

Societal Costs of Obesity: How Can We Assess When Federal Interventions Will Pay?

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The 2001 report *The Surgeon General's Call To Action To Prevent and Decrease Overweight and Obesity* identified overweight and obesity as major public health problems costing U.S. society as much as \$117 billion a year and posing as large a threat of morbidity as poverty, smoking, or problem drinking. This striking conclusion is leading public health officials to search for new ideas to increase the effectiveness of programs designed to influence diet, exercise, and other weight-reducing lifestyle choices.

Proposed government programs that might reduce the incidence of

overweight and obesity can be assessed from a variety of perspectives. Economists can project the financial benefits and costs of a program. When net benefits (benefits minus costs) are positive, programs are said to be an efficient use of public resources. Programs with negative net benefits are said to be inefficient use of taxpayer funds.

Estimates of net benefits of public health programs are useful for guiding policy decisions because there are limits to the financial resources the public and private sectors can commit to public health. Armed with net benefit estimates, policymakers can more easily iden-

tify programs that are likely to prevent many illnesses and premature deaths at little cost, as well as those that are likely to add little to public health at great expense. Guiding expenditures toward low-cost, high-return programs and away from the opposite will likely enable public health programs to generate the biggest possible improvements in public health.

As obesity is a relatively new area for economic inquiry, notions of program costs and benefits are not yet fully formed. As a first step, we identify issues in estimating costs and benefits of programs intended to reduce the incidence of obesity and overweight. We note that costs, even when large, should not be the only consideration in selecting policies that contribute to health and well-being.

Cost-of-Illness Estimates Suggest Obesity Is a Major Public Health Problem...

The Surgeon General's report leaves no doubt that excess weight is a major public health problem in the United States. Overweight and obesity are associated with an increased risk of many diseases, including coronary heart disease; Type 2 diabetes; endometrial, colon, postmenopausal breast, and other cancers; and musculoskeletal disorders, such as knee osteoarthritis.

A ban on ice cream might make people thinner but in restricting choice and limiting satisfaction, such an action could actually make people worse off.

Credit: Comstock.



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The estimated \$117-billion societal cost of overweight and obesity is composed of \$61 billion in direct costs and \$56 billion in indirect costs. Direct costs include medical expenditures for preventative, diagnostic, and treatment services. Indirect costs include lost wages resulting from people being unable to work because of illness, disability, or premature death. The direct costs alone equal 4.7 percent of total (public and private sector) U.S. health care expenditures in 2000, estimated by the Health Care Financing Administration to be \$1.3 trillion. The Centers for Disease Control and Prevention (CDC) estimated annual direct and indirect costs of tobacco use at \$100 billion.

Estimates of premature mortality also portray obesity as a public health problem comparable to tobacco use. The Surgeon General's report notes that annual deaths linked to obesity total 300,000, a number roughly equal to the populations of several large U.S. cities, including Anaheim, Toledo, and Buffalo. The 2000 Surgeon General's report on reducing tobacco use attributed 400,000 deaths a year to tobacco-related diseases.

...And That Costs Are Likely To Rise

While current costs of obesity are troubling, likely future costs also raise concerns. The CDC has reported that smoking and cigarette use has, in general, been in a long-term decline. Obesity rates, on the other hand, have been growing. In fact, rates have increased across all ages, races and ethnic groups, both genders, and every State.

Indeed, obesity rates could continue to increase for many years if the trends in childhood obesity provide a reliable guide to adult obesity rates. The Surgeon General's report indicates the share of children who are overweight nearly doubled from the late 1970s (7 percent) to 1999 (13 percent), and the share of adolescents who are overweight al-

most tripled (from 5 percent to 14 percent) in the same period.

The adverse health consequences of obesity are typically realized among the middle aged and older. As overweight children are more likely than healthy-weight children to become overweight adults, and overweight adults are likely to remain overweight, the continual increase in obesity rates is likely. Given the wide range of diseases resulting from obesity, it seems likely that the costs associated with obesity will also continue to rise.

Cost-of-Illness Estimates Do Not Fully Capture Effects on Societal Well-Being

The estimates of direct and indirect costs of illness due to overweight and obesity confirm that these conditions have a major effect on consumers' expenditures. Cost-of-illness estimates, however, are not the most appropriate measures to use in analyzing the costs and benefits of public sector programs intended to reduce the incidence of obesity. Estimates of direct and indirect costs of illness account for the shift in consumer expenditures from general consumption goods, and from savings and investment, to medical goods and services. The estimates also account for the drop in productivity resulting from illness or premature death. The estimates, however, suffer from two important problems: they do not measure changes in income for the economy as a whole, and estimates of change in economic activity—no matter how thorough or accurate—are not ideal measures of changes in societal well-being.

Direct costs for medical services indicate a redirection of economic activity but do not correspond to a drop in income for the economy as a whole. The estimates do not account for potential growth or contraction in other sectors of the economy that might be triggered by obesity-related health problems. For example, some medical services

industries might expand due to increasing obesity rates while an array of consumer product industries might contract as consumers have less disposable income. The net change could be positive or negative. Further, direct cost estimates do not include defensive expenditures, such as expenditures on weight-loss programs.

Cost-of-illness estimates also fail to account for social well-being, as economic activity and social well-being are not equivalent concepts. Cost-of-illness estimates include only marketed goods and services, that is, those with an observed market price. Thus, cost-of-illness estimates do not include the considerable value of pain and suffering associated with disease.

The usual cost-of-illness estimates include direct costs incurred across the entire U.S. population. Indirect cost estimates, however, leave out the well-being of people outside the paid labor force, including housewives, the retired elderly, and the infirm. Since these groups have no earnings that might be compromised by their inability to work, changes in their health status have no impact on the indirect component of cost-of-illness estimates. As workforce status and earnings vary systematically with race and gender, estimates of indirect costs will also vary along these lines, potentially leading to the untenable conclusion that obesity is more costly for some subpopulations than others.

Benefits Are Measured by Their Worth to Affected Individuals

To more accurately assess the benefits and costs of public health policy options, economists have adopted an approach that focuses on preferences rather than on costs. In other words, economists determine the worth of a program's health benefits to those whose health risks might be reduced. This approach recognizes that Government programs can sometimes reduce health risks, but no Govern-

ment program can promise longer life or complete freedom from certain diseases, such as cancer.

As individuals routinely make decisions that trade off money for health risk, economists can estimate the value individuals place on risk reduction. Economists preparing cost-benefit analyses of Federal programs intended to reduce health and safety risks often value reductions in fatal risks at \$5 million per fatality (in December 1990 dollars), adjusting the value upward for inflation and sometimes adjusting for the age of the at-risk population.

The \$5-million estimate comes largely from studies of labor markets, in which economists have related wage rates to risk choices and calculated the risk-dollar tradeoff workers make. Clearly, no one exchanges his or her life for \$5 million. Rather, economists have observed that a \$500 per year wage premium is required to induce workers to accept a 1-in-10,000 risk of a fatal on-the-job injury. In other words, one fatal injury could be expected among 10,000 workers accepting the wage premium. In total, employers may pay a \$5-million wage premium to 10,000 workers accepting such risks.

Using this approach, benefits to individuals of eliminating just the mortality risks associated with obesity would be significantly larger than the cost-of-illness estimate (including deaths and chronic illnesses). However, obesity raises unique cost issues. Even with obviously large estimates of benefits, public health intervention may not be an efficient use of resources, as the cost of an obesity-reduction program is likely to include more than just the tax revenues required to pay for the program. For example, there would not be any benefits from Government-subsidized exercise equipment unless consumers incurred the costs of using the equipment. This issue raises the question, Would weight-reducing programs that emanate from the Government (even those offer-

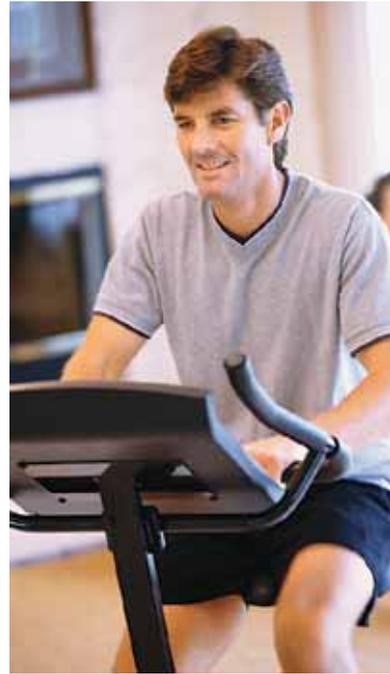
ing enormous benefits) involve costs to individuals that are larger than the risk-reducing benefits they would bestow?

Intervening To Reduce Obesity Can Carry High Costs to Individuals

Weight depends on energy (calorie) intake and energy expenditure. When energy intake exceeds energy expenditure over extended periods, weight increases. Genetic predisposition enables some individuals to use energy faster than others, such that some people have more difficulty managing weight. In other words, the cost of weight management—the time spent exercising or being generally active or the care with which food choices must be made—varies significantly among individuals.

Diet and lifestyle choices yield many outcomes other than weight status, and most people consciously or subconsciously choose among alternative outcomes every day. For example, the choice between going to the gym to exercise or spending an extra hour in the office may be a choice between weight reduction and high job performance. The fact that many people make diet and lifestyle choices cognizant of the adverse consequences for their weight suggests that keeping weight off or losing weight involves difficult and costly sacrifices for many individuals.

This effect poses a difficulty for public health strategies designed to reduce the incidence of obesity and overweight: by intervening in a manner that reduces individual choices, Government actions can actually make people worse off rather than better off even if it makes them slim. By definition, peoples' preferences are most likely to be satisfied when allowed to make their own choices. For example, a public ban on ice cream and riding lawnmowers might make people thinner, but the restrictions on choice and leisure time may ultimately leave people less satisfied.



Because some bodies burn energy faster than others, the cost of weight management—the time spent exercising or the care with which food choices must be made—varies significantly among individuals.

Credit: Eyewire.

Of course, interventions to reduce obesity need not be so severe as to restrict technologies or ban foods. Interventions could be constructed to create incentives to reduce energy intake or to increase energy expenditure. For example, some health researchers and consumer activists have suggested reducing energy intake by taxing fatty foods, soft drinks, or high-fat snacks and subsidizing consumption of fruit and vegetables. Similarly, people might increase energy expenditures if exercise equipment or exercise programs were subsidized. However, even these less coercive interventions would impose high costs on many individuals. For example, people who consume fatty foods in moderation and do not need to lose weight are not likely to welcome proposals for new taxes. Those who are overweight may not find a tax at the checkout counter a sufficient incentive to reduce consumption of foods that give them enjoyment, leaving many individuals to foot the tax bill but few to enjoy the weight-reduction benefits. Economists have not yet determined the levels of taxes and subsidies necessary to change health outcomes or the costs those changes would impose.

A Role for the Government Rests on the Existence of External Costs

In a market economy, economists frequently argue that Government intervention should be justified by the existence of a market failure. If markets are working well, they argue, then any Government intervention would likely reduce rather than improve economic efficiency. Reflecting this concept, the U.S. Office of Management and Budget requires Government regulatory impact analyses to identify market failures to be solved by proposed regulations even before cost-benefit assessments are conducted. A typical form of market failure is an externality, an external cost imposed (without compensation) on some individuals by the economic activity of others. For example, water pollution generated by a manufacturing plant that reduces the productivity of other downstream plants that rely on a supply of pure water is an externality.

We can extend this concept of market failure and external costs to health. One reason for consider-

ing public sector interventions in health choices is finding that individual health behaviors impose external costs on others. For example, individuals who choose not to be vaccinated against contagious diseases may contribute to the spread of disease. Vaccination requirements can offer benefits to many by reducing disease risks. The key feature of health market failure is observability—one cannot tell by looking at a person whether he or she is carrying a contagious disease. Obesity, however, is easily observable, and that makes it difficult to associate its prevalence with market failure.

Some individuals' lifestyle and diet choices can impose external costs on others when those choices are difficult to observe and monitor. For example, life insurance companies would like to sell policies to people who make diet and lifestyle choices that minimize risks of chronic illnesses. These individuals are likely to pay premiums for many years without filing claims. If insurance companies tried to distinguish between people who truthfully follow a healthy

regime and those who merely claim to do so, they would have to be vigilant in monitoring individuals' diet and lifestyle choices (and that would be expensive), or they would pay many unexpected claims. The individuals who falsely claim to follow a healthy lifestyle impose external costs on those who do. The external cost is the loss of mutually beneficial exchange.

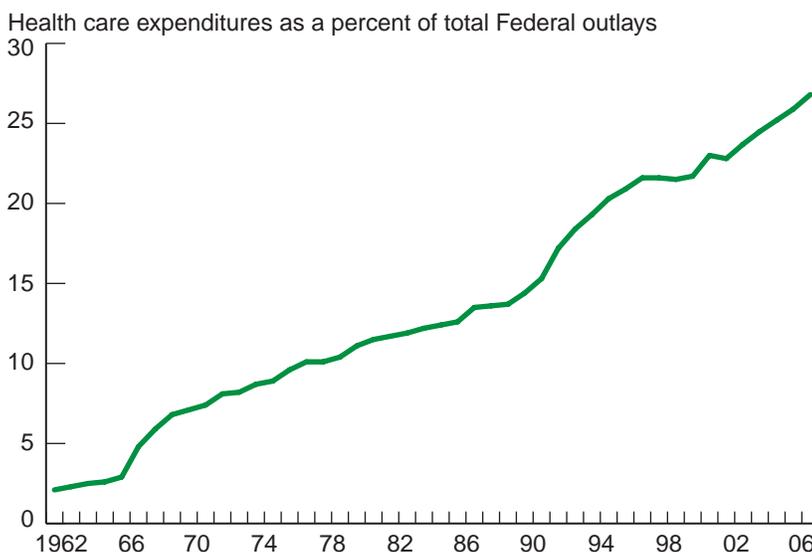
Unlike diet and lifestyle choices, weight status is easily and inexpensively observable. The public health community, in developing and promoting the use of body mass index (BMI), has made identifying overweight and obesity a fairly simple task. Not surprisingly, the private sector takes advantage of this information, such that life insurance rates often rise with weight status. In fact, insurance companies developed the first height and weight table in 1908. Its original purpose was to determine insurance rates based on life expectancy studies.

Through life insurance markets, then, there are financial rewards for behavior that avoids obesity-related health problems. These financial incentives help limit the external costs associated with obesity. Insurance markets, by themselves, cannot solve the obesity problem because life insurance coverage is not universal and health insurance rarely varies with weight status. The absence of risk-based health insurance may not indicate market failure. Instead, its absence may reflect that it is administratively complex to set varying rates when the product is sold at group rates and offered by employers to employees.

Federal Health Care Costs Underscore Need To Manage the Costs of Obesity

Weight status involves personal choices, and these personal choices tend to impose fewer external costs than some other major public health concerns. Together, these factors suggest that finding cost-ef-

Figure 1—Outlays for Health Programs May Soon Exceed 25 Percent of Federal Budget



Note: 2002-06 outlays are estimates.
Source: Budget of the U.S. Government, Fiscal Year 2003, Historical Tables.

fective Government interventions will be challenging. However, the existence of Government health care programs financed by U.S. taxpayers raises potentially large external costs from obesity.

The Federal Government, through the U.S. taxpayer, financially supports a large share of the personal health care in the United States. Since 1966, the Government has supported hospital, physician, and related expenses for the elderly through the Medicare program. Since 1973, the Government has also supported health care for the disabled and for persons with end-stage renal disease. Government-supported health expenses for some low-income individuals and families are provided through the Medicaid program.

These programs compose the largest share of Federal health care expenses. The share of health care expenditures in the Federal budget has grown over the last 40 years and is forecast at approximately one-fourth of all Federal program expenditures over the next 6 years (fig. 1). In 2001, Federal outlays for health programs, at \$429.6 billion, were larger than military expenditures or interest on the national debt.

Because obesity is associated with a wide range of diseases, it represents a large target for those interested in reducing Federal health care expenditures. Assuming the costs of obesity will grow, a program that reduces the incidence of obesity may offer large rewards in the future.

Individual taxpayers may have different preferences regarding the extent of Federal support for health expenditures for the elderly and those classified as low-income, but they are all certain to agree that paying less to achieve a certain level of health is preferable. Thus, it is important to entertain and assess public policy options intended to reduce the incidence of

obesity. Given that we are a nation committed to supporting personal health care expenses for many of our citizens, are there cost-effective programs that are likely to reduce the incidence of obesity? Which type of program offers the greatest reductions in health care spending related to obesity?

The Federal Government has experience with information programs intended to combat obesity. The National Heart, Lung, and Blood Institute (part of the National Institutes of Health) began the Obesity Education Initiative in 1991. The program promotes new medical research to educate health professionals and the public on the links between overweight, physical inactivity, and health risks. Various States are conducting education programs to encourage healthy eating patterns and regular physical exercise. Whether the education programs have or will cut into the rising obesity rates is unknown. Recommendations to maintain a healthy weight may have no effect if overweight individuals do not perceive themselves as overweight (see "Misperceptions in Self-Assessed Weight Status Vary Along Demographic Lines" elsewhere in this issue). Many may already be aware of recommended behavior and have chosen otherwise.

The Surgeon General's comparison of obesity and overweight to smoking may be appropriate for thinking about the difficulty involved in changing human behavior. The public sector has engaged in anti-smoking efforts for four decades. These efforts include Federal, State, and some municipal excise taxes on cigarettes. Many States have imposed restrictions on where smokers may smoke. Numerous education efforts have been tried. Constructing analogous programs for obesity will involve the public sector in numerous diet and lifestyle choices.

References

- Battle, E. Katherine, and Kelly D. Brownell. "Confronting a Rising Tide of Eating Disorders and Obesity: Treatment vs. Prevention and Policy," *Addictive Behaviors*, Vol. 21, No. 6, 1996, pp. 755-65.
- Kenkel, Donald S. "Prevention," *Handbook of Health Economics*, A.J. Culyer and J.P. Newhouse (eds.), Volume 1B, 2000.
- Kuchler, Fred, and Elise Golan. *Assigning Values to Life: Comparing Methods for Valuing Health Risks*, Agricultural Economic Report No. 784, U.S. Department of Agriculture, Economic Research Service, November 1999.
- Nestle, Marion, and Michael F. Jacobson. "Halting the Obesity Epidemic: A Public Health Policy Approach," *Public Health Reports*, January/February 2000, Volume 115, pp. 12-24.
- Philipson, Tomas J., and Richard A. Posner. *The Long-Run Growth in Obesity as a Function of Technological Change*, NBER Working Paper Number 7423, 1999.
- Thompson, David, John Edelsberg, Graham A. Colditz, Amy P. Bird, and Gerry Oster. "Lifetime Health and Economic Consequences of Obesity," *Archives of Internal Medicine*, Volume 159, October 1999, pp. 2177-83.
- U.S. Office of Management and Budget. *Budget of the United States Government Fiscal Year 2003—Analytical Perspectives*, Accessed March 1, 2002, <http://www.whitehouse.gov/omb/budget/fy2003/pdf/spec.pdf>
- Viscusi, W. Kip. "Value of Risks to Life and Health," *Journal of Economic Literature*, Volume 31, December 1993, pp. 1912-46. **FR**