

Childhood Obesity: An Issue for Public Health Advocates, Researchers, and Community Development Practitioners¹

By Robin Newberger and Kristin F. Butcher

Obesity rates for U.S. children have risen precipitously over the past 20 years. According to data from the National Health and Nutrition Examination Surveys from 1999–2002, 15 percent of children on average, ages 2–19 are obese. With little evidence that individual weight loss programs can solve the problem, attention is increasingly turning to the environment in which children live, in an effort to understand both the causes of and potential solutions to childhood obesity. Drawing on recent research, this article provides an overview of childhood obesity trends from the 1970s to 2002, explains briefly why obesity is a matter of concern, and discusses why this issue may overlap with the interests of community development practitioners. Many of the potential causes explored in the research literature involve topics that relate to community development. These topics include school budgets, lack of access to supermarkets in certain neighborhoods, the location of public buildings and amenities, and the increase in dual-career and single-parent working families. These issues suggest that community development practitioners have a role in understanding the social and institutional forces that may have contributed to the surge in childhood obesity. Along with public health advocates, city planners, and researchers, community development experts also have a role in developing policies that address the problem.

Trends in Childhood Obesity

Between 1974 and 2002, the share of obese children rose from about five to about 15 percent. This increase affected girls and boys alike, as well as all age categories between two and 19. Obesity and overweight in children are typically defined as having a body mass index (BMI) above a certain percentile cut-off for a given age and gender.² These cut-off points reflect the 85th and 95th percentiles of the BMI distribution for a population that was surveyed in the early 1970s before obesity began to rise. Individuals who are considered obese today have

BMI at or higher than that original 95 percent cut-off mark for their age and gender. As Figures 1 and 2 show, more children (aged 2–19 years) and adults (aged 20–70 years) have a BMI above the overweight and obese cutoff points since 1980.³

It is worth noting why obesity is a problem. Many overweight and obese children suffer from a range of physical and mental health problems, such as Type 2 diabetes, hypertension, low self-esteem and depression. Recognizing that the health consequences of obese adults await many of the obese children – obese children are more likely than normal-weight children to be obese adults – it is worthwhile to review some of the implications for adults as well. Obese adults are at greater risk for a range of illnesses including diabetes, heart disease, and stroke. Obesity is one of the main reasons for the rise in disability among adults ages 30–49.⁴ According to one estimate, obesity-related medical payments and lost productivity for U.S. companies amount to more than \$12 billion a year.⁵ In addition, taxpayers pay more than half of the \$75 billion in obesity-related medical costs in the Medicaid and Medicare programs.⁶

Importantly, it is not the case that everyone in 2002 had a body weight 10 percent higher than the equivalent age-gender cohort from 30 years earlier. Rather, the obese today are much heavier than obese persons in previous decades. Between 1974 and 2002, BMI at the 95th percentile of the distribution increased by about 17 percent. In contrast, BMI at the median, where half the population has a higher BMI and half the population has a lower BMI, increased by less than half of this rate, some six percent. Figures 1 and 2 illustrate this point. The histograms show the fraction of the population that is overweight (but not obese) and the fraction of the population that is obese, for children and adults. The BMI distributions of two populations, one surveyed in 1971–1974, and another in 1976–1980, are basically identical.

However, the BMI distribution of the population surveyed in 1988–1994 shows a shift, with both more overweight and more obese individuals. By 1999–2002 this change is even more pronounced. The information in the figures on BMI at the median and at the ninety-fifth percentile of the distribution shows that not only is a higher proportion of the population past the “obese” cutoff point, but the obese weigh more than they did in the past.

Further, obesity is not evenly distributed across all economic and demographic groups. Obesity is a particular problem for minorities and children in low-income households. Over the past 30 years, the fraction of Blacks that were obese rose by about 13 percentage points, from six percent of all Black children in 1971–1974 to about 19 percent in 1999–2002. Among low-income children, there was a 12 percentage point increase, from six percent of all low-income children in 1971–1974 to 18 percent in 1999–2002. Obesity rates are also higher among Hispanic children than among White non-Hispanic children. The heaviest Black children, and the heaviest low-income children, are also heavier than the average obese child in the general population. These differences are important to bear in mind since the population groups most affected by obesity are likely to be the same groups most affected by the costs of obesity.

Potential Explanations for the Rise in Obesity Rates

The strongest evidence to date of a causal connection between calories consumed and childhood obesity comes from studies on sweet beverages. Research has found a positive relationship between being overweight and drinking soft drinks for preschoolers, grade schoolers, and older children alike.⁷ The data also suggest that the consumption of sweet beverages has increased in step with rising obesity rates. Thirty-seven percent of children

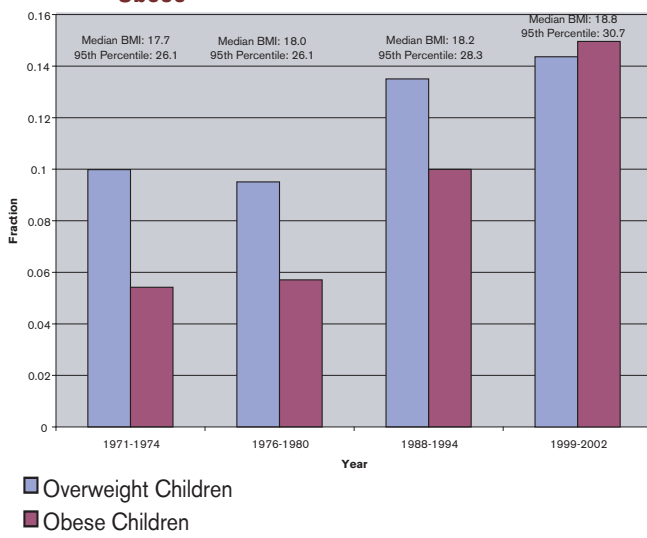
drank soft drinks in 1977–1978, compared to 56 percent of children in 1994–1998. The amount consumed rose by 50 percent between each of these periods, from 14–21 ounces per day.⁸

Reductions in energy expenditure contribute to rising childhood obesity rates as well. While studies focusing on the relationship between physical activity and obesity have found mixed results, perhaps because it is difficult to accurately measure exertion during physical activity, research has established an empirical link between sedentary activities and obesity, especially watching television. By one account, each additional hour of television viewing per day increases the prevalence of obesity by two percent.⁹ The number of minutes per week spent watching television has increased from about 355 in 1970 to just over 440 in 1999.¹⁰ Since television has been around for many years, the challenge is to understand why viewing time has increased, and how children and adults can be encouraged to spend more time in active pursuits.

Some of the potential reasons for the rise in sweet beverage consumption and the drop in physical activity have nothing to do with community development per se. These reasons may include large portion sizes, an increase in advertising to children, and changes in the technology of food preparation that have made it cheaper and more convenient for people to eat outside of their homes.¹¹

Other possible explanations relate more directly to community and economic development issues. For example, the few studies that examine the relationship between school food policies and obesity find a positive and often significant correlation between the availability of snack foods and beverages and increased BMI among students. Researchers estimate that a 10 percentage point increase in the availability of junk food in schools produces an average increase in BMI of one percent in adolescents.¹² For adolescents with an overweight parent, the effect is twice as great. Facing financial pressure, schools have increasingly made junk food available to children as a way to supplement their general budgets. Between 1977/78 and 1994/98, the fraction of soft drink consumption that comes from vending machines increased by 48 percent.¹³ Between 1994 and 2000, there was an increase in students’ access to vending machines in schools. For example, for high schools, access to vending machines increased from 88 percent to 96 percent.¹⁴ In addition, in 2000, nearly three-quarters of high schools, more than half of middle schools, and about 40 percent of elementary schools had “pouring rights” contracts with soft drink companies – contracts giving vendors exclusive rights to sell products in schools. The increased availability of junk food in schools may explain about a quarter of the increase in average BMI of adolescents over the 1990s.¹⁵ Additionally, school

Figure 1: Fraction of Children Who are Overweight or Obese



lunches may have a hand in increasing children's obesity. Recent work finds that for children entering kindergarten with similar obesity rates, those eating school lunches (compared to those who bring their own lunch) are about two percentage points more likely to be overweight at the end of first grade.¹⁶

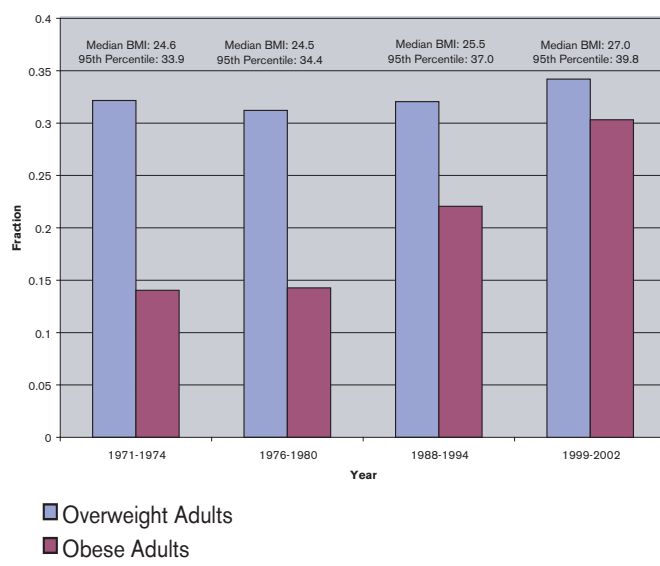
School policies may affect the energy expenditure side of the obesity equation as well. With growing budgetary pressures, many schools have narrowed their focus to academic accountability, squeezing out other areas of study such as nutrition and physical education (PE), and even reducing the time available for lunch (USGAO, 2003; USDA, 2001).¹⁷ Since the late 1970s, children have seen a 25 percent drop in play and a 50 percent drop in unstructured outdoor activities.¹⁸ Data collected at the elementary school level shows that 40 percent of elementary schools reduced, deleted, or considered deleting recess since 1989, when 90 percent of schools had some form of recess.¹⁹ The trends in high school physical education (PE) are less clear, with about 42 percent of schools reporting daily PE classes in 1991, and 29 percent reporting it by 2003.²⁰ However, no empirical work has made the causal connection between changes in school physical education or play policies and obesity rates.

Another potential explanation that has received consideration is the development of businesses that promote the consumption of snacks or fast foods. Fast food restaurants and other establishments selling inexpensive snack foods are more prevalent today than they were 20 years ago. The argument here is one of both price and availability. Some researchers find that the decline in the relative price of food has led to increased intake, and hence to increases in obesity.²¹ If, as some argue, energy-dense foods cost less than whole grains, fruits and vegetables, then demand for such foods may be particularly strong among people looking to economize on their food budgets.²² At the least, prepared foods eliminate the time-related cost of having to cook meals from scratch. A number of studies also document a so-called "grocery gap" in inner-city neighborhoods. This describes a situation where supermarkets do not locate in certain areas, residents of these areas find fewer healthy food choices at their neighborhood stores, and when fresh produce is offered at these stores, it is more expensive than at large supermarkets.²³ Given that many residents of lower-income neighborhoods lack cars or access to convenient public transportation, traveling to a distant supermarket imposes another set of costs. While factors like the ready availability of fast foods and lack of access to "nutritious" foods has the potential to increase obesity, it is difficult to rule out that the changes are coincidentally related. For example, if consumer tastes change such that they want more fast foods, then obesity

and fast food availability could both rise in response to this change in tastes. Addressing this issue may take some experimentation with, for example, explicitly encouraging access to supermarkets carrying nutritious foods in certain neighborhoods, and careful evaluation of the effects of such policies on health outcomes. Such experimentation would require coordination from community advocates, researchers, and others.

Changes in the built environment is another potential cause of obesity under investigation by researchers. The built environment refers to all buildings, spaces, and products created or modified by people, including housing, schools, workplaces, and transportation systems. While many aspects of the built environment may be involved in lowering physical activity levels, researchers have focused much attention on the proliferation of urban sprawl. With people living farther and farther from commercial centers, "vehicle miles" traveled per household have jumped from about 33 miles daily between 1977 and 1983, to 41 miles in 1990.²⁴ Given the design of many newer communities, that has also meant less travel by walking or bicycling than in earlier periods. A lack of walkways and/or bicycle lanes along many roads creates a further disincentive. The location of new schools farther from people's home has also created a greater reliance on cars and buses. According to one study of South Carolina schools, children are less likely to walk to a school that was built more recently.²⁵ At schools built in the 1990s, over 25 percent of students were eligible for bus transportation because the walking route to school was deemed hazardous. While research has not confirmed a causal link between urban sprawl and obesity, the built environment has become an integral part of the debate on people's health.

Figure 2: Fraction of Adults Who are Overweight or Obese



Finally, the rise in dual-career families may impact both the energy consumption and expenditure sides of the obesity equation. While studies show it is not the act of working per se that affects childhood obesity, a 10-hour increase in a mother's average hours worked per week over a child's lifetime increases the probability that the child is obese by about one percentage point.²⁶ One story that might fit this result is that when parents both work long hours, there is less time to prepare nutritious meals. In addition, when both parents work, there may be less time to supervise active play. Children may be encouraged to stay inside when they come home from school, while those who live in neighborhoods with fewer outside play spaces may have less opportunity to get to more distant recreation areas. The increase in employment among the mothers of preschool-age children over the past 30 years has also led to greater use of third-party child care. While the quality of child care varies, the increasing number of children in third-party care may be another source of a drop in physical activity and increasing consumption of less nutritious foods. Third party caregivers may be more intent on meeting children's immediate needs, rather than promoting long-term health. For example, it may be important in schools or child care settings that a hungry and disruptive child eat something, and the expedient choice may be to offer French fries instead of broccoli.

Summary

Given the limited success of individual weight loss programs, a change in the environment may be needed to address increasing childhood (and adult) obesity. Unfortunately, research does not point to a single causal factor as its source. Childhood obesity is associated with many changes that have simultaneously upset the balance between children's energy intake and expenditure over the past 20 years. Even if the research did point to a particular factor or set of factors, it may not be possible to put the so-called genie back in the bottle. Instead, the approach increasingly followed by anti-obesity organizations, such as the Consortium to Lower Obesity in Chicago's Children (CLOCC),²⁷ consists of a multi-pronged public health/community development response. These organizations address both the influences on the energy consumption side, like access to healthful foods, as well as the influences on the energy expenditure side, like access to safe play spaces. Fighting childhood obesity has become a collaborative effort that unites medical, academic, government, and community organizations to attack the problem on various fronts. As these efforts progress, it will be important to evaluate which are the most efficacious in addressing childhood obesity.

Notes

- 1 Much of this article is based on the following forthcoming review piece: Patricia M. Anderson and Kristin F. Butcher, "Childhood Obesity: Trends and Potential Causes," in *The Future of Children: Child Overweight and Obesity*, Vol. 16, No. 1, Spring 2006, Brookings Institution Press. Interested readers are referred to that article and the other articles in the same journal, for a more thorough discussion.
- 2 BMI is defined as weight in kilograms divided by height in meters squared (kg/m^2). In Imperial units, this is equivalent to $(\text{weight in pounds}/\text{height in inches}^2) \times 703$. For adults, one is considered overweight with a BMI greater than or equal to 25 and obese with a BMI greater than or equal to 30.
- 3 For more details on these calculations, see Patricia M. Anderson and Kristin F. Butcher, "Childhood Obesity: Trends and Potential Causes," in *The Future of Children: Child Overweight and Obesity*, Vol. 16, No. 1, Spring 2006, Brookings Institution Press. The figures are from Anderson and Butcher's calculations using the National Health and Nutrition Examination Surveys; nationally representative health surveys collected over several years in the United States.
- 4 D. N. Lakdawalla, J. Bhattacharya, and D. P. Goldman, "Are the Young Becoming More Disabled? Rates of Disability Appear to Be on the Rise Among People Ages Eighteen to Fifty-Nine, Fueled by a Growing Obesity Epidemic," *Health Affairs*, Vol. 23, No. 1, January/February 2004, pp. 168-176.
- 5 *The Wall Street Journal*, January 9, 2004, citing a study from the National Business Group on Health.
- 6 *The Wall Street Journal*, January 22, 2004, citing 2003 research by RTI International and the Centers for Disease Control and Prevention.
- 7 David S. Ludwig, Karen E. Peterson, and Steven L. Gortmaker, "Relation Between Consumption of Sugar-Sweetened Drinks and Childhood Obesity: A Prospective, Observational Analysis," *Lancet* 357 (2001):505-508.
- 8 Simone A. French, Bing-Hwan Lin, and Joanne Guthrie, "National Trends in Soft Drink Consumption Among Children and Adolescents Age 6 to 17 Years: Prevalence, Amounts, and Sources, 1977/1978 to 1994/1998," *Journal of the American Dietetic Association* 103 (2003):1326-1331.
- 9 William H. Dietz and Steven L. Gortmaker, "Do We Fatten Our Children at the Television Set? Obesity and Television Viewing in Children and Adolescents," *Pediatrics* 75 (1985): 807-812.
- 10 For more details on these calculations, see Patricia M. Anderson and Kristin F. Butcher, "Childhood Obesity: Trends and Potential Causes," in *The Future of Children: Child Overweight and Obesity*, Vol. 16, No. 1, Spring 2006, Brookings Institution Press.
- 11 For more details on these calculations, see Patricia M. Anderson and Kristin F. Butcher, "Childhood Obesity:

- Trends and Potential Causes," in *The Future of Children: Child Overweight and Obesity*, Vol. 16, No. 1, Spring 2006, Brookings Institution Press.
- 12 Patricia M. Anderson and Kristin F. Butcher, "Reading, Writing and Raisinets: Are School Finances Contributing to Children's Obesity?" *NBER Working Paper* 11177, 2005.
- 13 Simone A. French, Bing-Hwan Lin, and Joanne Guthrie, "National Trends in Soft Drink Consumption Among Children and Adolescents Age 6 to 17 Years: Prevalence, Amounts, and Sources, 1977/1978 to 1994/1998," *Journal of the American Dietetic Association* 103 (2003):1326-1331.
- 14 Patricia M. Anderson, Kristin F. Butcher, and Phillip B. Levine, "Economic Perspectives on Childhood Obesity," Chicago Fed *Economic Perspectives*, Quarter 3, 2003.
- 15 Patricia M. Anderson and Kristin F. Butcher, "Reading, Writing and Raisinets: Are School Finances Contributing to Children's Obesity?" *NBER Working Paper* 11177, 2005.
- 16 Diane Whitmore Schanzenbach, *Do School Lunches Contribute to Childhood Obesity?* University of Chicago, mimeo. (2005).
- 17 United States General Accounting Office, *School Lunch Program: Efforts Needed to Improve Nutrition and Encourage Healthy Eating*, GAO-03-506, Report to Congressional Requesters. May 2003; United States Department of Agriculture, *Foods Sold in Competition with USDA School Meal Programs*, A Report to Congress, January 12, 2001.
- 18 L. MacPherson, "Development Experts Say Children Suffer Due to Lack of Unstructured Fun," *Pittsburgh Post-Gazette*. October 1, 2002. Available at www.post-gazette.com/lifestyle/20021001childisplay1001fnp3.asp.
- 19 National Association of Early Childhood Development Specialists in State Departments of Education. *Recess and the Importance of Play*. A position Statement on Young Children and Recess, 2001. Available at www.eric.ed.gov.
- 20 Centers for Disease Control. "Participation in High School Physical Education – United States 1991-2003." *Morbidity and Mortality Weekly Report*. 2004. 53: 844-847.
- 21 Darius. N Lakdawalla and Tomas J. Philipson, "Technological Change and the Growth of Obesity," *NBER Working Paper* 8946. (Cambridge, MA: National Bureau of Economic Research, 2002).
- 22 Adam Drewnowski, "Obesity and the Food Environment: Dietary Energy Density and Diet Costs," *American Journal of Preventive Medicine* 27 (2004): 154-162; Adam Drenowski, Nicole Damon, and André Brien, "Replacing Fats and Sweets With Vegetables and Fruits – A Question of Cost," *American Journal of Public Health* 94 (2004): 1555-1559.
- 23 See Prevention Institute *Nutrition Policy Profiles: Supermarket Access in Low-Income Communities*, available at www.preventioninstitute.org/pdf/CHI_Supermarkets.pdf.
- Also see Morland K., Wind S., Diez Roux A., Poole c. 2002, "Neighborhood Characteristics Associated with the Location of Food Stores and Food Service Places." *American Journal of Preventive Medicine* 22(1) 23:29.
- 24 Patricia S. Hu and Timothy R. Reuscher, *Summary of Travel Trends: 2001 National Household Travel Survey*, (Washington, DC: USDOT Federal Highway Administration Report, 2004). Available at <http://nhts.ornl.gov/2001/reports.shtml>.
- 25 Cristopher Kouri, "Wait for the Bus: How Lowcountry School Site Selection and Design Deter Walking to School and Contribute to Urban Sprawl," *Terry Sanford Institute of Public Policy at Duke University Report* prepared for the South Carolina Coastal Conservation League, 1999. Available at www.scccl.org/pgm_over_reports.html.
- 26 Patricia M. Anderson, Kristin F. Butcher, and Phillip B. Levine, "Maternal Employment and Overweight Children," *Journal of Health Economics* 22 (2003): 477-504.
- 27 Available at www.clocc.net.

Robin Newberger is a business economist in the Consumer Issues Research unit in the Consumer and Community Affairs division of the Federal Reserve Bank of Chicago. Ms. Newberger holds a B.A. from Columbia University and a masters in public policy from the John F. Kennedy School of Government at Harvard University. Ms. Newberger holds a Chartered Financial Analyst designation.

Kristin Butcher is a senior economist in the Research Department at the Federal Reserve Bank of Chicago. She received her B.A. in economics from Wellesley College, an M. Sc. in economics from the London School of Economics, and M.A. and Ph.D. degrees in economics from Princeton University.