAL REPORT
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# INTRODUCTION

This annual report gives an overview of the tax programs administered by the Operations component of the Income and Excise Audit Division and provides a summary of revenues, statistics and other information relevant to those programs for the fiscal year ended June 30, 1993.

Operations is responsible for collecting and processing Alaska's tax revenues and returns, except for oil and gas production and property tax, and for administering the state's unclaimed property program. Responsibilities include ensuring that tax laws are administered in accordance with statutory requirements. Operations is centralized in Juneau and carries out the following seven primary functions:

1. Cash Remittance Processing
2. Data Capture of Tax Return Information
3. Examination of Returns
4. Licensing
5. Enforcement Collections
6. Tax and License Fee Sharing
7. Unclaimed Property

The mission of Operations is to provide taxpayers with efficient and economical administration of Alaska tax laws and provide the Division's audit field offices with timely and effective support.

*Operations Staff '93*

Photo by Edie Bundy

(L to R) Myron Richardson, Renea Rovner, Rachel Marshall, Bruce Winniford, Lillian Patterson, Bette Cole, Anne Jones, Ampy Cruz, Janet Jefferson, Aida Santos, Paul Dick, Claudia Rosenau, Julie Wilson, Leonora Pajarillo, Jim Gruber, Nestor Catli, John Johnson, Edie Bundy
(Not Pictured) Eloise Herrick, Rhonda Holt, Raquel Helf, Beni White, Kathy Mally, Kay Fuelle, Rita Marvin, Anne Jones, Sandie Yadao

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# ORGANIZATION

Operations is comprised of four units and staffed by 27 full-time positions. Each unit is staffed with a supervisor who reports to a Revenue Audit Supervisor (Operations Manager). Two positions, an analyst programmer and an accounting technician, report directly to the Operations Manager.

## Tax Examination Units

Operations' organization includes two tax examination units which are responsible for receiving, processing and examining all returns for tax types listed below.

### Corporation Tax Unit

| Tax Type | Statutory Reference | Filing Frequency |
|---|---|---|
| Corporation Income | AS 43.20 | Annually |

### Fish and Excise Tax Unit

| Tax Type | Statutory Reference | Filing Frequency |
|---|---|---|
| Fisheries Business | AS 43.75 | Annually |
| Salmon Enhancement | AS 43.76 | Monthly |
| Seafood Marketing | AS 16.51 | Annually |
| Estate | AS 43.31 | Death |
| Motor Fuel | AS 43.40 | Monthly |
| Tobacco | AS 43.50 | Monthly |
| Alcoholic Beverages | AS 43.60 | Monthly |
| Mining License | AS 43.65 | Annually |
| Regulatory Cost Charges (APUC) | AS 42.05.253<br>AS 42.06.285 | Quarterly |
| Electric/Telephone Cooperative | AS 10.25.550<br>AS 10.25.555 | Annually |

Each unit is responsible for ensuring primary compliance that taxpayers fulfill their filing requirements and for assessing additional taxes, penalties and interest due when appropriate.

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# ORGANIZATION

The units received and processed the following number of returns during the fiscal year:

| *Tax Type* | *Returns* |
|---|---|
| **Total Corporation** | **13,101** |
| Motor Fuel | 2,044 |
| Salmon Enhancement | 694 |
| Fisheries Business | 588 |
| Tobacco | 436 |
| Mining | 388 |
| Seafood Marketing | 330 |
| Regulatory Cost Charges | 183 |
| Alcoholic Beverages | 135 |
| Coin-Operated Device | 434 |
| Estate | 42 |
| Electric/Telephone Co-op | 20 |
| **Total Fish and Excise** | **5,294** |
| **Total Both Units** | **18,395** |

The **Corporation Tax Unit** is staffed by a Tax Examiner III (supervisor), four tax examiners, and three clerical positions. In addition to the corporation returns, the unit receives partnership and other miscellaneous information returns. Since these returns are informational only, the Division does not track them through its computerized taxpayer file (masterfile) and accordingly statistics on these returns are not available.

The Unit examines returns based on priority criteria which include large dollar tax liabilities, refund claims and returns identified from exception listings (primarily accounts with masterfile balances differing from return information).

The Unit assists in updating the corporation tax return form to reflect changes in federal and Alaska tax laws and is responsible for mailing the return forms to corporate taxpayers on file with the division. The Unit maintains corporation tax return files, taxpayer correspondence and estimated payment documents with a retention schedule of three years. Returns and related documents older than three years are archived each year.

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# ORGANIZATION

The **Fish and Excise Tax Unit** is staffed by a Tax Examiner III (supervisor), four tax examiners, and one clerical position. Beside processing returns, the unit provides the following functions.

The Unit licenses fisheries businesses who process or export fisheries resources from the state. The Unit issued 540 licenses during the fiscal year. As part of the licensing function, the Unit accounts for cash prepayments and other forms of security submitted by businesses to secure their tax liabilities as required by AS 43.75.055.

Effective July 1, 1993 the Unit will assume responsibility for the fish processor and buyer bonding program which was previously administered by the Alaska Department of Labor. This program will be integrated into the fisheries licensing program and by doing so will increase efficiency in the overall administration of both programs. Integrating these two programs will eliminate delays in licensing, duplication of data, and confusion amongst processors by having one less state agency to correspond with.

The Fish and Excise Tax Unit is responsible for administering the following other miscellaneous licensing programs: motor fuel (qualified dealers), mining, alcoholic beverages and tobacco.

The Unit issues refunds to persons who purchased and paid tax on motor fuel but used the fuel for off-highway or exempt purposes. The Unit processed 636 claims for refunds during the fiscal year.

The Unit prepares an annual report for the Department of Commerce and Economic Development to report salmon enhancement tax data which is used for determining appropriations to regional aquaculture associations. The Unit also includes data in the report relating to the location where the salmon was purchased versus where caught.

The Unit semiannually prepares a wholesale canned salmon report required under AS 43.80.050. The report includes data for the periods April through September and October through March. The Unit distributes about 30 reports semiannually to legislators, processors and other agencies.

During FY 93, the Fish and Excise Tax Unit transferred the nonresident affidavits program as provided under AS 43.10.160 to the Division's Compliance Section since it is an integral part of identifying corporations with tax filing requirements in Alaska.

The Fish and Excise Tax Unit issued approximately 500 death certificates required under the estate tax program during the fiscal year. The certificates are required under AS 43.31.181.

The Unit was responsible for receiving and processing 434 coin-operated device tax returns in the fiscal year. As a part of this program, the Unit issued tax receipts to each taxpayer as required by AS 43.35.

# ORGANIZATION

## Accounting and Collections Unit

The Accounting and Collections Unit is staffed by an Accounting Supervisor I, two accounting technicians, two accounting clerks and two clerical positions. The Unit is responsible for receiving and processing tax payments, data entering tax information from all returns received by the Division, reconciling tax revenues, and maintaining the Division's tax masterfile system. The masterfile system is a computer file of all taxpayers on record with the Division with filing requirements for the tax types administered by the Division, and functions as the subsidiary ledger to the state accounting system. The Unit is responsible for transferring a portion of cigarette tax receipts to the School Fund on a monthly basis.

Masterfile tracks estimated payments, returns filed with the division, subsequent payments and other financial information related to individual accounts. Masterfile also tracks account information such as status and to whom the account is assigned.

An integral function of masterfile is cash remittance processing which includes validating and depositing all tax payments received by the division. The Unit data captures payments onto masterfile and reconciles cash activity to deposit summary information which is posted on the state accounting system. The Unit posts assessments for additional taxes and penalties onto masterfile.

The Unit generates management reports as a part of its reconciliation process and for identifying exception items. Special reports are generated for Department personnel upon request.

The Unit is responsible for issuing refunds and collecting delinquent tax liabilities. The collection function includes contacting taxpayers for payments and taking appropriate enforcement actions such as filing liens and levying assets of delinquent taxpayers.

As part of the collection function, the Unit tracks cases in bankruptcy status and maintains files for uncollectible accounts until the statute of limitation for collection expires, normally six years. As of June 30, 1993, the balance of accounts in collections was approximately $1.5 million.

In conjunction with provisions of the Constitutional Budget Reserve Fund which took effect July 1, 1990, the Accounting and Collections Unit is also responsible for accounting for oil and gas settlement payments received by the state. The Unit receives a payment characteristic form for each settlement payment from respective oil and gas agencies. The form includes a breakdown of the various funds for which settlement payments are to be accounted. The Unit maintains a database of all settlement payments which accounts for the nature of each payment and an accounting of the funds. The Unit issues monthly reports summarizing detail activity and balances in each fund.

# ORGANIZATION

## Unclaimed Property Unit

The Unclaimed Property Unit is staffed by an Unclaimed Property Administrator (supervisor) and one full-time accounting clerk. Temporary clerk typists and an accounting clerk are hired during peak seasons to assist the Unit with seasonal workloads. The Unit is responsible for administering the unclaimed property program as provided by AS 34.45. During the fiscal year, the Unit was located in the Department of Labor building in Juneau.

The unclaimed property program became effective in September 1986 and encompasses receiving and accounting for funds and certain assets of persons who cannot be located, and that are not claimed after a statutory period of time. Holders of unclaimed property are required to report and remit annually to the Unit any unclaimed funds or property in their possession.

The Unclaimed Property Unit attempts to locate persons every March by advertising in major Alaska newspapers and distributing listings around the state which report unclaimed properties being held by holders or the Unit. Upon verification of the rightful owner, properties are returned to the owner.

In FY 93, the Unit received 4,286 owner inquiries and processed 547 petitions for unclaimed property refunds totalling $346,373. The Unit processed 2,826 holder reports and received $1,820,444 in unclaimed property from holders. During peak season (following the March advertisement), the unit receives in excess of 200 phone calls per day.

Since the program's inception in 1986, the Division has transferred approximately $7.1 million from the unclaimed property trust account to the General Fund.

The Unit maintains an inventory of safe deposit box contents submitted by holders after they have attempted to contact the owner of the contents. The contents are held in a secured vault in Juneau.

Additionally, the Unclaimed Property Unit is responsible for the escheated property program which involves receiving and accounting for funds which are subject to escheat to the state after the statutory period of seven years. The escheated tax program covers those funds received prior to inception of the unclaimed property program. All remaining funds held by the state will escheat to the state in September 1993.

# ORGANIZATION

## Tax and License Sharing

One of Operations' functions is sharing certain tax receipts and license fees to communities statewide. This includes accounting for all revenues subject to sharing provisions in statutes and issuing warrants to respective communities during certain times of the year. The following tax and license types are subject to sharing:

| Tax Type | Reference | Share Frequency |
|---|---|---|
| Fisheries Business | AS 43.75.130 | Annually |
| Aviation Motor Fuel | AS 43.40.010 | Semiannually |
| Coin-Operated Device | AS 43.35.050 | Annually |
| Electric/Telephone Cooperative | AS 10.25.570 | Annually |
| Liquor License Fees | AS 04.11.610 | Semiannually |

The Division issued approximately $24 million to 120 eligible communities from taxes and fees collected during the fiscal year. The Division only shares taxes and fees collected. Interest and penalty amounts collected are not subject to sharing. Amounts shared to each community are compiled in an annual report under separate cover and is distributed to the public upon request.

During FY 93, the Division worked with the Department of Community and Regional Affairs (DCRA) to implement HB 456 (Ch. 195, SLA 1990) which provides for additional sharing to municipalities based on fisheries activities within them. Under this program, 50% of fisheries tax revenues not previously subject to sharing are shared through allocation with municipalities statewide. The shared amount is transmitted annually to DCRA who then allocates monies to municipalities based on a formula as specified in their regulations. The total amount of revenues not subject to sharing in FY 93 was $1,351,014. Accordingly, the Department transmitted $675,507 to DCRA.

The legislature passed the landing tax bill (Ch. 67, SLA 1993) during the 1993 legislative session. This bill contains tax sharing provisions which are the same as those for the fisheries business tax. The landing tax does not become effective until January 1, 1994 and the first tax returns will not be due until March 31, 1995.

# ACCOMPLISHMENTS

## *Subsidiary Databases*

Operations' most notable accomplishment for FY 93 was the implementation of subsidiary databases for excise taxes. With the Division's masterfile system fully implemented in 1992, Operations began to focus our efforts on better accounting for subsidiary information compiled by the division. This subsidiary information includes summary activity for each of the excise tax types such as gallons of motor fuel and number of cigarettes sold during a specific month. The Division uses this information to generate reports required by various federal and state agencies. Additionally, reports are distributed to private research agencies.

Databases were implemented for the following tax types during the fiscal year: motor fuel, tobacco, alcoholic beverages, and salmon enhancement. Of these tax types, the most notable accomplishment was implementation of the motor fuel database because of the complexity of the tax type (four tax rates and six fuel types) and the need to generate two different monthly reports with different information sorts.

Implementation of these databases resulted in two major accomplishments for the Division. First, the Division was able to generate reports and data which reconciled to the masterfile and state accounting system (AKSAS). Second, the Division was able to provide comprehensive reports to more accurately reflect the monthly tax type activity such as gross motor fuel distributions before exemptions and refunds.

## *Reorganization*

Operations reorganized during the fiscal year to utilize resources more efficiently in accomplishing its priorities and emphasis on compliance. Operations added a new position (Revenue Auditor III) to its organization to provide better oversight of the examination function and provide technical assistance. This position will work closely with the audit managers in FY 94 to identify cases with maximum audit gain potential by developing management reports and establishing criteria which flag cases for audit.

In accordance with the Division's direction toward placing increased emphasis on compliance, Operations reorganized its tax examiner resources to provide assistance to the Compliance Section. As a part of this reorganization, Operations adjusted its workloads and priorities to continue to meet critical deadlines and examination coverage of respective tax types.

To accommodate the seasonal increases in corporation tax return filings attributable to April and October filing due dates, the unit filled temporary clerical positions to assist in data capturing and processing returns received during those times. This proved to be successful in meeting the goal of providing timely data capture and service to examination and audit personnel. Additionally, temporary help has proved to be an efficient means of minimizing personnel costs.

# ACCOMPLISHMENTS

### *Regulatory Cost Charges Program*

Operations successfully implemented the new regulatory cost charges (RCC) revenue collection program. The RCC program was legislated in the first special session of 1992 (Ch 2 FSSLAA 92) as a user fee to fund the budget of the Alaska Public Utilities Commission (APUC). As a part of the legislation, the Department of Revenue was charged with responsibility to collect the RCCs for APUC. The program became effective November 1, 1992.

The Division successfully integrated the RCC revenue accounting program into masterfile. As a result, Operations was able to efficiently account for RCC detail information, track account status and identify nonfilers. During the fiscal year, Operations fostered a successful working relationship with APUC staff to design forms, establish data requirements, and provide summary information reports on a periodic basis.

### *Computer Enhancements*

In accordance with the Division's commitment of increasing efficiencies through computerization, Operations acquired hardware to equip all of its personnel with IBM-compatible PCs. This allowed Operations to install a Local Area Network (LAN) which resulted in more effective communication through common word processing and spreadsheet programs. Specifically, Operations formatted the Corporation Unit's tax adjustment report form on Lotus to increase efficiencies by downloading account information and programming formulas to reduce typing and possibility of mathematical errors.

Additionally, the Division acquired a CD ROM and subscribed to Commerce Clearing House's (CCH) CD tax service. As a part of the service, CCH provides updated CDs on a quarterly basis which guarantees that the Division has the most current information available. This has enhanced our tax research efforts because of easier access to information and assurance of up to date information.

# NEW LEGISLATION

Three bills and one executive order impacting Operations were passed by the 1993 legislature and signed by the Governor. The bills and executive order are summarized below.

**HB 133 (Ch 44 SLA 93) - "Value" of Fisheries Resources Amended.** This bill amends the definition of "value" under AS 43.75.290(11) which is used to compute fisheries business taxes. Under this bill, value was expanded to specifically include bonuses, tendering fees and delivery payments. This bill takes effect January 1, 1994.

**HB 264 (Ch 67 SLA 93) - Fishery Resource Landing Tax.** This bill enacts a new tax (landing tax) on trawlers and fishery businesses which bring or land processed fishery resources in Alaska. The landing tax is codified under a new chapter (Chapter 77) under Title 43.

The landing tax is 3.3% of the unprocessed value of the fishery resource based on a statewide average price as reported to the Alaska Department of Fish and Game. This bill provides that the .3% portion of the landing tax must be paid into a separate account for appropriation by the legislature to the Alaska Seafood Marketing Institute. The remaining 3% portion will be deposited in the General Fund, of which 50% is subject to revenue sharing with municipalities where the fishery resources were landed.

Taxpayers are required to file calendar year returns and pay landing taxes before April 1 of the following year. This bill takes effect January 1, 1994.

**HB 275 (Ch 55 SLA 93) - Salmon Marketing Tax.** This bill enacts a new tax (salmon marketing tax) on limited entry or interim-use permit holders that transfer salmon to a buyer in the state or export salmon outside of Alaska. The salmon marketing tax is codified under a new article (Article 2) under AS 43.76.

The salmon marketing tax is 1% of the value of salmon transferred to buyers or exported from the state. For salmon transferred to buyers, each buyer will collect the salmon marketing tax at the time of purchase and remit the tax to the Department of Revenue on a monthly basis. For salmon exported, permit holders will file returns and pay taxes directly to the department. The salmon marketing tax is accounted for separately in the General Fund and is subject to appropriation by the legislature to the Alaska Seafood Marketing Institute (ASMI) for domestic salmon marketing programs.

Monthly returns are due by the last day of the month following the month that the salmon was purchased or exported. This bill also included provisions for reorganization of ASMI which do not directly affect the Department of Revenue. This tax takes effect July 1, 1993.

**Executive Order 85 - Labor Fish Bonding Program Transfer.** This executive order transfers the fish bonding program administered by the Department of Labor to the Department of Revenue effective July 1, 1993. The order transferred statutory provisions for the program under AS 16 (Department of Labor) to AS 44.25 (Department of Revenue).

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## Table 1
## Revenues by Tax Type

| | |
|---|---|
| **CORPORATION NET INCOME** | |
| Current Year | |
| Chapter 20 - Oil and Gas Corporations | $117,648,826 |
| Chapter 20 - Other Corporations | 25,143,425 |
| Payments from Resolution of Prior Years | |
| Chapter 20 - Net Income Tax | 639,739,091 |
| Chapter 21 - Separate Accounting | 89,723,154 |
| *Total Tax Receipts* | $872,254,496 |
| **FISHERIES BUSINESS** | |
| Established | |
| Shore-Based | $22,549,210 |
| Floating | 13,100,428 |
| Cannery | 5,138,902 |
| Developing | |
| Shore-Based | 200,628 |
| Floating | 31,052 |
| 1993 Prepayments | 1,175,517 |
| Penalties and Interest | 341,128 |
| Fisheries Business License Fees | 14,425 |
| Gross Tax Receipts | 42,551,290 |
| Less Credits | |
| Winn Brindle | (367,458) |
| Fisheries Business | (17,423) |
| Alaska Education | (575) |
| Net Tax Receipts | 42,165,834 |
| Less Fisheries Tax Shared | |
| Department of Revenue | (20,895,923) |
| Department of Community and Regional Affairs | (675,507) |
| *Amount Retained by State* | $20,594,404 |

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## Table 1
## Revenues by Tax Type

| | |
|---|---|
| **MOTOR FUEL** | |
| Highway | $38,703,424 |
| Aviation | 9,566,039 |
| Marine | 9,011,190 |
| Penalties and Interest | 55,397 |
| Less Timely Filing Deductions[1] | (65,037) |
| Gross Motor Fuel Tax Receipts | 57,271,013 |
| Less Claims for Refund[2] | (16,528,105) |
| Net Tax Receipts | 40,742,908 |
| Less Aviation Tax Shared | (116,796) |
| *Amount Retained by State* | $40,626,112 |
| [1] Lesser of 1% of Tax Liability or $100 | |
| [2] Refer to Table 6 for detail by fuel type | |
| **TOBACCO** | |
| Cigarette | $15,651,976 |
| Wholesale Tobacco | 1,224,103 |
| Less 1% Commissions | (165,271) |
| Total Cigarette Tax Receipts | 16,710,808 |
| Less Transfer to School Fund | (2,668,122) |
| *Amount Retained in General Fund* | $14,042,686 |
| **ALCOHOLIC BEVERAGES** | |
| *Total Tax Receipts* | $11,898,804 |
| **SALMON ENHANCEMENT** | |
| Aquacultural Region | |
| Cook Inlet | $1,957,437 |
| Southern Southeast | 1,805,983 |
| Northern Southeast | 1,133,843 |
| Kodiak | 852,676 |
| Prince William Sound | 656,014 |
| Chignik | 304,370 |
| Total Aquacultural Regions | 6,710,323 |
| Penalties and Interest | 35,512 |
| *Total Tax Receipts* | $6,745,835 |

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## Table 1
## Revenues by Tax Type

| | |
|---|---|
| **SEAFOOD MARKETING ASSESSMENT** | |
| Seafood Marketing Assessments | $3,535,259 |
| Penalties and Interest | 27,988 |
| *Total Receipts* | $3,563,247 |
| **APUC REGULATORY COST CHARGES** | |
| Electric Utilities | $1,084,080 |
| Telephone Utilities | 503,888 |
| Other Utilities | 550,337 |
| Pipeline Carriers | 241,077 |
| Total RCC Collections | 2,379,382 |
| Penalties and Interest | 959 |
| *Total Receipts* | $2,380,341 |
| **ELECTRIC AND TELEPHONE COOPERATIVE** | |
| Total Tax Receipts | $2,178,911 |
| Less Cooperative Tax Shared | (2,067,696) |
| *Amount Retained by State* | $ 111,215 |
| **ESTATE** | |
| *Total Tax Receipts* | $918,402 |
| **MINING LICENSE** | |
| *Total Tax Receipts* | $425,607 |

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## Table 1
## Revenues by Tax Type

**COIN-OPERATED DEVICE**

| | |
|---|---|
| Total Tax Receipts | $108,194 |
| Less Device Tax Shared | (48,289) |
| *Amount Retained by State* | $ 59,905 |

**INDIVIDUAL INCOME**

| | |
|---|---|
| *Total Tax Receipts* | $16,460 |

**CIGARETTE LICENSE FEES**

| | |
|---|---|
| *Total License Fees (Deposited Directly to School Fund)* | $3,760 |

***Total Tax Receipts - All Tax Types***

| | |
|---|---|
| Total Net Tax Receipts | $ 973,641,274 |
| Amounts Shared | 23,804,211 |
| Amount Transferred to School Fund | 2,668,122 |
| **Total Tax Receipts Collected** | **$1,000,113,607** |

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## Table 2
## Additional Assessments Issued by Tax Examiners

| Tax Type | Tax | Penalty | Total | Number |
|---|---|---|---|---|
| Corporation (Non Oil and Gas) | $2,093,525 | $ 705,203 | $2,798,728 | 1,099 |
| Fisheries Business | 341,359 | 227,227 | 568,586 | 115 |
| Mining | 111,547 | 5,161 | 116,708 | 11 |
| Motor Fuel | 44,419 | 68,783 | 113,202 | 124 |
| Seafood Marketing | 27,397 | 18,199 | 45,596 | 68 |
| Tobacco | 438 | 17,418 | 17,856 | 16 |
| Salmon Enhancement | 3,573 | 14,084 | 17,657 | 37 |
| Estate | 6,513 | 5,349 | 11,862 | 2 |
| Coin-Operated Device | 2,400 | 556 | 2,956 | 11 |
| Individual | 496 | 227 | 723 | 7 |
| Alcoholic Beverages | 0 | 198 | 198 | 2 |
| **Total** | **$2,631,667** | **$1,062,405** | **$3,694,072** | 1,492 |

The amounts above summarize data for assessments generated by Operations through examination of returns. Audit assessments are not included in these amounts.

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## Table 3
## Collections from Assessments by Tax Examiners

| Tax Type | Amount | Number of Accounts |
|---|---|---|
| Corporation | $ 890,566 | 442 |
| Fisheries Business | 395,294 | 60 |
| Motor Fuel | 214,463 | 64 |
| Seafood Marketing Assessments | 72,081 | 33 |
| Individual | 19,437 | 12 |
| Salmon Enhancement | 12,850 | 14 |
| Tobacco | 7,907 | 8 |
| Mining | 6,247 | 12 |
| Estate | 4,234 | 4 |
| Coin-Operated Device | 3,057 | 7 |
| Alcoholic Beverages | 202 | 2 |
| **Total Collections** | **$1,626,338** | **658** |

The amounts above summarize data for enforced collections of taxes, penalties and interest resulting from assessments made by tax examiners. Enforced collections begin after taxpayers have been notified of an assessment.

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## Table 4
## Taxpayer Refund Claims Issued

| Tax Type | Amount | Number |
|---|---|---|
| Corporation (Non Oil and Gas) | $16,037,601 | 1,348 |
| Corporation (Oil and Gas) | 11,480,160 | 21 |
| Motor Fuel (Consumer Refunds)[1] | 6,216,283 | 636 |
| Fisheries Business | 370,475 | 116 |
| Estate | 97,849 | 10 |
| Salmon Enhancement | 43,429 | 13 |
| Motor Fuel (Taxpayer Refunds) | 17,459 | 18 |
| Seafood Marketing | 13,691 | 9 |
| Tobacco | 9,354 | 2 |
| Individual | 8,499 | 1 |
| Regulatory Cost Charges | 1,204 | 3 |
| Electric/Telephone Co-op | 900 | 1 |
| Alcoholic Beverage | 264 | 1 |
| Mining | 200 | 2 |
| **Total** | **$34,297,368** | **2,181** |

The amounts above summarize data for refunds claimed by taxpayers on their returns. Refunds typically resulted from taxpayers whose estimated payments exceeded their year-end tax liability or who file amended returns.

[1] Consumers may claim a refund of motor fuel tax paid on fuel used for exempt and off-highway purposes.

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## Table 5
## Statistics

### *Corporation Net Income Tax*

| *Tax Returns Filed by Type* | |
|---|---|
| **Return Type** | **Returns Filed** |
| Original (Non Oil and Gas) | 6,840 |
| Sub-S Corporations | 3,388 |
| Inactive | 648 |
| Amended (Non Oil and Gas) | 624 |
| NOL Carrybacks | 544 |
| Exempt | 448 |
| Homeowner Association | 316 |
| IRS Audit Adjustment Report | 120 |
| Foreign | 55 |
| Original (Oil and Gas) | 33 |
| Amended (Oil and Gas) | 25 |
| Miscellaneous | 60 |
| **Total** | **13,101** |

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## Table 5
## Statistics

### *Fisheries Tax*

| *Fisheries Business Licenses Issued* | |
|---|---|
| Floating | 258 |
| Shore-based | 218 |
| Exporters | 64 |
| **Total Licenses Issued** | **540** |

| *Security Posted for Fisheries Business Licenses* | |
|---|---|
| Lienable Real Property | $75,391,196 |
| Fisheries Business Bond | 5,490,900 |
| Letters of Credit | 2,208,424 |
| Cash Prepayments | 1,296,910 |
| Certificates of Deposit | 817,239 |
| **Total Security Posted** | **$85,204,669** |

| *Civil Penalties Assessed* | |
|---|---|
| 1st Violation ($5,000) | 6 |
| 2nd Violation ($10,000) | 1 |
| ***AS 43.75.011(b) authorizes the Department to assess civil penalties for processing without a license.*** | |

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## Table 5
## Statistics

### *Motor Fuel Tax*

*Taxable Gallons Distributed in Alaska*

| | Highway | | Aviation | | Marine | |
|---|---|---|---|---|---|---|
| | *Gasoline* | *Diesel* | *Gasoline* | *Jet Fuel* | *Gasoline* | *Diesel* |
| Total Gallons Sold | 245,045,071 | 717,721,554 | 18,614,798 | 744,157,849 | 10,824,735 | 180,713,779 |
| Less Exemptions[1] | -14,529,363 | -464,322,299 | -465,075 | -387,915,859 | -123,704 | -8,888,973 |
| Less Refunds[2] | -1,214,840 | -23,137,007 | -76,775 | -127,805,650 | -1,076 | -1,457,698 |
| Fuel Reclassifications[3] | -13,947 | 2,697,155 | 3,291 | 0 | 10,657 | -2,697,155 |
| Total Taxable Gallons | 229,286,921 | 232,959,403 | 18,076,239 | 228,436,340 | 10,710,612 | 167,669,953 |

[1]Amounts claimed and deducted on taxpayer returns. Certain fuel sales as specified under AS 43.40.100 are exempt from motor fuel tax. The four largest categories of exempt sales include fuel sold for heating, exported as cargo, used on foreign flights and sold to governmental entities.
[2]Refunds of full tax claimed by resellers for fuel which was sold for exempt purposes. Refunds were claimed primarily for heating fuel and foreign flight sales.
[3]Amount of gallons for which the final usage differed from the original classification under which it was purchased. For example, a taxpayer purchased highway fuel but used it in his boat (marine fuel).

*Gallons Converted to Off-highway Use*

| | *Gasoline* | *Diesel* | *Total* |
|---|---|---|---|
| Total Off-highway Gallons[1] | 1,812,637 | 179,452,163 | 181,264,800 |

[1]Gallons used off-highway are subject to a refund of 6¢ per gallon under AS 43.40.030. Since these gallons are subject to some tax (net 2¢ per gallon), they are included in the table above.

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## Table 5
## Statistics

### *Alcoholic Beverages Tax*

| *Taxable Gallons Sold* | |
|---|---|
| Beer | 13,263,354 |
| Wine | 1,288,650 |
| Liquor | 1,099,956 |
| **Total Gallons Sold** | **15,651,960** |

### *Tobacco Tax*

| | |
|---|---|
| Taxable Cigarettes Sold | 1,079,446,621 |
| Total Wholesale Price of Tobacco Sold | $4,896,412 |

### *Estate Tax*

| | |
|---|---|
| Number of Estate Tax Certificates Issued | 500 |

### *Licensing*

| *Licenses Issued* | |
|---|---|
| **License Type** | **Number Issued** |
| Fisheries Business | 540 |
| Mining | 433 |
| Cigarette | 174 |
| Motor Fuel Dealer | 147 |
| Alcohol Bond Warehouse | 13 |

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# Table 5
# Statistics

## *Unclaimed Property*

### *Unclaimed Property Trust Account*

| | | |
|---|---|---|
| Beginning Balance | | $1,234,405 |
| Less Prior Year Adjustment[1] | | (47,899) |
| Net Balance | | 1,216,506 |
| Deposits | | 1,820,444 |
| Less Total Transfers and Refunds: | | |
| Transfer to General Fund | 1,657,100 | |
| Refunds Issued | 346,373 | |
| Total Transfers and Refunds | | (2,003,473) |
| Ending Balance | | $1,033,477 |

[1] *Amount of escheated property refunds issued during fiscal year 1992. All financial activity for the escheated property program is accounted for in the unclaimed property trust account.*

### *Unclaimed Property Activity*

| Category | Number |
|---|---|
| Owner Inquiries | 4,286 |
| Reports Processed | 2,826 |
| Refunds Issued by Holders | 816 |
| Refunds Issued by Department of Revenue | 547 |

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## Table 6
## Motor Fuel Refund Detail

This table breaks out by transportation mode the total dollar amount of motor fuel refunds reflected in Table 1. AS 43.40.030 provides for full refunds of tax paid on motor fuel used for exempt purposes and partial refunds of 6 cents per gallon on motor fuel used for off-highway purposes. Off-highway refunds for FY 93 totalled $10,876,000. The bulk of aviation fuel refunds resulted from fuel used on foreign flights which is tax exempt.

| | Highway | Marine | Aviation | Total |
|---|---|---|---|---|
| Gross Tax Receipts[1] | $38,701,987 | $9,010,219 | $9,558,807 | $57,271,013 |
| Claims For Refunds | (13,150,263) | (179,630) | (3,198,212) | (16,528,105) |
| **Net Tax Receipts** | **$25,551,724** | **$8,830,589** | **$6,360,595** | **$40,742,908** |

[1] Net of timely filing deductions and penalty and interest collections

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## Table 7
## Salmon Enhancement Tax Detail

| Aquaculture Region | *Where Bought* | | *Where Caught* | | Tax |
|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | |
| Cook Inlet | 72,856,623 | $ 97,825,388 | 72,833,895 | $ 98,726,898 | $1,957,437 |
| Southern Southeast | 122,619,903 | 60,071,355 | 104,670,237 | 53,985,703 | 1,805,983 |
| Northern Southeast | 52,153,536 | 37,549,572 | 69,192,232 | 42,203,543 | 1,133,843 |
| Kodiak | 43,750,311 | 42,675,357 | 43,750,311 | 42,675,357 | 852,676 |
| Prince William Sound | 37,115,037 | 32,809,841 | 37,136,495 | 31,900,673 | 656,014 |
| Chignik | 18,269,216 | 15,218,527 | 18,269,216 | 15,218,527 | 304,370 |
| **Total** | **346,764,626** | **$286,150,040** | **345,852,386** | **$284,710,701** | **$6,710,323** |

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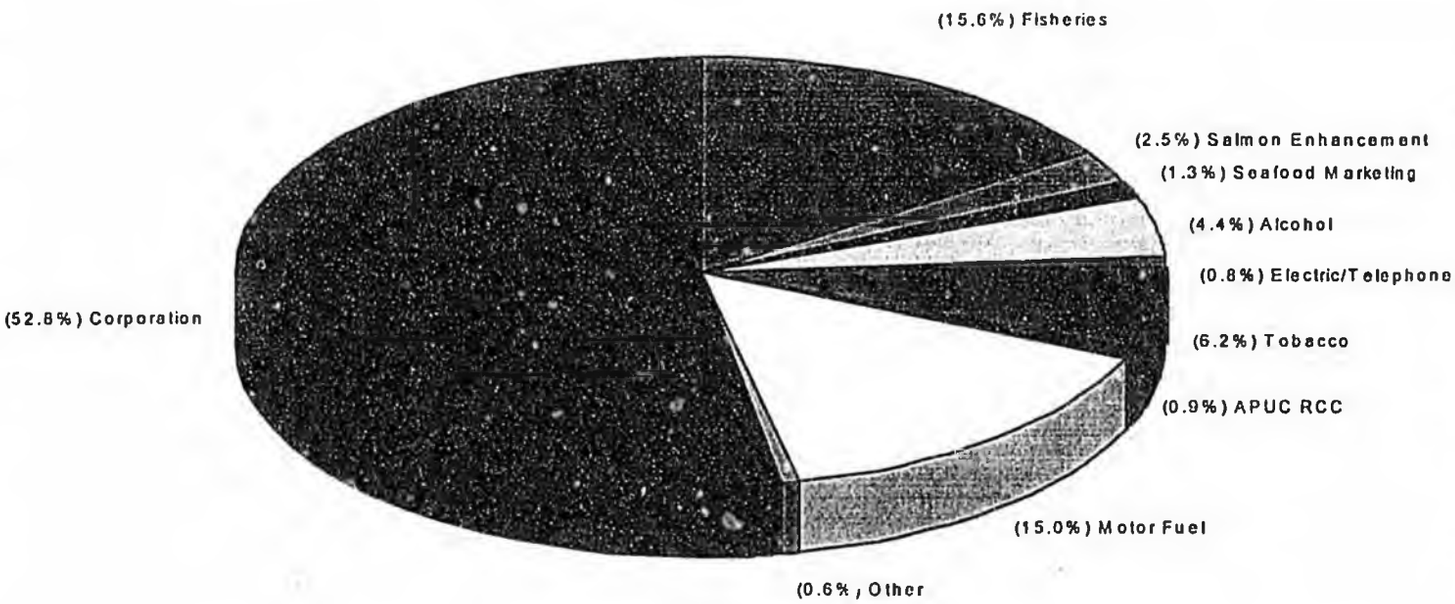
## Table 8
## Tax Receipts Collected




***FY 93 Tax Receipts***
*(In Millions of Dollars)*

| | |
|---|---|
| Corporation | $142.8 |
| Fisheries | 42.2 |
| Motor Fuel | 40.7 |
| Tobacco | 16.7 |
| Alcohol | 11.9 |
| Salmon Enhancement | 6.7 |
| Seafood Marketing | 3.6 |
| APUC RCC | 2.4 |
| Electric/Telephone | 2.2 |
| Other | 1.5 |
| Total | $270.7 |

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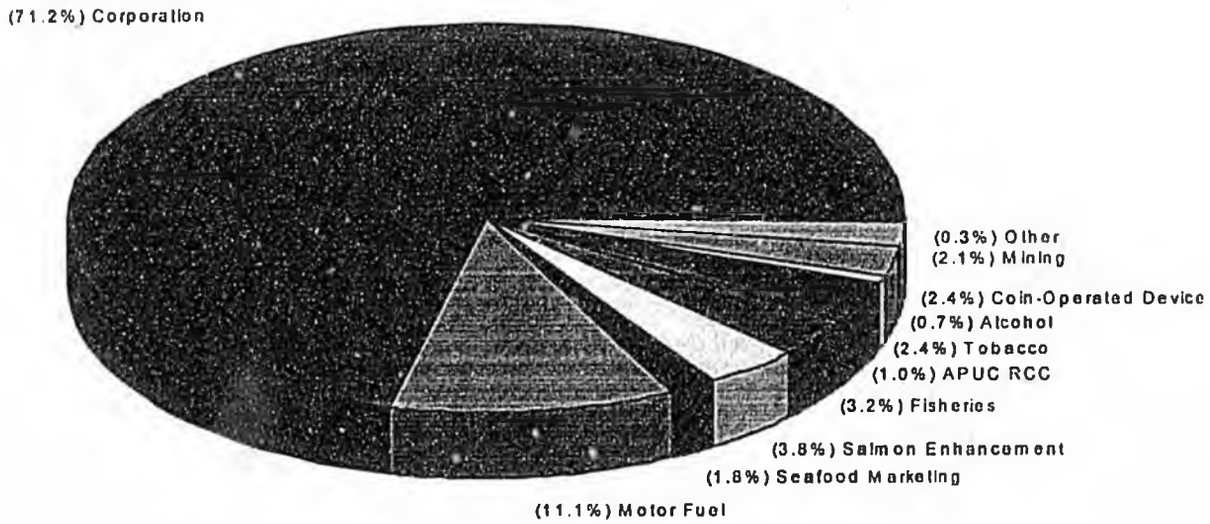
## Table 9
## Return Filing Volume




***Returns Filed in FY 93***
*(Number of Returns)*

| | |
|---|---|
| Corporation | 13,101 |
| Motor Fuel | 2,044 |
| Salmon Enhancement | 694 |
| Fisheries | 588 |
| Tobacco | 436 |
| Coin-operated Device | 434 |
| Mining | 388 |
| Seafood Marketing | 330 |
| APUC RCC | 183 |
| Alcohol | 135 |
| Other | 62 |
| Total | 18,395 |

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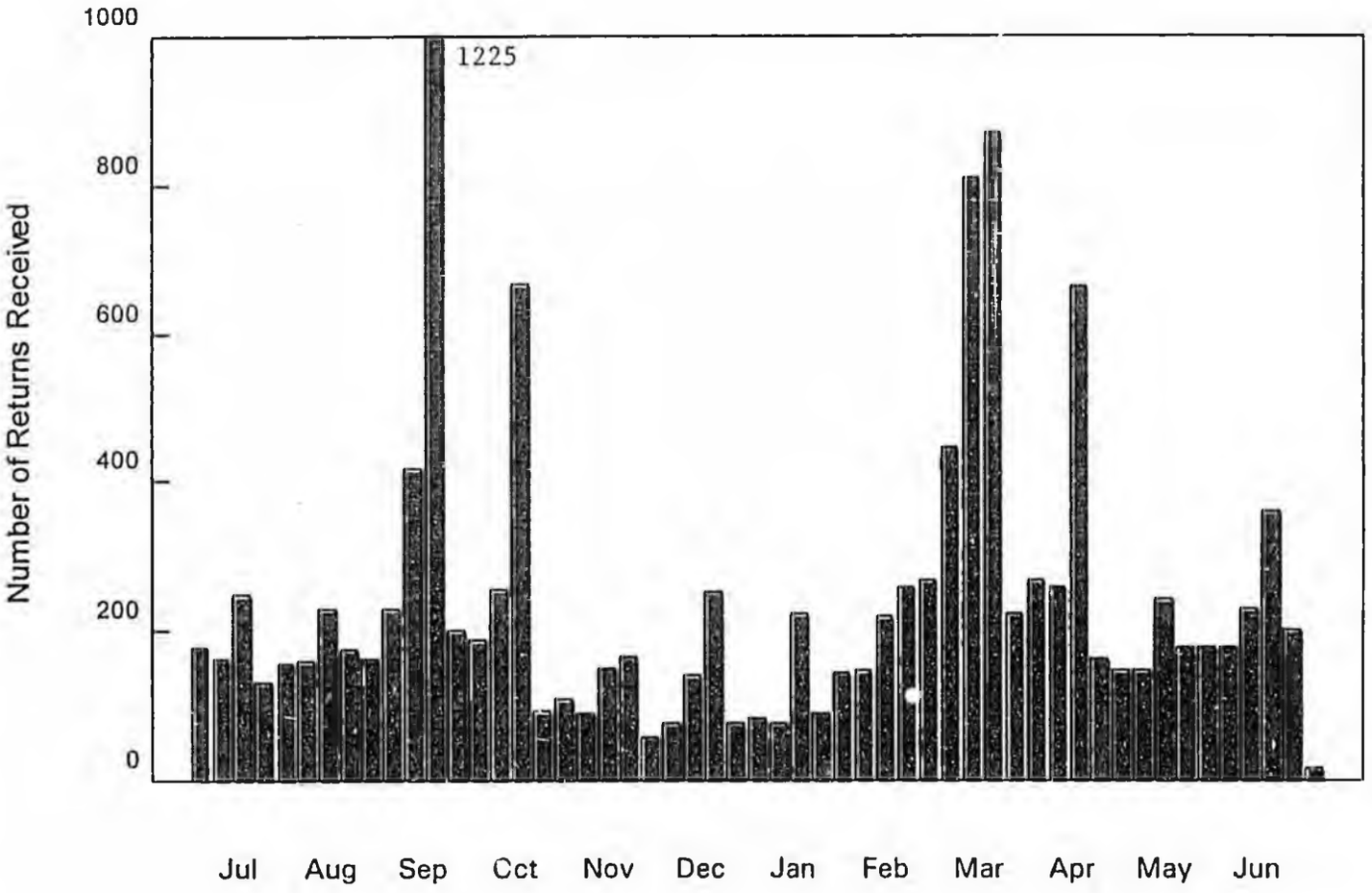
## Table 10
## Corporation Return Filing Activity




Total Returns Filed: 13,101