

Combating childhood obesity: A survey of laws affecting the built environments of low-income and minority children

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Abstract

Childhood overweight and obesity have reached epidemic proportions, with nearly one out of every three children in the United States being affected. That factors in the built environment are closely correlated to childhood obesity has become increasingly evident. Negative built-environment factors disproportionately affect poor and minority children. This article examines the current research on the state of childhood overweight and obesity and surveys the built-environment factors that have been linked to the problem. Analyzing the built environment from a legal perspective, this article identifies how zoning, legislation, public/private partnerships, and contracts are being used at the local, state, and federal levels to combat the epidemic of childhood obesity. Using these tools, local, state, and federal government agencies are increasing access to healthy food, decreasing the density of unhealthy food sources, and increasing physical activity resources for children. Whereas some of the programs are geared toward minority and low-income children, many apply to children across the socioeconomic and demographic spectrum.

Keywords

childhood obesity, overweight, zoning, laws, legislation, joint-use agreements, supermarket, urban garden

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I. Introduction

a. The current state of childhood obesity in the United States

Childhood overweight and obesity are problems that have reached epidemic proportions (1). Today, nearly one in three children in the United States is considered overweight, and one in six is considered obese (2). Overweight and obesity are determined by measuring a child's body mass index (BMI) and comparing this number to other children of the same sex and age (3). When compared with the Centers for Disease Control and Prevention (CDC) sex-specific growth charts showing BMI for age,

children with BMI at or above the 85th percentile for sex and age are considered overweight, and children at or above the 95th percentile are considered obese (4). According to the 2007 National Survey of Children's Health (NSCH), 31.6% of children nationally between the ages of 10 and 17 years were considered either overweight or obese, with 16.4 % classified as being obese (5).

These statistics represent a more than three-fold increase over the past three decades, with a disproportionate number coming from poor and minority populations (6). In their 2010 study of the 2007-2008 National Health and Nutrition Examination Survey (NHANES), Ogden et al. (6) found that 15.6% of white-American females between 6 and 19 years of age are obese as compared with 25.9% of black-American females and 19.7% of Mexican-American females in the same age group. Although some evidence suggests that the trend in overweight among children has begun to stabilize since 2003 (7), the 2007 NSCH report found that a significant rise in levels of obesity continues (5).

Nationally, an estimated 10.58 million children between 10 and 17 years of age are overweight and obese (5). This alarming number is of great concern due primarily to the major economic and health implications that obesity carries over the course of a child's lifetime. Overweight children are at an increased risk of becoming obese adults, and as many as 80% of obese adolescents will become obese adults (8). In turn, obese adults face major health problems as well as shortened life expectancy, ranging anywhere from 8 years in the case of highly obese middle-aged white-American females to 20 years for severely obese black-American males (9). Decreased life expectancy for obese young adults today is estimated to reach as high as 25% (10). Because of the major health implications that accompany overweight and obesity, for the first time in modern history, experts are predicting that the children of today will have a lower life expectancy than their parents (9).

Overweight and obese children are at risk of developing a number of serious and chronic health problems that may persist and worsen in adulthood. Many diseases once thought to afflict only adults have now begun to surface in overweight and obese children as young as six years of age. These include cardiovascular disease, high blood pressure, left ventricular hypertrophy, atherosclerosis, metabolic syndrome, lipidemia, insulin resistance, type II diabetes, obstructive sleep apnea, asthma, gastrointestinal disorders and skeletal malformation. Originally dubbed "Adult Onset Diabetes," Type II Diabetes is now growing faster in children between the ages of 8 and 19 than in any other age group (11).

These health challenges translate into an extremely low quality of life for overweight and obese children. One study found that "health related quality of life for obese children and adolescents was comparable to that of children diagnosed with cancer." (11) And for obese children also suffering from obstructive sleep apnea (OSA), the quality of life was found to be comparable to that of "children undergoing chemotherapy." Obesity for these children often results in its own self-perpetuating cycle. For example, children suffering from OSA do not get the rest they need. Therefore, they have lower levels of energy, trouble concentrating, and perform poorly in school. This may in turn lead to depression and other emotional disorders, which in turn may contribute to more sedentary behaviors.

Moreover, studies have shown that overweight and obese individuals are highly stigmatized in society. They are often viewed as being lazy, ugly, sloppy, or stupid. These stereotypes tend to affect girls more than boys. Obese adolescent females who become obese adults are more likely to have less education, lower earning power, higher likelihood of poverty, and a lower likelihood of marriage (11). Obese individuals are less likely to be admitted to college and may also experience discrimination in acquiring housing (11). Similarly, obese adults may experience discrimination in obtaining employment or promotions (12).

In addition to these medical and social ramifications, the childhood obesity epidemic carries with it heavy economic consequences (13). The health care costs for obesity alone accounted for 27% of the rise in health care spending between 1987 and 2001. The direct medical costs of childhood obesity are nearly \$4.34 billion a year (13). This number rises steeply if the obese child becomes an obese adult. Adult health care costs related to obesity are estimated at an astounding \$147 billion annually (13). These are just the health-related costs directly attributable to obesity. Other costs include obesity-

related job absenteeism, lower productivity, and further costs related to delayed learning, lower education levels, lower earning potential and higher levels of poverty for obese children who grow to be obese adults.

b. How the Built Environment Impacts Childhood Obesity

Factors such as a child's genetic makeup, familial environment, and cultural heritage have been shown to influence overweight and obesity rates (14). Social, economic, and built environments may also play moderate to significant roles in a child's weight. Each of these factors alone is highly complex and presents unique design and implementation challenges for studies seeking to establish scientifically reliable links to obesity. Research on the link between obesity and the built environment in particular is still emerging, especially as it pertains to childhood obesity. Because the built environment is comprised of all the man-made structures in which we live, work, and play, including our homes, buildings, schools, transportation infrastructure, and even parks and trails, each of these factors may singularly and/or collectively impact childhood obesity rates. In order to establish clearer evidence on the correlates and causal connections between the built environment and childhood obesity, more studies are being called for, designed, and implemented (15,16).

While these new studies are designed to show stronger causal links between obesity and the built environment, numerous studies have established that a connection exists between the man-made environment and its impact on our food and physical activity choices (17). The recurring theme throughout these studies is that the built environment may be significantly contributing to childhood obesity in poor and minority neighborhoods because it inhibits physical activity in youth, and it reduces access to healthy food sources while simultaneously providing abundant sources of energy-dense and nutrient-poor food. Research is showing that low-income neighborhoods are more likely to have higher concentrations of minority populations, higher crime rates (18), higher numbers of abandoned, vandalized, and/or dilapidated houses, more garbage, litter and noise (19), less access to playgrounds and green space, fewer walkable streets and sidewalks (20), less connectivity between neighborhoods (21), fewer recreational centers (22), and more overweight and obese children.

According to Singh et al., "Children living in neighborhoods with no access to sidewalks or walking paths, parks or playgrounds, and recreation or community centers had 32%, 26%, and 20% higher adjusted odds of obesity than children in neighborhoods with access to such amenities, respectively." The group of children apparently most affected by these built-environment factors is girls aged 10-11. For these girls, living in neighborhoods with the fewest health-promoting amenities (sidewalks, parks, trails, recreation centers, etc.) presents a 276% greater likelihood of obesity and 121% greater likelihood of overweight than girls of the same age living in neighborhoods with the most amenities. To put these numbers in context, girls age 10-11 are more than twice as likely to be overweight and obese when compared to any other childhood age group living in similarly deficient neighborhoods (19).

For children in general, the neighborhoods they live in have the following built-environment factors :

- 26.7 % of children have no access to sidewalks or walking paths;
- 19.2 % have no access to parks or playgrounds;
- 35.0 % have no access to recreation or community centers;
- 14.0 % have no access to libraries or bookmobiles;
- 14.0 % were reported to live in unsafe neighborhoods;
- 17.0 % lived in neighborhoods with litter or garbage on the streets and sidewalks;
- 14.6 % lived in neighborhoods with poor or dilapidated housing; and
- 11.6 % lived in neighborhoods characterized by vandalism, such as broken windows or graffiti (19).

Studies have also found that minorities are more likely to live in neighborhoods with the greatest

number of negative built-environment factors and safety issues. For instance, the Singh study also found that 26% of black and 23% of Hispanic children were reported to live in unsafe neighborhoods, compared with 8% of white children (19).

As a result of these detrimental built-environment factors, poor and minority children are at greater risk of overweight and obesity. Specifically, according to the 2007 NSCS report, Black, American Indian/Alaska Native, and Hispanic children have 72%, 74%, and 66% higher odds of obesity and 56%, 51%, and 61% higher odds of overweight respectively than their non-Hispanic white counterparts when analyzed solely according to their built environments. Analysis of these same factors from an economic standpoint shows that children below the poverty line had 134 % higher odds of being obese and 120% higher odds of being overweight when compared with children with family incomes greater than 400% above the poverty line (19). Taken together, these statistics show that minority and/or low-income children have a dramatically higher potential of being overweight and obese. Due to the new and emerging evidence that the built environment plays a major role in this likelihood, an effective approach to breaking this cycle will be to modify the laws and public policies creating the detrimental built environment factors in the first place.

II. METHODS

The two major objectives of this project were: (1) to ascertain the state of childhood overweight and obesity by examining the most current scientific research and to determine what factors of the built environment may be contributing to the problem, and (2) to analyze current legal approaches impacting these built-environment factors. Therefore, step one of this project involved conducting a literature review in order to ascertain the current state of research on the correlation between built-environment factors and childhood obesity. To find the relevant literature, a search was conducted of the PubMed database using the terms “built environment” and “obesity.” The search returned 58 results which were then further refined by excluding those papers dealing exclusively with adult obesity. The remaining papers were then used to ascertain both the scope of the current childhood obesity epidemic and its scientific correlation to the built environment. The results ranged from minor to significant correlations and varied greatly according to socioeconomic and minority status. Also, information and resources from the Centers for Disease Control and Prevention’s website were gathered and analyzed.

Step two of the project involved looking at the legal paradigms shaping the built environment on the local, state, and national levels. A fifty-state survey of state laws was conducted on the Westlaw legal database using the search terms “obesity” (returning 439 results) and “childhood obesity” (returning 42 results). These results included proposed legislation, passed legislation, and legislative resolutions. The laws were then analyzed for their potential connection with the built-environment factors outlined in step one. The laws reviewed ranged from mandating insurance coverage for bariatric surgery in Mississippi, to so-called “cheeseburger laws” protecting food producers and distributors from liability for lawsuits brought by their customers, to laws regulating the built environment specifically to combat childhood obesity. A search of law review journals was also conducted through Westlaw using the search string “(child! /5 (obes! overweight))” where the exclamation points are root-expanders which will return all terms containing the root preceding the mark (e.g. “child!” will return all references to “childhood”, “childish”, “children” etc.). This search returned 457 results. The same search, modified to only search journal titles “TI(child! /5 (obes! overweight))” returned 27 results. None of these articles dealt specifically with childhood obesity and the built environment; however, some of them were pertinent to specific built-environment factors, such as school nutrition programs. Others were also pertinent to policy issues impacting childhood obesity. However, as none dealt with the overall topic of childhood obesity and the built environment, this topic area may yet be emerging within the legal community. Further Internet resources were used in this stage of the project as well, including the websites for the U.S. Department of Agriculture, the Centers for Disease Control and Prevention, the National Institute of Health, the Food Trust, Policy

Link, and the National Policy and Legal Analysis Network to Prevent Childhood Obesity (NPLAN).

III. DISCUSSION - Specific Contributing Factors and Their Legal Remedies

Because the factors contributing to the childhood obesity epidemic are manifold, complex, and interrelated, it is impossible to design a “one-size-fits-all” solution. Rather, due to the diversity of these factors, individual solutions must be tailored for the subgroups and communities to which the particular factors apply. This paper focuses solely on factors stemming from the built environment and examines the legal paradigms that influence these factors. Each section will analyze how particular built-environment factors affect poor and minority children within two broad categories: food access and physical activity. It will then survey a range of laws at the local, state, and federal levels that have been implemented to address the adverse impact of these factors on healthy weights for children.

a. How the Built Environment Affects Access to Healthy Food Sources

Individual choice of food consumption is influenced primarily by preference and availability. Individuals prefer certain foods based upon ethnic/cultural influences, social environments, education, and personal proclivities. However, individual food choice is also limited by the availability and cost of the food.

Access to healthy cheap food is a major issue in poor and minority communities. For most communities, supermarkets and farmers’ markets provide the best sources for healthy foods, especially high quality fruits and vegetables at the lowest cost (23). Studies have shown generally that the quality of a community’s diet is related to its access to healthy food sources, such as supermarkets and farmers’ markets (22). Morland et al., in particular found that the presence of each additional supermarket within a census tract resulted in a 32% increase in the likelihood that black Americans would meet the U.S. Department of Agriculture and the U.S. Department of Health and Human Service’s 2000 Dietary Guidelines for fruit and vegetable intake (24). Jago et al., found that when adolescents 10-14 years of age have greater access to convenience and fast food stores, their intake of fruits and vegetables decreases in direct proportion (25). Higher quality diets, in turn, lower the risk for obesity and improve health outcomes of communities. The relationship between access to supermarkets, improved nutrition, and lower obesity rates has been shown repeatedly in many studies (24).

Unfortunately, the U.S. Department of Agriculture found in a congressional study that 44% of low-income individuals live more than a mile away from a supermarket. Because many low-income individuals also lack regular access to personal transportation, living more than a mile away from a supermarket is a severe impediment to maintaining a healthy diet. Furthermore, the USDA report also found that 68% of low-income individuals have limited or no access to supermarkets (26). This translates to approximately 23.5 million individuals lacking a reliable source of healthy foods (27). Larson, Story, and Nelson (23) further reported that “the availability of chain supermarkets in predominantly black neighborhoods was found to be one-half that in their counterpart white neighborhoods.” The absence of large chain-supermarkets and medium-sized supermarkets from low-income neighborhoods has come to be called the “grocery gap,” and the communities affected by the grocery gap are being labeled “food deserts.”

Researchers have identified several barriers that may work together to prevent food retailers from locating stores in urban and inner-city environments. First, supermarkets operate on extremely thin profit margins. In urban and low-income environments, where stores are struggling to maintain profits even in the face of large sales volumes, these margins are even slimmer. The discrepancy lies in the tendency of urban and low-income customers to purchase low-profit items (27). As a result, there is very little room for error in a food retailer’s site selection. Second, both real and perceived market demand, employment pools, neighborhood safety, and crime levels all play an important role in a retailer’s decision to locate in a particular area (28). Often, there is a large untapped economic

potential in urban markets that goes unrealized because of inaccurate market perceptions that can only be rectified through difficult and expensive market analysis. Furthermore, a lack of other similar business interests in a given area may serve to further the misconception that a retail food outlet would not thrive in a given geographic location, while at the same time making market entry more risky due to an inability to gauge the success of a similar business venture in that area. Finally, other barriers include lack of access to financing; higher costs for land assembly, construction, workforce training, and security in under-served communities; and complex regulatory environments (28).

As a result, many of the residents of food desert communities are forced to rely on small drug and convenience stores and gas stations for their groceries (23). These stores tend to operate on much higher profit margins, especially the drug stores, and they do not have as strict a regulatory environment to navigate because they do not operate in perishable goods. Unfortunately, small grocery and convenience stores typically carry only pre-made, high-calorie products. If they do offer any fresh produce, it is usually at a much higher price than in supermarkets.

Low-income communities also have a greater density of fast-food restaurants. For example, in New Orleans, Louisiana, predominantly black neighborhoods have an average of 2.4 fast-food restaurants compared to 1.5 for predominantly white neighborhoods (29). Along with this reliance on this concentration of low-quality food sources, poor communities also exhibit higher rates of obesity (30). Therefore, an effective solution to fighting obesity in lower-income and minority neighborhoods would be to decrease the density of fast-food restaurants and attract more medium and large supermarkets and supermarket chains to these areas.

b. Legal Approaches to Improving Access to Healthy Foods and Decreasing Access to Unhealthy Foods

As these studies have shown, the built environment in low-income and minority neighborhoods thus can foster both a lack of access to healthy food sources and an abundance of unhealthy food sources. The legal approaches to addressing these two issues will be very different. The first approach will involve using primarily local and state government to overcome barriers to large supermarkets entering low-income markets. The second approach will involve using local land use, zoning, and possibly tax laws to try to reduce the density of unhealthy food sources in low-income neighborhoods.

1. Laws and Government Programs Promoting More Supermarkets and Farmers' Markets

Increasing access to healthy food sources is one area where there appears to be widespread agreement among politicians, policy advisers, civic leaders, and industry groups on the national, state, and local levels.

Municipal Programs. To attract supermarkets to under-served areas, cities and municipalities are working with food retailers to overcome the barriers to entry listed above. Cities have the greatest understanding of their individual needs and resources and can design programs that are best suited to their particular localities. Also, as the following examples show, cities can be empowered to act utilizing their own resources and need not wait on state or federal action before initiating programs.

For example, Chicago, Illinois began its "Retail Chicago" program which creates a "one-stop-shop" to streamline and fast-track the permitting, site selection, and land assembly processes for food retailers looking to enter Chicago's under-served markets (31). In addition, Retail Chicago provides in-depth market analysis for the various site locations, offers tours of the area to potential developers, identifies potential not-for-profit partners for the venture, and assembles a range of financial incentives for developing in target market areas.

New York City recently undertook a comprehensive audit of its departments to determine how it could increase access to high-quality, low-cost foods in its under-served areas. This resulted in several new programs, including "Green Carts", to help produce vendors locate in under-served neighborhoods with high rates of obesity and diabetes; "Healthy Bodegas", to improve healthy offerings in corner stores; "Health Bucks", to promote produce purchasing at farmers' markets; and

FRESH, to provide zoning and financial incentives to promote grocery store development, upgrading, and expansion in under-served areas.”(32). These zoning and financial incentives include real estate tax reductions, density bonuses, sales tax exemptions, and as-of-right development in manufacturing districts (28).

New Orleans has instituted the “Fresh Food Retail Incentive Program” (FFRIP) to attract food retailers to its under-served areas. New Orleans actions are a prime example of a city using its unique resources to creatively address food access issues. In the aftermath of Hurricane Katrina, New Orleans is uniquely situated to proactively address the needs of its citizens as it rebuilds its parishes. Thus, the city is investing \$7 million of federal Community Development Block Grant recovery funds it received post-Katrina to implement the FFRIP (28, 33).

State Programs. At the state level, Pennsylvania has led the way in initiatives to increase access to supermarkets in its under-served communities with its “Fresh Food Financing Initiative” (FFFI). This initiative represents a combined effort by local and state government, civic groups, and private industry to implement solutions to the “grocery gap” that are beneficial across the board. The program began in Philadelphia in 2001, with a task force aimed at creating better access to healthy food in poor Philadelphia neighborhoods. With an initial investment of \$30 million from the State, the FFFI has grown into a statewide \$165 million public-private partnership (34). By creating a public-private partnership, Pennsylvania combined industry know-how with government incentives to overcome many of the barriers to entry into its most underserved markets. Within the public-private context, industry representatives can work closely with the government agencies responsible for industry regulation, city planning, and economic and real estate development, to identify the hurdles faced in individual communities. They can then work to develop solutions that reduce or eliminate these hurdles, allowing industry to enter the market in a more cost-effective manner.

As a result of this initiative, Pennsylvania has funded 83 supermarket projects in 34 Pennsylvania counties (35). This translates into increased access to fresh produce and healthy food for approximately 500,000 children and adults. In addition, these projects have created or retained an estimated 4,860 jobs and provided more than 1.5 million square feet of fresh food retail (33). This is not the end of the benefits, however. Supermarkets often serve as high-volume “anchors” in commercial developments. Because they tend to generate a large amount of foot traffic, they in turn attract complementary stores and services, especially banks, pharmacies, video rentals, and restaurants. Therefore, a successful supermarket can serve as an economic boon to blighted neighborhoods and communities that results in the creation of jobs and an increase in property value (27, 32).

Other states have begun to emulate the success of the FFFI by designing programs utilizing the same ideas and tailoring them to their specific needs. Groups such as Food Trust (35) and Policy Link (36) aim to assist federal, state, and local governments in emulating the success of FFFI, and have worked with Illinois, Louisiana, Colorado, and New York to establish their own supermarket access programs. These organizations are also working with Colorado and New Jersey to implement variations of the FFFI theme.

For example, Illinois’ Buy Illinois Program (37) has invested \$10 million to create a statewide financing program similar to the FFFI called the Illinois Fresh Food Fund. In addition to the Fresh Food Fund, Illinois created an “Illinois Food Systems Policy Council” which will “develop policies around food access and security, improve individual health and well-being, promote economic incentives for Illinois farmers, agri-businesses, and other private enterprises, and encourage public/private partnerships around healthy food options (*see* 37 at 12).” New York created a similar program called the New York Healthy Foods, Healthy Communities Initiative, which also creates a statewide financing model with an initial \$10 million investment (38). The Louisiana Legislature passed the Healthy Food Retail Act, which tasks the Louisiana Department of Agriculture and Forestry to administer the Healthy Food Retail Financing Program (39). The funds through this program will be available (as of this writing the law is still awaiting appropriations funding) to any

for-profit or not-for-profit, public or private, sources that meet certain criteria for increasing access in low-income communities to fresh fruits and vegetables, with an emphasis on selling local agricultural products where possible. Supermarkets, farmers' markets, food co-ops, and community gardens could all receive funding under this law.

Some states are not going as far as the FFFI program, but are still passing legislation to encourage their citizens to purchase more healthy foods. For instance, Colorado has begun a program to encourage its citizens to buy more fresh fruits called the "Fresh Fruits Program,"(40) and California has instituted a program targeting particular low-income counties to encourage recipients of their Supplemental Nutritional Assistance Program (SNAP), formerly known as "food stamps," to purchase healthier foods, called the Healthy Food Purchase Program (41).

Federal Programs. Beginning early in 2009, officials from several branches of the federal government began looking at replicating the FFFI on a national level. In July 2009, representatives from the Urban Affairs department of the White House traveled to Philadelphia to highlight the success of the FFFI program. In December 2009, Rep. Allyson Schwartz (D-Pa.) and 39 co-sponsors introduced a resolution to show their support for the creation of a National Fresh Food Financing Initiative (42). In February 2010, First Lady Michelle Obama, accompanied by Secretary of Agriculture Tom Vilsack and Secretary of the Treasury Timothy Geitner, visited a supermarket opened in Philadelphia as a result of the FFFI (43). Her initiative to combat childhood obesity "Let's Move" is highlighting successful initiatives and also pushing for action at the national level to help create better access to healthy foods in minority populations (44). Finally, in his FY2011 budget, President Obama has allocated \$400 million for a national Healthy Food Financing Initiative which is modeled after Pennsylvania's FFFI and has been aided by many of the same organizations which led to the successful implementation of the Pennsylvania program (33).

The federal government has several other programs that provide resources to states and municipalities interested in increasing access to fresh fruits and vegetables and other nutritious food. One of these programs, known as the Community Foods Projects (45), started in 1996, and was recently extended as part of the Food and Nutrition Act of 2008 (46). The Community Foods Project makes available \$5 million per year, distributable in one-time grants from \$10,000 to \$300,000 for up to 3 years. The program is intended to "promote comprehensive responses to local food, farm, and nutrition issues" in under-served communities that have "limited access to affordable, healthy foods, including fresh fruits and vegetables."(47). The recipient must match community food project grants dollar for dollar using either state or local government or private sources. The grants are intended to provide one-time cash infusions for long-term projects designed to promote local agriculture and improve access, quality, and cost for the food needs of low-income individuals and communities. The grants are also available for projects to improve or expand food retail infrastructure, for instance, in a store that wants to expand to offer fresh, low-cost fruits and vegetables (45).

Another federal government program available to local and state governments and community organizations is the Farmers' Market Promotion Program (48). This program is authorized to provide up to \$5 million in grants for fiscal years 2009 and 2010, and up to \$10 million in grants for fiscal years 2011 and 2012. The purpose of these grants is to "establish, expand, and promote" farmers' markets, roadside stands, community-supported agriculture programs, agri-tourism activities, and other direct producer-to-consumer marketing opportunities (48). The grants are available to agricultural cooperatives, producer networks or associations, local governments, nonprofit corporations, public benefit corporations, economic development corporations, and regional farmers' market authorities. One goal of the program is to increase access to and intake of healthy foods in low-income populations. Therefore, at least 10% of the overall grants must be given to programs designed to increase the use of Electronic Benefit Transfers (EBT) in farmers' markets. Grant recipients must also demonstrate a plan to provide EBT access at one or more farmers' markets. Finally, the money cannot be used for the "purchase, construction, or rehabilitation of a building or structure."(48)

2. Laws and Government Programs Promoting Greater Access to Healthy Foods through Schools

Schools play a central role in the majority of children's lives in the United States. Therefore, many states and some federal programs are targeting schools as the locus for improving children's diet. They are doing this primarily through two strategies: (1) improving the quality of the food, snacks, and beverages served on school grounds by improving farm-to-school linkages and promoting community gardens, and (2) reducing the number of high-calorie snacks and beverages schoolchildren have access to during school hours. The second approach will be addressed below in the section dealing with restricting access to unhealthful foods.

There has recently been a burgeoning of farm-to-school initiatives that link schools to local agricultural producers to purchase their products for school nutrition programs. In addition, these initiatives often create "Garden Learning Programs" on school premises, where the students raise crops in school gardens and even sometimes learn how to care for small livestock, such as chickens, goats, and dairy cows. The crops grown from these programs may also be used in school nutritional programs, or are sometimes sold to the surrounding schools and communities.

Nearly every state has some form of a farm-to-school (FTS) program, with varying levels of local and state government support (49). Illinois has implemented a "Farm Fresh Schools Program" (50) that is designed to "link schools with local and regional farms in order to provide schools with fresh and minimally processed farm commodities for inclusion in school meals, vending machines, salad bars, and snacks." The program will also integrate nutritional awareness into the curriculum through visits to the farms, cooking demonstrations, and school gardening and composting projects. New York has also implemented FTS programs as part of its Eat Well, Play Hard community initiatives (51). Both Washington D.C. and California (52, 53) have similar programs which use appropriate portions of the schools' property for gardens that also act as educational tools in science and agriculture and teach "fundamental concepts about nutrition and obesity prevention." In all, more than 18 states have passed legislation creating, expanding, and funding FTS (54), and still more states are in the process of considering and passing legislation (55).

The FTS movement has gained such momentum that this year two bills to implement and fund FTS on a national level were introduced to Congress as part of the Child Nutrition Act reauthorization. The House bill, titled the "Farm to School Improvements Act of 2010," was introduced in February 2010 (56), and the Senate Bill, titled "Growing Farm to School Programs Act," was introduced in March 2010 (57). Both bills require \$50 million to be allocated for State Farm to School programs. In addition, the USDA recently released a clarification of its rules on how schools may use food-service funding in relation to farm-to-school programs (58). The USDA stated that schools may use this money to purchase seeds, gardening tools, fertilizer, and other gardening necessities for school garden programs. Schools may even use food-service funding to purchase crops from other school garden programs for use in its nutrition program.

3. Laws and Government Programs Promoting Community Gardens

Many studies have found that cultivating community or urban (these terms will be used interchangeably in this paper) gardens is a viable approach to increasing access to healthy food sources for populations struggling for access to healthy food sources. In fact, approximately 20 million urban gardens produced as much as 40% of the fresh fruits and vegetables consumed during WWII (59). Community gardens are agricultural initiatives that develop urban land plots into gardens for food and/or aesthetics. In some instances, urban gardens may include keeping bees or small livestock, such as chickens, goats, and dairy cows. Community gardens arise when the agricultural activities take place on public land or vacant lots. These gardens are usually tended by community garden associations or are run by a department of the local government, usually a parks and recreation department, who rent out or assign the plots to gardeners.

Urban garden programs carry with them multiple benefits to the wider community beyond just

providing access to healthy food sources. They can also lower food costs, increase awareness and education about nutrition, revitalize urban environments and create green-space, and help provide physical activity for those working in the gardens (60). One study found that community gardens save the gardeners between \$50 and \$250 in food costs per growing season (58). In blighted areas, community gardens have even been shown to reduce crime rates (61). And in areas with dense urban populations, these gardens may contribute to a decrease in childhood obesity simply by creating more green space (62). For all these reasons, states and cities have a vested interest in promoting the development of urban gardens especially in their low-income areas.

In encouraging these activities, however, several issues should be anticipated and planned for. On the part of local government interests, most state laws dealing with community gardens tend to have three main concerns: (1) defining community gardening as a valid land-use; (2) creating a system for identifying and tracking for use as community gardens; and, (3) protecting from liability for personal injury and property damage while the land is being used as a community garden (60). For their part, community gardening organizations are concerned with having some legal right of access to their gardens, access to water and other resources, and issues of legal liability. Indeed, because most community gardening occurs on land not owned by the organization or the individuals, urban gardeners may be liable for trespass when they develop a plot without permission from the true owner if community gardens are not a recognized land-use in their locality.

Organizations and individuals also need to be cautious that the land they are working on is suitable for agricultural purposes. Some urban land may have high levels of toxins, particularly heavy metals such as lead, cadmium, nickel and mercury. These heavy metals are often found in higher concentrations in soil near older developments that may have issues with lead-based paint and where the lot was used as a dump. Heavy metals from batteries and discarded electronics can make their way into the soil and subsequently be absorbed into the fruits and vegetables (63).

To protect against these toxic risks, cities like Washington D.C. and Hartford, Connecticut have programs to identify and catalogue urban land that is suitable for community gardens (64). In addition, some cities simply purchase land to establish community gardens. The city of Madison, Wisconsin, for instance, used federal Community Block Grant funds to purchase blighted properties and renovate the land into urban agriculture plots. It now has 12 community garden sites that are operated by the Community Action Coalition (65). And finally, some cities administrate community garden programs on city property, usually through a parks department. San Francisco is a good example of this type of a program, with 40 community gardens. As part of this program, San Francisco adopted its Community Gardens Policies in 2006 to address many of the issues discussed earlier in this section, including indemnification for personal injury and property damage, dispute resolution, and access to utilities and supplies, among other challenges (66).

Many states are just beginning to explore the benefits that urban and community gardens can provide to their citizens (67). For these states and localities, organizations such as the National Policy and Legal Analysis Network to Prevent Childhood Obesity have compiled model language statutes for state land-use comprehensive plans and local zoning ordinances which provide protections both to the state, locality, and community garden groups (68).

4. Laws Limiting Access to Unhealthy Foods

Whereas there appears to be near universal support for increasing access to healthy food choices, the same is not true for limiting access to unhealthy food sources, such as fast-food restaurants, except in the case of limiting access to unhealthy foods for our children.

In Schools. Programs to limit unhealthy foods in schools appear to have widespread political support, even on the part of industry. Some states, such as California and Colorado, have passed measures banning unhealthy foods from school breakfast and lunch programs and school vending machines and from selling sugar-filled beverages on school premises (69, ⁷⁰). There has also been recent activity on the part of major beverage providers to voluntarily restrict the sale of sugary sodas

and drinks in schools. Coke announced in March 2010 that it had voluntarily removed all of its sugared beverages from schools in America and replaced them with low- and no-calorie alternatives (71). Many other major beverage providers are following suit (72). In addition, many of the farm-to-school programs referred to above also contain initiatives to remove junk-food from schools and replace it with healthful alternatives.

Through Zoning. Early in the 20th century, the United States was quickly moving from an agrarian-based society to an urban-industrial society. As cities' populations exploded, there emerged a corresponding increase in public health concerns. Urban slums bred communicable diseases, like typhoid and cholera, and industrial and manufacturing works endangered public health and created nuisances through pollution and noise. Largely in response to these issues, states began experimenting with zoning as a viable way for cities to protect the public good. Using their broad police powers to protect the safety, health, morals, and general welfare of their citizens (73), states empowered cities, through delegating legislation called comprehensive plans, to structure their growth primarily by dictating how land may be used in particular areas. By segregating land use in this manner, cities kept industrial uses from residential uses.

These early zoning laws were challenged on the grounds that they were an unconstitutional exercise of state power. However in a landmark case called *Village of Euclid v. Amber Realty*, the Supreme Court upheld the rights of the states to implement zoning ordinances as a legitimate extension of their police powers (74). This set the stage for zoning to become one of the most important modern tools for shaping urban built environments. Using modern zoning law, states may delegate to cities the power to regulate the size, appearance, and density of buildings, the dimensions of land plots, and the way in which the land may be used in a given area (75). Today, many zoning ordinances are enacted for the purpose of relieving traffic congestion or preserving a neighborhood's character or historicity (76).

One of the earliest justifications for zoning was to "promote health and general welfare." (77). Thus, zoning may be used to limit the availability and density of retail outlets viewed as being harmful to public health, such as liquor stores (78). As the body of scientific evidence grows that the obesity epidemic poses a serious threat to public health, and as more studies emerge linking fast-food establishments with obesity rates, courts will likely recognize states' rights to exercise their police powers by regulating the location, density, and number of fast-food restaurants in a given area as a response to the obesity epidemic.

To date, no cities have enacted permanent zoning regulations specifically to combat obesity. In 2008, however, the Los Angeles City Council voted unanimously to ban the building of all new fast-food restaurants in certain parts of the city for one year (79). While regulation of aesthetics and business competition were the primary focus of the ordinance, adverse impacts on "the built environment and quality of life" were cited as justification for the ordinance as well (80).

Cities have also used other, more traditional justifications to accomplish this same objective. Utilizing their power to zone, cities have passed ordinances completely banning fast-food restaurants, restricting the density or number of fast-food restaurants, and restricting the placement of fast food restaurants within a certain distance from schools. For instance, Detroit, Michigan, passed a zoning ordinance banning the placement of any fast-food restaurant within 500 feet of any elementary, junior high, or high school (81). The City of Carmel, California banned all "drive-in, fast food, take-out or formula restaurants" with a zoning ordinance designed to protect the aesthetic character of this coastal California town (82). Finally, cities have also zoned for density, requiring that fast-food restaurants be a certain distance from one another, and by number, limiting the overall number of fast-food establishments that may be located in a given area. All these measures have withstood judicial scrutiny (83).

c. How the Built Environment Affects Physical Activity

In addition to increasing the amounts of healthy foods and decreasing the amounts of unhealthy foods

children are consuming, physical activity is an important tool in combating childhood obesity. Unfortunately, children living in low-income areas face many obstacles to being physically active. Low-income areas have less access to physical activity resources, such as parks, community centers, trails, and bike paths.

Sometimes, local schools can provide physical activity amenities to their surrounding communities. Usually school grounds are inaccessible during school hours, however, they may also be locked before and after school and on the weekends, preventing the surrounding communities from utilizing their amenities for physical activity. A 2007 study of adolescent female access to 407 school facilities across six states found a correlation between locked schoolyards and increased BMI among adolescent females (84). Almost half of the schools included in the study were locked or did not have active amenities. Further, the schools which were locked were primarily located in neighborhoods which were characterized as non-white, densely populated, with a lower percentage of education, and lower-income. Finally, the study found that “girls with a greater number of locked schools had higher BMI than either girls with no schools or schools with active amenities within a half-mile of their home.” (82) Lacking access to these built-environment amenities often translates into lower level of physical activity for children and adolescents, which in turn can result in higher BMI (21).

Another barrier to physical activity is often neighborhood safety. Unsafe neighborhoods due to crime, physical hazards such as glass, trash, and debris, poor lighting, or high traffic levels, can be a powerful deterrent to childhood physical activity. Studies have demonstrated that children living in unsafe neighborhoods are more likely to have sedentary behaviors, such as watching TV and playing video games. According to Singh et al., (19) “[c]hildren living in neighborhoods with the most unfavorable social conditions were 50% more likely to be physically inactive, 52% more likely to watch television more than two hours per day, and 65% more likely to engage in recreational computer use of more than two hours per day than children living in most favorable social conditions.” As a result, children who live in unsafe neighborhoods are 61% more likely to be obese and 43% more likely to be overweight than children living in safe neighborhoods.

d. Legal Approaches to Increasing Physical Activity

1. Laws Increasing Access to Recreation Facilities through Joint-Use Agreements Between Schools and Communities

One avenue for increasing physical activity in children and adolescents is to increase access to the amenities located on elementary, junior high, high school, and even college campuses. Many neighborhood schools own sports equipment, playgrounds, gyms, soccer, baseball, and football fields, indoor and outdoor basketball courts, and sometimes even pools and exercise equipment. These amenities could be utilized by the surrounding communities that provide the funding for the schools; however, unfortunately, they often go unused after school hours and on the weekends. School districts may be reluctant to open up their facilities for public use for a number of reasons. First, there may be some questions as to whether the school has the legal authority to open up the facilities. Second, the school district may be concerned about assuming liability for personal injury and property damage from those sharing the facilities. Third, there may be issues regarding who will administer the program. And finally, school boards may be concerned about operational costs and maintenance for the extra wear and tear on the campus.

One possible approach to creating more access to such facilities is for communities to enter into joint-use agreements with the schools in their area. Joint-use agreements present a viable option for keeping these facilities open so that the community can access them. Joint-use agreements are contracts which help protect the schools from liability should someone hurt himself while using the school's property. They also provide for arrangements on maintenance and cost sharing from the extra wear and tear on the facilities and equipment. Sometimes, communities may enter into joint-use agreements before building or expanding new-school projects. By doing this, communities and school

districts can share the up-front costs of capital improvements and set the parameters for community use before the facilities are even built.

Groups like Public Health Law & Policy (PHLP) (85) are working to increase the number of communities which operate under joint-use agreements by providing standard forms which cover the most common legal issues related to these types of agreements, technical assistance to help craft land-use agreements which are tailored to individual needs, and training on issues of legal tools related to land use. PHLP has also developed model laws for states to adopt which authorize, and sometimes mandate, that schools enter into joint-use agreements. By adopting this type of legislation states have a simple, cost-effective solution to increasing access to physical activity resources thereby reducing health disparities. For example, California currently has at least five laws relating to joint-use agreements, including the Community Recreation Act (86), the School Facility Joint-Use Program (87), the California Civic Center Act (88), the California Community College Act (89), and the After School Education & Safety Program (90). These laws run the gamut from authorizing school districts to enter into joint-use agreements, to mandating that they seek agreements to help mitigate the cost of capital projects (91). On the federal level, Congress passed the 21st Century Community Learning Centers Act (92) which provides grants to states to help fund the use of schools and community colleges to provide certain programs and recreational activities to the community (93).

2. *Laws Increasing the Number of Sidewalks and Safe Routes to Walk and Bike to School.*

Children in poorer communities have less access to safe sidewalks and live in less-connected neighborhoods, making it difficult for them to use active transportation (walking, running, biking, etc.) to get to school (8). This problem is exacerbated by modern school policies requiring that new schools have a certain amount of land allotted for each student. These policies resulted in cities building big schools on the outskirts of communities, rather than smaller schools in the center of communities. Bigger schools mean more students drawn from further distances. As a result, only 15% of students walk or ride their bikes to school today, whereas in 1969, nearly half of students age 5-18 used active transportation to get to school (94). Realizing that these policies are not working, many cities are reverting back to the smaller, centrally located school models. Cities are also working to provide safer, better streets and routes for active transportation to and from school.

In 2005, Congress allocated \$612 million to give to states as grants for state Safe Routes to Schools Programs (SRTS) through 2009 as part of its Transportation Bill (95). Since 2005, the STRS program has provided evaluation, education, and engineering to cities and counties to improve active transportation to more than 6,500 schools (96). This has resulted in a large increase in the number of children walking and biking to school. One study found that the SRTS program in California has resulted in a 38% increase in the number of children getting to school by active transportation (97). New Jersey is another example of a successfully implemented SRTS program. Using over \$4 million in federal SRTS grants, New Jersey encouraged children to walk and bike to school while also improving the safety for them to do so (98). SRTS programs help children get exercise and fight obesity, and they also help reduce pollution and morning congestion. There are currently plans to reauthorize and re-fund the SRTS program in the 2010 Federal Transportation Bill.

Several states and localities are using the land-use laws discussed above to improve how streets and other transportation lanes are constructed. These programs are known as “Complete Streets” programs. California’s Complete Streets Act of 2008 will require all cities and counties to design their streets, roadways, and highways so they can safely accommodate motorists, pedestrians, cyclists, children, seniors, public transit subscribers, commercial vehicles, and people with disabilities beginning January 1, 2011 (99, 100). Washington has a similar program through its Healthy Communities and its Active Community Environments programs. Both of these programs help counties and cities implement the “complete streets” ideal by increasing the number of bicycle facilities, sidewalks, trails, and mixed-use developments so that pedestrians and bicyclists can easily access homes, businesses, schools, and other community facilities (101). Florida also has a Conserve

by Bicycle program (102). In 2009 Louisiana introduced legislation aimed at creating a Complete Streets workgroup in its Department of Transportation for “streets and roadways that are safe and convenient for travel by automobile, foot, bicycle, and transit regardless of age or ability.”(103) Programs such as these are effective at increasing active transportation methods. For instance, Portland, Oregon experienced a 74% increase in bicycle traffic after implementing a “Complete Streets” program in the 1990’s.

e. Other Programs

As part of its State-Based Nutrition & Physical Activity Program to Prevent Obesity and Other Chronic Diseases, the CDC has teamed up with 25 states providing them with grants for programs aimed at reducing childhood obesity (104). States use these funds in a variety of ways. New York’s fifteen Eat Well, Play Hard community projects mentioned earlier are designed to do everything from improve nutrition in schools through farm-to-school programs to increase women’s ability to breastfeed their children for longer by mandating that employers and public facilities accommodate breastfeeding mothers by providing them with time and places to express their milk while at work, and safe and inconspicuous space to breastfeed while in public.

Some states, such as North Dakota, have taken very little or no action in obesity initiatives, while other states have initiated programs emphasizing partnerships across multiple sectors and social marketing. This social-ecological strategy also incorporates increased monitoring, education, and nutrition programs, and is best exemplified by Delaware’s Nemours Program (105). Still other states are focusing on actions such as mandating that insurance providers cover bariatric surgery, such as in Mississippi (106) where the obesity rate among children leads the nation at 44.4% (5).

III.CONCLUSION - Changing the Built Environment

There is much to be optimistic about as we confront the challenges of childhood obesity. Many parties of disparate, and even sometimes contrary, interests are coming together for a common cause. There are broad coalitions being formed across the local, state, and national level to share expertise and information to come to a broader and more nuanced understanding of the forces shaping the childhood obesity health crisis. From the federal government and major corporations down to grass-roots organizations many are working to implement policies that will influence the communities we live in for the better. The First Lady is drawing a lot of public attention to the issue with her “Let’s Move” campaign, and the President is committed to funding programs, such as Complete Streets, Safe Routes to School, and Fresh Food Financing Initiatives, which have been proven to be successful at the local and state levels. In addition, childhood obesity is a major news issue, with new stories tracking both the epidemic and new initiatives to fight it appearing in major news sources almost on a daily basis. Finally, as scientific studies establish stronger links between individual built-environment factors and childhood obesity policy makers will have better information to shape potent interventions.

While there exists a growing public awareness of the problem, scientific understanding of its mechanisms and desire on a broad level to implement effective solutions, it is important to acknowledge that there are also barriers to changing the built environment. Changing infrastructure is a slow and costly process, and investors want constant and predictable rules that protect their investments. As a result, there may be entrenched and well funded interests that will fight to keep the status quo. However, there is one thing that is inevitable: the built environment will change. Old buildings and infrastructure are being replaced and renovated at every moment. As more information is gathered on the extent of the problem, there will be greater political will to enact tough changes. Implementing positive policy changes now will bear fruit for years on down the road. That is the nature of the built environment. In a certain sense, that is a point of optimism. We do not have to change the whole system overnight. The system is changing and evolving. We only just need to guide it as it changes, so that our children can live healthy, full lives regardless of their racial or socio-economic backgrounds.

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