The built environment: how city design impacts child health

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ABSTRACT
Environmental factors, such as soil, air and water quality, are well known to influence population health. With the increasing urbanization of Canada and other countries around the world, more attention is now being paid to how the ‘built environment’ – all the elements of the environment designed by humans – also plays a crucial role in human health. This article briefly examines how a few key components of the built environment contribute to child health. Thoughtful placement of schools and efforts to create safe, walkable neighbourhoods can increase the number of students who walk to school instead of relying on cars. Providing children and their families with recreational infrastructure promotes physical activity. Creating farmers’ markets in urban cores increases access to a less expensive source of nutritious food for a city’s inhabitants. Knowledge about these interactions between urban design and child health can allow physicians to provide more practical advice to their patients about developing a healthy lifestyle within a city. It is also a promising field for physician advocacy: by offering their expertise to inform city planning decisions and persuading city planners to consider the health impacts of their decisions, physicians can help make it easier for their young patients to live a healthy, active lifestyle.

THE BUILT ENVIRONMENT AND URBANIZATION
When considering individual patients, we are taught to consider the impact of patients’ environments on their health: where and with whom they live, what kind of work they do, etc. It stands to reason that factors of a larger environment – such as a neighbourhood or city – may influence the health of groups of people living there. Of specific interest is the built environment (BE) – all of the elements of the environment designed by humans – including the land-use zoning of a neighbourhood, road layouts, access to shops and facilities, and the presence or absence of sidewalks. A growing body of research illustrates that BE design in urban and suburban areas can have a significant impact on the health of people living in these areas. This article endeavours to give a practical overview of the influence of BE on health, with a specific focus on how BE can influence child health, activity levels and development.

Where people live in Canada has changed dramatically since World War II and the subsequent boom of industry, with an increased proportion of the population moving toward urban areas. Currently, 68% of the Canadian population lives in metropolitan areas and this figure continues to increase annually.¹ The development of sufficient housing and infrastructure for the rapidly growing number of city dwellers often results in urban sprawl. The low-density housing and partitioned land use common to suburban areas may now be contributing to chronic health problems.² At least four main threats of sprawl to population health have been identified: physical inactivity, poor air quality, more motor vehicle collisions due to reliance on cars, and mental health issues.³ Mitigating such health effects requires an understanding of the interplay of city design and human health followed by appropriate urban planning.

THE CURRENT STATE OF CHILD HEALTH IN CANADA
The most recent estimates suggest that 26% of Canadian children are overweight and 8% are obese. The percentages of children that are overweight or obese have doubled and tripled, respectively, over the past 25 years and research indicates that these unhealthy body weights often persist into adulthood.⁴ To curb this trend, public education has focused on the importance of children eating five or more daily servings of fruits and vegetables and engaging in regular physical activity. However, the role of a child’s neighbourhood environment in influencing their physical activity and overall health is often not considered. Finding ways to create an environment that encourages physical activity is a novel, population-based approach to help curb the trend toward childhood overweight/obesity as well as the presence of ‘adult’ diseases in children (e.g., type 2 diabetes mellitus).

COMMUNITY PLANNING FOR HEALTHY LIFESTYLES

The School Commute
Walking to school was previously a staple daily activity for most children. However, this has been eroded by a trend toward building larger centralized schools to which children must be bused, increased parental fears over child safety and the construction of less ‘walkable’ neighbourhoods. Not surprisingly, the most important factor influencing whether or not children commute to school in a physically active way is proximity. Specifically, if children live ≤ 800 m from their school they are 5-10 times more likely to commute actively to school than if they live farther away.⁵

More subtle factors have also been identified that make a neighbourhood ‘walkable,’ namely what we associate with ‘older’ neighbourhoods – a grid system layout with lots of connections between roads, high population density and a variety of land uses including housing, shops, services, and recreational facilities. Conversely, most suburban housing developments are designed in such a way that walking is unappealing: streets are often convoluted in their layout, connections to stores and restaurants are limited, and there is a low population-density. These car-oriented neighbourhoods discourage physically active transport.⁶ On the contrary, children and adolescents who live in ‘walkable’ neighbourhoods not only walk to school more often but are also more likely to be physically active outside of school hours.⁷

Both the real and perceived danger of a neighbourhood are critical factors in parents’ decisions about allowing their children to walk to school and other local destinations. Similarly, older adolescents – especially girls – are more likely to be active in their neighbourhoods if they perceive them to be safe.⁸ This may explain why males are more likely
to actively commute to school than girls – they tend to perceive their neighbourhoods as safer. Creating safe neighbourhoods in which residents perceive them as such is key to encouraging physical activity.6

**Recreational Facilities**

The availability of recreational facilities (parks, playing fields, pools, etc.) also plays a role in how active children are in a given environment. A survey study done in London, Ontario found that after controlling for season and demographic factors, youth who have two or more recreational facilities in their neighbourhood engage in an average of 17 minutes more daily physical activity than their comparable peers who have fewer local facilities.7 Trails for walking and cycling can also help to promote physical activity. One Texas study found a 1.5 times greater odds of walking for a minimum of half an hour at least once a week among people who perceived themselves as living close to a trail.3 This is a modest finding, but does show a potential role of trails as one small step in establishing a culture of physical activity for families. To maximize trail usage, city planners designing trail routes should note that trail segments with mixed views of urban and natural landscapes as opposed to only natural views experienced 39% higher trail traffic.3 This further touts the health benefits of mixed land use mentioned in the studies on walkable neighbourhoods.3

**Access to Nutritious Food**

Much like recreational opportunities, access to a source of nutritious food can have a positive impact on a child’s health. Unfortunately, disparities in food access related to socio-economic factors have been well documented in several studies in both the US and UK.9 Recent studies have examined whether neighbourhood characteristics such as proximity to a grocery store served to lessen such disparity. One Toronto study found that only 1% of variation in food security and even less of the variation in severe food insecurity could be attributed to one’s neighbourhood of residence. This effect actually disappeared completely after accounting for covariates such as income, number of dependent children and status as a recent immigrant, leading the researchers to conclude “we found no evidence that geographic food accessibility mitigates the effect of financial constraints on household food security.”9

Conversely, a different study examined the effects that the creation of a farmer’s market in a food desert – a district with little or no access to healthy foods – in London, Ontario had on the price and availability of healthy food. The researchers found that the market improved access to fresh foods such as broccoli and green grapes and allowed for hundreds of dollars in potential annual savings for families.10 Such savings could help to reduce the financial barriers to a healthy diet like those noted in the Toronto study, allowing parents to afford healthier foods for their children.

**WHY SHOULD PHYSICIANS CARE?**

Similarly to how overweight/obese children become overweight/obese adults, physically active teens are much more likely to be active as adults.11 By taking steps to ensure that our children and adolescent patients are active and healthy in their younger years we are setting the foundation for healthy living in the years to come.

Preventing or delaying chronic disease in our children is one of the most efficient ways to help both our community’s health and our overburdened health care system. Interventions to change the BE may serve as a powerful tool in achieving this goal. Notably, changing the BE is less reliant on evoking specific behavioural changes within individual patients – a difficult task to which any doctor can attest. As Dr. Leonard Syme, an epidemiologist at UC Berkeley’s School of Public Health points out, “Changing individual behaviours in isolation may be more difficult than modifying the environment that facilitates and promotes them”.2

**WHERE DO WE GO FROM HERE?**

For doctors to successfully harness urban planning as a new tool in patient care, there are two vital goals:

1. collaboration with other professionals such as politicians, city planners, public health professionals and teachers
2. advocacy for population health as a major factor in city planning decisions

For example, physicians could join with school board officials and other community partners in creating walk-to-school campaigns. This might involve having pamphlets and other literature available in their offices for parents, as well as speaking to their young patients about how walking to school can help keep them healthy. City planning advocacy could follow the lead of the campaign that banned smoking in public places, in which physicians played a crucial role. Hopefully as physicians become more informed about the impact urban design can have on their patients, similar advocacy gains can be made in the field of city planning.

**REFERENCES**


