



Summary of *Raising the Excise Tax on Cigarettes: Effects on Health and the Federal Budget*

The federal government spends roughly \$1 trillion on health care programs each year, so it is easy to imagine that policies that promote a healthier population could have a significant impact on the federal budget. Such policies might include initiatives that discourage smoking or excessive alcohol consumption, that promote better eating habits and physical activity to reduce obesity, or that encourage compliance with medical and dietary regimens for chronic conditions such as diabetes. In this study, the Congressional Budget Office (CBO) analyzes a policy involving smoking—a hypothetical increase of 50 cents per pack in the federal excise tax on cigarettes and small cigars (adjusted each year to keep pace with inflation and, in the long term, with the growth of people’s income)—to demonstrate the complex links between policies that aim to improve health and effects on the federal budget. The emphasis is on estimating the budgetary effects that would result from improvements in the health of the population stemming from the policy.

CBO’s analysis suggests that the illustrative tax increase, and the resulting impact on people’s behavior and health, would increase federal revenues by about \$41 billion and reduce spending by less than \$1 billion through 2021 (the end of the 10-year period covered by CBO’s standard budget estimates when this analysis was conducted). Almost \$38 billion of the additional revenues through 2021 would come from the higher excise tax (including partially offsetting effects on income and payroll taxes), according to estimates by the staff of the Joint Committee on Taxation. Another \$3 billion in revenues would stem from improvements in health, primarily from additional

Notes: For the full report, see *Raising the Excise Tax on Cigarettes: Effects on Health and the Federal Budget*, www.cbo.gov/publication/43319.

Numbers in the text and tables of this report may not add up to totals because of rounding.

The effects on the federal budget deficit reported here refer to the primary deficit, which excludes the impact of interest payments on federal debt.

earnings as better health allowed people to work more and be more productive. Spending on the government's largest health care programs, Medicare and Medicaid, would decline slightly during that period as people's health improved, and spending on Social Security would increase slightly as more people lived longer. Those changes would be very small relative to the size of the programs (about 0.01 percent or less of each program's projected outlays through 2021).

Over the longer term (through 2085 in this analysis), the policy's effect on people's longevity would play a growing role, and federal outlays would rise relative to the amounts projected under current law. Those increases would continue to be small, however, compared with the size of the programs involved. The largest total increase over that period would be for Medicare, and even in 2085, its increase would represent less than 0.1 percent of the program's total projected outlays.

On net, the illustrative policy would reduce federal budget deficits throughout the long-term projection period, primarily because of the additional excise tax receipts. Looking only at the effects of improved health (including greater longevity) on revenues and outlays, those effects would have the net result of reducing deficits for roughly the next 50 years. After that, however, the increase in spending (spurred by greater longevity) would start to exceed the increase in revenues stemming from better health. Whether positive or negative, those health effects on the deficit would always be very small—less than 0.01 percent of the nation's gross domestic product (GDP)—and they would always be outweighed by the increase in revenues from the higher excise tax (see [Summary Table 1](#)). (All of the effects on the federal budget deficit reported here refer to the primary deficit, which excludes the impact of interest payments on federal debt.)

If lawmakers were to consider raising the federal excise tax on cigarettes, their decisions would most likely depend on various considerations besides the effects on the federal budget. Those other considerations would probably include the effects of the policy on people's health and mortality rates, views about the appropriate role of the government in influencing behavior, the burdens that the policy might impose on people in different circumstances, and the policy's effects on the budgets of state and local governments. Such other considerations are beyond the scope of this analysis, which addresses only the impact on the federal budget (with related analysis of the effects on health and longevity).

Similarly, if lawmakers considered other policies to promote a healthier population, their decisions would depend on a number of considerations in addition to the budgetary impact. Moreover, the effects of other health-improving policies on the federal budget might differ substantially from the effects of the increase in the tax on cigarettes analyzed in this report.

CBO's Analytic Approach

A policy initiative aimed at improving the health of the population would affect the federal budget through the following links:

- The effects of the policy on people's behavior,
- The impact of changes in behavior on people's health, and
- The implications of improvements in health for people's health care spending, life expectancy, and earnings. Specifically, better health would tend to reduce annual health care spending per capita—the amount spent on health care per person in a given year, including public, private, and out-of-pocket spending. Better health might also lead to lower mortality rates and greater longevity, thus increasing the size of the population and changing its age distribution. Better health could also affect total earnings, because healthier people might make different decisions about working and might be more productive at work.

To produce comprehensive estimates of how such a policy initiative would affect the federal budget, CBO must assess the magnitude of each of those complex links. That process requires a great deal of analysis by CBO and a significant amount of research by outside analysts on which CBO can draw.

Policies that influence the health of the population could have differing effects on different parts of the budget. Currently, about one-quarter of federal spending goes toward Medicare, Medicaid, and various smaller mandatory health care programs. (A mandatory program is one whose funding is determined by the program's rules and eligibility criteria rather than by annual appropriations from lawmakers.) To the extent that better health reduced annual health care spending per capita, the costs of those mandatory programs might decrease. But to the extent that better health led to greater longevity, the number of beneficiaries—and thus the programs' costs—might increase. Those countervailing effects could vary for different health care programs.

At the same time, improvements in health would increase outlays for programs that pay benefits to retired people—such as the retirement portion of Social Security, which accounts for one-sixth of federal spending (about \$600 billion in 2011)—as greater longevity increased the number of people collecting benefits. Outlays for retirement programs would also be affected if people who were healthier made different decisions about when to retire and to begin collecting benefits. In the case of income support programs, such as programs that pay disability benefits, the effects of better health on outlays would be complicated. Those effects would depend on changes in the number and age distribution of people entering a program and on changes in the ages at which people left the program or died. Improvements in health would also affect federal revenues, primarily through the impact of changes in earnings on receipts from income and payroll taxes.

This study uses smoking as an example for estimating the overall impact on the federal budget of a hypothetical policy intervention to improve health. Other health-improving policies would have many of the same types of effects on the budget as those described here, but the size of those effects could differ substantially for different policies.

The policy considered in this analysis would raise the federal excise tax on cigarettes and small cigars from \$1.01 per pack to \$1.51 beginning in fiscal year 2013 and would adjust that increase each year for inflation. CBO assumed that in later years, the increase would also be adjusted to keep pace with long-term growth in real (inflation-adjusted) income. Such a policy would increase federal revenues directly by raising receipts from the excise tax (even taking into account reductions in cigarette sales because of the higher price, as well as other offsetting factors that affect revenues).¹ The focus of this study is the additional budgetary effects that would result from the change in people's health, as fewer people smoked and as nonsmokers were exposed to less secondhand smoke.

Like virtually all CBO analyses of the budgetary impact of a proposed policy change, this study measures the effects of the change relative to what is projected to happen under current law. In the case of smoking, CBO expects that the percentage of U.S. adults who smoke—which has fallen by roughly half in the past 50 years—will continue to decline, although at a slower pace than in recent decades. Specifically, CBO projects that under current law, the prevalence of smoking in the United States will decrease from roughly 19 percent of adults in 2010 to roughly 15 percent by about 2035, before leveling off near that percentage for the long term.

Such declines in smoking rates are at least partly attributable to the many reports that have been issued since the mid-1960s about the harmful effects of smoking on health and to the various antismoking initiatives that have been carried out at all levels of government. Those initiatives include increases in federal and state excise taxes on tobacco, bans on smoking in public places, limits on tobacco advertising, and numerous educational initiatives. The estimates presented in this analysis reflect the further changes in smoking behavior and health projected to occur under the hypothetical increase in the federal excise tax.

1. Excise taxes reduce the base for income and payroll taxes because they are a business expense for companies required to pay them. That additional expense results in decreases in taxable income somewhere in the economy (depending on whether companies pass the expense on to their workers or their customers), which produces a loss of government revenues from income and payroll taxes that partly offsets the revenues collected from the excise taxes themselves. For more details, see Congressional Budget Office, *The Role of the 25 Percent Revenue Offset in Estimating the Budgetary Effects of Legislation* (January 2009), and Joint Committee on Taxation, *The Income and Payroll Tax Offset to Changes in Excise Tax Revenues*, JCX-59-11 (December 23, 2011). Throughout this report, any references to changes in excise tax receipts are net of those associated losses in income and payroll tax receipts.

This analysis is more thorough in its assessment of budgetary effects than previous CBO cost estimates of policies that would reduce smoking. In the past few years, CBO estimated that several proposed policies to discourage smoking would decrease federal outlays for Medicaid by reducing the number of low-birth-weight babies (who have higher-than-average health care costs) born to women enrolled in Medicaid. (Versions of those policies have since been enacted.) This analysis of the budgetary impact of an antismoking policy is more comprehensive than such cost estimates in several respects:

- It includes new estimates of effects on annual health care spending per capita and on longevity,
- It considers the effects on a wider range of federal programs and revenue sources than are included in traditional cost estimates,
- It provides estimates for the longer term as well as for the 10-year period typically considered in budget estimates, and
- It does not make the assumption, usually made in cost estimates, that the proposed policy would have no impact on GDP.

Effects of an Increase in the Cigarette Tax on People's Behavior

The first broad step in assessing the budgetary impact of a policy to promote health is determining how the policy will affect behavior. In the example considered here, the issue is how an inflation-adjusted increase of 50 cents per pack in the federal excise tax on cigarettes and small cigars would affect smoking. That tax increase—along with price changes by manufacturers in response to the policy—would raise the price that consumers would pay for cigarettes by about 10 percent, on average, nationwide.

Fairly extensive research has been done about how the consumption of cigarettes changes in response to changes in the price (including tax) that smokers or would-be smokers face. Studies suggest that teenagers respond most strongly to higher cigarette prices and that such responsiveness declines with people's age. On the basis of that research, CBO estimates that a few years after the hypothetical tax increase took effect, the number of 12- to 17-year-olds who smoked cigarettes would be about 5 percent lower than it would be otherwise, the number of 18-year-old smokers would be 4.5 percent lower, the number of 19- to 39-year-old smokers would be almost 4 percent lower, and the number of smokers age 40 or older would be about 1.5 percent lower. In later years, the main effect of the tax increase on behavior would be to keep more young people from starting to smoke. For example, CBO estimates that in 2021, 4.3 percent fewer 18- to 24-year-olds would be smokers than under current law. Over time, those reductions in the number of teenagers and young adults who took up smoking would translate into a lower percentage of adults who smoked than under current law.

The link between cigarette prices and people's behavior is often described by an "elasticity," which quantifies the percentage change in the number of people who smoke, or in the number of cigarettes smoked, in response to a 1 percent increase in price. CBO's estimates of changes in the number of smokers are based on an average elasticity of almost -0.3—meaning that a 1 percent rise in the price of cigarettes results in roughly a 0.3 percent decline in the number of smokers. The total reduction in cigarette consumption from such a price increase is significantly greater than 0.3 percent, according to past research, because it reflects both the decrease in the number of people who smoke and a decrease in the average number of cigarettes consumed by people who continue to smoke.

The estimates of health and budgetary effects in this study focus on the first of those components—the reduction in the number of smokers and the resulting decline in people's exposure to secondhand smoke. The health effects on smokers who reduced their cigarette consumption but did not quit would be negligible, CBO assumed. That assumption was made because research into whether reducing the number of cigarettes smoked improves health is inconclusive—partly because evidence suggests that such smokers are apt to smoke each cigarette more intensively than they did before.

Effects on Health, Health Care Spending, and Longevity

Numerous studies have concluded that reducing the number of smokers would improve health and increase longevity. Smoking has been shown to cause or worsen an array of medical problems—including cardiovascular diseases, various types of cancer, bronchitis, and reproductive health problems—and to contribute to early death. People who quit smoking see some improvements in their health fairly quickly, but many of the ill effects of smoking can take years to go away, and some may never entirely disappear. Because research evidence suggests that it takes time for the health of a former smoker (as measured by such things as cardiovascular efficiency and incidence of various cancers) to begin to resemble the health of someone who never smoked, CBO built a "health response lag" into its estimates. Research evidence also implies that the biggest gains in health from a policy to discourage smoking would come from preventing some young adults from ever starting to smoke. As time elapsed after the policy change, more and more age groups would include a subset of people who never took up smoking because of the policy. For all of those reasons, the effects of the policy on the overall health of the population would take many years to reach their full extent.

CBO used data from several sources to estimate the extent to which smoking affects the average amount spent by all sources on a person's health care in a given year. Those estimates of smoking's impact on annual health care spending per capita were combined with CBO's estimates of smoking's impact on mortality rates to produce estimates of the effects of smoking on total health care spending from all sources.

Annual per Capita Spending on Health Care

CBO used linked data from two large national surveys—the Medical Expenditure Panel Survey, produced by the Agency for Healthcare Research and Quality, and the National Health Interview Survey, produced by the Centers for Disease Control and Prevention—to estimate the effects of smoking on annual health care spending per capita. The linked dataset provided information about each respondent’s smoking history, health care spending, and other important characteristics, including age, sex, race or ethnicity, education level, marital status, income, geographic location, health insurance coverage, alcohol consumption, categories of body mass index, and measures of attitudes about risk and about the need for medical care in the event of an illness.

After analyzing those data and considering the research findings of others, CBO estimated the extent to which annual health care spending per capita would be lower if people who otherwise would have smoked either quit or never started smoking as a result of a policy intervention. That estimate came from comparing health care spending for smokers and nonsmokers. Such comparisons are complicated because, on average, smokers and nonsmokers differ in ways other than smoking—such as in education, race or ethnicity, insurance coverage, location, and alcohol consumption—that can affect their health care costs. When considering a policy that would change smoking behavior, therefore, it is important to compare current smokers with people who have never smoked but who otherwise resemble smokers—because the policy may alter smoking behavior but not necessarily the other characteristics that can affect someone’s health and health care spending.

CBO used regression analysis to separate the effects of smoking from the effects of other personal characteristics that are correlated with smoking but that exert their own influence on annual health care spending per capita. In general, the effects of smoking on per capita spending are smaller when the analysis adjusts for those other characteristics than when it simply compares average health care spending for smokers and nonsmokers.

CBO estimated that people who have never smoked but who otherwise resemble smokers have lower annual health care spending per capita than current or former smokers do: about \$1,000 (or 16 percent) lower for people in the 45–64 age range; about \$1,100 (or 12 percent) lower for people in the 65–74 age range; and about \$1,300 (or 11 percent) lower for people age 75 or older. (Those dollar amounts are in 2008 dollars.) The estimated dollar differences are smaller for people under age 45, both because younger people tend to have better health in general and because younger smokers have had less time for smoking-related health problems to develop. Among 18- to 24-year-olds, annual health care spending per capita is about \$200 (or 11 percent) lower for nonsmokers who otherwise resemble smokers than for current or former smokers; among 25- to 44-year-olds, the difference in annual spending is about \$400 (or 13 percent).

On the basis of those differences, CBO estimated that roughly 7 percent of the nation's total annual health care spending (for noninstitutionalized adults) is attributable to smoking.² That figure is consistent with the range of results from other research studies. Some of those studies built up their analyses using evidence and calculations of the costs of specific diseases associated with smoking. Other studies followed a method more like the one that CBO used for this analysis: comparing annual spending for people with different histories of smoking and statistically controlling for other personal characteristics that can affect health care spending.

Longevity

CBO employed a similar approach to assess the effects of smoking on mortality rates and thus on life expectancy. The analysis used data from the National Health Interview Survey linked with death certificate records from the National Death Index, enabling CBO to determine whether a survey respondent had died. Similar to the way CBO produced the statistical estimates of the effects of smoking on annual per capita health care spending, the agency used regression analysis of mortality rates to separate the effects of smoking from the effects of other personal characteristics.

Mortality rates are generally higher for current and former smokers than for people who have never smoked but who otherwise resemble smokers. Between the ages of 25 and 74, current and former smokers are 1.8 to 2 times as likely to die in a given year as people who have never smoked but who have the other characteristics of smokers.

In terms of longevity, smoking appears to decrease someone's life expectancy at age 30, 45, or 60 by about 5 to 6 years. That estimate comes from comparing people with a typical history of smoking (a category that reflects the probability that a person will quit smoking at some point in his or her life) with people who have never smoked but who have the other characteristics of smokers. (The difference in life expectancy is even greater if the analysis does not control for those other characteristics but simply compares typical smokers with people who have never smoked.)

Differences between smokers and otherwise similar nonsmokers in the probability of surviving to age 70 and beyond are especially large. Because mortality rates are very low at young ages, even being twice as likely to die in a given year does not translate into much difference in the probability of surviving to middle age. However, because the probability of surviving to a particular age depends on the cumulation of previous year-to-year mortality rates, and because mortality rates only begin to rise sharply at older ages, smoking causes a particularly large difference in the probability of surviving past age 70. For instance, if one compares a 30-year-old who has a typical history of smoking with an otherwise similar 30-year-old who has never smoked, the smoker is

2. That number is based on the share of the population that has a history of smoking (either current or former smokers), which is about half of all adults, and the difference in per capita health care spending between people with a history of smoking and otherwise similar nonsmokers, which varies from 11 percent to 16 percent depending on age group.

98 percent as likely as the nonsmoker to live to age 45, 95 percent as likely to live to age 55, and 91 percent as likely to live to age 65—but only 80 percent as likely to reach age 75.

Those differences imply that the greatest increase in the population from a policy that reduces smoking will occur in the over-65 age group—an implication that has substantial consequences for the policy's long-term impact on the federal budget. The "longevity effect" (in which a reduction in smoking decreases mortality rates and increases life expectancy) will be most likely to drive up the costs of federal programs that are aimed at older people, because it is at those ages that the reduction in smoking will result in the most additional people staying alive. Of course, the higher costs for such programs must be netted against the savings in annual health care spending per capita and the effects on revenues from income and payroll taxes to calculate the total effect of the improvements in health on the federal budget.

Effects Found Among Recent Quitters

The increases in annual health care spending per capita and mortality rates caused by smoking are not limited to current smokers. People who stopped smoking in the previous 10 years, and especially those who quit in the past 5 years, have even higher annual per capita health care spending and mortality rates than do current smokers of the same age and with the same other characteristics (such as education and race). That result has been found by other researchers as well. In the judgment of CBO and others, that result does not imply that quitting leads to higher health care spending or mortality. Instead, a more likely explanation is that some quitters stop smoking in response to a serious illness, and the effects of such illnesses on health care spending and mortality are evident in the data. CBO's methodology accounts for that effect in estimating the changes in per capita health care spending and mortality rates that would result from the illustrative policy examined in this analysis.

Effects on Labor Earnings

Smoking can affect a person's earnings and hence the amount of federal revenues collected from income and payroll taxes. A policy—such as an increase in the cigarette tax—that reduced the number of smokers could influence earnings in various ways. For example, decreasing the number of people who smoked would result in more people in better health, which in turn could affect their decisions about whether and when to join the labor force and when to retire. In addition, better health could improve employees' earnings while in the workforce by causing them to have fewer absences from work, to be more effective while on the job, or to work for more hours.

CBO used the Census Bureau's Current Population Survey (CPS) and its special Tobacco Use Supplement to explore the connections between a person's history of smoking and his or her earnings (including such factors as labor force participation, retirement, and hourly wages). The CPS collects data on people's earnings and other

income, employment status, and other social and demographic characteristics; the Tobacco Use Supplement provides information about their history of smoking. (CBO also conducted a more limited analysis using data from the University of Michigan's Health and Retirement Study.)

CBO's analysis indicates that smoking results in lower earnings than would otherwise occur. Specifically, CBO concluded that because of smoking, average earnings are 4 percent lower for 18- to 34-year-olds who smoke than for otherwise similar nonsmokers. The percentage difference rises to between 5 percent and 7 percent for 35- to 74-year-olds. Smoking appears to reduce the likelihood of having a job and to decrease average wages per hour. However, smoking appears to have no effect on, or to slightly increase, the hours that people work when they are employed. Like all of the estimates in this study, those precise numeric conclusions about the effects of smoking on earnings are subject to significant uncertainty.

The estimates above are smaller than the gap in earnings measured from the CPS data when comparing smokers with nonsmokers who have similar measured characteristics, because CBO believes that a portion of that gap results from differences between smokers and nonsmokers in attributes that are not measured by surveys, such as will-power, self-confidence, and quality of education. In CBO's judgment, differences in such unmeasured characteristics can have a marked effect on earnings, although they are less likely to affect health care spending or longevity.

Effects on the Federal Budget

To estimate the budgetary impact of a policy that would reduce smoking, CBO developed a model to follow cohorts of smokers and people who would have been smokers in the absence of the policy. The model keeps track of cohorts as they age and compares the annual per capita health care spending and earnings they would be expected to have under current law with the health care spending and earnings projected for them under a policy in which the federal excise tax on cigarettes and small cigars would be 50 cents higher per pack in 2013 and adjusted for inflation thereafter (and for income growth over the longer term). CBO assumed that it would take one year for the tax increase to have its full impact on the smoking behavior of people who were already smokers. However, it would take many more years for the policy to have its full impact on health—and thus on annual health care spending per capita and mortality rates—for people who quit because of the policy.

The model accounts for other effects of the policy as well. Using results from the analyses described earlier, it incorporates the different mortality rates that would occur as some people who would otherwise have continued to smoke quit because of the higher cigarette price resulting from the tax increase. The model also accounts for young people who would have started smoking under current law but never do because of the higher price. Their health care spending per capita, earnings, and mortality are projected under current law, in which they take up smoking, and under the higher-tax

policy, in which they never smoke. In addition, the model takes into account the fact that some smokers will eventually quit on their own under current law, even without an increase in the excise tax. (Assumptions about such quitting are based on the experience of cohorts of smokers observed in recent data and are consistent with CBO's assumptions about the future prevalence of smoking by different age groups under current law.)

After calculating the policy's effects on health care spending per capita and on the number of people alive at each age, CBO used those results to estimate changes in enrollment and spending for the various mandatory programs in the federal budget whose outlays would be affected by the policy and then summed the effects to calculate total changes in federal outlays by year.³ At the same time, CBO calculated how higher earnings for people who did not smoke because of the policy, and an increase in the number of people who survived to have earnings, would translate into changes in total earnings each year—and thus into changes in annual revenues from income and payroll taxes. The revenue estimates also account for the additional excise tax receipts that would be collected because of the increase in the cigarette tax. The net result of the changes in outlays and the changes in revenues is the total budgetary effect of the policy for a given year.

Impact on the Population

By discouraging people from smoking, the excise tax increase would improve the average health of the population. By 2021, almost 1.4 million adults would have quit rather than smoking until death, quit earlier than they would have otherwise, or not started smoking because of the policy—among them about 10,000 adults who would not otherwise have survived to that year.⁴ (CBO projects that almost 43 million adults will be smokers in 2021 under current law.)

Over time, the policy's impact on the average health and longevity of the population would grow because of the continuing improvement in health for people who stopped smoking, the decline in the share of people who took up smoking as teenagers or young adults, and the cumulative effects of lower mortality rates. CBO estimates that by 2035, about 63,000 additional adults would be alive because of the higher cigarette

3. Some federal health care programs have both mandatory and discretionary components. Funding for the discretionary components of a program is determined by annual appropriations (rather than by statutory rules about the program's eligibility and payments). The spending numbers discussed in this summary include only changes in mandatory spending. Potential changes in discretionary spending for programs that have discretionary components are discussed in Chapter 6 of the report. Those changes would be quite small compared with the changes in mandatory spending discussed here.

4. Health would also improve for people who lived with someone who did not smoke as a result of the policy, because those people would not be exposed to secondhand smoke at home. CBO's estimates of the budgetary effects of the policy include an adjustment to account for the impact of a reduction in exposure to secondhand smoke.

tax. And by 2085, over 3 million adults would be nonsmokers specifically because of the policy, including about 200,000 who would otherwise have died earlier. (By comparison, about 57 million adults are projected to be smokers in 2085 under current law.)

Budgetary Impact Through 2021

CBO estimates that the illustrative increase in the cigarette tax would have the net effect of reducing federal budget deficits (excluding interest) by a total of about \$42 billion through 2021 (the end of the 10-year window for CBO's budget estimates at the time this analysis was conducted). Most of the net effect during that period would come from increases in excise tax revenues. Those additional revenues would begin in 2013 and total almost \$38 billion through 2021 (about \$4 billion in 2021 alone). In addition, higher collections of income and payroll taxes from people who were more productive in the workforce or had greater labor force participation because of not smoking would increase revenues by another \$2.9 billion through 2021 (about \$700 million in 2021, or 0.02 percent of total income and payroll tax receipts projected for that year).⁵ At the same time, total federal outlays would be slightly reduced—by \$730 million over the 2013–2021 period (\$124 million in 2021)—because of the health effects that would result from the higher cigarette tax.

Focusing specifically on the policy's health-related budgetary effects (including the increased revenues from higher earnings), the combination of net outlay reductions and net revenue increases resulting from the policy's impact on health and longevity would reduce deficits by a total of about \$4 billion over the 2013–2021 period (about \$900 million in 2021). Those health-related budgetary effects are about 10 percent of the size of the total increase in excise tax receipts over that period.

The illustrative policy would affect spending for federal programs in different ways, increasing outlays for some programs and decreasing outlays for others. In all cases, however, the changes would be very small relative to the size of the programs.

- Medicaid would see the largest savings over the 2013–2021 period—about \$560 million (\$120 million in 2021, or 0.02 percent of total expected federal outlays for Medicaid in that year). Those figures represent the sum of savings for all of the different types of beneficiaries that Medicaid serves; they also represent the net impact of decreases in annual spending per capita and increases in the number of beneficiaries because of greater longevity. In the first few years of the policy, one of the biggest sources of savings for Medicaid would be better health among pregnant women, infants, and young children.

5. Those revenue increases would not be considered in regular cost estimates of proposed legislation because of the longstanding practice with such estimates of assuming that proposals would not affect GDP.

- Medicare would have the next-largest savings in the near term—about \$250 million over the 2013–2021 period (\$50 million, or 0.006 percent of net Medicare outlays, in 2021). Those savings constitute the net impact of two elements: lower annual spending per capita as the health of former smokers gradually improved and a greater number of beneficiaries as healthier people lived longer. The first of those elements would be larger than the second throughout the 10-year budget window.
- By contrast, Social Security’s Old-Age and Survivors Insurance program, which pays retirement benefits, would experience the largest net *increase* in costs because of the policy. On net, outlays for Social Security would rise by about \$150 million over the 2013–2021 period (about \$55 million, or 0.005 percent of that program’s outlays, in 2021). Those increases would result from more people living to collect benefits or collecting them for longer periods, although there would be a reduction in benefits paid to the survivors of deceased workers.

The budgetary effects of the increase in the cigarette tax would be small relative to the overall size of the programs involved for several reasons. First, only a small fraction of the people receiving benefits from a program would change their behavior as a result of the tax increase. For example, in the case of Medicare, CBO estimates that about 1.5 percent of the smokers who would be over age 65 between 2013 and 2021 would quit because of the policy. Because smokers make up about 10 percent of Medicare’s population, only 0.15 percent of the program’s beneficiaries would change their behavior in a way that improved their health. Second, it takes time for a former smoker to recover from the damage done while smoking. CBO estimates that annual per capita health care spending is roughly 10 percent higher for a smoker than for an otherwise similar person in that age group who has never smoked. The reduction in annual health care spending for someone who quit smoking immediately because of the tax increase would be only about two-thirds of that 10 percent by 2021 (the ninth year of the policy). The result of that chain of calculations is savings of 0.01 percent for the Medicare program, even before considering the higher spending that would result from having more people survive to receive benefits.

Budgetary Impact Over the Longer Term

Beyond the next 10 years, estimates of the budgetary effects of the illustrative increase in the cigarette tax are even more uncertain. Because people’s income tends to rise over time with the growth of productivity, it would probably be necessary to increase the excise tax beyond the 50-cent inflation-adjusted rise that was modeled for the first decade in order to continue to have the same effect on people’s smoking behavior. Thus, for its longer-term estimates, CBO assumed that the excise tax increase would be indexed not only for inflation but also for growth in average real income.

Despite the greater uncertainty of longer-term estimates, CBO’s model of changes in annual health care spending per capita and in longevity offers some insights into the pattern and rough size of the budgetary impact over the long run. As more time passes,

the savings from reductions in annual health care costs per capita increase, as does the number of living people who otherwise would have died. In addition, people who quit smoking because of the policy see bigger improvements in their health over time. Also, as the years go by, a larger share of the population consists of people who grew up with the higher excise tax in effect, and because young people are more sensitive to cigarette prices than older people are, a greater fraction of people who otherwise would have smoked choose not to because of the policy.

Effects on Specific Programs Through 2085. Whether health care programs would have lower or higher costs over time would depend on whether the reduced annual per capita spending on healthier people outweighed the added costs of providing health benefits to more people. In the case of Medicare, CBO's modeling indicates that the decreases in mortality because of reductions in smoking would add people disproportionately to older age groups—the population served by Medicare—and that sometime during the second decade of the policy, the increase in health care costs from greater longevity would become the dominant effect for that program. Consequently, the policy would have little net impact on annual spending for Medicare in 2025, CBO estimates, and it would increase Medicare spending thereafter: by about 0.001 percent of GDP (0.02 percent of net program spending) in 2035 and by 0.007 percent of GDP (0.07 percent of net program spending) in 2085 (see [Summary Table 1](#)).⁶

By contrast, for Medicaid and for subsidies offered through the health insurance exchanges established by the Affordable Care Act, the savings in annual health care costs per capita would always outweigh the costs of increased longevity, because much of those programs' spending is targeted toward the nonelderly population.⁷ As a result, the increase in the cigarette tax would reduce federal spending for Medicaid and the exchange subsidies each year through 2085—by no more than 0.001 percent of GDP, CBO estimates. (Relative to projected spending for those programs, the reduction would equal 0.02 percent in 2025, 0.03 percent in 2035, and 0.02 percent in 2085.)

Because of the policy's effect on longevity, Social Security would see outlays for retirement and disability benefits increase by about 0.001 percent of GDP (0.01 percent of total program spending) in 2025, by 0.002 percent of GDP (0.03 percent of program spending) in 2035, and by 0.005 percent of GDP (0.07 percent of program spending) in 2085.

Overall Effects Through 2085. Including the changes in spending for other programs, CBO estimates that the illustrative increase in the cigarette tax would lead to a net change in total outlays of less than 0.0005 percent of GDP in 2025. Total outlays

6. Net Medicare spending is total program spending net of beneficiaries' premiums and certain amounts paid by states.

7. The Affordable Care Act refers to the Patient Protection and Affordable Care Act (Public Law 111-148) and the health care provisions of the Health Care and Education Reconciliation Act of 2010 (PL. 111-152).

would increase in subsequent decades because of the policy—by about 0.002 percent of GDP in 2035 and 0.012 percent in 2085. The effects of both lower annual per capita health care spending and greater longevity would grow over time, with the effect of increased longevity becoming dominant during the second decade of the policy (see [Summary Figure 1](#)).

On the revenue side of the budget, the policy's effect on excise tax receipts would continue to play the largest role, increasing annual revenues by about 0.018 percent of GDP through 2085. In addition, better health would cause revenues from income and payroll taxes to rise (see [Summary Figure 2](#)). That increase can largely be attributed to a combination of higher labor earnings per capita (because improvements in health would result in greater earnings while people were employed and cause some people to participate in the labor force longer than they would otherwise), increased longevity (which means that some people who would otherwise have died because of smoking would instead be alive and in the labor force), and lower health insurance premiums (and thus a higher share of compensation taking the form of taxable wages). Together, those health-related effects on revenues are estimated to amount to 0.005 percent of GDP in 2025, 0.007 percent in 2035, and 0.009 percent in 2085.

Those changes to outlays and revenues would have the net effect of reducing deficits throughout the long-term projection period, mainly because of the additional revenues stemming from the higher excise tax. The overall reduction in the deficit (including the effects of better health) would amount to 0.023 percent of GDP in 2025 and 2035 and to 0.015 percent of GDP in 2085. By themselves, the policy's health effects would have a miniscule impact on the deficit, reducing it by 0.005 percent of GDP in both 2025 and 2035. After about 50 years, the increases in spending for Medicare, Social Security, and other, smaller mandatory programs stemming from increased longevity would exceed the combination of savings for Medicaid and other programs and additional revenues stemming from better health, greater productivity, and more time spent in the labor force. By 2085, those health effects would have the net result of increasing the deficit by 0.003 percent of GDP.

Uncertainty of the Estimates

CBO's estimates are based on a thorough analysis of existing data and a review of numerous studies on topics ranging from how people's behavior changes when cigarette prices rise to the specific health consequences of smoking. Those studies differ in their conclusions about the sizes of various effects, and CBO's own analysis is subject to the uncertainties that occur whenever researchers make inferences from data. In addition, the estimates in this report depend on a variety of assumptions that were made when constructing the model of cohorts of smokers and people who would have been smokers in the absence of the policy.

CBO considered those sources of uncertainty and examined how its estimates might change with differing assumptions. Under a range of plausible alternative assumptions,

the following general conclusions about an increase in the cigarette tax would continue to apply:

- The changes in federal spending that would result from improved health because of a decrease in the number of smokers would be quite small relative to the size of the affected programs.
- Federal spending would be reduced throughout the first decade that the tax increase was in effect but would be increased beginning in the second or third decade.
- The effects of improved health would increase revenues on an ongoing basis.
- The health effects of the tax increase would produce a very small net decline in the annual budget deficit for roughly five decades.
- The increased excise tax receipts would exceed the health-related effects of the policy on both revenues and outlays for at least 75 years, with the overall result being a net decrease in the deficit.

Summary Table 1.

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Budgetary Effects of the Illustrative Increase in the Cigarette Tax

(Percentage of gross domestic product)

	2025	2035	2085
Effects on Outlays^a			
Medicare	*	0.001	0.007
Medicaid and subsidies through health insurance exchanges	-0.001	-0.001	-0.001
Social Security	0.001	0.002	0.005
Other	*	0.001	0.002
Total	*	0.002	0.012
Effects on Revenues			
Cigarette tax receipts ^b	0.018	0.017	0.018
Effects from improvements in health ^c	0.005	0.007	0.009
Total	0.022	0.025	0.027
Net Decrease (-) in the Deficit^d	-0.023	-0.023	-0.015
Memorandum:			
Net Increase or Decrease (-) in the Deficit from Improvements in Health ^e	-0.005	-0.005	0.003

Source: Congressional Budget Office.

Notes: The illustrative tax increase modeled in this analysis is a 50-cent per pack rise in the federal excise tax on cigarettes and small cigars, beginning in 2013 and indexed each year thereafter to keep pace with inflation (and, after 2021, to keep pace with the growth of inflation-adjusted income).

The budgetary effects shown here are relative to the long-term projections under the extended baseline scenario published in Congressional Budget Office, *CBO's 2011 Long-Term Budget Outlook* (June 2011, corrected February 2012).

* = between -0.0005 percent and 0.0005 percent.

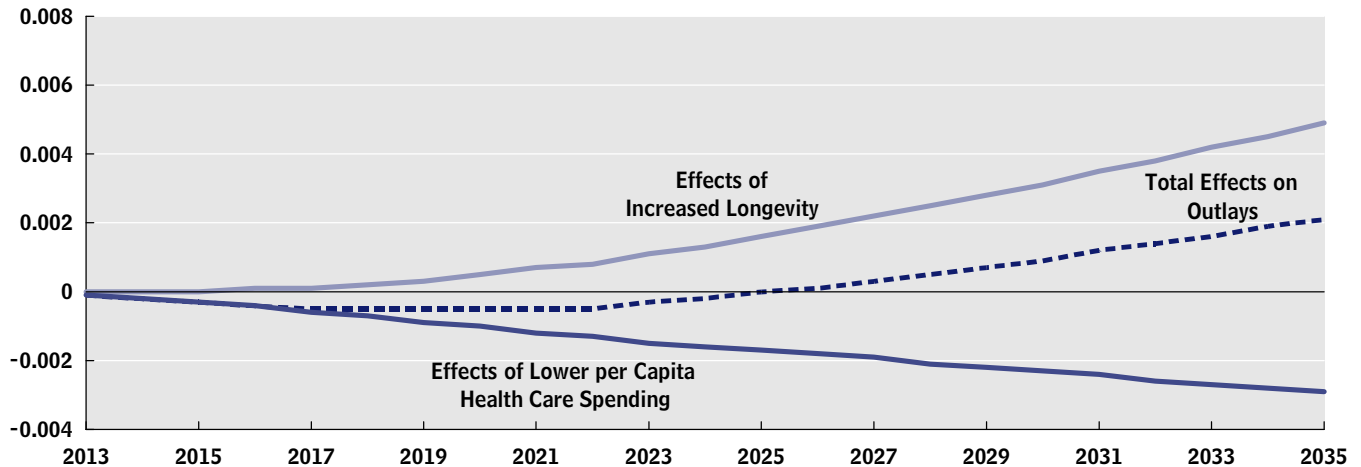
- The outlay effects of the tax increase all result from improvements in health (they reflect changes in longevity and per capita health care spending). The effects shown here apply only to mandatory outlays.
- An increase in excise taxes reduces revenues from income and payroll taxes; these estimates are net of those reductions.
- These effects are on receipts from income and payroll taxes.
- Excludes debt-service costs.
- Excludes cigarette tax receipts and debt-service costs.

Summary Figure 1.

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Effects on Outlays of the Illustrative Increase in the Cigarette Tax

(Percentage of gross domestic product)



Source: Congressional Budget Office.

Notes: The illustrative tax increase modeled in this analysis is a 50-cent per pack rise in the federal excise tax on cigarettes and small cigars, beginning in 2013 and indexed each year thereafter to keep pace with inflation (and, after 2021, to keep pace with the growth of inflation-adjusted income).

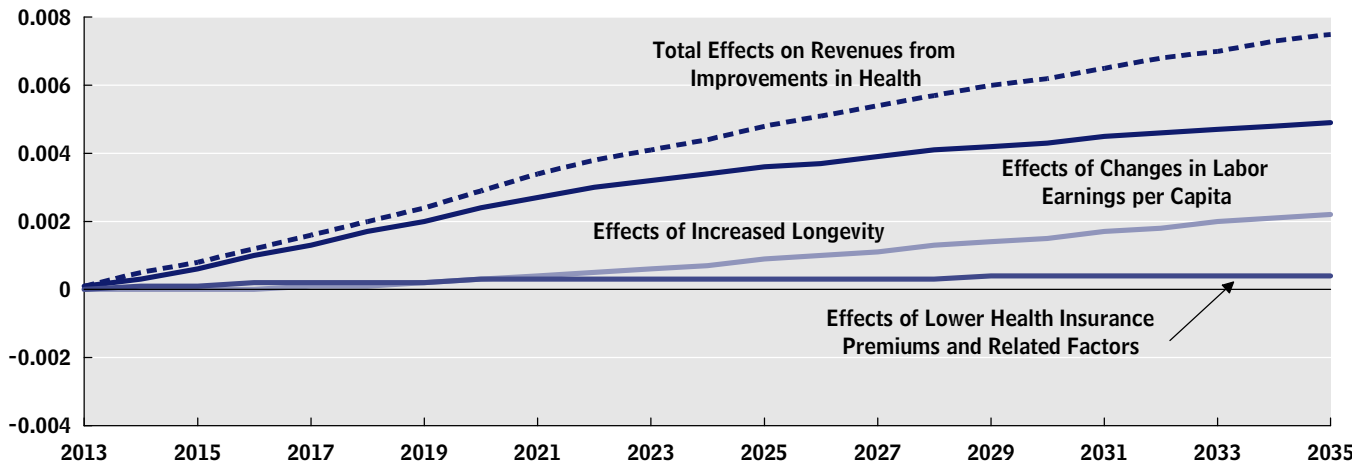
The outlay effects of the tax increase all result from improvements in health. The effects shown here apply only to mandatory outlays.

Summary Figure 2.

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Health-Related Effects on Revenues of the Illustrative Increase in the Cigarette Tax

(Percentage of gross domestic product)



Source: Congressional Budget Office.

Note: The illustrative tax increase modeled in this analysis is a 50-cent per pack rise in the federal excise tax on cigarettes and small cigars, beginning in 2013 and indexed each year thereafter to keep pace with inflation (and, after 2021, to keep pace with the growth of inflation-adjusted income).