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presentation & slides**

Agenda

Part 1 Introduction & Overview (20 minutes)

- Welcome, introductions, format for session (Anne-Marie Tynan, Centre for Research on Inner City Health, CRICH)
- Background on the partnership and datasets (Rick Glazier, CRICH)
- Brief orientation to website (Peter Gozdyra, CRICH)

Part 2 Geography Primer + Linkage to Health Data (25 minutes)

- Geography 101 (Peter Gozdyra) - A GIS primer
- How do we link geography to health indicator data? (Mohammad Agha, CRICH)

Part 3 Ontario Marginalization Index – ON-Marg: Geography & data (25 minutes)

- The Ontario Marginalization Index – ON-Marg (Flora Matheson, Katie McIsaac, CRICH & Trevor van Ingen, Public Health Ontario)
- Why and how did we create ON-Marg?
- Some practical applications of ON-Marg
- Current challenges and new developments

Part 4 (10 minutes)

- Wrap Up

Today's Presenters

Anne-Marie Tynan: Anne-Marie is a Research Manager at the Centre for Research on Inner City Health (CRICH), St. Michael's Hospital and holds a Masters degree in Immigration & Settlement Studies with a focus on the Health of Immigrant Communities;

Rick Glazier: Rick is a Family Physician and is the Research Director in the Department of Family & Community Medicine at St. Michael's Hospital. He is also a Research Scientist at CRICH, Senior Scientist & Program Lead, for Primary Care & Population Health Research at the Institute for Clinical Evaluative Sciences (ICES) and a Professor at the University of Toronto (UofT) with cross appointments to the Dalla Lana School of Public Health and the Faculty of Medicine;

Peter Gozdyra: Peter has extensive experience working as a Medical Geographer at both ICES & CRICH. He has been involved in numerous projects that require in-depth understanding of spatial analytic tools. He holds a Masters in Geography from UofT;

Mohammad Agha: Mohammad holds a PhD in Epidemiology from UofT and is an Adjunct Scientist at ICES and a Senior Research Associate at CRICH. He has extensive experience in developing and generating health indicator data including linkages between data and geography;

Flora Matheson: Flora is a Research Scientist at CRICH, an Adjunct Scientist at ICES and Assistant Professor at the Dalla Lana School of Public Health, UofT;

Katie McIsaac: Katie McIsaac is a social epidemiologist who studies and describes the health of vulnerable populations. Katie is currently a research associate at CRICH and the Dalla Lana School of Public Health;

Trevor van Ingen: Trevor is an Epidemiologist Lead at Public Health Ontario involved in health inequity monitoring.

Thanks to Cynthia Damba & Nathalie Sava, TC LHIN and Naushaba Degani, Health Quality Ontario for their help in today's workshop!

Overview of Partnership & Datasets used by TCHPP

Rick Glazier, TCHPP

Current Partners

- **Centre for Research on Inner City Health (CRICH), St. Michael's Hospital**
- **Toronto Central Local Health Integration Network (LHIN)**
- **Toronto Public Health**
- **Wellesley Institute**
- **The Southeast Toronto Project (SETo)**
- **Access Alliance Multicultural Health & Community Services**
- **Institute for Clinical Evaluative Sciences (ICES)**
- **Wellbeing Toronto**
- ***Central LHIN – new partner as of November 2015***

Overall goals:

- Foster **collaborations & partnerships** between health services providers, researchers and policy-makers
- Facilitate **access to health information** to support planning
- Maximize the **effective use of system resources** for planning
- **Increase capacity** of health service providers to use health information
- Deepen **understanding of Health Inequities** and how to measure, monitor and reduce them.

TCHPP Website

- In 2005 the Toronto Community Health Profiles Partnership launched the Toronto Community Health Profiles Partnership Website with the purpose of making detailed, area-level health data available to everyone.
- Data available on freely accessible portal
- Updated regularly with latest data

What gap are we filling?

- Producing health indicators for Toronto communities and service providers to:
 - ✓ **Reduce duplication** of work
 - ✓ **Maximize efficiency and productivity** by collaborating and sharing
 - ✓ Use **common** definitions, data standards, methods, quality assurance
 - ✓ Create a **single point of access** for health indicators **on website**
 - ✓ Provide **information and training**

Our focus:

- Vulnerable populations
- Neighbourhood-level areas with greatest health needs
- Multiple barriers to access
- Translation and cultural interpretation priorities
- Equity

Access to numerous data sources

- Physician services (OHIP)
- Hospitalizations (CIHI, OMHRS)
- Emergency Department visits (NACRS)
- Vital Statistics (Office of the Registrar General of Ontario)
- Specialized databases (Cytobase, Ontario Breast Screening Program (OBSP))
- Chronic disease provincial registries (Diabetes, Asthma, COPD, etc.)
- Census (1991, 1996, 2001, 2006, 2011)
- Immigration data (CIC) linked to health services use
- Numerous Geographic datasets
- Partner data from Toronto Public Health (e.g. STI, Mothers & Babies)
- Other sources of data that become available to us

Health Topics

- Socio-demographic Data
- Hospital Admissions
- Emergency Department Care
- Adult Health and Disease
- Prevention
- Sexual Health
- Mothers & Babies
- Premature Mortality
- Ontario Marginalization Index
- Top High Cost Health Care Users
- Primary Care (Attachment & Continuity In Care)

Overview of Toronto Community Health Profiles Partnership website

Go back to website homepage

Peter Gozdyra

Geography 101: A Primer

Peter Gozdyra

Ontario's geographic units: Overview and Recent Changes



PETER GOZDYRA

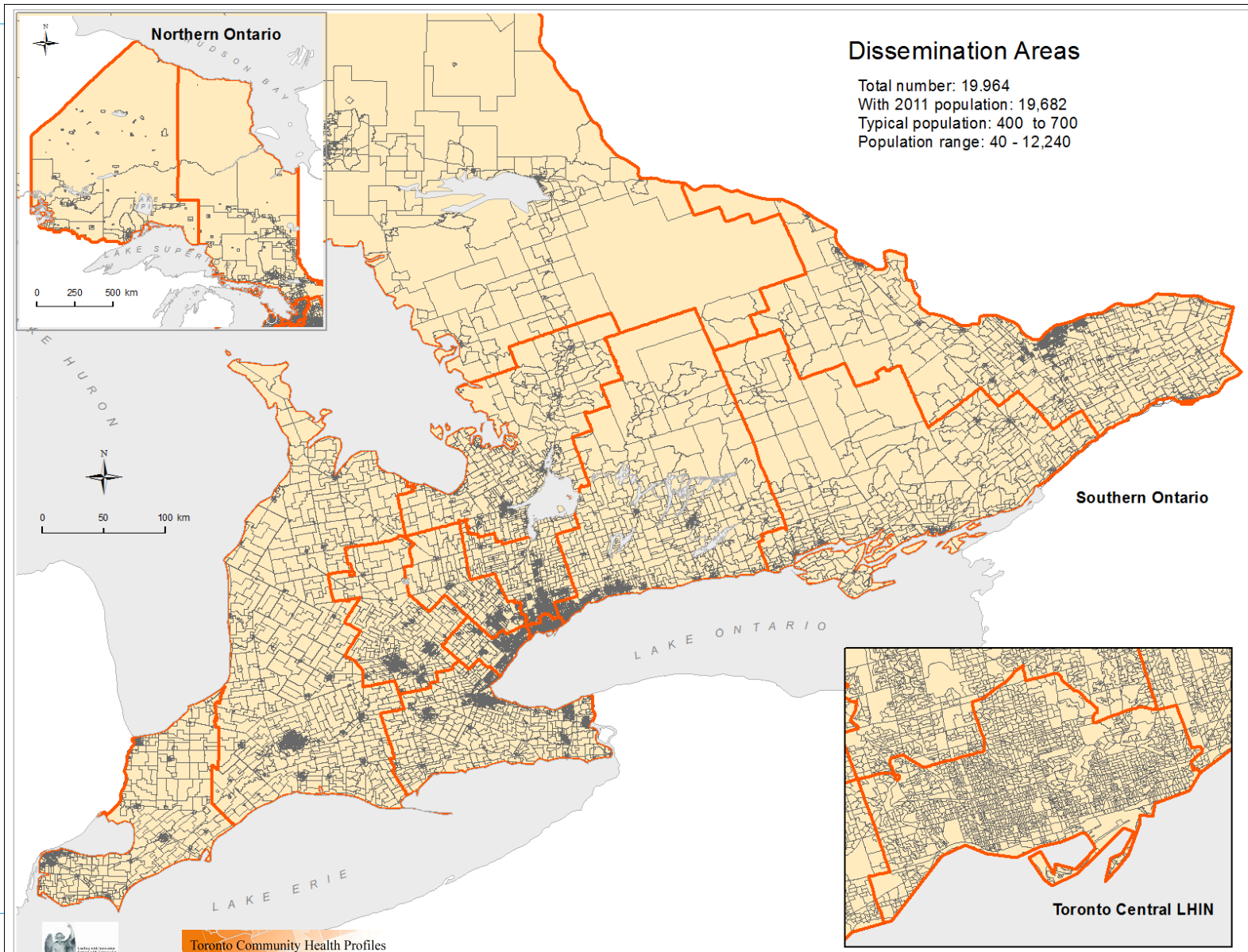
March 4, 2016

What We Will Cover

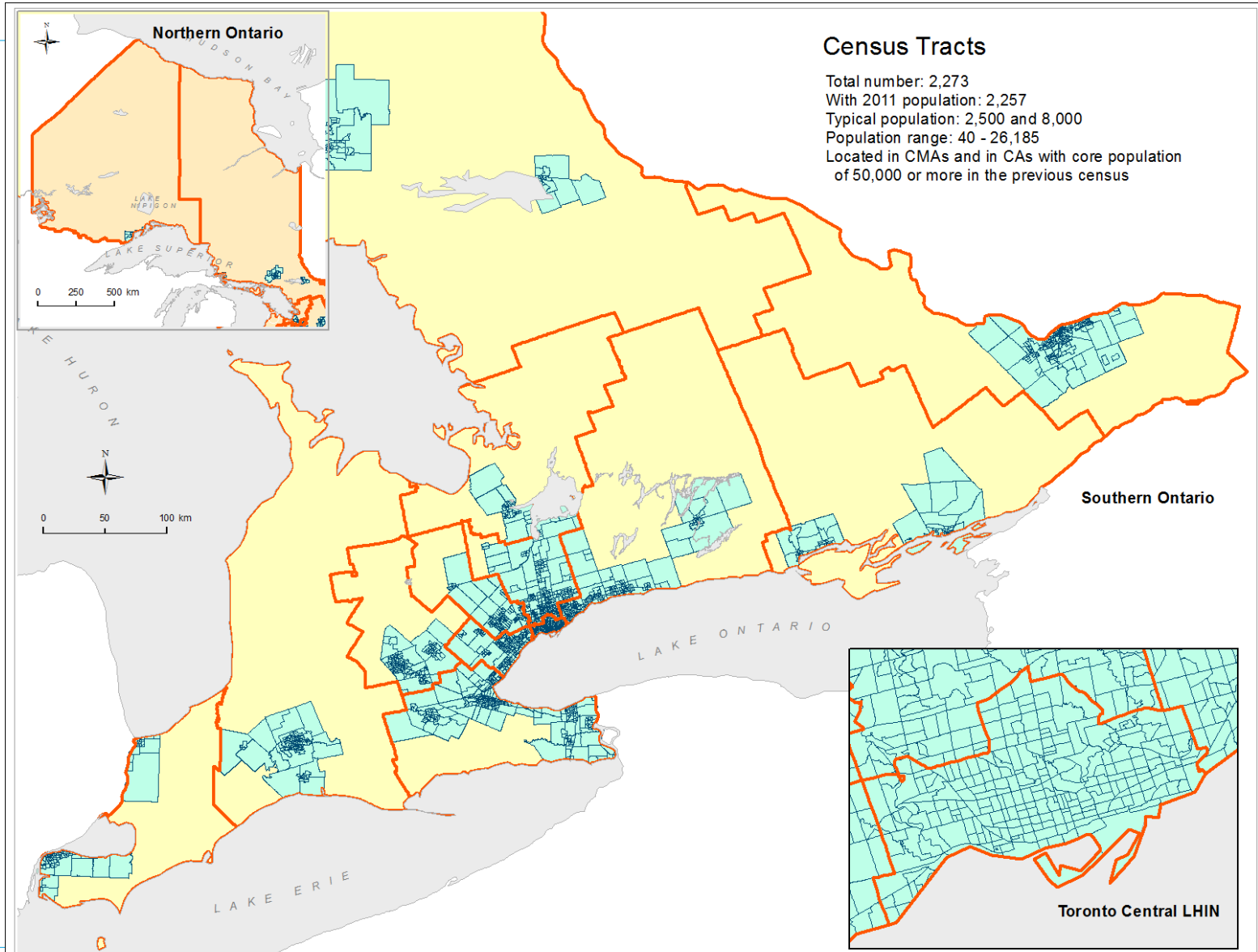
1. Review of standard geographic units

2. New geographic areas

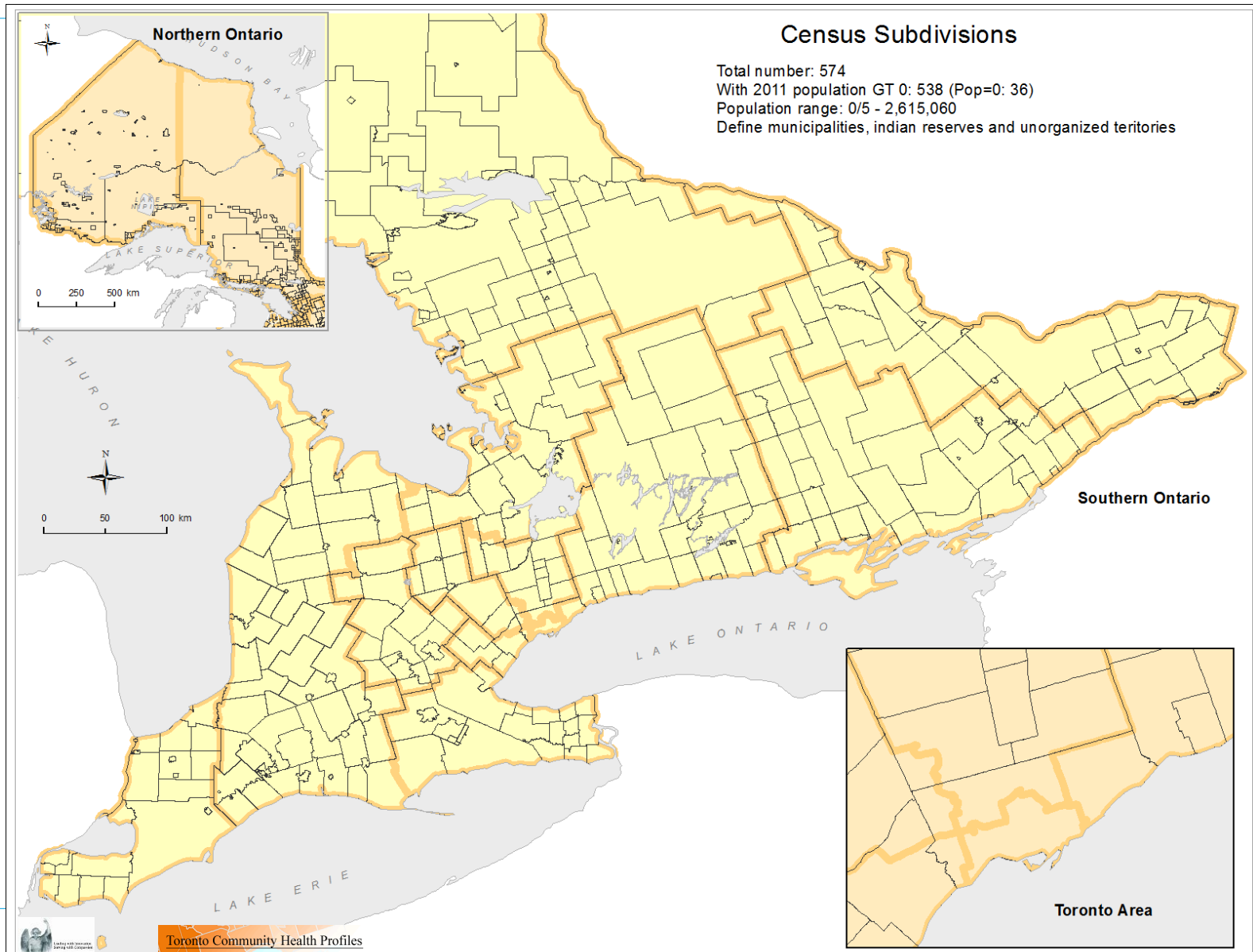
Standard Units – census based



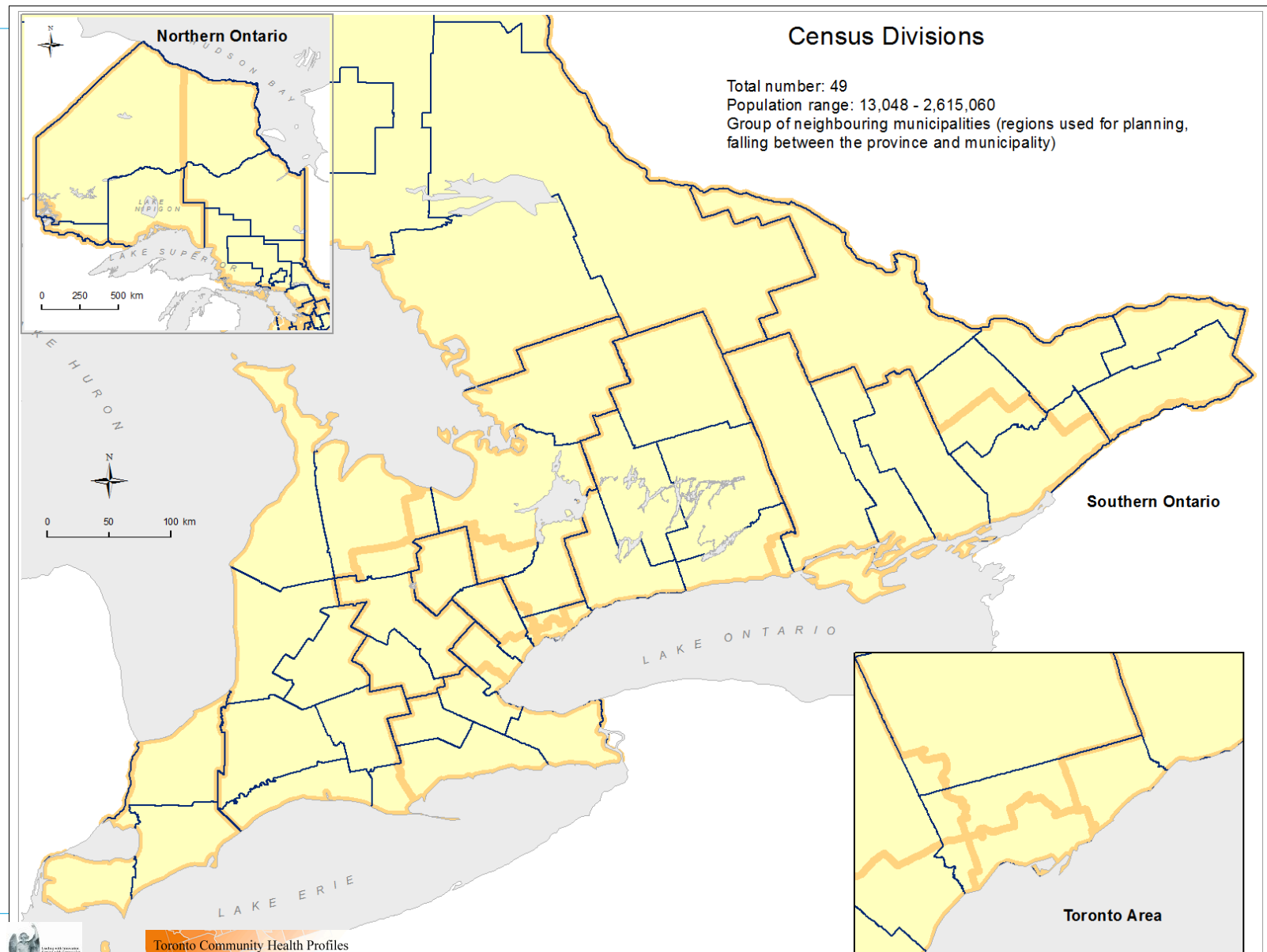
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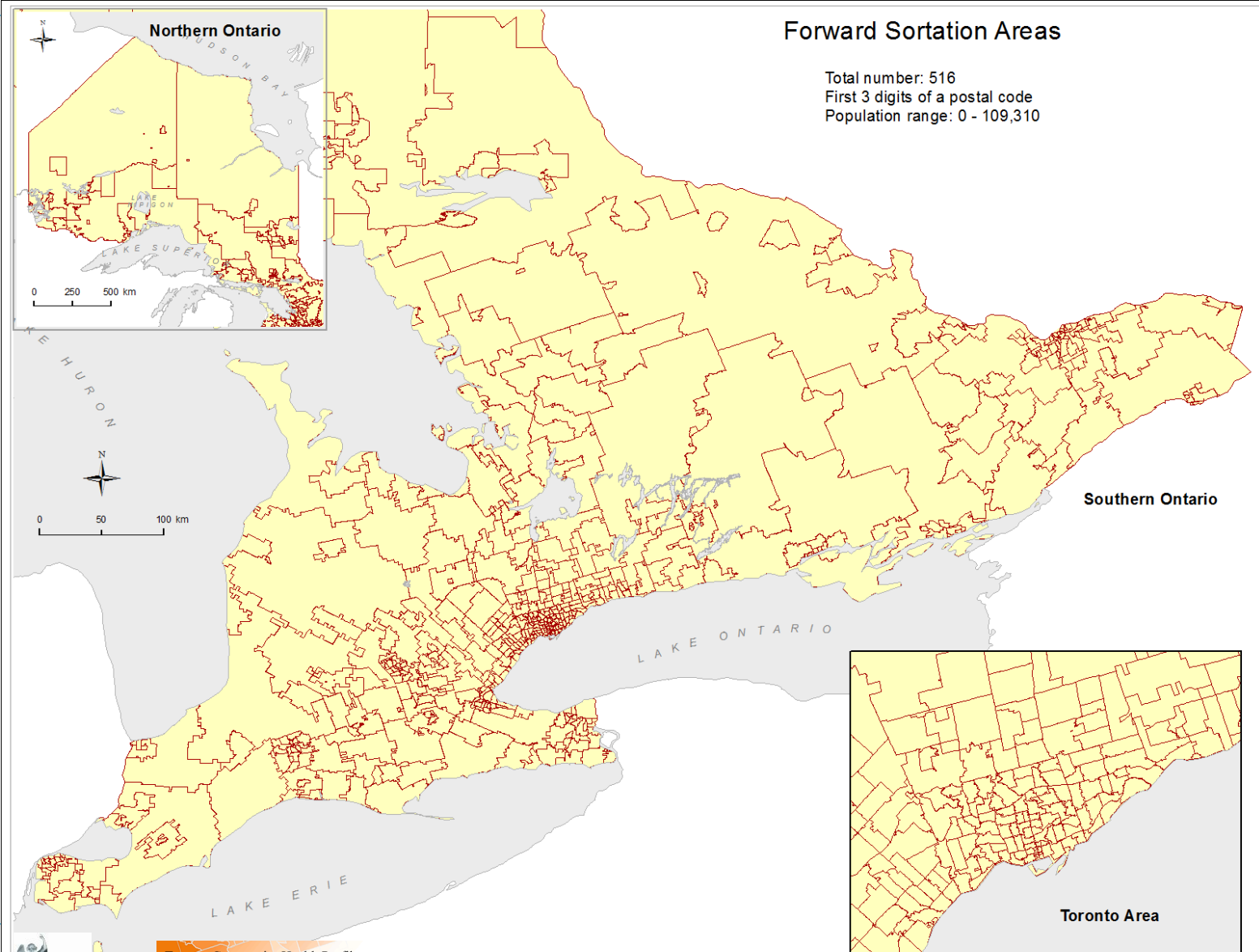
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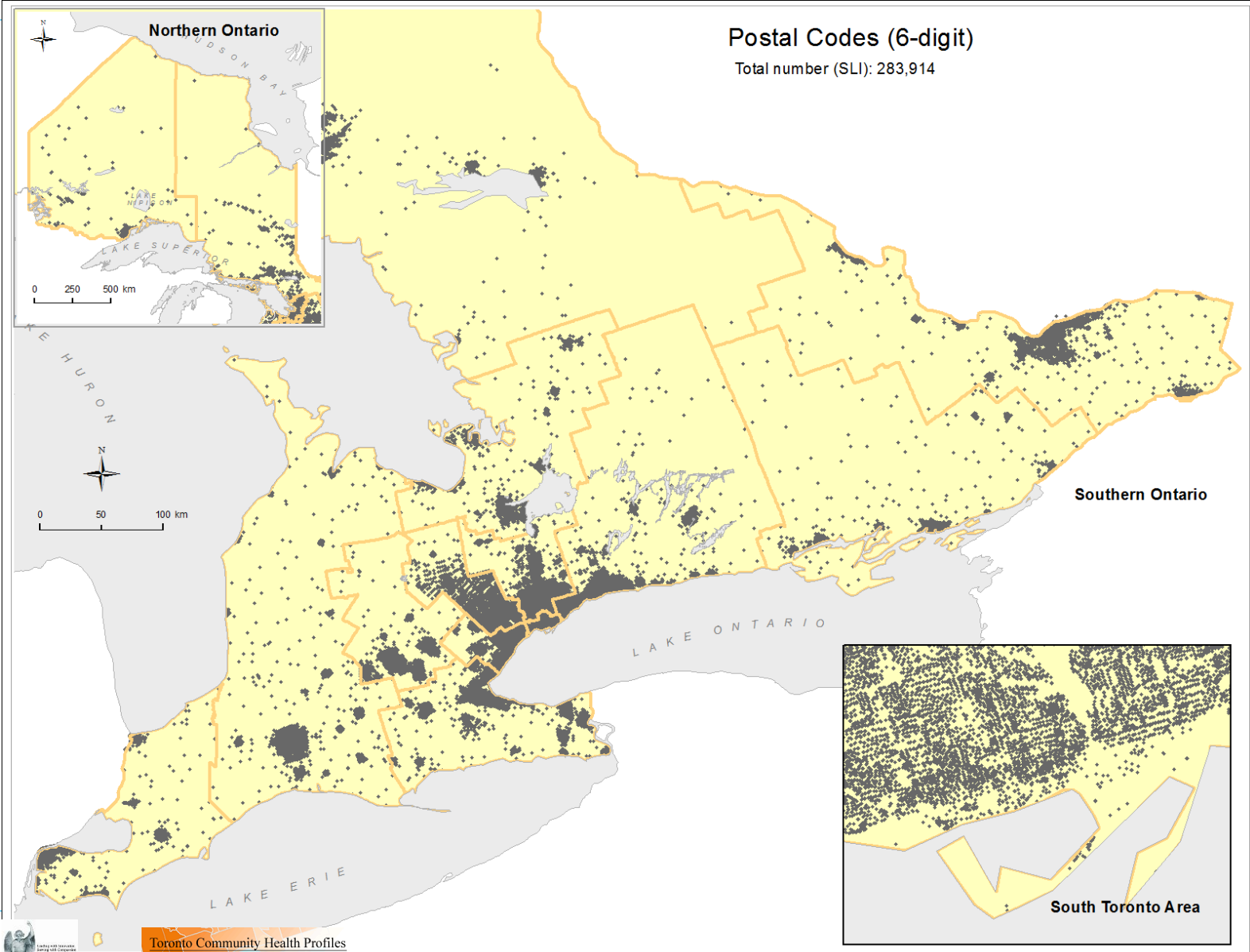
Standard Units – census based



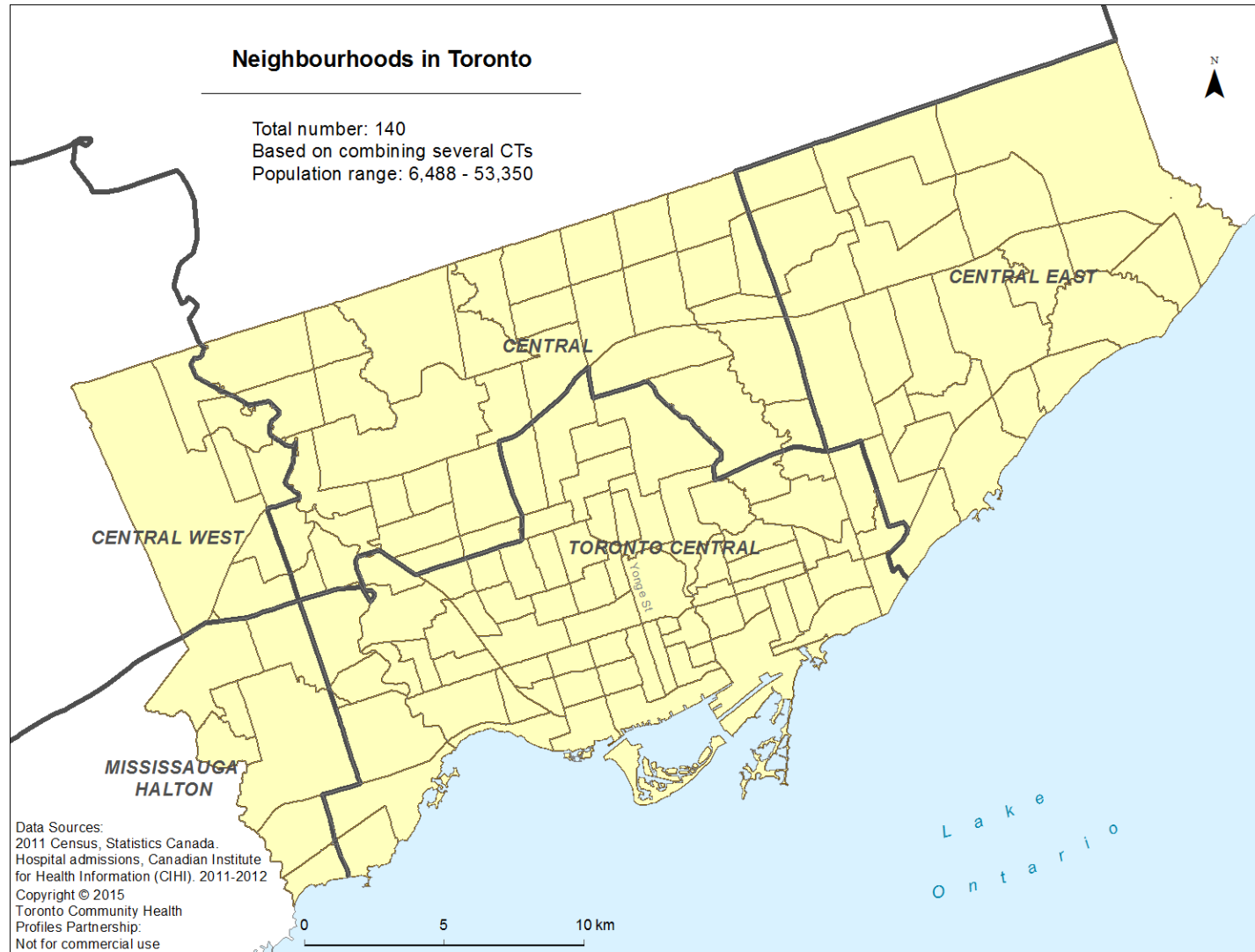
Standard Units – postal based



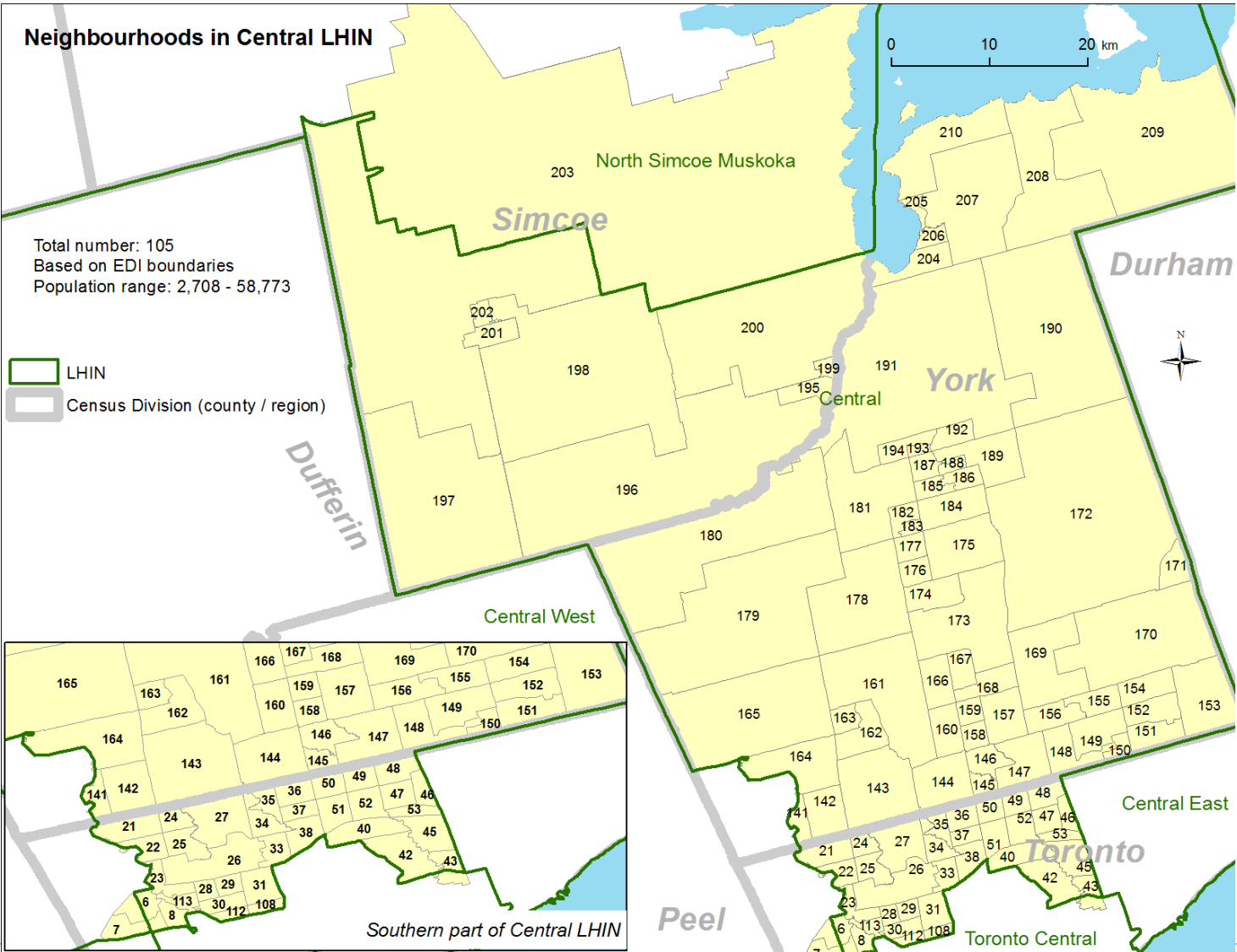
Standard Units – postal based



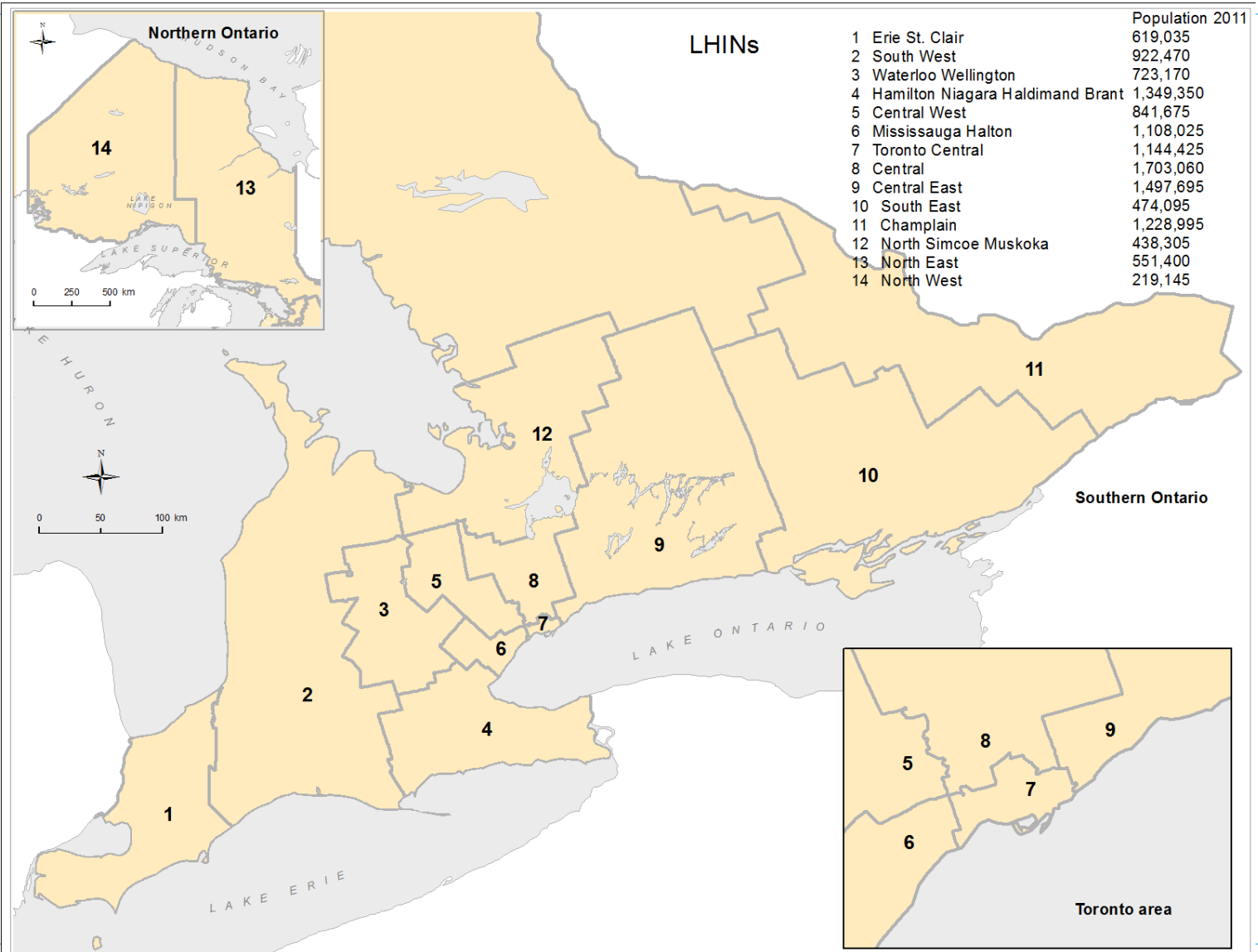
Standard Units – other



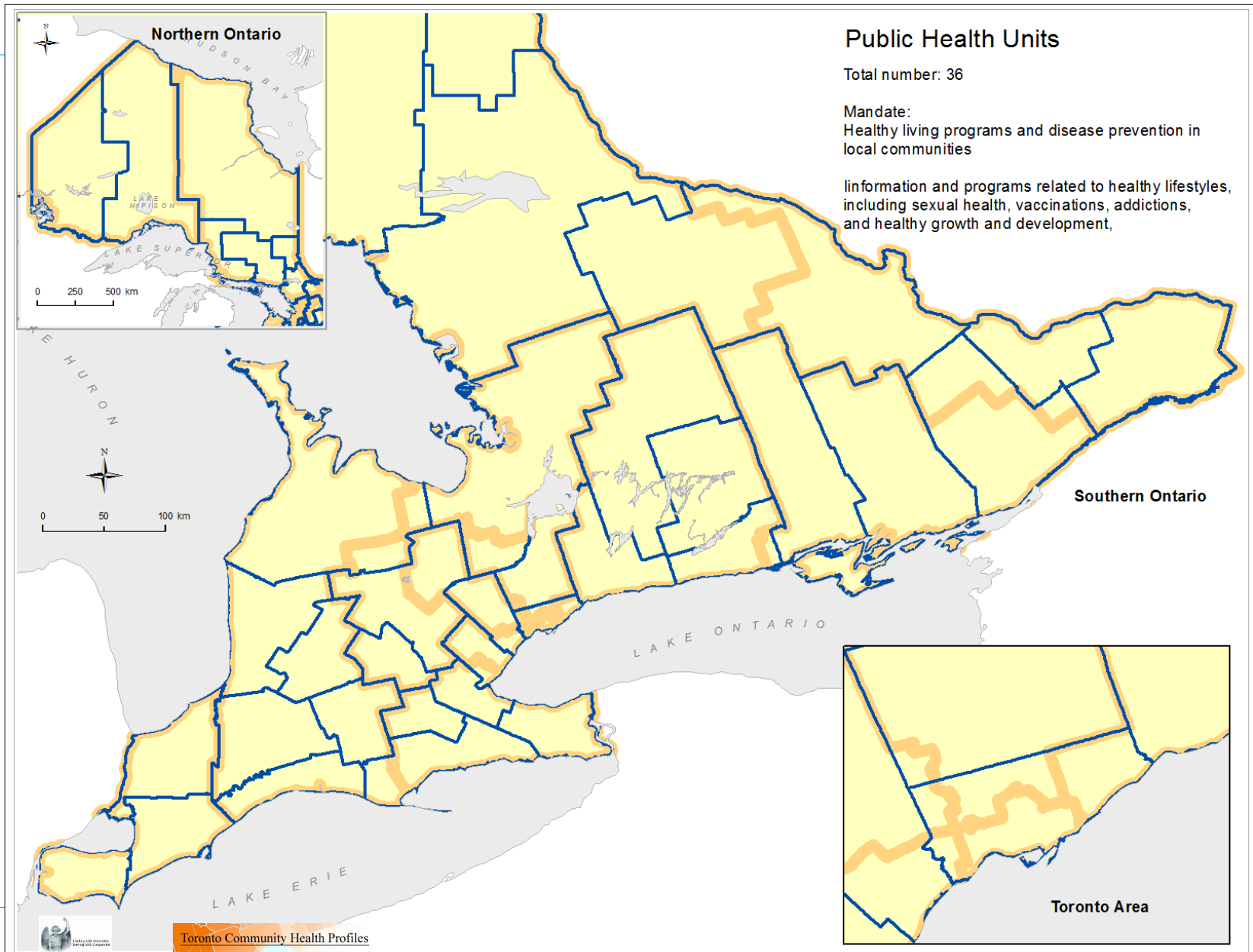
Standard Units – other



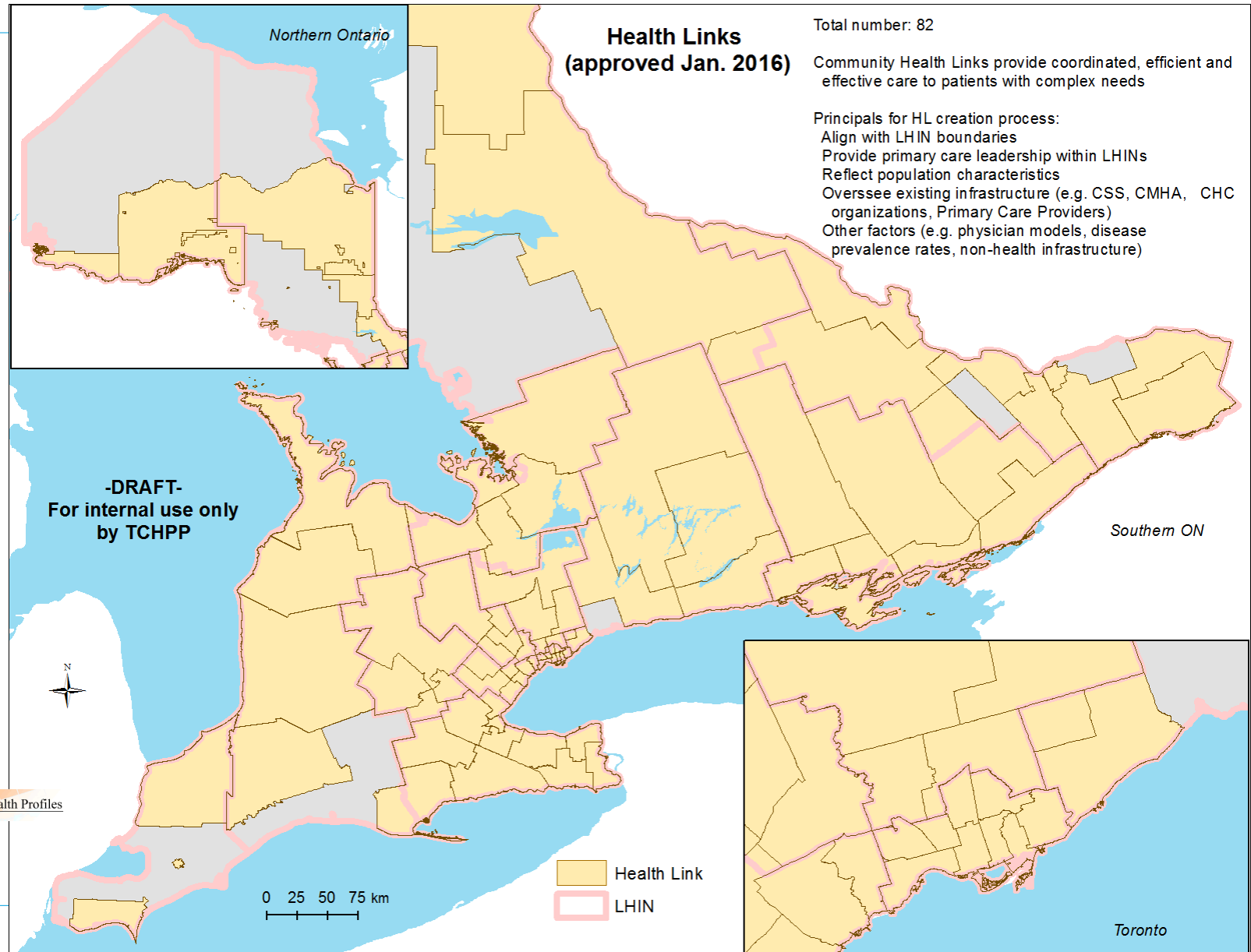
Standard Units – health based



Standard Units – health based

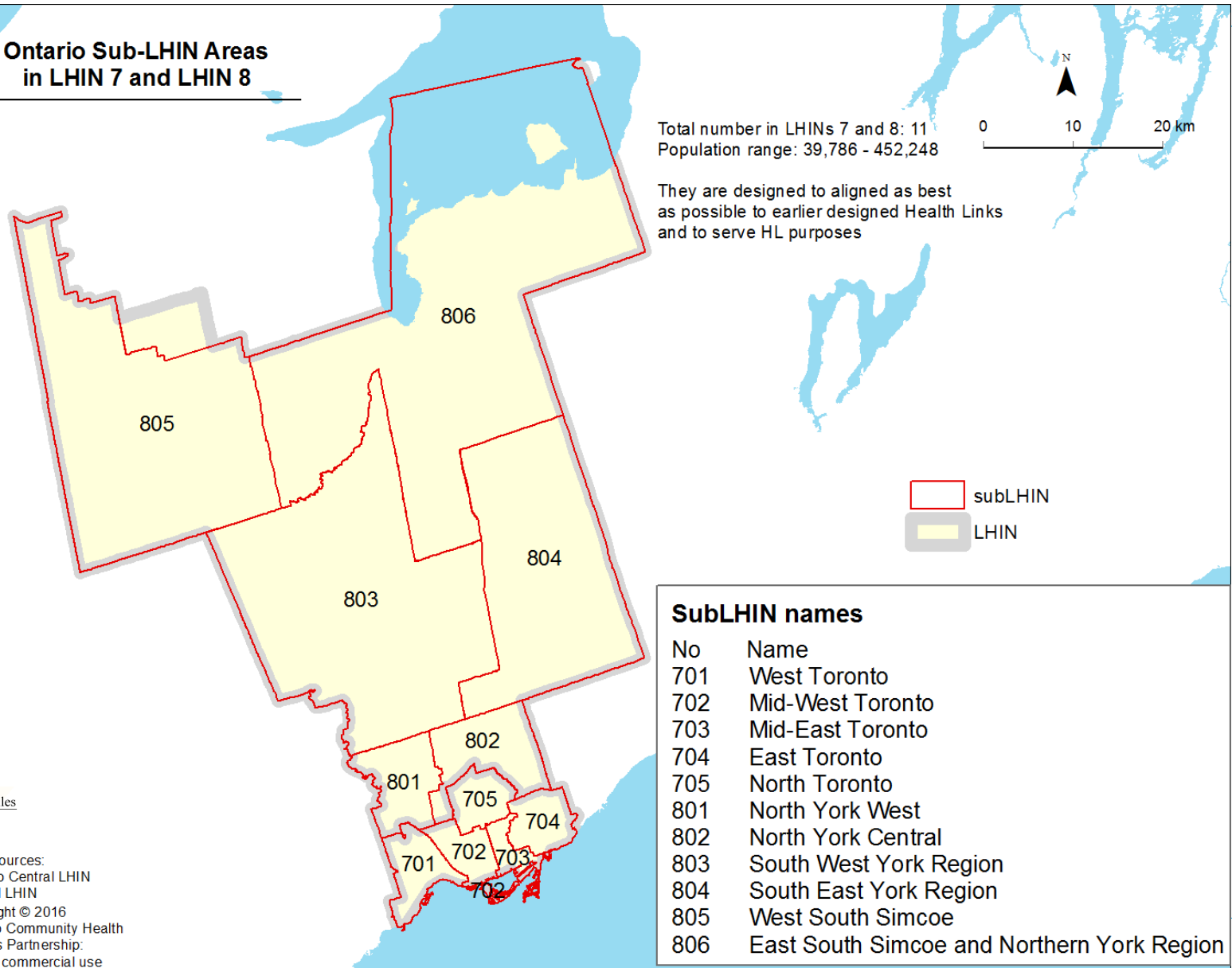


New Geographic Units



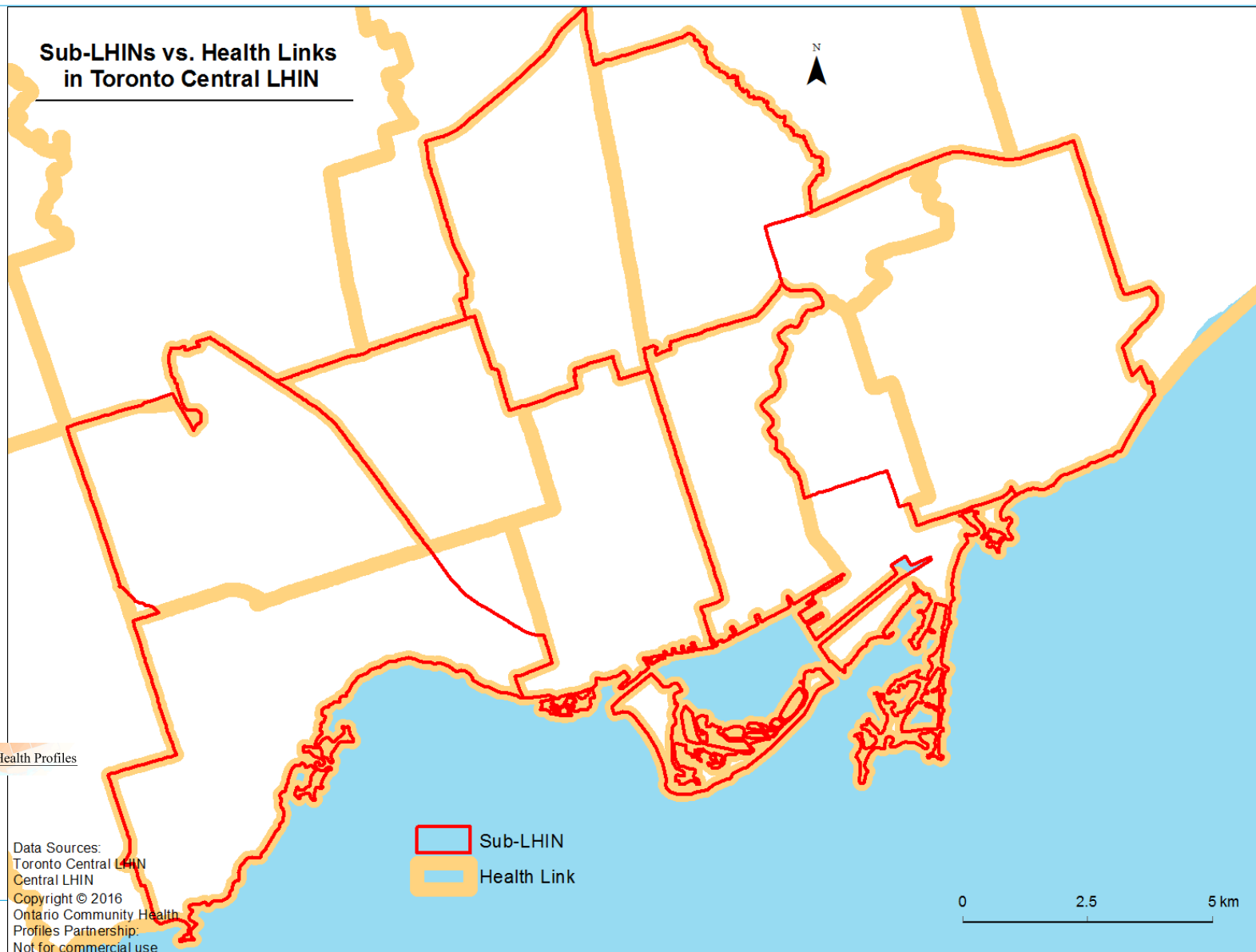
New Geographic Units

Ontario Sub-LHIN Areas in LHIN 7 and LHIN 8



New Geographic Units

Sub-LHINs vs. Health Links
in Toronto Central LHIN



Toronto Community Health Profiles



How do we link the geography to the health data?

Mohammad Agha, CRICH

Data Linkage-Population Data

How do we generate denominator population data?

- All postal codes in Ontario are linked to a Dissemination Area (DA)
- The population for each DA is taken from Census Data
- The population for each geographical unit is estimated by summing DA populations in each geography

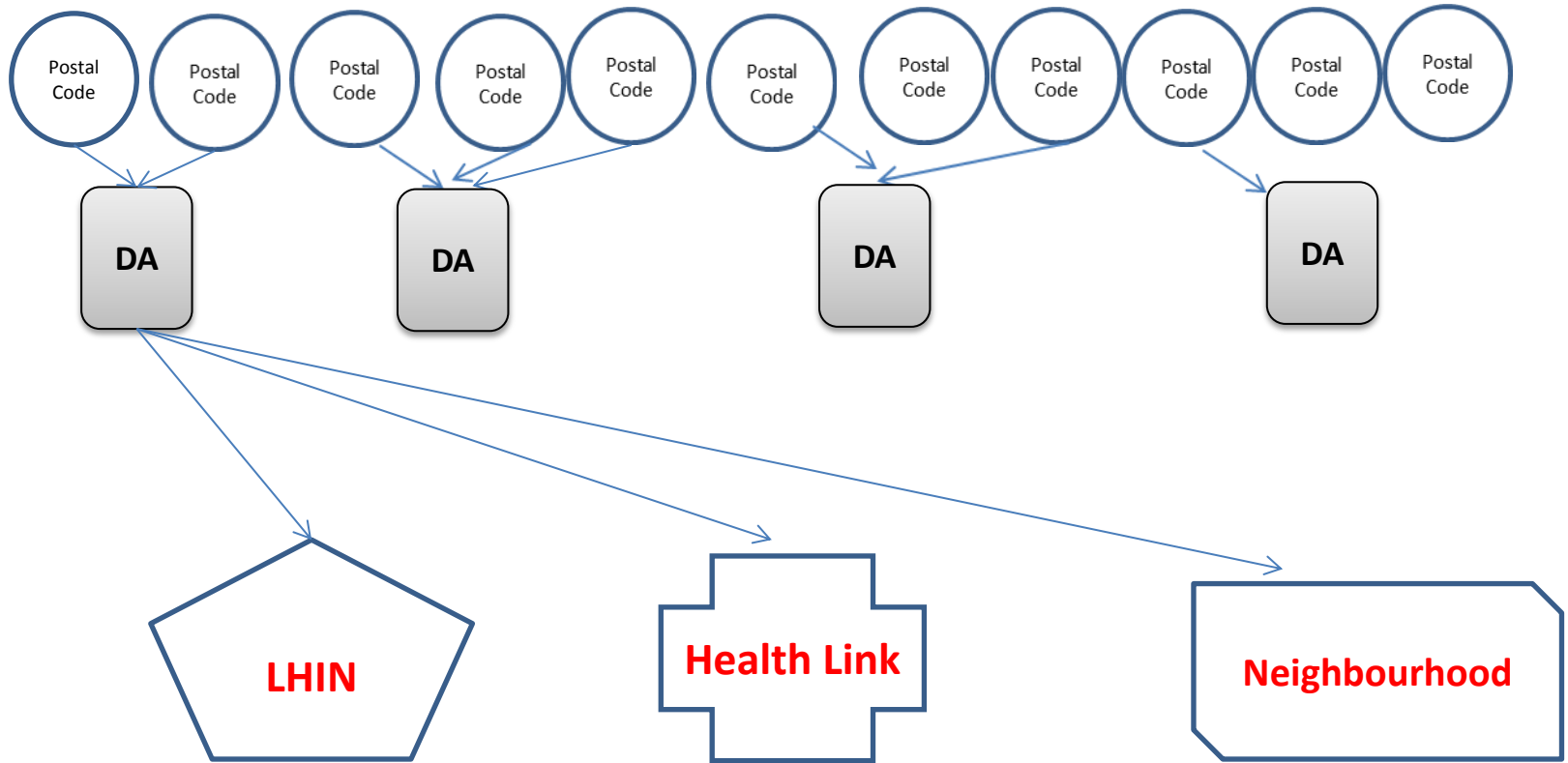
- Groups of DAs make up larger geographical units:

Example:

- LHINs
- Sub-LHINS
- Health Links
- Neighbourhoods

Example of Data Linkage

Postal Codes → Dissemination Areas → Geographic Units



Data Linkage-Numerator

How do we generate numerator data?

- We select specific variables from health data sets stored at ICES (e.g., CIHI, NACRS, OHIP, Diabetes, Cancer, Asthma, etc.) for a given year
- Scrambled Health Card Numbers for all patients are linked to the Registered Persons Database (RPDB). This database contains data such as: postal codes, date of birth, death, for all OHIP-registered individuals in the Province of Ontario
- Using the postal code reported for a patient, these are linked to a specific Dissemination Area in Ontario.
- Using the geography file and using DA, each individual is assigned to a LHIN, a SubLHIN, Health Link, and neighbourhood.

Ontario Marginalization Index ON-Marg

**Flora Matheson,
Katie McIsaac, CRICH
Trevor van Ingen, PHO**

CENTRE FOR RESEARCH ON INNER CITY HEALTH
St. Michael's
Inspired Care. Inspiring Science.



RRASP

Réseau de recherche sur l'amélioration
de la santé des populations

PHIRN

Population Health Improvement
Research Network



Social Sciences and Humanities
Research Council of Canada

Conseil de recherches en
sciences humaines du Canada

Canada

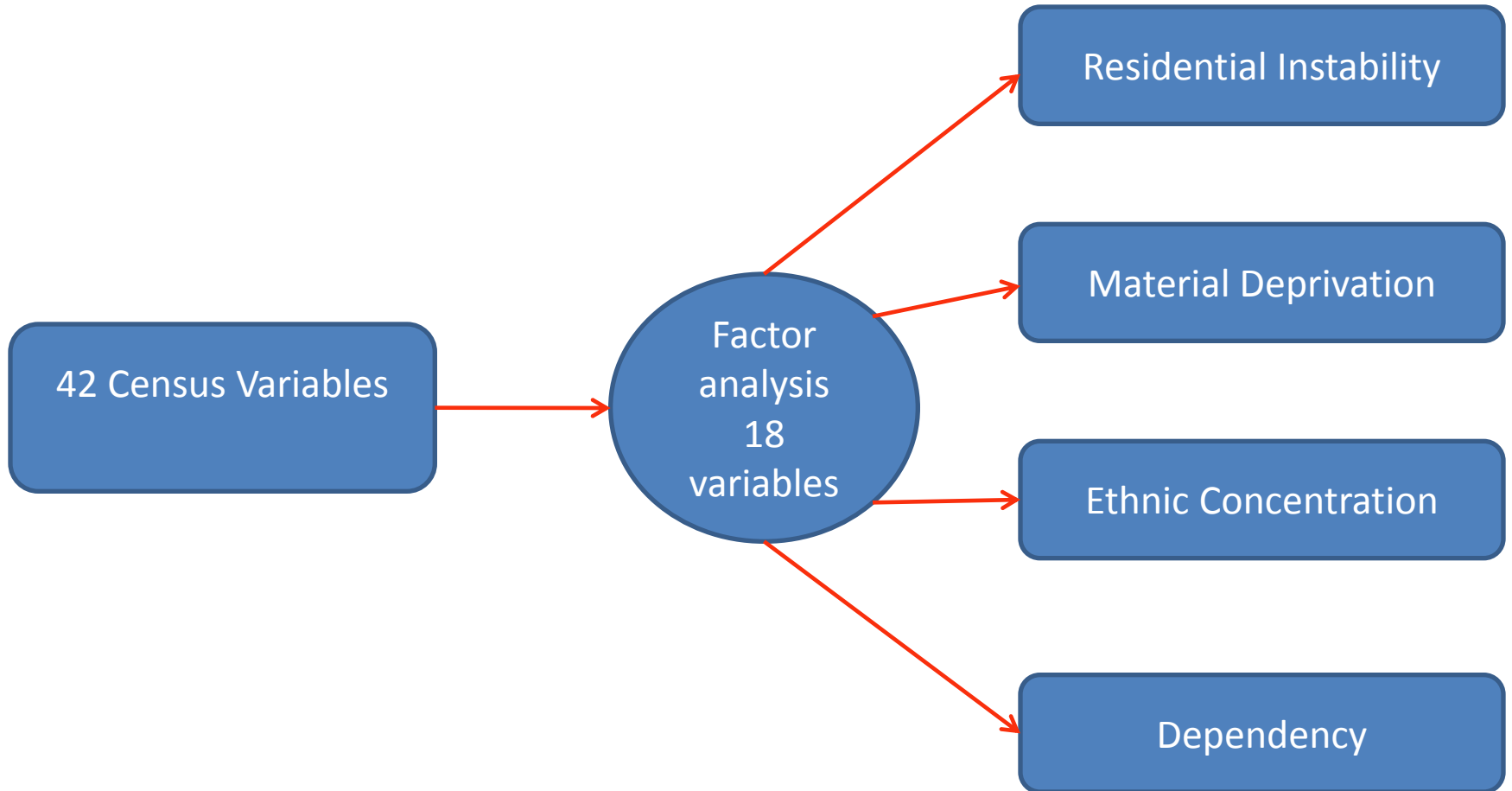
Purpose of ON-Marg

- 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

Creating ON-Marg

- 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 CT measures
- Validated

Dimensions of ON-Marg



Dimensions and Census Indicators

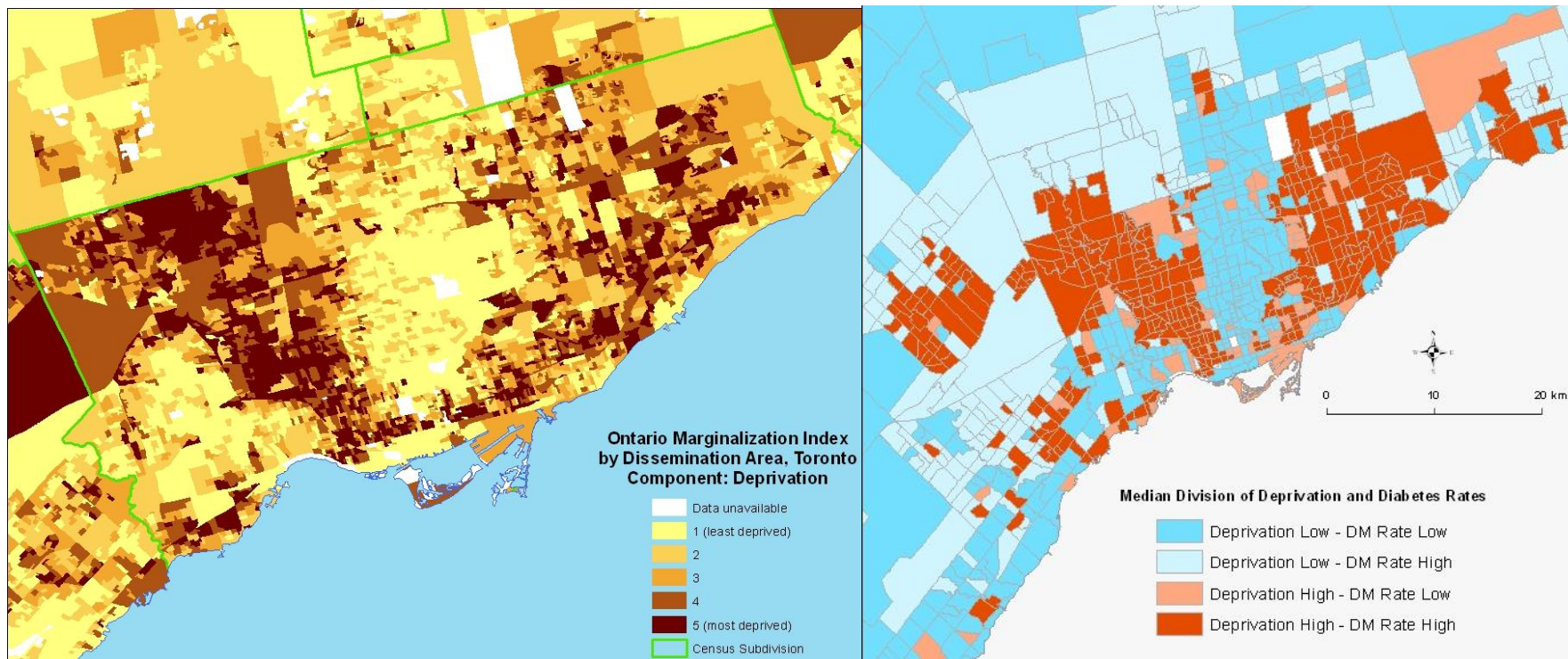
Residential Instability	Material Deprivation	Dependency	Ethnic Concentration
7 indicators	6 indicators	3 indicators	2 indicators
% living alone	% without a high-school diploma **	% aged 65 and older	% recent immigrants (5yr)
% non -youth (16+)	% single parent families	Dependency ratio (total population 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			

Using ON-Marg

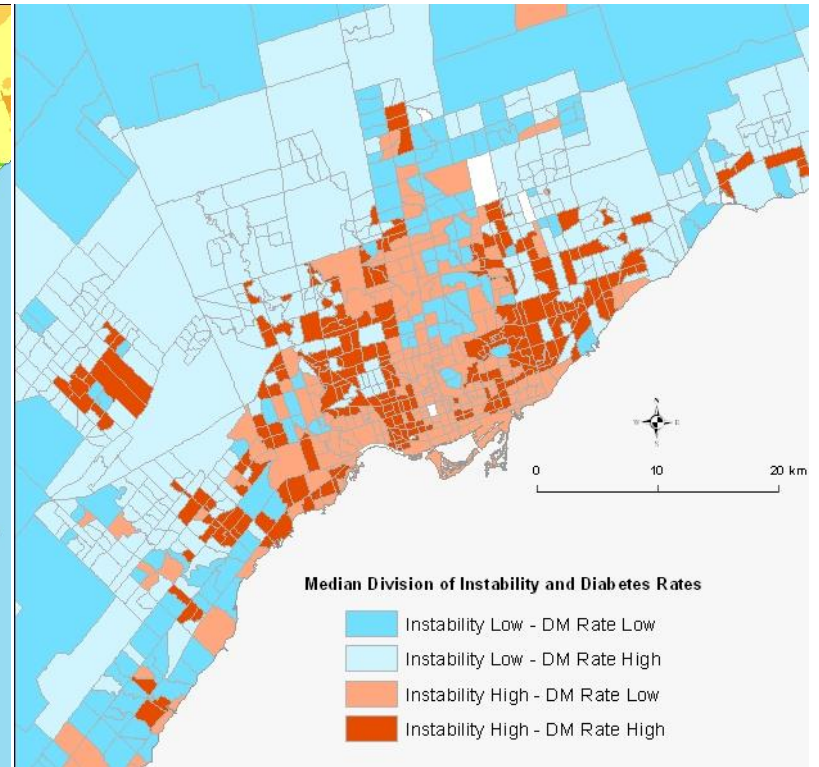
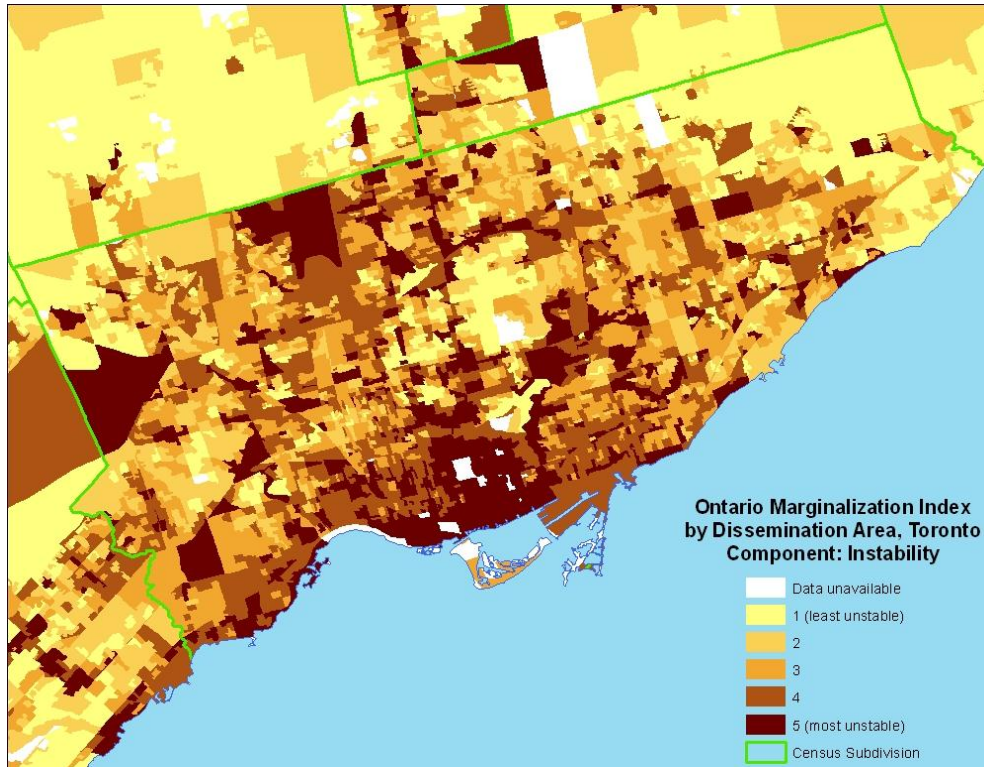
- Each dimension represents a separate index with a standardized factor score for each area
 - E.g. the material deprivation index ranges from a score of -2 (low deprivation) to +6 (high deprivation)
- Each dimension/index is also available in quintiles
 - Q1 represents least deprived and Q5 the most deprived

ON-Marg is available for public health units, sub-LHINs, LHINs, census divisions, census sub-divisions, and consolidated municipal service manager areas.

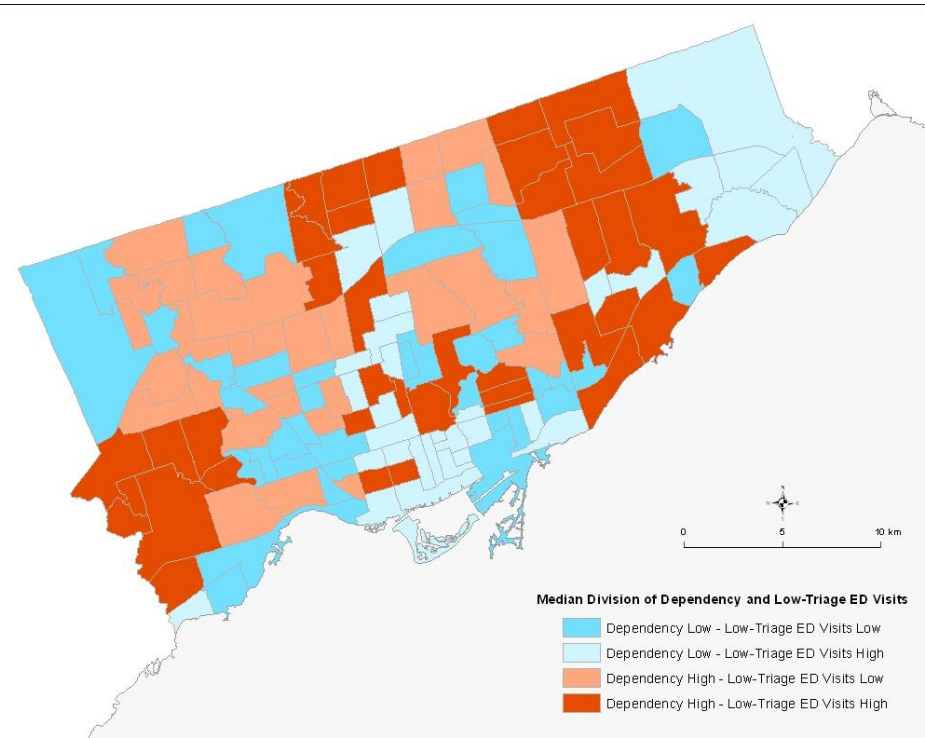
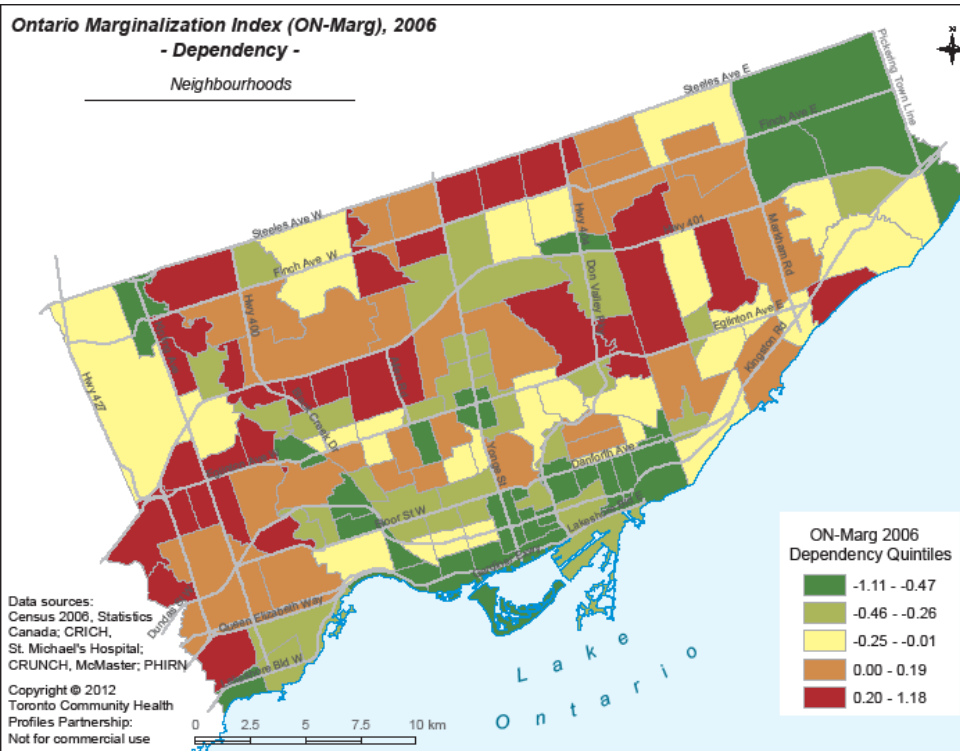
Deprivation in Toronto (CTs)



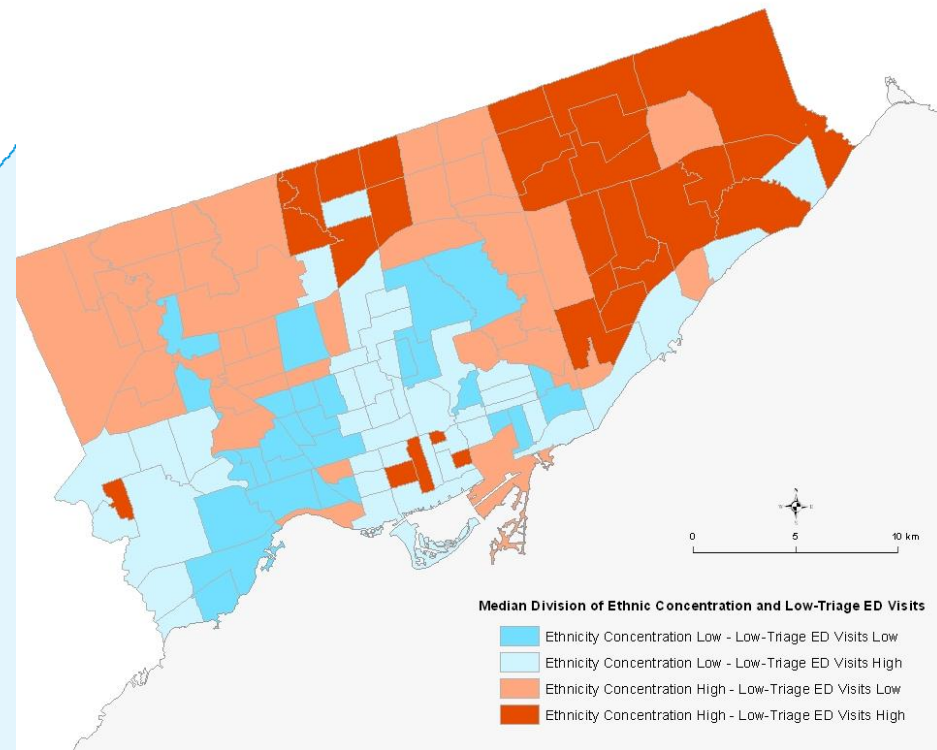
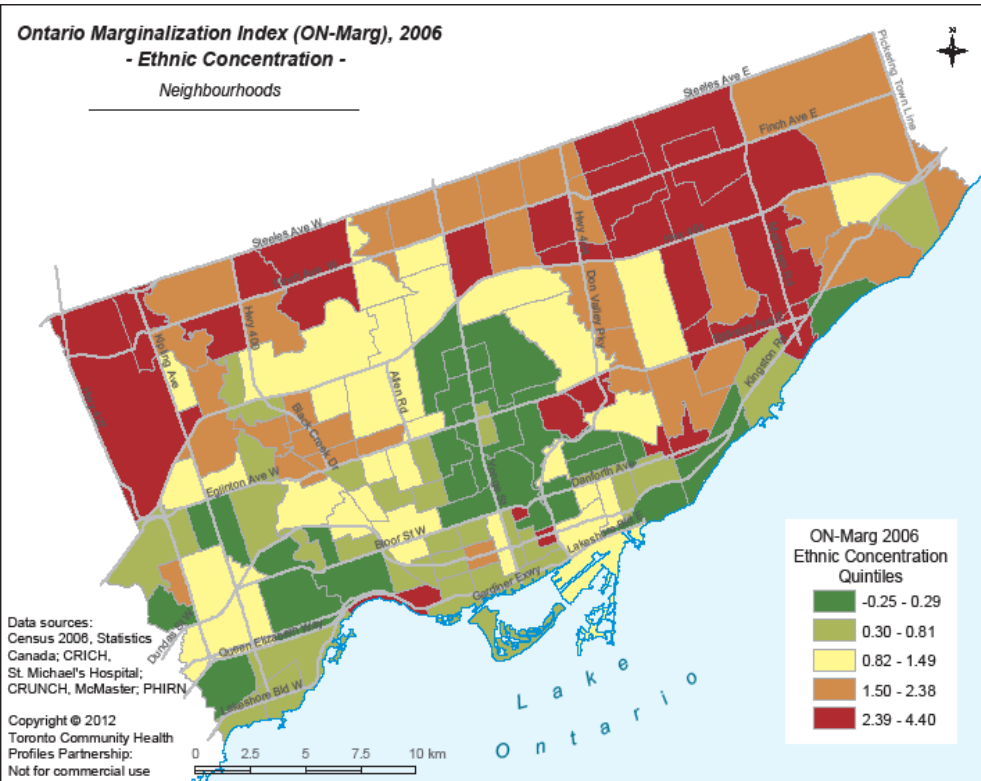
Instability in Toronto (CTs)



Dependency in Toronto (Neighbourhoods)



Ethnic concentration (Neighbourhoods)



Potential Uses of the ON-Marg

1. Planning and needs assessment
 2. Monitoring inequities
 3. Resource allocation
 4. Advocacy
 5. Research
- *The benefit to ON-Marg is that it allows comparability across studies in Ontario*

Use 2: Monitoring inequities

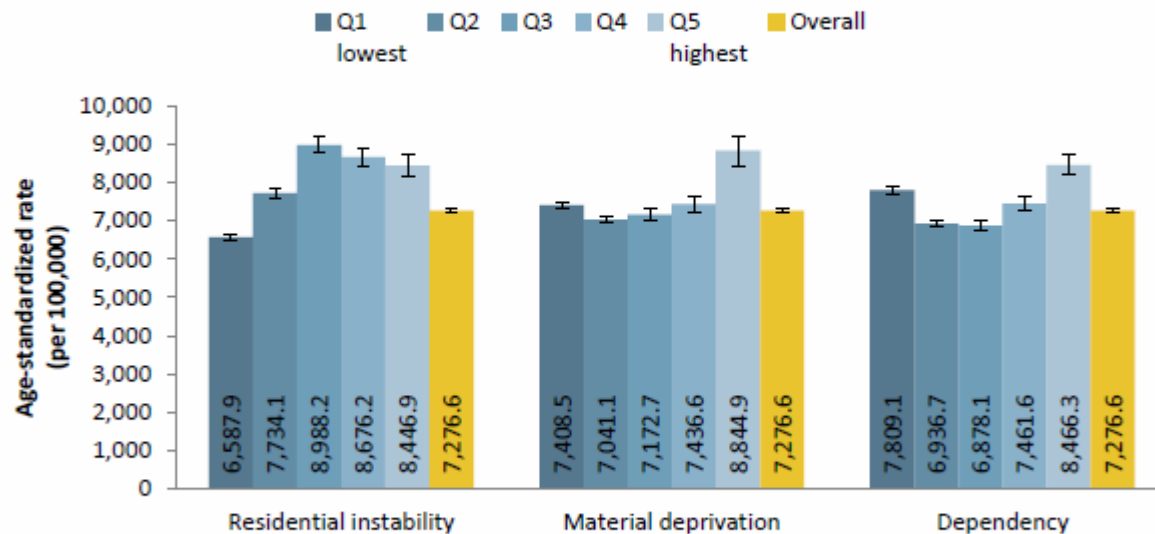
Table 2 Number of Dissemination Areas and Population by Ontario Marginalization Index Dimension Quintiles, York Region, 2006

	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

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

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

2011 ON-Marg Refresh

- Most recent ON-Marg based on 2006 census data
- Voluntary nature of National Household Survey (2011) compromised ability to study marginalized populations
- Collaboration between CRICH and PHO to obtain alternative data sources and update index for 2011

Data Sources

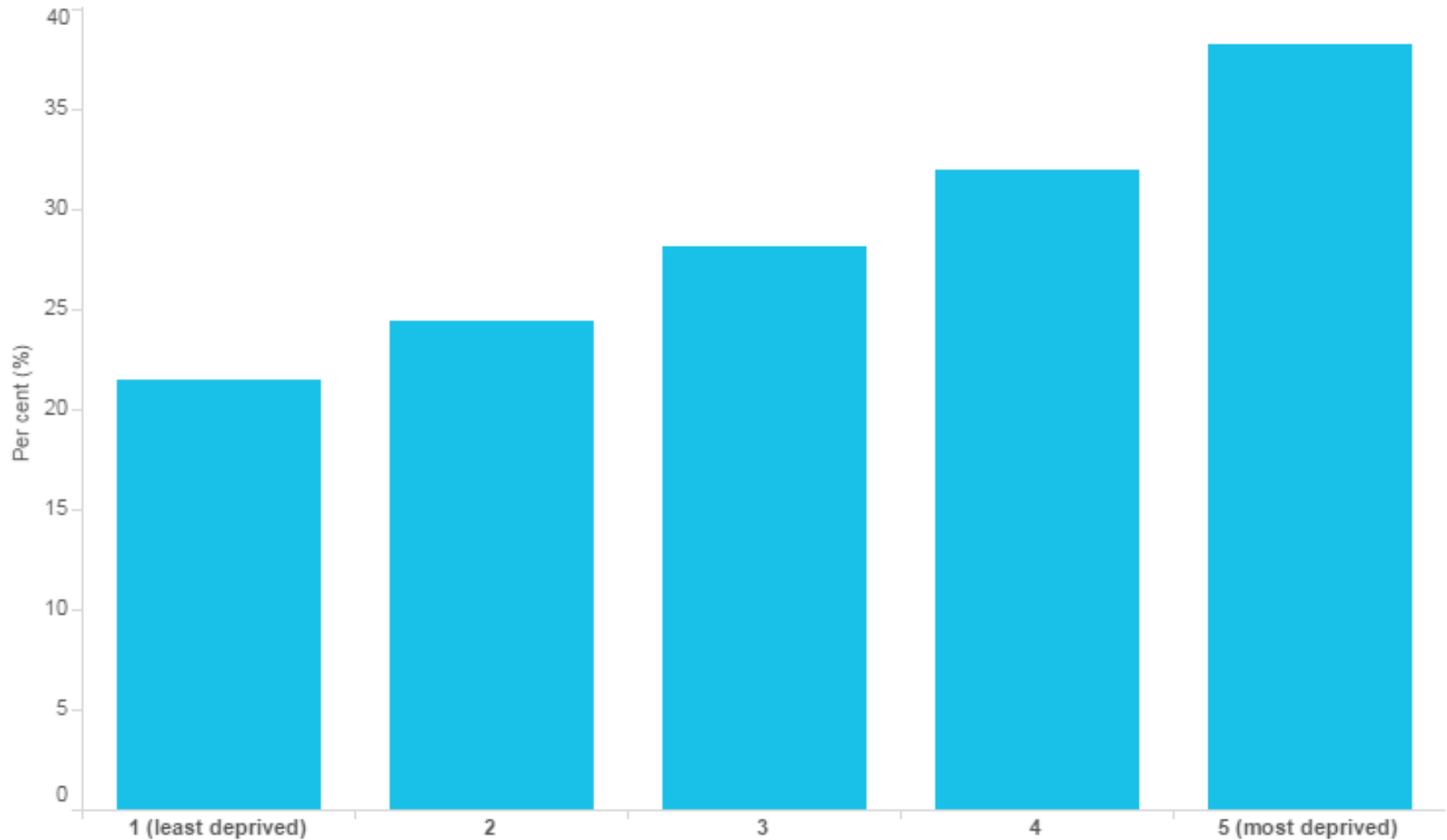
- **Short form census**
- **Taxfiler:** Low income, government transfers, labour force participation.
- **Municipal Property Assessment Corp (MPAC):** multi-unit housing, owned dwellings, houses needing repair
- **Citizenship and Immigration Canada:** 5-year immigration, visible minority

What's Happening

- Purchasing data
- Updated index released summer/fall 2016:
 - Publication
 - Marginalization quintiles + principal component factor scores for various levels of geography
 - Maps
 - Validation using 2006 data

Using ON-Marg at PHO

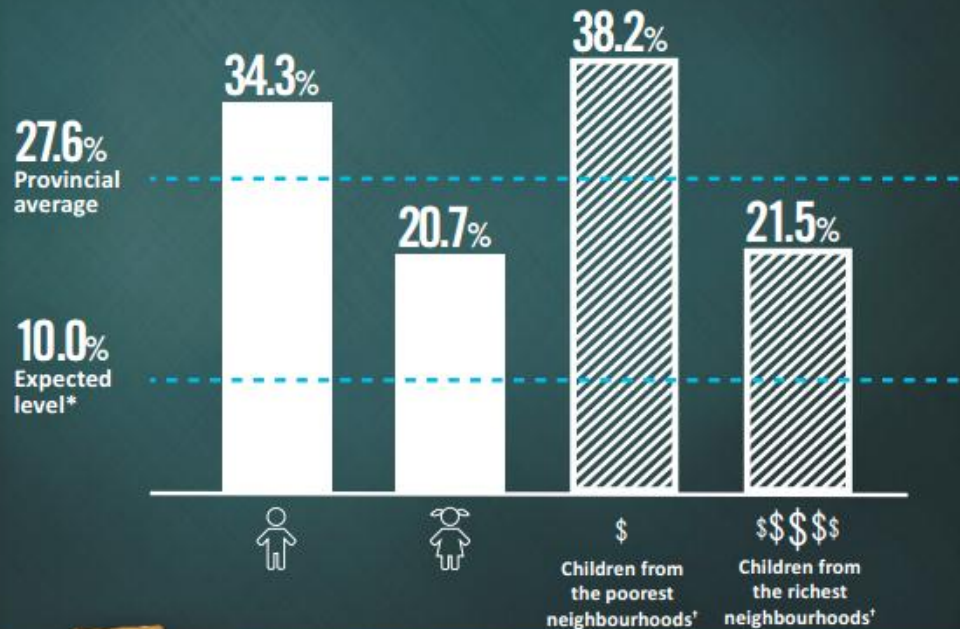
Figure 3: Children with one or more vulnerabilities in school readiness by material deprivation and sex, Ontario, 2009–12



Ontario Health Profiles

A child's first five years strongly influence health across the life course.^{1,2,7,8} Some children, due to socioeconomic, environmental and biological factors, experience vulnerabilities in early childhood growth and development, leaving them at a disadvantage.

VULNERABILITY IN SCHOOL READINESS



*This is based on biological variation and plausible vulnerability rates from other jurisdictions.

[†]Measured using the material deprivation dimension of the Ontario Marginalization Index.

Vulnerability in school readiness: Per cent of children in Ontario with vulnerabilities (scoring below the 10th percentile) in one or more domains of school readiness as determined by the Early Development Instrument in 2009-2012.¹¹ It has been suggested that vulnerability levels above 10% are avoidable.³

Using ON-Marg at PHO

- Health inequity report
 - Describe differences in health across quintiles of marginalization
 - Changes over time
 - Ontario, Public Health Unit level analysis
 - Visualizations
- Interactive Snapshot tool
 - Map-based dashboards
 - Interactive visualization of rates of health and risk factors across marginalization quintiles