

### Current Trends

#### **Cigarette Smoking-Attributable Mortality and Years of Potential Life Lost — United States, 1990**

Cigarette smoking is the single most preventable cause of premature death in the United States (1). An estimated 390,000 smoking-attributable deaths in the United States occurred in 1985 (1), and more than 434,000 deaths occurred in 1988 (2); in 1988, an estimated 1,198,887 years of potential life lost (YPLL) before age 65 were attributed to smoking (2). To estimate the national impact of cigarette smoking on mortality and YPLL, calculations were performed using the Smoking-Attributable Mortality, Morbidity, and Economic Cost (SAMMEC) software (3). This report summarizes the results of this analysis.

SAMMEC uses attributable risk formulas to estimate the number of deaths from neoplastic, cardiovascular, respiratory, and pediatric diseases associated with cigarette smoking (3). Estimates for adults (aged ≥35 years) and infants (aged <1 year) were based on 1990 mortality data, the 1990 prevalence of cigarette smoking among adults, and 1989 data on smoking prevalence among pregnant women from CDC's National Center for Health Statistics (4,5; CDC, unpublished data, 1993). The number of burn deaths was obtained from the National Fire Protection Association (6), and estimates of lung cancer deaths from environmental tobacco smoke (ETS) among nonsmokers were obtained from an Environmental Protection Agency report (7). The YPLL to age 65 years and to life expectancy were calculated using standard methodology (3), and smoking-attributable mortality (SAM) and YPLL rates were age-adjusted to the 1980 U.S. population to allow more accurate comparisons with 1988 SAM and YPLL.

During 1990, 418,690 U.S. deaths (approximately 20% of all deaths) were attributed to smoking (Table 1). Overall, approximately twice as many deaths occurred among males as among females. A total of 179,820 of these deaths resulted from cardiovascular diseases; 151,322\*, neoplasms; 84,475, respiratory diseases; and 1711, diseases among infants. Lung cancer (119,920 deaths\*), ischemic heart disease (98,921 deaths), and chronic airway obstruction (48,982 deaths) accounted for the most deaths; combined, these conditions were responsible for 64.0% of all SAM.

Cigarette smoking resulted in 1,152,635 YPLL before age 65 years and 5,048,740 YPLL to life expectancy (Table 2). Compared with SAM and YPLL during 1988(2), SAM declined by 3.6% and YPLL to age 65 years by 3.9% during 1990. SAM rates, total YPLL, and YPLL rates were higher for males than for females.

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**Editorial Note:** The slight decline in SAM during 1990 compared with 1988 primarily reflects the 10.4% decline in deaths from cardiovascular disease. The rate of these deaths in the United States has decreased substantially since 1968 (8). In contrast, deaths from lung cancer increased by 4.4% and deaths from chronic obstructive pulmonary disease by 4.8%. SAM from these two conditions continue to increase

\*Includes deaths from ETS.

## Cigarette Smoking — Continued

TABLE 1. Relative risks\* (RR) for death attributed to smoking and smoking-attributable mortality (SAM) for current and former smokers, by disease category and sex — United States, 1990

Disease category (ICD-9 code) <sup>†</sup>	Male			Female			Total SAM
	RR	Former smokers	SAM	RR	Former smokers	SAM	
	Current smokers	Former smokers	SAM	Current smokers	Former smokers	SAM	
<b>Adult diseases (persons aged ≥25 yrs)</b>							
Neoplasms							
Lip, oral cavity, pharynx (140-149)	27.5	8.8	5,033	5.6	2.9	1,442	6,475
Esophagus (150)	7.8	5.8	5,668	10.3	3.2	1,616	7,284
Pancreas (157)	2.1	1.1	2,667	2.3	1.8	3,447	6,114
Larynx (161)	10.5	6.2	2,379	17.8	11.9	811	2,990
Trachea, lung, bronchus (162)	22.4	9.4	81,179	11.9	4.7	35,741	116,920
Cervix uteri (180)	NA <sup>‡</sup>	NA	NA	2.1	1.9	1,294	1,294
Urinary bladder (188)	2.9	1.9	3,046	2.6	1.9	980	4,026
Kidney, other urinary (189)	3.0	2.0	2,868	1.4	1.2	353	3,218
<b>Cardiovascular diseases</b>							
Hypertension (401-404)	1.9	1.3	3,299	1.7	1.2	2,151	5,450
Ischemic heart disease (410-414)	2.8	1.8	26,431	3.0	1.4	7,701	34,132
Persons aged 35-64 yrs	1.6	1.3	38,918	1.6	1.3	25,871	64,789
Other heart diseases (390-398, 415-417, 420-429)	1.9	1.3	23,295	1.7	1.2	12,019	35,314
<b>Cerebrovascular diseases</b> (430-438)							
Persons aged 35-64 yrs	3.7	1.4	4,557	4.8	1.4	4,114	8,671
Persons aged ≥65 yrs	1.9	1.3	10,421	1.5	1.0	4,189	14,610
Atherosclerosis (440)	4.1	2.3	3,737	3.0	1.3	2,675	6,412
Aortic aneurysm (441)	4.1	2.3	5,913	3.0	1.3	1,382	7,295
Other arterial disease (442-448)	4.1	2.3	2,032	3.0	1.3	1,115	3,147
<b>Respiratory diseases</b>							
Pneumonia and influenza (480-487)	2.0	1.6	11,292	2.2	1.4	7,881	19,173
Bronchitis, emphysema (491-492)	9.7	8.8	9,324	10.5	7.0	5,541	14,865
Chronic airway obstruction (496)	9.7	8.8	30,385	10.5	7.0	18,597	48,982
Other respiratory diseases (010-012, 493)	2.0	1.6	787	2.2	1.4	668	1,455
<b>Pediatric diseases (persons aged &lt;1 yr)</b>							
Short gestation, low birth weight (765)	1.8		285	1.8		222	507
Respiratory distress syndrome (769)	1.8		219	1.8		141	360
Other respiratory conditions of newborn (770)	1.8		214	1.8		180	374
Sudden infant death syndrome (798)	1.5		288	1.5		182	470
<b>Burn deaths<sup>§</sup></b>							
Environmental tobacco smoke deaths <sup>**</sup>			1,055			1,945	3,000
<b>Total</b>			276,153			142,537	418,690

\*Relative to never smokers.

<sup>†</sup>International Classification of Diseases, Ninth Revision.<sup>‡</sup>Not applicable.<sup>§</sup>Source: National Fire Protection Association, 1993 (6).<sup>\*\*</sup>Deaths among nonsmokers from lung cancer attributable to environmental tobacco smoke (Environmental Protection Agency, 1992 [7]).

## Cigarette Smoking — Continued

TABLE 2. Estimated number and age-adjusted rates\* of smoking-attributable mortality (SAM) and smoking-attributable years of potential life lost (YPLL), by sex and age<sup>†</sup> — United States, 1990<sup>‡</sup>

Category	SAM		Smoking-attributable YPLL before age 65 yrs		Smoking-attributable YPLL to life expectancy	
	Estimated no.	Rate	Estimated no.	Rate	Estimated no.	Rate
	Men	275,147	527.8	732,389	1,919.1	3,124,208
Women	141,832	224.8	308,801	764.6	1,797,024	3,070.7
Infants	1,711	NA <sup>§</sup>	111,445	NA	127,508	NA
<b>Total</b>	<b>418,690</b>	<b>364.5</b>	<b>1,152,635</b>	<b>1,325.8</b>	<b>5,048,740</b>	<b>4,541.3</b>

\*Per 100,000 persons aged ≥35 years, adjusted to the 1980 U.S. population.

<sup>†</sup>Men and women=aged ≥35 years; infants=aged <1 year.<sup>‡</sup>SAM rates and YPLL estimates and rates do not include 3000 deaths from passive smoking because such data were not available.<sup>§</sup>Not available.

*Cigarette Smoking — Continued*

because of the long latency period between the onset of smoking and the development of disease.

The higher SAM and larger number of YPLL among males is consistent with previous reports (1,2). Men in the United States are more likely to smoke and to smoke more cigarettes per day than women (1,4). However, the smoking prevalence among men has declined substantially since 1965 (1). The smoking prevalence among women, after increasing in the 1960s, also has declined since the late 1970s (1). Therefore, future estimates of SAM and YPLL will most likely indicate a smaller difference between men and women.

The SAM and YPLL described in this report may be underestimated for at least four reasons. First, these estimates are based on current smoking prevalence data, whereas most smoking-attributable deaths during 1990 resulted from the higher smoking prevalence during earlier decades (2). Second, the SAM estimate for infants may be substantially underestimated because previous research suggests that approximately 10% of the 38,351 infant deaths that occurred during 1990 may be attributable to smoking (1,9). Third, the SAM estimates do not include deaths from other conditions, such as leukemia (2) and peptic ulcer disease (1), that also may be associated with smoking. Finally, these estimates do not include mortality caused by cigar smoking, pipe smoking, or smokeless tobacco use. The SAM and YPLL estimates in this report are not adjusted for confounders (e.g., alcohol), which may lower the estimates for laryngeal and certain upper gastrointestinal cancers (1).

The decrease in the prevalence of cigarette smoking since the 1960s has contributed to the decline in SAM (1,4). Maintaining this decline will require continued reduction in the prevalence of smoking. The human and economic costs associated with smoking require continued vigorous efforts to prevent the initiation of smoking, to encourage smoking cessation, and to protect nonsmokers from the adverse effects of ETS. Because many factors influence both smoking initiation and smoking cessation, multiple approaches are necessary (1) including 1) school-based health education; 2) reducing minors' access to tobacco products; 3) more extensive counseling by health-care providers about smoking cessation; 4) developing and enacting strong, clean indoor air policies and laws; 5) restricting or eliminating advertising targeted toward persons aged <18 years (10); and 6) increasing tobacco excise taxes.

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