

# Introducing the Issue

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**P**ediatricians, parents, and policymakers alike are concerned about high and rising rates of overweight and obesity among U.S. children. Over the past three decades, the share of children who are considered overweight or obese has doubled, from 15 percent in the 1970s to nearly 30 percent today, while the share of children who are considered obese has tripled. The problem of childhood obesity has captured public attention and is regularly featured on the evening news, in school newsletters, and in articles in parenting magazines. Increasingly policymakers are recognizing the need for action. In 2004, the Institute of Medicine released a report calling the prevention of childhood obesity a national priority.<sup>1</sup>

Despite all the public attention, no one is sure which policies and programs will most effectively combat childhood obesity. The uncertainty reflects in part a lack of agreement about what caused obesity to increase in the first place. Theories abound. The “epidemic” in childhood obesity has been attrib-

uted to various factors: increases in television and computer game use that have led to a new generation of “couch potatoes”; the explosive proliferation of fast-food restaurants, many of which market their products to children through media campaigns that tout ties to children’s movies and TV shows; increases in sugary and fat-laden foods displayed at children’s eye level in supermarkets and advertised on TV; schools that offer children junk food and soda while scaling back physical education classes and recess; working parents who are unable to find the time or energy to cook nutritious meals or supervise outdoor playtime; the exodus of grocery stores from urban centers, sharply reducing access to affordable fresh fruits and vegetables; and suburban sprawl and urban crime, both of which keep children away from outdoor activities. The problem is not the lack of explanations for the increase in childhood obesity, but the abundance of them. In such circumstances, deciding which of the possible causes to address first and which policies and programs will be most effective is not easy.

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This issue of *The Future of Children* lays out the evidence on the multiple causes, consequences, and methods of dealing with childhood obesity. Now is an opportune time to assess what is and is not known. Many policymakers, having become convinced that childhood obesity is indeed a problem, are searching for effective ways to combat it. The Child Nutrition and WIC (Women, Infants, and Children) Reauthorization Act of 2004, for example, responding in large measure to the rise in childhood obesity, requires school districts that participate in the National School Lunch Program or School Breakfast Program to develop a local wellness policy by the beginning of the 2006–07 school year. Many states are developing broader programs aimed at curbing obesity and improving health among their citizens. The “Healthy Arkansas” initiative, launched in 2004, aims—ambitiously—to reduce the state’s rate of childhood obesity from 11 percent to 5 percent. Other states are taking similar steps, many with the support of the Centers for Disease Control and Prevention (CDC), which in 2005–06 gave funds to twenty-one states to build capacity in the area of obesity and to seven more to implement programs. But while the policymakers’ desire to reduce obesity is clear, state and federal budgets are stretched thin. It is crucial to develop programs and policies that are effective and can be implemented at reasonable cost.

### **Why Should We Care about Childhood Obesity?**

Although there may not be universal agreement on what caused the increase in childhood obesity, there is fairly widespread consensus on several important points. The first is that obesity in general, and childhood obesity in particular, has serious adverse health consequences. Obesity causes many health problems, as Stephen Daniels documents in

his article in this volume. Heart disease, high blood pressure, hardening of the arteries, type 2 diabetes, metabolic syndrome, high cholesterol, asthma, sleep disorders, liver disease, orthopedic complications, and mental health problems are just some of the health complications of carrying excess weight. The difficulty for children is twofold. First, many obese children today are developing health problems that once afflicted only adults. These children thus have to cope with chronic illnesses for an unusually extended period of time. Living with type 2 diabetes beginning around age fifty is one thing; living with it from age sixteen is quite another. Second, in obese children, such health problems as heart disease begin, almost invisibly, earlier in life than they do in normal-weight children. Even if the disease is not diagnosed until adulthood, it begins taking its physical toll sooner, perhaps resulting in more complications and a less healthy life. The possibility has even been raised that given the increasing prevalence of severe childhood obesity, children today may live less healthy and shorter lives than their parents.<sup>2</sup> Although this claim is controversial, it is dramatic enough to give us pause and reinforce the idea that childhood obesity is far more than a cosmetic concern.

The increase in obesity is an economic issue as well. Estimates of the costs of treating obese children are relatively small but rising rapidly. For example, Guijing Wang and William Dietz estimate that hospital costs of treating children for obesity-associated conditions rose from \$35 million to \$127 million (in 2001 constant dollar values) from 1979–81 to 1997–99.<sup>3</sup> Costs of treating adult obesity and its attendant health problems are far more substantial. Roland Sturm estimates that health care costs (including inpatient costs and costs of ambulatory care) of non-

elderly obese adults are 36 percent greater than those of the non-obese, while costs for medicines are 77 percent greater.<sup>4</sup> The cost differences between obese and non-obese adults are even greater than those between smokers and nonsmokers. Eric Finkelstein and several colleagues conclude that in 1998 the nation spent between \$51.5 and \$78.5 billion on health care related to overweight and obesity among adults. The upper bound on these estimates, based on what the authors judge the better of their two data sources, corresponds to 9.1 percent of total annual medical spending in the United States.<sup>5</sup> Roughly half of this spending was publicly funded—paid for by all Americans through Medicaid and Medicare, the government’s health programs for the poor and elderly. And ever higher rates of obesity will burden society with other costs. Obese adults may be more likely than their normal-weight counterparts to become disabled before retirement, lowering their earnings and raising the costs of the federal disability insurance system, and may require more nursing home care as they move into retirement.<sup>6</sup>

If the heaviest health and economic burdens of obesity are borne by adults instead of children, why should the focus be on childhood obesity rather than adult obesity? There are two key reasons to focus on children. First, those who are overweight and obese as adolescents are much more likely than others to become obese as adults.<sup>7</sup> Second, it is quite difficult for obese adults and children to shed excess weight. Although the health professions have developed new drugs and medical procedures for treating obesity-related health problems, these procedures are expensive and do not counter all such problems. Preventing obesity in childhood must be the centerpiece of plans to reduce both the health-related and economic costs of obesity.

A final point of broad consensus is that childhood obesity is best viewed as a societal problem reflecting the interactive influences of environment, biology, and behavior, rather than as an individual medical illness. Most agree that the nation has seen dramatic changes in the past thirty years in the ways Americans work, live, and eat. Broad societal and environmental trends have engineered routine physical activity out of everyday life for most Americans and made low-nutrition,

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energy-dense foods and beverages more accessible, affordable, and appealing than more healthful foods. Although reducing obesity requires changes in behaviors surrounding eating and physical activity, strategies that rely only on individual “self-control” are unlikely to be effective in environments that are conducive to poor eating habits and sedentary activity. This is especially true for children, who don’t control the environments in which they live, learn, and play. In addition, children have a more limited capacity to make informed choices about what is healthful and what is not. For this reason, there is a clear rationale for modifying children’s environments to make it easier for them to be physically active and to make healthful food choices, thus reducing their chances of becoming obese.

Defining obesity as a societal issue does not imply that all children are at equal risk of gaining too much weight. The articles in this volume indicate that some groups of children—in particular, children from low-income families and from ethnic minority groups—are at a higher risk of becoming obese. Evidence presented in this volume indicates that the obesity crisis is also a result of the interplay between people’s genes and environments. While humans may be hardwired to overeat in times of plenty, those with a greater genetic propensity for weight gain may be more likely to gain weight in an environment that promotes or encourages unhealthful eating and minimal physical activity. The idea that susceptibility to obesity is genetic has led some to speculate that it will one day be possible to tailor interventions toward those with predispositions to obesity. For now, however, broader policies that alter children’s environments are the only realistic options.

### What Does This Volume Do?

This volume is a collection of articles that present up-to-date literature reviews and analyses written by leading researchers and experts from many disciplines. The goal of the issue is to promote effective policies and programs targeting childhood obesity by providing timely, objective information based on the best available research on this topic.

The development of effective strategies to prevent childhood obesity must be informed by an understanding of why obesity has risen so fast and so much in the past thirty years. Thus, we asked one pair of researchers to document the trends in childhood obesity, paying careful attention to the timing of the increase in obesity trends compared with the timing of changes in the environment that may have aided the increase in weight. We

asked another researcher to document the effects that these trends have had on the health of those who become obese as children.

To identify effective strategies for reducing rates of overweight and obesity among children, we focused on several broad domains of children’s environments—the marketplace, the built environment, schools, child care providers, and homes—that might be modified to reduce obesity. We, therefore, asked researchers to present the best evidence on the role of each of these domains in the development of overweight and obesity and to assess strategies for keeping children at healthy weights. Finally, we asked a pair of researchers to consider issues that are unique to ethnic minority and low-income children, and another researcher to document how those in the medical community—particularly pediatricians—are handling the health problems that come with childhood obesity when prevention efforts fail.

### Common Issues: Definitions and Standards of Evidence

Because childhood overweight and obesity are not always defined uniformly across studies, a note about definitions is warranted. Unless otherwise noted, all articles in this volume follow the common convention of defining overweight and obesity in terms of “body mass index,” a measure of how much a person weighs relative to how tall that person is. Specifically, the body mass index (BMI) is equal to weight (in kilograms) divided by height (in meters) squared.<sup>8</sup> For adults, the CDC identifies those with BMI values at or above 25 but less than 30 as overweight but not obese and those with BMIs at or above 30 as obese. For example, an adult who is 5 feet and 9 inches tall would be considered overweight at between 169 and 202 pounds and obese at 203 pounds or more.

As Patricia Anderson and Kristin Butcher note in their article, however, the conventional definitions for children and adolescents are somewhat different, because normal BMI values change throughout childhood. Instead, children's levels of adiposity, or fatness, are assessed by comparing their BMI values with those of a fixed reference group of U.S. children of the same age and sex. Children at or above the 85th percentile of the BMI distribution—meaning that at least 85 percent of children of the same age and sex in the reference group had lower values of BMI—are often defined as being overweight, and those at or above the 95th percentile of the distribution for the reference group are often defined to be obese. Although researchers commonly agree that the 85th and 95th percentiles are appropriate cutoffs, not all use the same sets of labels to define children who exceed these cutoffs. The CDC and some researchers refer to children at or above the 85th percentile as being “at risk for overweight” and those at or above the 95th percentile as being “overweight.”<sup>9</sup> Most of the articles in this volume, however, use the labels “overweight” and “obese” for parsimony and to be consistent with the adult definitions. Finally, in speaking generally, our authors often use the term “childhood obesity” to refer to both overweight and obesity as seen in both children and adolescents. The distinctions between overweight and obesity are made clear when it is important to do so.

Many of the articles in this volume review evidence on how various features of the environment are related to overweight and obesity. Assessing the quality of that evidence is important in developing effective programs and policies. For example, we may want to know whether children who are breast-fed are less likely to become obese. If so, “preventing obesity” can be added to the long list

of benefits of breast-feeding. Similarly, we may want to establish whether children who live in neighborhoods with more fast-food restaurants or who attend schools with vending machines stocked with low-nutrient, high-calorie foods and beverages are more likely to become obese. For most of the topics discussed in this volume, we do not yet have evidence that firmly establishes cause-and-effect relationships. For example, in their article on the built environment, James Sallis and Karen Glanz note that evidence

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that people who live near parks are more physically active could suggest that easy access to parks is a cause of that physical activity. But it could also be that more physically active people choose to live near parks. So far, research has not conclusively established that proximity to parks reduces obesity.

Evidence on other topics is less equivocal, although often not definitive. Some studies carefully account for the factors that could be linked with obesity but that do not reflect causal relationships. Others rely on comparisons of individuals' behaviors and body weights before and after policy changes or programs are put into place. Finally, in a small but growing body of evidence based on experimental studies, children are randomly

assigned to interventions, such as programs designed to reduce TV viewing or to improve nutrition, which may or may not be effective. Comparing the weights of children assigned to the intervention with the weights of those in a control group provides conclusive evidence of the specific intervention's effectiveness among the children being studied. Of course, as Sallis and Glanz point out, randomized interventions are rarely feasible for large-scale programs such as park construction or changes in a city's zoning laws. The quality of available evidence necessarily varies from topic to topic. For the articles in this volume, we have asked the authors to review the best evidence available on their topics and to make it clear how firmly the evidence establishes causal relationships.

## **What We Have Learned**

Each article in the volume contains a detailed discussion of recent evidence on childhood obesity. We briefly summarize each article's chief findings below.

### **Documenting the Trends**

Patricia Anderson and Kristin Butcher document trends in childhood obesity and examine the possible underlying causes of the obesity epidemic. They note that the increase in childhood obesity rates began between 1980 and 1988, and then they assess whether the timing of various changes in the children's environment coincides with the observed increase in obesity. Among the changes that have affected children's energy intake during the critical time period are increases in the availability of energy-dense, high-calorie foods at school; in the consumption of soda and other sugar-sweetened beverages; in the advertising of these products to children; and in dual-career or single-parent working families that may have also increased demand for food away from home or for prepared

foods. Changes that have reduced energy expenditure over the critical time period include less walking to school and more travel in cars; changes in the built environment and in parents' work lives that make it more difficult for children to engage in safe, unsupervised (or lightly supervised) physical activity; and possibly more time spent in sedentary activities, such as viewing television, using computers, and playing video games. Anderson and Butcher find no single critical factor that has led to increases in children's obesity. Rather, many complementary changes have simultaneously increased children's energy intake and decreased their energy expenditure.

### **How Obesity Harms Children's Health**

Stephen Daniels documents the heavy toll that the obesity epidemic is taking on the health of the nation's children. He notes that many obesity-related health conditions, such as type 2 diabetes and high blood pressure, that were once seen almost exclusively in adults are now being seen in children and with increasing frequency. Obesity affects many systems of the body—cardiovascular, pulmonary, gastrointestinal, orthopedic—and although adult obesity damages each, childhood obesity often exacerbates the damage. For example, the processes that lead to a heart attack or stroke often take decades to develop into overt disease. Obese children may thus suffer the adverse effects of cardiovascular disease at a younger age than their parents would despite the advent of new drugs to treat some of these problems. They also suffer from higher rates of depression, greater difficulty in peer relationships, and poorer quality of life than their normal-weight counterparts.

### **The Role of Markets**

In the first of five articles that survey in detail the environments that may have contributed

to increasing childhood obesity, John Cawley focuses on the role of markets. He first documents important market changes, such as increases in the costs of preparing foods at home relative to eating out, that may have contributed to the increase in obesity. He then lays out three economic rationales to justify government intervention in markets to reduce obesity. First, because free markets generally underprovide information, the government may intervene to provide consumers with information they need to make healthy choices. Second, because society bears the soaring costs of obesity, the government may intervene to lower the costs to taxpayers. Third, because children are not what economists call “rational consumers”—that is, they cannot evaluate information critically and weigh the future consequences of their actions—the government may intervene to educate them and help them make better choices. Cawley assesses an array of market-based policy interventions and concludes that the most promising policies are those that reduce advertising targeted to children, increase the incentives for food manufacturers and restaurants to provide more nutritious choices, and improve the quality of foods that schools provide to children, although further evidence on their cost-effectiveness is required.

### Changes in the Built Environment

Over the past forty years, the built environment in the United States has changed in ways that have promoted sedentary lifestyles and less healthful diets. James Sallis and Karen Glanz conclude that although researchers have found many links between the built environment and children’s physical activity, they have yet to find definitive evidence that aspects of the built environment promote obesity. For example, children and adolescents with easy access to recreational

facilities are more active than those without such access, and few of these facilities exist in low-income neighborhoods. Likewise, safe and short routes to school make it easier for children to walk and cycle to school. But, given the paucity of research, researchers cannot yet establish conclusively that more access to recreation or more active commuting would reduce rates of obesity or even identify which kinds of environmental changes are most likely to promote greater physical activity. Recent changes in the nutrition environment, including greater reliance on convenience foods and fast foods, a lack of access to fresh fruits and vegetables, and expanding portion sizes, are also believed to contribute to the epidemic of childhood obesity. But, again, conclusive evidence that changes in the nutrition environment will reduce rates of obesity does not yet exist.

### Changes in Schools

Mary Story, Karen Kaphingst, and Simone French demonstrate that U.S. schools offer many opportunities for developing obesity-prevention strategies. They explain that meals at school are available both through the U.S. Department of Agriculture’s school breakfast and lunch programs and through “competitive foods” sold à la carte in cafeterias, vending machines, and snack bars. School breakfasts and school lunches must meet federal nutrition standards, but competitive foods are exempt from such requirements. While schools argue that budget pressures force them to sell popular but nutritionally poor foods à la carte, limited evidence shows that schools can offer students more healthful à la carte choices and not lose money. In fact, some states are limiting sales of nonnutritious foods, and many of the nation’s largest school districts restrict competitive foods. Other pressures can compromise schools’ efforts to provide comprehensive

physical activity programs. As states use standardized tests to hold schools and students academically accountable, schools view physical education and recess as lower priorities. Yet some states are promoting more physical activity in schools. In addition, randomized evaluations of a small number of school-based interventions have shown success at reducing weight gain among children. These interventions typically involve components that teach children about nutrition, promote reductions in television viewing, and engage children in physical activity. Many also involve parents to promote more healthful eating and greater physical activity when children are not in school. These studies indicate that school-based programs, policies, and environments can make a difference in childhood obesity.

### **Changes in Child Care**

Mary Story, Simone French, and Karen Kaphingst also acknowledge that researchers know relatively little about either the nutrition or the physical activity environments in the nation's child care facilities, though existing research suggests that the nutritional quality of meals and snacks may be poor and activity levels may be inadequate. Part of the problem is that no uniform standards apply to nutritional or physical activity offerings in child care centers. With the exception of the federal Head Start program, which has federal performance standards for nutrition and physical activity, child care facilities are regulated by states, and state rules vary widely. One federal program—the Department of Agriculture's Child and Adult Care Food Program—provides funding for meals and snacks for almost 3 million children in child care each day. Providers who receive these funds must serve meals and snacks that meet certain minimal standards but not specific nutrient-based standards. With a large share of

young children attending child care and preschool programs, policymakers should place a high priority on understanding what policies and practices in these settings can prevent childhood obesity.

### **Changes in Parenting**

Ana Lindsay, Katarina Sussner, Juhee Kim, and Steven Gortmaker review evidence on how parents can help their children develop and maintain healthful eating and physical activity habits—and thereby ultimately help prevent childhood obesity. They show how important it is for parents to understand how their roles in preventing obesity change as their children move through critical developmental periods, from before birth through adolescence. They point out that researchers, policymakers, and practitioners should also make use of such information to develop more effective interventions and educational programs that address childhood obesity right where it starts—at home. Although a great deal of research has been done on how parents shape their children's eating and physical activity habits, surprisingly few high-quality data exist on the effectiveness of obesity-prevention programs that center on parental involvement. The authors also review research evaluating school-based interventions that include components targeted at parents. The authors acknowledge that achieving the ultimate goal of preventing and controlling the growing childhood obesity epidemic will require programs and policies that are multifaceted and community-wide, but they emphasize that parents are central to these wider efforts. Research shows that successful intervention must involve and work directly with parents from the very early stages of child development and growth to make healthful changes in the home and to reinforce and support healthful eating and regular physical activity.

## Targeting Interventions for Minority and Low-Income Children

Although rates of childhood obesity among the general population are alarmingly high, they are higher still in ethnic minority and low-income communities. Shiriki Kumanyika and Sonya Grier summarize differences in childhood obesity prevalence by race and ethnicity and by socioeconomic status. They then discuss how various environmental factors may have contributed to the higher obesity rates among disadvantaged and minority children. The authors show that low-income and minority children watch more television than white, non-poor children and thus are exposed to many more commercials for high-fat and high-sugar foods. They note that neighborhoods where low-income and minority children live typically have more fast-food restaurants and fewer vendors of healthful foods than do wealthier neighborhoods. Children in these neighborhoods often face many obstacles to physical activity, such as unsafe streets, dilapidated parks, and a lack of facilities. The authors see some promise in the schools that low-income and minority children attend. The national school lunch and breakfast programs, for example, provide important nutritional safety nets for many of the nation's poorer children. Also, state efforts to limit sales of sugar- and fat-laden foods at school could lead the way to effective obesity prevention—although the authors caution that these policies may impose a financial burden on poorer school districts.

## When Prevention Fails: The Medical Community's Response

Sonia Caprio notes that although pediatricians are concerned about the problem of obesity, most are not equipped to treat obese children. The most effective treatment programs have been carried out in academic centers through an approach that combines a

dietary component, behavioral modification, physical activity, and parental involvement. Such programs, however, have yet to be translated to primary care settings. Successfully treating obesity will require a major shift in pediatric care that makes use of the findings of these academic centers regarding structured intervention programs. To ensure that pediatricians are well trained in treating obesity, the American Medical Association is working with federal agencies, medical specialty societies, and public health organizations to educate physicians about how to prevent and manage obesity in both children and adults, incorporating evidence from new research as it is developed. The goal is to include such training as part of undergraduate, graduate, and continuing medical education programs. Effective treatment will also require changes in how obesity treatment and prevention services are financed. Currently, because insurance often does not cover obesity treatment, long-term weight-management programs are beyond the reach of most patients.

## Implications

The research in this volume firmly establishes that increases in childhood overweight and obesity pose a real health threat for the nation's children. As the articles demonstrate, researchers have proposed many environmental and policy solutions—from building more sidewalks, to limiting soda sales in schools, to building more grocery stores in poor neighborhoods—to fix the problem. But evidence on the effectiveness of many of these proposed solutions will take time to develop. In the short run, it makes sense to focus attention on programs and policies that have a good chance of being effective and for which there are policy “levers” to produce change. A review of the evidence in this volume suggests four promising strategies. The

first is to implement obesity-prevention initiatives that involve and benefit both children and their parents. The second is to improve nutrition and physical activity environments within schools. The third is to limit children's exposure to advertising. And the fourth is to improve the way pediatricians deliver preventive care and treatment for obesity and related conditions.

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Several articles in this volume discuss obesity-prevention programs that have been shown to work. These interventions, discussed in the two articles by Mary Story, Karen Kaphingst, and Simone French and in the article by Ana Lindsay, Katarina Sussner, Juhee Kim, and Stephen Gortmaker, have been implemented with children of varying ages, from preschoolers to adolescents. They are typically conducted within schools and child care centers and involve components that teach children and their parents about diet and television viewing and that engage children in physical activity. In some programs, such as "Planet Health"—which Mary Story and her colleagues discuss in their article on schools—parents and children are asked to work collaboratively to make such changes in the home environment as reducing TV time. Others combine in-school activ-

ities with informational materials sent home to parents. Although more work is required to tailor these interventions to children of various ages and demographic groups, the evidence indicates that obesity-prevention interventions can be effective at changing the behaviors of both children and their parents.

It makes sense to locate obesity-prevention programs in schools and child care centers, where instructors can reach both children and their parents, but many schools and child care centers lack the resources or skills to implement new programs. In addition, schools are under increasing pressure to devote time to academics rather than to health-oriented programs. These problems can be countered in part by providing schools and child care centers with the funds and training required to implement obesity-prevention programs. Another possible venue for obesity prevention is after-school programs. These programs serve a growing number of children, especially low-income and minority children who are at the highest risk of becoming obese. Implementing obesity-prevention strategies in after-school programs presents an attractive option for many schools, because it may present fewer conflicts with the schools' academic mandates.

Another promising strategy is to improve the foods that children eat at school. Because it is easier for policymakers to regulate what is served in the school cafeteria than to affect what is offered on the kitchen table, schools are a logical place to focus efforts to improve children's diets. Local, state, and federal policies affect what foods are now served in schools. The Department of Agriculture (USDA) enforces standards for the nutritional content of food sold in the national school lunch program, and schools that participate in this program are prohibited from

selling foods of “minimal nutritional value” in school cafeterias during lunchtime. But, as Mary Story and her coauthors point out, the definition of “minimal nutritional value” includes only a small class of foods (such as soda and chewing gum) and excludes such foods as candy bars, cookies, and potato chips. Barring additional state or local regulations, schools that follow the USDA’s regulations are free to sell these foods in their cafeterias and can sell food of minimal nutritional value outside of cafeterias, often in vending machines or student stores.

Many states and local school districts have chosen to impose requirements that are stronger than those the USDA enforces. By April 2005, twenty-eight states had taken steps to limit competitive foods sold in school cafeterias.<sup>10</sup> The National Conference of State Legislatures reported in May 2005 that a few states had enacted laws regulating vending machine sales in schools, and others had introduced legislation that would, if enacted, restrict vending machine sales.<sup>11</sup> The popularity of these initiatives is heightened by evidence, discussed by Mary Story and her coauthors, that schools that have shifted to more healthful foods in cafeterias and vending machines have been able to do so without losing revenue. An important question is whether these state efforts are sufficient, or whether it is time for the USDA to play a larger role in regulating sales of competitive foods. A strong case could be made for changes in federal policy if the states that are experimenting with new school nutrition policies show success in promoting more healthful eating and in preventing childhood obesity. Although less is known about the relationship between the nutritional quality of foods provided in child care centers and the development of obesity, the Child and Adult Care Food Program, which serves these set-

tings, provides similar opportunities for federal policy to influence children’s diets.

Schools may also take steps to increase children’s physical activity. However, the evidence on the best way to do so is mixed. A recent study by John Cawley, Chad Meyerhoefer, and David Newhouse indicates that states that increased the time that students were required to spend in physical education classes did not show reductions in the share of children who were overweight.<sup>12</sup> Yet some interventions aimed at increasing physical activity in schools have been proven effective. The key to this puzzle may be that many physical education classes do not provide students with enough vigorous exercise to be effective. The study by Cawley, Meyerhoefer, and Newhouse found that increases in the required hours of physical education translated into much smaller increases in students’ reports of time spent exercising. Researchers should place a high priority on identifying and implementing programs that effectively increase physical activity at school.

Another area that deserves immediate attention is commercial advertising aimed at children. Regulated at the federal level by Congress and the Federal Communications Commission, advertising aimed at children, particularly advertising that promotes unhealthy behavior, has traditionally been subject to limits that courts have found constitutionally permissible.<sup>13</sup> As John Cawley notes in his article in this volume, children view an average of 40,000 television ads a year. A child watching Saturday morning television may see one food commercial every five minutes, with most featuring such energy-dense, minimally nutritious foods as candy, sugared cereal, and fast food.<sup>14</sup> Although studies have not found a conclusive link between the content of advertising and

obesity, they have shown that children find advertisements very persuasive and that, in turn, children successfully influence their parents' food purchases.<sup>15</sup> The evidence that Shiriki Kumanyika and Sonya Grier present in this volume indicates that low-income and minority children, who have a higher chance than other children of becoming obese, are exposed to more advertising than other children.

Obviously, one strategy for limiting children's exposure to advertising is to educate parents about television and encourage them simply to turn off the TV. The reality is, however, that even with limited television viewing, children are exposed to a great deal of advertising. Thus another strategy is to reduce advertising time for energy-dense foods aimed at children or to mandate that ads for junk food be balanced with advertising for healthy foods such as fresh fruits and vegetables. The most aggressive strategy would be to institute an outright ban on advertising for foods that are high in sugar, fat, and calories during children's programming, just as Congress has banned all tobacco advertising on television and radio.<sup>16</sup> Although the evidence of a link between obesity and advertising may not yet be strong enough to justify a ban on food advertisements geared toward children, the evidence that children are easily swayed by food commercials suggests that some limits are advisable.

A final area that clearly needs reform is the way pediatric medical care is delivered to prevent and treat childhood obesity. As Sonia Caprio documents, pediatricians are not being adequately trained to screen for, prevent, and treat childhood obesity. To remedy this deficiency, medical schools and pediatric residency programs need to train physicians how to prevent obesity as well as how to man-

age its associated health problems. In addition, doctors must be compensated for delivering obesity-related care. Although federal law does not prevent states from reimbursing providers for obesity prevention and treatment services through Medicaid and the State Child Health Insurance Programs (S-CHIP), neither does it mandate that they do so. Many states now offer little coverage for these services.<sup>17</sup> Moreover, some private insurance companies do not recognize obesity as a disease or reimburse treatment at low rates.<sup>18</sup> Thus some providers find themselves in the position of being able to claim reimbursement for treating specific health problems that stem from obesity, but not being reimbursed fully for treating obesity itself. States could mandate that Medicaid and private insurance cover obesity as a disease, with appropriate reimbursement for evidence-based counseling and biomedical interventions. Several states have already done so; according to Sonia Caprio's article in this volume, of the four bills introduced in states this year to require Medicaid treatment options, two became law. At the federal level, views about whether obesity is or is not a disease are also starting to shift. In July 2004, the Department of Health and Human Services removed language from the Medicare Coverage Issues Manual stating that obesity was not an illness. Removing this language paved the way for Medicare recipients—primarily elderly Americans—to be covered for obesity treatments that are shown to be effective. Policymakers should take similar steps for the public and private health insurance programs that cover children.

These policy recommendations are cautious, based on strategies that promise to yield the most results in the short term. But they are simply first steps in what is likely to be a long battle to reverse obesity trends. Numerous

innovative policies and programs, not now supported by strong evidence, nevertheless hold promise. Among them are improving access to healthful foods in low-income neighborhoods by bringing in farmers' markets and grocery stores; constructing sidewalks so that children can walk or bike to school; building or enhancing hiking trails and parks so that children and their families can be more physically active; and requiring restaurants to provide more helpful nutrition information to consumers.

The only way to learn whether these strategies work is to experiment with them. Many

states and communities are undertaking new programs that incorporate a wide array of obesity-prevention strategies. These initiatives can teach us about the most effective ways to reduce child obesity. But to realize their full promise, researchers must carefully and extensively evaluate these initiatives and then disseminate their findings widely. A prerequisite for any effective public health campaign is a solid base of knowledge about what can be done to improve health. Building this knowledge base will take time, attention, and funding, but it is essential to halting the rise in childhood obesity.

## Notes

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3. Guijing Wang and William H. Dietz, "Economic Burden of Obesity in Youths Aged 7 to 17 Years: 1979–1999," *Pediatrics* 109, 5 (2002): E81.
4. Roland Sturm, "The Effects of Obesity, Smoking, and Drinking on Medical Problems and Costs," *Health Affairs* 21, no. 2 (2002): 245–53.
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7. Robert C. Whitaker and others, "Predicting Obesity in Young Adulthood from Childhood and Parental Obesity," *New England Journal of Medicine* 337 (1997): 869–73.
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9. Department of Health and Human Services, "2000 CDC Growth Charts for the United States: Methods and Development," *Vital and Health Statistics*, series 11, no. 246 (Hyattsville, Md.: National Center for Health Statistics, 2002).
10. U.S. Government Accountability Office, "School Meal Programs: Competitive Foods Are Widely Available and Generate Substantial Revenues for Schools" (Government Accountability Office, August 2005) ([www.gao.gov/new.items/d05563.pdf](http://www.gao.gov/new.items/d05563.pdf) [accessed December 5, 2005]).
11. [www.ncsl.org/programs/health/vending.htm](http://www.ncsl.org/programs/health/vending.htm) (accessed December 6, 2005).
12. John Cawley, Chad D. Meyerhoefer, and David Newhouse, "The Impact of State Physical Education Requirements on Youth Physical Activity and Overweight," Working Paper 11411 (Cambridge, Mass.: National Bureau of Economic Research, June 2005).
13. See Children's Television Act of 1990, P.L. 101-437; Children's Internet Protection Act, P.L. 106-554; *Code of Federal Regulations* 47, sec. 73.670 (1991 FCC rule limiting commercials aimed at children); 15 U.S.C. 1335 (congressional prohibition of advertisements for tobacco on radio and television). See also *People of State of California v. R. J. Reynolds Tobacco Co.* (2004), which let stand a lower court decision that sanctioned R. J. Reynolds for targeting youth with tobacco advertising in magazines with a teen audience of 15 percent or more—a violation of the tobacco litigation Master Settlement Agreement.

14. Krista Kotz and Mary Story, "Food Advertisements during Children's Saturday Morning Television Programming: Are They Consistent with Dietary Recommendations?" *Journal of the American Dietetic Association* 94, no. 11 (1994): 1296–1300.
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16. 15 U.S.C. 1335.
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