

Modeling the 20-Year Health and Economic Impact of Reducing Cigarette Use in Minnesota



ModelHealth™: Tobacco Minnesota

The damaging health and economic effects of tobacco use are well established. More than 6,000 Minnesotans die each year as a result

of tobacco use.¹ Additionally, the annual cost of smoking in Minnesota is estimated to be over \$7 billion: \$3.19 billion in direct health care costs and \$4.3 billion in lost productivity.²

Minnesota has been at the forefront of tobacco control, including being the first state to enact clean indoor air legislation, one of a few states that taxes e-cigarettes as tobacco products, and one of the first to sue tobacco companies. That tobacco lawsuit established ClearWay MinnesotaSM in 1998 to implement tobacco control programs and fund research. During ClearWay Minnesota's tenure, the adult smoking prevalence in Minnesota fell from 21.8 percent in 1997 to 15.2 percent in 2016.³ This 30 percent decline in smoking prevalence in less than 20 years is a significant public health achievement. Prior studies have estimated lives lost from tobacco along with the cost of smoking. The prevented heart attacks, cancers, tobacco-related deaths and medical expenses resulting from a decline in tobacco use have not been counted until now.

Study Methods

This study uses a simulation model to quantify health and economic gains to help account for the impact of tobacco control programing and inform future decisions. Researchers at HealthPartners Institute and ClearWay Minnesota conducted a study based on HealthPartner's previous work in developing a nationally recognized model, ModelHealth: Tobacco. This simulation model uses databases and evidence-based research to simulate

lifetime changes in smoking status on a person-by-person basis. The model used a simulation of 1.3 million individuals to estimate changes in rates of smoking-attributable disease, death, medical care spending and lost productivity from reduced cigarette smoking. A constant prevalence scenario was created to simulate the tobacco harms that would have occurred had smoking prevalence stayed at 1997 levels. Those harms were compared to a scenario with actual prevalence in Minnesota from 1998 to 2017.

Results

The simulation model predicts that reducing cigarette smoking from 1998 to 2017 has prevented 4,560 cancers, 31,691 hospitalizations for cardiovascular and diabetes, 12,881 respiratory disease hospitalizations and 4,118 smoking-attributable deaths. Minnesotans spent an estimated \$2.7 billion less in medical care and gained \$2.4 billion in worker productivity (inflation adjusted to 2017 U.S. dollars).

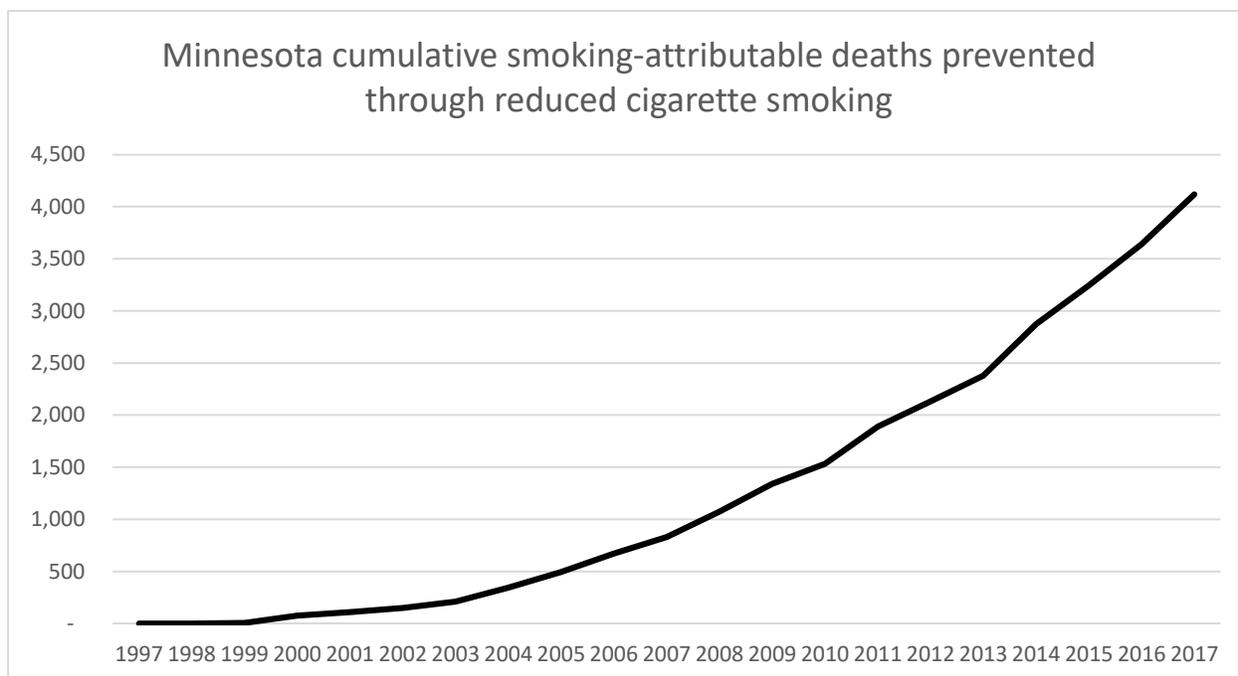
Conclusions

ClearWay Minnesota's investment in comprehensive tobacco control measures has driven down smoking rates, saved billions in medical care and productivity costs, and prevented tobacco-related deaths and diseases among Minnesota residents. Notably, during the last five years of the 20-year timeline, the impacts are four times higher than during the first five years. Additional gains are possible in coming decades through maintaining and expanding evidence-based tobacco control policy. The benefits of prevention and cessation accrue gradually, so these numbers will grow as people who quit or never started over the past 20 years live longer and enjoy better health.

¹BCBSM 2017 Healthcare Costs and Smoking in Minnesota

²BCBSM 2017 Healthcare Costs and Smoking in Minnesota

³Behavioral Risk Factor Surveillance System
http://nccd.cdc.gov/s_broker/WEATSQL.exe/weat/index.hspl. Accessed November 9, 2015.



Cumulative impact of reducing smoking prevalence, Minnesota 1998 to 2017

Outcome	Constant Prevalence Scenario	Realized Prevalence Scenario	Difference
Youth smoking prevalence, ages 9-17 ^a	13.7%	4.3%	-9.4%
Adult smoking prevalence, ages 18+	23.5%	13.5%	-10.0%
Person-years of cigarette smoking, all ages	19,717,413	14,167,908	-5,549,505
SA cancers	175,533	170,974	-4,560
SA CVD and diabetes hospitalizations	1,507,229	1,475,538	-31,691
SA respiratory disease hospitalizations	452,004	439,123	-12,881
SA deaths	186,555	182,437	-4,118
SA medical costs (millions of 2017 \$US)	29,829	27,172	-2,657
Productivity (millions of 2017 \$US)	4,807,088	4,809,466	2,378

SA = Smoking-attributable. CVD = Cardiovascular disease

^aYouth rates in the model in all youth 9-17 and reflect a lower overall prevalence than the rates reported elsewhere for middle and high school students.