Canadian Population Health Initiative
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Summary Report
Urban Physical Environments and Health Inequalities

The report *Urban Physical Environments and Health Inequalities* from the Canadian Population Health Initiative (CPHI) builds on previous research to explore two aspects of the urban physical environment known to negatively affect health: outdoor air pollution and heat extremes.

The report provides an overview of the literature and presents new Canadian analyses on outdoor air pollution and heat extremes, and their relationship to socio-economic status and health inequalities. The following is a summary of the report and key findings. For a more comprehensive presentation of the topic, please consult the full report at www.cihi.ca/cphi.

The literature reviewed and the new analyses conducted for this report show that those who are already more vulnerable to poor health may be at increased risk of being exposed to the effects of air pollution and heat extremes because of the areas in which they live.

New CPHI analyses of outdoor air pollution, socio-economic status and health service utilization show that hospitalization rates for respiratory and circulatory diseases are higher in areas that are closer to pollution-emitting facilities. This relationship is strongly mediated by socio-economic status and may reflect the fact that residents of lower socio-economic status areas are more likely to face other health inequities. When examining the rates of hospitalization for residents from the lowest socio-economic areas only, rates of hospitalization for both respiratory and circulatory diseases were found to significantly decrease with increased residential distance from a pollution-emitting facility. A similar decline in hospitalization rates was not found for residents of higher socio-economic areas.

New CPHI analyses of heat extremes and health service utilization in Toronto and Montréal show that hospitalization rates in both cities, and visits to emergency departments in Toronto, did not significantly increase on hot days or during short heat waves during the summers from 2005 to 2008 for either respiratory or circulatory diseases.

Who We Are

Established in 1994, CIHI is an independent, not-for-profit corporation that provides essential information on Canada's health system and the health of Canadians. Funded by federal, provincial and territorial governments, we are guided by a Board of Directors made up of health leaders across the country.

Our Vision

To help improve Canada's health system and the well-being of Canadians by being a leading source of unbiased, credible and comparable information that will enable health leaders to make better-informed decisions.

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Key Messages

Chapter 1
Outdoor Air Pollution, Socio-Economic Status and Health Inequalities

Previously published research on air pollution, socio-economic status and health inequalities shows that

- Individuals and families with a lower socio-economic status are more likely to be exposed to outdoor air pollution; they may also be more vulnerable to the health effects of this exposure.
- Rates of hospitalization tend to be higher among individuals and families residing in areas defined by a lower socio-economic status.

The results of CPHI's new analyses examining the relationship between outdoor air pollution, socio-economic status and health inequalities in Canada corroborate previous findings from social and health research. In particular, this study found that residential proximity to pollution-emitting facilities poses a health risk for particular subgroups of the urban population. It also found that lower socio-economic status areas are more likely to be close to pollution-emitting facilities and major roadways.

New CPHI analyses show that

- More than one million urban Canadians living in lower socio-economic status areas are within one kilometre of a pollution-emitting facility; in comparison, approximately 325,000 people living in the highest socio-economic status areas are within this distance.
- Rates of hospitalization for respiratory and circulatory diseases tend to increase in areas closer to a pollution-emitting facility. This relationship, however, is strongly associated with socio-economic status and may reflect the fact that residents of lower socio-economic status areas are more likely to face other health inequities.
- For residents of the lowest socio-economic areas, rates of hospitalization for respiratory and circulatory diseases significantly decrease with increased residential distance from a pollution-emitting facility.

Key Messages (cont'd)

Chapter 2
Heat Extremes, Socio-Economic Status and Health Inequalities

Previously published research on heat extremes, socio-economic status and health inequalities shows that

- Mortality rates are higher during periods of hot weather and some individuals, including seniors and those who do not have adequate housing, are more vulnerable to the effects of heat extremes.
- Built and natural environments influence the way the physical environment responds to heat and thereby contribute to within-city temperature differences.
- Access to cooler spaces and/or green space can mitigate the harmful health effects of heat extremes.

The new analyses examining the distribution of heat pockets, or micro-urban heat islands, in Canadian cities presented in this report provide support for the growing concern that some urban residents might be more at risk of being exposed to extreme heat conditions and their health effects. Elements of the urban built and natural environments respond differently to heat extremes, thereby either worsening or buffering against the potential health effects of hot weather. Inequalities in the structure and design of physical environments result in the unequal distribution of micro-urban heat islands within cities. To analyze this variation in the distribution of micro-urban heat islands within Canadian cities, CPHI used Toronto and Montréal as case studies.

New CPHI analyses show that

- Land surface temperatures vary significantly within a city; neighbourhoods with more built and artificial surfaces, such as those near city centres, reach much hotter temperatures than those with more natural vegetation coverage.
- The lowest socio-economic status areas in Montréal and Toronto are more likely to reach high temperatures and are less likely to have green space, compared with the highest socio-economic status areas.

Key Messages (cont'd)

Chapter 2
Heat Extremes, Socio-Economic Status and Health Inequalities
(cont'd)

The report also presents new analyses of health service utilization on hot days and during short heat waves in the summers from 2005 to 2008. The results revealed that for respiratory and circulatory diseases

- Hospitalization rates in Montréal and Toronto, and emergency department visits in Toronto, did not significantly increase on hot days or during short heat waves during this time period.

Previous research has shown that the effect of heat on hospitalizations varies by geographic location, potentially because of differences in health and social services. For example, cities that have better social services for seniors or more effective heat warnings targeted to seniors, homeless persons and those living in poor-quality or precarious housing may be less likely to show increased hospital admissions on hot days. Although not evaluated for their impact on hospitalizations, both Toronto and Montréal have heat response plans that are implemented during extreme hot weather periods.

This report is the first in a two-part series on urban physical environments and health inequalities by CPHI. A second report will build on this analytical work and identify potential areas for action by reviewing and providing a synthesis of interventions in the urban physical environment that affect health and inequalities.

If you would like to receive a copy of this policy review and synthesis product, email us at cphi@cihi.ca and we will send you a copy.