

THE HEALTH AND ECONOMIC BURDEN OF SMOKING IN NEW YORK



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The Health and Economic Burden of Smoking in New York

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Executive Summary

Although current smoking prevalence continues to decline in New York State, the societal burden caused by cigarettes remains substantial. This report aims to provide recent estimates of mortality, morbidity, and healthcare expenditures that are associated with smoking and secondhand smoke in New York State. We summarize mortality and morbidity overall and break down tobacco-attributable deaths by disease. We also present total healthcare expenditures associated with smoking and break those expenditures down by payer and type of expenditure.

Key findings: Over 22,000 deaths in New York State in 2017 were attributable to smoking or secondhand smoke. Nearly 550,000 potential healthy life years are lost each year due to

premature death or disability from cigarette smoke. Smoking-attributable healthcare expenditures are estimated to have declined by \$2.5 billion from 2011 to 2017, consistent with declines in adult smoking prevalence in New York State. However, \$9.7 billion a year is still spent on preventable smoking-related healthcare expenditures—about half of which is paid by public payers.

The health burden and cost impacts of smoking have improved in recent years because of reduced smoking prevalence. Reductions in smoking may be associated with tobacco control policies in New York State. The burden of ongoing tobacco use should continue to be addressed.

Background

Cigarette smoke causes significant preventable illness, premature deaths, and economic costs. One of the clearest ways to quantify the toll of smoking is mortality, with around 480,000 deaths in the United States each year being attributable to smoking.¹ The list of diseases that can be caused by smoking only continues to grow after decades of research. Secondhand smoke exposure can also increase the risk for several of the same diseases.² Many tobacco control policies and smoke-free air laws have helped reduce exposure to secondhand smoke in public places, but it is a particular risk for adults and children living in households with smokers. Health conditions caused by smoking and secondhand smoke can diminish quality of life and lead to premature death.

Treating and managing diseases caused by smoking can also produce substantial expenses for individuals as well as both public and private insurance payers. Medical expenditures are a measure of the direct economic costs of smoking. The Centers for Disease Control and Prevention (CDC) previously estimated that in 2004, 7.6% of all US healthcare expenditures could be attributed to smoking.¹ Healthcare spending overall has continued to rise due in part to an aging population, prices of treatments, and disease prevalence.³ However, it is not known precisely how smoking-attributable costs have changed over time with changes in smoking prevalence.

In response to tobacco control efforts, adult current smoking prevalence in New York State has dropped from 18.1% in 2011 to 14.1% in 2017.⁴ The smoking-attributable fraction (SAF) of expenditures can be assumed to depend on a variety of factors, including smoking prevalence. If fewer people are smoking, it follows that there will be fewer adverse health outcomes requiring medical attention. As such, the SAF of healthcare expenditures is expected to be lower as smoking rates decrease.

This report quantifies health and economic burden of smoking in New York State with the most recent data available.

Quantifying the burden of smoking with current, state-specific estimates of smoking-related morbidity, mortality, and healthcare expenditures is crucial for informing tobacco control programs and advocacy efforts. The main source for estimates of tobacco-related health and economic outcomes in the United States has been CDC's Smoking-Attributable Mortality, Morbidity, and Economic Costs (SAMMEC) model. The SAMMEC model has been featured in many peer-reviewed publications, including the 2014 U.S. Surgeon General's Report¹ and CDC's 2014 *Best Practices for Comprehensive Tobacco Control Programs*.⁵ However, its estimates only encompass the years 2005 through 2009, and the model does not report outcomes related to secondhand smoke exposure. Other published research on smoking-attributable mortality, morbidity, and healthcare expenditures has followed similar approaches and methods used by the SAMMEC model.⁶ In 2016, the National Cancer Institute produced "Monograph 21: The Economics of Tobacco and Tobacco Control," which provided a framework for estimating the costs of tobacco use.⁷ Newer state-specific estimates would better inform current strategic planning efforts.

This report provides updated estimates of mortality, morbidity, and healthcare costs associated with smoking in the state of New York State. This report presents total mortality and morbidity associated with smoking and secondhand smoke exposure as well as a breakdown of deaths associated with smoking and secondhand smoke exposure by disease. This report also presents total healthcare expenditures associated with smoking along with a breakdown of those expenditures by payer and expenditure type.

Data and Methods

Data Sources

A variety of data sources were used to gather estimates of the health and economic consequences of smoking in New York State. For more detail on each data source, see Appendix A.

Terms used in this report

Years of life lost: potential years that a person would have been expected to live if they had not died early

Years lived with disability: years lived with a disease or disability that lowers quality of life

Disability-adjusted life years lost: the sum of lost life years and years lived with disability—this quantifies the total loss of healthy years of life

Morbidity and mortality attributed to smoking and secondhand smoke:

- Estimates of mortality, years of life lost due to premature mortality, years lived with disability, and disability-adjusted life years lost were obtained from the 2017 Global Burden of Disease (GBD) study and broken down by disease

Smoking-attributable healthcare expenditures:

- Total New York State healthcare expenditures for 1991–2014 were obtained from the Centers for Medicare & Medicaid Services (CMS) and broken down by payer and expenditure type
- Expenditures were adjusted for inflation and expressed in real 2017 dollars using the Consumer Price Index (CPI) for medical care
- Smoking prevalence estimates for New York State for 1998–2017 were obtained from CDC’s Behavioral Risk Factor Surveillance System (BRFSS)

Methods

Data from the GBD study website were downloaded for New York State in 2017. Estimates of mortality and morbidity were reported by risk factor (smoking, secondhand smoke exposure) and disease.

Total healthcare expenditures from CMS were forecasted for the years 2015–2017 based on average growth over the past 5 years

of data available from CMS (2010–2014). All expenditures were then adjusted to 2017 dollars.

We calculated an estimate of the fraction of the money spent on healthcare in New York due to smoking-related illness, called the **smoking-attributable fraction (SAF)**

To estimate the healthcare expenditures associated with smoking, a SAF approach was used, following the CDC SAMMEC model. This fraction does not account for secondhand smoke exposure. We used year-over-year changes in the adult smoking prevalence in New York State to adjust the 1998 SAF for New York over time. We calculated annual smoking-attributable healthcare expenditures in New York State by multiplying inflation-adjusted total healthcare expenditures by the annual adjusted SAF. See Appendix A for more detail on the SAF methods.

Total healthcare expenditures data from CMS were available by payer (Medicare, Medicaid, and Private Health Insurance). We calculated “Out of Pocket” healthcare expenditures as:

$$\text{Out of Pocket} = \text{Total} - (\text{Medicare} + \text{Medicaid} + \text{Private Health Insurance})$$

Total expenditures data from CMS were also available by expenditure type (i.e., hospital care, physician services). Data by expenditure type were further broken down for Medicare and Medicaid. Data on total healthcare expenditures by expenditure type were not available for private health insurance. We calculated an “Other” category, which includes both private health insurance expenditures and out-of-pocket expenditures, as:

$$\text{Other} = \text{Total} - (\text{Medicare} + \text{Medicaid})$$

Since healthcare expenditure data was only available through 2014, we calculated average shares by payer and type of care for the most recent 5 years of data (2010–2014). These average shares were then applied to 2017 smoking-attributable healthcare expenditures.

Findings

13.5% of deaths of New Yorkers age 30+ are attributable to smoking.

Health Consequences

Approximately 159,362 New Yorkers died from all causes in 2017. When broken down by risk factor, 20,906 deaths among people age 30 or older were attributable to smoking (13.5%). Another 1,384 deaths among all ages were attributable to secondhand smoke exposure (0.9%). Previous estimates for 2005–2009 from the CDC SAMMEC model estimated average annual smoking-attributable mortality for New York State at 28,170 deaths. This suggests that deaths caused by smoking have declined.

To quantify the degree of premature deaths caused by smoking, we looked at potential years of life lost among those who died from smoking or exposure to secondhand smoke. New Yorkers' deaths in 2017 due to smoking and secondhand smoke represent nearly 414,000 years of life lost (93.1% of which are due to smoking, and 6.9% of which are due to secondhand smoke; Table 1).

Many New Yorkers live with chronic health conditions caused by smoking and secondhand smoke. The burden of health conditions due to smoking and secondhand smoke in 2017 was about 135,471 years lived with disability (88.5% of which were attributable to smoking, and 11.5% of which were attributable to secondhand smoke exposure). In combination with years of life lost, this adds up to 549,397 healthy life years (or disability-adjusted life years) lost due to cigarette smoke (Table 1).

Table 1. Tobacco-Attributable Mortality and Morbidity in New York State Due to Smoking and Secondhand Smoke Exposure

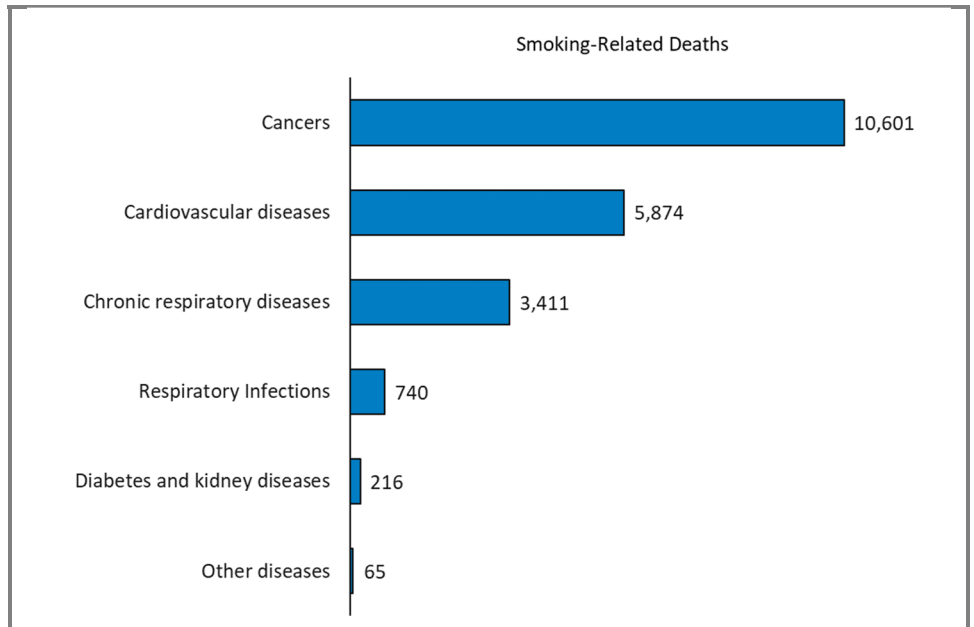
Category	Smoking + Secondhand Smoke Exposure	Smoking	Secondhand Smoke Exposure
Deaths	22,290	20,906	1,384
Years of Life Lost	413,927	385,431	28,495
Years Lived with Disability	135,471	119,899	15,572
Disability-Adjusted Life Years Lost	549,397	505,330	44,067

Note: See Table A-1 for lower and upper bounds of these estimates.

More than 10,000 New Yorkers died in 2017 from smoking-attributable cancers alone.

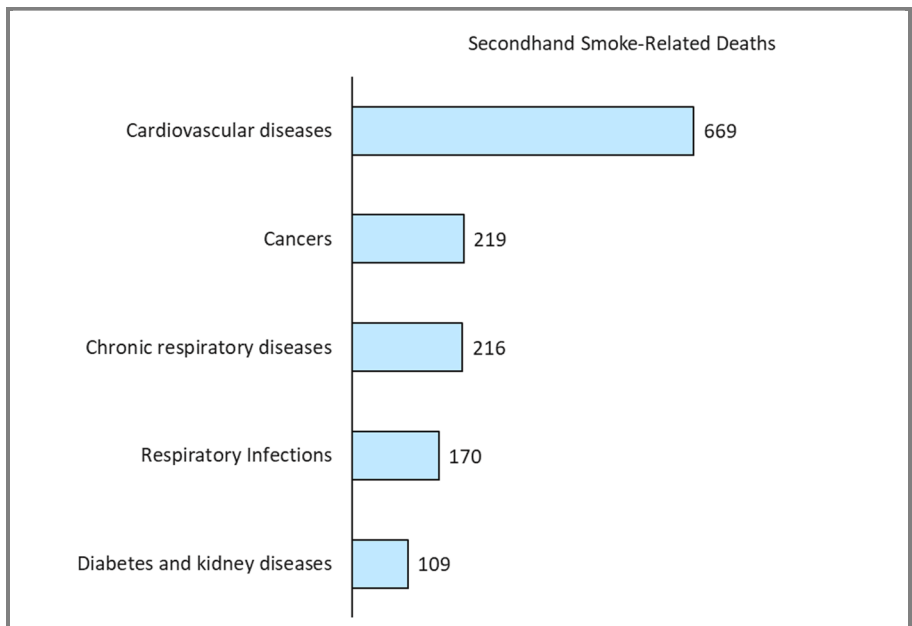
The majority of deaths associated with smoking and secondhand smoke in New York State in 2017 were from cancers, cardiovascular diseases, and chronic respiratory diseases (Figures 1 and 2). Just over half of all smoking-attributable deaths were from some type of cancer (10,601 deaths), with lung cancer accounting for the largest number of deaths (6,752). In addition to the most common diseases, smoking is also associated with a small number of deaths from peptic ulcer disease and rheumatoid arthritis. In contrast to smoking-related deaths, secondhand smoke-related deaths are most often from cardiovascular diseases (669 deaths). See Table A-1 for the full list of diseases and their respective morbidity and mortality estimates.

Figure 1. Annual Smoking-Related Deaths by Disease Group in New York State, GBD 2017



Note: See Table A-2 for full list of smoking-attributable diseases with associated mortality and morbidity.

Figure 2. Annual Secondhand Smoke-Related Deaths by Disease Group in New York State, GBD 2017



Note: See Table A-3 for full list of secondhand smoke-related diseases with associated mortality and morbidity.

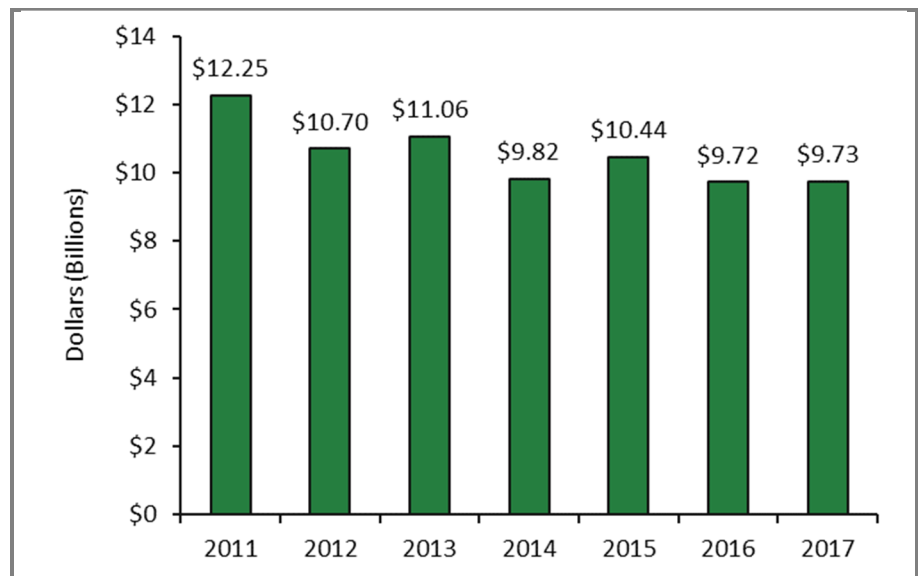
Healthcare Expenditures

Total healthcare expenditures in New York State were \$210.5 billion in 2014, up from \$209 billion in 2011. Smoking prevalence declined during this period, and the proportion of healthcare expenditures attributable to smoking decreased as well (from 5.9% in 2011 to 4.6% in 2017). Based on this, we estimate that smoking-attributable healthcare expenditures declined from \$12.3 billion in 2011 to \$9.7 billion in 2017 (Figure 3).

We examined healthcare expenditures by payer to understand on whom the cost burdens are falling. Healthcare expenditures in New York State were highest for private health insurance (32.8%). However, Medicaid (27.7%) and Medicare (20.8%) combined comprised nearly half of the expenditures overall (Figure 4). Based on this, we estimate that 2017 smoking-attributable healthcare expenditures for Medicaid and Medicare combined were approximately \$4.7 billion.

Most smoking-related healthcare expenditures in New York State are hospital costs (\$3.57 billion, or 36.7%). Billions more annually go to medications, dental care, clinical expenses, nursing home care, and other expenditures due to smoking-related illnesses (Table 2).

Figure 3. Smoking-Attributable Healthcare Expenditures in New York State, 2011–2017



Note: Numbers are expressed in inflation-adjusted 2017 dollars.

Figure 4. New York State Smoking-Attributable Healthcare Expenditures by Payer, 2017

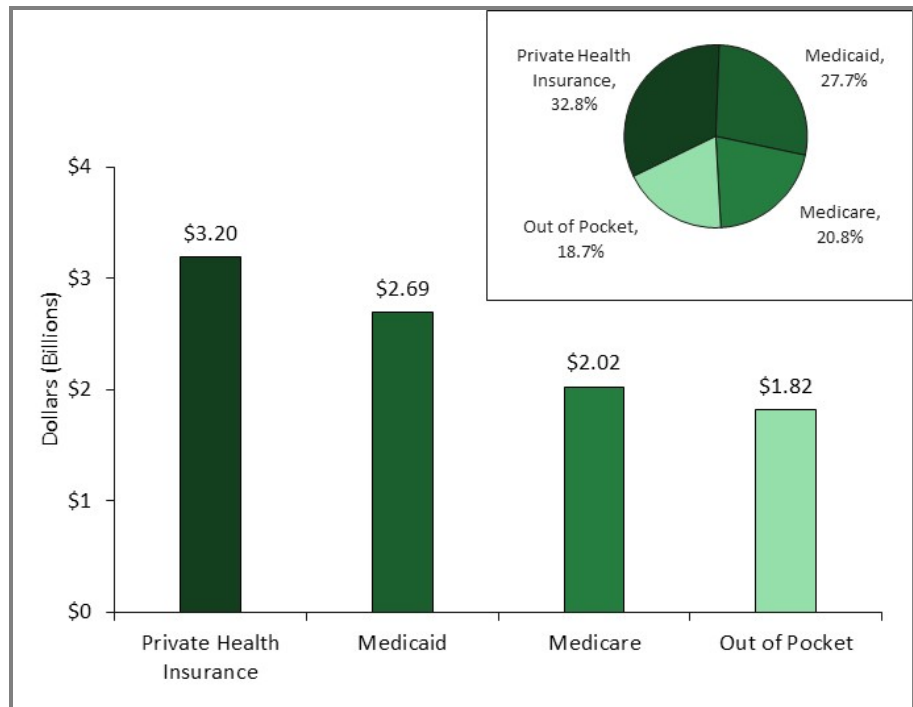


Table 2. New York State Smoking-Attributable Healthcare Expenditures by Type of Care and Payer, 2017

Healthcare Expenditure Type	Total	Medicare	Medicaid	Other (PHI + OOP)
Hospital Care	\$3.57 B	\$910.8 M	\$947.5 M	\$1.71 B
Physician & Clinical Services	\$1.87 B	\$496.8 M	\$224.3 M	\$1.15 B
Prescription Drugs and Other Non-durable Medical Products	\$1.36 B	\$303.6 M	\$168.6 M	\$892.3 M
Other Health, Residential, and Personal Care	\$992.1 M	\$14.2 M	\$605.1 M	\$372.9 M
Nursing Home Care	\$658.1 M	\$129.6 M	\$350.7 M	\$177.9 M
Home Health Care	\$455.3 M	\$70.6 M	\$309.4 M	\$75.2 M
Dental Services	\$373.9 M	\$1.9 M	\$37.0 M	\$334.9 M
Other Professional Services	\$300.7 M	\$74.3 M	\$27.2 M	\$199.2 M
Durable Medical Products	\$143.4 M	\$22.2 M	\$25.0 M	\$96.2 M
Total Smoking-Attributable Health Expenditures	\$9.73 B	\$2.02 B	\$2.69 B	\$5.01 B

Notes: Data on separate cost breakdowns for PHI and OOP are not available. PHI = private health insurance; OOP = out of pocket.

Discussion

The purpose of this report is to provide updated estimates of the health consequences and economic burden of smoking and secondhand smoke exposure in New York State. The main source for estimates of smoking-related health and economic outcomes in the United States has been CDC's Smoking-Attributable Mortality, Morbidity, and Economic Costs (SAMMEC) model. The SAMMEC model has been featured in many peer-reviewed publications, including the 2014 U.S. Surgeon General's Report¹ and CDC's 2014 *Best Practices for Comprehensive Tobacco Control Programs*.⁵ Although CDC's SAMMEC model is based on reliable data and uses sound and defensible methodology, published results from the SAMMEC model are dated. The most recent published SAMMEC estimates are for the years 2005 through 2009.

In this report, we present mortality and morbidity associated with smoking and secondhand smoke exposure in New York State in 2017 from the 2017 Global Burden of Disease (GBD) Study. We also updated the CDC SAMMEC estimates of smoking-attributable health care expenditures through 2017. Our estimates are based on similar data and methods as the CDC's SAMMEC model but are newer (by 8 years). Our results also include estimates of mortality and morbidity associated with secondhand smoke exposure, which are not included in the published CDC SAMMEC estimates.

The key findings from this report are:

- Nearly 21,000 New Yorkers died in 2017 from diseases associated with smoking.
- Deaths associated with smoking in New York State declined from approximately 28,000 annually during 2005–2009 (CDC SAMMEC) to around 21,000 in 2017 (GBD). This decline is consistent with reductions in adult smoking prevalence from 2009 through 2017.

- Despite elimination of smoking in most public places, involuntary exposure to secondhand smoke still leads to deaths and health consequences. Nearly 1,400 New Yorkers died in 2017 from exposure to secondhand smoke.
- Chronic health conditions make up approximately 91% of the deaths and 84% of the disability caused by smoking. These include cancer, heart disease, chronic respiratory diseases, and diabetes. Chronic illness associated with smoking and exposure to secondhand smoke can lead to many years lived with disability and dramatically reduce quality of life.
- Individuals who experience short-term or acute adverse health events due to smoking and secondhand smoke exposure, such as heart attacks and strokes, often continue to live for many years but with long-term disabilities and reduced quality of life.
- Diseases and disabilities caused by smoking also lead to substantial healthcare expenditures. Nearly half of all smoking-attributable healthcare expenditures are paid for through public funds (e.g., Medicare and Medicaid) Medicaid alone paid an estimated \$2.7 billion in smoking-attributable healthcare expenditures in New York State in 2017. For context, total New York State Medicaid healthcare expenditures were estimated to be \$54.7 billion in 2017. Smoking-attributable expenditures also place a large burden on individuals and families in New York State. Out-of-pocket healthcare expenditures associated with smoking were \$1.83 billion in 2017.

Limitations

Some limitations of this study include being unable to estimate healthcare expenditures associated with secondhand smoke or other indirect costs of smoking. The SAF was first estimated in 1998, and although it was adjusted over time, it is possible that the fraction of healthcare expenditures associated with smoking in New York State has not changed exactly proportionately with adult smoking prevalence over time. We also assumed that the distributions of payers and expenditure types for smoking-attributable expenditures are the same as those of total

expenditures. However, it is possible that Medicaid may pay a larger share of the smoking-attributable expenses due to a higher rate of smoking in the Medicaid population. It is also possible that those with smoking-related diseases may require certain types of healthcare expenditures more than the general population.

Potential Extensions of this Study

Extensions of this study could include estimating mortality and morbidity associated with smoking and secondhand smoke exposure in New York State by sub-groups, such as age and/or gender. Historical GBD data could be analyzed to examine trends in mortality and morbidity associated with smoking and secondhand smoke in New York State over time. Future work could also include forecasting scenarios based on different projections of smoking and secondhand smoke levels. This could help assess health and economic benefits of reaching target smoking levels. Reducing smoking and exposure to secondhand smoke has the potential to generate substantial benefits in terms of deaths averted, life years gained, quality of life improved, and direct cost savings. Offering quantitative estimates of these health and economic benefits helps translate the importance of public health improvements to more audiences, including policy-makers.

Conclusion

New York State's smoking rate has decreased, resulting in reduced smoking-related mortality, morbidity, and healthcare expenditures attributable to smoking. These improvements in health outcomes and healthcare expenditures demonstrate the contributions of the state's tobacco control program's efforts.

Despite the reductions in smoking-related mortality, morbidity, and healthcare expenditures in New York State, the health and economic burden of smoking remains substantial. In 2017, nearly 21,000 New Yorkers died from smoking-related diseases, almost 1,400 New Yorkers died from secondhand smoke exposure, and healthcare expenditures for treating tobacco-related illness were \$9.73 billion. Approximately half of all smoking-attributable healthcare expenditures in 2017, \$4.7 billion, were paid for by

public payers (e.g., Medicare and Medicaid). This level of public funding for smoking-related healthcare expenditures puts a strain on both state and federal healthcare budgets. In addition, nearly \$1.83 billion was spent by New Yorkers out of pocket on smoking-related healthcare expenditures in 2017. Those expenditures place a large financial strain on individuals and families, above and beyond the high cost of purchasing cigarettes.

The health and economic burden still associated with smoking in New York State, as well as mortality and morbidity associated with secondhand smoke exposure, clearly highlight the critical need for the New York State Tobacco Control Program to continue its efforts to reduce smoking and exposure to secondhand smoke in New York State.

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Appendix A: Data Sources, Measures, and Analyses

Description of Data Sources

This report uses data from the Global Burden of Disease (GBD) study, Centers for Medicare & Medicaid Services (CMS), the Consumer Price Index (CPI), and the New York Behavioral Risk Factor Surveillance System (BRFSS). Each data source is described in more detail below.

Global Burden of Disease Study

The 2017 GBD study, produced by the Institute for Health Metrics and Evaluation (IHME), serves as a tool for estimating morbidity and mortality from a broad spectrum of diseases and risk factors across 195 countries and territories from 1990 through 2017. GBD data are collected and analyzed by a consortium of over 3,000 researchers in more than 130 countries. Data capture premature mortality and disability from more than 300 diseases and injuries by geography, year, age, and sex. This data is accessible on the IHME's Global Health Data Exchange (GHDx) website: <http://ghdx.healthdata.org/gbd-results-tool>.

Centers for Medicare & Medicaid Services

CMS provides nominal annual total personal healthcare expenditure data by state of residence for the years 1991 through 2014, available online. Breakdowns are available by payer (Medicare, Medicaid, and private health insurance) and expenditure type (e.g., hospital care, prescription drugs).⁸ The CDC SAMMEC model also used healthcare expenditure data from CMS.

We forecasted nominal annual total personal healthcare expenditures in New York State for the years 2015 through 2016 based on the rate of growth in real (inflation-adjusted) personal healthcare expenditures in New York State from 2009 through 2014.

Consumer Price Index for Medical Care

The Consumer Price Index (CPI) for medical care in the United States is produced by the Bureau of Labor Statistics and is used to estimate inflation through tracking the price of goods and services over time.⁹ Medical care is one of eight major groups and includes both medical care services and commodities. Weights for each item or service in the CPI database are determined using the Consumer Expenditure Survey, which looks at out-of-pocket spending and weights those which consumers spend the most on the most heavily.

We adjusted nominal healthcare expenditures in New York State for inflation using the national CPI for medical care. All healthcare expenditures data estimates presented in this report are expressed in real, inflation-adjusted, 2017 dollars.

New York Behavioral Risk Factor Surveillance System (BRFSS)

The New York BRFSS is an annual survey designed by the Centers of Disease Control and Prevention (CDC) among adults aged 18 and older.¹⁰ The survey is used to monitor risk factors associated with the leading health conditions. Data is collected monthly through landline and cellular calls to statewide representative samples and aggregated into publicly available annual datasets.

New York BRFSS estimates of adult current smoking prevalence were used in our adjustments to the smoking-attributable fraction of healthcare expenditures.

Measures

Smoking-attributable mortality (SAM) is a measure of deaths in a population that are associated with cigarette smoking.

Years of life lost (YLL) is a measure of premature mortality, estimated by subtracting age at death from the average life expectancy for a population.

Years lived with disability (YLD) is a measure of healthy life years that are lost due to chronic health conditions or disabilities.

Disability-adjusted life years (DALY) combines YLL and YLD to estimate the total loss of healthy life years.

Smoking-attributable fraction (SAF) refers to the proportion of total personal healthcare expenditures that are associated with smoking.

Smoking-attributable personal healthcare expenditures (SAE) refers to all healthcare costs for individuals, regardless of payer, that are associated with smoking.

Smoking-Attributable Fraction Methods

We obtained estimates of the smoking-attributable fraction (SAF) of healthcare expenditures in New York State in 1998 and 2004 from the CDC SAMMEC model. The CDC SAF estimates used by the SAMMEC model are based on state-specific SAF estimates previously published in Miller et al. (1999).¹¹ CDC has not described their methods for adjusting the SAF in any documentation for the SAMMEC model. CDC also only presents smoking-attributable expenditures, and it is no longer possible to deduce the SAF used by SAMMEC from the data made publicly available online through the CDC website. Because new estimates of SAF are not readily available and are difficult to obtain given the data requirements for producing such estimates, the standard approach is to adjust the reported SAF over time. Based on year-over-year relative changes in adult smoking prevalence, we conducted adjustments to the 1998 CDC SAMMEC SAF using the formula below:

$$SAF_{Adjusted} = SAF_{Previous\ Year} \times (1 + Relative\ \% \ Change\ in\ Smoking\ Prevalence)$$

We calculated SAE for New York State using the formula below:

$$SAE = Total\ Personal\ Healthcare\ Expenditures_{Real\ \$\ 2017} \times SAF_{Adjusted}$$

Mortality and Morbidity Associated with Smoking and Secondhand Smoke in New York State

Table A-1. Mortality and Morbidity Associated with Smoking and Secondhand Smoke Exposure in New York State, 2017 Global Burden of Disease (GBD) Study

Category	Smoking and Secondhand Smoke Exposure	Smoking	Secondhand Smoke Exposure
Deaths	22,290 [17,054–28,153]	20,906 [16,204–26,136]	1,384 [850–2,018]
Years of Life Lost	413,927 [316,420–521,638]	385,431 [298,929–479,895]	28,495 [17,491–41,743]
Years Lived with Disability	135,471 [91,695–187,417]	119,899 [85,196–161,097]	15,572 [6,500–26,320]
Disability-Adjusted Life Years Lost	549,397 [413,860–702,036]	505,330 [389,740–634,573]	44,067 [24,120–67,463]

95% confidence intervals for each estimate are presented in brackets.

Table A-2. Deaths and Disability-Adjusted Life Years Lost Associated with Smoking in New York State by Disease, 2017 GBD

Disease	Deaths		Disability-Adjusted Life Years Lost	
	Value	95% CI	Value	95% CI
Total	20,906	[16,204–26,136]	505,330	[389,740–634,573]
Cancers	10,601	[8,531–12,884]	202,944	[161,948–247,212]
Tracheal, bronchus, and lung cancer	6,752	[5,923–7,624]	127,273	[109,833–145,220]
Pancreatic cancer	796	[645–981]	14,265	[11,585–17,487]
Colon and rectum cancer	650	[384–945]	12,994	[7,883–18,319]
Leukemia	453	[236–684]	8,158	[4,746–12,123]
Esophageal cancer	415	[328–513]	8,538	[6,878–10,528]
Bladder cancer	350	[238–492]	6,358	[4,493–8,586]
Liver cancer	328	[187–487]	6,769	[3,773–10,086]
Larynx cancer	206	[161–251]	4,719	[3,696–5,704]
Stomach cancer	200	[153–252]	3,665	[2,711–4,621]
Kidney cancer	171	[106–248]	3,346	[2,145–4,752]
Cervical cancer	139	[61–229]	3,655	[1,808–5,729]
Lip and oral cavity cancer	122	[95–152]	2,741	[2,097–3,401]
Nasopharynx cancer	18	[12–26]	463	[300–655]
Cardiovascular diseases	5,874	[4,302–7,620]	143,602	[105,657–186,130]
Ischemic heart disease	4,604	[3,436–5,821]	99,325	[74,921–124,760]
Hemorrhagic stroke	641	[475–836]	22,968	[16,886–30,010]
Ischemic stroke	208	[153–272]	10,532	[7,468–14,372]
Aortic aneurysm	183	[139–228]	4,120	[3,154–5,126]
Peripheral artery disease	162	[56–353]	3,488	[1,459–7,010]
Atrial fibrillation and flutter	76	[44–110]	3,169	[1,769–4,852]
Chronic respiratory diseases	3,411	[2,773–4,153]	121,658	[99,902–146,828]
Chronic obstructive pulmonary disease	3,376	[2,758–4,099]	115,829	[97,478–136,984]
Asthma	34	[15–54]	5,829	[2,425–9,844]
Respiratory Infections	740	[417–1,084]	13,393	[7,811–19,252]
Lower respiratory infections	731	[411–1,073]	13,146	[7,640–18,918]
Tuberculosis	9	[6–12]	247	[172–334]
Diabetes and kidney diseases	216	[139–304]	20,005	[12,713–28,872]
Diabetes mellitus	216	[139–304]	20,005	[12,713–28,872]
Other diseases	65	[42–90]	3,728	[1,708–6,279]
Peptic ulcer disease	59	[41–78]	1,680	[1,183–2,193]
Rheumatoid arthritis	6	[1–12]	1,743	[363–3,577]
Cataract	0	[0–0]	263	[150–424]
Macular degeneration	0	[0–0]	43	[12–86]

CI = confidence interval

Table A-3. Years of Life Lost Due to Deaths Associated with Smoking and Years Lived with Disability Associated with Smoking in New York State by Disease, 2017 GBD

Disease	Years of Life Lost		Years Lived with Disability	
	Value	95% CI	Value	95% CI
Total	385,431	[298,929–479,895]	119,899	[85,196–161,097]
Cancers	197,128	[157,713–239,606]	5,816	[3,750–8,239]
Tracheal, bronchus, and lung cancer	124,884	[107,840–142,385]	2,389	[1,715–3,081]
Pancreatic cancer	14,085	[11,461–17,273]	180	[120–253]
Colon and rectum cancer	12,067	[7,422–16,927]	927	[511–1,422]
Leukemia	7,864	[4,588–11,668]	294	[154–488]
Esophageal cancer	8,411	[6,774–10,383]	127	[83–181]
Bladder cancer	5,762	[4,069–7,725]	596	[378–875]
Liver cancer	6,653	[3,707–9,885]	116	[64–182]
Larynx cancer	4,294	[3,351–5,217]	425	[280–595]
Stomach cancer	3,543	[2,619–4,459]	122	[79–170]
Kidney cancer	3,143	[2,001–4,444]	203	[114–319]
Cervical cancer	3,486	[1,709–5,515]	169	[80–297]
Lip and oral cavity cancer	2,490	[1,881–3,093]	251	[163–349]
Nasopharynx cancer	447	[290–633]	16	[9–27]
Cardiovascular diseases	120,447	[89,427–154,793]	23,156	[14,743–34,033]
Ischemic heart disease	95,623	[72,316–120,241]	3,702	[2,386–5,474]
Hemorrhagic stroke	13,462	[9,899–17,302]	9,506	[6,254–13,553]
Ischemic stroke	3,155	[2,340–4,082]	7,378	[4,858–10,569]
Aortic aneurysm	4,120	[3,154–5,126]	0	[0–0]
Peripheral artery disease	2,844	[990–6,189]	644	[251–1,273]
Atrial fibrillation and flutter	1,243	[727–1,853]	1,926	[993–3,164]
Chronic respiratory diseases	48,957	[40,291–58,695]	72,701	[56,362–90,350]
Chronic obstructive pulmonary disease	47,984	[39,856–57,204]	67,845	[54,385–81,805]
Asthma	972	[435–1,492]	4,856	[1,976–8,545]
Respiratory Infections	13,216	[7,698–19,019]	178	[92–285]
Lower respiratory infections	12,997	[7,548–18,720]	149	[75–241]
Tuberculosis	218	[150–298]	28	[17–44]
Diabetes and kidney diseases	4,457	[2,976–6,108]	15,548	[9,421–23,460]
Diabetes mellitus	4,457	[2,976–6,108]	15,548	[9,421–23,460]
Other diseases	1,227	[824–1,675]	2,501	[829–4,730]
Peptic ulcer disease	1,112	[800–1,441]	567	[326–847]
Rheumatoid arthritis	115	[24–234]	1,628	[341–3,374]
Cataract	0	[0–0]	263	[150–424]
Macular degeneration	0	[0–0]	43	[12–86]

CI = confidence interval

Table A-4. Deaths and Disability-Adjusted Life Years Lost Associated with Secondhand Smoke Exposure in New York State by Disease, 2017 GBD

Disease	Deaths		Disability-Adjusted Life Years Lost	
	Value	95% CI	Value	95% CI
Total	1,384	[850–2,018]	44,067	[24,120–67,463]
Cardiovascular diseases	669	[504–864]	15,748	[11,574–20,802]
Ischemic heart disease	575	[436–737]	12,651	[9,417–16,525]
Hemorrhagic stroke	72	[51–98]	2,272	[1,582–3,124]
Ischemic stroke	22	[16–30]	825	[574–1,153]
Cancers	219	[114–363]	4,911	[2,561–8,060]
Tracheal, bronchus, and lung cancer	219	[114–363]	4,911	[2,561–8,060]
Chronic respiratory diseases	216	[101–347]	9,783	[4,678–15,833]
Chronic obstructive pulmonary disease	216	[101–347]	9,783	[4,678–15,833]
Respiratory Infections	170	[91–264]	3,294	[1,742–5,093]
Lower respiratory infections	170	[91–264]	3,294	[1,742–5,093]
Diabetes and kidney diseases	109	[40–180]	10,331	[3,566–17,676]
Diabetes mellitus	109	[40–180]	10,331	[3,566–17,676]

CI = confidence interval

Table A-5. Years of Life Lost Due to Deaths Associated with Secondhand Smoke and Years Lived with Disability Associated with Secondhand Smoke Exposure in New York State by Disease, 2017 GBD

Disease	Years of Life Lost		Years Lived with Disability	
	Value	95% CI	Value	95% CI
Total	28,495	[17,491–41,743]	15,572	[6,500–26,320]
Cardiovascular diseases	14,560	[10,742–19,211]	1,189	[747–1,749]
Ischemic heart disease	12,584	[9,364–16,454]	67	[43–98]
Hemorrhagic stroke	1,634	[1,139–2,288]	638	[399–939]
Ischemic stroke	341	[239–468]	484	[305–712]
Cancers	4,827	[2,513–7,929]	83	[41–144]
Tracheal, bronchus, and lung cancer	4,827	[2,513–7,929]	83	[41–144]
Chronic respiratory diseases	3,634	[1,703–5,865]	6,150	[2,938–9,988]
Chronic obstructive pulmonary disease	3,634	[1,703–5,865]	6,150	[2,938–9,988]
Respiratory Infections	3,234	[1,714–5,012]	60	[30–105]
Lower respiratory infections	3,234	[1,714–5,012]	60	[30–105]
Diabetes and kidney diseases	2,241	[819–3,727]	8,090	[2,744–14,334]
Diabetes mellitus	2,241	[819–3,727]	8,090	[2,744–14,334]

CI = confidence interval



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