REPORT

Health-related Socioeconomic Inequalities in School Neighborhoods in Spokane, Washington, USA

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INTRODUCTION

A consistent relationship between socio-economic status (SES) and health has been documented in numerous studies in diverse settings worldwide. Socioeconomic inequality in health is often blamed on individual choices but is shaped just as much by structural factors like the social and physical environment of neighborhoods in which people live.

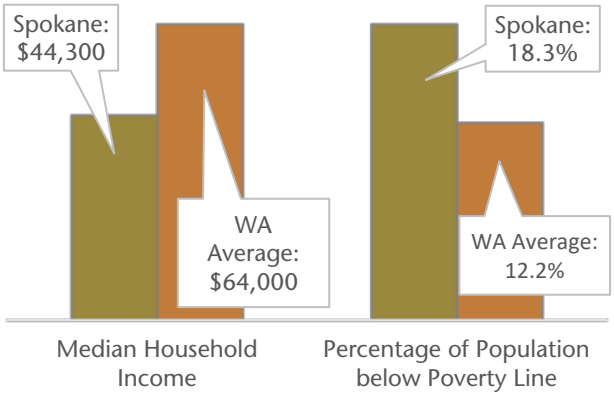
The characteristics of a neighborhood can have a direct impact on individual health outcomes. These characteristics include access to supermarkets and other stores that sell healthy food, as well as availability of recreational facilities, neighborhood walkability, crime, green space availability, and air quality. Children may be particularly vulnerable to poor social and environmental neighborhood conditions. Compared to adults, they tend to have less freedom of movement outside the neighborhood. The impact of these neighborhood conditions on their health and social functioning can last well into adulthood.

The school environment, where children spend a large part of their day, can also play an important role in shaping their health. Because younger children often attend school within their home neighborhoods, public elementary schools tend to have students who are socioeconomically similar.

Moreover, research has shown that factors like travel distance, traffic, and crime are an important influence on parents' decisions about how their children get to school. Neighborhood conditions perceived to be unsafe can be a major barrier to children walking and bicycling to school nationwide.

This study aimed to assess whether elementary schools' socioeconomic status levels would correlate to differences in aspects of the built and social environments.

Figure 1. City of Spokane vs. Washington State Data



RESEARCH RESULTS AND DISCUSSION

This study was conducted in the city of Spokane, the second-most populous city in Washington state.

Spokane:

- Population: approximately 220,000[1]
- Commercial, cultural and medical hub for surrounding rural areas in eastern Washington, northern Idaho, and western Montana

Despite its central role within the region, the city's poverty rate is higher than the state average. As shown in the figure above, in 2015, the city's median household income was below the state average, and the percentage of its population living below the poverty line was above the state average.[2]

In regard to social and environmental factors, the neighborhoods surrounding public elementary schools in Spokane varied substantially.

FACTS & FIGURES:

SCHOOLS ANALYZED IN THIS STUDY

- 34 elementary schools
- 16,090 students, ages 5-13 years
- Average enrollment per school: 473 children
- Mean percentage of children qualifying for free and reduced-price meals: 64%

Public schools can be socioeconomically categorized based on the percentage of students in a school eligible for free or reduced-price meal plans: a higher percentage of eligible children indicates lower socioeconomic status. For this study, the city's 34 elementary schools were divided into three groups of school-level SES (low, mid, high) defined by the percent of students eligible for free and reduced-price meals in each school.

The percent of eligible students per school varied substantially among the three classifications, from a mean of 34% in the "High SES" category to a mean of 86% in the "Low SES" category. In 11 of the schools included in the analysis, more than 80% of students were eligible for free and reduced-price meals, indicating high rates of poverty in the district.

For analysis, data was collected from all the schools, with the high SES category used as a reference point. The data from the other two categories was then measured against this baseline.

Demographic information on the analyzed schools was obtained from the website for Washington State's Office of the Superintendent of Public Instruction.[3]

Environmental conditions were calculated with a one-mile (1.6 km) walking catchment surrounding each school and listed to the right. As socioeconomic status decreased, walkability, crime counts, and road exposure consistently increased. Access to green space decreased insignificantly, and the percent of healthy food establishments decreased inconsistently.

TABLE 1: Elementary school characteristics by socioeconomic status (SES) in Spokane Public Schools.

	SCHOOL-LEVEL SES		
School Demographics	HIGH	MIDDLE	LOW
Free-and-reduced lunch (%)	34.1	74.0	86.0
Non-Hispanic Black (%)	1.4	2.8	4.7
Non-Hispanic White (%)	77.4	66.4	56.4
Hispanic (%)	8.0	11.2	13.5
School Neighborhoods			
Median residential property value ($)[a]	193,485	134,824	106,087
Walkability[b]	0.2	0.4	0.5
Crime Counts[c]	294	914	1240
Arterial Road Exposure (%)[d]	41.5	52.9	54.6
Access to Green Space (%)[d]	4.9	3.0	4.8
Healthy Food Access[e]	0.31	0.14	0.19

[a] Data from Spokane county, 2016; [b]based on the method developed by Frank et al.; [c]2015 data from City of Spokane; [d]data from City of Spokane; [e]modified Retail Food Environment Index, food outlet data from InfoUSA

One-third of schools have more than 80% of students receiving free and reduced meals

OVERALL OUTCOMES

- Lower-SES schools had significantly higher percentages of Hispanic students and lower percentages of non-Hispanic white students.
- No significant differences in either access to green space or the healthiness of the food environment were observed.
- Lower-SES schools tended to be surrounded by neighborhoods with higher crime rates and higher exposure to major arterial roads. However, these same neighborhoods tended to be the most walkable.
- Lower-SES neighborhoods may provide better walking opportunities, but the actual propensity to engage in active travel to school may be discouraged by the high crime rates and arterial road density within those neighborhoods.

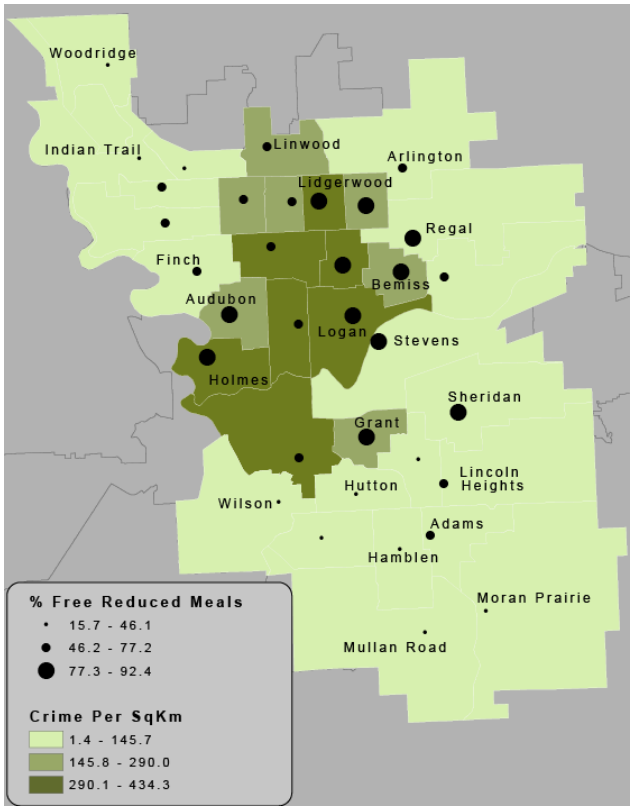


Figure 2. For each Spokane Public Elementary School, the percent of students eligible for free and reduced meals as the "dot" size, and crime rate as the shade of green, with larger dots and darker green color as the respective numbers increase.

Our findings show that schools serving children of lower SES level lived in neighborhoods, which, although more walkable, were characterized by social and built environments that were less healthy and less safe for children. Since the impact of neighborhood safety on the mental and physical health of children is well known, this is significant.

It is important to acknowledge that measuring the relationship between SES and health outcome is complex and involves assessing a plethora of factors including individual, contextual, historical, economic, and political.

Based on previous research, the large discrepancy in SES in the city of Spokane will likely result in poorer health outcomes for children residing in low SES neighborhoods, and the adoption of several measures to remedy inequalities in exposure to social and environmental factors will be needed.

IMPLICATIONS FOR SCHOOL HEALTH

In Spokane schools and in public school districts across the USA, programs aim to promote child health through increased active travel. Since 2005, the federally-funded Safe Routes to School program has supported transportation, neighborhood and school-based initiatives that encourage walking and bicycling to schools.[4] A key objective of these initiatives is to improve the safety and attractiveness of active travel. Therefore, the reach or effectiveness of these programs may be limited for schools near which families have safety concerns, especially as our results revealed higher crime rates and density of arterial roads near lower-SES schools.

CONCLUSION

This study provides clear evidence of the relationship between low SES and exposure to an unhealthy neighborhood school environment in Spokane. The results of this study can therefore be used to improve the school environment, particularly for the most disadvantaged neighborhoods in the city, through policies and programs that improve health and safety conditions near schools.

ACKNOWLEDGMENTS

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POTENTIAL IMPROVEMENTS

- Reduction of crime rates and reduction or slowing of traffic around schools, to increase healthy outdoor travel activity and improve mental and physical health of children and parents
- Technical improvements, such as improved engine efficiency, in order to reduce per-vehicle air and noise pollution
- Public transit enhancements and cycling infrastructure upgrades as part of urban planning and policy efforts to reduce automobile use
- Installation of high efficiency particulate air (HEPA) filters in ventilation systems, sealing of windows and doors, and the use of double glazed windows in classrooms in areas of heavy motor traffic
- Consideration and potential avoidance of close proximity to major roads and highways when building new schools.

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