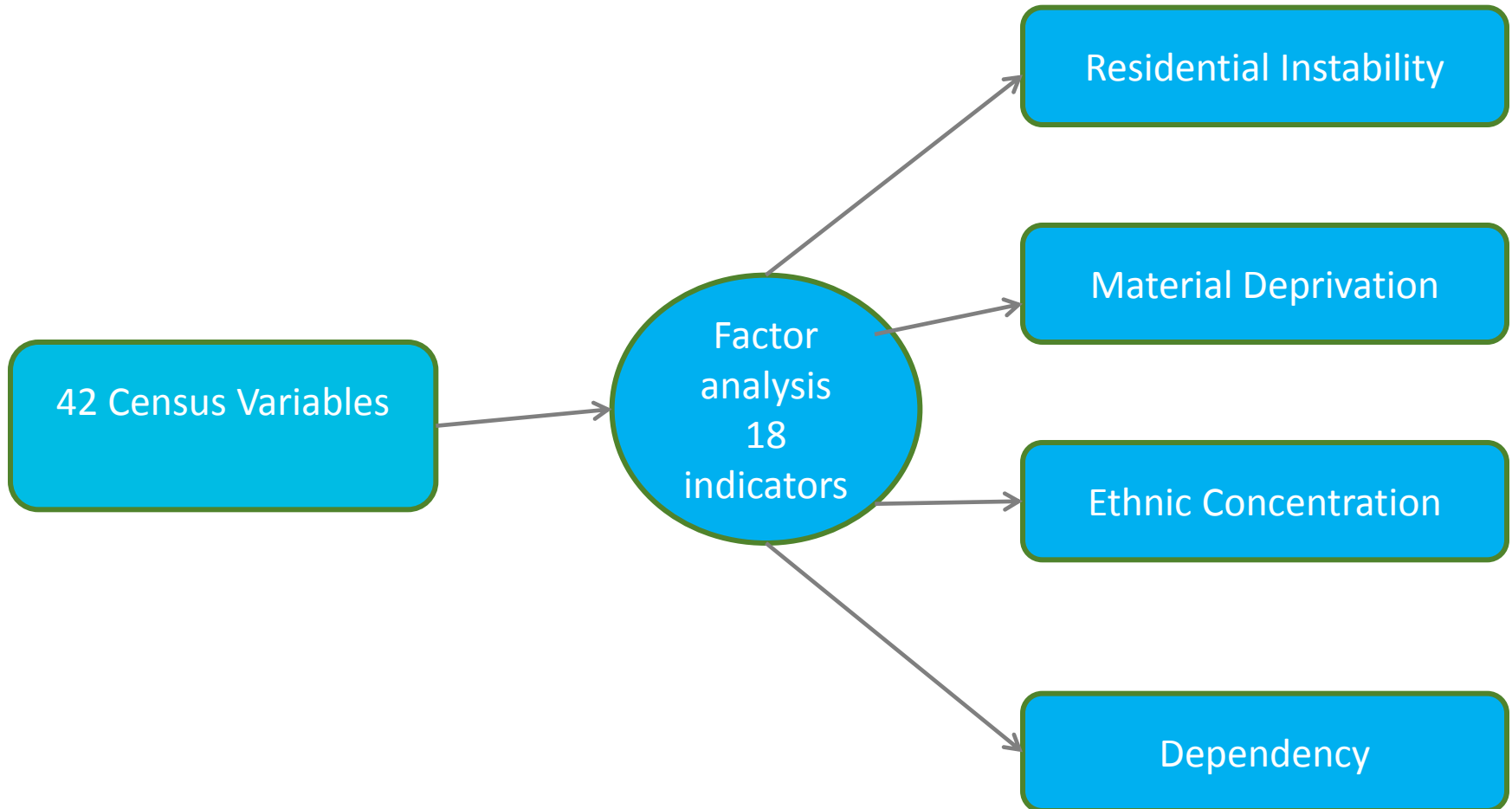


Updating the ON-Marg for health equity monitoring without the long-form census

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- Background on the Ontario Marginalization Index (ON-Marg)
- Use of NHS in 2011 update of ON-Marg
- Plans to updating ON-Marg using alternative data sources

Dimensions of ON-Marg



Dimensions & Census Indicators

Residential Instability	Material Deprivation	Dependency	Ethnic Concentration
7 indicators	6 indicators	3 indicators	2 indicators
% living alone	% without a high-school diploma	% aged 65 and older	% recent immigrants (5yr)
% non -youth (16+)	% single parent families	Dependency ratio (total population 0-14 and 65+/total population 15-64)	% visible minority
% apartment buildings	% receiving government transfer payments	% not participating in labor force (15+)	
% single, divorced, widowed	% unemployed		
% rental dwellings	% low-income households		
% move in past 5 years	% houses needing major repair		
Crowding - average number of persons per dwelling			

- Most recent ON-Marg based on 2006 short form (SFC) and long form census (LFC) data
- In 2011, LFC replaced with National Household Survey (NHS)
- Updating same index would mean using NHS data; concerned this compromised ability to study marginalized and vulnerable populations
- Conducted reliability study to investigate quality of NHS data vs. LFC data

- Collaborative project between Public Health Ontario and the Centre for Research on Inner City Health at St. Michael's Hospital.
- Update ON-Marg using alternative data sources to replace indicators formally based on long-form census:
 1. Statistics Canada Taxfiler
 2. Municipal Property Assessment Corporation
 3. Immigration, Refugee, and Citizenship Canada

- Indicators:
 - Receiving government transfer payments
 - Unemployed
 - Living below Low Income Measure (LIM)
 - Labor force participation
- 97% coverage
- Differences:
 - Ability to look at income after taxes and transfers
 - Low Income Measure instead of Low Income Cut-Offs (LICO)
 - Definition of family

- Indicators:
 - Multi-Unit Housing
 - Dwellings owned
 - Fair/poor housing
 - Includes 50+ and 25+ year old houses with no history of renovations
- Based on in-person property assessments
- Differences:
 - Different definition for “needing major repair”
 - Excludes basement apartments
 - Based on most recent assessment

- Indicators:
 - Recent (5-year) immigrant
 - Visible minority
- Link data with Registered Persons Database (RPDB) at ICES
- Ethnicity estimated from mother tongue and country of birth
 - Based on algorithms developed by Rezai et. al (2013) at ICES
- Access to data is pending. Special approval is needed from IRCC to access this data; this project falls within a “grey zone”

Main differences in update

- Different sources = different coverage
 - Basement apartments
 - Students, young adults
 - RPDB
- Slightly different definitions for indicators
 - LIM vs LICO
 - Unemployed vs receiving EI
 - Needing major repair vs fair/poor conditions
- Some indicators not available
 - Education
 - Visible minority for total population

1. Data acquisition completed
2. Build index using Principal Component Analysis
3. Validation: Use 2006 MPAC, taxfiler and IRCC data to compare with 2006 ON-Marg:
 - Check indicator agreement
 - Build 2006 ON-Marg using alternative sources, and assess agreement
 - Sensitivity analysis

- **2017 release:**
 - Excel file containing index values and quintiles
 - User guide
 - FAQ
 - Publication
- Hosted at both Public Health Ontario and Ontario Community Health Profiles websites
- Taxfiler data will also be made available for 2006 and 2011 at the DA-level

- Summary:
 - Ontario Marginalization Index (ON-Marg) is a powerful tool to help understand how area-based marginalization drives health inequities at the neighbourhood level.
 - High non-response on the 2011 National Household Survey could lead to misclassification of DAs if used to update the ON-Marg.
 - PHO and CRICH are working collaboratively to acquire alternative data sources including Taxfiler, MPAC, and IRCC.
 - Updated 2011 ON-Marg is expected Fall 2016.



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Purpose of ON-Marg

- To show differences in marginalization between areas
- To understand inequities in various measures of *health and social well-being*, either between population groups or between geographical areas
- The benefits to ON-Marg are that it allows comparability across studies in Ontario. It allows comparisons across small-area geographies, and now over time as well

- Census-based, geographically derived index
- Developed originally as CAN-Marg in 2001 with census tracts (urban areas)
- 42 census measures used in principal components factor analysis
- Measures with low factor loadings were removed on an iterative basis
- Four factors emerged with 18 census indicators
- Validated

- Each dimension represents a separate index with a standardized factor score for each area
 - E.g. the material deprivation index ranges from a score of -2 (low deprivation) to +6 (high deprivation)
- Each dimension/index is also available in quintiles
 - Q1 represents least deprived and Q5 the most deprived
- ON-Marg is available for public health units, sub-LHINs, LHINs, census divisions, census sub-divisions, and consolidated municipal service manager areas

Potential Uses of the ONMarg

1. Planning and needs assessment
2. Monitoring inequities
3. Resource allocation
4. Advocacy
5. Research

Use 2: Monitoring inequities

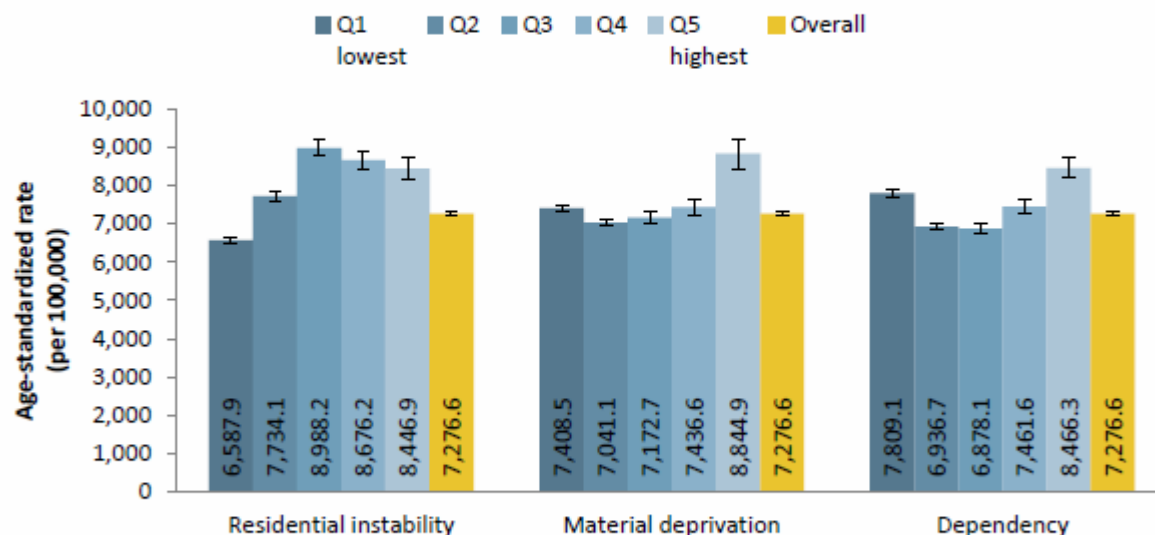
Table 2 Number of Dissemination Areas and Population by Ontario Marginalization Index Dimension Quintiles, York Region, 2006

	ON-Marg Dimension Quintile*							
	Residential Instability		Material Deprivation		Dependency		Ethnic concentration	
	# of DA	Population	# of DA	Population	# of DA	Population	# of DA	Population
1 (Least deprived)	656	510,856	384	337,196	291	246,412	34	18,125
2	215	196,533	366	291,576	367	331,720	96	50,206
3	125	81,596	224	160,955	259	178,573	171	102,846
4	82	61,972	119	81,006	129	73,919	269	195,405
5 (Most deprived)	50	41,402	35	21,626	82	61,735	558	525,777
Total	1,128	892,359	1,128	892,359	1,128	892,359	1,128	892,359

*Each quintile does not contain an equal proportion of the York Region population.

Use 2: Monitoring inequities

Figure 7 - Injury-related emergency ambulatory visit rate by select ON-Marg dimensions and quintiles, York Region, 2006



Data Sources: Ambulatory Emergency External Cause Data 2006, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, April 2013. 2006 Census, Statistics Canada. Ontario Marginalization Index, Centre for Research on Inner City Health, 2012.

York region. *Impact of socioeconomic factors on health in York Region*. 2014

https://www.york.ca/wps/wcm/connect/yorkpublic/f4776d6b-4b13-47e4-ac04-0bfd3a980d05/Health_Equity_Report.pdf?MOD=AJPERES

Use 3: Resource allocation

“At Peel Public Health, we have used ON-Marg to identify elementary schools in which students are at higher risk for dental caries. This means that in our dental screening program we can use the limited resources to greater effect. As a result, we are finding more children with urgent dental needs and getting them into a treatment program.”

David Mowat, Medical Officer of Health, Peel Region

Use 5: Research

Table 3

Multilevel logistic regression odds ratios of depression by individual and neighborhood characteristics ($N = 56,428$)

Variables	Depression (4+ symptoms)		
	Model 1	Model 2	Model 3
<i>Individual level</i>			
Female	1.87***		
Age 18–29	2.46***		
Age 30–39	2.84***		
Age 40–49	2.78***		
Age 50–59	2.20***		
Married	0.49***		
High school graduation	0.73***		
Visible minority	0.65***		
<i>Neighborhood level</i>			
Residential instability			
Material deprivation			
Dependency			
Ethnic diversity			
Intercept	0.06***		
Intercept Variance Component	1.07***		

Notes: * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$.

Matheson et al. Urban neighbourhoods, chronic stress, gender and depression. *Soc Sci Med* 2006; 63: 2604-2616.

Reliability Study: methods

- Compare agreement between ON-Marg indicators
 - 7 indicators: SFC: 2006; 2011
 - 11 indicators: LFC, 2006; NHS, 2011

Hypothesis: less variability at DA level between indicators derived from SFC vs. NHS/LFC across years

- 3 measures of agreement
 - Pearson correlation coefficient (PCC)
 - Spearman correlation coefficient (SCC)
 - Intra-class correlation (ICC)

- Interpretation

Strong agreement	> 0.70
Moderate agreement	$0.50-0.70$
Weak agreement	<0.50

Percent (%) of indicators demonstrating strong, moderate, weak agreement between 2006 and 2011, by survey

	Pearson CC		Spearman CC		Intraclass C	
	SFC	LFC/NHS	Census	LFC/NHS	Census	LFC/NHS
Strong	100	36	86	35	71	27
Moderate	0	45	14	45	14	36
Weak	0	18	0	18	14	36

Strong agreement > 0.70
 Moderate agreement 0.50 – 0.70
 Weak agreement <0.50

SFC : Short Form Census (2006 and 2011)
 NHS: National Household Survey (2011)
 LFC : Long Form Census (2006)

Sensitivity analyses:

- Compared agreement across **quartiles of non-response** in DAs in 2006/11
 - Greater non-response:
 - Tendency for weak agreement between LFC/NHS indicators
 - Tendency for strong/moderate agreement between SFC indicators
- Compared agreement in 2001 to 2006 (when both surveys mandatory)
 - Tendency for strong/moderate agreement across census years for both LFC and SFC derived indicators

- Strong agreement between ON-Marg indicators collected on the SFC across 2006 and 2011
- Moderate / weak agreement between ON-Marg indicators collected on the LFC/NHS across 2006 and 2011
- Sensitivity analyses suggested weaker agreement when non-response was high
- Results suggest measurement error (bias) in NHS

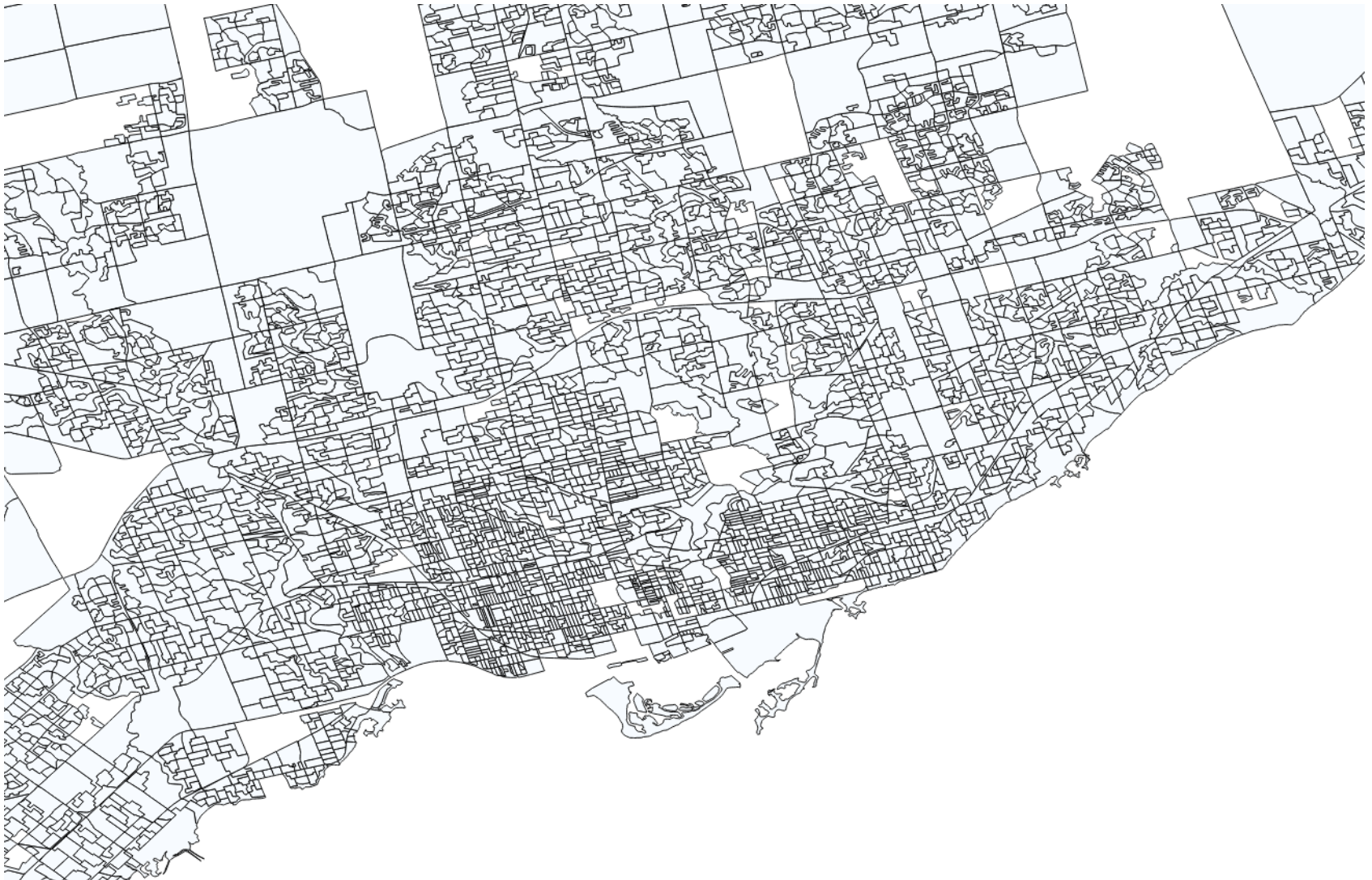
Using NHS derived-measures to create ON-Marg could lead to misclassification of DAs because of measurement error

St. Michael's

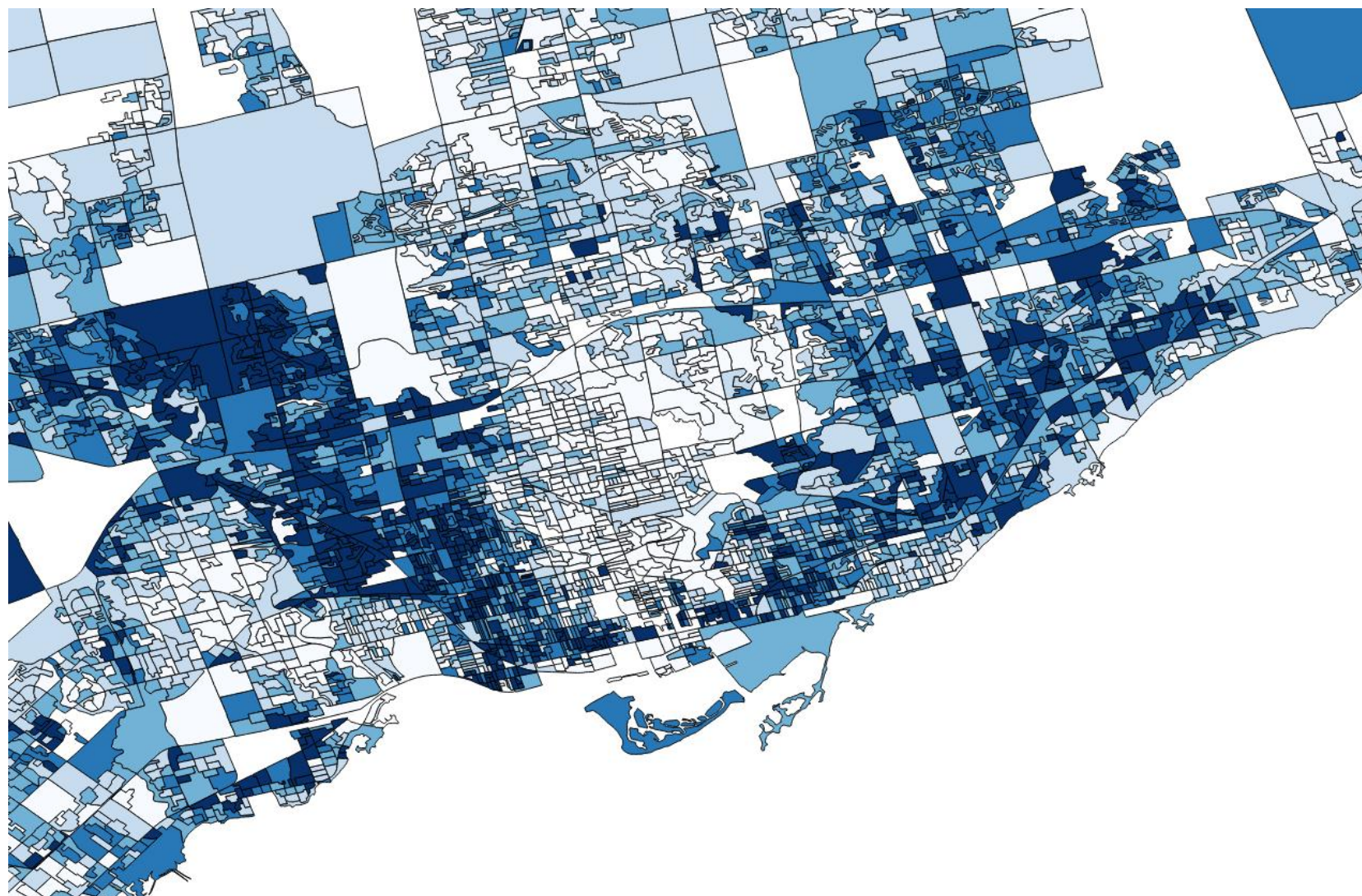
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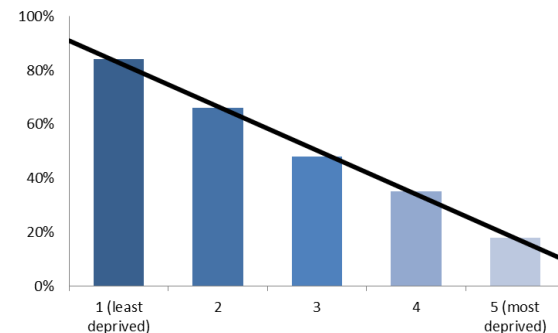
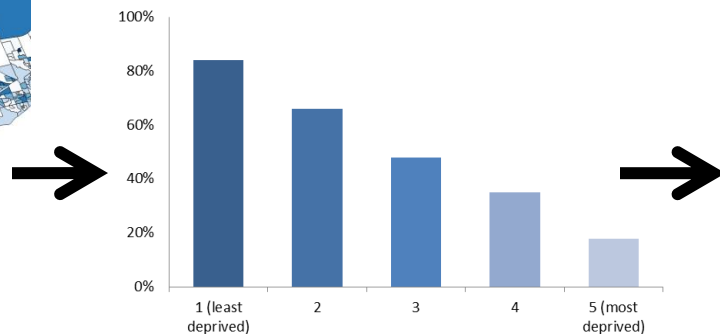
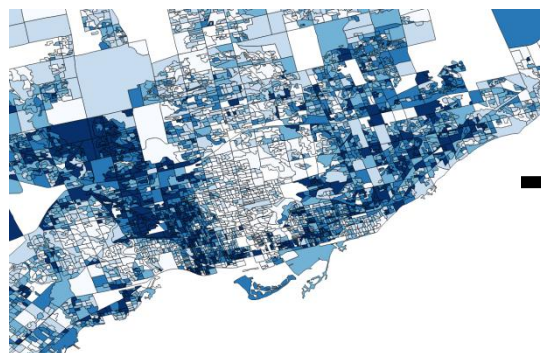
ON-Marg at PHO



ON-Marg at PHO



ON-Marg at PHO



Summary Measure of Inequality

Rate Difference:	58.0%
Rate Ratio:	4.7
Slope Index of Inequality:	71.5%
Relative Index of Inequality:	5.6



“Smoking rates are 58% greater in the most deprived quintile compared to the least deprived quintile.”

ON-Marg Products at PHO

End of the year 2016:

- Stakeholder consultation in July
- Interactive maps
 - Ability to download ON-Marg and source data
 - Future updates to include population health lens
- Dashboards
 - Interactive, uninterpreted data tables describing health status across quintiles over time
 - 5 to 8 key health status indicators
 - Summary measures of inequality

