

Is the Obesity Epidemic a Public Health Problem? A Review of Zoltan J. Acs and Alan Lyles's *Obesity, Business and Public Policy*

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We review the recent but growing economic literature on the worldwide growth of obesity, relating the review to a recent anthology of articles—Obesity, Business and Public Policy. We discuss the competing explanations for the growth of obesity as well as the role of governments in attempting to limit it.

1. Introduction

The recent rise in obesity has generated enormous popular interest and policy concern in developing countries, where it is rapidly becoming a major health problem. But obesity (which we define broadly and loosely as weight significantly in excess of what the health-care industry deems normal) is not only a public health issue—it is also an economic problem in several respects. First, it is, in major part at least, a function of two choices that people make: the number of calories to consume and the number to expend—the more the former number exceeds the latter, the more weight a person will gain. Consuming calories comes with costs and benefits, and likewise expending

calories through exertion. Second, obesity has changed over time and differs across populations and, to the extent that it is a product of choice, explaining these changes and differences is a task for economics. The rate of the rise in obesity will also depend on biological factors that vary, within a range, across persons and time, but such factors *alone*, including genes, cannot explain the rise in obesity, because it has happened much too quickly to be explicable in evolutionary terms. Third, obesity may create social as well as private costs, and, if so, there is a question whether the government should intervene to try to reduce obesity. Fourth, the answer to that question depends, to the economist, on the cost of alternative methods of public intervention and the benefits, in reducing the social costs of obesity, that each method can be expected to produce. A growing scholarly literature in economics and other social sciences addresses the growth in obesity. We shall discuss the

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positive and normative analysis of obesity found in that literature, but our particular focus is a recent anthology of articles, primarily economic, on obesity—*Obesity, Business and Public Policy* edited by Zoltan J. Acs and Alan Lyles (Elgar, 2007).

From a positive perspective, the long-run growth in obesity is most easily explained by simple changes in the price of consuming and expending calories. Agricultural innovation has greatly reduced the time and resources required to go from hungry to full. Human beings used to spend most of their time and energy on producing food. The switch from agricultural economies to ones based on manufacturing and later services was made possible by a dramatic gain in agricultural productivity that greatly reduced the cost of consuming calories. At the same time, increased productivity through technological changes in other forms of production, notably the movement from manual labor to automation, simultaneously raised incomes and increased the price of spending calories, as exercise was no longer a byproduct of work, as it had been when work was mainly manual. The gym and jogging revolution resulted from the reallocation of exercise from working time to leisure time. These economic changes explain the cross-sectional and time-series patterns of obesity better than do biological factors, addiction issues, and cultural changes, none of which *alone* can explain why Africans are less obese than Americans or why obesity has increased in the near term.

From a normative perspective, we argue that obesity may be more a private health problem rather than a public one. The fact that a population is overweight in a medical sense does not imply that it is necessarily overweight in a Pareto sense.

2. *Positive Aspects of the Growth in Obesity*

Weight is clearly the outcome of diet and exercise, and both of these factors are needed

to explain long-run weight trends in the United States. During the twentieth century, weights rose even when the total consumption of food did not, presumably due to a fall in spending of calories; the immediate post-war period witnessed substantial growth in weight and *declining* consumption of calories. This suggests that analysis of obesity must account not only for food consumption but also for changes in the strenuousness of work and leisure, both at home and in the market, caused by economic development (Darius Lakdawalla and Tomas J. Philipson 2002, 2007; Lakdawalla, Philipson and Jay Bhattacharya 2005).

The neoclassical theory of obesity (Philipson and Richard A. Posner 1999; Lakdawalla and Philipson 2002) stresses that technological change provides the best explanation of the time-series data. While food has gotten cheaper through technological change in agriculture, exercise has gotten more expensive, as work (at home and in the market) has become less physically demanding through technologies that at the same time raise productivity and lower calorie spending. The theory also stresses the complementarities of calorie consumption and calorie expenditure. Cheaper food results in more eating, higher weight, *and* more exercise. Similarly, as the implicit price of exercise rises, there is less exercise, higher average weight, *and* less food consumption as people substitute toward other forms of weight control. The declining price of food and the rising price of exercise thus have offsetting impacts on food consumption, which is one interpretation of why the twentieth-century data shows periods of both rising and falling food consumption in spite of continual increases in weight and falling food prices.

The neoclassical model of obesity also yields predictions about the relation between income and weight. Health, or “closeness” to one’s preferred “ideal” weight, is likely to be a normal good, which implies a nonmonotonic

relationship between income and weight. For poor, underweight people, income growth leads to more food consumption and a drive to increase weight, while among well-off, overweight people, income growth might lead to weight loss as people may have increased incentives to invest resources on striving to attain their ideal weight. Thus, in rich countries, income raises weight among the poorest groups but lowers it throughout the upper half of the income distribution. In addition, while income has a nonmonotonic effect on weight within countries, it has a strong positive effect across countries—a greater effect than can be accounted for by aggregation. The impact of technology on weight is essential to interpret this pattern. Across countries, more sedentary but more productive technologies are employed, causing both income and weight to rise.

Behavioral theories of obesity have been proposed (e.g., David M. Cutler, Edward L. Glaeser, and Jesse M. Shapiro 2003) following the initial work on rational addiction by Gary S. Becker and Kevin M. Murphy (1988) and the more recent applications of this model to obesity by John Cawley (1999) and Timothy J. Richards, Paul M. Patterson, and Abebayehu Tegen (2007). They are useful compliments to the neoclassical theory as they can help us understand why people seek self-control or commitment devices (for example, by joining a Weight Watchers group or undergoing bariatric surgery). However, commitment issues *alone*, as initially discussed by Thomas C. Schelling 1978, do not explain well the cross-country and time-series evidence on obesity as they alone cannot account for why poorer countries are naturally less obese or what has changed in commitment incentives recently to generate the observed growth of weight.

Evidence related to the importance of technological change in driving weight change has been developed in several contexts. Lakdawalla and Philipson (2002, 2007) provide evidence that the strenuousness

of work has very large effects on weight, while Cutler, Glaeser, and Shapiro (2003) emphasize the agricultural angle of cheaper calories by stressing the declining time cost of preparing food as a result of technological change in food processing. They also note that U.S. consumption of snack foods rose after their prices declined. But since obesity is a worldwide phenomenon, caution must be taken in generalizing from explanations tied to particular circumstances in the United States. Shin-Yi Chou, Michael Grossman, and Henry Saffer (2004) analyze a wide variety of price effects and find that weight seems to rise with lower relative prices of food at home, lower relative prices of fast-food and full-service restaurants, the wider availability (and, hence, the lower full price) of such restaurants, lower relative prices of alcohol, and higher relative prices of smoking.¹ In addition, the percentage of income spent on food has steadily declined since the Great Depression (Judy J. Putnam 2000). Lakdawalla and Philipson (2002) report that about half the growth in weight since the late 1970s can be explained by the declining relative price of food. Lakdawalla, Philipson, and Bhattacharya (2005) report similar findings for food quality, as opposed to quantity: increases in the relative prices of certain types of foods seem to increase the prevalence of deficiencies in nutrients from those foods. For example, when orange juice is more expensive, vitamin C deficiency rises, and so on.

The social aspects of obesity may have a multiplier effect on the growth of obesity. When obesity is relatively rare, it is considered abnormal and repulsive, and this negative response helps to keep it in check. As obesity begins to rise, the negative image of

¹Cawley, Sara Markowitz, and John Tauras (2004) focus more specifically on the effect of smoking on weight—they show that adolescents, particularly females, sometimes initiate smoking as a method of weight control.

obesity becomes less intense because obesity is now more common (see also Amnon Levy 2002). Hence, one cost of obesity declines and this helps obesity continue to grow. At some point, however, the health effects of obesity become so serious that the reduction in the negative image of obesity is offset by health costs.

Childhood obesity has grown along with adult obesity and, indeed, these are positively correlated because technological change in leisure (e.g., computers and television) has raised utility while lowering calorie expenditure. Kids are free to play outside if they wish, but they prefer to play inside on their computers. Cawley (2006) argues that parental control and bounded rationality are important factors in childhood obesity. (He repeats the argument in chapter 3 of *Obesity, Business and Public Policy*.) They may be important factors, but that is nothing new and so cannot explain the growth in childhood obesity. Since children (after infancy) generally eat the same meals as their parents, food-related factors promoting adult obesity will work similarly with children. In another chapter (chapter 5) of *Obesity, Business and Public Policy*, Cawley discusses the effect of obesity on income (see also Daniel S. Hamermesh and Jeff E. Biddle 1994; Biddle and Hamermesh 1998; Susan Averett and Sanders Korenman 1996; Charles L. Baum and William F. Ford 2004; Cawley 2004; Stephen Morris 2006). To isolate that effect, he compares the wages of siblings of different weight. Surprisingly, he finds that the only effect is in reducing the wages of obese relative to normal white women.²

The rise in obesity in other developed countries has lagged the rise in the United States, and this leads David B. Audrestsch

and Dawne DiOrio, in chapter 2 of *Obesity, Business and Public Policy*, to argue that obesity is a negative outgrowth of today's American culture, with its emphasis on fast food and the rise of light service industries, and is bundled with other American practices and transferred to other countries through globalization. A more straightforward explanation, and one more consistent with economic analysis, is that, rather than imitating the United States, countries at a similar stage of development exhibit similar behaviors in their population because the same causal factors, such as rising income and automation, are at work.

Regarding the future of obesity, Acs, Ann Cotten, and Kenneth R. Stanton, in chapter 8 of *Obesity, Business and Public Policy*, predict that half of the U.S. population will be obese by 2016, compared to about a third at present. There is too much uncertainty about the demand for and supply of the factors that influence obesity to justify placing much weight on such a prediction, but the income or education effect on health will clearly be an important offsetting force to the further impact of technological change. The future of obesity depends on which of two effects on obesity that stem from income growth dominate: the more sedentary way the higher income is generated or the larger demand for health it induces.

3. Normative Aspects of the Growth in Obesity

Naturally, when obesity is regarded as a public health issue, government intervention to control it is recommended as soon as a substantial percentage of the population weighs more than is optimal for maximizing health. From an economic standpoint, the proper maximand is of course not health but utility, in which good health is only one argument. Rational persons constantly trade off health for competing goods, such as pleasure,

² However, Bhattacharya and M. Kate Bundorf (2005) estimate that most of this wage differential can be explained by the higher health care premiums employers must pay for obese workers.

income, time, and alternative consumption possibilities. Intervention that considers such trade-offs unworthy of consideration is paternalistic. This is recognized in such areas as highway safety—no one proposes to shut down highways in order to reduce traffic deaths or to force automobile manufacturers to equip their cars with engines that limit top speed to twenty-five miles per hour—but the principle that legitimizes trade-offs involving life and health is equally applicable to obesity. The point is not that governmental efforts to control obesity should be ruled out of bounds a priori, but that all relevant costs and benefits of such efforts should be considered.

This is particularly important in analyzing the claim that public intervention to control obesity is justified because of the higher average medical expenses of the obese on public health insurance, such as Medicare and Medicaid.³ We are skeptical that such fiscal externalities are the true underlying concern of the public health community in promoting intervention. This is because other fiscal effects, such as higher mortality rates⁴ of obese individuals (Lawrence Garfinkel 1986), which reduce Social Security spending, are not considered seriously. An exception is B. McCormick and I. Stone (2007) who argue that the medical expenses associated with obesity have been exaggerated because of the cost savings resulting from the tendency of obese people to die earlier. However, standard analysis (Fred Kuchler and Nicole Ballenger 2002; Eric A. Finkelstein, Ian C. Fiebelkorn, and Guijing Wang 2004; Finkelstein, Christopher J. Ruhm, and Katherine M. Kosa 2005; and

Truls Østbye, John M. Dement, and Katrina M. Krause 2007) focuses on health care alone. If fiscal externalities is the issue, a more extensive examination of whether obese individuals lower public spending, rather than raise it, seems warranted.

Nor are insurance externalities a good argument for public intervention to reduce obesity. Rather they are an argument for experience-rating health insurance, so that groups with above-average expected medical expenses pay higher insurance premiums (Bhattacharya and Neeraj Sood 2005). There is no reason to single out obesity as a basis for higher insurance costs, since there are other equally or more risky “life style” choices that increase expected medical costs.

It is unclear whether obesity would create externalities if insurance were allowed to adjust. A more serious problem may be a combination of consumer ignorance with seller exploitation (discussed by Stephen J. Gould and Fiona Sussan in chapter 6 of *Obesity, Business and Public Policy*) based on people’s addictive tendencies having biological roots; in the ancestral environment to which human beings were biologically adapted, a taste for high-caloric foods had great survival value.

4. *Specific Actual and Proposed Interventions*

The principal public interventions, actual or proposed, thus far are education, taxation, fast-food regulation, and a little of everything on the model of the campaign against cigarette smoking.

4.1 *Education*

Education is the most frequently proposed and implemented public intervention to control obesity. It comes in several forms, including requirements for furnishing nutritional information on labels for food products, publicly financed advertising of

³ In the spirit of the early work by Emmett B. Keeler et al. (1989), Grossman and Inas Rashad (2004) have argued that obesity externalities are created by public health insurance pools.

⁴ Roland Sturm 2002; Amy Block Joy, Vijay Pradhan, and George Goldman 2006. Elsie R. Pamuk et al. 1992, 1993 discuss the relationship between obesity and mortality.

the health consequences of obesity (similar to publicly financed advertising against smoking), nutrition or exercise education, and general education. The motivation for such interventions is the observation, emphasized by Lenneal J. Henderson in chapter 4 of *Obesity, Business and Public Policy*, that obesity varies across socioeconomic, racial, and cultural groups (and even geographically), even though food is cheaper and work and leisure are more sedentary for everyone. But deficiencies in education and information cannot be the key to explaining the growth of obesity, since people have become much better informed about characteristics of food, including calories, as a result of food labels, diet advertising, and publicity about obesity. Incentives created by technological change have more than offset the increased understanding of caloric intake and expenditure. Thus, the effectiveness of labeling in combating obesity has not been confirmed in the empirical literature (see Lorna Aldrich 1999; Sung-Yong Kim, Rodolfo M. Nayga, and Oral Capps 2001; Jayachandran N. Variyam and Cawley 2006; Maria L. Loureiro, Azucena Gracia, and Nayga 2006).

Still, particular subgroups in the population may be more ignorant than others about the health effects of obesity and about the foods that conduce to obesity. Of course there may be other factors; the feedback effect that we noted earlier may be especially important among groups, such as black and Hispanic women, where obesity is so common as to be normal, reducing social pressures to be thin. However, Henderson's analysis of three educational weight-loss programs targeted on vulnerable groups presents no statistical evidence that such programs are effective.

In chapter 9 of *Obesity, Business and Public Policy*, Parke E. Wilde discusses the ineffectuality of federal efforts to educate the public about a healthy diet. The government issues dietary guidelines that, if followed, would reduce obesity but, at the same time,

through its commodity check-off program, it mandates promotional advertising for beef, pork, and other high-caloric foods. The result, Wilde argues, is to increase the demand for fad diets, which promise quick results enabling consumers to continue or soon resume eating their favorite foods but do not deliver.

Most of the obese population probably understands the mechanisms by which weight is gained and lost, and so additional nutritional education would have only a very limited effect. If we randomized our existing government programs for educating people about overweight and then measured weight five years later, it is unlikely that those who received the nutrition education would be thinner. (Kamhon Kan and Wei-Der Tsai 2004 suggest otherwise.)

More promising are programs of *general* education focused on increasing years of schooling for vulnerable populations (e.g., Variyam and James Blaylock 1998). The problem is not that disadvantaged persons cannot read labels and are unaware that obesity is bad for their health, but that uneducated persons have less of an incentive to invest in their health because their longevity and their utility from living are below average.⁵

4.2 Taxation

An excise tax on food would reduce consumption, although it would be regressive. A better form of obesity tax would be a non-linear tax—a tax on *overconsumption* of food—rather than a flat tax on all sales of food. But such a tax would be extremely difficult to enforce; it would be the equivalent of taxing fat people. Julie Ann Elston et al., in chapter 10 of *Obesity, Business and Public Policy*, analyze four linear tax responses to obesity—a tax on all foods, a tax proportional to particular ingredients (such as sugar

⁵ For a discussion on weight as a signaling mechanism to potential mates, see Avner Offer 2001.

or butter), a tax applied to categories of foods, and a value-added tax on food producers. The last, which is the one they favor, would be proportioned to the difference between the price of the raw inputs and the selling price of the finished product and, thus, would penalize heavily processed products. This is a feasible linear-tax response to obesity, although its effects would probably be quite limited. The ingredient tax is attractive in principle, but Elston's chapter (pp. 184–185) presents a number of complicating factors (see also Kuchler et al. 2005). Probably any feasible tax response to obesity would cost more to enforce than it would be worth in reducing the social costs of obesity.

4.3 Fast Food Regulations

The shift of producing and preparing food from the home to the market (due to the increase in the market value of women's time), in particular to fast-food preparation and carry-out, is often believed to be an important factor in the rise of obesity, although data are sparse. Chou, Rashad, and Grossman (2005) find a strong correlation between obesity and fast-food establishments across regions. This strong correlation is puzzling, given that the vast majority of meals are still home-produced.⁶

Acs, Cotten, and Stanton, in chapter 8 of *Obesity, Business and Public Policy*, proposed restricting access to vending machines and the location of fast-food restaurants. These would be costly measures of uncertain efficacy, given substitution possibilities. Regulation of advertising may affect obesity growth more substantially. The food industry is the second largest advertiser in the United States (after the automotive industry) (Mary

Story and Simone French 2004). In addition, 11 percent of food advertising geared to children is advertising for fast food and only 2 percent for foods low in sugar, fat, and salt, and almost no ads are directed at children for fruit or vegetables (Center for Science in the Public Interest 2003).

4.4 The Tobacco Precedent

David T. Levy and Marilyn Oblack, in chapter 11 of *Obesity, Business and Public Policy*, point out that federal, state, and local government have attempted with considerable success to curb tobacco consumption through a combination of mandatory warnings in and other restrictions on labeling and advertising, media campaigns, stiff taxes, highly publicized lawsuits, and location restrictions that have culminated in the prohibition of smoking in most public places. Very little, in contrast, has been done to limit obesity, perhaps rightly so if obesity has less external costs than smoking. In any event, the tobacco model has only limited applicability to obesity. It is relatively easy not to begin smoking, so that over time campaigns designed to arouse public awareness of the dangers of smoking, and to increase the expense of the habit as well as creating a non-monetary inconvenience cost resulting from the location restrictions, reduce the number of smokers even if no current smokers are able to break their habit. Everyone has to begin eating, however, and having begun one is highly susceptible to becoming obese as a result of biological predisposition, poor information, and the asymmetry of gaining and losing weight (gaining easy, losing hard). Stiff taxes on food, in contrast to stiff taxes on cigarettes, would be intolerable for persons of modest means, and ingredient, nonlinear, and other superior forms of taxing calories are unlikely to be feasible and effective. In chapter 12 of *Obesity, Business and Public Policy*, José Felipé Anderson argues that class actions against the fast-food industry can

⁶ Joanne F. Guthrie, Biing-Hwan Lin, and Elizabeth Frazao (2002), on the basis of 1996 data, estimated that only 17 percent of total calories consumed by men aged eighteen to thirty-nine, and 13 percent of the total calories consumed by women in that age group came from fast-food establishments.

be effective in reining in obesity, but these actions are likely to fail for the same reason that most suits by smokers against cigarette companies have failed: juries see the illness resulting from voluntary consumption of dangerous products to be self-inflicted and, hence, not compensable.

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