Children's Healthy Weight and the School Environment

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The ANNALS of the American Academy of Political and Social Science 2008; 615; 38
DOI: 10.1177/0002716207308953

As people became aware of the epidemic of childhood obesity, policy makers and public health practitioners called for the schools to change their environments to encourage healthy eating and increased physical activity. This article describes recent policy developments and clarifies what can and cannot be expected of schools based on existing and emerging evidence for prevention of childhood obesity.

Keywords: childhood obesity; prevention; energy balance; school environment; wellness policies

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By
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Concern about the recent increase in the percentage of overweight children has led many policy makers and the public to call for changes in schools to address the problem. This chapter outlines the promise and limitations of schools in preventing childhood obesity. While schools are unlikely to reverse the epidemic of childhood obesity by themselves, they are an important venue for prevention, in concert with a comprehensive community-wide effort.

The schools seem like an obvious choice for prevention, since more than 97 percent of

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children five years and older spend six to eight hours a day there for nine to ten months a year (Institute of Medicine 2006; Trust for America's Health 2006). The policies that affect factors within schools can be monitored more readily than the wide variety of policies affecting community environments (Institute of Medicine 2006). Advocates have noted disturbing trends in school environments and are calling for reversal of those trends (e.g., Action for Healthy Kids 2007). They have called for reforms to restore time spent on recess and physical education, to limit "competitive foods" (foods of little nutritional value that compete with the school breakfast and lunch), and to improve healthy offerings in the school cafeteria.

There is also a public perception that schools should initiate efforts to prevent childhood obesity. A recent national poll revealed that 87 percent of respondents believed schools should address the problem (Research!America 2006). Other polls consistently mirror this trend (Napier 2006; Stein 2004). Public health professionals agree: a survey of state health department chronic disease directors (who have responsibility for preventing obesity) rated school-based approaches as the highest priority to prevent childhood obesity (Trust for America's Health 2006; Segal and Gadola 2008 [this volume]). In line with these perceptions, federal and state policy makers are requiring changes to make the school environment conducive to preventing obesity. The environmental factors in school seem readily apparent and somewhat easier to change than the many forces in communities that are contributing to the problem.

At the same time, there are limits to what schools can do about the problem. Historically, health promotion has never been a priority of the schools. School health services are often criticized for poor planning, a lack of clear goals, and failure to keep up with the changing needs of students. Schools are often hard-pressed financially, forcing them to make difficult choices about programs to save or cut, including physical education. Schools have been forced into an almost exclusive focus on improving achievement scores (the "No Child Left Behind" legislation is merely the most recent pressure). The focus on achievement has consumed limited time in the school day, forcing out many activities that are not seen as directly supporting student achievement (Pedulla et al. 2003; Stecher and Barron 2001, Trust for America's Health 2006). Finally, school personnel often suffer from "innovation fatigue": they have seen many changes come and go (Troman and Woods 2001). Control over school program implementation depends on cooperation at several levels: the district level, the school facilities, and the individual teacher or staff person (Berends, Bodilly, and Kirby 2002). Without staff buy-in, who will implement any reforms to prevent childhood obesity?

Fortunately, these obstacles can be overcome. Recent innovations for school programming and experiences in policy reform suggest that the obstacles to changing the environment are not as great as we feared, and some perceived obstacles are not well founded in actual experience.

Population-Wide Improvements Require Environmental Changes

Prevention, not treatment of obesity, is the goal of school interventions. In framing the childhood obesity problem, prevention needs to be clearly differentiated from medical treatment for children who are already obese. People do not usually differentiate prevention and treatment, and this poses a challenge for school settings. Focus groups conducted by the Robert Wood Johnson Foundation indicate that the public—and many policy makers—automatically think that weight loss is the answer to the problem. With that focus come associated concerns about encouraging eating disorders and other problems.

In framing the childhood obesity problem, prevention needs to be clearly differentiated from medical treatment for children who are already obese. People do not usually differentiate prevention and treatment, and this poses a challenge for school settings.

The Institute of Medicine (2005) noted that prevention helps children who are not obese to maintain a healthy weight and is therefore appropriate for school interventions. Treatment (weight loss) is best accomplished under a doctor's supervision. A healthy school environment can help support weight loss and, provided that adequate follow-up and treatment are available, may be helpful in screening for overweight (Institute of Medicine 2005). The school nurse can play a role by following through with medical recommendations and supporting behavior change (Costante 2001). Finally, there is some reason to be concerned that obesity prevention in the schools may increase stigma, teasing, and victimization of overweight children—but effective staff training programs can minimize these problems (Puhl and Latner 2007). Well-conducted programs in Arkansas have seen no increase in teasing (Raczynski et al. 2007).

Prevention requires small but consistent changes in schools. Recent statistical modeling suggests that normal-weight children need only small daily changes to achieve a balance between calories consumed and calories expended through physical activity (Hill et al. 2003; Wang et al. 2006). Normal weight children consume (or fail to expend) between 110 and 165 excess calories every day, leading to an excess weight gain of ten pounds over ten years. In contrast, overweight children consume between 700 and 1,000 calories in excess of what is required for normal growth, leading to a gain of fifty-eight excess pounds over ten years (Wang et al. 2006). It is plausible that school environments can assist prevention, because the required changes in the energy balance are relatively small. Treatment of obesity that includes weight loss requires a scale of behavior modification that is beyond the power of most school environments, however.

Prevention requires environmental changes to achieve consistent effects. Environmental interventions engineer behavior change to make it automatic or to minimize opportunities for individual choices or habits. Environmental interventions may also enable individual choices and habits that are otherwise more difficult (Green and Kreuter 2005). When environmental interventions are available, public health professionals usually prefer them to interventions that depend on human error and individual choices. For example, clean drinking water is greatly preferred to individual purification systems or purchase of bottled water, and engineered safety protections at the workplace are greatly preferred to safety rules that are subject to human error. Environmental interventions can apply to entire populations, not just to targeted individuals (Leviton, Rhodes, and Chang 2007). They also have more consistent effects, and in the case of childhood obesity it is the daily, consistent balance in energy that is required. Recently health promotion has turned away from a strict focus on direct intervention or health education with individuals, to what is termed the ecological approach. This approach recognizes many levels of influence on individual health and behavior, including individual factors, community, organizations, society, industry and agriculture, policy, environment, and interpersonal factors. These all have reciprocal influences; interventions are generally more powerful when tailored to several levels at the same time (Green and Kreuter 2005).

Focus groups conducted for Robert Wood Johnson Foundation indicate that many health professionals do not understand the ecological approach to obesity prevention, relying instead on didactic approaches or, at most, experiential learning. Yet as seen below, most school-based programs that focus solely on individual change have relatively small effects or no effect on obesity-related behaviors, while programs that include environmental changes generally have larger effects.

A variety of environmental changes are needed in schools. No quick fixes or single policy solutions exist for the school environment. For example, many policy makers have focused on limiting sweetened beverages at school (Institute of Medicine 2005). Indeed, good evidence suggests that reducing their consumption will help to restore energy balance (James et al. 2004; Vartanian, Schwartz,

TABLE 1
NATIONAL SURVEYS OF SCHOOL POLICIES AND ENVIRONMENTS

Every year the Youth, Education, and Society (YES) component of the Robert Wood Johnson–supported program "Bridging the Gap" reports on policies and environment for physical activity and nutrition in middle and high schools.
Every six years the Centers for Disease Control and Prevention (CDC) supports SHPPS: the School Health Policies and Programs Study, which examines the school environment for physical activity, health education, and nutrition (results for 2006 were not available at the time of this writing).
In 1996, 2002, and 2004, the CDC also supported surveys using the School Health Profile, which covers physical education and health education in middle and high schools.
Every seven years the U.S. Department of Agriculture (USDA) supports the School Nutrition Dietary Assessment Study (SNDA), which monitors the quality of reimbursable school breakfast and lunch (results for 2005 are only now being reported).
In 2005, the U.S. Department of Education also conducted a survey of elementary school administrators concerning physical activity and nutrition (Parsad and Lewis 2006).

and Brownell 2007). After all, one can of sweetened soda has about 155 calories, which is about enough to restore a day's energy balance all by itself. However, while limiting soda is a good idea, it is probably not sufficient by itself to prevent obesity throughout the schools. Not all children want a can of soda; some consume too many calories outside of school hours, and some children consume fewer calories but are overly sedentary. The statistical simulations deal in averages, meaning the energy balance needs vary among a population of children. Prevention will be best served when children's environment gives them a variety of opportunities to consume healthy food and to be physically active.

Negative Environmental Forces Stimulate a Call for Action

Surveillance of policies and school environments. If a variety of small changes in the schools are required, then the schools are generally going in the wrong direction. Survey data (see Table 1) have revealed some disturbing features of the school environment. Note, however, that because these surveys all used somewhat different methods, we should use caution in inferring any direct comparison or conclusion about trends.

Physical activity. The School Health Policies and Programs Study (SHPPS) revealed that, in 2000, slightly fewer than one-half of elementary schools required physical education in grades one through five, while only 25 percent required it in eighth grade and 5 percent required it in twelfth grade. In 2005,

the U.S. Department of Education reported that 99 percent of elementary schools provided physical education, and the annual survey conducted by Youth, Education, and Society (YES) indicated that physical education was provided in 86 percent of eighth grades, 53 percent of tenth grades, and 21 percent of twelfth grades (Johnston et al. 2006). This appears to be a striking improvement and consistent across surveys, but merely having physical education is not sufficient. The Institute of Medicine (2005) recommended daily physical education, yet according to SHPPS 2000, only 8 percent of elementary schools and 6 percent of middle and high schools meet this requirement (Burgeson et al. 2001). According to the U.S. Department of Education in 2005, however, daily physical education was offered by a somewhat larger percentage of elementary schools: between 17 and 22 percent depending on grade level. The 2005 YES survey indicated that the average number of days of physical education in middle and high school was four days per week and the average number of minutes was fifty-four (Johnston et al. 2006).

Healthy food offerings. The food environments of schools are correlated with weight status—where school policies support frequent snacking and the availability of foods high in calories and fat, children's body mass index (BMI) is greater (Kubik, Lytle, and Story 2005). Two general forces affect the food environment: whether the school food service follows the U.S. Department of Agriculture (USDA) dietary guidelines, and whether competitive foods, those that "compete" with the school breakfast and lunch, are present.

The USDA has a powerful effect on school environments through reimbursement of school breakfast and lunch: 99 percent of all public schools and 83 percent of all private and public schools participate in the program (Story, Kaphingst, and French 2006). Since 1995, school breakfasts and lunches have been required to meet the USDA dietary guidelines—yet according to the 1998 School Nutrition Dietary Assessment Study (SNDA), more than 75 percent of schools had not yet met the guidelines for fat content.[1] The USDA provides training on nutritious food service, but in 2005 fewer than half of the schools responding to the YES survey were participating in such training (Johnston et al. 2006); even where they did so, their ability to follow the guidelines may still be in question. The general conclusion is that the USDA-funded School Lunch and Breakfast are better than they were in 1995, but there is still room for improvement in terms of fat and calorie content, use of fresh fruits and vegetables, skim milk, and whole grains (Story, Kaphingst, and French 2006).

Of most concern, however, are competitive foods. Because the cafeteria foods are often unappetizing, competitive foods displace consumption of healthy foods, and unfortunately they are often high in calories and fat (Story, Kaphingst, and French 2006). The 2000 SHPPS revealed that 43 percent of elementary schools, 74 percent of middle schools, and 98 percent of high schools sell competitive foods in snack bars, school stores, and vending machines and for fund-raising (Wechsler et al. 2001). By 2005, according to the U.S. Department of Education, 94 percent of public elementary schools reported offering food for sale outside

the school breakfast and lunch (Parsad and Lewis 2006). For middle and high schools in 2005, 81 percent of schools offered soft drinks for sale at some point during the school day (Johnston et al. 2006). The preliminary findings of the 2005 SNDA are that 38 percent of all schools have vending machines near the cafeteria, and 68 percent have no restrictions on the types of food sold (Frost and McKinney 2006). The 2004 School Health Profile survey indicated that in the twenty-seven states studied, 94.5 percent of middle and high schools sold sweetened drinks through vending machines (Institute of Medicine 2005), a pattern entirely consistent with the 2005 YES survey (Johnston et al. 2006). Advocates call for making the school breakfast and lunch more appetizing, making competitive foods healthier, or eliminating competitive foods altogether.

Because schools are held accountable for student test scores, any subject that is not tested gets a lower priority, and as a result health education, physical education, and recess have been pushed out of the curriculum.

What maintains these unhealthy school environments? Story, Kaphingst, and French (2006) have analyzed the reasons for the rise in competitive foods and the decline in physical activity in schools.

1. School food service often needs to be self-supporting, and in 2000 the USDA only reimbursed 51 percent of the cost of a meal. The easiest way for schools to make up the difference is to offer the popular competitive foods, and competitive foods do not have to meet USDA nutritional requirements.
2. School districts come to rely on the revenues from competitive foods not only to support food service, but also academic and extracurricular activities. Also, school districts negotiate "pouring rights," exclusive contracts for the sale of soft drinks. Companies offer incentives to school districts in the form of lump-sum payments and a percentage of the profits (see Graff 2008 [this volume]).
3. The vending machines and school stores are more attractive to students when their lunch period is scheduled as early as 10 a.m., when they have insufficient time to eat, and face long lines in cramped and unpleasant cafeterias. However, scheduling and space are usually not under the food service's control.
4. Because schools are held accountable for student test scores, any subject that is not tested gets a lower priority, and as a result health education, physical education, and recess have been pushed out of the curriculum.
5. Students often do not have transportation to take advantage of sports or other physical activity before and after schools.

Story, Kaphingst, and French (2006) outlined several approaches to deal with these obstacles. Indeed, as states and school districts introduce reforms to address obesity, it is becoming clear that some of the feared consequences are simply without foundation. Properly conducted physical education does not detract from academic test scores (at least in the case of one curriculum; see Sallis et al. 1999), and Story, Kaphingst, and French cited some evidence that physical activity is associated with achievement: several studies examining the relationship between achievement scores and physical activity or physical education policies, and one study indicating that fourth-graders had trouble concentrating on days without recess. In addition, Wharton, Long, and Schwartz (forthcoming) challenged the fear that school districts will lose revenue from food service reforms. They conducted a systematic review of the effect on school revenues when school districts limited competitive foods and put nutritional standards into place. Contrary to expectations, most schools do not lose revenue, and some schools saw an increase in USDA School Lunch participation. Technical assistance and ideas for overcoming the problems of school food service are abundant (Story, Kaphingst, and French 2006; Wharton, Long, and Schwartz forthcoming).

The Evidence Base: What Might the Schools Achieve for Prevention?

The role of controlled studies. Controlled studies of school-based prevention are important because they indicate whether reversing the trend in prevalence of childhood obesity is feasible and suggest the directions that policy and environmental change should take. Ideally, a local school district or state department of education would mandate that schools implement evidence-based programs and environmental interventions to combat childhood obesity. The Centers for Disease Control and Prevention (CDC) Task Force on Community Preventive Services has conducted several systematic reviews to determine which kinds of school intervention are effective and for what purpose (CDC 2005a, 2005b). However, the evidence to definitively guide school changes is simply not available in many cases.

Obesity prevention. The Task Force on Community Preventive Services recently concluded that there was insufficient evidence to support school-based programs for obesity prevention (Story, Kaphingst, and French 2006). In contrast, the direct relationship between physical activity and obesity prevention is much more clear. A systematic review by Strong et al. (2005) examined both experimental and quasi-experimental studies of health effects of physical activity on children's body mass index. Moderately intense physical activity for thirty to sixty minutes a day led to a reduction in percent body fat for overweight children and youth. No reduction in body fat percentage occurred in normal-weight children in these studies. However, it is important to bear in mind that prevention

means maintaining the weight of normal-weight children, so one might not expect to see a change in those with normal weight.

Changing children's diet. The Community Preventive Services Task Force has concluded that evidence is mixed and more research is needed to determine whether school-based intervention will change children's diet (CDC 2005b). Nutrition education by itself is not generally effective in getting children to make healthier choices. One controlled study of British school children did find that a five-session curriculum aimed at reducing sweetened soda consumption did reduce children's drinking of these sodas and the prevalence of overweight in the treatment schools (James et al. 2004). However, the methods of this study are flawed (French 2004). Multicomponent intervention studies have been somewhat more successful. For example, the High 5 Project was a randomized experiment including classroom, cafeteria, and family involvement—it produced relatively large changes in children's consumption of fruits and vegetables (Reynolds et al. 2000). Consuming more fruits and vegetables is not by itself sufficient to prevent overweight; however, they can give a sense of fullness and may therefore displace the more calorie-dense "junk foods."

Changing the school food environment, that is, the price, promotion, and availability of foods, has been found effective in changing children's choices of food during the school day. However, very little research has focused on the effects of the school food environment on children's overall eating behavior or on prevalence of overweight (Story, Kaphingst, and French 2006). Healthy food environments are associated with lower body mass index (Kubik, Lytle, and Story 2005), but this finding concerns an association, not a causal connection, between healthy school environments and lower body mass index. It is correlational, not causal, because families may self-select into schools with these environments or a third, unknown variable may be responsible for both the food environment and lower body mass index. To the best of my knowledge, no randomized experiment to date has tested the causal relationship.

Increasing physical activity. Enhanced physical education, which uses credentialed teachers, is effective in increasing children's physical activity (CDC 2005a). An important policy reform is the choice of an evidence-based physical education curriculum. SPARK (Sports, Play and Active Recreation for Kids) is one such curriculum. It provides for physical education specialists and teacher training in physical education. In a quasi-experiment, children receiving instruction from specialists or trained teachers were more physically active at the end of two years than were comparison students (Sallis et al. 1997). Physical activity outside of school hours was unaffected. There were no significant effects on body mass index (Sallis et al. 1993). SPARK had no adverse effect on academic achievement (Sallis et al. 1999). At the end of one and a half years, specialists were withdrawn, and at four years the teachers were still implementing SPARK at 88 percent of its previous quality (McKenzie et al. 1997). Although this finding argues for using credentialed physical education teachers, the fact that SPARK continued to be

implemented at this level is notable. SPARK has been adopted and its use sustained in school districts all over the country (Dowda et al. 2005).

While advocates are urging schools to restore recess time in elementary and middle schools, the characteristics of recess are critically important. Children are more active generally at school when there is equipment such as basketball hoops, improvements in playgrounds, and supervision to organize active games (Sallis et al. 2001; Stratton and Mullan 2005; Verstraete et al. 2006).

Reducing screen time. Television and video games may be implicated in the rise in prevalence of childhood obesity, because too much time in these sedentary activities replaces physical activity and because many children snack while viewing television. In one study, elementary school children were given a six-month curriculum to reduce television, videotape, and video game use. They significantly reduced these activities, as well as eating while watching television, and significantly reduced their BMI (Robinson 1999). The "We Can!" initiative of the National Institutes of Health (www.nichd.nih.gov/news/resources/spotlight/042407_wecan.cfm) includes limiting screen time as an important evidence-based practice for the schools. The Community Preventive Services Task Force is currently undertaking a systematic review of this topic.

Multicomponent interventions. Programs that cover both nutrition and physical activity should, in theory, be more effective than single component interventions. The Planet Health intervention was a randomized experiment testing health outcomes of a two-year school-based health education intervention for sixth to eighth graders. It integrated health education into four major subjects as well as physical education, and focused on reduced television viewing, eating fewer high-fat foods, eating more fruits and vegetables, and increased physical activity. Body mass index declined for girls but not boys; girls ate more fruits and vegetables and consumed fewer calories. For both boys and girls, television viewing declined (Gortmaker et al. 1999). However, Planet Health primarily involves individual health education to change knowledge and attitudes; it does not have a strong environmental component.

Other well-conducted multicomponent interventions were not successful in changing the prevalence of overweight. Two well-conducted studies intervened with third- to fifth-grade children: Child and Adolescent Trial for Cardiovascular Health (CATCH) and the Pathways study for American Indian schoolchildren. These programs changed food offerings in schools, enhanced the physical education curriculum, and offered health education. Although they were school based, they also provided family education to promote lifestyle change beyond the school walls. CATCH was successful in changing children's eating and physical activity but had no effect on body mass index (Luepker et al. 1996). Pathways changed some aspects of diet as well as knowledge and attitudes but had no effect on physical activity or body mass index (Caballero et al. 2003).

Making sense of the evidence. What, then, is one to do with the mixed findings from these studies? First, it is worth keeping in mind that society overall was changing toward the increasing prevalence of children's overweight at the same

time that these studies aimed to affect children's behavior through the schools (Ogden et al. 2002). The schools, like society as a whole, were engineering physical activity out of the environment, luring children with sedentary video games, expanding portion sizes, and increasing the availability of junk foods during the day. In the face of such changes, even a comprehensive program might not be effective—little changes making for an energy imbalance were mounting up.

Second, the school environment itself may have defeated prevention efforts. A key principle of health promotion is to focus on the ecology in which health behavior takes place (Green and Kreuter 2005). It is likely that the presence of junk food, limited time for physical activity, and other features of the school environment undercut the health message in some of these programs and contributed to energy imbalance.

The Community Preventive Services Task Force must use the most stringent criteria of effectiveness. Yet the epidemic will not wait. At the moment, the Task Force must deal with a paucity of well-controlled studies, variation in outcome measures, variation in student ages, variation in the models being implemented, and variation in the implementation of the models being tested. Even the most casual reader of the available studies can see reason for optimism in school-based approaches, suggestions about where to put effort, and reasons to discount some findings.

Furthermore, the correlational evidence concerning the environment is more consistent and positive than the evidence from controlled studies of effectiveness. School environments are associated with weight status and related behavior. A logic model or theory of change is required, and it provides a much greater sense of optimism. While the logic model itself needs a test, it still provides a guide to action. An abbreviated logic model might be as follows:

- The physical activity connection:
  - *If* time is made for physical education and supervised recess, *then* kids are more physically active;
  - *if* they are more physically active, *then* they expend more calories and are closer to achieving an energy balance.
- The food environment connection:
  - *If* schools limit competitive foods *and* provide appetizing school meals that meet dietary guidelines, in appealing circumstances with sufficient time to eat,
  - *then* they will consume appropriate calories and come closer to achieving an energy balance.
- The school environment:
  - *If* schools have a healthy environment for eating and physical activity,
  - *and* community and family environments are also healthy,
  - *then* children will achieve an energy balance and maintain healthy weight.

What Is Being Done?

As policy and environmental approaches are proposed and endorsed, we are seeing a familiar pattern: local initiatives take the lead, followed by state and federal actions. The reasons are understandable: as in the case of tobacco, local decision makers are in a better position to take some risks and try new things

(Lawrence W. Green, personal communication on the evolution of policy advocacy in prevention policies, January 20, 2006). Advocates would say that for the competitive foods issue in particular, the food industry has hampered progress (Story, Kaphingst, and French 2006).

Federal action. Resources have been provided for some time for training and technical assistance (Institute of Medicine 2005). The CDC has long provided funding and technical assistance to states to implement the coordinated school health program model, emphasizing physical education and nutrition and a healthy school environment (www.cdc.gov/HealthyYouth/CSHP/). The USDA offers a variety of resources to states to assist school food service to meet the mandated dietary guidelines (http://teamnutrition.usda.gov/grants.html).

The Child Nutrition and WIC Reauthorization Act of 2004 mandated that by fall of 2006, all schools participating in the USDA School Lunch and School Breakfast programs were required to establish and implement wellness policies. The wellness policies would set forth requirements for physical education, health education, and nutrition and ensure that school meals meet the federal dietary guidelines. However, with only $4 million appropriated to implement the policies, this is essentially an unfunded mandate for the schools.

The 2007 Farm Bill is under consideration at the time of this writing. It is a wide-ranging set of laws that touch every aspect of the food systems of this country. Public health advocates, nutrition experts, and the USDA have recommended several changes in the law to improve the food environment of schools. These include enforcing the requirements that school food service meet the federal dietary guidelines, authorizing new resources to train food service employees, and authorizing $500 million over the next ten years to provide fruit and vegetable snacks to students (e.g., American Public Health Association 2007; Institute of Medicine 2007). These changes are sorely needed because so many schools have failed to meet the federal dietary guidelines for so long.

National voluntary efforts. Action for Healthy Kids (AFHK) is a public–private partnership of more than fifty national organizations and government agencies organized in 2002 to combat childhood obesity through changes in school. Through 51 Teams in every state and the District of Columbia, AFHK works through thousands of volunteer parents, school and health care personnel, and citizens. It provides model projects and policies and shares suggestions about how to engage schools, and develop parent and youth advocates. Local volunteers make sure that school districts have oversight and person power to implement obesity prevention strategies (AFHK 2007).

The Alliance for a Healthier Generation is a national partnership between the American Heart Association and the William J. Clinton Foundation on childhood obesity prevention. In 2006, the Alliance launched the Healthy Schools program, which focuses on helping schools to create healthier environments. The Alliance provides relationship managers, who work regionally with individual school districts to assist them, and it provides virtual technical assistance online. The Alliance developed standards for policy, program, and practice based on the best

evidence for physical activity and healthy eating. These standards serve as the basis for a recognition program.[2] The relationship managers assist the schools with planning and assessment, but also in identifying resources. For example, by buying equipment and supplies together, schools can reduce expenses they may incur when changing practices and programs. In May 2007, 230 schools received technical assistance from a relationship manager, and another 900 schools enrolled in the virtual support program. The Alliance plans to include another 6,400 schools that serve primarily low-income and minority children who suffer disproportionately from the obesity epidemic.

State-level changes. State legislatures and departments of education have been active in the past few years in passing new laws and regulations on the school environment. Since the 2004 federal requirement for school wellness policies, the level of activity has increased. Many states have their own wellness policies, which the school districts have emulated. The Robert Wood Johnson Foundation Web site (www.rwjf.org) publishes Balance, a series of tracking reports on state legislation and regulations relevant to childhood obesity. A 2006 annual report is now available (Health Policy Tracking Service 2006). These reports indicate that the states are generally increasing the required time for physical education and recess; raising standards for physical education and nutrition education; increasing compliance with the USDA dietary guidelines in school service; and most notably, limiting access to foods of limited nutritional value in vending machines, school stores, and cafeterias. However, the quality of the state laws is also a matter of concern: public health advocates worry that the requirements can be considerably watered down.

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The National Cancer Institute has developed assessment measures for state policies on school physical activity and nutrition that takes into account a variety of features of the school environment and assigns points for the quality of each (Mâsse, Frosh, et al. forthcoming; Mâsse, Chriqui, et al. forthcoming). While other organizations have also ranked the quality of state policies, these assessment measures have the advantage that that they were developed through an expert consensus process.

Local district changes. According to the USDA, 56 percent of schools were not subject to a wellness policy in 2005 (Frost and McKinney 2006). Districts were to have written and implemented wellness policies by the beginning of the 2006-2007 school year. Federal surveys have not been conducted, yet from the available evidence progress has been slow. AFHK (2007) reviewed a sample of policies from 256 school districts in forty-nine states between summer 2006 and February 2007. Although the sample was not representative, it did include urban, rural, and suburban schools and small, medium, and large school districts. AFHK assessed the policies to determine whether they met the minimum requirements of the law, and also compared the policies to the AFHK model policy. The policies generally addressed the elements required by the law (the range was 78 percent requiring meals that adhere to the dietary guidelines, to 88 percent establishing school health councils or wellness teams). However, only 15 percent required physical education that meets national standards and 35 percent required qualified staff for physical education; 58 percent included requirements for recess and activities outside school hours. Nutrition education was required to be incorporated into health education and the general curriculum in more than 60 percent of policies, while 40 percent required teacher training for nutrition education. Almost 85 percent of the policies address nutrition standards for competitive foods in vending machines and student stores, and 56 percent state that competitive foods must meet or exceed the dietary guidelines.[3] Most serious, however, was the lack of attention in most school policies to planning for implementation and evaluation.

Implementation is clearly the largest challenge to wellness policies in the schools. For example, Samuels and associates (2006) examined six California school districts that had passed policies limiting sweetened beverages and snacks high in sugar and fat on school campuses. The policies had only been partially implemented at the time of the case studies. In the same way, schools in the state of Arkansas, which passed ambitious legislation in 2004, were making some progress by 2007 but were far from satisfying the law (Raczynski et al. 2007). And schools' general failure to implement the USDA dietary guidelines for school meals led to strong advocacy for reform in the pending Farm Bill. Implementation is incremental in schools, so that continued supports will be needed. The voluntary efforts of AFHK, the Alliance for a Healthier Generation, government agencies, and youth-serving organizations can all work to provide this support.

Conclusions

The school environment can contribute to an overall energy balance in children's lives. The evidence is far from definitive, but the correlational evidence is striking, and there is just enough in the way of causal tests of effectiveness for some optimism. At a minimum, schools can reverse decades of policies and environmental

changes that have helped to produce the epidemic of overweight. Monitoring data indicates they may well have done so. Of course, the schools cannot reverse the epidemic by themselves. Moving beyond the school walls, coordinated efforts include farm-to-school programs, safe routes that permit children to walk to school, use of the school facility by community organizations for active after-school time, and a host of other efforts that have not been touched on here (Story, Kaphingst, and French 2006). To change the school environment, however, will take time and effort. The available evidence is that implementation is the key, and implementation is a long, hard road for any school program.

Notes

1. Findings from School Nutrition Dietary Assessment Study (SNDA) III on this point are not available at the time of this writing.

2. The recognition criteria can be found at www.healthiergeneration.org/schools.aspx?id=76&ekmensel=1ef02451_10_12_76_2.

3. Other important features of the school policies can be found at the Action for Healthy Kids Web site: http://www.actionforhealthykids.org.

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