

Executive Summary

This study illustrates the importance for policymakers of long-term budget impact analyses of preventive health policies, specifically those aimed at obesity prevention. The study recommends that the Congressional Budget Office (CBO), the agency responsible for estimating costs of proposed federal legislation, develop the capacity to estimate the costs of these policies over a 75-year horizon.

Background

Obesity rates have doubled among adults in the last twenty years and tripled among children in a single generation. Evidence suggests that by 2040 roughly half the adult population may be obese. Obesity increases the risk of type 2 diabetes, high blood pressure, heart disease, certain types of cancer, stroke, and many other diseases and conditions. These associated conditions carry high financial costs and can be devastating to quality of life. Health care spending due to obesity is estimated to be as high as \$210 billion annually, or 21 percent of total national health care spending. When also accounting for the non-medical costs of obesity, the overall annual cost is estimated to be \$450 billion.

The Institute of Medicine and other scientific bodies have identified evidence-based strategies for addressing the childhood obesity epidemic. One impediment to pursuing obesity prevention policies at the federal level lies in how their budgetary impacts are assessed. CBO generally uses a ten-year budget window, but effective preventive health measures can have long-run budgetary impacts that differ greatly from their ten-year projections. In fact, very little of the federal savings they induce may be captured in the first decade, especially if an intervention is geared toward children or young adults and yields meaningful impacts on health care costs for individuals receiving Medicare decades in the future.

In addition to distorting policymakers' understanding of the net cost of preventive health policies, a narrow budget window also fails to distinguish between effective and ineffective interventions. Because a ten-year window misses most or all of the savings from an effective obesity prevention policy, a ten-year cost estimate for such a policy would not differ from a ten-year estimate for an ineffective one.

The Study

This study constructs an illustrative model of the long-term budget impact of obesity prevention policies, accounting for the Medicaid, Medicare, Social Security, and tax effects of preventing obesity. The model demonstrates the complexities involved in reaching a long-term cost estimate. Using four obesity prevention policies and programs as examples, the model generates lifetime (i.e., 75-year) per-capita savings estimates for different types of people. In so doing, it makes it possible to compare the discrepancy between 75-year and ten-year cost estimates of a policy to prevent obesity.

General Findings

The largest budgetary benefits from obesity prevention are the federal savings within the Medicare and Medicaid programs that would result from avoiding obesity-related diseases and co-morbidity. Another

benefit to the federal budget of curbing obesity is increased tax revenues. Obese workers earn lower wages on average than normal-weight workers, and higher wages resulting from obesity prevention would yield more tax revenue. Healthier workers may also enjoy longer careers and greater productivity, both of which increase tax revenues.

These cost decreases and tax revenue increases add up to significant federal budget savings over the long term. On the other side of the ledger, the federal government would have higher entitlement program costs because people who avoid obesity generally live longer.

Because the greatest amount of benefit, and thus federal savings, is achieved by preventing obesity in childhood, the study concludes that the most appropriate budget window for preventive health measures is 75 years. In addition, there is precedent for a 75-year window: a recent CBO study of an increase in the cigarette tax included a 75-year cost estimate, and CBO, along with the Social Security and Medicare trustees, routinely provides 75-year projections for those programs.

Illustrative Savings Analyses

The federal budget impact of preventing obesity differs depending on an individual’s income, age, and gender, among other characteristics. This study examines four obesity prevention programs/policies to illustrate the net costs for different types of individuals.



1. Obesity screenings (represents average taxpayer, age 22 through end of life).

Assuming that obesity screenings result in a child avoiding becoming obese throughout his or her life, the indirect lifetime federal savings estimate for an average married female taxpayer who is a secondary earner would be \$44,100, and for an average male taxpayer, \$113. If obesity screenings were responsible for

helping 1 million children and teens maintain normal weight throughout their lives as average income earners, estimated federal savings (excluding the cost of the intervention) would range from \$113 million (if all boys) to \$44.1 billion (if all girls).

2. SCHIP childhood obesity demonstration project (represents average Medicaid enrollee, age 19 through end of life).

Assuming the strategies devised through this demonstration result in a child avoiding becoming obese throughout his or her life, the indirect lifetime federal savings estimate for an average female Medicaid beneficiary would be \$41,500, and for an average male Medicaid beneficiary, \$30,600. If the obesity demo were responsible for 1 million children who are future Medicaid

beneficiaries maintaining normal weight throughout their lives, federal savings (excluding the cost of the intervention) would range from \$30.6 billion (if all boys) to \$41.5 billion (if all girls).

3. Diabetes Prevention Program (DPP) (represents average participant, age 51 through end of life). For a 51-year-old female participant, the wage effect of obesity prevention is reduced relative to a younger woman, making the indirect federal savings estimate \$18,400. As there is no statistically significant wage effect for men, the estimate for a comparable man is \$113, the same as a younger man not on Medicaid. If the DPP helped 1 million people in this age range maintain normal weight, estimated federal savings over 75 years (excluding the cost of running the DPP) would be \$113 million for 1 million male workers and \$18.4 billion for 1 million female workers.

4. Weight-loss drugs in Part D (represents average Medicare beneficiary, age 65 through end of life). Covering weight-loss drugs under Medicare Part D would only affect Medicare beneficiaries, thus excluding the wage effect for women. The savings estimate for a female Medicare beneficiary is thus \$11,400. For a male Medicare beneficiary, the savings estimate is again \$113. If weight-loss drugs helped 1 million older adults achieve normal weight, estimated federal savings (excluding drug costs) would range from \$113 million for 1 million men to \$11.4 billion for 1 million women.

Next Steps

Given the clear evidence that obesity contributes significantly to increased federal health care costs and adversely impacts workers' incomes, policymakers need more thorough budgetary analyses that can capture the long-term impact of effective obesity prevention policies. Particularly with the budget constraints lawmakers currently face, it is critical to identify the most effective preventive measures, and that goal can only be achieved with a longer budget window.

Properly modeled, effective obesity prevention measures will demonstrate their cost-containment effects outside the ten-year budget window. The next step beyond the illustrative case studies presented here would be for CBO to develop full-scale 75-year cost estimates that reflect the variation in health status and income levels.

Introduction

Costs associated with obesity threaten the viability of the U.S. health care system and must be addressed for the sake of the societal and fiscal well-being of the nation. One impediment to pursuing obesity prevention policies lies in how their budgetary impacts are assessed. With the exception of Social Security reform proposals, the Congressional Budget Office (CBO) generally provides cost estimates of proposed federal legislation for only the first ten years. Preventive health policies, such as those targeting obesity, are often long-term endeavors, which means that the benefits from effectively designed policies—including savings for federal government health care programs—may not be realized in just ten years.

Furthermore, an ineffective preventive policy cannot be distinguished from an effective policy with the same initial cost if the budget horizon is too short. When it comes to obesity prevention, CBO's standard ten-year budget window is inadequate for assessing the long-run budgetary impact of various policy options and distinguishing between and among competing options. In short, the ten-year window effectively distorts policymakers' perspective on preventive health policies by focusing on the initial cost of the interventions and failing to capture the full scope of the policies' impact in the long term.

This study illustrates the importance of longer-run CBO estimates of the budget impact of preventive health policies, specifically those aimed at obesity prevention. It is important to note that this study focuses exclusively on federal budgetary effects and does not address assessments of policies' cost-effectiveness. In this, the study takes its cue from CBO, whose cost estimates are strictly concerned with changes in revenues and outlays that proposed legislation would induce for the federal government.

Because the greatest amount of benefit, and thus federal savings, is achieved by preventing obesity in childhood, a 75-year estimate would capture the full scope of savings, whereas a ten-year estimate would include little or none of these savings.

The study is divided into two parts. Part 1 establishes the issues surrounding obesity, including the steady rise in obesity, the associated health problems and costs, and proposed or implemented strategies and policies to reduce obesity's prevalence. This first part also provides background on CBO's cost estimates and discusses the challenges inherent in estimating the budget impact of preventive health measures. To reinforce the importance of overcoming these challenges and persevering in making longer-term budget estimates, Part 1 concludes with examples of preventive measures whose costs in the initial ten years are dramatically offset by savings in the following years.

If CBO were to offer a longer-term budget estimate for preventive health policies, it would be no small task, as the costs and overall savings to the federal government are multifaceted. Part 2 delineates the many components of a broadened framework for cost estimates and incorporates these components in an illustrative model. This model demonstrates the complexities involved in reaching a long-term cost

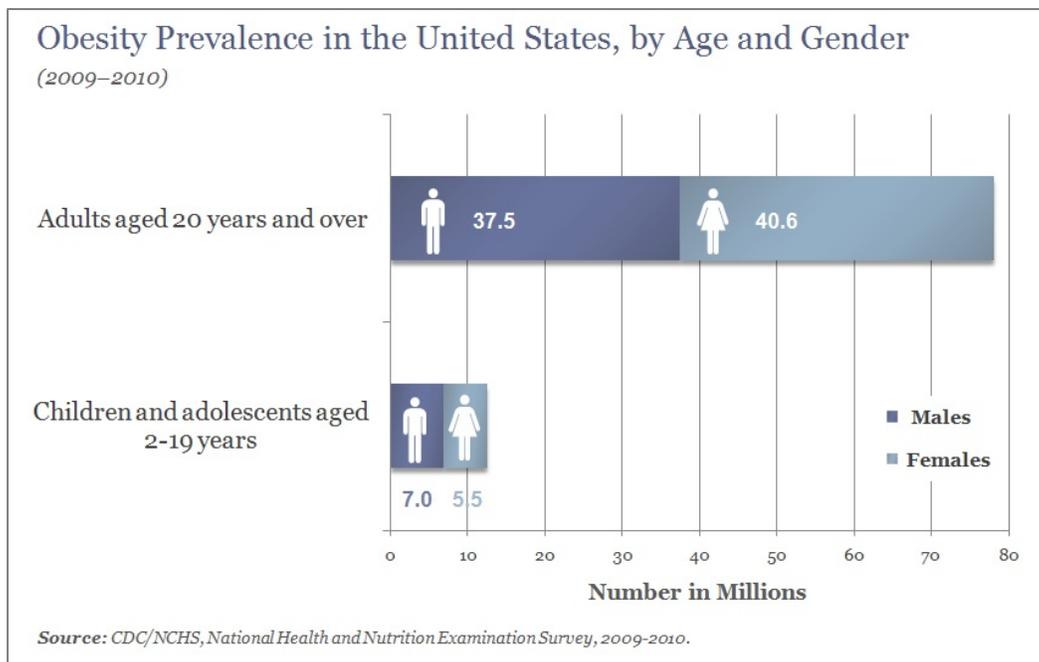
estimate. Equally important, it makes it possible to produce—and quantify the discrepancy between—a lifetime (i.e., 75-year) and a ten-year cost estimate of a hypothetical policy to prevent obesity. Because the greatest amount of benefit, and thus federal savings, is achieved by preventing obesity in childhood, a 75-year estimate would capture the full scope of savings, whereas a ten-year estimate would include little or none of these savings.

The model presented in this study could serve as a template for CBO in constructing a model of its own to estimate the long-term budget impact of preventive health policies. With more complete information, policymakers would be able to consider the merits of proposed preventive health legislation based on the legislation’s long-run budget impact as well as other standards of measurement, such as effectiveness, efficiency, and quality of life.

Currently, however, policymaking revolves almost entirely around near-term budget concerns. This is not without reason, given repeated federal deficits in excess of \$1 trillion and an increase in the amount of outstanding federal debt held by the public as a share of the overall economy (the debt-to-GDP ratio) from 36 percent in 2007 to an estimated 76 percent in 2013. However, to resolve this critical macroeconomic fiscal challenge, policymakers need to also focus on long-run spending challenges in federal entitlement programs—particularly health care programs—and pay careful attention to preventive health measures.

Part 1: Obesity and the Budget Window

Obesity has been a rapidly growing problem in the United States. Though recent data from the Centers for Disease Control and Prevention (CDC) indicate some moderation in obesity prevalence in some states, the situation remains serious.



In 2009–2010, over 35 percent of adults were obese, while 17 percent of young people age 2–19 were obese. This equates to 78 million obese adults and 12.5 million obese children and teenagers (Ogden et al. 2012). As the above chart illustrates, of obese adults, over 40 million were women, and over 37 million were men. Among children who were obese, girls comprised over 5 million, and boys, 7 million. Compared to a generation ago, three times as many children and adolescents are obese (CDC 2012a). Adult obesity has more than doubled in just the last two decades—in 1990, all fifty states had obesity rates under 15 percent. In 2011, 39 states had obesity rates of 25 percent or more, and 12 of these had rates of 30 percent or above (CDC 2012b). Recent research that relies in part on the National Health and Nutrition Examination Surveys concludes that in 2040, 47 percent of men and 51 percent of women in the United States may be obese (Preston et al. 2012).

In this analysis, obesity is defined by body mass index (BMI), which is calculated as a person’s weight in kilograms divided by their height in meters squared. Among children, CDC defines obesity as a BMI at or above the 95th percentile for a specific age and gender (CDC 2012c). For adults, a BMI of 30 or higher defines a person as obese (CDC 2012d).

There are serious health problems associated with obesity, including increased risk of type 2 diabetes, high blood pressure, heart disease, certain types of cancer, gallbladder disease, stroke, osteoarthritis, asthma, and depression, among other health issues and diseases (NIH 1998 and Dixon 2010).

For example, over 25 million people have diabetes in the United States, with annual direct and indirect costs associated with the disease totaling \$174 billion (CDC 2011a). Among diabetic adults, 95 percent have type 2 diabetes (CDC 2012e). And among people with type 2 diabetes, nearly 55 percent are obese, while 85 percent are overweight or obese (CDC 2004).

Health care spending due to obesity is estimated to be as high as 21 percent of total national health care spending. By 2030, U.S. health care costs for obesity are expected to rise by \$48 billion–\$66 billion.

Cancer is estimated to kill over half a million people and cost over \$200 billion annually in the United States (American Cancer Society 2013), and obesity increases the risk of developing certain types of cancer. Among men and women newly diagnosed with cancer, 4.4 percent and 7.5 percent of cases, respectively, are attributable to obesity (Polednak 2008). Certain cancers have much higher rates. For women, the cancers most attributable to obesity are endometrial and esophageal, with roughly 40 percent of new cases due to obesity. For men, the cancers with the greatest link to obesity are liver and esophageal—with 32 and 36 percent of new diagnoses, respectively, attributable to obesity (Ibid.).

Nationally, health care spending due to obesity is estimated to be as high as \$210 billion (in 2008 dollars), or 21 percent of total national health care spending (Cawley and Meyerhoefer 2012). By 2030, U.S. health care costs for obesity are expected to rise by \$48 billion–\$66 billion (Trust for America’s Health 2012). When also accounting for the non-medical costs of obesity both to individuals, such as

food and clothing expenses, and to employers, such as absenteeism and lost productivity, the overall annual cost of being obese is estimated to be \$450 billion annually (McKinsey & Company 2011).

Given the quality of life concerns, health care costs, and other financial burdens associated with obesity, the federal government has been increasingly interested in preventing people from becoming obese. The obesity-related costs specific to the federal government are discussed in greater detail below in the context of CBO budget estimates. The next section looks more closely at the type of federal preventive health policies in existence and under consideration.

Federal Policies and Programs for Preventing Obesity

The primary areas of focus for obesity prevention are physical activity, diet, education, and medical interventions when necessary and appropriate. This section offers an overview of the current state of obesity prevention at the federal level, looking individually at existing programs, proposed policies and strategies, and recent legislation containing measures to facilitate obesity prevention. As discussed in greater detail below, CBO is, by statute, responsible for estimating the federal budget impact of Congressional proposals. Therefore, although obesity prevention also takes place at the individual, community, local, and state levels, this section is limited to federal programs and strategies exclusively.

The federal government engages in a wide variety of policy measures aimed at obesity prevention. For example, a recent study by the Government Accountability Office (GAO) (2012a) found that combined federal preventive health spending (of which weight loss and obesity prevention programs were a subset) exceeded \$25 billion annually, not including policies contained within Medicare and Medicaid.

Existing programs. The majority of federal efforts to curb obesity are geared toward children. Longstanding federal programs for children, which incorporate nutrition-specific obesity prevention components, include Head Start; the National School Breakfast and Lunch Programs; and the Special Supplemental Program for Women, Infants, and Children (WIC). On the physical activity front, the Department of Education offers grants through the Carol M. White Physical Education Program (PEP) to local educational agencies or community-based organizations to run programs designed to help K–12 students meet state physical education standards. In addition, First Lady Michelle Obama’s *Let’s Move!* campaign, in conjunction with the White House Task Force on Childhood Obesity, is “dedicated to solving the problem of obesity within a generation.”

Other programs to improve nutrition and physical activity and reduce obesity are administered at the state level but funded by the federal government. For example, CDC’s Division of Nutrition, Physical Activity, and Obesity funds state-based obesity prevention efforts for children and adults in 25 states. Other federal programs that cover both children and adults include the Department of Agriculture’s Supplemental Nutrition Assistance Program, which provides financial assistance to low-income people to purchase food, and Child and Adult Care Food Program (CACFP), which provides healthy meals to low-income people.

In addition, the Prevention and Public Health Fund (PPHF), established in the Affordable Care Act (ACA), provides grants to federal agencies, states, and private organizations for a variety of activities related to

preventive health. According to GAO (2012b), fiscal year 2010 PPHF awards targeting obesity totaled over \$50 million, including \$35 million for Communities Putting Prevention to Work and \$9.1 million for obesity media activities. In fiscal year 2011, the PPHF awarded \$0.7 million for seven contracts promoting obesity prevention in early childhood and \$8.6 million for two contracts for anti-obesity communication campaigns. Also in fiscal year 2011, nearly \$40 million went to Chronic Disease Prevention and Health Promotion Programs within state health departments.

Finally, the National Diabetes Prevention Program is an existing federal program aimed at preventing type 2 diabetes—one of the most prevalent and costliest obesity-related diseases (Trust for America’s Health 2012). According to CDC (2011a), the program “showed that lifestyle intervention to lose weight and increase physical activity reduced the development of type 2 diabetes by 58% during a 3-year period. The reduction was even greater, 71%, among adults aged 60 years or older.”

Proposed policies and strategies. The Institute of Medicine (IOM) in 2012 released a comprehensive strategy for obesity prevention. Driven by the belief that no single policy can prevent obesity, the IOM report includes recommendations for leaders across the spectrum, including health care and public health professionals; child care and early childhood education regulators; federal, state, and local government agencies; urban planners, architects, and developers; and state and local health departments. Those recommendations aimed at the federal government include federal support for translating scientific evidence into guidelines for physical activity, the expansion of healthy vending/concession guidelines to all government-owned and -operated locations, federal funding for a national social marketing campaign for physical activity and nutrition, and the potential implementation of a nutrition labeling system for the fronts of food packages.

The IOM’s proposed measures to reduce obesity among children include federal requirements for both a K–12 food and nutrition curriculum and a K–12 physical education curriculum that includes benchmarks for progress.

The National Center for Children in Poverty in 2012 made recommendations for obesity prevention in early childhood. On the federal level, these include expanding WIC and CACFP and reducing existing barriers to participation, such as correcting the discrepancy between CACFP reimbursement and actual cost (Banghart 2012).

While the majority of federal obesity prevention programs target childhood obesity, some specific policies are tailored exclusively to adults and older Americans on Medicare. For example, H.R. 6666, legislation introduced by Representative Ron Kind (D-WI) during the 112th Congress, would have allowed for the coverage of prescription drugs for chronic weight management for obese or overweight Medicaid and Medicare Part D beneficiaries with a weight-related co-morbidity.

Recent legislation containing preventive health measures. In recent Congresses, proposed legislation incorporating obesity prevention measures include the MEAL Act, the FIT Kids Act, the National Obesity Prevention Act, the Healthy Lifestyles and Prevention America Act, and the Health Promotion FIRST Act, among others (Ferguson et al. 2009).

Several bills that include obesity prevention programs have been enacted into law recently. In February 2009, the Children’s Health Insurance Program Reauthorization Act established the Childhood Obesity Demonstration Project to provide grants to “eligible entities” to “develop a comprehensive and systematic model for reducing childhood obesity” (Sec. 401, P.L. 111-3). The ACA included \$25 million in funding for the demonstration, which is being run through CDC. In September 2011, CDC announced the four project grantees—three research facilities (University of Texas Health Science Center at Houston, San Diego State University, and Massachusetts State Department of Public Health) and one evaluation center (University of Houston). The project will conclude in September 2015, whereupon CDC will publish the findings and recommendations (CDC 2011b).

The ACA also included a provision that requires health insurance providers to fully cover items or services that the U.S. Preventive Services Task Force (USPSTF) recommends with an “A” or “B” rating. The USPSTF recommendation for obesity screening by clinicians for adults and children age 6 and older received a “B” rating. According to the Kaiser Family Foundation (2011), removing cost-sharing for preventive services will increase the likelihood that people will request them: “While a number of factors contribute to use of preventive services, out-of-pocket costs in the form of copayments and deductibles can act as a barrier, keeping even the insured from seeking recommended screenings, counseling, and immunizations.”

Finally, the Healthy, Hunger-Free Kids Act (also called the Child Nutrition Reauthorization Act), signed into law in December 2010, reauthorized and provided additional funding to federal child nutrition programs, expanded eligibility among children for school meal programs, and set nutrition standards for both school meal programs and food served in schools outside of a meal program (in vending machines, school stores, and à la carte lines), among other changes.

Surgical interventions. Different types of surgeries, known collectively as bariatric surgery, are available to help already obese people lose weight. Bariatric surgery has been shown to be effective in decreasing an individual’s food intake through various means, including gastric bypass, gastric banding, or the removal of part of the stomach (NIH 2011). A Medicare beneficiary is eligible for bariatric surgery if he or she has a BMI of 35 or higher, suffers from an obesity-related health issue, and has been unable to lose weight with other medical treatment (CMS 2013). Medicaid coverage of bariatric surgery is determined at the state level. In 2010, Medicaid programs in forty-five states offered coverage, with various restrictions (Lee et al. 2010).

Background on CBO Cost Estimates

As mentioned above, CBO is required by statute to provide cost estimates of proposed legislation. The law that established CBO—the Congressional Budget and Impoundment Control Act of 1974—set various tasks for the agency, including the following:

The Director of the Congressional Budget Office shall, to the extent practicable, prepare for each bill or resolution of a public character reported by any committee of the House of Representatives or the Senate (except the Committee on Appropriations of each House) . . . an estimate of the costs which would be incurred in carrying out such bill or resolution in the fiscal

year in which it is to become effective and in each of the 4 fiscal years following such fiscal year, together with the basis for each such estimate. . . . (Sec. 402, P.L. 93–344)

The cost estimates that CBO produces compare federal outlays and revenues as they would be under current law with what they would be if the proposed legislation were enacted. CBO reports the budget effects in three areas: discretionary spending (e.g., defense, education, transportation, etc.), mandatory spending (e.g., Social Security, Medicaid, Medicare), and revenues, though estimates of tax policy changes are performed by the Joint Committee on Taxation (CBO 2013a).

Although the law only requires CBO to provide a five-year cost estimate, it has become accepted practice for the cost estimates to span ten years. While ten years may be sufficient for many types of legislation, preventive health measures, such as those designed to reduce obesity, can have long-run budgetary consequences that are very different from their ten-year impact. In fact, very little of the federal savings they induce may be captured in the first ten years, especially if the interventions are geared toward children or young adults and yield meaningful impacts on health care costs for individuals receiving Medicare decades in the future.

Preventive health measures, such as those designed to reduce obesity, can have long-run budgetary consequences that are very different from their ten-year impact. In fact, very little of the federal savings they induce may be captured in the first ten years.

In short, for effective obesity prevention and other preventive health measures, the narrowness of CBO’s focus and methodology yields incomplete cost estimates (O’Grady and Capretta 2012). Furthermore, such a narrow budget window for long-run policy interventions fails to assist policymakers

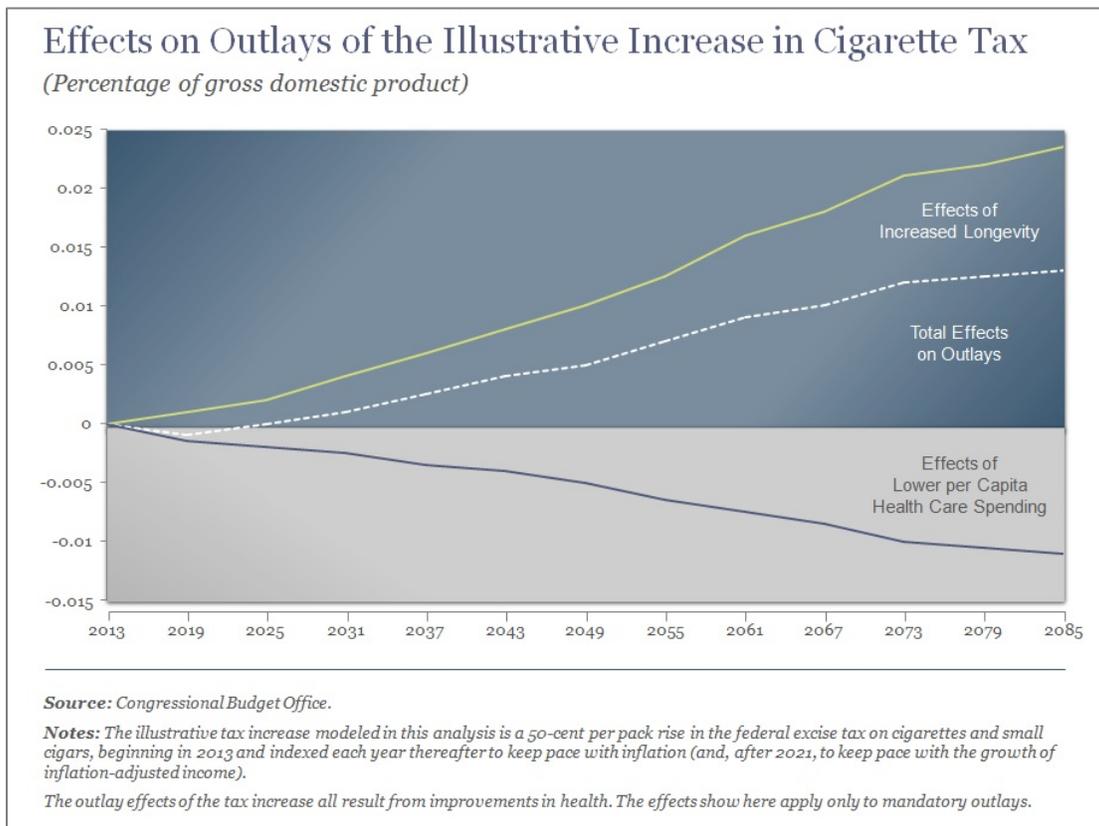
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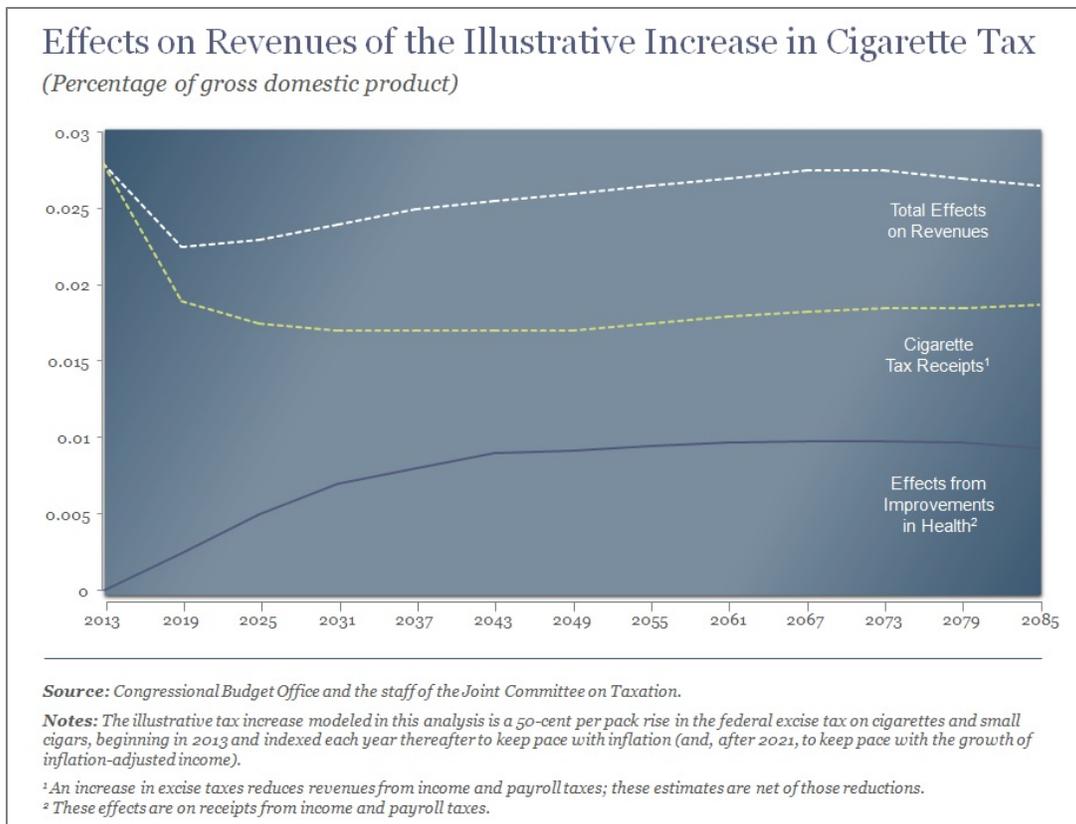
CBO is already aware of the shortcomings of the ten-year window for assessing preventive health measures. In a lengthy report on the health and budget effects of raising the cigarette tax, the agency acknowledged, “The budgetary effects of a policy, such as a cigarette tax increase, that changed health behaviors would not be fully realized within the standard 10-year budget window” (CBO 2012a, p. 56).

The CBO report on the cigarette tax did calculate a long-term score—through 2085. The chart below shows the estimated outlays from a \$0.50 per-pack tax increase. The difference between the anticipated outlays in 2023 (when the ten-year budget window would end) and the anticipated outlays in 2085 is remarkable. In approximate terms, the outlay effect of this tax increase is near \$0 over ten years but is about 0.012 percent of gross domestic product (GDP) per year in the long run, equivalent to about \$190 billion a year in today’s economy. This increase in spending can be disaggregated into two distinct effects: 1) the longevity impact, which increases spending as more individuals stop smoking and live longer, and 2) the per-capita health care spending effect, which reduces outlays because of an individual’s improved health status. In the case of smoking, the longevity effect dominates.

While traditional CBO scoring is reported in nominal dollars, this CBO chart reports the outlay effect relative to GDP. Thus, even at the end of the extended budget window, when total outlays appear to level off, they are actually increasing at the nominal growth rate of the economy.



The following chart shows CBO’s estimated long-run revenue impact from the \$0.50 per-pack tax increase. As the chart shows, in 2023, direct revenues from the excise tax are not drastically higher than they are expected to be in 2085, relative to GDP. But over time, the improvement in the health status of the workforce results in additional hours worked nationally. This increase in the labor supply results in higher payroll and income taxes. That effect is relatively small within the first ten years, but it eventually offsets almost half of the outlay effect induced by longevity. Overall, when combined with anticipated outlays, the total budget impact in 2085 is quite different than it is in the ten-year window.



Despite CBO’s acknowledgement of the insufficiency of the ten-year budget window for cost estimates of preventive health measures, the agency notes that there are serious challenges to regularly estimating preventive health measures’ budget impact. These challenges are discussed next.

Challenges to Estimating Preventive Health Measures’ Budget Impact

Cost estimates of preventive health policies are difficult to determine because a policy’s impact is usually multifaceted and its effectiveness is difficult to assess. GAO has reported on the limitations inherent in estimating costs and savings from this type of policy and attributes the difficulty to “the multiple factors that can affect these estimates, including the need to make assumptions and a lack of key data . . . as well as a lack of widespread agreement on what constitutes a preventive health activity” (GAO 2012a, p. 32). Furthermore, while many policies are well-intentioned, the actual federal resources being spent may include significant “leakages,” dollars being diverted to administrative purposes instead of actual interventions. In addition, some federal dollars may displace local, state, or private funds that would have been spent on preventive health had the federal dollars not been provided.

When it comes to preventive measures aimed specifically at obesity, GAO’s general assessment of these challenges is complicated further by the unique problems obesity presents. CBO articulates the issues surrounding policies targeting obesity thus:

Unlike smoking, which involves a unique substance that is not healthy in any quantity, obesity is the end result of several interacting factors that are not all intrinsically unhealthy. One of those

factors is obviously diet, which can be hard to regulate because many foods are safe to eat in moderation. Another key factor is lack of exercise, a bad habit that—like a poor diet—can be difficult for individuals to change and is particularly difficult for policymakers to influence. Approaches for losing weight reflect those difficulties: A variety of interventions appear to succeed in the short run, but relatively few participants are able to maintain their weight loss for a long period of time. Keeping to a lower weight may require longer-lasting, and potentially more expensive, approaches. (Elmendorf 2009, pp. 4–5)

While some public health advocates may disagree with the intensity of CBO’s claim, there are undoubtedly certain policies targeting obesity that will not yield long-run improvements in health status. Yet, other policies can be effective. And as long as the federal government funds preventive health measures, accurate estimates of their true, long-run budget impact will be essential. Cost estimates simply must incorporate long-term costs and savings because stopping at ten years yields a distorted picture of the policies’ budget impact. Those policies that are highly effective over the long run could potentially result in net savings to the federal government. Conversely, obesity prevention policies that are poorly designed, poorly targeted, or not effective will rightly have long-run cost estimates far greater than the cost shown within the ten-year budget window.

Examples of Ten-Year Budget Window’s Inadequacy

The most compelling evidence of the inadequacy of a ten-year budget window is the existence of many studies that have found preventive health measures to be cost-effective or cost-saving significantly beyond ten years. This section looks at two such studies on smoking cessation and one on obesity. The focus of these studies is not the budget window specifically; the applicability of the findings to the duration of CBO’s budget estimates is incidental.

Lifetime medical costs of obesity. Particularly relevant to the subject at hand is a 2008 study by Duke University economist Eric A. Finkelstein and colleagues in the journal *Obesity*. Finkelstein, a well-known expert on the economics of obesity, and coauthors estimate and compare lifetime medical costs of obesity from starting ages of 20 and 65. They conclude that “from the perspective of a 20-year-old adult, the short-term costs of obesity are relatively modest. This results because many of the diseases that obesity promotes are not prevalent until older ages” (Finkelstein et al. 2008, p. 5).

Given this, there is clearly little immediate savings opportunity from obesity prevention among younger adults. Because the costs of obesity are largely deferred until individuals’ later years, the real costs (and thus potential savings) occur in Medicare, even for people who are obese in their younger years. This is important for two reasons: 1) the federal government ends up being on the hook for much of the medical costs associated with obesity, and 2) the savings from a government obesity prevention program targeting youth would not be realized for decades.

Raising the legal smoking age. A study in the journal *Health Policy* examines the health benefits and cost savings of raising the legal smoking age in the United States to age 21 (Ahmad 2005). In addition to the smoking-driven health care costs borne by society (which comprise Medicare, Medicaid, out-of-

pocket, and private insurance expenditures), the study includes the cost the government incurs in enforcing compliance of the new minimum age and the cost to sellers of checking purchasers' IDs.

The study presents total costs at ten, twenty, and fifty years (in constant 2003 dollars). As the author clarifies, "A simulation period of 50 years was chosen to ensure that much of the lifespan of the individuals who would be affected by the policy would be included and the gradually accumulating health benefits of the policy change would be captured" (p. 82). Indeed, at ten years, the policy is estimated to have societal savings of \$10.5 billion, and at twenty years, \$39 billion. At fifty years, societal savings are more than fivefold the twenty-year estimate, at \$212 billion.

School-based anti-tobacco education. A study in the journal *Preventive Medicine* analyzes a national anti-tobacco education program targeting seventh and eighth graders (Tengs et al. 2001). As in Ahmad (2005), the medical savings are calculated at the societal level. The authors estimate that the health care savings induced by a school-based program would be \$0.48 billion–\$1 billion over 25 years. Notably, they calculate that the savings over fifty years would be four times greater than over 25 years.

Explaining the reason why savings quadruple when the time period under analysis is doubled, Tengs et al. write: "Savings occur because those youth influenced by the program in the early part of the century will have aged sufficiently to reap the long-term health gains from avoiding tobacco use" (p. 564).

While the authors ultimately deem the school-based anti-tobacco education program cost-effective, it is not cost-saving, as the cost to run the program ends up outstripping the estimated savings. But, had the analysis stopped at 25 years (or earlier), the long-term benefits would have been largely excluded. For example—and of particular relevance to the question under discussion in this study regarding the length of the budget window—the ten-year cost of running the anti-tobacco education program is estimated at roughly \$1.9 billion.

Savings outside the ten-year budget window. While Finkelstein et al. (2008), Ahmad (2005), and Tengs et al. (2001) are not exclusively focused on government health care costs and are not necessarily interested in the budget window, their findings, and the findings of many others, point unequivocally to the inadequacy of only examining ten years of a preventive health policy's budget effect. In fact, because the federal government's responsibility for national health care costs are disproportionately weighted toward the costs incurred by the elderly, the share of total societal cost borne by the government increases over the budget window.

This is not to say that a preventive health measure should be assumed by its nature to be either cost-saving or cost-effective. As health policy experts point out in the *New England Journal of Medicine*, "Although some preventive measures do save money, the vast majority reviewed in the health economics literature do not. Careful analysis of the costs and benefits of specific interventions, rather than broad generalizations, is critical" (Cohen et al. 2008). It is, in fact, because only some preventive health measures yield meaningful cost benefits beyond the traditional ten-year budget window that it is so critical to have a broader time horizon. Given the budget constraints facing lawmakers, it will be critical to identify the most effective preventive measures, and that goal can only be achieved with a longer budget window.

Part 2: Analysis

As Part 1 of this study has established, the need for a longer budget window is clear. However, there are complexities involved in estimating a preventive health measure's long-term budget effects in order to reach a true, long-term cost estimate. Understanding these complexities is the first step in creating a broadened framework for thinking about an appropriate budget window for preventive health policies. The next step is incorporating these components into a budgetary model that would yield a more accurate estimate of the budget impact of these policies.

Broadened Framework for Longer-Term Cost Estimates

This study distinguishes between the costs of a preventive health intervention itself and the costs and savings the intervention would induce. For simplicity, the intervention is considered the “direct effect” of the policy, while costs and savings brought about by the policy are called its “indirect effects.” This section delineates the indirect budgetary effects to the federal government from a policy that succeeds in reducing the number of obese individuals. It is important to note that, in addition to the long-term federal savings and increased revenue that a successful obesity prevention policy would induce, a longer budget window must also include the longer-term costs of obesity prevention—namely, the costs associated with increased life expectancy. This section first addresses the long-term positive budget impact, followed by the costs.

Reduced federal health care spending and increased federal revenue. The largest budgetary benefit from obesity prevention would be the federal savings within the Medicare and Medicaid programs that would result from avoiding obesity-related diseases and co-morbidity. The reality is that obese patients are far more expensive to treat than normal-weight patients. There is no mystery about why this is the case. According to public health experts, “Although pharmaceutical, medical, and surgical interventions to treat obesity are available, these treatments remain rare. As a result, the costs attributable to obesity are almost entirely a result of costs generated from treating the diseases that obesity promotes” (Finkelstein et al. 2009, p. 829). As discussed in Part 1, obesity-related diseases include type 2 diabetes, heart disease, certain types of cancer, asthma, depression, and gallbladder disease, among others.

A subcategory of Medicare and Medicaid savings would be the reduced spending on obesity-induced disability. This would also result in savings to Social Security, with fewer people on Social Security disability insurance or Supplemental Security Income.

Another benefit to the federal budget of curbing obesity is increased tax revenues. In short, obesity prevention would lead to higher wages, which would yield more tax revenue. This is the case because obese people on average earn lower wages than normal-weight workers. For women in particular, academic research has shown obesity to be linked to lower wages. For men, the evidence is not as certain. There is debate over what causes wage discrepancy between obese and non-obese workers—whether it is tied to productivity, the result of discrimination, or compensating for health care costs for employer-sponsored health plans (Bhattacharya and Bundorf 2009). However, in consideration of CBO's budget window, only the existence of the discrepancy is relevant because, in essence, lower wages

mean less tax revenue for the federal government. In addition, healthier workers may also enjoy longer careers. This effect would be in addition to any wage impact of obesity. For example, a non-obese worker may be less likely to retire early at 62. Additional years of work will also increase tax revenues.

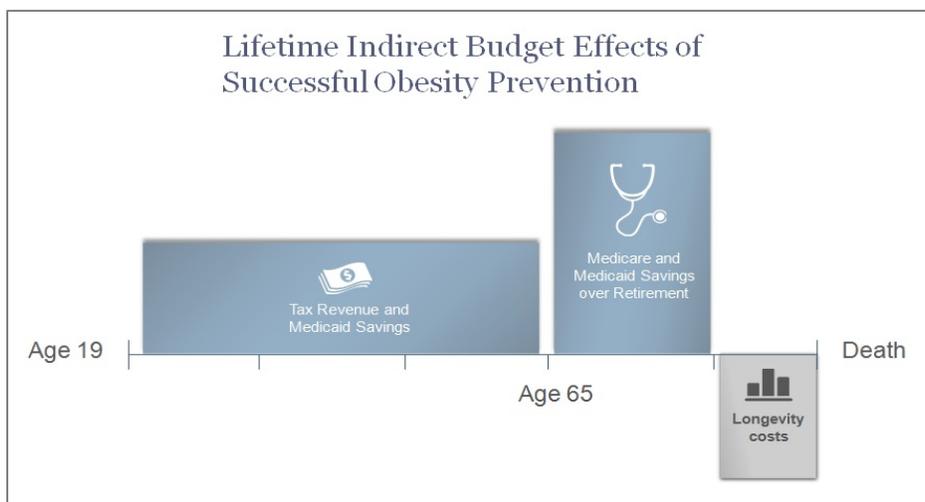
Last, obesity among workers also reduces productivity, with a total cost of as much as \$66 billion per year (Hammond and Levine 2010). Higher levels of productivity affect CBO’s budget forecasts thus:

Forecasts of productivity growth play a critical role in forecasting potential output, which is CBO’s estimate of the amount of output that the economy would produce with a high rate of use of its capital and labor resources. As such, CBO’s forecast of potential output shows how much the economy can sustainably grow during periods of expansion and determines the trajectory of gross domestic product (GDP) in the later years of the agency’s 10-year forecasts. (CBO 2013b, p. 7)

Overall, the revenue effect, whether through increased hourly wages, an increase in labor supply, or both, will result in additional revenue from income and payroll taxes. This effect was a key component of the CBO analysis of the long-term impact of increasing the tobacco tax discussed above. As such, it is certainly a factor that CBO is capable of recognizing and modeling if the agency were to consider the long-run impact of effective obesity prevention policies.

Increased federal entitlement program spending. On the other side of the ledger, obesity prevention produces the same indirect “problem” as effective tobacco cessation programs—both increase life expectancies, and there are costs associated with increased longevity. Namely, when people live longer, the government spends more on Medicare, Medicaid, and Social Security.

Lifetime indirect budget effects. The following chart offers a visual representation of the long-term indirect budget effects of preventing obesity, from early adulthood through retirement and death.



Quantifying these costs and savings requires an application of the broadened framework just outlined. The next section undertakes such an application by constructing a model that illustrates how CBO could approach a long-term cost estimate of a preventive health policy targeting obesity.

Modeling Long-Term Indirect Budget Effects of Obesity Prevention

The model constructed for this study uses national averages for the types of indirect costs and savings delineated above. In current ten-year cost estimates, CBO captures the short-term direct cost of a preventive health intervention and any indirect effect that occurs within the budget window. If the intervention is ongoing, estimating its long-term direct cost is simply a matter of extending this cost over the longer budget window and adjusting for population growth, inflation, and/or real growth, as appropriate. But to estimate the true long-term budget impact of a policy aimed at curbing obesity, CBO would need to also incorporate the long-term indirect effects. The model in this study illustrates the components—positive and negative—that CBO should consider when modeling these effects.

There are multiple types of models that could be employed for this analysis, but the model constructed here is intended to be simple to understand, supported by sufficient empirical evidence, and closely aligned with an approach that CBO could pursue. It is a binary, per-capita model that estimates the tax and spending impact of preventing an individual from becoming obese or helping a person achieve and maintain normal weight. Because the model is binary, meaning that it only captures the effects of a large change in an individual's BMI, there may be additional benefits that are not being captured here from incremental weight loss. Similarly, the model does not distinguish between obese (BMI>30) and morbidly obese (BMI>40).

The model constructed here is intended to be simple to understand, supported by sufficient empirical evidence, and closely aligned with an approach that CBO could pursue.

Positive long-term indirect effects of obesity prevention. Estimates of increased tax revenue and reduced health care spending resulting from successful obesity prevention are constructed as follows:

Inputs Affecting Tax Revenue Analysis

- In a review of eleven studies on obesity's wage effect, Dor et al. (2010) find that obese men on average are not likely to have lower wages than men of normal weight. For women, however, obesity does appear to have a negative relationship to wages, with estimates of lost wages ranging from 1.5 percent up to 15 percent. This model uses an estimate from Baum and Ford (2004), which finds that obese women's wages are lower by 6.1 percent. This estimate is corroborated by the analysis conducted by Dor and colleagues.
- According to the Bureau of Labor Statistics (2013), average wages in 2012 were \$35,932 for women. A female worker at this wage level who earns 6.1 percent more by avoiding obesity would make on average an additional \$2,192 (in 2012 dollars) in annual wages.
- The Tax Policy Center (2013) calculates the average effective marginal tax rate (EMTR) on labor income to be 22.9 percent. At this rate, annual additional income tax revenue from a woman avoiding obesity would be approximately \$502.

- Incorporating payroll taxes can present a challenge because they sometimes result in higher Social Security benefits in retirement. However, for a married person who is a secondary earner, Social Security benefits are calculated based on the primary earner's record. Thus, payroll taxes that secondary earners pay do not result in extra Social Security benefits. For a male secondary earner who avoids becoming obese, there is no payroll tax effect because there is no statistically significant obesity wage effect. For a female secondary earner, the EMTR for income and payroll taxes is 34.7 percent (TPC 2013), yielding annual additional federal tax revenue of approximately \$761.
- For the lowest quintile of earners, however, the average EMTR is -0.9 percent. Therefore, for a low-income female worker who avoids obesity, there is actually a negative federal tax impact from higher wages. This negative tax effect is the result of the Earned Income Tax Credit (EITC). Depending on a worker's income, the EITC can provide a tax subsidy for increased amounts of work. To account for this effect, this model includes a woman who has one child and earns the federal poverty level for 2012 (\$15,130). A woman in these circumstances who avoids obesity would earn \$946 more per year, with a tax impact of -\$9 annually.

Annual additional income tax revenue
\$502 per average female worker
\$761 per average female secondary earner
-\$9 per average low-income female worker
\$0 per average male worker

Medicaid and Medicare Savings

- In the most widely cited study of payer-specific per-capita medical spending attributable to obesity, Finkelstein and colleagues (2009) estimate that, on average, an obese Medicaid enrollee in 2008 cost \$1,021 more than a normal-weight enrollee. On average, 57 percent of Medicaid spending is attributable to the federal government. Based on these estimates, in 2012 dollars, an obese person on Medicaid costs the federal government an extra \$663 per year compared to a normal-weight enrollee.
- Finkelstein and colleagues estimate that an obese Medicare beneficiary in 2008 cost on average \$1,723 (\$1,964 in 2012 dollars) more than a normal-weight beneficiary.

 - Cawley and Meyerhoefer (2012) find that an obese woman has annual medical expenditures \$3,613 higher than a non-obese woman, while a man has obesity-related costs of \$1,152. In addition, they find that Medicaid spending for obese individuals is

Federal Medicaid savings
\$663 per Medicaid enrollee per year

Medicare savings
\$1,964 per Medicare beneficiary per year

\$3,674 higher than for non-obese individuals. These estimates are significantly greater than the widely cited Finkelstein et al. (2009) results and are in some respects preferable because the statistical techniques are superior. However, Cawley and Meyerhoefer’s findings for men and Medicaid beneficiaries are not statistically significant due to their large standard errors, and the results are largely driven by the impact of the most obese patients in the sample. For these reasons and to ensure a conservative approach, the model constructed here uses Finkelstein et al. (2009) estimates.

Negative long-term indirect effects of obesity prevention. Estimates of long-term indirect costs of successful obesity prevention are constructed as follows:

Increased Longevity

- Public health experts estimate that a normal-weight man and woman at age 65 have life expectancies of 82.53 and 86.15 years, respectively. An analogous obese man and woman have life expectancies of 80.93 and 84.75 years, respectively (Yang and Hall 2008).
 - Other estimates of obesity’s longevity effect include Olshansky et al. (2005), who conclude that, absent obesity, life expectancy at birth would be higher by 0.3–1.08 years, depending on gender and race. Fontaine et al. (2003) estimate years of life lost to obesity and find significant variation based on age, gender, race, and BMI. This report uses the Yang and Hall (2008) estimates of increased life expectancy—1.6 years for a man and 1.4 years for a woman—because the illustrative model does not consider race.

Social Security Longevity Cost

- According to the Social Security Administration, the average monthly benefit (not specific to a retired worker’s wages during his or her working life) at the beginning of 2012 was \$1,230. This means that the federal government would pay on average an additional \$23,616 for a man and \$20,664 for a woman who avoids becoming obese and lives to the average normal-weight life expectancy.

Social Security longevity cost
\$23,616 per average man (1.6 years)
\$20,664 per average woman (1.4 years)

Medicare Longevity Cost

- During the additional years of life that result from avoiding obesity, per-beneficiary spending in Medicare would be lower than it would be for obese individuals. Finkelstein et al. (2009)

Medicare longevity cost
\$7,553 per male beneficiary (1.6 years)
\$6,745 per female beneficiary (1.4 years)

estimate that health care spending for an obese Medicare beneficiary exceeds spending for a normal-weight beneficiary by 36.4 percent.

- Based on this estimate, total federal costs for a male Medicare beneficiary would be \$7,553 (in 2012 dollars) during the 1.6 years of increased life expectancy, and for a female beneficiary during her 1.4 additional years, \$6,745 (in 2012 dollars).

Implications for Budget Window Length

The model outlined above has clear implications for the future of CBO cost estimates for preventive health measures. In short, it indicates that a more meaningful and appropriate budget window for preventive health measures would be 75 years because it would capture a more accurate picture of the costs and savings to the federal government over the lifetime of someone who avoids becoming obese. Supporting this move is the fact that there is precedent for a 75-year window: CBO's own study of the cigarette tax described in Part 1 of this report included a 75-year cost estimate. In addition, the Social Security and Medicare trustees routinely provide 75-year projections for those programs.

As mentioned above, the majority of federal savings from obesity prevention is achieved through children becoming normal-weight adults and eventually normal-weight retirees. A budget window of a decade is far too short to capture these savings, but even a window covering a few decades would miss significant savings from preventing obesity in children.

In addition, as mentioned above, an important benefit of a longer budget window is that it would allow policymakers to distinguish between effective and ineffective preventive health policies. While CBO does incorporate in its cost estimates evidence regarding a policy's estimated effectiveness, ten years is not enough time for the savings induced by an effective obesity prevention policy to make the policy distinguishable from an ineffective one.

On the subject of policymakers weighing whether to pursue a preventive health policy, Finkelstein et al. (2010) rightly points out: "The requirement for cost savings is an extremely high bar for publicly funded health promotion efforts and may ultimately prove infeasible. This is not to say that efforts should not be made to address obesity, but only that cost savings may not be the appropriate justification." In other words, some preventive health measures may be worth pursuing despite their costs.

As O'Grady and Capretta (2012) explain: "One way of measuring this balance between clinical benefit and cost is through quality adjusted life years (QALY). The calculation of the QALY measures the amount of clinical benefit achieved for the dollars spent. In this way it provides within a single data point the

A more meaningful and appropriate budget window for preventive health measures would be 75 years because it would capture a more accurate picture of the costs and savings to the federal government over the lifetime of someone who avoids becoming obese.

tradeoff between clinical improvement and cost.” However, because this study is intended solely to examine the potential long-run federal budgetary impact of obesity prevention policies and does not evaluate the societal benefit (or cost) of these policies, QALYs are not considered in this study.

Scoring Analysis: 75-Year Indirect Savings Estimates

This section presents illustrative 75-year savings estimates for the federal government from obesity prevention measures. Modeling four of the obesity prevention policies or programs outlined in Part 1 showcases the

indirect long-term budget impact for different segments of the population, illustrating the components that CBO should consider in a long-term model. Shown at right, the 75-year savings estimates (all in 2012 dollars) for each of the four case studies are described in detail below.



1. Obesity screenings (represents average taxpayer, age 22 through end of life). Because the USPSTF recommendation for obesity screening by clinicians for adults and children age 6 and older received a “B” rating, health insurance providers are required by the ACA to fully cover these screenings. Assuming that obesity screenings result in a child avoiding becoming obese throughout his or her life, the indirect lifetime federal savings estimate for an average married female taxpayer who is a secondary earner would be \$44,100, and for an average male taxpayer, \$113.

Based on CDC data, an estimated 23.5 million U.S. children and teenagers age 2–19 are overweight or obese. If a preventive measure were responsible for helping 1 million children and teens maintain normal weight throughout their lives as average income earners, estimated federal savings (excluding the cost of the intervention) would range from \$113 million (if all boys) to \$44.1 billion (if all girls).

Clearly, preventing a woman from becoming obese has a much higher positive budgetary impact for the federal government. The near zero indirect impact for males in this example is the result of the decreased health care costs being almost exactly offset by the additional longevity cost. For the females in this example, higher wages are the predominant factor driving the positive long-run indirect result.

To construct a large-scale long-term cost estimate for obesity screening, further research is needed on the effectiveness of screenings. For example, a report for the Agency for Healthcare Research and

Quality has noted the lack of randomized controlled trials to evaluate whether obesity screenings for adults improve health outcomes (LeBlanc 2011).

2. SCHIP childhood obesity demonstration project (represents average Medicaid enrollee, age 19 through end of life). The new obesity prevention demonstration focuses on low-income children. Assuming the strategies devised through this demo result in a child avoiding becoming obese throughout his or her life, the indirect lifetime federal savings estimate for an average female Medicaid beneficiary would be \$41,500, and for an average male Medicaid beneficiary, \$30,600.

If the obesity demo were responsible for 1 million children who are future Medicaid beneficiaries maintaining normal weight throughout their lives, federal savings (excluding the cost of the intervention) would range from \$30.6 billion (if all boys) to \$41.5 billion (if all girls). In this case, the savings for men and women are high primarily because of reduced Medicaid spending. In both cases, the Medicare spending effects—from improved health and longevity—result in only a small net impact.

Once the demonstration’s grant recipients issue their strategies and recommendations in September 2015, the interventions’ direct costs and likely effectiveness can be modeled in conjunction with the indirect budget effects calculated here.

3. Diabetes Prevention Program (represents average participant, age 51 through end of life). The average age of a participant in the Diabetes Prevention Program (DPP) clinical trial was 51 (Diabetes Prevention Program Research Group 2000). For a female participant of this age, the wage effect is reduced relative to a younger woman, making the total indirect federal savings estimate \$18,400. As there is no statistically significant wage effect for men, the estimate for a comparable man is \$113, the same as a younger man not on Medicaid.

Based on CDC and Census data, approximately 14 million people age 45–54 are obese. If an intervention helped 1 million people in this age range maintain normal weight, estimated federal savings over 75 years (excluding the cost of running the DPP) would be \$113 million for 1 million male workers and \$18.4 billion for 1 million female workers.

In an assessment of scaling up the community-based DPP to the national level, Thorpe and Yang (2011) estimate that “building the capacity to deliver the community-based diabetes prevention program nationally (that is, conducting protocol training, data collection and reporting, and outreach) would cost about \$80 million . . . [and] that delivery capacity could reach fifteen million at-risk adults” (p. 1675). It should be noted that, while diabetes is a disease closely linked to weight and obesity, the DPP is not focused on obesity prevention specifically. A large-scale estimate of the long-term budget impact of this program would need to take this into account.

4. Weight-loss drugs in Part D (represents average Medicare beneficiary, age 65 through end of life). Covering weight-loss drugs under Medicare Part D would only affect Medicare beneficiaries. For a woman, the wage effect is excluded since the policy only affects her in retirement. The federal savings estimate for a female Medicare beneficiary is thus \$11,400. For a male Medicare beneficiary, the savings estimate is again \$113, as there is no male wage effect to begin with.

Among U.S. adults age 65 and over, 13 million are obese (Fakhouri et al. 2012). If an intervention helped 1 million older adults achieve normal weight, estimated federal savings (excluding drug costs) would range from \$113 million for 1 million men to \$11.4 billion for 1 million women.

In a study of the savings achievable through weight loss among Medicare beneficiaries, including the effect of weight-loss drugs, Thorpe et al. (2013) note, “Aggregate savings to the Medicare program will depend on the number of seniors with overweight and obesity who take the medication, and the cost of drug to Medicare each year.” A budget window as long as 75 years clearly is not required in estimating the costs of a policy that targets Medicare beneficiaries and has a relatively immediate effect, but 10 years remains insufficient. For the sake of consistency in budget assessments for preventive health measures, a 75-year window is still appropriate.

Ten-year vs. 75-year estimates. In the first two cases, a ten-year budget window could potentially capture a small amount of either the wage effect or Medicaid savings for a young adult, but it would exclude all Medicare savings and, if the individual in question were low-income, a large portion of the Medicaid savings that a 75-year window would capture. In the second two cases involving adults more advanced in age, a 75-year budget window is not required, but 10 years is insufficient to capture the savings from someone who lives several decades in retirement at normal-weight.

In each scenario, the potential savings for a woman is clearly greater than for a man, particularly among average workers. But if the wage effect of obesity is shown to be statistically significant for men, lifetime savings for a man could be far greater. It is also important to note that a proper accounting of the costs and savings of an obesity prevention policy over 75 years would discount future year budget impacts. The model constructed here does not incorporate any present value analysis in order to be consistent with conventional CBO methodologies.

Limitations of Illustrative Model

To produce an accurate long-term cost estimate of an obesity prevention policy, CBO would need to rely on its own assumptions regarding the wage effect (and appropriate tax rates), the health care savings effects in Medicare and Medicaid, and the longevity effects of reducing obesity. Also critically important is that CBO ascertain the expected level of effectiveness of the obesity prevention measure in question. Some obesity prevention programs may have only a temporary effect; others may entail costly side effects; some policies may only be effective among a fraction of those who are treated or exposed to the intervention; and, of course, other preventive measures may be wholly ineffective. The model presented here focuses only on the indirect effects of a policy assumed to effectively and permanently prevent an individual from being obese.

Other limitations of the model stem from the fact that it simplifies potentially important factors. It does so to demonstrate a key point about the value of a longer-range budget window, but it is important to note several simplifying assumptions it makes.

- 1) The model only provides estimates for men and women, but obesity prevalence—and therefore cost—varies by race, gender, and geographic location (Wang and Beydoun 2007). A more

thorough analysis for an entire population would consider these additional budgetary variations and weight the results based on the overall affected population.

- 2) The model assumes that all individuals reach retirement age, but some fraction of individuals who benefit from a preventive health intervention may die prior to retirement. Depending on when death occurs, the positive revenue effect may not be fully realized.
- 3) The model excludes several areas of federal savings for the sake of simplicity: 1) savings through the Department of Defense from obesity prevention in the military and through the Department of Veterans Affairs among veterans, 2) disability savings and productivity gains that would accompany obesity prevention, and 3) the payroll tax increase for female primary earners.
- 4) Finally, adult Medicaid enrollees in the model remain on Medicaid without interruption, which is not often the case. In addition, the model does not include “dual eligibles,” low-income elderly individuals who are eligible for both Medicare and Medicaid. Federal spending on dual eligibles is estimated to be over three times the cost for non-dual eligible Medicare beneficiaries (Young et al. 2012 and Jacobson et al. 2012). It is unclear from existing academic research exactly how much of this extra cost is obesity-related. If the proportion is high, savings from preventing people in this cohort from becoming obese would be even greater. If the proportion is low, spending during the years of increased longevity in this cohort would be higher.

Clearly, to reach an accurate long-term cost estimate using the framework outlined in this study, CBO would need to account for the components currently excluded from the illustrative model. Simply put, to construct a valid long-term cost estimate, CBO would need to more closely represent the policy and program realities as well as health trends in the United States.

Nevertheless, for select representative case studies, this model captures the primary components affecting federal revenues and spending. As the results indicate, the long-run indirect budgetary impact for certain individuals, especially young women, is quite significant. Conversely, reducing obesity among older, median-income males may have roughly offsetting net budgetary impacts.

Conclusion and Next Steps

While there are many legitimate complications associated with cost estimates over many decades, this report has made clear that a ten-year window presents a distorted perspective on the actual federal budgetary impact of an effective health prevention measure. Despite some evidence that obesity rates have declined in certain areas and among certain demographics, the overall upward trend in health care expenditures and the serious strain that entitlement spending will place on the overall federal budget in the coming decades make it increasingly important to identify and pursue policies that will have a positive long-run impact on these programs.

Toward that end, this study has shown that, properly modeled, effective preventive health measures will demonstrate their cost-containment effects outside the ten-year budget window, while ineffective measures will be shown to yield no such long-term benefits. Policymakers concerned about the rise in obesity rates in the U.S. and the associated increase in health care costs must be able to distinguish between effective and ineffective policies, and a longer-run budget analysis can serve as a critical

component for that decision-making. This conclusion assumes, of course, that sufficient empirical evidence exists to convince CBO staff that effective interventions do, in fact, yield statistically significant and quantifiable economic and budgetary impacts. Such valid empirical evidence is accumulating among qualified researchers, though additional data and analysis are necessary with regard to specific policies and other economic and budgetary factors.

As this study demonstrates, the budgetary impact of an effective policy intervention can vary considerably. For example, the short budget window most negatively misrepresents an effective policy geared toward children—girls in particular. Successful childhood obesity prevention could result in higher wages, additional tax revenues, and lower federal health care costs that total, over 75 years, as much as \$44.1 billion for every 1 million average female earners helped. But a ten-year budget window would capture the cost of the intervention and virtually none of these savings.

The next step beyond the illustrative case studies presented here will be to develop full-scale cost estimates that reflect the variation in health status and income levels. This may require CBO to build or expand a microsimulation model that is capable of reflecting relevant population characteristics (i.e., one that represents the income, age, gender, and weight distribution among the population) and the associated economic and budgetary consequences of obesity.

CBO's existing research related to Social Security reform and the agency's long-term model, CBOLT, may be useful on this front. As CBO (2009) notes, "CBOLT models Social Security in detail at the individual level, but the current version of the model projects health care spending at an aggregated level in its actuarial section." As such, one possible avenue for strengthening CBO's analytical capabilities would be to extend the CBOLT model to capture obesity-related factors explicitly. This approach would be a significant departure from CBO's current approach to modeling long-term health care costs, which depends on projections for excess cost growth. CBO (2012b) defines excess cost growth as "the increase in health care spending per person relative to the growth of potential GDP per person after removing the effects of demographic changes on health care spending." CBO's efforts to impute educational status to the representative sample of individuals in the CBOLT model may imply a willingness to further refine and improve this model (CBO 2009).

Alternatively, CBO could pursue modeling strategies more closely aligned with the techniques utilized to measure the long-run impact of an increase in the tobacco tax (CBO 2012a), as discussed earlier in this study. That work, much like the model results presented here, highlights the effects of an increase in the tobacco tax on additional labor supply, reduced health care costs per capita, and the cost impact of increased longevity.

Finally, CBO will need to carefully and clearly distinguish the costs of increased longevity for policymakers' consideration. CBO's cost estimates are not designed to account for increase in quality of life and thus omit societal benefits that obesity prevention offers outside the budget. While quantifying these benefits is outside CBO's bailiwick, policymakers should not ignore them. As health care economist Charles Roehrig (2013) asks, "Why should primary prevention be put on the defensive over its successful reduction of premature mortality?"

Ideally, CBO would report the long-term budgetary impacts of all preventive health measures in a manner similar to its recent long-run analysis of an increase in the cigarette tax, by isolating the effects of lower per-capita health care spending from the effects of increased longevity. Such an approach would capture the aggregate, long-run budget impact but also permit policymakers to distinguish among various cost drivers and between outlay and revenue effects of effective policies.

In conclusion, given the clear evidence that obesity contributes significantly to increasing federal health care costs and adversely impacts workers' incomes, policymakers need more thorough budgetary analyses that can capture the long-run impact of effective prevention policies.

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