"One size does not fit all": Health policy implications of English Official Language Minority Community health vulnerability profiling in the province of Quebec

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Health Canada   Santé Canada

Context

- Reorganization of the health system in Quebec (Bill 10, 2015)
  - **Major challenge for adapting the** Quebec health system for the provision of equitable access to health and social services for the English OLMC in Quebec
    - **Integration of the population health approach** into new health access plans for the English-OLMC in the health regions across Quebec
    - **Lack of tools to measure** the geographic variation of a variety of English-OLMC health needs (a composite measure or typology) in Quebec
    - **Lack of tools to visualize and locate** the adequation of OLMC health needs with the local health service offer

- The English-OLMC population of Quebec : 1 058 250 (2011 Census of Canada)
  - **Unequal geographic distribution** across the regions of Quebec
    - **Very high concentration** in the Montreal region (80% of Quebec English-OLMC population)
      - 845 320 people or 22.5% of the total population in the Montreal Census Metropolitan Region (MCMA)
    - **Low concentration** in numerous clusters across the reste of Quebec
      - 14 300 people or 1.9% of the total population of the Quebec Census Metropolitan Area (QCMA)

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Research objectives

- Describe the English (First Official Language Spoken – English, 2011 Census) geographic location and spatial variation
  - **Develop an analytical procedure** for the analysis of the spatial distribution of the English-OLMC population
  - **Evaluate the geographic variation** of significant concentrations of the English-OLMC in Quebec

- Develop a vulnerability typology (profile) of the English-OLMC population in the census metropolitan areas of Montreal (MCMA) and Quebec (QCMA)
  - **Construct a unique composite measure** that associates the location of English-OLMC spatial clusters with a health vulnerability indicator (social determinant of health)
  - **Identify local neighbourhoods of vulnerability** in the spatial clusters of the English-OLMC population according to the principal social determinants of health

- Visualise the spatial distribution of English-OLMC vulnerability neighbourhoods in the health service offer establishments at different geographic scales
  - **Construct an online map** to visualize the specific health establishment (CSSS and CLSC) service areas overlaid by the English-OLMC health vulnerability typology

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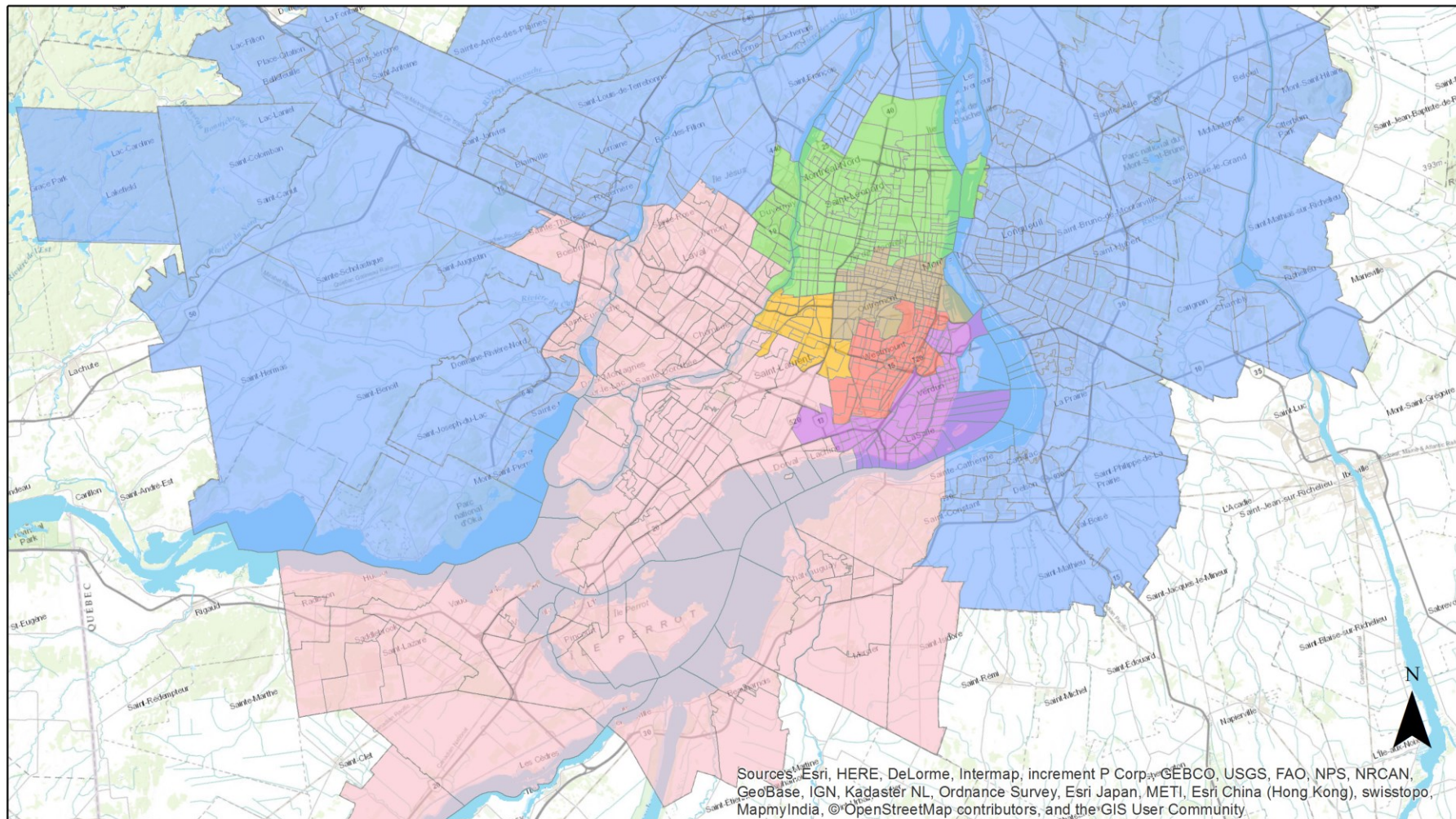
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Method – Geodemographic Analysis

- **Principal component analysis** (Luo & Wang, 2003)
  - Reduces the number of important variables and identifies those that are most important in terms of vulnerability in association with the English-OLMC population
  - Identifies problems of multicollinearity and regroups the variables according to principal dimensions (factors)
  - First step before classification and exploratory modeling (regression)

- **Geodemographic population cluster analysis** (Singleton & Speilman, 2013)
  - Application of the SKATER (Spatial "K"luster Analysis by Tree Edge Removal, Assuncao et al, 2006) classification method by census tract
  - Ecological association of the principal social determinants of health with the spatial distribution of the English-OLMC population
  - Integration of the results of the principal component analysis as a starting point
  - Spatial grouping of census tracts with similar values into k=7 classes (Montreal) and k=5 classes (Quebec)

- **Visualisation — mapping of results and overlay analysis**
  - Visualisation and analysis of maps of neighbourhood vulnerability in association with the English-OLMC population
  - Overlay analysis of health service points and territories

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List of the principal social determinants of health analysed

Variable name	RMRM	RMRQ
Immigrants	X	X
Total visible minority population	X	X
North American Aboriginal origins		X
Aboriginal identity	X	
Migrants	X	
No certificate, diploma or degree	X	X
Postsecondary certificate, diploma or degree	X	
Unemployed	X	X
Housing-Major repairs needed	X	X
Low income - Less than 18 years	X	
Low income - 65 years and over	X	
Prevalence of low income in 2010 based on after-tax low-income measure %		X
Population percentage change, 2006 to 2011	X	
Population density per square kilometre	X	
Number of persons not in census families 65 years and over - Living alone	X	
Single-parent		X
OLMC - FOLS-English adjusted	X	X

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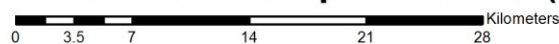
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Spatial cluster groupings of vulnerability (SKATER method)
FOLS-English population by Census Tract (2011 Census and NHS, 2011)
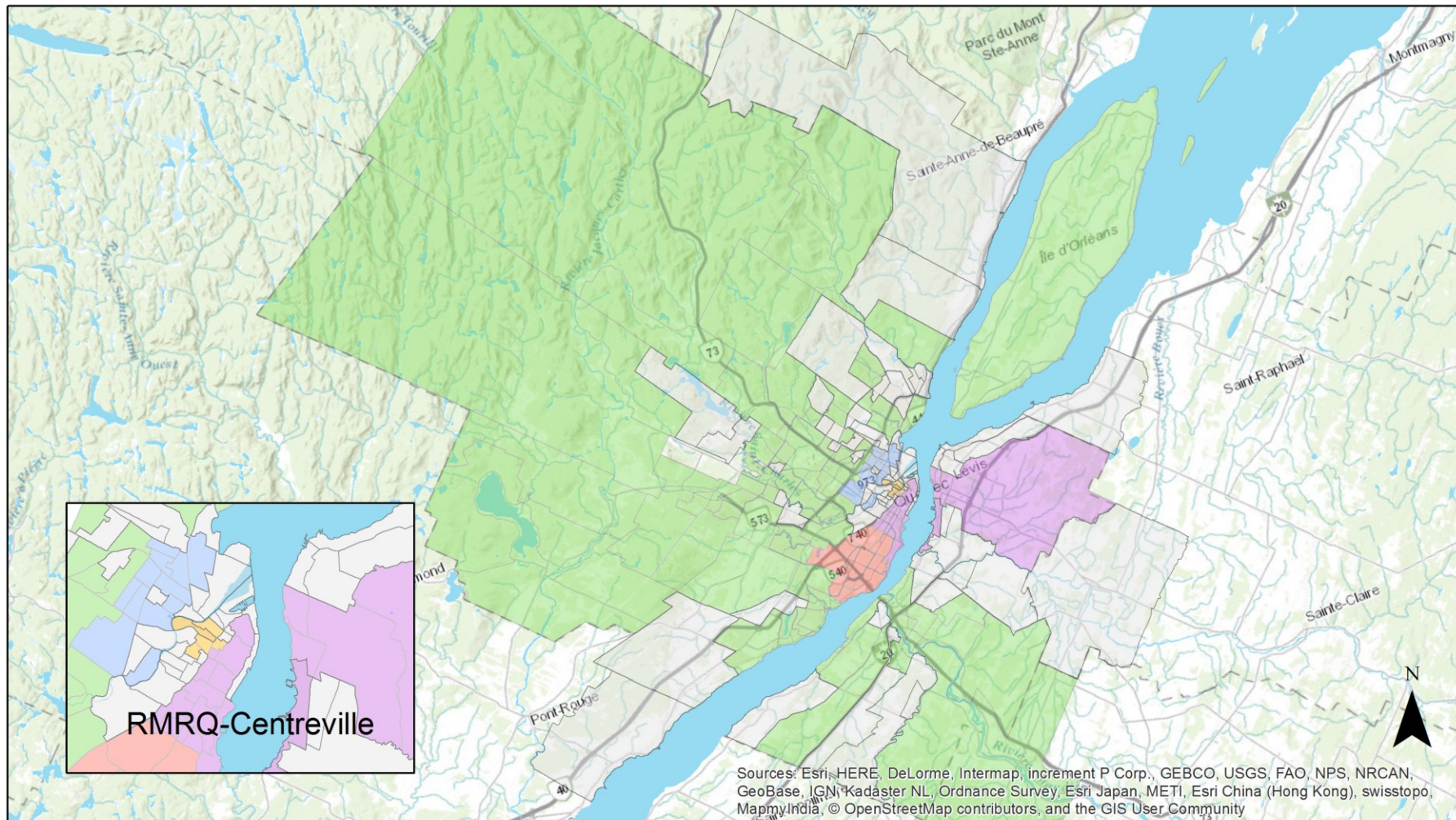**Montréal Census Metropolitan Area (MCMA)**

Note
Official language minority community (OLMC)
by First Official Language Spoken-English (FOLS-English) population in Quebec : 1 058 250 (13.5%)
FOLS-English population in the Montréal Census Metropolitan Area (MCMA) : 845 320 (22.5%)
Projection:Lambert conformal conic projection, Canada
Data source:: National Household Survey, 2011 (non-random sample)
Method: SKATER spatial cluster and grouping (Assuncao et al, 2006)
Cartographic software: ArcGIS, ESRI version 10.4.1
Author:, J. Warnke, Research-analyst, Université Laval, October, 2016

Kilometers
0   3.5   7   14   21   28

1 - Growing pop., low vulnerability
2 - High English, immigrant, in-city
3 - Low English, high vulnerability
4 - High English, immigrants, youth
5 - Some English, youth, SES mix
6 - Some English, rmaj. repairs, high educ
7 - High English, growing pop, low vulnerability

RMRQ-Centreville

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Spatial cluster groupings of vulnerability (SKATER method)
FOLS-English population by Census Tract (2011 Census and NHS, 2011)
Quebec Census Metropolitan Area (QCMA)

Note
Official language minority community (OLMC)
by First Official Language Spoken-English (FOLS-English) population in Quebec: 1 058 250 (13,5 %)
FOLS-English population in the Québec Census Metropolitan Area (QCMA)l:14 300 (1,9 %), 2011 Census
Projection:Lambert conformal conic projection, Canada
Data sources: National Household Survey, 2011 (non-random sample); 2011 Census of Canada, (100 % sample).
Method: SKATER spatial cluster and grouping (Assuncao et al, 2006)
Cartographic software: ArcGIS, ESRI version 10.4.1
Author:, J. Warnke, Research-analyst, Université Laval and Jeffery-Hale Community Services, October, 2016

Kilometers
0   4   8   16   24   32

1 - Vulnerable population, low English
2 - English, immigrants, high scholarity, unemployed
3 - English, low scholarity
4 - Low income, unemployed, maj. repairs, NA Aboriginal origins
5 - Maj. repairs, low income, immigrants, English
5 to 50 FOLS-English (not included in analysis)

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Results and Conclusion : A « one size fits all » health service offer cannot adequately statisfy the health service needs of the English-OLMC in Quebec

- **The geographic variation of the English-OLMC has been identified**
  - Spatial aggregation in high density clusters is more prevalent in the MCMA than in the QCMA
    - High density spatial clusters of population are neighbourhood specific
    - Regions of low English-OLMC population are distributed across the province

- **A typology of English-OLMC vulnerability in the MCMA (online map)**
  - 14 variables retained for the analysis of 900 census tracts in the MCMA
  - 3 groups out of 7 optimally represent the FOLS-English vulnerability condition in the MCMA

- **A typology of English-OLMC vulnerability in the CMA (online map)**
  - 9 variables were retained for the analysis of 112 census tracts in the QCMA
  - 3 groups out of 5 optimally represent the FOLS-English vulnerability condition in the QCMA

- **Health policies and programs must take into account the variety of OLMC health needs**

- **Next steps**
  - Validation of factors associated with OLMC health service use by different classes of health service users in the Quebec region (Jeffery Hale Community Services) and in the Ottawa region (Hôpital Montfort)

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Thank-you!!

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