

## RESEARCH REPORT

### **The Economics of Obesity**

*By Inas Rashad & Michael Grossman*

Hardly a day goes by that we do not read about the dire consequences of the increase in obesity. In March, the Centers for Disease Control and Prevention predicted that obesity will overtake smoking as the leading cause of preventable deaths in the United States by next year if current trends continue. "This is a tragedy," Julie Gerberding, director of the Centers, told the *Washington Post*. "We're looking at this as a wakeup call." The obesity problem is real, Gerberding's melodrama notwithstanding, and seems to be worsening each year. The percentage of adults who are obese has doubled since the late 1970s, and tripled among children. From increases in the size of coffins, to increases in the size of pets, to the appearance of new diets and new surgical techniques to lose weight, and to a patent for an in-car system for dieters that weighs them and tells them when they have strayed, the evidence of America's obesity problem is everywhere.

Obesity and sedentary lifestyles accounted for approximately 400,000 deaths in 2000 compared to 435,000 from cigarette smoking, 100,000 from alcohol abuse, and 20,000 from illegal drug use. Obesity costs more in annual medical care expenditures than cigarette smoking — around \$75 billion in 2003 — because of the long and costly treatments for its complications. A large percentage of these costs are borne by Medicare, Medicaid, private health-insurance companies, and ultimately by the population at large rather than by the obese. The so-called "cheeseburger bill" to curb lawsuits against the fast-food industry, which passed the House of Representatives in March, might fend off at least some new costs to the non-obese for the obesity problem, but these costs have grown by more than 3 percent per year during the past few years and show no signs of stopping. To make matters worse, Americans spend \$33 billion annually on weight reduction products. There are often serious health risks associated with some of these products, which can further increase the costs of obesity.

Obesity is measured by the body mass index (BMI), defined as weight in kilograms divided by height in meters squared ( $\text{kg}/\text{m}^2$ ). To calculate body mass index using pounds and inches, multiply weight in pounds by 704.5, then divide the result by height in inches, and divide that result by height in inches a second time. According to the World Health Organization and the National Heart, Lung, and Blood Institute, a BMI value of between 20 and 22 is "ideal" for adults regardless of gender in the sense that mortality and morbidity risks are minimized in this range. Persons with a BMI greater than or equal to 30 are classified as obese. An overweight child (the term "obese" is reserved for adults) is defined as having a BMI above the 95th percentile based on growth charts for children and adolescents in the first National Health and Nutrition Examination Survey (NHANES I), conducted between 1971 and 1975.

As shown by the data in Table 1 for adults and in Table 2 for children, obesity and overweight rates remained steady from approximately 1960 until about 1980. Since then they have spiraled almost out of control. Between 1980 and 2000, the percentage of obese adults grew

from 14 percent to 30 percent, and the percentage of overweight children rose from 5 percent to 14 percent. If we are to grapple effectively with today's obesity problem we need to understand how and why obesity became a problem in the first place.

### **Some possible causes**

Obesity has a large genetic component, and this plays an important role in explaining why a given individual is obese. But genetic characteristics in the population change very slowly, and so they clearly cannot explain why obesity has increased so rapidly in recent decades. Researchers have instead sought to explain obesity by looking at technological changes, changes in taste and consumer habits, and at changes in the social environment. Economists have taken the lead in these efforts. Not surprisingly, they have emphasized the role of prices.

According to the economists Darius Lakdawalla and Tomas Philipson, declines in the real prices of grocery food items caused a surge in caloric intake that can account for as much as 40 percent of the increase in the body mass index of adults since 1980. Technological advances in agriculture caused grocery prices to fall, the authors show, and these declines caused consumers to demand more groceries. Government policy only heightened the effect by encouraging overproduction. Journalist Michael Pollan points to a shift in the early 1970s toward direct farming subsidies as another source of the rise in caloric intake. The old system, an agricultural-support arrangement designed to discourage overproduction of corn and other storable commodities, had much smaller effects on producers' decisions. But the new system "free[d] them to dump their harvests on the market no matter what the price."

Important technological changes in the home kitchen seem to have fostered more caloric intake, too. Economists David M. Cutler, Edward L. Glaeser, and Jessie M. Shapiro, present evidence that the tools responsible for reductions in the time we spend preparing meals at home — at least for certain groups in the population — have contributed to an increase in caloric consumption. Microwaveable meals and other foods that are easy to cook are desirable because they are quicker to prepare; they are also fattier and higher in caloric content.

Other factors that have contributed to the growth in obesity include the decline in physical activity and urban sprawl. Physical exercise has declined since 1980, and that decline is a proximate cause of the increase in body weight. Statisticians Reid Ewing, Tom Schmid, Richard Killingsworth, Amy Zlot, and Stephen Raudenbush have attributed part of the increase in obesity to the degree of urban sprawl, or how conducive a city is to exercise. Urban sprawl is defined as the process through which the spread of development across the landscape outpaces population growth. Those urban areas that offer more transportation choices, are more compact, and have a variety of stores and activity centers within reach have lower rates of obesity. Government spending on roadwork and infrastructure may thus have an influence on the obesity rate by subsidizing sprawl.

### **Restaurants, anti-smoking, and obesity**

While these various factors all clearly matter, we have found in our research with colleagues Shin-Yi Chou and Henry Saffer that several others seem to be more important in explaining trends in obesity. First and foremost, eating out at fast-food restaurants and full-service restaurants seems to be the most important factor in explaining the rise in obesity.

According to our research, as much as two-thirds of the increase in adult obesity since 1980 can be explained by the rapid growth in the per capita number of fast-food restaurants and full-service restaurants, especially the former. It's not hard to imagine how the explosive growth in

these restaurants could fuel the obesity epidemic. Food served in these restaurants has extremely high caloric density, and almost certainly has contributed to obesity. We also found that the very modest growth in the per capita number of fast-food and full-service restaurants accounts in large part for the stability of adult weight in the period from 1960 to 1980, before the first major obesity upswing. During that period, the per capita number of full-service restaurants actually fell. Indications point to restaurant growth as the primary cause of increased obesity after 1980.

What caused this explosive restaurant growth? The principal driver seems to have been the increases in rates of labor force participation by women. As nonwork time for women became increasingly scarce and valuable over the last few decades, time devoted to at-home meal preparation decreased. Families began eating out more often. Indeed, the economists Patricia M. Anderson, Kristin F. Butcher, and Phillip B. Levine find that the rise in average hours worked by mothers can account for as much as one-third of the growth in obesity among children in certain families. In part, the rise in obesity seems to have been an unintended consequence of encouraging women to become more active in the workforce.

We have also unmasked a second and perhaps more surprising culprit in the alarming rise in obesity: the crackdown on smoking via tax increases. Higher cigarette taxes and higher cigarette prices have caused more smokers to quit — but these smokers seem to have begun eating more as a result. According to our research, each 10 percent increase in the real price of cigarettes produces a 2 percent increase in the number of obese people, other things being equal.

Clearly, those who curtail their habit or quit smoking altogether typically gain weight as the appetite-suppressing and metabolism-increasing effects of smoking come to an end. This is no small effect: The inflation-adjusted price of cigarettes has risen by approximately 164 percent since 1980. This large growth resulted in part from four federal excise tax hikes, a number of state tax hikes, and the settlement of the state lawsuits filed against cigarette manufacturers to recover Medicaid funds spent treating diseases related to smoking. The rise in the real price of cigarettes is the second-most important factor next to the growth in restaurants in the trend in the post-1980 obesity trend. We estimate that it accounts for almost 20 percent of the growth in obesity.

Our findings underscore the idea that social action can have unintended consequences: Oftentimes, there is a tradeoff involved in achieving goals that society favors, such as increased food production, more workforce participation by women, and fewer smokers. Lower real food prices have significantly increased living standards. Expanded labor market opportunities for women have increased families' command of real resources and increased equality of opportunity. Cigarette smoking is still the largest cause of premature death among Americans; pushing smokers to quit will have obvious health benefits. But our results and those of other economists also suggest that these efforts contribute to the rising prevalence of obesity. Whether public policies should be pursued that offset this ignored consequence of previous public policy to discourage smoking, increase market opportunities, and make cheaper food available depends on the costs and benefits of these policies.

### **A public concern?**

If obesity were purely a cosmetic problem, the pressing need for answers as to why this has happened and solutions to reverse it would not seem necessary. Yet obesity has been linked to various medical conditions such as hypertension, high cholesterol, coronary heart disease, type 2 diabetes, psychological disorders such as depression, and various types of cancer.

Clearly, obesity carries a high personal cost. But does it carry a high enough social cost to make it a concern of public policy? The answer is no if consumers are fully informed, and if the obese bear all the consequences of their actions. The answer is yes if consumers do not have full information or something that reasonably approximates it, or if third parties like Medicare, Medicaid, private health insurance companies and ultimately the non-obese end up bearing significant amounts of the costs.

It would seem, then, that obesity is a matter for public concern. Clearly, the non-obese do subsidize the obese. Health and life insurance premiums paid by the latter do not fully reflect their higher medical care costs and their higher probability of death. The economists Willard G. Manning, Emmett B. Keeler, Joseph P. Newhouse, Elizabeth M. Sloss, and Jeffrey Wasserman show that this external cost is partially, but not fully, offset by the smaller pension benefits, including Social Security payments, received by the obese, since they die sooner. Raising premiums for the obese could correct this externality, but would raise considerable equity concerns given that obesity has such a large genetic component. Imposition of taxes on "junk food," fast food, or food with a high caloric content might be viewed as a substitute, since the consumption of these types of food is a conscious choice made by individuals. But this policy imposes costs on people who consume these types of food in moderation, too.

Such market externalities generally require correction. An externality arises when the public price of a good is not fully accounted for in the private price. This could come in the form of a positive externality, as in the case of a flu shot that should be cheaper because it benefits society and not simply the person receiving the flu shot. It could be a negative externality, such as when a steel factory emits pollution and does not include the cost of the pollution it is releasing in the price of steel. In these cases, the government might choose to subsidize flu shots and tax the polluting factory in order to correct the externalities or diminish their effect.

Like pollution, obesity should be viewed as a negative externality whose real cost exceeds its market price. Food taxes are one means of correcting this obesity externality, but a better solution than food taxes would be to encourage and reward exercise. Giving benefits to people who exercise and subsidizing facilities and programs for them might be a more promising approach.

The question of whether the government should take an active role in reversing the obesity trend clearly demands more research, but at least a few pros and cons to government action are already apparent. Obesity is at first glance a personal problem, one involving self control and trade-offs between current and future utility. Should the government step in to change incentives and influence decisions? When a person walks into a restaurant intending to order a salad rather than fries but ends up ordering the latter, is it for the government to decide that the person's future utility would be increased if the option to buy fries were somehow not available or not as accessible?

Considering that Medicare and Medicaid finance about half the medical costs associated with obesity, one might be tempted to say that obesity has, by definition, become a public concern. Yet government intervention would seem to have more justification in cases pertaining to children, not adults, since the government is already deeply involved in children's lives as things stand. Through its sponsorship of school programs, school lunches, and recreational facilities, it can more easily and immediately affect the choices of children than adults. The fact that obese children are extremely likely to become obese adults, and that children are less likely to have information about the consequences of their actions or to heavily discount these consequences only strengthens the case. Of course, one would still need to consider the degree of government involvement that is merited. This would depend on the size of the negative external costs that obese adults impose on others, the size of the external benefits of

curtailing childhood obesity, the costs of implementing alternative policies, and the issue of whether it is fair to punish the obese for the costs that they impose on others.

### **Unintended consequences**

The dramatic increase in obesity since 1980 has caused a surge in social-science research on its determinants. Would the people of the past, who toiled through their workdays and often did not have enough food, have predicted this problem? Would those who once dreamed of ending poverty and supplying enough food for all have even imagined that being too fat would become the predominant health risk nationwide?

The main message of contemporary research is that there is no free lunch, that with benefits come costs. Positive changes such as increases in technology, reduced smoking, and increased female participation in the labor force have also carried unforeseen negative consequences. Was the anti-smoking campaign a mistake if it also encouraged obesity? Of course, we do not believe people should start smoking in order to become thin, substituting one type of unhealthy behavior for another. This was simply one of the unintended consequences of social change and government action. Nor do we suggest that women abandon the labor force to provide their families with home-cooked meals. Whether public policies should be pursued that offset the ignored or unanticipated consequence of previous policies that contributed to the rise in obesity will depend, in the end, on these policies' costs and benefits over time.

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Table 1

Trends in Body Mass Index and the Percentage Obese,  
Persons 18 Years of Age and Older<sup>a</sup>

Survey	Period	Body Mass Index <sup>b</sup>	Percentage Obese <sup>c</sup>
NHES I	1959-1962	24.91	12.73
NHANES I	1971-1975	25.14	13.85
NHANES II	1976-1980	25.16	13.95
NHANES III	1988-1994	26.40	21.62
NHANES 99	1999-2000	27.85	29.57

<sup>a</sup>The surveys are as follows: National Health Examination Survey I (NHES I), National Health and Nutrition Examination Survey I (NHANES I), National Health and Nutrition Examination Survey II (NHANES II), National Health and Nutrition Examination Survey III (NHANES III) and National Health and Nutrition Examination Survey 1999-2000 (NHANES 99). Survey weights are employed in all computations.

<sup>b</sup>Weight in kilograms divided by height in meters squared. Actual weights and heights are used in calculation.

<sup>c</sup>Percentage with body mass index equal to or greater than 30.

Table 2

Trends in Body Mass Index and the Percentage Overweight,  
Persons 2 to 17 Years of Age<sup>a</sup>

Survey	Period	Body Mass Index <sup>b</sup>	Percentage Overweight <sup>c</sup>
NHES II-III	1963-1970	18.53 <sup>d</sup>	4.41 <sup>d</sup>
NHANES I	1971-1975	18.16	4.81
NHANES II	1976-1980	18.36	5.01
NHANES III	1988-1994	18.86	10.35
NHANES 99	1999-2000	19.26	14.07

<sup>a</sup>The surveys are as follows: National Health Examination Survey II and III (NHES II-III), National Health and Nutrition Examination Survey I (NHANES I), National Health and Nutrition Examination Survey II (NHANES II), National Health and Nutrition Examination Survey III (NHANES III) and National Health and Nutrition Examination Survey 1999-2000 (NHANES 99). Survey weights are employed in all computations.

<sup>b</sup>Weight in kilograms divided by height in meters squared. Actual weights and heights are used in calculation.

<sup>c</sup>Percentage with body mass index equal to or greater than the 95<sup>th</sup> percentile based on Centers for Disease Control and Prevention growth charts. See <http://www.cdc.gov/growthcharts>.

<sup>d</sup>Data pertain to 6-17 year olds rather than to 2-17 year olds.