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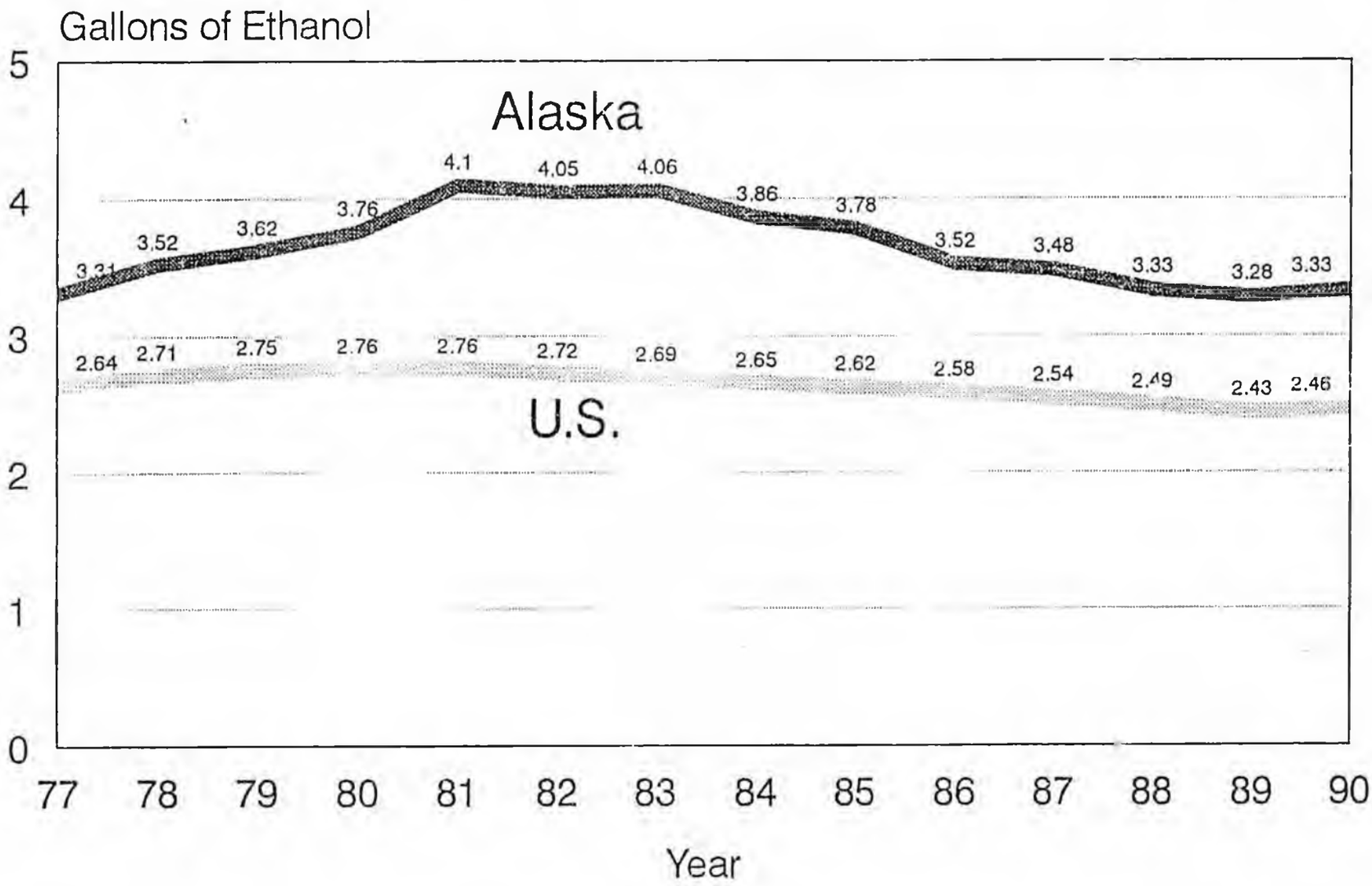
Apparent Per Capita Alcohol Consumption

Gallons of Ethanol Consumed Per Person 14 Years of Age and Older



Source: National Institute on Alcohol Abuse and Alcoholism, Surveillance Report # 23, December 1992

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Division of Biometry and Epidemiology
Alcohol Epidemiologic Data System

SURVEILLANCE REPORT #23

APPARENT PER CAPITA ALCOHOL CONSUMPTION: NATIONAL, STATE, AND REGIONAL TRENDS, 1977-1990

Gerald D. Williams, Ph.D.[1]
Frederick S. Stinson, Ph.D.[2] David Clem, A.S.[2]
John Noble, B.A.[3]

[1] CSR, Incorporated
Suite 600
1400 Eye Street, N.W.
Washington, DC 20005
(202) 842-7600

[2] Cygnus Corporation
Suite 1475
1400 Eye Street, N.W.
Washington, DC 20005
(202) 289-4992

[3] Division of Biometry and Epidemiology
National Institute on Alcohol Abuse and Alcoholism
Room 14C-06
5600 Fishers Lane
Rockville, MD 20857
(301) 443-3305

December 1992

U.S. Department of Health and Human Services
Public Health Service
National Institutes of Health

Cygnus Corporation operates the Alcohol Epidemiologic Data System (AEDS) under Contract No. ADM 281-92-0001 for the Division of Biometry and Epidemiology, National Institute on Alcohol Abuse and Alcoholism. CSR, Incorporated is an AEDS subcontractor.

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National Institute on Alcohol Abuse and Alcoholism
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Rockville, MD 20857
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Table 2

Apparent Alcohol Consumption for States, Census Regions, and the United States, 1990

[Volume and ethanol in thousands of gallons, per capita consumption in gallons, based on population age 14 and older.]

State or Other Geographic Area	Beer			Wine			Spirits			All Beverages		
	Volume	Ethanol	Per Capita	Volume	Ethanol	Per Capita	Volume	Ethanol	Per Capita	Ethanol	Per Capita	U.S. Decile
AL	80,899	3,640	1.13	4,566	589	0.18	4,830	2,000	0.62	6,229	1.94	9
AK	14,607	657	1.62	1,466	189	0.46	1,234	511	1.26	1,357	3.33	1
AZ	101,755	4,579	1.59	8,276	1,068	0.37	5,630	2,331	0.81	7,977	2.77	2
AR	46,863	2,109	1.13	1,875	242	0.13	2,774	1,148	0.62	3,499	1.87	9
CA	691,050	31,097	1.32	106,909	13,791	0.59	49,877	20,649	0.88	65,538	2.79	2
CO	77,974	3,509	1.35	5,910	762	0.29	4,738	1,961	0.75	6,233	2.40	6
CT	65,000	2,925	1.09	9,488	1,224	0.46	6,026	2,495	0.93	6,644	2.47	5
DE	17,215	775	1.45	1,552	200	0.37	1,483	614	1.15	1,589	2.98	2
DC	16,225	730	1.42	3,050	393	0.77	2,456	1,017	1.98	2,141	4.17	1
FL	365,079	16,429	1.54	32,045	4,134	0.39	26,849	11,116	1.04	31,678	2.97	2
GA	139,039	6,257	1.22	9,201	1,187	0.23	10,805	4,473	0.87	11,917	2.33	6
HI	32,470	1,461	1.65	2,753	355	0.40	1,716	710	0.80	2,527	2.86	2
ID	23,048	1,037	1.36	1,939	250	0.33	1,085	449	0.59	1,736	2.28	7
IL	290,352	13,066	1.44	25,731	3,319	0.37	18,291	7,572	0.83	23,958	2.64	3
IN	124,264	5,592	1.27	6,829	881	0.20	6,842	2,833	0.64	9,305	2.11	8
IA	66,011	2,971	1.35	3,162	408	0.18	2,893	1,198	0.54	4,576	2.07	9
KS	48,827	2,197	1.13	1,985	256	0.13	2,511	1,040	0.53	3,493	1.80	10
KY	73,696	3,316	1.13	2,570	332	0.11	4,313	1,785	0.61	5,433	1.85	9
LA	111,375	5,012	1.55	5,897	761	0.23	6,188	2,562	0.79	8,334	2.57	4
ME	26,577	1,196	1.22	2,374	306	0.31	1,974	817	0.83	2,319	2.36	6
MD	104,108	4,685	1.22	9,941	1,282	0.33	8,968	3,713	0.97	9,680	2.52	5
MA	133,706	6,017	1.22	17,298	2,231	0.45	11,623	4,812	0.97	13,060	2.64	3
MI	218,289	9,823	1.34	16,126	2,080	0.28	14,411	5,966	0.81	17,869	2.43	6
MN	101,354	4,561	1.33	7,202	929	0.27	8,032	3,325	0.97	8,815	2.57	4
MS	59,871	2,694	1.35	1,420	183	0.09	3,183	1,318	0.66	4,195	2.11	8
MO	124,578	5,606	1.38	7,080	913	0.22	6,959	2,881	0.71	9,400	2.31	7
MT	22,230	1,000	1.61	1,415	183	0.29	1,173	486	0.78	1,669	2.68	3
NE	38,905	1,751	1.42	1,888	244	0.20	1,937	802	0.65	2,796	2.26	7
NV	46,587	2,096	2.18	5,179	668	0.70	4,499	1,862	1.94	4,627	4.82	1
NH	36,470	1,641	1.85	3,356	433	0.49	4,265	1,766	1.99	3,840	4.33	1

Table 2 (continued)

Apparent Alcohol Consumption for States, Census Regions, and the United States, 1990

[Volume and ethanol in thousands of gallons, per capita consumption in gallons, based on population age 14 and older.]

State or Other Geographic Area	Beer			Wine			Spirits			All Beverages		
	Volume	Ethanol	Per Capita	Volume	Ethanol	Per Capita	Volume	Ethanol	Per Capita	Ethanol	Per Capita	U.S. Decile
NJ	162,454	7,310	1.16	23,712	3,059	0.49	14,582	6,037	0.96	16,406	2.60	4
NM	43,377	1,952	1.69	2,506	323	0.28	1,925	797	0.69	3,072	2.65	3
NY	367,567	16,541	1.13	46,719	6,027	0.41	27,166	11,247	0.77	33,814	2.31	7
NC	138,677	6,240	1.16	11,407	1,472	0.27	8,537	3,534	0.66	11,246	2.09	8
ND	16,355	736	1.47	658	85	0.17	1,133	469	0.94	1,290	2.59	4
OH	258,980	11,654	1.35	14,476	1,867	0.22	11,130	4,608	0.53	18,129	2.10	8
OK	61,817	2,782	1.12	2,603	336	0.14	3,356	1,389	0.56	4,507	1.81	10
OR	66,615	2,998	1.32	8,200	1,058	0.47	4,010	1,660	0.73	5,716	2.52	5
PA	306,239	13,781	1.42	13,531	1,746	0.18	13,006	5,385	0.56	20,911	2.16	8
RI	24,113	1,085	1.32	2,802	362	0.44	1,579	654	0.79	2,100	2.55	4
SC	89,170	4,013	1.45	5,493	709	0.26	6,197	2,565	0.93	7,287	2.64	3
SD	16,275	732	1.37	739	95	0.18	1,046	433	0.81	1,261	2.35	6
TN	106,589	4,796	1.22	4,418	570	0.15	5,796	2,400	0.61	7,766	1.98	9
TX	479,825	21,592	1.64	26,380	3,403	0.26	18,425	7,628	0.58	32,623	2.48	5
UT	21,859	984	0.81	1,170	151	0.12	1,388	575	0.47	1,709	1.40	10
VT	14,686	661	1.47	1,687	218	0.48	936	388	0.86	1,266	2.82	2
VA	139,422	6,274	1.26	11,716	1,511	0.30	7,613	3,152	0.63	10,937	2.19	7
WA	109,067	4,908	1.28	13,734	1,772	0.46	7,114	2,945	0.77	9,625	2.50	5
WV	38,857	1,749	1.20	1,185	153	0.10	1,483	614	0.42	2,515	1.73	10
WI	149,312	6,719	1.74	9,150	1,180	0.31	9,715	4,022	1.04	11,922	3.08	1
WY	11,364	511	1.48	598	77	0.22	781	323	0.93	912	2.64	3
Regions												
Northeast	1,136,810	51,156	1.24	120,968	15,605	0.38	81,158	33,599	0.81	100,361	2.43	*
Midwest	1,453,502	65,408	1.38	95,027	12,259	0.26	84,901	35,149	0.74	112,815	2.39	*
South	2,068,727	93,093	1.37	135,318	17,456	0.26	123,255	51,028	0.75	161,576	2.37	*
West	1,262,004	56,790	1.37	160,054	20,647	0.50	85,170	35,260	0.85	112,698	2.72	*
U.S. Total	5,921,042	266,447	1.34	511,368	65,966	0.33	374,484	155,036	0.78	487,450	2.46	*

* Decile values apply only to state-level data. Numbers may not add due to rounding.

American Heart Association

AMERICAN LUNG ASSOCIATION®
The Christmas Seal People

AMERICAN CANCER SOCIETY®

Coalition on Smoking OR Health

SAVING LIVES AND RAISING REVENUE:

Reasons for Major Increases In State and Federal Tobacco Taxes

January, 1993

1150 Connecticut Avenue, NW, Suite 820, Washington, DC 20036
Telephone: (202) 452-1184 FAX: (202) 452-1417

"Saving Lives and Raising Revenue: Reasons for Major Increases in Federal and State Tobacco Taxes" outlines rationales for major increases in tobacco taxation at the state and federal levels. It is a working document of the American Cancer Society, American Heart Association and American Lung Association, united as the Coalition on Smoking OR Health. It is intended for general use by state and federal policy makers, the media and health groups. This document will be updated as new information becomes available.

For more information on tobacco taxation and other public policy health issues relating to tobacco use, please contact the Coalition on Smoking OR Health.

The Coalition on Smoking OR Health gratefully acknowledges assistance and advice on tobacco excise tax issues by Jeffrey Harris, M.D., Ph.D., Professor of Economics, Massachusetts Institute of Technology, Eugene Lewit, Ph.D., Director, Research and Grants, Packard Foundation Center for the Future of Children, David Sweanor, J.D., Legal Counsel, Non-Smokers' Rights Association of Canada, Kenneth Warner, Ph.D., Professor and Chairman, Department of Public Health Policy and Administration, School of Public Health, University of Michigan, and Jeffrey Wasserman, Ph.D , Program Manager, SysteMetrics, Inc.

EXECUTIVE SUMMARY

Cigarettes kill about 435,000 Americans and cost society tens of billions of dollars each year. For thirty years national policy has been to discourage tobacco use.

As budget difficulties at all levels of government increase, and as more and more Americans die from tobacco use, many public health officials, economists and elected officials have concluded that the time has come for major increases in state and federal cigarette excise taxes. The case for raising these taxes is persuasive on several fronts:

* **As a health measure.** Cigarette taxes have an enormous potential to rapidly and significantly reduce smoking among teenagers and adults. For example, a conservative estimate is that a $2 per pack tax increase, maintained in real terms, would prevent roughly **2 million premature deaths** over time by discouraging young people from beginning to smoke and by encouraging some current smokers to quit. That is a saving of a greater number of lives than American losses from all wars combined.

* **As one of few taxes most Americans support.** Cigarette taxes provide a unique opportunity for federal and state governments to save millions of lives and simultaneously raise substantial revenue for priorities such as deficit reduction and health care reform. While proposals to increase most taxes meet fierce popular resistance, polling data shows that 70 percent or more of the public supports higher cigarette taxes.

This document discusses in greater detail how raising tobacco taxes substantially can play a critical role in reducing the death, disease and economic hardships caused by tobacco use. It concludes with the following policy recommendations:

* State and federal governments should enact major increases in cigarette excise taxes.

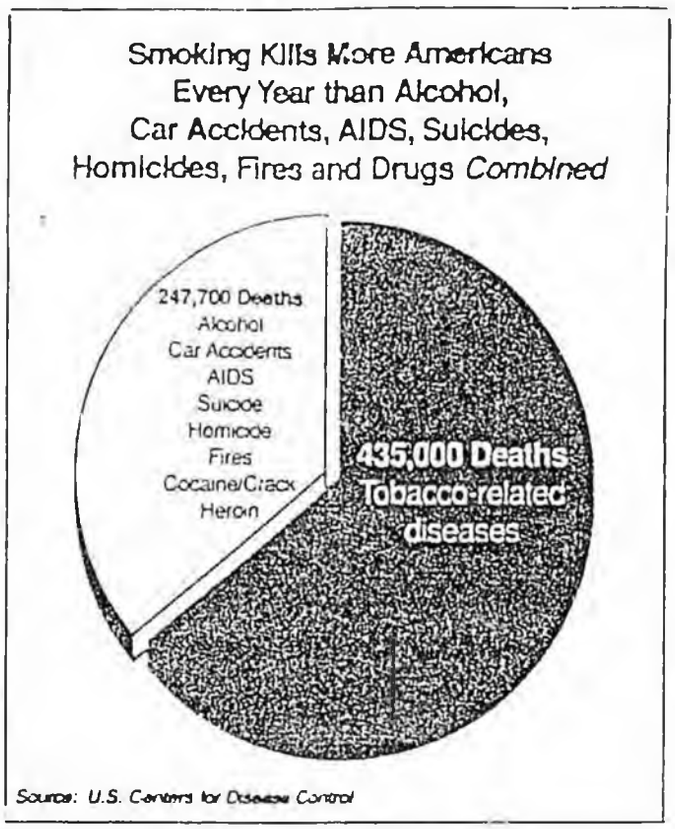
* Federal and state cigarette taxes should be indexed to keep pace with rising product prices.

* All other tobacco products should be taxed in proportion to the rate imposed on cigarettes.

CIGARETTES: AMERICA'S LEADING PREVENTABLE CAUSE OF DEATH

Nearly thirty years after the 1964 Surgeon General's Report sounded the health alarm on smoking, one-fourth of the nation's adult population remains addicted to cigarettes, and smoking remains the leading preventable cause of premature death and crippling disease in the United States. In all, smoking now kills an estimated 435,000 Americans each year -- more than alcohol, heroin, crack, automobile and airplane accidents, homicides, suicides and AIDS combined.

Figure 1



The cigarette is the only legal product that:

* kills more than one out of three long-term users and disables many more, when used as intended

* has been determined to be a major cause of heart disease, lung cancer, mouth and throat cancer, emphysema, chronic bronchitis, chronic obstructive pulmonary disease, low birthweight babies, strokes and a variety of other diseases[1]

* is as addictive as cocaine or heroin

[1] U.S. Department of Health and Human Services. Reducing the Health Consequences of Smoking: 25 Years of Progress. A Report of the Surgeon General. DHHHS Publication No. (CDC) 89-8411, 1989.

Environmental tobacco smoke (ETS) -- smoke from other people's cigarettes -- has been identified as the nation's third leading cause of preventable death, causing approximately 35,000 to 40,000 deaths per year from cardiovascular disease among nonsmokers and 3000 lung cancer deaths.[2] A panel of experts appointed by the Environmental Protection Agency has recommended that ETS be labeled a "Group A Carcinogen," a category reserved for only the most serious human carcinogens such as benzene and asbestos.[3]

More than one million teenagers begin smoking each year, a rate of approximately 3000 per day. Ninety percent of young smokers report that they became regular smokers before age 18.[4] Thus reducing smoking by children and teenagers is accepted as a key to reducing the enormous burden of addiction, death and disease smoking imposes on the health and economy of the United States.

Despite public health programs aimed at reducing teenage smoking, and despite the fact that it is illegal (with rare exceptions) to sell cigarettes to children, the smoking initiation rate among children and teenagers remains alarmingly high, and the age of initiation of new smokers has fallen steadily for several decades.[5] This is no accident. It is partly the result of marketing strategies typified by R.J. Reynolds' "Joe Camel" advertising campaign aimed at children and teenagers. Cigarette companies lavish nearly $4 billion on youth-oriented advertising and gimmicks designed to promote and reinforce the image of smoking as youthful, sophisticated and sexy, and to associate smoking with freedom and good health.

In addition to strengthening and enforcing laws to limit youth access to tobacco, the search for an effective strategy to discourage teenage smoking leads to one point upon which health experts and the cigarette industry agree: **major increases in cigarette taxes will dramatically reduce smoking.**

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[2] Council on Cardiopulmonary and Critical Care, American Heart Association, "Environmental Tobacco Smoke and Cardiovascular Disease," Circulation, August 1992, and U.S. Environmental Protection Agency, Respiratory Health Effects of Passive Smoking, Review Draft, May, 1992.

[3] U.S. Environmental Protection Agency, Respiratory Health Effects of Passive Smoking, Review Draft, May, 1992.

[4] Pierce, Naquin, Gilpin, Giovino, Mills and Marcus, "Smoking Initiation in the United States: A Role for Worksite and College Smoking Bans," Journal of the National Cancer Institute, vol. 83, pp. 1009- 1013 (1991).

[5] CDC, "Differences in Age of Smoking Initiation Between Blacks and Whites, United States," MMWR, Vol. 40, pp. 754-757, November 8, 1991.

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.

---

[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

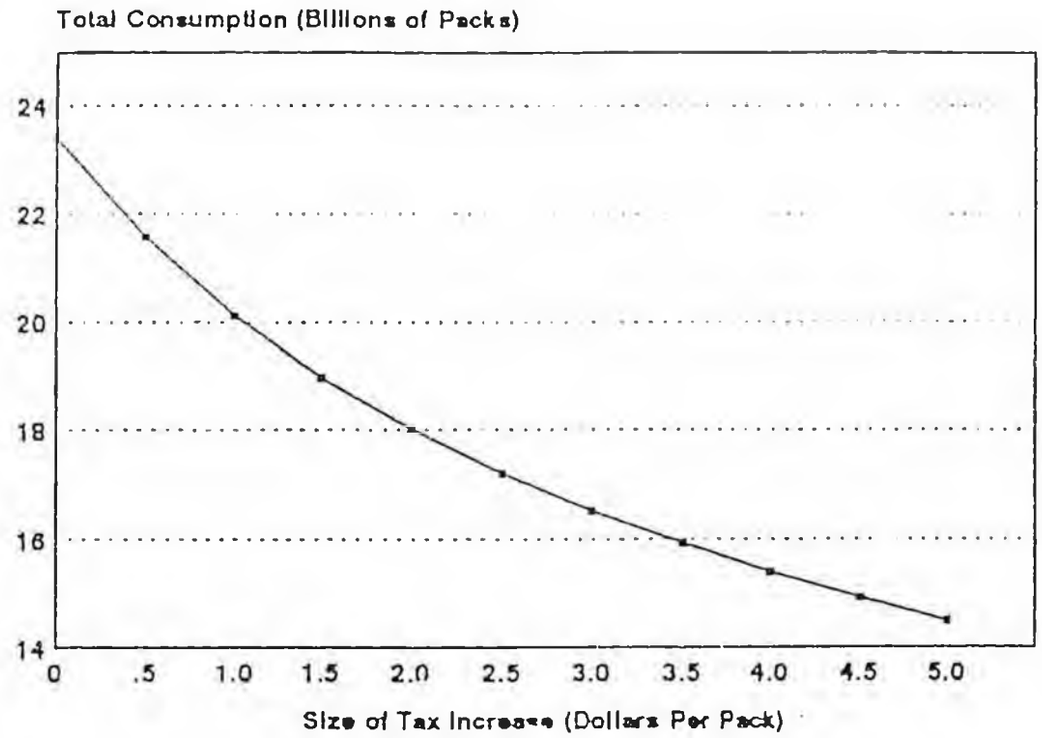

Figure 2

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 result 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.

---

[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

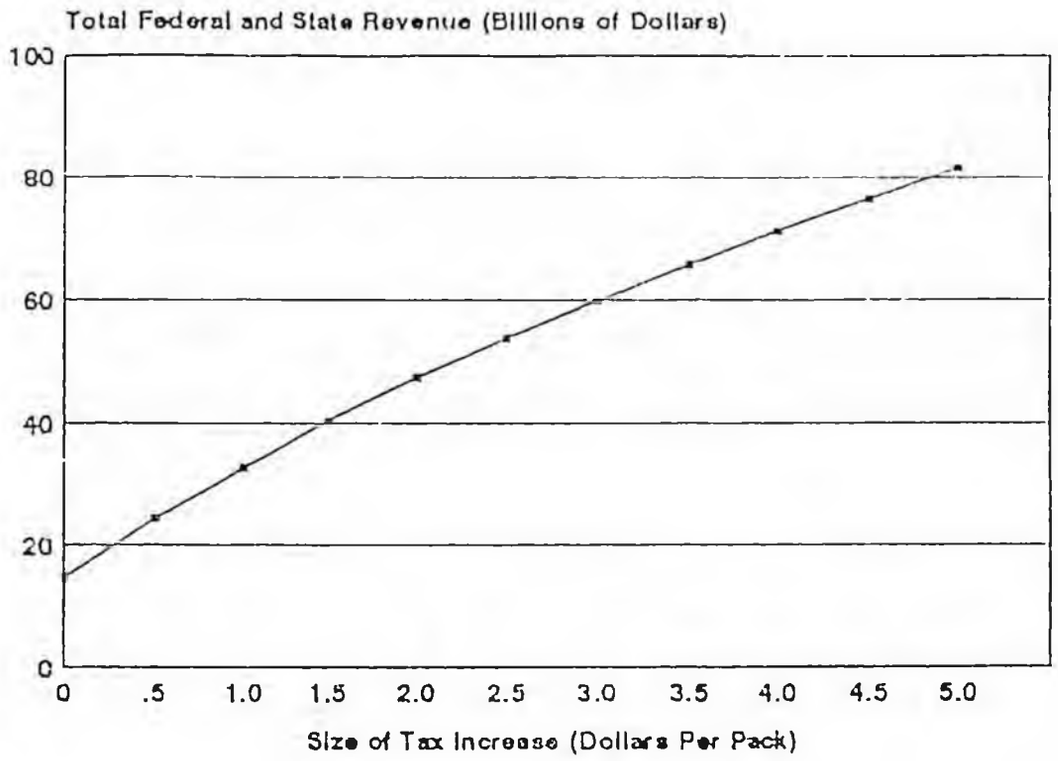

Figure 3

NOTE:
Figure 3 projects combined federal and state revenue in 1993 dollars 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 higher 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, and thus are more likely to successfully quit smoking in response to tax increases. Assuming that this finding 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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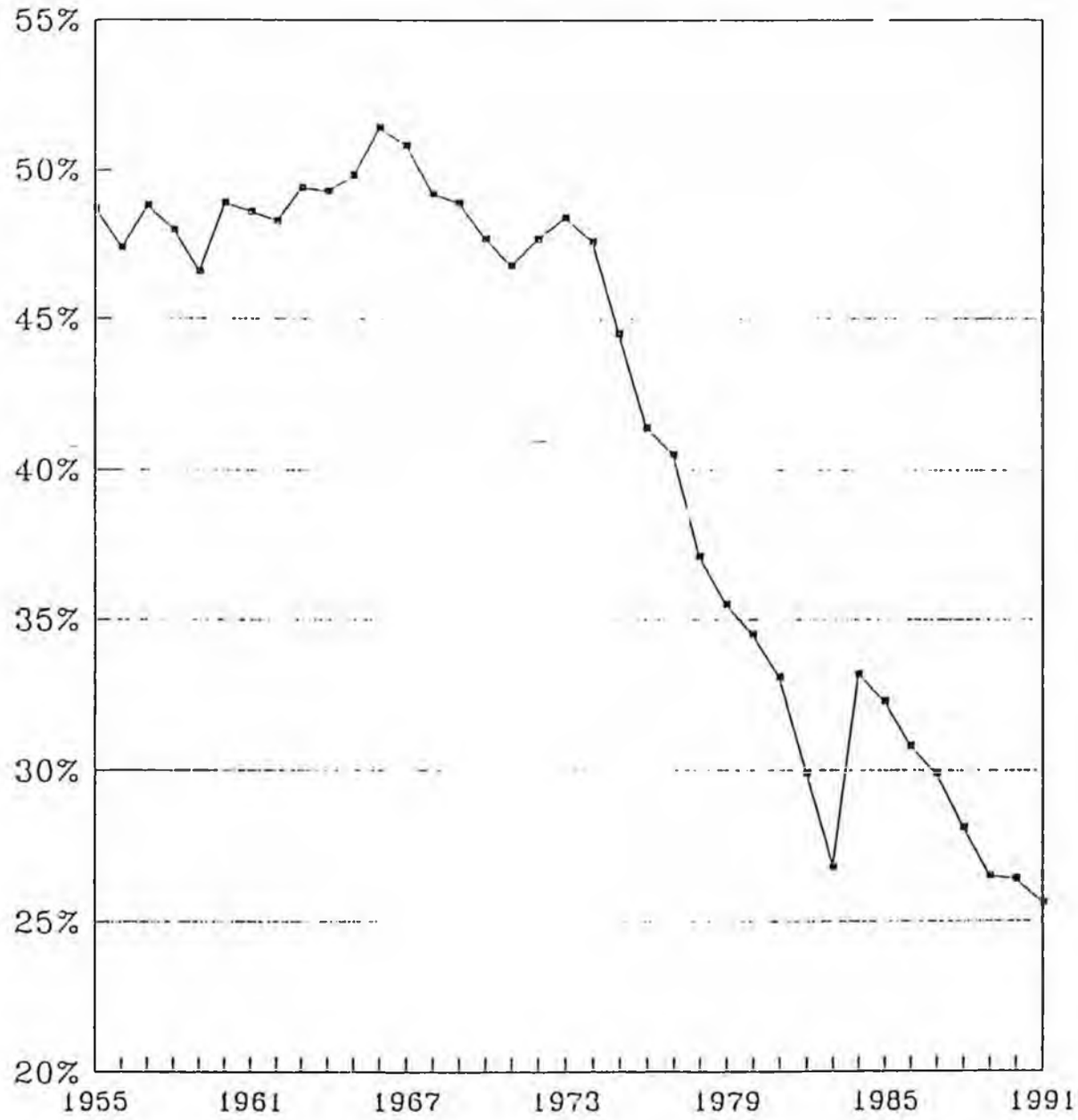
[18] Operating profits divided by operating revenue, Philip Morris Companies Inc. Annual Report, 1991.

[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

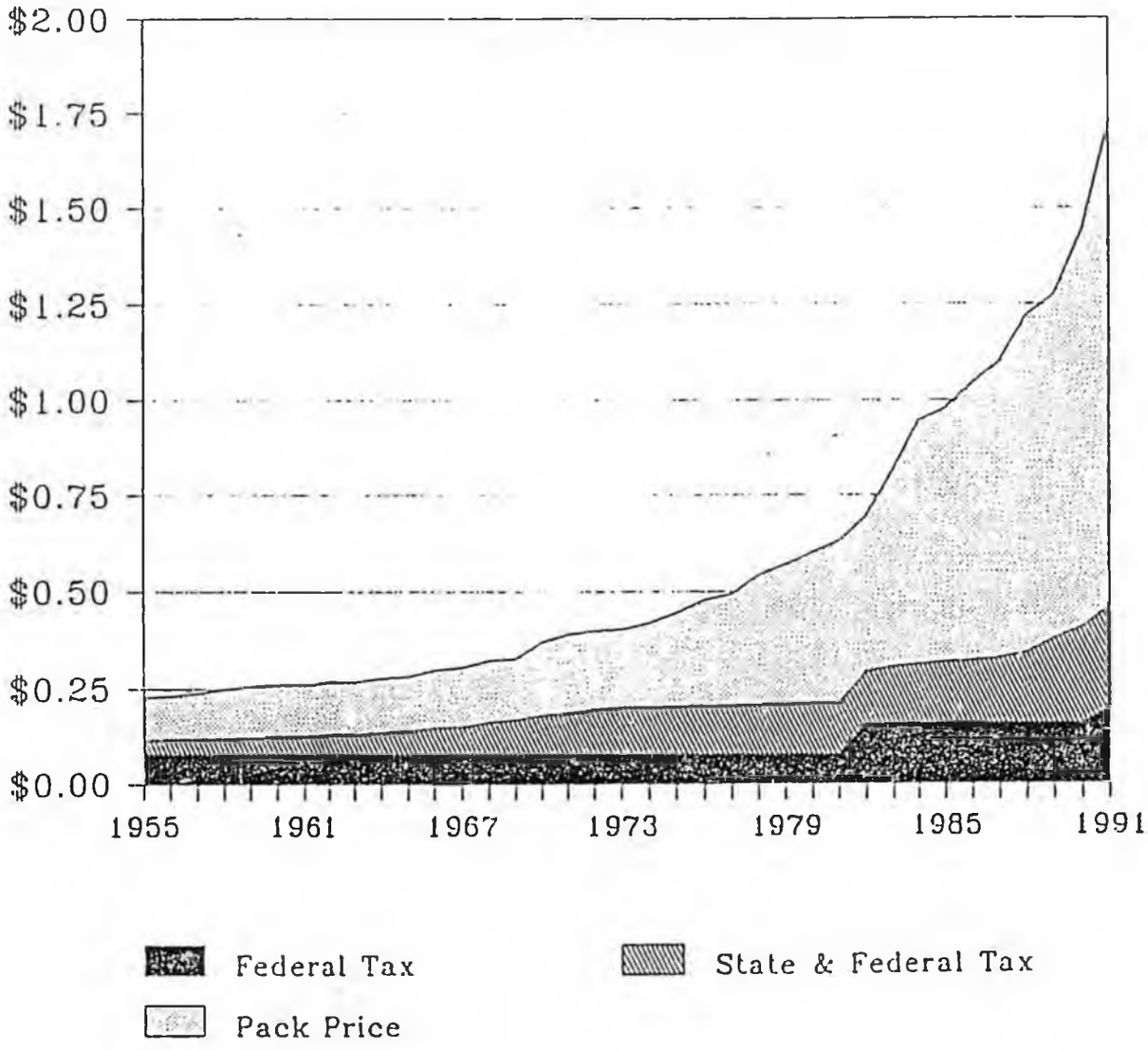
AVERAGE CIGARETTE TAX AS A PERCENTAGE OF RETAIL PRICE



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.

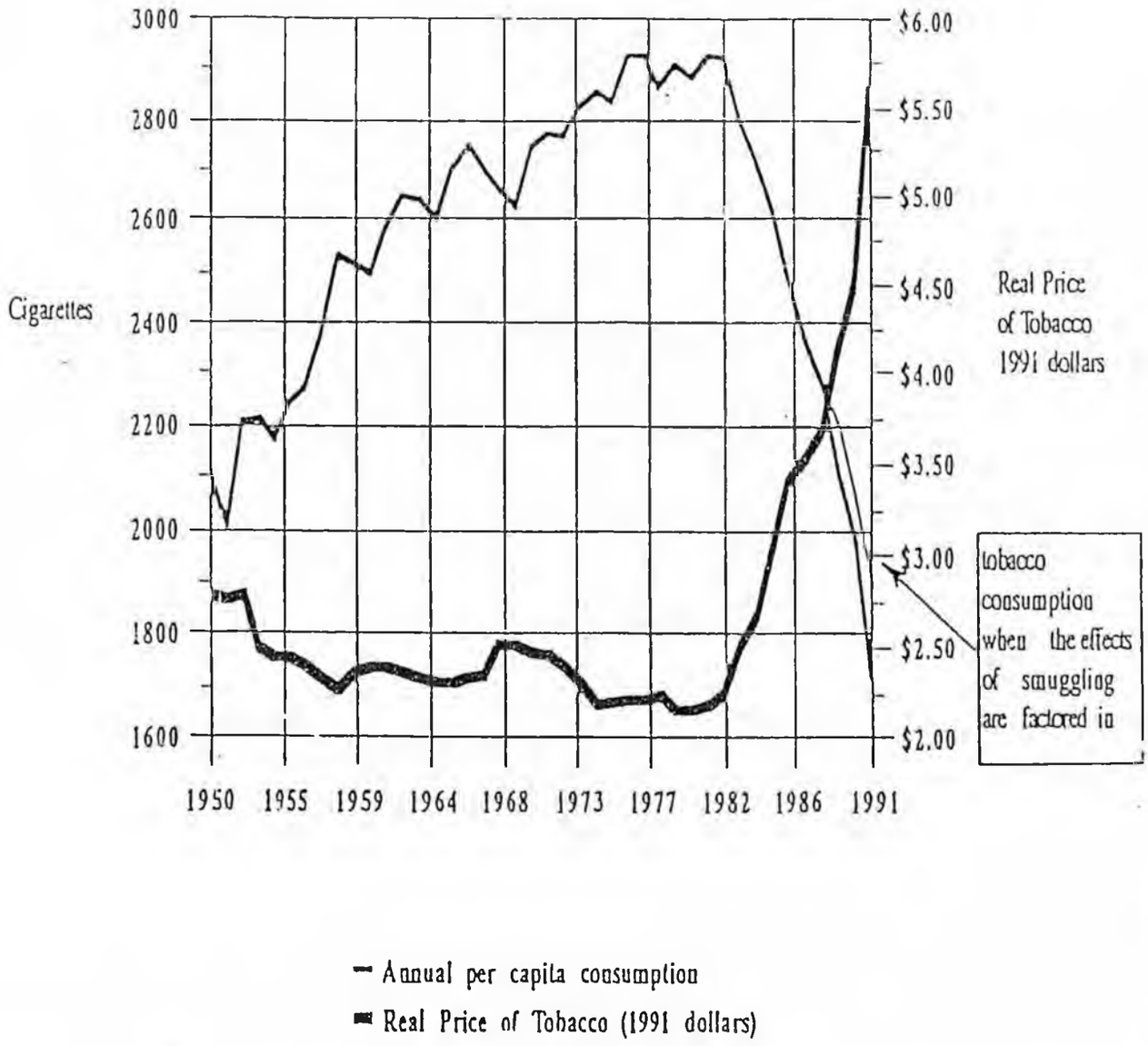
While other factors, such as Canada's ban on cigarette advertising, also contributed to Canada's success, experts agree that the tax increases have been the most important component of Canada's comprehensive tobacco control program.

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

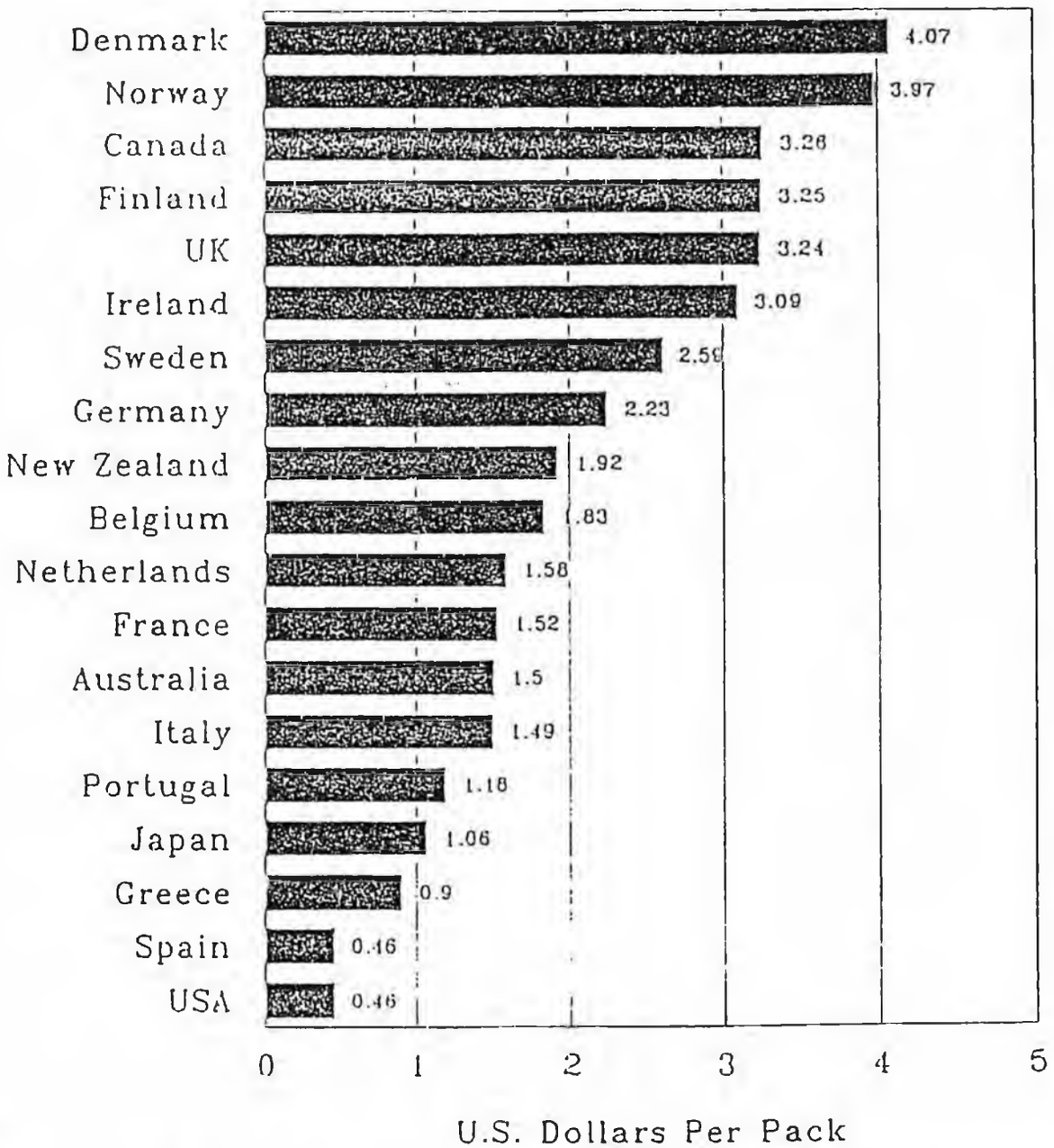
ANNUAL PER CAPITA CONSUMPTION OF CIGARETTES
AND REAL PRICE OF TOBACCO (per 20 cigarettes)
CANADA 1950 - 1991



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[1] (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.
[1]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 teen[illegible]e 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

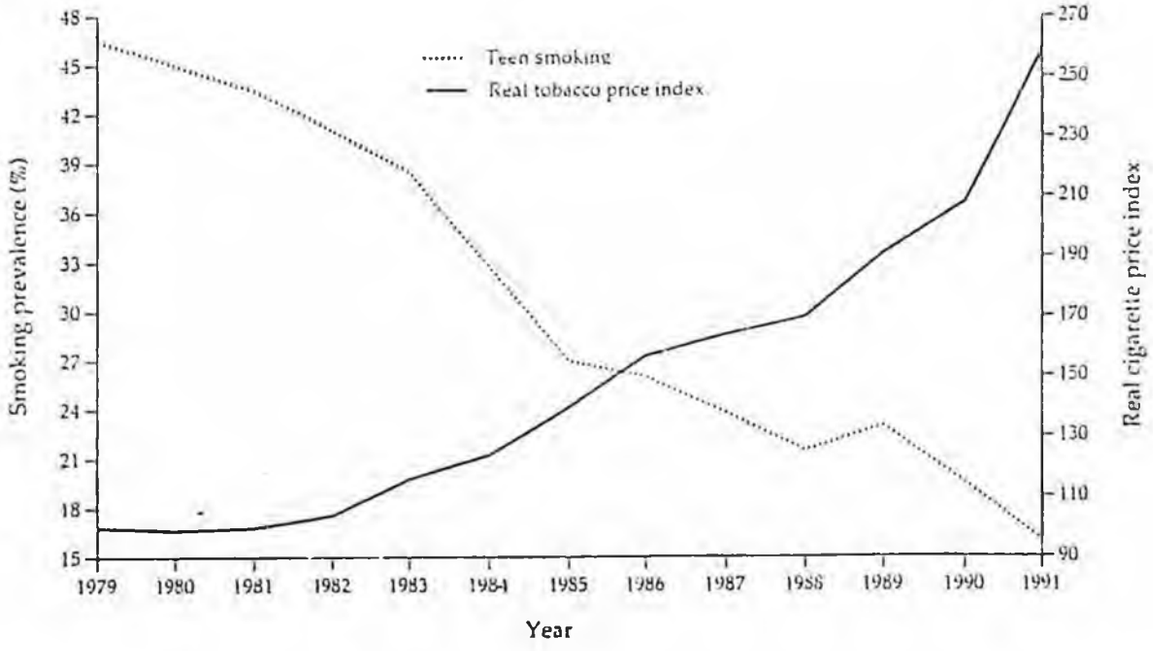
tobacco-producing states), the effects of inflation have been allowed to substantially reduce the values of these taxes. Although additional tax increases in states that have continually raised their cigarette excise taxes over time could spur a return to the organized smuggling of the 1970s, this problem 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.

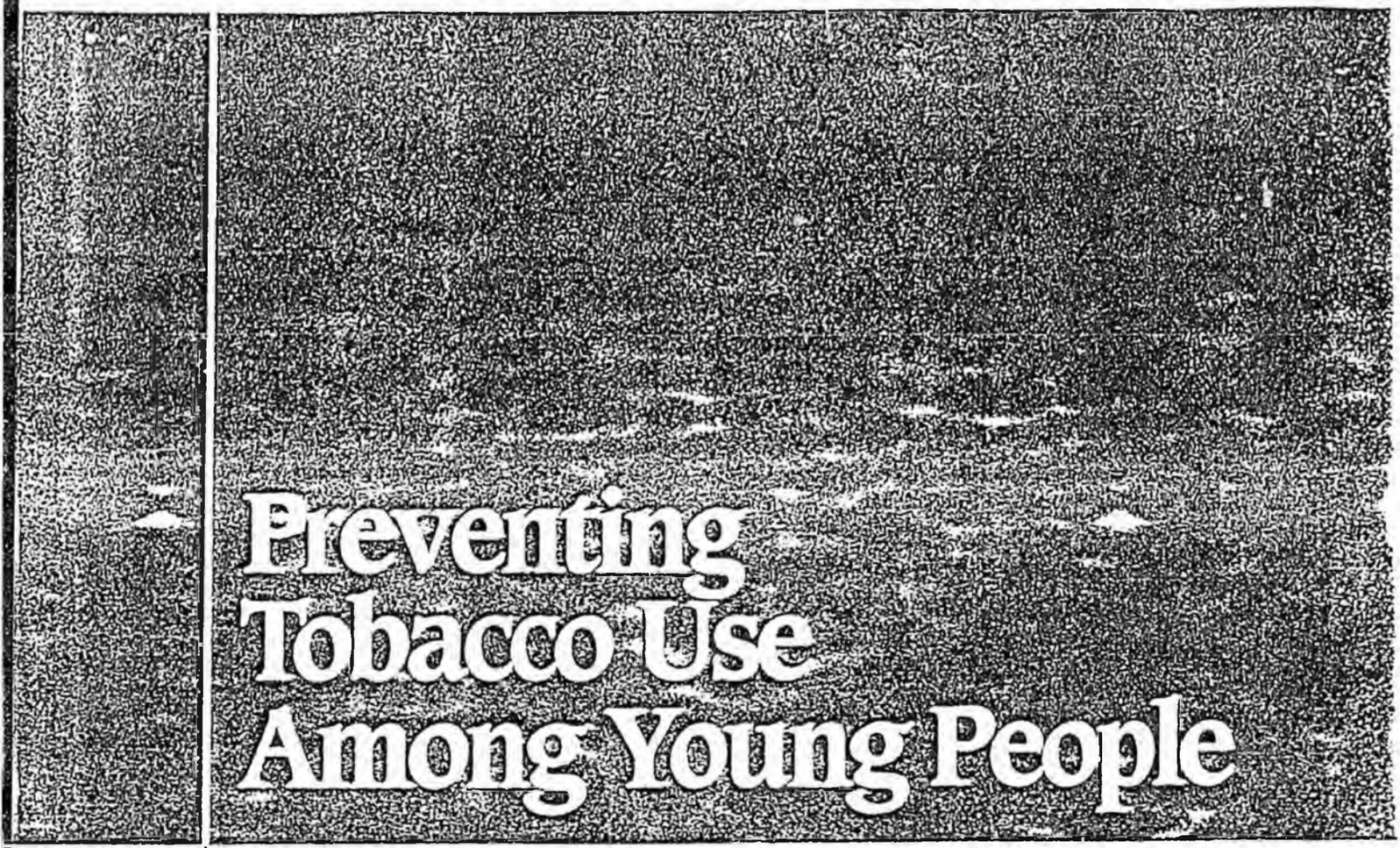
To offset declines in real revenues due to inflation, Canada switched to an ad valorem tax on cigarettes at both the federal and provincial levels in the 1980s. These ad valorem taxes were partly responsible for a 25 percent increase in real cigarette prices, which was accompanied by a 10 percent decline 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.



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 .964 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

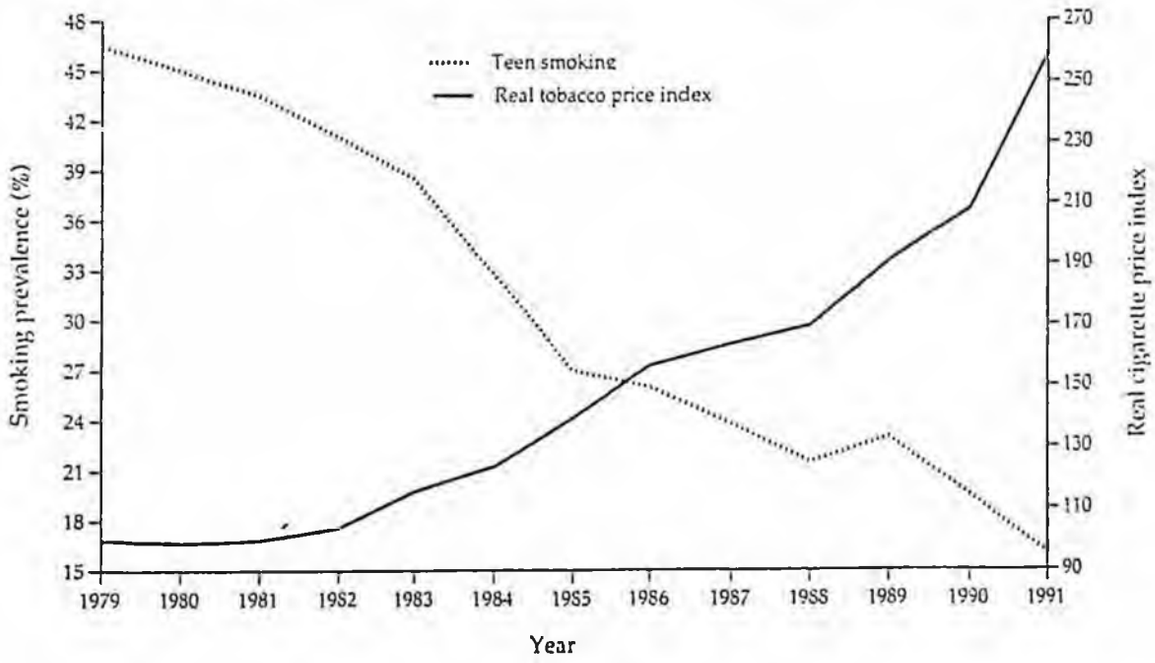
tobacco-producing states), the effects of inflation have been allowed to substantially reduce the values of these taxes. Although additional tax increases in states that have continually raised their cigarette excise taxes over time could spur a return to the organized smuggling of the 1970s, this problem 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.

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Date: Feb. 25, 1994

To: Dept. of Health & Social Services

Attn: Commissioner's Office

Fax No.: 465-3068

No. Pages (including this cover): 3

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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.

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.

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STATE OF ALASKA

DEPT. OF HEALTH AND SOCIAL SERVICES

DIVISION OF PUBLIC HEALTH
HEALTH PROMOTION PROGRAM

WALTER J. HICKEL, GOVERNOR

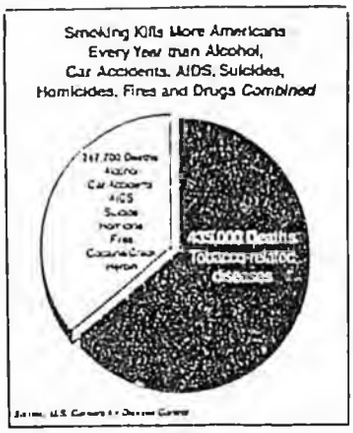
P.O. BOX 110610
JUNEAU, ALASKA 99811-0610
PHONE: (907) 465-3140

In Favor of House Bill 413
Division of Public Health
February 24, 1994

The Division of Public Health enthusiastically supports House Bill 413 for the purpose of reducing the burden of disease caused by tobacco use.

Casual links exist between tobacco use and the following chronic diseases:

stroke
cancers of the mouth, throat, and esophagus
cancer of the larynx
coronary heart disease
chronic obstructive pulmonary disease
lung cancer
pancreatic cancer
ulcer
bladder cancer
peripherial artery disease
cervical cancer
low birth weight baby risks



Tobacco is a drug that when used as directed will kill one out of three long term users, and disable many more. Tobacco is as addictive as heroin and cocaine.

IN ALASKA:

- 1992 survey results show that 28% of Alaskan adults smoke (aged 18 and older).
- It is estimated that 39% or more Alaska Native adults smoke.
- Alaska has one of the highest prevalence rates of smoking in the country, ranking within the top three, along with Tennessee and Kentucky.

- Of the 2,092 deaths among Alaskans in 1989, 351 (17%) were smoking-related.

- Among Alaskans who died in 1989 at age 35-65 years, smoking-attributable years of potential life lost were estimated to be 1,445 person-years, an average of 9.6 years per person.

The total smoking-attributable cost for Alaskans 35 years of age or older was $83.2 million in 1989.

The reason for the Division of Public Health's enthusiastic support for increasing the tax on tobacco is that nearly 90% of smokers start smoking before the age of 21 and increasing the price of tobacco has been demonstrated to decrease the number of users, especially among youth.

Although there have been dramatic gains in recent decades in the campaign against tobacco smoking, tobacco use among youth continues to be a public health epidemic. Every day more than 3,000 American teenagers become regular smokers.

Affordability of tobacco appears to be the most important determinant of the number of children who will start smoking. An increase in the cigarette excise tax may be the most effective approach to reducing tobacco use. Teenagers are much more responsive than adults to increases in the price of cigarettes because they have less disposable income and may be three times more sensitive to price increases than adults' consumption. Also children and teenagers are usually less addicted than many adult smokers and, therefore, more likely to be able to stop smoking when prices increase.

In 1989, California voters approved a citizen's initiative to raise their cigarette excise tax by 25 cents. Cigarette smoking dropped 17% between 1989 and 1991, about twice the U.S. average.

Data compiled in the United States, Canada, California, and the United kingdom indicate that for every 10% increase in the inflation-adjusted price of tobacco, general consumption will fall by about 4% but, more significantly, it will drop by about 10% among youth.

The natural liability involved in using tobacco products results in the State having to assume a significant financial responsibility for medical costs incurred by tobacco users in the form of State contributions to Medicaid, Medicare, and the provision of public health services. All states and the District of Columbia levy taxes on tobacco. Alaska's $.29 tobacco tax ranks 23rd among states. The Governor's proposed increase will move Alaska's rank to the 9th or 12th position, depending on the success of pending tax increases in Nebraska and Arkansas. While the tobacco excise tax proposed by the Governor is very modest by national and especially world standards, it nevertheless is the single most effective action that the State can initiate

to reduce tobacco use among youth and to reduce the future public burden for the diseases that result from tobacco use.

American tobacco taxes are among the lowest percentage of total price of virtually any country in the world.

CIGARETTE TAXES AND PRICES

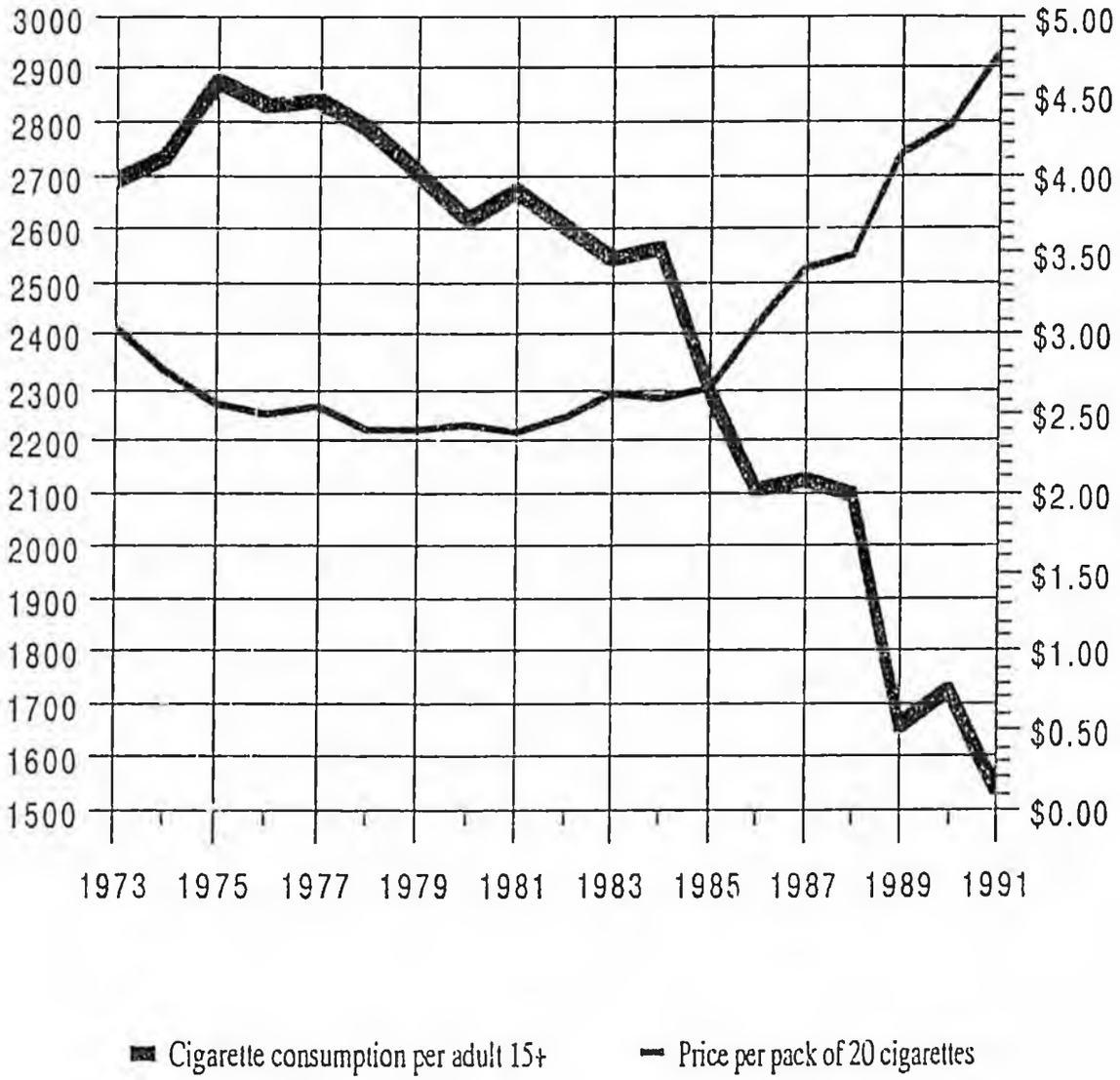
Country	Taxes	Price	T/P
Denmark	$3.68	$4.33	85%
U.K.	$2.52	$3.32	76%
Ireland	$2.77	$3.70	75%
India	$0.63	$0.84	75%
Finland	$2.45	$3.32	74%
Portugal	$1.01	$1.36	74%
Brazil	$0.31	$0.42	74%
Sweden	$2.87	$3.93	73%
Belgium	$1.72	$2.35	73%
Germany	$2.11	$2.90	73%
Canada (hi)	$3.69	$5.11	72%
Italy	$1.11	$1.54	72%
Greece	$0.75	$1.06	71%
France	$1.37	$1.93	71%
Netherlands	$1.45	$2.07	70%
Argentina	$0.99	$1.41	70%
Canada aver	$3.01	$4.34	69%
New Zealand	$1.81	$2.67	68%
Norway	$3.33	$4.87	68%
Canada (lo)	$2.59	$3.88	67%
Luxembourg	$1.15	$1.71	67%
Spain	$0.37	$0.60	62%
Korea	$0.46	$0.76	61%
Japan	$1.05	$1.75	60%
Australia	$1.38	$2.29	60%
Philippines	$0.24	$0.44	55%
Thailand	$0.32	$0.59	54%
Hong Kong	$1.37	$2.65	52%
Switzerland	$1.05	$2.10	50%
Taiwan	$0.66	$1.39	47%
U.S.A. (hi)	$0.86	$2.15	40%
Kuwait	$0.22	$0.74	30%
U.S.A. (aver)	$0.56	$1.89	30%
U.S.A. (lo)	$0.34	$1.73	20%

hi = highest state or province, lo = lowest state or province; aver. = average state or province
Source: Non-Smokers' Rights Assn (Canada)

The benefits of increasing the tobacco tax will most immediately be seen in the drop in consumption by youth and in the decrease in the number of youth who begin to use tobacco products. Only a very small percentage of tobacco users begin as adults. Reducing the initiation of youth to tobacco use is the most important prevention objective of health professionals. Studies have shown that children and adolescents who start to use tobacco do not understand the nature of tobacco addiction and are unaware of or underestimate important health consequences of tobacco use. Children and adolescents who use tobacco are persuaded to do so through advertising and peer pressure resulting from media images, and because it is readily available as well as inexpensive. Research concludes that higher tobacco excise taxes significantly reduce the number of teenage tobacco users.

CIGARETTE CONSUMPTION VERSUS PACK PRICE

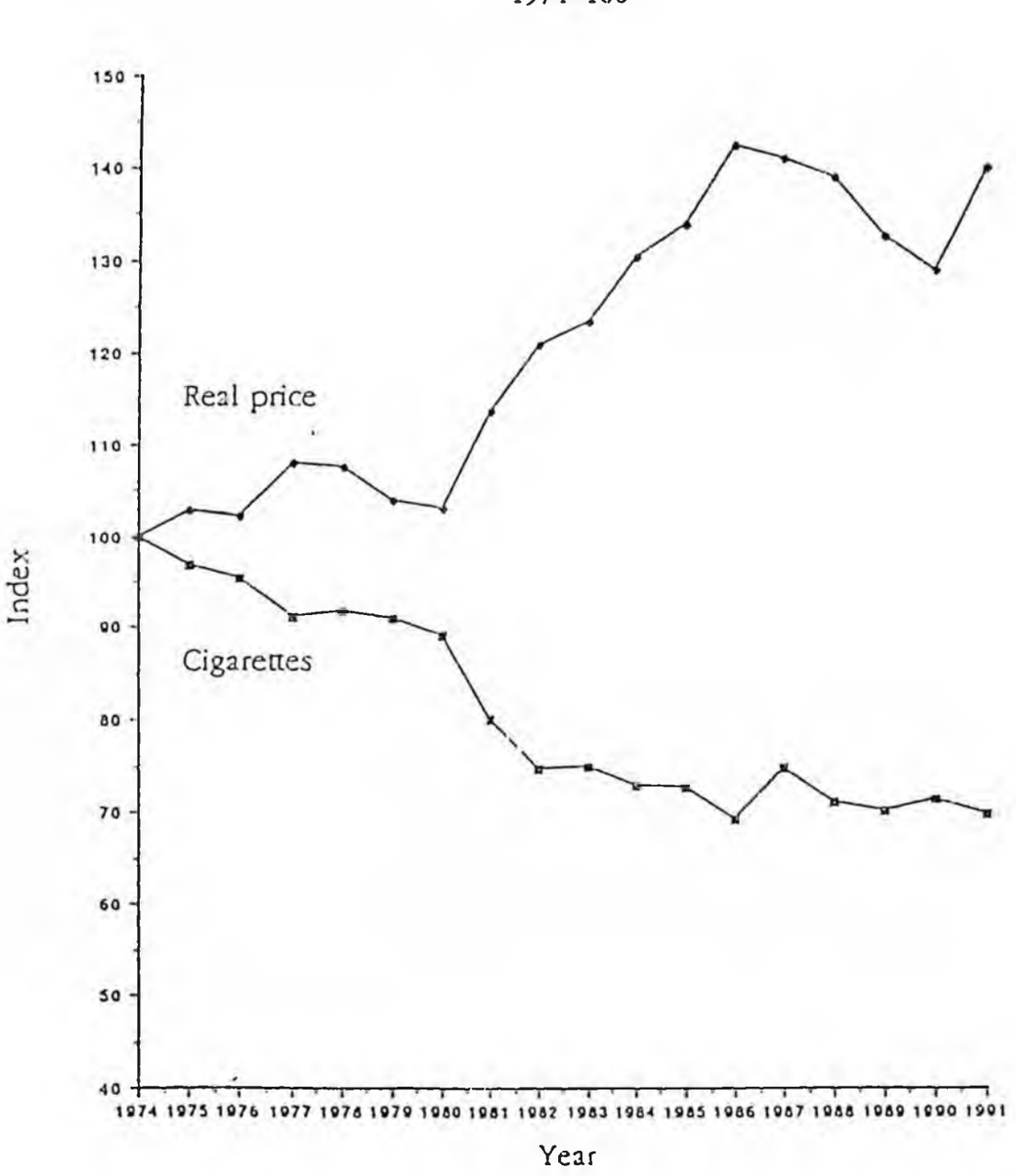
New Zealand, 1973 - 1991



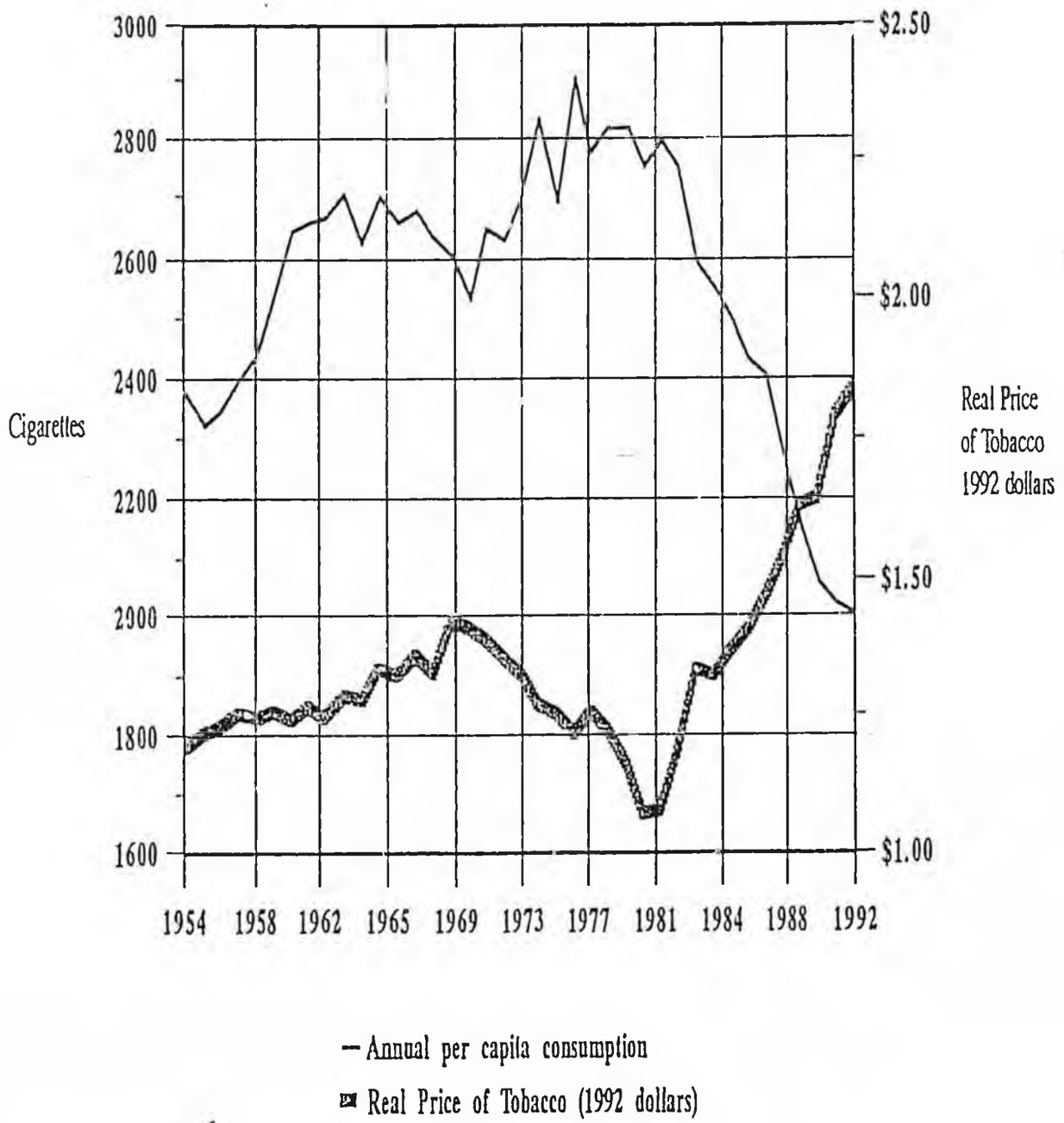
Non-Smokers' Rights Association (Canada), Suite 300, 124 O'Connor, Ottawa, Ontario K1P 5M9
Tel.: (613) 230-4211 Fax (613) 230-9454

UNITED KINGDOM

TREND IN THE REAL PRICE OF TOBACCO

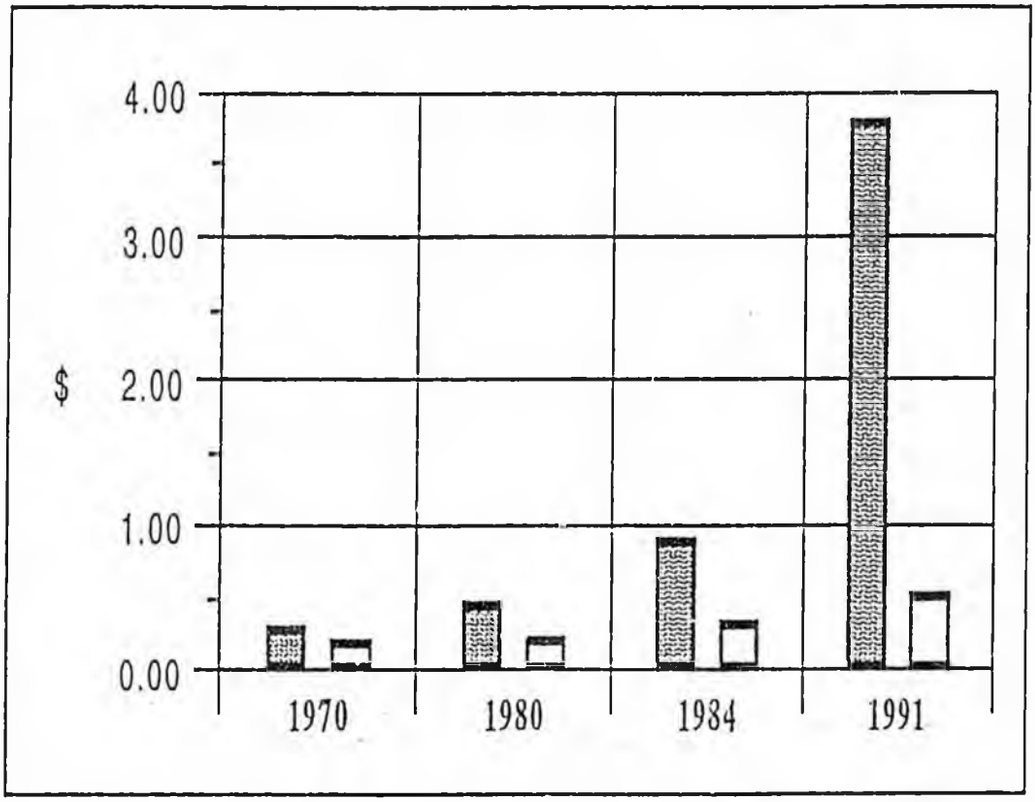


ANNUAL PER CAPITA CONSUMPTION OF CIGARETTES
AND REAL PRICE OF TOBACCO (per 20 cigarettes)
UNITED STATES 1954 - 1992



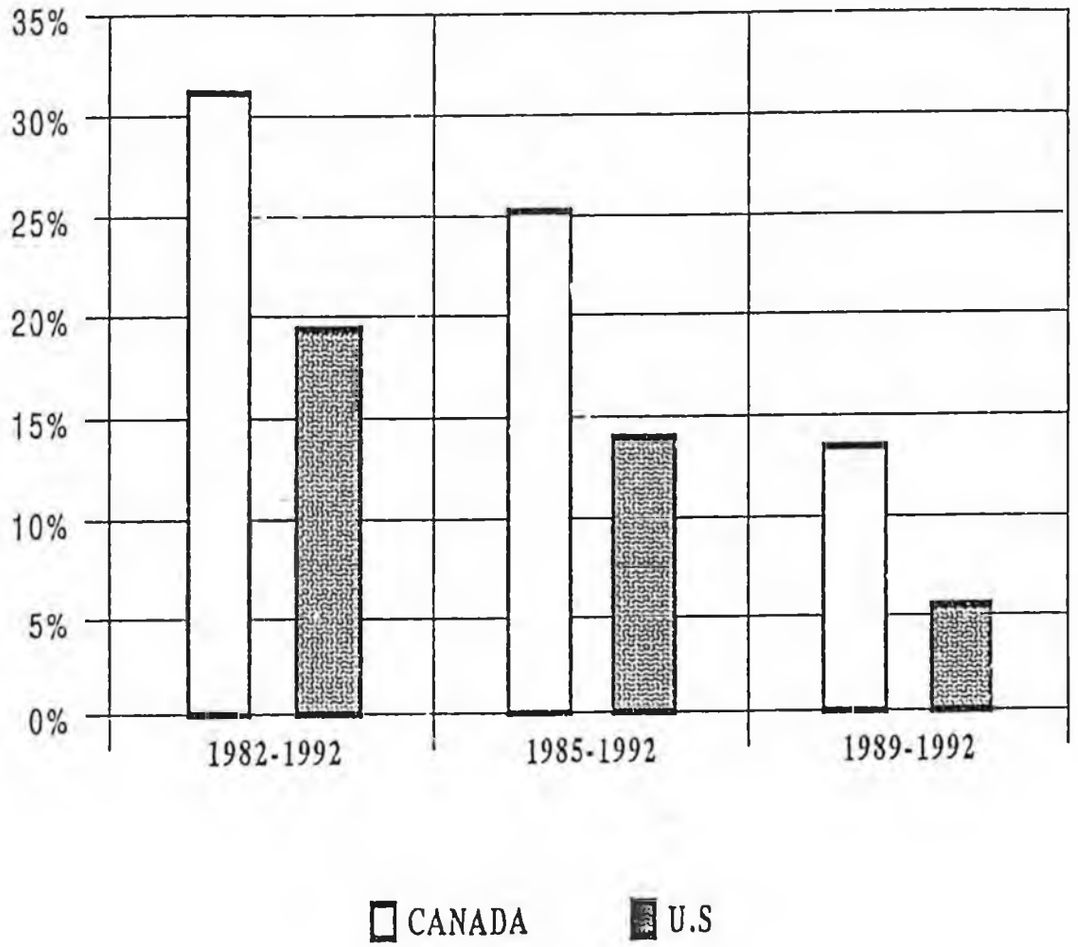
Sources: 1. THE TAX BURDEN ON TOBACCO. The Tobacco Institute, United States, Volume 27, 1992.
2. United States Consumer Prices Index (All Items).

AVERAGE TAXES ON 20 CIGARETTES COMBINED
FEDERAL & STATE/PROVINCIAL TOBACCO AND SALES TAXES
(NOT ADJUSTED FOR INFLATION OR CURRENCY FLUCTUATION)



Non-Smokers' Rights Association (Canada), Suite 300, 124 O'Connor, Ottawa, Ontario K1P 5M9
Tel.: (613) 230-4211 Fax (613) 230-9454

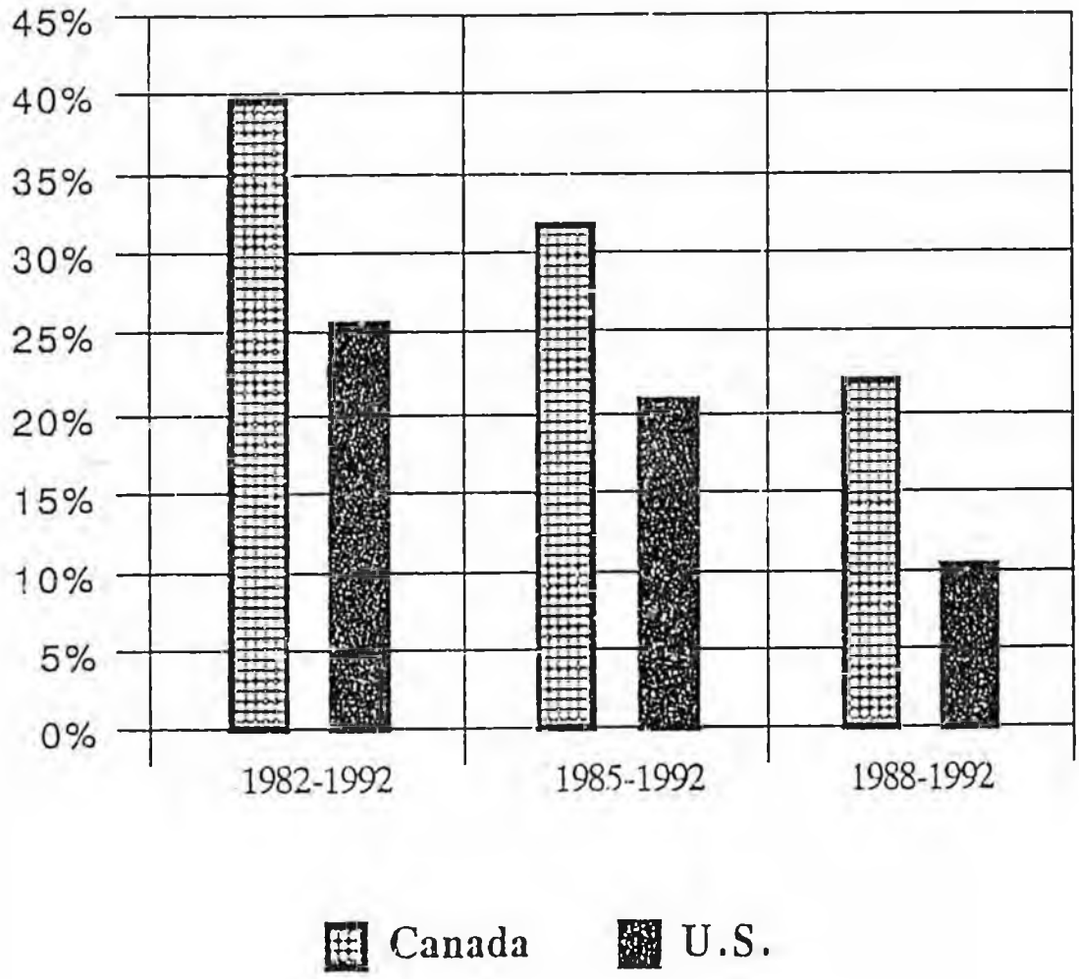
DECLINE IN DOMESTIC SALES OF CIGARETTES IN CANADA AND THE UNITED STATES



	CANADA	U.S.
1982 - 1992	31.18%	19.56%
1985 - 1992	25.16%	14.14%
1989 - 1992	13.36%	5.56%

Note: Canadian data includes highest credible estimates of smuggling

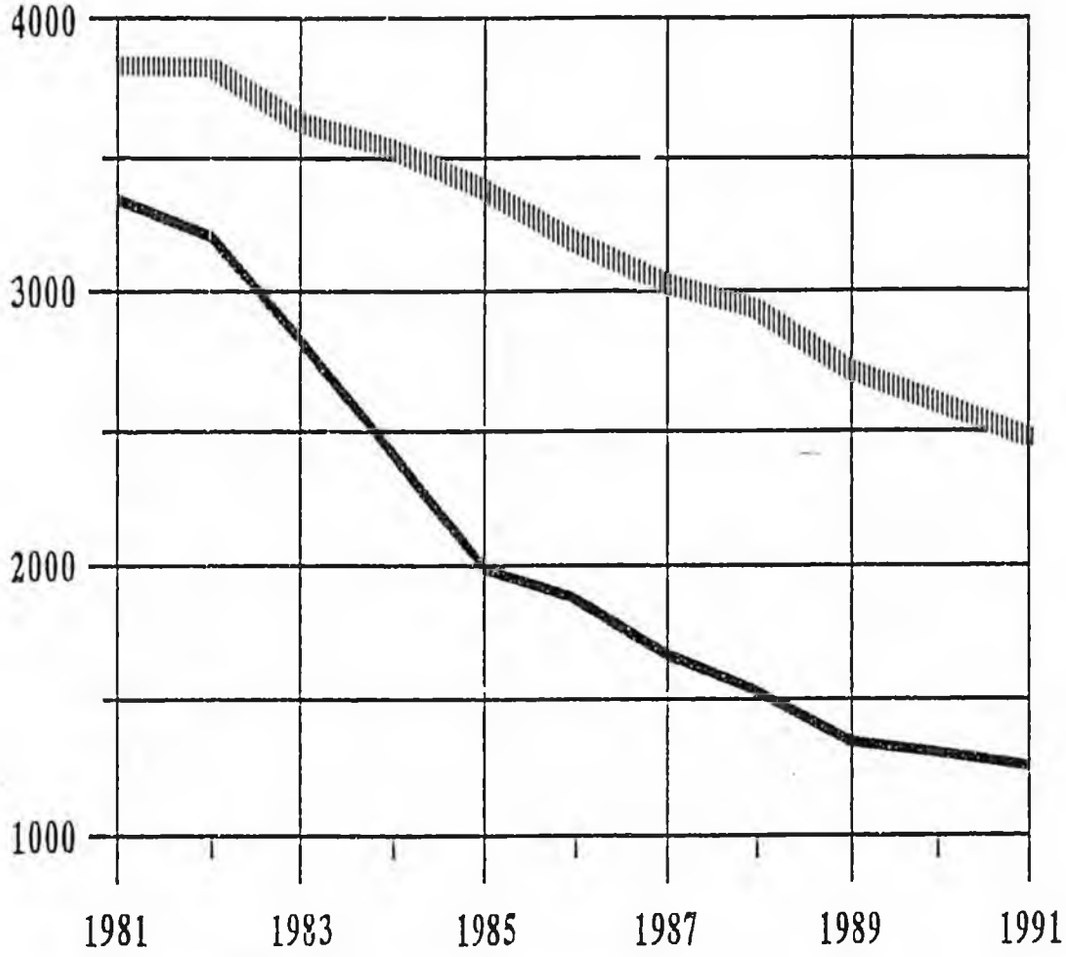
Decline in daily per capita consumption of cigarettes Canada versus United States 1982 - 1992



	Canada	U.S.
1982-1992	39.7%	25.7%
1985-1992	32.0%	20.8%
1988-1992	22.0%	10.4%

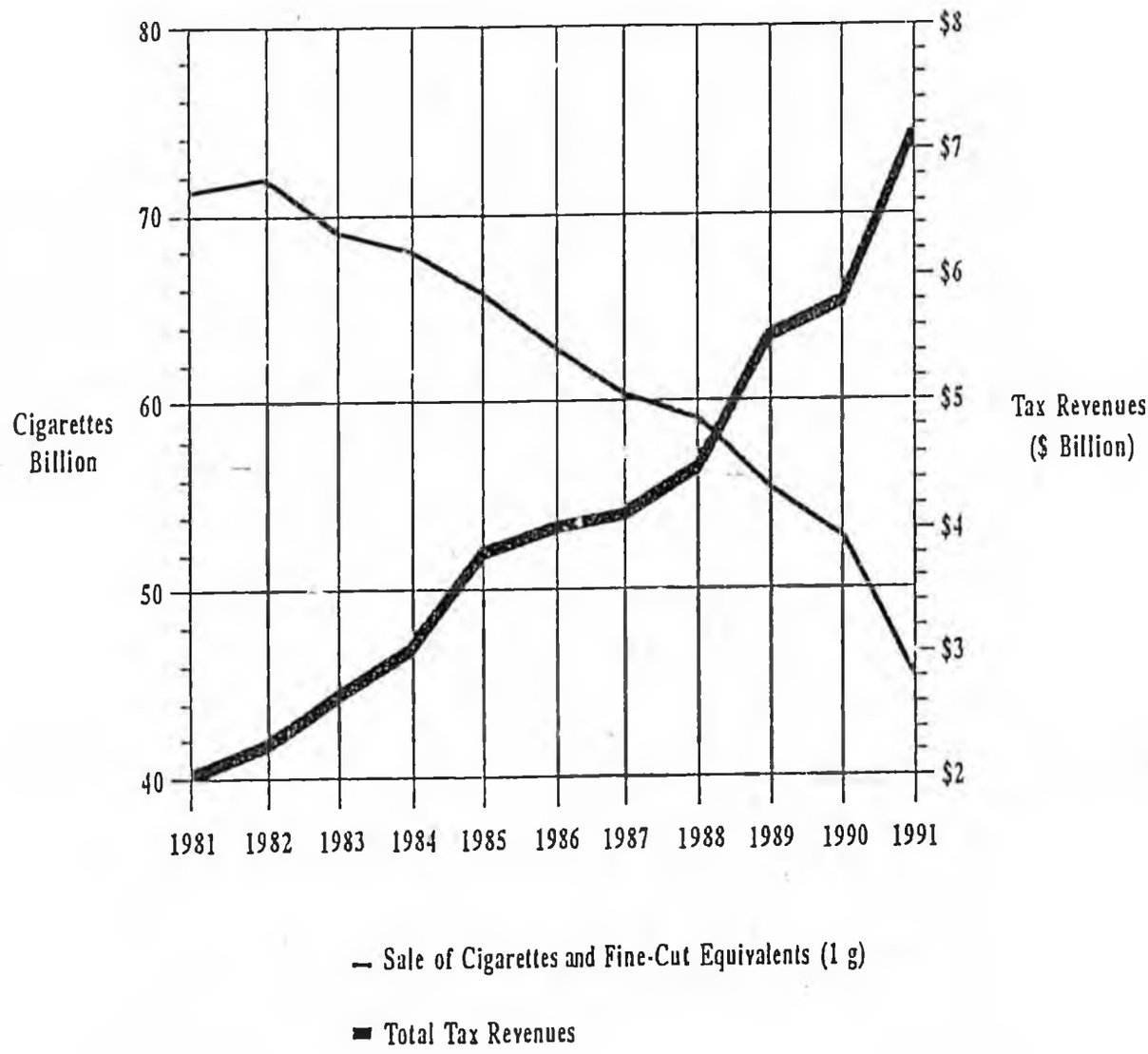
Source: Canadian Tobacco Manufacturers' Council (for 1982 to 1991 consumption data); adjusted to include 1992 data.

ANNUAL PER CAPITA CIGARETTE CONSUMPTION
CANADA 1981 - 1991



Note: Calculations include highest credible estimate of smuggling.
Cigarettes include fine-cut equivalents.

Domestic Sale of Cigarettes and Fine-Cut Equivalents Versus Domestic Tobacco Tax Revenues Canada 1981 - 1991



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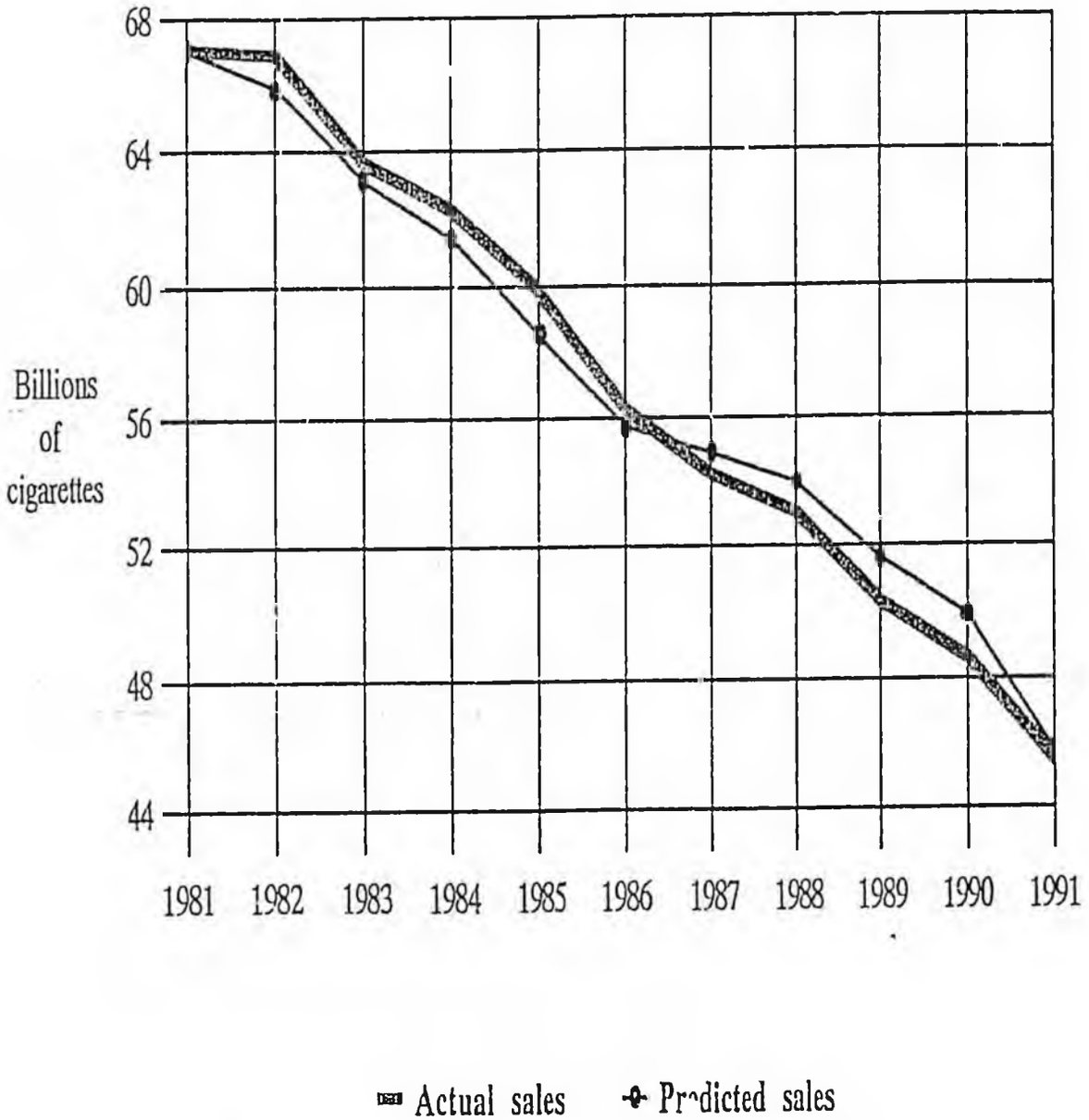
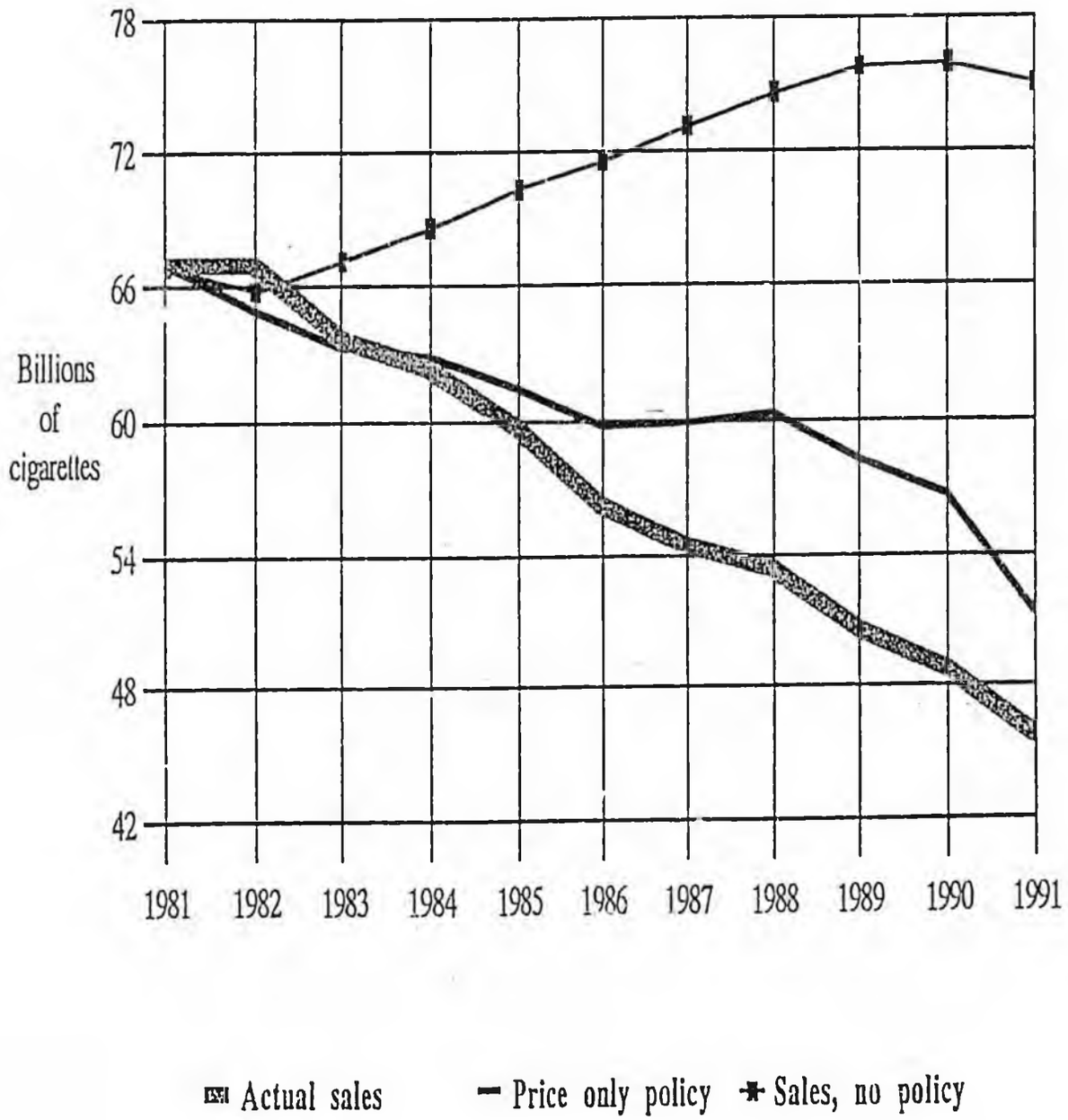
ACTUAL AND PREDICTED CIGARETTE SALES

no demand curve shift

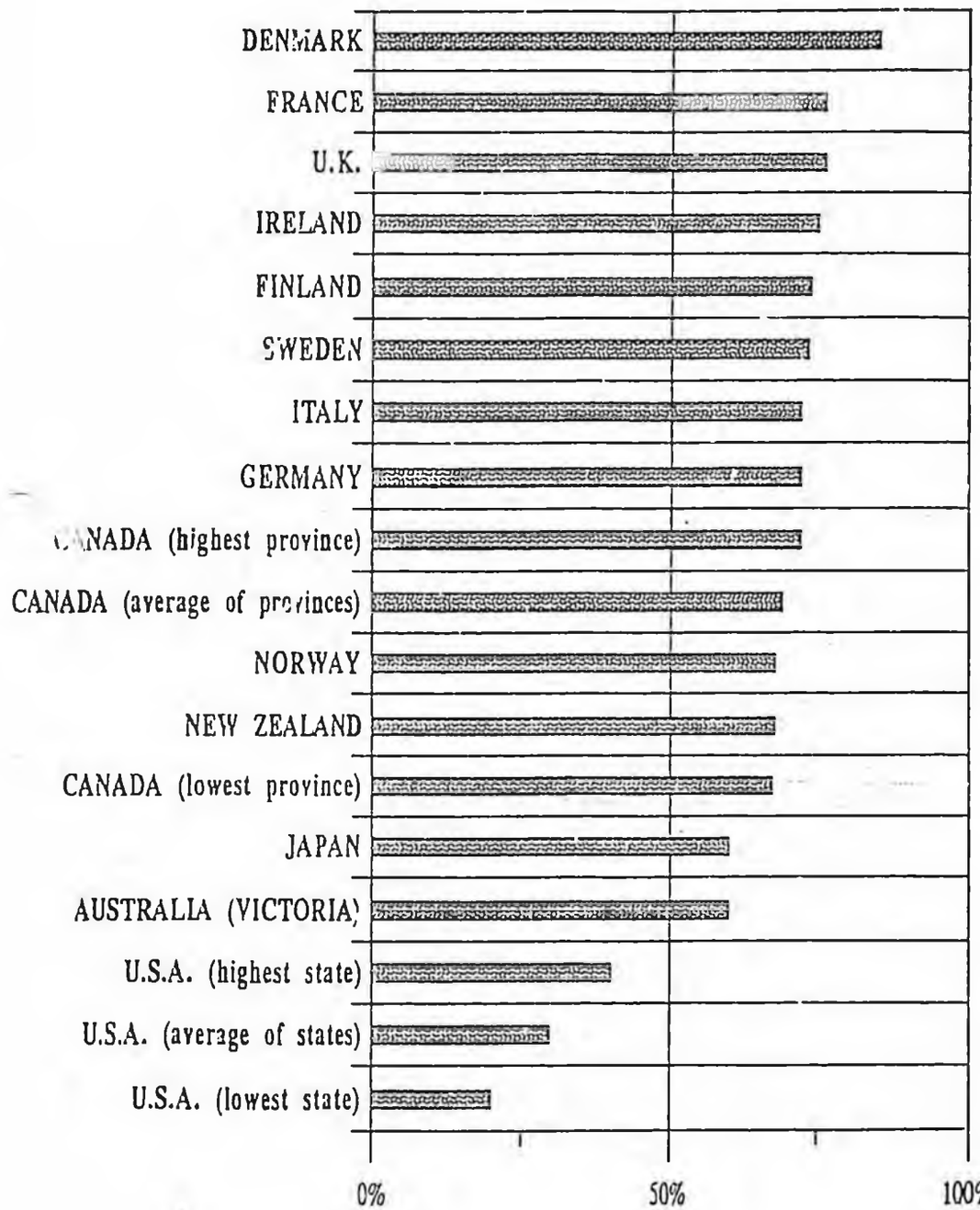


IMPACT OF TOBACCO CONTROL POLICIES

income elasticity equals 0.5



TOTAL TAX INCIDENCE ON A PACK OF 20 CIGARETTES
IN VARIOUS COUNTRIES, AS OF APRIL 22, 1993



NON-SMOKERS' RIGHTS ASSOCIATION, 124 O'CONNOR ST., OTTAWA, ONTARIO (CANADA) K1P 5M9
TEL.: (613) 230-4211 FAX: (613) 230-9454

FISCAL NOTE

STATE OF ALASKA **BILL NO.** HB 413

1994 LEGISLATIVE SESSION

Revision Date:

Dept. Affected: Revenue

Title: Increase tobacco and alcohol taxes

BRU: Revenue Operations

Component: Income and Excise Audit

Sponsor: (H) Rules by request of the Governor

Requestor: (H) L&C

COMPONENT SERIAL NO. 113

Expenditures/Revenues: (Thousands of Dollars)

OPERATING	FY95	FY96	FY97	FY98	FY99	FY00
PERSONAL SERVICES						
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	0	0	0	0	0	0
CAPITAL						
REVENUE FUND SOURCE: General	14,998.8	14,998.8	14,998.8	14,998.8	14,998.8	14,998.8

FUNDING: (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF						
1005 GF/Program Receipts						
1006 GF/MHTIA						
Other						
TOTAL	0	0	0	0	0	0

POSITIONS:

FULL-TIME						
PART-TIME						
TEMPORARY						

Estimate of current year (FY94) impact: $ 0 0

ANALYSIS: (Attach a separate page if necessary.)

(See Attached)

Prepared by: Larry E. Meyers Phone: 465-2320

Division: Director Date: February 3, 1994

Approved by Commissioner: Darrel J. Rexwinkel Date: February 3, 1994

Agency: Department of Revenue

PREPARER TO PROVIDE ALL DISTRIBUTION COPIES TO GOVERNOR'S LEGISLATIVE OFFICE
For further distribution information call the Governor's Legislative Office

This bill would increase excise tax rates effective July 1, 1994 as follows.

	Current Tax Rate	*HB 413 Tax Rate*	*% Increase*
Cigarettes	14.5 mills* (29¢/pack)	21.75 mills* (43.5¢/pack)	50%
Tobacco	25% Wholesale Price	50% Wholesale Price	100%
Liquor	$5.60/gallon	$8.40/gallon	50%
Wine	$.85/gallon	$1.275/gallon	50%
Beer	$.35/gallon	$.52.5/gallon	50%

* Includes 2.5 mills assessed under AS 43.50.090.

In determining the amount of additional revenue generated from this bill, Department of Revenue used consumption data available from FY 93. Amounts below do not reflect impacts on consumption, if any, due to increased tax rates and other factors. Additional revenue generated from this bill is estimated to be $14,998,800 calculated as follows.

	FY93 Consumption	*FY 93 Revenue*	*HB 413 Revenue*	*Additional Revenue*
Cigarettes	1,079,500,000	$15,652,800	$23,479,200	$7,826,400
Tobacco	$4,896,000 Sales	1,224,000	2,448,000	1,224,000
Liquor	1,100,000 gallons	6,160,000	9,240,000	3,080,000
Wine	1,288,000 gallons	1,094,800	1,642,200	547,400
Beer	13,263,000 gallons	4,642,000	6,963,000	2,321,000
Total		**$28,773,600**	**$43,772,400**	**$14,998,800**

This bill will not affect the Department's operating costs because amendments made under this bill increase tax rates only.

FISCAL NOTE

STATE OF ALASKA

BILL NO. HB 413

1994 LEGISLATIVE SESSION

Revision Date:

Dept. Affected: Revenue

Title: Increase tobacco and alcohol taxes

BRU: Revenue Operations

Component: Income and Excise Audit

Sponsor: (H) Rules by request of the Governor

Requestor: (H) L&C

COMPONENT SERIAL NO. 113

Expenditures/Revenues: (Thousands of Dollars)

OPERATING	FY95	FY96	FY97	FY98	FY99	FY00
PERSONAL SERVICES						
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	0	0	0	0	0	0
CAPITAL						
REVENUE FUND SOURCE: General	14,998.8	14,998.8	14,998.8	14,998.8	14,998.8	14,998.8

FUNDING: (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF						
1005 GF/Program Receipts						
1006 GF/MHTIA						
Other						
TOTAL	0	0	0	0	0	0

POSITIONS:

FULL-TIME						
PART-TIME						
TEMPORARY						

Estimate of current year (FY94) impact: $ 0.0

ANALYSIS: (Attach a separate page if necessary.)

(See Attached)

Prepared by: Larry E. Meyers

Phone: 465-2320

Division: Director

Date: February 3, 1994

Approved by Commissioner: Darrel J. Rexwinkel

Date: February 3, 1994

Agency: Department of Revenue

PREPARER TO PROVIDE ALL DISTRIBUTION COPIES TO GOVERNOR'S LEGISLATIVE OFFICE
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Total		**$28,773,600**	**$43,772,400**	**$14,998,800**

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No. 1
Bill Version: HB 413
(H) Publish Date: 1/28/94

FISCAL NOTE

STATE OF ALASKA
1994 LEGISLATIVE SESSION

BILL NO

Revision Date:
Dept. Affected: Revenue
Title: An act increasing excise taxes on cigarettes, tobacco products and alcoholic beverages
BRU: Revenue Operations
Component: Income and Excise Audit
Sponsor: Governor
Requester: Governor
COMPONENT SERIAL NO. 113

Expenditures/Revenues: (Thousands of Dollars)

OPERATING	FY95	FY96	FY97	FY98	FY99	FY00
PERSONAL SERVICES						
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	0	0	0	0	0	0
CAPITAL						
REVENUE FUND SOURCE: General	14,998.8	14,998.8	14,998.8	14,998.8	14,998.8	14,998.8

FUNDING: (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF						
1005 GF/Program Receipts						
1006 GF/MHTIA						
Other						
TOTAL	0	0	0	0	0	0

POSITIONS:

FULL-TIME						
PART-TIME						
TEMPORARY						

Estimate of current year (FY94) impact: $ 0

ANALYSIS: (Attach a separate page if necessary.)

(See Attached)

Prepared by: for Larry E. Meyers
Division: Director
Approved by Commissioner: Darrel J. Rexwinkel
Agency: Department of Revenue

Phone: 465-2320
Date: January 3, 1994
Date: January 3, 1994

PREPARER TO PROVIDE ALL DISTRIBUTION COPIES TO GOVERNOR'S LEGISLATIVE OFFICE
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This bill would increase excise tax rates effective July 1, 1994 as follows.

	Current Tax Rate	*Draft Bill Tax Rate*	*% Increase*
Cigarettes	14.5 mills (29¢/pack)	21.75 (43.5¢/pack)	50%
Tobacco	25% Wholesale Price	50% Wholesale Price	100%
Liquor	$5.60/gallon	$8.40/gallon	50%
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Cigarettes	1,079,500,000	$15,652,800	$23,479,200	$7,826,400
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