COUNTY OF LOS ANGELES
DEPARTMENT OF HEALTH SERVICES
Public Health

TOBACCO CONTROL & PREVENTION PROGRAM

Cost of Tobacco Use in Los Angeles County

A thorough review of the economic costs of tobacco use identified four methodologies that served as the basis for calculating the Los Angeles County estimates (Max and Rice, 1994; Miller, Ernst, and Collin, 1999; the CDC, 2002; and Max, Rice, Zhang, Sung, and Miller, 2002). Total costs (direct and indirect) for tobacco use in Los Angeles County was $2.7 billion (in 1993 dollars) for Max and Rice's 1994 method and $3.2 billion (in dollars averaged from 1995-1999) for the CDC. Adjusting Max and Rice's estimate to 1998 dollars utilizing the Consumer Price Index (Medical Care Services) results in an estimate of $3.3 billion, which is comparable to the CDC estimate. The estimate of $1.3 billion provided by Miller et al. is an estimate of direct costs only, and falls in between the direct cost estimates provided by Max and Rice (adjusted to 1998 dollars) of $1.2 billion and that provided by the CDC of $1.6 billion. The estimate of $4.3 billion provided by Max, et al. (2002) uses the most current and sophisticated methodology and includes both direct and indirect costs.

A brief description of the cost categories utilized to generate the different estimates is provided below. Pertinent calculations are also included in the Appendix. Future research aimed at including additional factors such as secondhand smoke effects, mediation effects of smoking on diseases and their treatments, and also a more complete list of smoking-related diseases will improve the accuracy of total economic cost estimates.

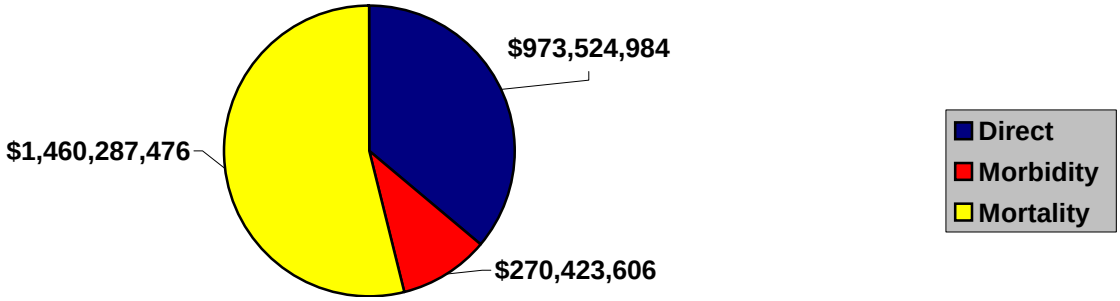
Max and Rice, 1994[1]

Max and Rice conducted an analysis of the economic cost of smoking in California in 1993 utilizing data from the American Cancer Society Cancer Prevention Study II (1982-1986) and CDC Smoking-Attributable Mortality Morbidity and Economic Costs software (SAMMEC). They included three components in their total cost formula: direct costs ([36%] direct health care expenditures such as hospital care, nursing home care, and other professional services), morbidity costs ([10%] work-loss days and bed-disability days due to smoking-related illnesses), and mortality costs ([54%] deaths attributed to smoking and the resulting productivity losses). The authors estimated the total cost to California in 1993 to be $10.0 billion, which comes to $2,014 per smoker.

Using this information, the results of the cost analysis for Los Angeles County indicate:

- $2.4 billion in smoking-attributable costs for adults
- $269 million in smoking-attributable costs for youth

$2.7 billion in direct and indirect smoking-attributable costs



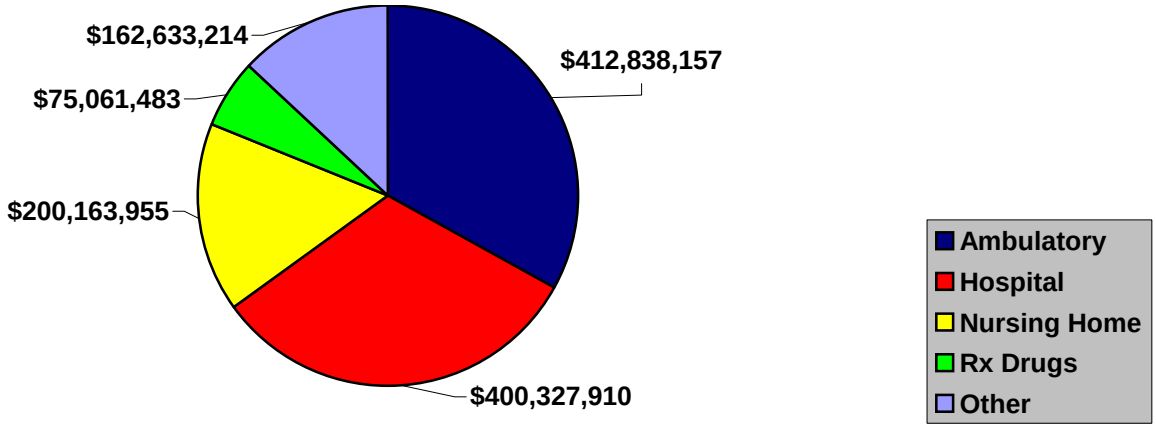
Miller, Ernst, and Collin, 1999[2]

Miller, Ernst, and Collin conducted an analysis of the economic cost of smoking in the U.S. utilizing the 1987 National Medical Expenditure Survey. They included five categories in their estimates of direct costs: ambulatory costs (33%), hospital costs (32%), nursing home (16%), prescription drug costs (6%), and other costs ([13%] home health services, vision care, and medical equipment). The authors estimated the smoking-attributable direct costs for California in 1993 to be $5.4 billion, which comes to $931.71 per smoker.

Using this information, the results of the cost analysis for Los Angeles County indicate:

- $1.1 billion in smoking-attributable costs for adults
- $125 million in smoking-attributable costs for youth

$1.3 billion in direct smoking-attributable costs



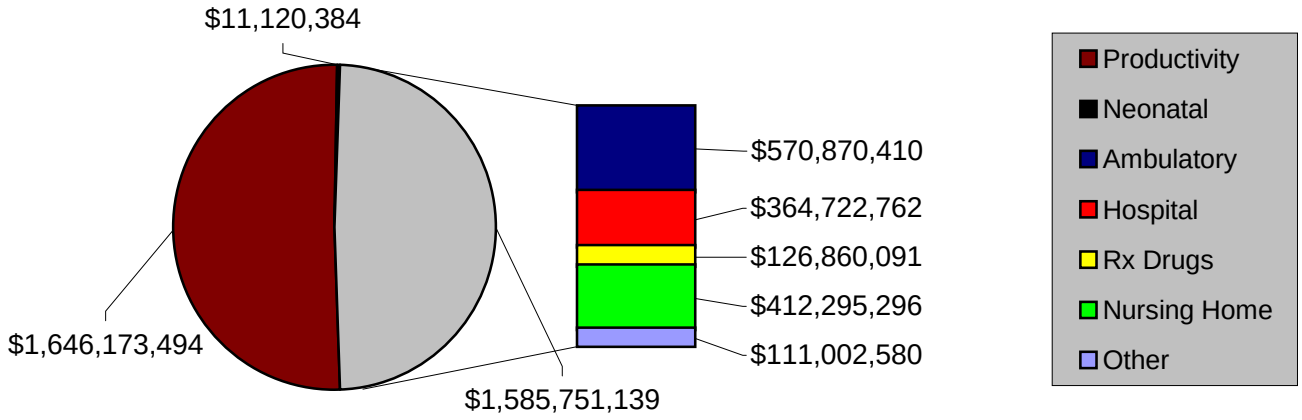
CDC, 2002[3]

The CDC estimated the economic cost of tobacco use in the U.S. utilizing data from the American Cancer Society Cancer Prevention Study II (1982-1988) and SAMMEC software. They included three categories in their total cost formula: productivity costs (52%); medical costs (48%) comprising ambulatory care (36%), hospital care (23%), prescription drugs (8%), nursing home (26%), and other care (7%); and neonatal medical costs (.2%). The authors estimated the total smoking-attributable cost per smoker as $1,226 for productivity costs, $1,181 for medical costs, and $704 per maternal smoker for neonatal medical costs.

Using this information, the results of the cost analysis for Los Angeles County indicate:

- $1.5 billion in smoking-attributable productivity costs for adults
- $164 million in smoking-attributable productivity costs for youth
- $1.4 billion in smoking-attributable medical costs for adults
- $158 million in smoking-attributable medical costs for youth
- $11 million in smoking-attributable neonatal medical expenditures

$3.2 billion in direct and indirect smoking-attributable costs



Max, Rice, Zhang, Sung, and Miller, 2002[4]

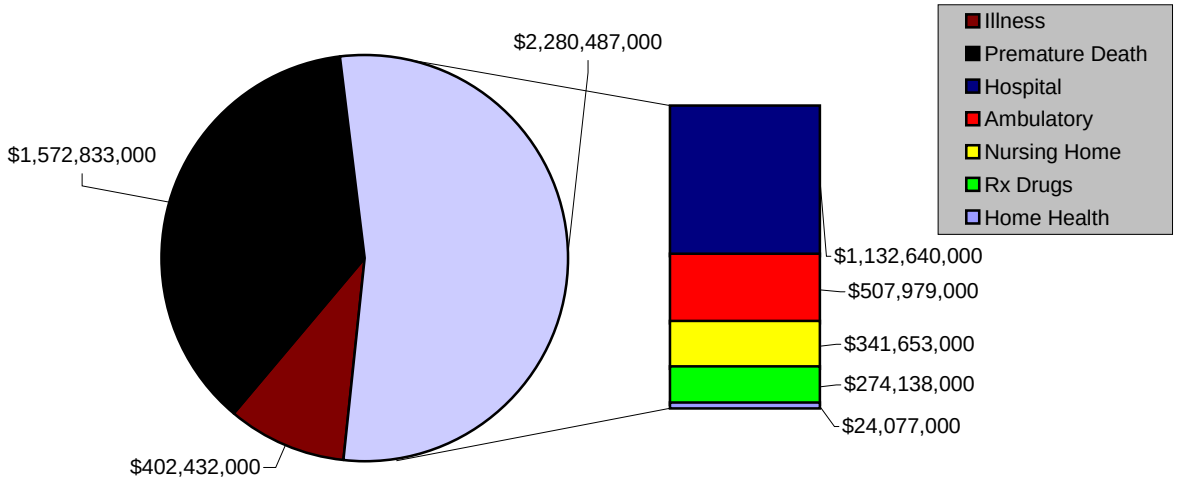
Max, Rice, Zhang, Sung, and Miller utilized the most current accepted methodology for determining the economic cost of smoking in California and its 58 counties. This methodology estimated Smoking Attributable Fractions through the use of the National Medical Expenditure Survey data and econometric models that allowed for statistical control of various socioeconomic and risk factors. The authors included both direct (54.3%) and indirect (45.7%) costs in their total cost formula. The direct costs comprised five categories: hospital (25.5%), ambulatory care (13.1%), nursing home (8.0%), prescription (7.2%), and home health (0.6%). The indirect costs included productivity losses due to

illness (9.6%) and productivity losses due to premature deaths (36.1%). It should be noted that these costs were calculated based on the 1999 population aged 18 years or older except for two aspects: the population aged 1 year and younger for perinatal illness as a result of in utero exposure to maternal smoking and deaths due to fires associated with cigarette use. Further, some effects of ETS exposure were accounted for in this model such as deaths of non-smoking people due to lung cancer, ischemic heart disease, and low birth weight.

The results of the cost analysis for Los Angeles County indicate:

- $2.3 billion in direct smoking-attributable health care expenditures
- $2.0 billion in smoking-attributable lost productivity costs

$4.3 billion in direct and indirect smoking-attributable costs



References

[1]Max W., Rice D. (1995) The Cost of Smoking in California, 1993. Tobacco Control, 4(suppl 1), S39-346.

[2]Miller, V., Ernst, C., and Collin, F. (1999) Smoking-attributable medical care costs in the USA. Social Science and Medicine, 48, 375-391.

[3]CDC (2002) Annual smoking-attributable mortality, years of potential life lost, and economic costs – United States, 1995-1999. Morbidity and Mortality Weekly Report, 51 (14), 300-303.

[4]Max W., Rice D., Zhang X., Sung H., and Miller L. (2002) The Cost of Smoking in California, 1999. Sacramento, CA: California Department of Health Services, 2002.

Appendix: Cost Analysis of Tobacco Use Costs in Los Angeles County

Los Angeles County Prevalence of Current Smokers:
Youth (14 – 17): 27.12% (YRBS, 1997)
Adults (18+): 18% (LACHS, 1997)

Estimated Current Number of Smokers:
Youth: 133,719 (based on youth population of 493,065 – CA Dept. of Finance, 1997)
Adults: 1,209,000 (LACHS, 1997)

CA Maternal Smoking Prevalence: 9.8% (CA Dept. of Health Services, 2000)

Live Births Occurring in Los Angeles County: 161,185 (CA Dept. of Health Services, 2000)

Estimated Current Number of Maternal Smokers: 9.8% x 161,185 = 15,796

Max and Rice, 1994

Cost per CA Smoker (1993): $2,014

Adult LA County Smoking-Attributable Costs: $2,014 x 1,209,000 = $2,434,926,000

Youth LA County Smoking-Attributable Costs: $2,014 x 133,719 = $269,310,066

Total LA County Smoking-Attributable Costs: $2,704,236,066

Miller, Ernst, and Collin, 1999

Total CA Smoking-Attributable Medical Costs (1993): $5,369,210,000

CA Smoking Prevalence (BRFSS, 1993): 18.5%

CA 1993 Population (CA Dept. of Finance, 2002): 31,150,000

Estimated Number of CA Smokers (1993): 18.5% x 31,150,000 = 5,762,750

Cost per CA Smoker: $5,369,210,000 / 5,762,750 = $931.71

Adult LA County Smoking-Attributable Costs: $931.71 x 1,209,000 = $1,126,437,390

Youth LA County Smoking-Attributable Costs: $931.71 x 133,719 = $124,587,329

Total LA County Smoking-Attributable Costs: $1,251,024,719

CDC, 2002

Smoking-Attributable Productivity Cost per Smoker (1995-1999): $1,226

Adult LA County Smoking-Attributable Productivity Costs: $1,226 x 1,209,000 = $1,482,234,000

Youth LA County Smoking-Attributable Productivity Costs: $1,226 x 133,719 = $163,939,494

Total LA County Smoking-Attributable Productivity Costs: $1,646,173,494

Smoking-Attributable Medical Costs Per Smoker (1997): $1,181

Adult LA County Smoking-Attributable Medical Costs: $1,181 x 1,209,000 = $1,427,829,000

Youth LA County Smoking-Attributable Medical Costs: $1,181 x 133,719 = $157,922,139

Total LA County Smoking-Attributable Medical Costs: $1,585,751,139

Neonatal Smoking-Attributable Medical Costs per Maternal Smoker (1996): $704

Neonatal LA County Smoking-Attributable Medical Costs: $704 x 15,796 = $ 11,120,384

Total LA County Smoking-Attributable Costs: $3,243,045,017

Max and Rice – Consumer Price Index (Medical Care Services) Adjustment (1993 – 1998)

1994: 5.36% x 2,704,236,066 = 144,947,053 2,704,236,066 + 144,947,053 = 2,849,183,119

1995: 4.40% x 2,849,183,119 = 125,364,057 2,849,183,119 + 125,364,057 = 2,974,547,176

1996: 3.16% x 2,974,547,176 = 93,995,691 2,974,547,176 + 93,995,691 = 3,068,542,867

1997: 2.89% x 3,068,542,867 = 88,680,889 3,068,542,867 + 88,680,889 = 3,157,223,756

1998: 3.23% x 3,157,223,756 = 101,978,327 3,157,223,756 + 101,978,327 = 3,259,202,083