The Legal Perspective

The Built Environment and Its Relationship to the Public's Health: The Legal Framework

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The built environment significantly affects the public's health. This was most obvious when infectious disease was the primary public health threat during the industrial revolution; unsanitary conditions and overcrowded urban areas facilitated the spread of infection.

However, even today in the age of chronic diseases there remains an important connection between population health and the built environment. Physical spaces can expose people to toxins or pollutants and influence lifestyles that contribute to diabetes, coronary vascular disease, and asthma.

Public health advocates can help shape the design of cities and suburbs in ways that improve public health, but to do so effectively they need to understand the legal framework. This article reviews the connection between public health and the built environment and then describes the legal pathways for improving the design of our built environment. (*Am J Public Health.* 2003;93: 1390–1934)

DURING THE 19TH CENTURY, the connection between public health and the built environment became increasingly apparent as hundreds of thousands of workers crowded into unsanitary, industrial cities with a resulting increase in disease and epidemics and a decrease in life expectancy.[1] In this era, dramatic improvements in public health in industrialized nations were made possible by changes in the built environment. The installation of comprehensive sewer systems, improvements in building designs to ensure that residents had light and fresh air, and the movement of residential areas away from noxious industrial facilities all brought significant improvements in health.[1] In many respects, sanitary engineers were the first urban planners in America.[2]

Industrialization not only highlighted the connection between the built environment and public health, but it also established the dominant view that population concentration and proximity between businesses and residences were unhealthy. This view was reflected in the esthetics of the City Beautiful movement[3,4] as well as in the social agenda of many in the early 20th-century housing-reform movement.[4] It is also reflected in the zoning ordinances that took hold in the 1920s. These ordinances separated neighborhoods for residential, business, and industrial uses and specified building heights, setbacks, and the density of use.[4] They were consistently justified because population deconcentration and separation of uses improved "public health, safety, morals, [and] general welfare."[5]

By the mid-20th century, the connection between public health and the built environment seemed to diminish. Infectious disease had been brought under control, and as a result the layout and planning of cities came to be viewed as a matter of esthetics or economics, but not health. Public health officials concentrated on human behaviors such as smoking and to the extent they considered the built environment, the focus was on more discrete issues such as lead paint rather than larger-scale planning issues.

Today the primary public health problems are chronic diseases rather than infectious diseases, and half of Americans live in suburban rather than urban or rural settings.[6] These changes have not eliminated the connection between public health and the built environment but suggest a sharply different focus than that of a hundred years ago. Indeed, deconcentration of populations and the separation between residential and business areas, measures urged a hundred years ago to improve health, may contribute to chronic health problems. The spread-out design of suburbs increases reliance on the automobile. This in turn contributes to air pollution, with its detrimental effects including chronic respiratory ailments, and to a sedentary lifestyle and obesity.

In contrast to the situation in the cities of the mid-19th century, today nearly all aspects of the built environment are shaped by law and governmental decisions. What can be built in what location is regulated by a complex set of local, state, and federal laws. A second significant change is that unlike the situation in the 19th and early 20th centuries, today's public health advocates have been largely absent from discussions about major planning or land-use decisions involving the built environment. Many cities and counties around the country have large planning departments or other bureaucracies that regulate land use and buildings. These frequently in-

clude urban planners, architects, lawyers, economists, transportation engineers, environmental scientists, and demographers. They rarely include public health officials. This may reflect a broader phenomenon of the increasing isolation of public health officials within government.[7] Nonetheless, public health officials can add an important voice to the decisions that shape the built environment. We later explain the relation between physical space and healthy populations, examine the legal tools to improve the built environment, and offer guidelines to help public health professionals be effective advocates in political decisionmaking.

THE RELATION BETWEEN PHYSICAL SPACE AND HEALTHY POPULATIONS

The built environment influences the public's health, particularly in relation to chronic diseases. There is good evidence to indicate that the burden of chronic disease in the population can be reduced through an active lifestyle, proper nutrition, and reduced exposure to toxic conditions.[8] However, many urban and suburban environments are not well designed to facilitate healthy behaviors or create the conditions for health. Health officials can provide information about healthy living, but if people live in poorly designed physical environments, their health will suffer.

To understand the effect of the built environment on health, it is necessary to examine the major health threats facing Americans. The leading causes of death in the United States today are heart disease, cancer, cerebrovascular diseases (including stroke), chronic lower respiratory diseases (such as asthma, bronchitis, and emphysema), and unintentional injuries.[9]

A sedentary lifestyle and poor nutrition contribute to obesity, a risk factor for some of the leading causes of mortality, including cardiovascular disease, diabetes, stroke, and some cancers.[10–12] In fact, more stroke deaths in the United States are caused by obesity and hypertension than any other behavioral risks.[11] Although the American public is largely aware of the health risks associated with obesity, the percentages of overweight or obese (overweight is defined as having a body mass index greater than or equal to 25, whereas obese is defined as a body mass index of greater than or equal to 30)[9] American adults and children are growing. In 1999–2000, 64.5% of Americans older than 20 years were overweight, and 30.5% were obese.[9] These figures are up about 8% from 1988–1994 figures. About 15% of children aged 6 to 19 years are overweight, a 4% increase from 1988–1994 data.[9]

Toxic conditions also contribute to the leading causes of morbidity and mortality, especially chronic respiratory diseases and cancer. Asthma, a chronic respiratory disease, can be triggered by environmental factors such as pollen and grass seeds and atmospheric pollutants, both indoor and outdoor.[13] Indoor pollutants are believed to be a significant cause of asthma in the inner city. It has been shown that cockroach antigens, found in the insects' feces, eggs, saliva, and shed cuticles, can trigger asthma.[14] Outdoor pollutants, such as ground-level ozone and respirable particulate matter, can also increase the incidence of asthma.[15] Automobiles and factories produce significant amounts of ground-level ozone, respirable particulates, and other pollutants. When traffic was reduced in Atlanta for the Olympic Games, peak ozone concentrations decreased 27.9% and the number of asthma emergency medical events simultaneously fell by 41.6%.[16]

Although the links between physical activity, proper nutrition, a clean environment, and health are well known, the current built environment does not promote healthy lifestyles. Many urban environments lack safe open spaces that encourage exercise and easily accessible nutritious food and promote the use of alcohol and tobacco products through outdoor advertising. A spread-out suburban design facilitates reliance on automobiles, increasing pollution and decreasing the time spent walking from place to place.

The environment is integral to encouraging physical activity.[17] Yet urban areas frequently lack adequate safe playgrounds and green spaces. The "open space" that exists may be vacant lots covered with garbage and debris, which attracts vermin and can harbor criminal activities.[18] Children may choose to play in the streets rather than in the broken glass, garbage, and used needles of the vacant lots.[18] This lack of safe places discourages a child's play and exercise. In addition, neighborhoods without green space lack a sense of community and feature increased acts of violence when compared with those that surround green space.[16]

Land-use patterns also affect the health of urban communities. Urban neighborhoods may be home to a region's most toxic sites. One area of the South Bronx section of New York City had the largest wastewater sludge pelletization plant in the Northeast (it was forced to close) and the region's largest medical waste incinerator.[19] Not coincidentally, the area has a childhood asthma rate 1000% higher than that of the rest of New York State.[19]

Urban environments may be lacking in other resources as well. Convenience stores and establishments that serve fast food may vastly outnumber grocery stores where people can purchase nutritious food. In addition, hospitals and medical care centers may close in urban places where constituents lack a strong political voice. The remaining medical providers are without sufficient resources.[20] The urban environment may also encourage risky behaviors such as smoking and drinking. Researchers have noted that tobacco and alcohol marketers have targeted urban communities.[21]

The design of suburban communities also affects the public's health. Large distances between work and home mean more space taken up by roads and an increased reliance on automobiles. This has multiple health effects. First, pollutants from automobiles increase as miles traveled increases. Increased pollution increases deaths from respiratory[22] and cardiopulmonary illnesses.[23] Second, as time spent in traffic increases, leisure time available for health-promoting activities may decrease. This leads to reduced time in which to exercise and engage in other health-promoting activities. Third, increasing hours on the road increase the opportunity for traffic accidents and deaths due to unintentional injuries.

Although suburban dwellers have higher rates of leisure exercise and suburban women have lower obesity rates than their urban and rural counterparts, better suburban design could increase opportunities for exercise.[24] Shopping areas are designed to be driven to, and walking from errand to errand is difficult. The spread-out nature of the suburb increases reliance on automobiles and may not be ideal for increasing opportunities for exercise.

The built environment affects health in a number of ways. It is not sufficient to educate people regarding healthy lifestyles; the built environment must promote, or at least allow for, engaging in healthy behaviors. Law can be used as a tool to accomplish this goal.[25]

LEGAL PATHWAYS FOR IMPROVING THE BUILT ENVIRONMENT

The law can be a potent tool in creating a built environment that is conducive to public health. Legislatures design broad policies and parameters, including processes for making decisions that affect the built environment. The decisions of legislatures are carried out and enforced by more specialized bodies such as planning boards, zoning boards, and administrative agencies. Public health practitioners can best influence decisions by intervening early in the process, when broad policies are being made about population density, land-use configurations, transportation, and other important issues.

There are 5 main legal avenues for affecting the built environment: environmental regulation to reduce toxic emissions; zoning ordinances that designate an area for a specific use and related developmental requirements; building and housing codes that set standards for structures; taxing to encourage or discourage activities or behaviors; and spending to provide resources for projects that enhance the built environment. The exact mechanisms vary by state and locality, but the general principles are similar.

Environmental Regulation

A web of federal and state laws regulates the emission of toxic substances or pollutants that degrade the environment. These measures are aimed at improving the built environment by reducing pollutants and ensuring the quality of air and water. Federal law, for example, requires US agencies to prepare an environmental impact statement before beginning a major action affecting the quality of the environment. The Environmental Protection Agency is empowered to establish air and water quality standards. This was the mechanism, for example, through which the Environmental Protection Agency prohibited the use of lead in automobile fuels, leading to improvements in children's health. State and local governments often have their own regulatory regimes for controlling the industrial release of toxic substances, as well as laws concerning storm water management, forest and stream valley protection, and septic systems.

Zoning and Related Developmental Requirements

The Supreme Court, in *Village of Euclid, Ohio v Ambler Realty Co*, long ago recognized that zoning ordinances are a proper exercise of the state's police power because they protect the health and safety of the community. Zoning laws specify within designated areas allowable uses of land and buildings and regulate building density and size. Common land-use classifications include industrial, manufacturing, agricultural, commercial, and residential. Zoning can have powerful effects on communities by separating manufacturing from residential areas but can also encourage spread-out suburban patterns where jobs, housing, and retail services are far apart, residents are entirely automobile-dependent, and walking to a destination is difficult. Indeed, large-lot zoning intended to protect open space may be a major contributor to suburban sprawl. Moreover, zoning has not always been used effectively to protect poorer and minority residential areas from potentially hazardous industries and uses. In addition to zoning, many communities impose additional requirements on some developments. For example, large residential developments may be required to provide a percentage of affordable housing units along with recreation amenities.

Building and Housing Codes

Building and housing codes influence the built environment, especially as Americans spend approximately 90% of their time indoors. These codes are designed to ensure that buildings are safe, sanitary, and efficient. Most localities adopt codes based on models developed by national organizations such as the International Code Council. Building codes require minimal safety features, such as gated enclosures around swimming pools, insect screens on windows, smoke alarms, and negotiable stairways and exits. These codes may also regulate toxic materials, including the removal of asbestos and lead pipes or paint. In fact, partly because of the abatement of lead paint in housing stock, blood lead levels in children have de-

clined dramatically.[26,27] But building codes can also be so restrictive that they discourage the renovation of existing buildings and thereby contribute to urban deterioration.

Taxing Power

Although pollution regulation, zoning, and building codes exert direct control over the design of buildings and communities, the law also affects the built environment marketplace through taxing and spending. The tax code influences the built environment through tax relief, tax burdens, and the ability to recognize and take title to abandoned property. The government can provide tax incentives to encourage construction of affordable housing and investments to renovate existing buildings or abandoned industrial sites. The government can also discourage actions that degrade the built environment by taxing them. For example, government can improve air quality by taxing gasoline and ozone-depleting chemicals to reduce their use and more accurately reflect their cost to society.

Spending Power

Closely related to the power to collect revenue is the power to spend. Governments can spend resources in ways that create or promote a healthier and safer built environment. The government, for example, can promote physical activity by locating and designing public facilities to encourage pedestrian access and including in the funding sufficient money for adequate sidewalks, bicycle paths, and streetscaping. It can acquire open space for recreation and environmental protection. For example, in 1998, New Jersey voters approved a $1 billion bond initiative to acquire 1 million acres of open space. Similarly, governments can require public health–enhancing behaviors as a condition of receiving appropriations. For example, federal transportation appropriations are linked with regions achieving specified reductions in ground-level ozone. On the other hand, government spending can also contribute to some unhealthful aspects of the built environment. Roads can be designed primarily for automobile speed, with little attention to pedestrian safety or comfort. Many state reimbursement policies for local school construction favor building new buildings over renovating old ones, and this can contribute to deterioration in existing neighborhoods and encourage sprawl.

Summary

Law influences the built environment in a variety of ways, ranging from environmental regulation, zoning, and building codes to economic incentives and disincentives. The public health community can use its voice, expertise, and influence to encourage legislatures and agencies to create and enforce laws designed to ensure the conditions for people to be healthy. The concluding section presents 7 strategies for accomplishing this goal.

PUBLIC HEALTH ADVOCACY FOR HEALTHIER PHYSICAL SPACES

With the decline in focus on sanitation and infectious disease, public health advocates have been relatively invisible in the political process that shapes the built environment. Instead, the leading voices have been those of environmentalists, the business community, land owners and developers, architects and urban planners, and civic activists seeking to protect established neighborhoods. Public health expertise is critical to the process. The following guidelines will help public health advocates become a constructive and effective voice:

1. *Get involved early in the planning process.* Critical decisions about land use and the built environment are made through a legal process. Once specific projects are proposed and presented to the public, it may be too late to have significant impact on what is built–the important ground rules are likely to have been set far in advance.
2. *Bring data to the table.* Public health scientists bring unique training in epidemiology and empirical analysis. Scientific data on the kinds of designs and land-use arrangements that encourage physical activity are lacking. Urban planners have instincts in this area, but these instincts may not be supported by sound data.
3. *Help policymakers use data more carefully.* Policymakers are particularly influenced by actions that are immediately measurable, and bureaucracies are set up to reward those who show positive short-term changes. For example, highway departments may be rewarded for reducing pedestrian accidents by making a road so inhospitable that few pedestrians venture out. Public health officials may be able to provide data and a perspective to counteract this tendency.
4. *Be a voice that is independent of the environmental and esthetic concerns.* Today, public health officials may find that they share much with the environmentalists and urban designers who promote compact, mixed-use development, but the agendas may not always be coextensive. Public health officials will be a credible and useful voice only if they maintain independence. For example, bicycle paths and sidewalks add impervious surfaces that may require felling trees or altering parkland. As a result, environmental groups that support the concept of increased walking and bicycling sometimes oppose the installation of trails and bicycle paths. Public health officials can clearly enunciate the health benefits of opportunities for safe, pleasant exercise.
5. *Promote healthy activities for children and particularly teenagers.* Childhood obesity is a growing problem, and the patterns for a healthy (or unhealthy) lifestyle are frequently set in childhood. The voices of children and teenagers are left out of the planning process. Teenagers in particular may have interests that conflict with the preferences of adults. Activities that

attract groups of teenagers can be viewed as threatening and undesirable. For example, home-owner associations may prohibit the installation of driveway basketball nets because they are unsightly and the games may get loud. Likewise, although new residential subdivisions may be required to include recreational facilities, developers rarely include facilities that would be of interest to teenagers, preferring instead "tot lots."

6. *Be a voice for underrepresented populations and minorities.* Poor, immigrant, and minority populations suffer much higher rates of chronic disease. They are also much more likely to live in substandard housing, to be exposed to environmental toxins,[28] and to be the victims of unsafe pedestrian facilities.[29] From the interstate highway program of the 1950s and 1960s that razed thousands of low-income housing units to rezoning for industrial uses, poor and minority populations have borne the brunt of some highly destructive land-use decisions.

7. *Encourage government to lead by example, not just by regulation.* Governments invest extensively in the built environment through construction and maintenance of roads, public transportation, and public buildings and facilities. These can be located and designed to encourage walking, bicycling, and other physical activity. Public health officials can be a voice to encourage comprehensive planning that considers not only the immediate purpose (e.g., Will this be a good library?), but also how the facility functions in the community to encourage healthy choices.

Public health can be an influential voice in shaping the built environment. If advocates demonstrate competence in the legal process and use their expertise effectively, physical spaces can be designed to promote healthy populations. ∎

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