Walking in deprived neighborhoods: what risk for child pedestrian in Montreal and Toronto?

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Background


THE TIMES-PICAYUNE
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COME ON, WHEN I WAS YOUR AGE, I HAD TO WALK SIX MILES THROUGH SNOW TO GET TO SCHOOL...
SO, YOUR PARENTS COULDN'T AFFORD GAS EITHER...

Why Deprivation Matters in Road Safety?

- At the **neighborhood level**:
  - Riskier built environments may be more present in lower socioeconomic areas e.g. more major streets
- At the **individual and family level**:
  - May influence the how risk is perceived
  - May Influence the EXPOSURE to traffic
    - Less access to a car, less parental accompaniment

- *Deprivation and road traffic was more of a focus in the early 2000s, but less so recently*

Objectives

To examine the presence of inequity in the spatial distribution of child PMVC risk in Montreal and Toronto

Specific Objectives:

1) To examine whether there is any *pattern in the spatial distribution* of child pedestrian motor vehicle collisions in Montreal and Toronto

2) To examine whether *census tract level deprivation is similar to the spatial distribution of those crashes*

Methods

Traffic Inducing Traffic

Study area: Montreal and Toronto, Canada

	Montreal (island)	Toronto (city)
Population (2006)	1 853 001	2 501 650
5-14 years old (2006)	191 645	274 205
% 5 -14 years old (2006)	10%	11%
Area	487 km^2	665 km^2
Collisions (2001-10)	12 731	20 282
% low income (2006)	16,9%	14,7%
# Census Tracts studied	509	524

Spatial Database

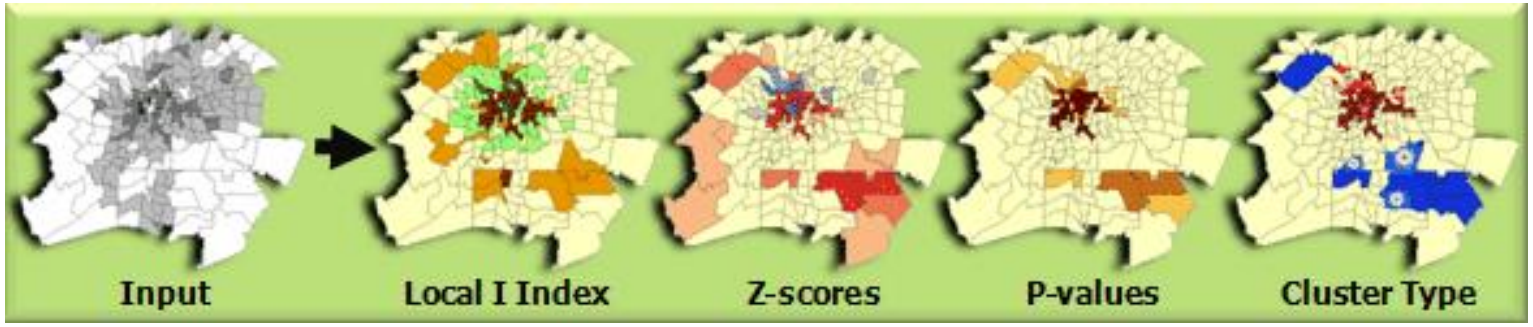
- **Child pedestrian motor vehicle collisions (PMVC)**

  •Police records of point-level data, ages 5 to 14, 2001- 2010
  •Rate = # crashes per 100 km road per census tract

- **Area Level Deprivation**

  •2006 census tract
  •% of dwellings below the Low Income Cut-off (LICO)

Spatial analysis: Local Moran's I

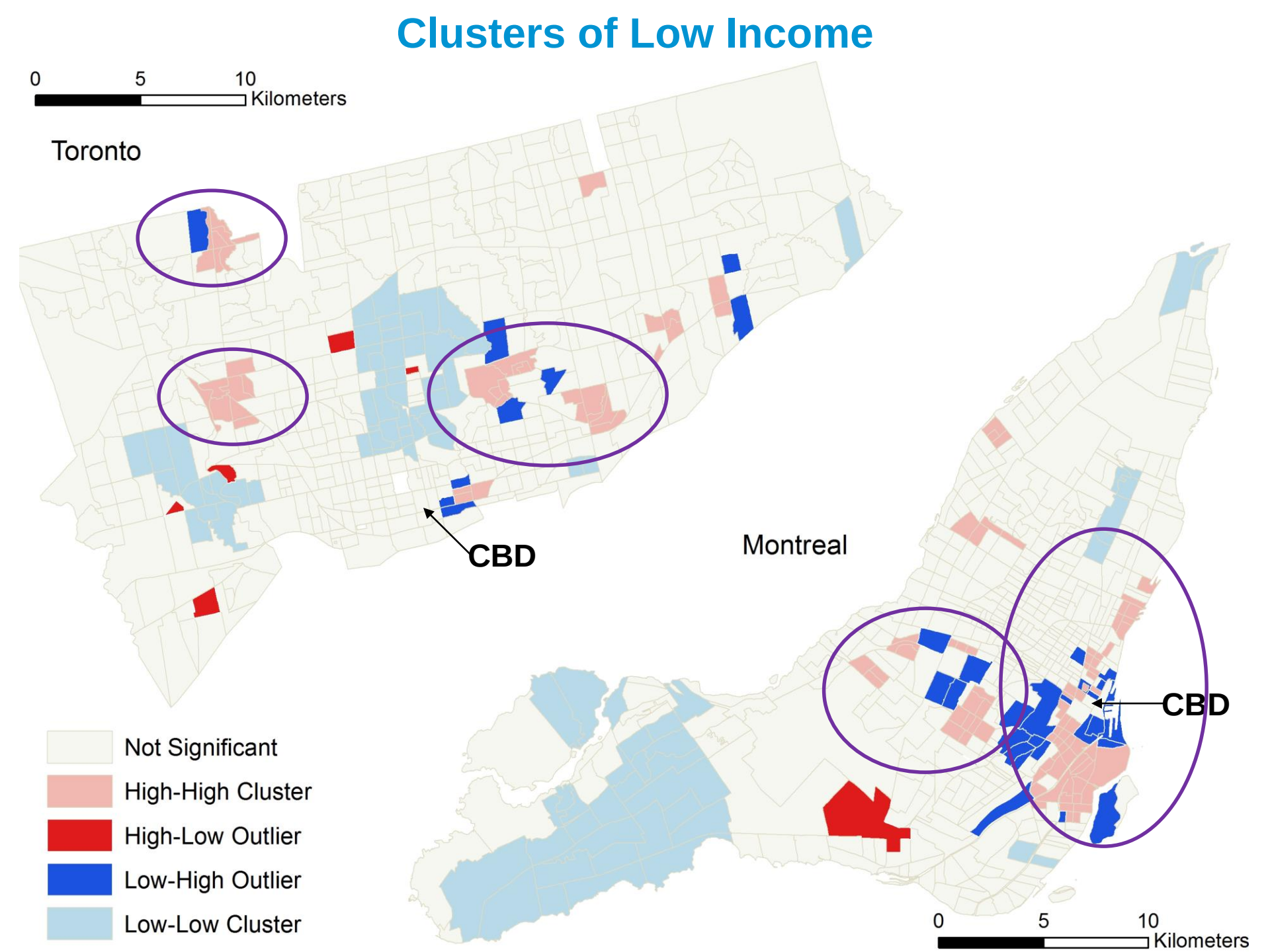


- **LISA tool (in ArcGIS)**
  - Identifies spatial clusters of features with high or low values
- **Input layers**:
  - Census Tract, LICO, Collisions
- **Descriptive spatial statistics:**
  - Selection of significant census tracts according to combinations of High-Low values

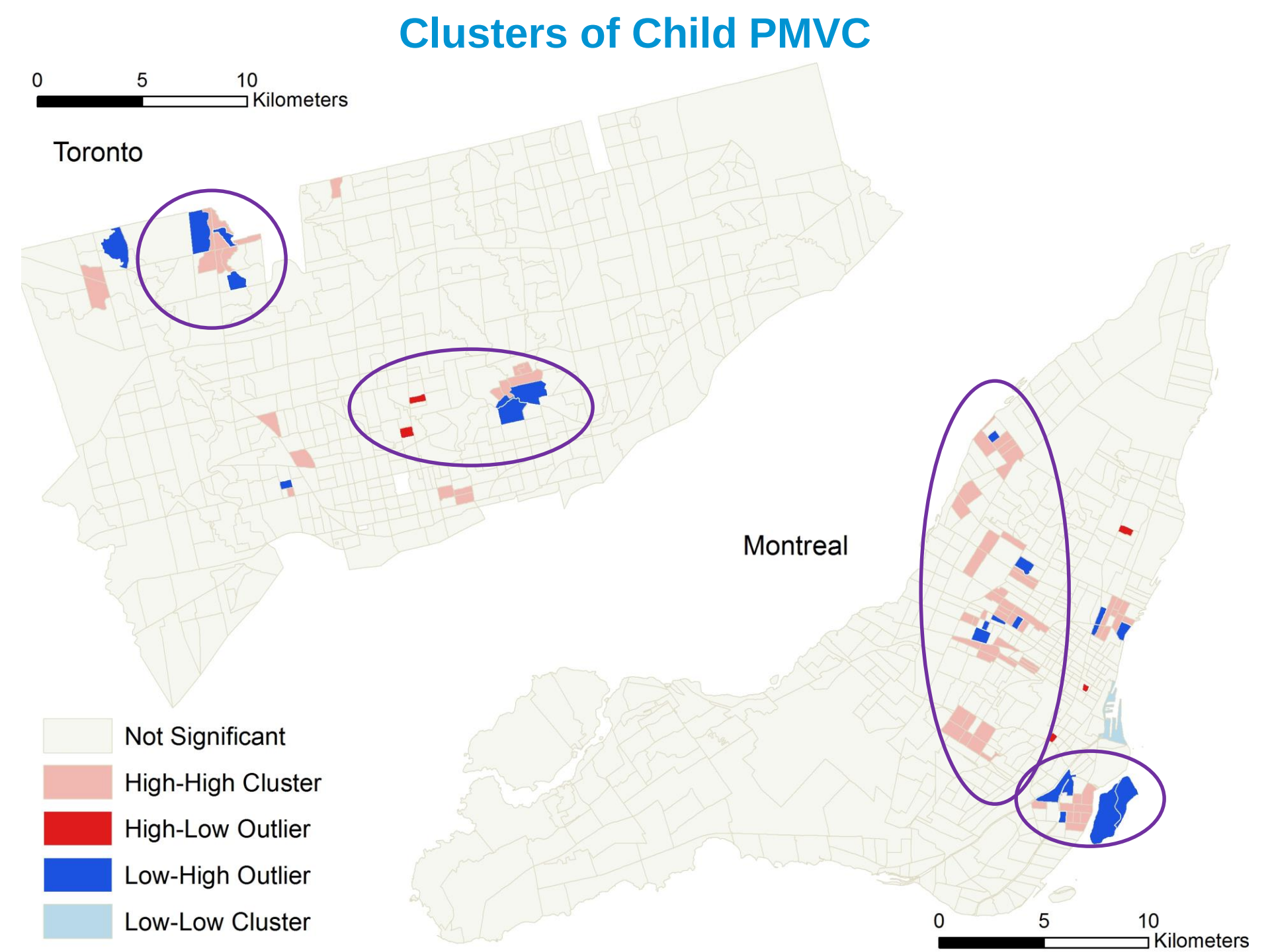
Anselin, L. "Local Indicators of Spatial Association—LISA," Geographical Analysis 27(2): 93–115, 1995.

Results

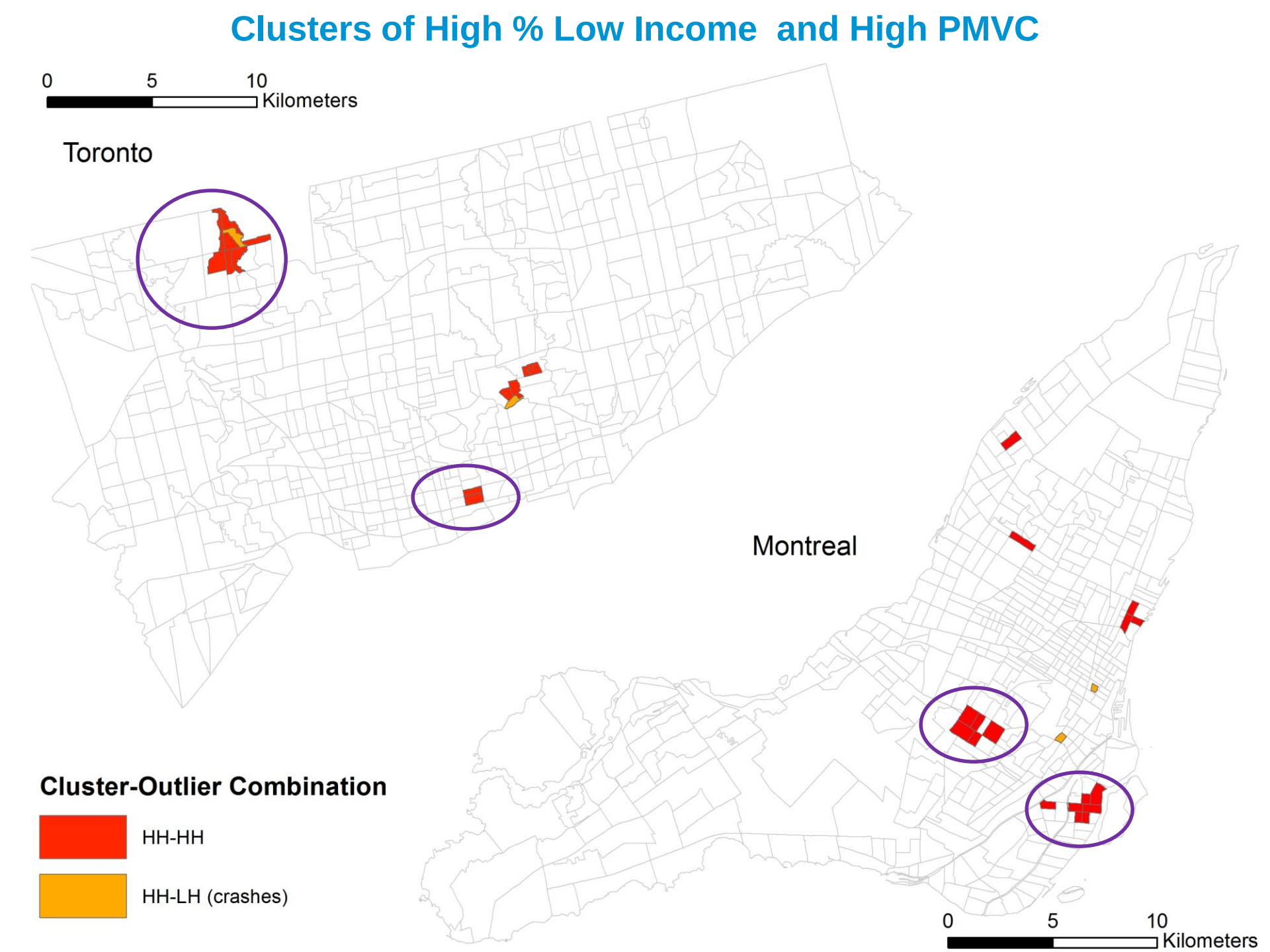
Clusters of Low Income



Clusters of Child PMVC



Clusters of High % Low Income and High PMVC



Significant Clusters

PMVC Cluster	Low % LICO Cluster	# OF CT	Average PMVC Rate	Average % ATLICO
H	H	13	2.04	35.2
H	L	1	1.05	2.9
L	L	2	0.08	4.8
L	H	2	0	42.5

Conclusions

Inequity in road risk for child pedestrians?

- The descriptive spatial cluster analysis identified several areas of concern
  - 18 CT in Toronto (North York)
  - 25 in Montreal (South-West + Côte-des-neiges)

- Although there were few numbers of significant CT, there were still substantial numbers of collisions at these locations within the 10-year period
  - 70 collisions in Toronto
  - 151 collisions in Montreal

NEXT STEPS……

- To examine similarities and differences in built environment features between clusters with:

  i) high collision rates and proportion of high versus low income

  ii) low collision rates and proportion of high versus low income

- BE risk and protective factors will be identified
- The analysis will be extended to all ages

➢ **This has important implications for policies related to the design of neighbourhoods which must transcend socioeconomic inequities.**

Thank you!

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