



Assessment of Vulnerability to the Health Impacts of Climate Change in Middlesex-London

Report Prepared for the Middlesex-London Health Unit

Summary and Recommendations

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Overview

Climate change poses a wide range of risks to the health of Canadians including impacts related to extreme weather events and natural hazards, air quality, stratospheric ozone depletion and water-, food-, vector- and rodent-borne diseases. The World Health Organization has called on health agencies to assess health vulnerabilities to climate change and take proactive adaptive actions. Recent events such as flooding in Manitoba (2011), Calgary (2013), Toronto (2013), extreme heat events in Montreal (2009) and wildfires in northern Ontario (2011) demonstrate the very severe impacts climate-related events can have on communities. Officials at the Middlesex-London Health Unit have identified climate change as a potentially significant hazard to residents and are seeking information which can be used to guide efforts to address the growing risks to health. This study reports on the results of an assessment of vulnerability of people living in Middlesex-London to the health impacts of climate change.

Assessing Health Vulnerability to Climate Change

This report employed new assessment methods developed by the World Health Organization (2012) and took a participatory approach involving meetings with community leaders, and public health and emergency management officials to discuss preliminary findings and adaptation options. The results are based on a scientific literature review; analysis of community health and meteorological data; and projections of future climate conditions related to extreme heat, flooding, air pollution and the Lyme disease vector.

Report Conclusions

Health risks from climate change are growing for people living in Middlesex County and London and actions are needed to address potential impacts. Middlesex-London has a variable climate that can experience severe cold spells and also extreme heat events. There has been a general warming of temperatures and more snow is falling as rain while summers are getting drier. General warming is expected to lead to specific health risks; for example, more smog in southern Ontario in the absence of further pollutant emissions controls.

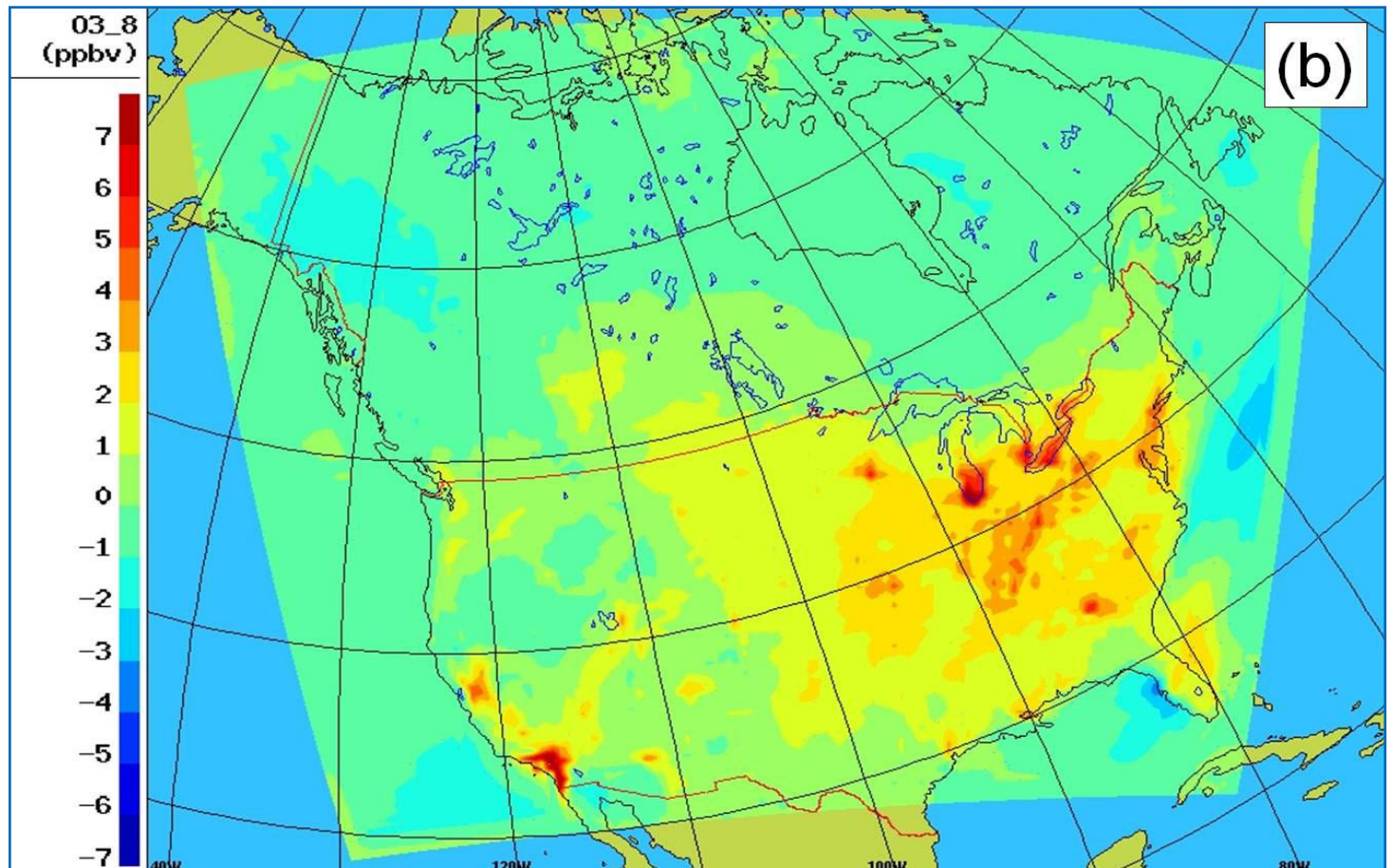
Factors which increase the vulnerability of Middlesex-London residents to climate change impacts are presented below.

Individual and Community-Level Exposure to Climate-related Hazards

- Smog is a serious health issue in Middlesex-London. As Figure 1 illustrates, warmer temperatures may amplify impacts on health, either by increasing the formation of air pollution or by synergistic impacts from the combined exposure to air pollution and extreme heat.

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Figure - Projected Changes in the Summer Average Daily Maximum 8-hour O₃ Between the "Current" Case and the "Future" Case in 2045 with Climate Change



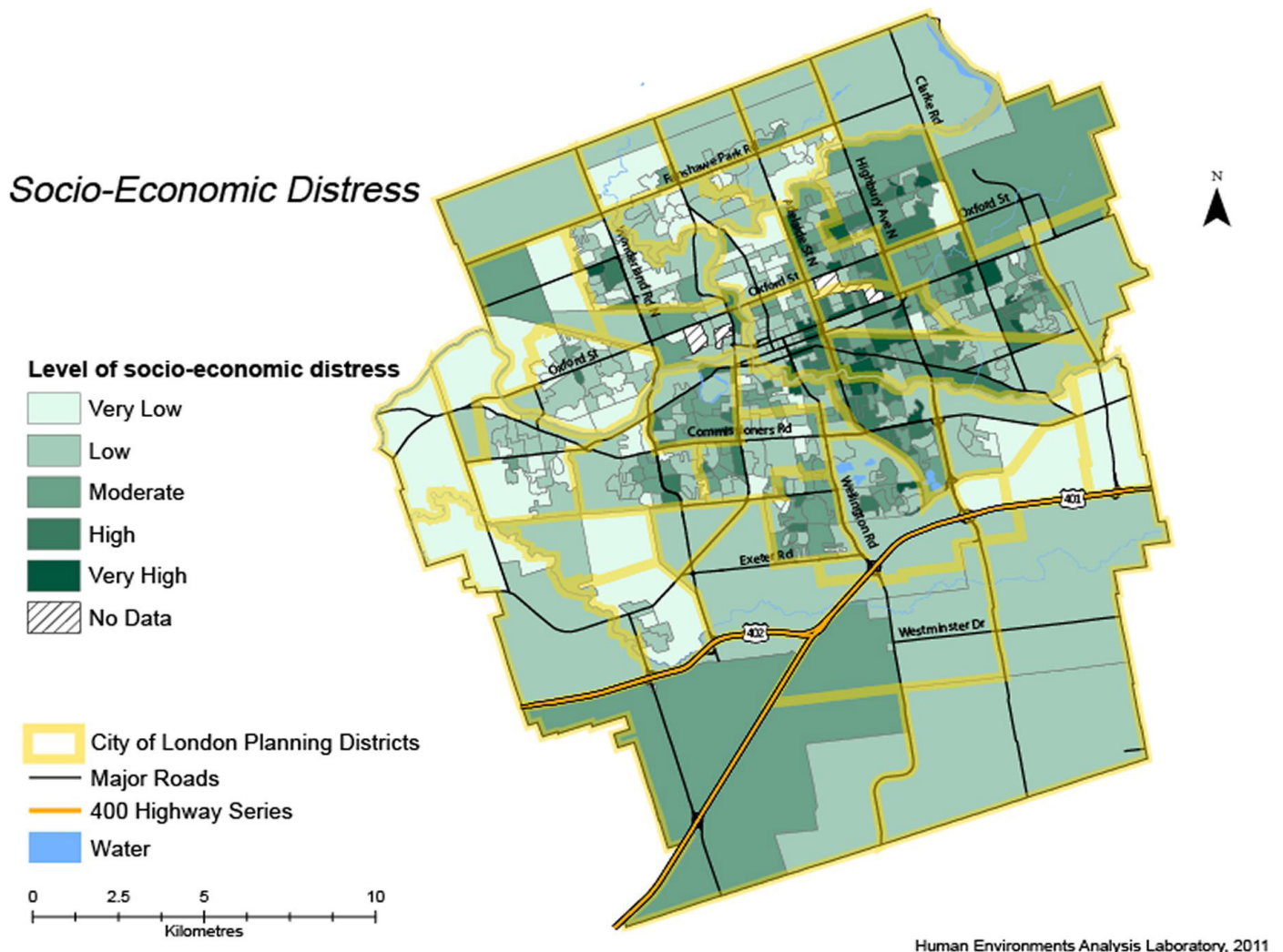
Source: Kelly et al., 2012

- The City of London currently experiences hot temperatures that impact health. Heat-stress related morbidity measured by hospitalizations or emergency room visits is positively correlated with increasing summer humidex values. Climate change could more than double heat-related mortality from the current baseline (4.3 per 100,000) by 2031-2050. This rate may increase by sixfold by 2071 and 2090.
- Urban heat islands have been documented in the City of London. Continued urbanization of this region will increase exposure to the extreme heat events that are projected to significantly increase under climate change.
- The number of older adults in Middlesex-London is expected to grow rapidly in the coming decades. This will significantly increase the number of individuals who are more vulnerable to climate change impacts on health.
- The growing number of seniors and people with chronic illnesses in Middlesex-London will require targeted education and outreach services and could impose higher stresses on health and social services when climate hazards strike.
- Large scale flood events in Middlesex-London can occur and can affect 1000s of buildings and people. Climate change is expected to increase the damage caused by large scale flood events, although the projected increases are not large (<10%).
- Middlesex-London residents are at risk from West Nile Virus, Eastern Equine Encephalitis and Lyme disease although confirmed human cases of these diseases have been low in recent years. However, climate warming is facilitating the rapid spread of vectors north into Ontario (e.g., tick causing Lyme disease) so risks will increase.

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- The City of London is home to an international airport with over 400,000 people travelling through this port of entry per year. Travel is an important risk factor for the spread of vector-borne diseases; this risk will increase with climate change.
- Capacity of Individuals and the Community to Reduce Climate Change Risks to Health
- Single person households comprise roughly 28% of all households in Middlesex-London which is higher than the provincial average of 24%. It also has slightly lower levels of volunteerism which may increase vulnerability to extreme weather events.
- In London 10.4% of the population is considered low income which is just lower than the provincial average (11.1%). However, unemployment rates in the region have been among the highest in Canada for several years.
- In Middlesex-London, vulnerable populations may not be prepared for emergencies, have the necessary capacity to cope, or be resilient when an emergency happens.
- The resiliency of emergency management systems needs to be evaluated given that climate change may lead to more disaster situations.

Figure – Socioeconomic Distress within the City of London



Source: MLHU, 2014e

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- Aging infrastructure and vulnerability of the electrical grid to extreme weather events is a cause for concern in the community, as is developing in high risk areas (e.g., on floodplains).
- Middlesex-London is taking a wide range of actions to manage risks from climate hazards including an extreme weather protocol, vector-borne disease monitoring and surveillance, the AQHI and actions to reduce air pollution. These activities help reduce current risks but may not be robust enough to reduce climate change impacts.
- As climate change increases air pollution along with a number of other weather extremes (e.g., extreme heat events) efforts may be needed to bolster public health and emergency services to accommodate the increases in numbers of people affected by these types of emergency events.
- Effective institutional arrangements to support climate change and health adaptation in Middlesex-London require greater clarity about roles and responsibilities of provincial and regional health organizations. This would support efforts to bring the health lens to climate change activities in other sectors.
- Key barriers reported by stakeholders to efforts to adapt to climate change impacts on health include financial constraints, staff support limitations, uncertainty about the best risk management approaches and low prioritization of the issue.

Recommendations

Climate Change and Health Action Plan – Efforts to address climate change risks to the health of people living in Middlesex-London would benefit from development of an Action Plan to direct future adaptation measures. The Action Plan, whether formal or informal, would be informed by results from this assessment report and consultation with issue experts and community stakeholders. Adaptations should be planned with the future impacts of climate change in mind. For example, the expansion of the tree canopy throughout the region should involve planting species that are resilient to a wide range of temperatures, water stress (i.e. drought), disasters and invasive species.

Education and Outreach – Educating public health officials, representatives from community service organizations and the public about the dangers associated with climate change and the need to take adaptive actions is necessary. To this end the results of the report should be disseminated to public health and emergency management officials in the City of London, Middlesex County and the Middlesex-London Health Unit and those with a role to play in reducing health risks from extreme heat events.

Evaluating Adaptations – Efforts to prepare for climate change health impacts will benefit from evaluations of existing measures to protect people in Middlesex-London from climate-related hazards. Examination of the effectiveness of efforts to reduce risks from extreme heat and cold, air pollution and food-, water- and vector-borne diseases that are sensitive to climate change and projected to increase is needed. Reviewing and enhancing the framework for conducting risk assessments and facilitating the rapid deployment of intervention measures in the event of WNV or EEE outbreaks would be beneficial.

Surveillance and Monitoring – Continued surveillance and monitoring of climate sensitive diseases is needed to better understand and estimate increased health risks that climate change might pose to the region. Priority should be placed on tracking heat-related morbidity and mortality. Middlesex-London could improve its HARS by quantifying thresholds based on heat-mortality relationships in the region.

Urban and Rural Vulnerabilities – Greater understanding is needed about how climate change and health vulnerabilities may differ between urban and rural populations and communities in the Middlesex-London Region. Future work towards developing an adaptation action plan, surveillance and monitoring, and engaging stakeholders through education and outreach should be undertaken with this knowledge need in mind.

Dealing with Uncertainty - A significant barrier to taking action to protect people in Middlesex-London is uncertainty about future climate change, the impacts of weather variability and how to respond. Policies and programs that address multiple risks (e.g. planting trees to reduce air pollution, enhance flood prevention and drought mitigation and reduce the UHI) can mitigate the effects of this uncertainty and are beneficial as are actions that target both adaptation and greenhouse gas mitigation goals concurrently (e.g., increasing active transportation).

Application of the Findings

The assessment of vulnerability to climate change health impacts in Middlesex-London provides a baseline of knowledge to inform the development of needed measures to reduce risks from climate change and increase community resiliency.

Reference

Berry, P., Paterson, J., Buse, C. Assessment of Vulnerability to the Health Impacts of Climate Change in Middlesex-London County. Report Prepared for the Middlesex-London Health Unit, Ottawa: 2014.

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