

Health Quality Ontario

The provincial advisor on the quality of health care in Ontario

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Geographic Location Methods Review: Summary Report



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Introduction

As Ontario's provincial advisor on the quality of health care, Health Quality Ontario (HQO) works in partnership with health care providers and organizations across the system, and engages with patients themselves, to help initiate substantial and sustainable change to Ontario's complex health care system. Health Quality Ontario received this mandate through the *Excellent Care for All Act, 2010*.¹ Its critical roles are:

- to monitor and report to the people of Ontario on the quality of health care;
- to support continuous quality improvement; and,
- to promote health care that is supported by the best available scientific evidence.

Health Quality Ontario has publicly reported on Ontario's health system performance across its suite of public reporting products, including *Measuring Up*² (its yearly report on the performance of Ontario's health care system), since 2006. In *Quality Matters: Realizing Excellent Care for All*,³ HQO's Health System Quality Framework, equity is identified as a Defining Element of Quality Care (see Appendix A: Defining Elements of Quality Care). This element recognizes the fact that every Ontarian, no matter who they are or where they live, should be able to access services that benefit them and be fairly treated by the health care system. In 2017, HQO initiated a review of methods to measure an important stratification of equity, geographic location, for health system performance measurement.

Health Quality Ontario's *Health Equity Plan*⁴ sets out to bring health and health care equity to the forefront, inspiring action so that all Ontarians receive the highest quality care. One of HQO's strategic priorities for this plan is to increase the availability of information to enable better decisions to achieve health equity locally and provincially. To address this strategic priority, HQO strives to increase awareness of health inequities through its suite of public reporting products (including *Measuring Up*,² specialized reports⁵ and online reports). However, HQO does not have a standardized method for measuring geographic location. Current methods vary based on the indicator being measured, are typically dictated by either the data provider or the data collection tool, and, for the most part, oversimplify the definition of geographic location by measuring within an urban/rural dichotomy (rather than acknowledging the existence of an urban/rural continuum). By employing a more robust methodology, HQO will be able to report more accurately on community health and outcomes of health care using more discrete categories across the urban/rural continuum.

In recent years, the Canadian Institute for Health Information (CIHI), along with other national, provincial and regional organizations, has expanded on their reporting of health indicators by socio-economic status and demographic factors.⁶ These efforts have improved the understanding of current patterns of inequities in health and factors influencing health. Monitoring health inequities in a systematic and comparable way over time will help to identify vulnerable populations and to examine the impact that policies and interventions have on health care delivery and population health.

Building on these initiatives, HQO has conducted a methodological review of its health system performance measurement across an important stratification of equity in health care: geographic location. Geographic location was identified as a priority because research has shown that differences in health status and risks exist within and across rural areas, has revealed inequities when comparing urban and rural areas, and has been able to gauge the benefits and gaps in new and emerging models of rural health delivery.⁷ We engaged a technical working group between December 2017 and May 2018, identifying the preferred method for measuring health system performance across the urban/rural continuum. By applying this method, HQO hopes to advance the quality of its suite of public reporting products. In alignment with *Better has no limit: Partnering for a Quality Health System*,⁸ HQO's three-year strategic plan (2016-2019), and HQO's *Health Equity Plan*,⁴ the revised method will improve HQO's ability to provide system-level leadership for health care quality and increase the availability of information to enable better decisions. This technical report describes the review process and recommendations from the technical working group, and the preferred method for geographic location.

Methods Review

Objectives

Health Quality Ontario's geographic location methods review had the following objectives:

1. Gather information on the methods for measuring geographic location that are currently used across HQO's suite of public reporting products and, through an environmental scan, discover other methods for consideration.
2. Through engagement with a technical working group, review the set of geographic location methods by applying them to a core set of health system performance indicators to understand interpretation and responsiveness.
3. Recommend the most suitable method for measuring geographic location.

Methodology

Phase 1: Methods Discovery

Health Quality Ontario compiled a list of methods, currently used by HQO and/or other organizations, to measure geographic location, including a full review of *In Pursuit of Health Equity: Defining Stratifiers for Measuring Health Inequality*,⁶ CIHI's review and proposal of equity stratifier definitions. Upon completing the scan, and in partnership with the University of Toronto's Population Health Analytics Lab and the Institute for Clinical Evaluative Sciences (ICES), a technical description, including maps to demonstrate the geography associated with each method under consideration, was prepared for presentation to the technical working group. Consideration was given as to how each method's base categorization could be collapsed to make measurement possible within an urban/rural dichotomy. To supplement this information, decision points were prepared to guide the technical working group's conversation. Additionally, a core set of health system performance indicators, chosen from HQO's suite of public reporting products and representative of The Six Domains of Health Care Quality,^{3,9} was identified for the purposes of testing each method under consideration.

Phase 2: Technical Working Group Consultation

A technical working group was struck to provide recommendations to HQO on the geographic methods under consideration. The technical working group included diverse perspectives, with consideration given to both government and non-government organizations, health system planners, research organizations (including HQO's partners in data provision), and individuals from a variety of urban and rural areas from across Ontario (see Appendix B: Membership of Technical Working Group).

There were two meetings of the technical working group. At the first technical working group meeting, Health Quality Ontario outlined its mandate, goals and objectives for public reporting and CIHI presented its review of health equity stratifiers. Health Quality Ontario also provided an overview of the methods under consideration and the core set of health system performance indicators being considered for testing, with two decision points to reach:

- Which methods should be chosen for further review?
- Which indicators should be included in the testing phase (when comparing the chosen methods)?

Prior to the second technical working group meeting, data on the core performance indicators were prepared using the different methods. In partnership with ICES (who acted as the data provider for this phase), each method was tested by applying it to each indicator in the core set of health system performance indicators. For each method and across each level of stratification, the percent difference (relative to the Ontario population) was calculated. This allowed the technical working group to study

the relative differences across each method's set of categories, rather than focusing on the magnitude of the performance results.

For the second technical working group meeting, HQO staff prepared a review of the results of the testing phase. In reviewing each indicator, the technical working group was asked to consider, based on their knowledge of geography and health system performance, if each method's results demonstrated what would have been expected across the urban/rural continuum, if each method seemed to discriminate based on geography, the definition of a suitable reference category, how health system performance data could be affected by small populations and sparsely populated areas, if certain confounding factors should be considered, the limitations of each method, and the interpretation of the results. One decision point was to be reached:

- Which method should be recommended for adoption?

Phase 3: Method Recommendation

Health Quality Ontario received the technical working group's final recommendation and considered how to incorporate the preferred method into future reporting and monitoring products. As well, where possible, presentations were made to other internal advisory groups and external stakeholders to gather relevant feedback.

Results

Phase 1 of the geographic location methods review identified three methods for further consideration:

- Population centre (POPCTR);¹⁰
- Statistical Area Classification (SAC);^{11,12} and,
- Rurality Index for Ontario (RIO).¹³

Details on each of these methods can be found in Appendix C: Methods for Measuring Geographic Location.

Where POPCTR and SAC are comparable at provincial-and-national-levels, can be collapsed into different categories, have easily accessible data sources and apply to all of Ontario's land area, they do not consider health-specific information in their definitions, are challenged in expanding on their definition of "rural" and rely on postal codes when assigning their geographic elements to the information found within health administrative databases (some postal codes cannot be assigned to a dissemination block (and thus to a POPCTR), but the magnitude of this issue is greater at the national than the provincial level). While the RIO is a continuous index, partially based on health-specific information and is used for a wide range of health-specific measures, it is only applicable within Ontario, requires frequent updates, does not apply to all of Ontario's land area and does not have a readily accessible data source. Upon reviewing these three methods at the first meeting, the technical working group decided to include the POPCTR and SAC for further testing and consideration. The RIO was eliminated for the reasons listed above, and also in part because the technical working group deliberately chose not to recommend a method that includes measures of health care access in order to avoid the correlative effects between measures of health care access and geographic location.

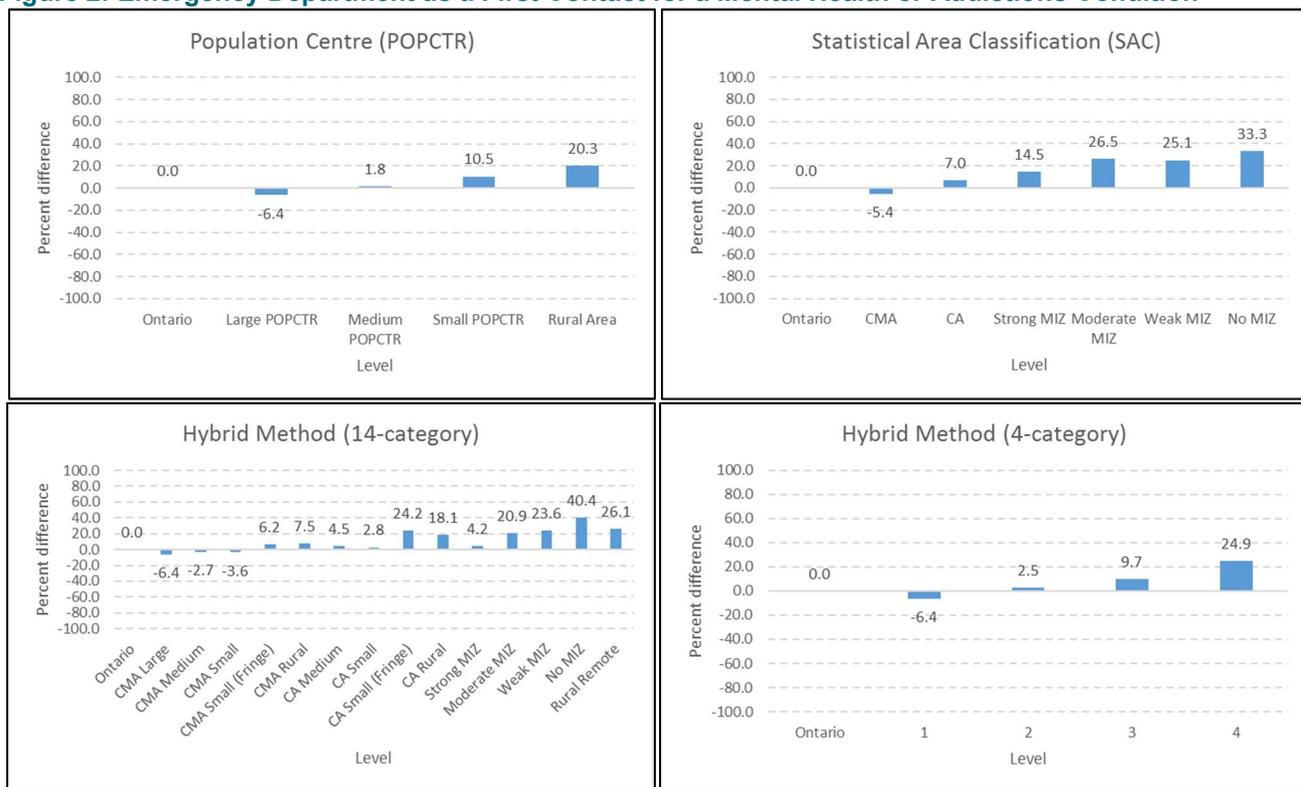
A fourth method, a hybrid method that combines POPCTR and SAC,¹⁴ was introduced at the first meeting and proposed for consideration by the technical working group members from the Ministry of Health and Long-Term Care (MOHLTC). Upon further review, the POPCTR/SAC hybrid method was included for further testing and consideration. Details on this method can be found in Appendix C: Methods for Measuring Geographic Location.

During the testing phase, each method was applied to the core set of health system performance indicators approved by the technical working group. Details on the core set of health system performance indicators can be found in Appendix D: Core Set of Health System Performance Indicators.

Figures 2 and 3 present the results of two of the indicators in the core set comparing the three methods to serve as an example of what the technical working group received as part of their deliberations. In both figures, the performance in Ontario serves as the reference point on the y-axis (y=0.0).

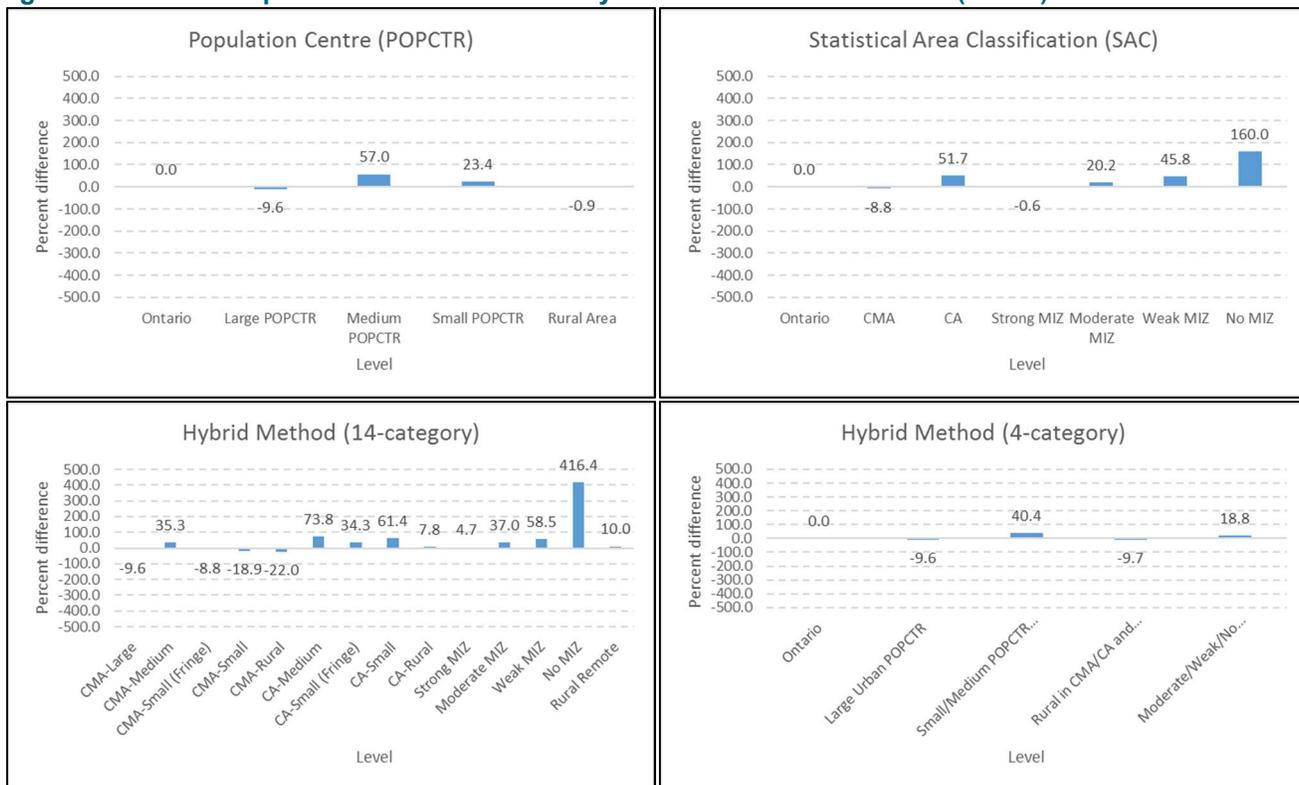
For Emergency Department as a First Contact for a Mental Health or Addictions Condition, all three methods (POPCTR, SAC, POPCTR/SAC hybrid method) tended to approximate the same pattern of effect in a predictable fashion. People living in the more urban areas tended to demonstrate a more positive result (a lower percentage of people visiting the emergency department as a first contact for a mental health or addictions condition, compared to Ontario overall), while people living in the more rural areas tended to demonstrate a more negative result (a higher percentage people visiting the emergency department as a first contact for a mental health or addictions condition, compared to Ontario overall).

Figure 2: Emergency Department as a First Contact for a Mental Health or Addictions Condition



For Rate of Hospitalizations for Ambulatory Care Sensitive Conditions (ACSC), each method (POPCTR, SAC, POPCTR/SAC hybrid method) presented a different pattern of effect with no obvious predictability demonstrated. Despite this, people living in the most urban areas tended to demonstrate a more positive result (lower rate of hospitalizations for ACSC), while people living in the most rural areas tended to demonstrate a more negative result (higher rate of hospitalizations for ACSC).

Figure 3: Rate of Hospitalizations for Ambulatory Care Sensitive Conditions (ACSC)



Technical Working Group Recommendations

The technical working group made the following recommendations to HQO:

1. The technical working group recommended that HQO use the POPCTR/SAC hybrid method when reporting health system performance across the urban rural continuum.
 - o POPCTR was eliminated because of its lack of discrimination in rural areas.
 - o SACTYPE was eliminated because it is not reliable in the north and some parts of the south (the size of census subdivision-(CSD)-level areas are too big in the north and too small in the south).
 - o While the POPCTR/SAC hybrid method is the preferred method, the four-category stratification is probably not enough. The 14-category stratification should remain as the backbone, but the roll-up can vary. The roll-up (or disaggregation) should depend on the report.
 - o The technical working group acknowledged that it is important to have a default roll up, to standardize measurement and reporting as much as possible. The four-level stratification is a fair grouping for now.
 - o The technical working group also noted that since the POPCTR/SAC hybrid method is based in part on POPCTR, it may not be reliable for all postal codes because of dissemination block assignment.
2. When reporting, make sure to note the limitation that no matter what method is used, it will still be difficult to quantify (or qualify) the truly unique impact of being 'remote'. Additional dimensions of commuter patterns, travel burden, physical geography (e.g., physical barriers to travel) and weather are important considerations for the most 'remote' areas.
3. For reporting purposes, consider using the large urban area (within census metropolitan areas (CMA)) as the reference group rather than Ontario as a whole.
4. Given that there is no natural order to the four-category stratification it is best to present the results as discrete, non-ordinal categories. This is because the order of the middle two groups

is unclear and may change depending on the indicator (one is not always more 'rural' than the other).

- Continue to work with external partners, including CIHI and Statistics Canada, to try to refine the preferred method by introducing other dimensions (such as travel burden and distance).

Notes on the final recommended method

Ultimately, the technical working group recommended the use of the POPCTR/SAC hybrid method because it provides a detailed classification across an urban/rural continuum and distinguishes by three important characteristics: population size, population density and the integration of rural areas and large urban centres. The standard POPCTR/SAC hybrid method classifies areas into 14 categories (see Appendix C: Methods for Measuring Geographic Location).

Areas are classified by their population size, population density and level of integration with a census metropolitan area (CMA) or census agglomeration (CA). Although the POPCTR/SAC hybrid method considers three important concepts for classifying areas across the urban/rural continuum, the use of 14 categories presents considerable difficulty for public reporting as statistical meaning can become lost and interpretability can become complicated. Therefore, a recommendation was made to collapse the standard POPCTR/SAC hybrid method into four categories, making it easier to interpret while retaining appropriate discrimination across the urban/rural continuum. As shown in Table 1, **Large Urban POPCTR (in red)**, **Medium/Small POPCTR in CMA/CA (in yellow)**, **Rural Areas in CMA/CA and Strong MIZ (in green)** and **Moderate/Weak/No MIZ and Rural Remote Areas (in blue)** correspond to the four-category stratification. Further consideration will be made to determine how the POPCTR/SAC hybrid method categories can be collapsed to make measurement possible within an urban/rural dichotomy.

Table 1: Population centre (POPCTR)/Statistical Area Classification (SAC) hybrid method

CMA/CA	Urban/Rural	Community Size	Examples	4-level Category
Census Metropolitan Area (CMA)	Urban Area (at least 400 people/km ²)	Large (100,000+)	Toronto, Ottawa, Sudbury	Large Urban POPCTR
		Medium (30,000-99,999)	Peterborough, Milton	Medium/Small POPCTR in CMA/CA
		Small (10,000-29,999)	Alliston, Fort Erie	Medium/Small POPCTR in CMA/CA
		Small, fringe (1,000-9,999)	Caledon, Manotick Station	Medium/Small POPCTR in CMA/CA
	Rural Area, in CMA		Sections of Oakville, Brampton and Vaughan	Rural in CMA/CA and Strong MIZ
Census Agglomeration (CA)	Urban Area (at least 400 people/km ²)	Medium (30,000-99,999)	Belleville, North Bay	Medium/Small POPCTR in CMA/CA
		Small (10,000-29,999)	Cobourg, Pembroke	Medium/Small POPCTR in CMA/CA
		Small, fringe (1,000-9,999)	Bobcaygeon, Porcupine	Medium/Small POPCTR in CMA/CA
	Rural Area, in CA		Areas outside the urban core of Cornwall and Belleville	Rural in CMA/CA and Strong MIZ
Areas outside of CMAs and CAs	Urban, Small Communities (1,000 – 29,999) (at least 400 people/km ²)	Strong MIZ	Carleton Place, Petrolia	Rural in CMA/CA and Strong MIZ
		Moderate MIZ	Deep River, Espanola	Moderate/Weak/No MIZ and Rural Remote
		Weak MIZ	Fort Frances, Dryden	Moderate/Weak/No MIZ and Rural Remote
		No MIZ	Deseronto, Factory Island	Moderate/Weak/No MIZ and Rural Remote
	Rural Area, remote		Majority of Adjala-Tosorontio	Moderate/Weak/No MIZ and Rural Remote

For reporting purposes, the technical working group recommended using the **Large Urban POPCTR (in red)** category as the reference category (rather than the entire population of Ontario). Although the two

outer categories (**Large Urban POPCTR (in red)** and **Moderate/Weak/No MIZ and Rural Remote Areas (in blue)**) acted in a way that was predictable across the core set of health system performance indicators, the two inner categories (**Medium/Small POPCTR in CMA/CA (in yellow)** and **Rural Areas in CMA/CA and Strong MIZ (in green)**) did not always present in the same predictable fashion. The central dimension of this method reflects an urban/rural continuum based on population size and population density, but there are other dimensions (such as commuting flow) that may position the two inner categories away from the two outer categories. Variation in the predictability of the order of these categories can be expected because the POPCTR/SAC hybrid method is influenced by many dimensions, certain categories may be influenced by small sample sizes, and government policies or programs will target specific parts of the urban/rural continuum that result in improved access to health care. When presenting data using this method, the technical working group recommended that the categories should not be presented in an ordered fashion (for example, as would be done for age or income).

Despite the need for a more concise way to present the POPCTR/SAC hybrid method's 14-category stratification, the technical working group noted that the four-category stratification may not always provide enough discrimination across the urban/rural continuum to confidently assess the differences in geographic location across Ontario. Therefore, the technical working group recommended that HQO should be willing to retain the 14-category stratification as the overall standard and assess the need for a more concise presentation of data on an indicator-by-indicator basis.

Limitations

Health Quality Ontario acknowledges that the POPCTR/SAC hybrid method presents some limitations. Firstly, the POPCTR method uses Statistics Canada's dissemination blocks¹⁵ as its base-level of geography. As most health administrative databases use postal codes as their main geographic element, each postal code must be matched to a dissemination block in order to assign POPCTR categories to each health record. This is done using the Postal Code Conversion File (PCCF)¹⁶ (a digital file which corresponds each postal code with Statistics Canada's census geographic areas), thereby providing a way to integrate data from various sources (in this case, the POPCTR/SAC hybrid method and the main geographic element found within most health administrative databases). However, the PCCF contains multiple records for a postal code when the postal code straddles more than one dissemination block, and rural postal codes tend to straddle several disseminations blocks (making it difficult to identify a precise physical location).¹⁶ For these reasons, not every health record found within health administrative databases (or any other database that uses postal codes as its main geographic element) can be assigned a POPCTR category.

Nationally, approximately 25% of all postal codes cannot identify a precise physical location using dissemination-block-level precision. For this reason, CIHI (a nationally-focused organization) identified SAC as their preferred method when expanding on their reporting of health indicators by geographic location.⁶ Within Ontario this number is approximately 9%, and when using the POPCTR/SAC hybrid method this percentage is reduced even further since postal codes without a dissemination block assignment in the Moderate/Weak/No MIZ and Remote Rural Areas category are assigned by the census-subdivision they belong to. For these reasons, HQO felt comfortable with the technical working group's recommendation of the POPCTR/SAC hybrid method as the preferred method for measuring geographic location

Secondly, certain data collection tools (e.g., Canadian Community Health Survey (CCHS))¹⁷ were designed to provide a regional-level analysis of health system indicators. Some of the geographic categories contained with the POPCTR/SAC hybrid method may not be suitable for certain rarer indicators, given that sample representativeness and sample coverage may not be sufficiently powered to provide stable results or representative estimates. Health Quality Ontario will ensure that it considers the usability of each data collection tool when applying the POPCTR/SAC hybrid method.

Finally, HQO recognizes that the POPCTR/SAC hybrid method does not incorporate the constructs of commuter patterns, travel burden, physical geography (e.g., physical barriers to travel) and weather in Geographic Location Methods Review Summary Report

its measure of geographic location. Although the POPCTR/SAC hybrid method provides a solid basis for improving HQO's current methods for measuring geographic location, continuing to improve upon its currently preferred methods should be a fundamental aspect of measurement advancement related to geographic location.

Recommendations for future work/data advocacy

Upon completing the technical working group consultation, HQO presented the recommended method to its Health System Performance (HSP) Editorial Committee for review and approval. Presentations were also delivered to other internal advisory groups (including the Health Equity External Advisory Committee) and external stakeholders (including the delegates at the 2018 Canadian Association for Health Services and Policy Research (CAHSPR) Conference and the International Population and Data Linkage Network Conference (IPDLN) 2018) to share the results and to gather relevant information for future application of the POPCTR/SAC hybrid method.

The technical working group also recommended that a standard general description of the POPCTR/SAC hybrid method, using common language, be drafted for HQO to use across its suite of public reporting products. This recommendation was subsequently seconded by the HSP Editorial Committee. In addition to this, common language terms that can be applied to each category in the four-category stratification would be developed.

Regardless of the method for measuring geographic location, the technical working group noted that it would be challenging to truly quantify the unique impact of living in the most 'remote' areas of Ontario. In response to this, HQO is committed to continue refining its methods (and explore new and improved methods) for measuring geographic location by acknowledging the importance that characteristics which are not addressed by the POPCTR/SAC hybrid method (for example, the burden of travel distance and the effects of weather) have an impact on the urban/rural continuum. Particular attention will be paid to Statistics Canada's Remoteness Index,¹⁸ a method brought to HQO's attention by members of the technical working group from Statistics Canada, but also one that, as of yet, is not publicly available for use as part of Statistics Canada's set of standard geographic concepts.

Conclusion

Health Quality Ontario is committed to providing patients, the public and health care providers with easily accessible, high-quality health system performance data that are as close to real-time as possible, and to reporting results tailored to a public audience. The newly recommended method for measuring geographic location reflects the views of experts and offers an improvement to health system performance measurement across the *Quality Matters* framework.³ Notwithstanding, important gaps in measurement have also been identified and have been prioritized for future development.

Appendices

Appendix A: Defining Elements of Quality Care

Element	Patient meaning	Provider meaning
Safe	I will not be harmed by the health system.	The care my patient receives does not cause the patient to be harmed.
Effective	I receive the right treatment for my condition, and it contributes to improving my health.	The care I provide is based on best evidence and produces the desired outcome.
Patient-Centred	My goals and preferences are respected. My family and I are treated with respect and dignity.	Decisions about my patient's care reflect the goals and preferences of the patient and his or her family and caregivers.
Efficient	The care I receive from all practitioners is well coordinated and efforts are not duplicated.	I deliver care to my patients using available human, physical, and financial resources efficiently, with no waste to the system.
Timely	I know how long I have to wait to see a doctor or for tests or treatments I need and why. I am confident this wait time is safe and appropriate.	My patient can receive care within an acceptable time after the need is identified.
Equitable	No matter who I am or where I live, I can access services that benefit me. I am fairly treated by the health care system.	Every individual has access to the services they need, regardless of his or her location, age, gender or socio-economic status.

Appendix B: Membership of Technical Working Group

Member	Organization	Role
Naushaba Degani (co-chair)	Health Quality Ontario	Manager, Performance Measurement
Laura C. Rosella (co-chair)	University of Toronto Public Health Ontario Institute for Clinical Evaluative Sciences	Associate Professor Scientist Adjunct Scientist
Alessandro Alasia	Statistics Canada	Chief, Centre for Special Business Projects
Nam Bains	Ministry of Health and Long-Term Care	Manager, Capacity Planning and LHIN Support
Michael Campitelli	Institute for Clinical Evaluative Sciences	Staff Scientist
Sharon Gushue	Health Quality Ontario	Senior Methodologist, Evaluation
Jean Harvey	Canadian Institute for Health Information	Director, Canadian Population Health Initiative
Carley Hay	Ministry of Health and Long-Term Care	Senior Specialist (Chronic Disease), Health Equity Policy Unit
John C. Hogenbirk	Centre for Rural and Northern Health Research	Senior Research Associate
David Kaplan	SickKids University of Toronto Health Quality Ontario	Senior Scientist Professor Clinical Quality Lead/Chair
Jean Le Moullec	Statistics Canada	Unit Head/Senior Analyst, Centre for Special Business Projects
Marc Lefebvre	Sudbury and District Health Unit	Manager, Population Health Assessment & Surveillance
Todd Norwood	Cancer Care Ontario	Staff Scientist
Erin Pichora	Canadian Institute for Health Information	Program Lead
Lyn Sibley	Ministry of Health and Long-Term Care	Senior Health Analyst, Analytics Reports and Tools Unit
Michael Spinks	South East Local Health Integration Network	Senior Epidemiologist
Roger Strasser	Northern Ontario School of Medicine	Dean
Trevor Van Ingen	Public Health Ontario	Epidemiologist Lead
Staff		
Alexander Yurkiewich	Health Quality Ontario	Research Analyst, Performance Measurement
Sharon Gushue	Health Quality Ontario	Senior methodologist, Performance Measurement
Emmalin Buajitti	University of Toronto	Doctoral student
Matthew Kumar	Institute for Clinical Evaluative Sciences	Analyst

Appendix C: Methods for Measuring Geographic Location

Population centre (POPCTR)¹⁰

A population centre (POPCTR) has a population of at least 1,000 and a population density of 400 persons or more per square kilometre, based on the current census population count. All areas outside population centres are classified as rural areas.

Taken together, population centres and rural areas cover all of Canada.

Population centres are classified into three groups, depending on the size of their population:

- small population centres, with a population between 1,000 and 29,999
- medium population centres, with a population between 30,000 and 99,999
- large urban population centres, with a population of 100,000 or more.

Population centre population includes all population living in the cores, secondary cores and fringes of census metropolitan areas (CMA) and census agglomerations (CA), as well as the population living in population centres outside CMAs and CAs.

Statistical Area Classification (SAC)^{11,12}

The Statistical Area Classification (SAC) groups census subdivisions according to whether they are a component of a census metropolitan area (CMA), a census agglomeration (CA) or a census metropolitan influenced zone (MIZ). The MIZ classifies all census sub-divisions (CSD) in provinces and territories that are outside CMAs and CAs.

The Statistical Area Classification is a variant of the Standard Geographical Classification (SGC). Census subdivisions form the lowest level of the classification variant. The next level consists of individual CMAs, CAs and MIZs. The highest level consists of three categories that cover all of the land mass of Canada:

- CMAs
- CAs
- outside CMAs and CAs.

CSDs outside CMAs and CAs are assigned to the following MIZ categories:

1. **Strong metropolitan influenced zone:** This category includes CSDs in provinces where at least 30% of the CSD's resident employed labour force commute to work in any CMA or CA. It excludes CSDs with fewer than 40 persons in their resident employed labour force.
2. **Moderate metropolitan influenced zone:** This category includes CSDs in provinces where at least 5% but less than 30% of the CSD's resident employed labour force commute to work in any CMA or CA. It excludes CSDs with fewer than 40 persons in their resident employed labour force.
3. **Weak metropolitan influenced zone:** This category includes CSDs in provinces where more than 0% but less than 5% of the CSD's resident employed labour force commute to work in any CMA or CA. It excludes CSDs with fewer than 40 persons in their resident employed labour force.
4. **No metropolitan influenced zone:** This category includes CSDs in provinces where none of the CSD's resident employed labour force commute to work in any CMA or CA. It also includes CSDs in provinces with fewer than 40 persons in their resident employed labour force.
5. **Territories (outside CAs):** This category includes CSDs in the territories outside CAs.

Rurality Index for Ontario (RIO): RIO2008_BASIC¹³

The Rurality Index for Ontario (RIO) was originally developed in 1999-2000 in response to the need for a continuous and broader measure of rurality than was available for policy development purposes. It was initially developed to evaluate and measure the effectiveness of policies and incentives aimed at physician recruitment and retention. The original methodology was refreshed in 2004, resulting in the release of the RIO2004. It was reviewed and updated again in 2007, resulting in a new measure of rurality: the RIO2008_BASIC.

The RIO2008_BASIC consists of three broad components as follows:

$$\text{RIO2008_BASIC} = \text{POP} + \text{TIME}_a + \text{TIME}_b$$

Where,

POP = Measure of community population and population density.

TIME_b = Measure of travel time to nearest basic referral centre.

TIME_a = Measure of travel time to nearest advanced referral centre.

The implicit weights or influence of each component is as follows: POP = 28.6 percent; TIME_b = 47.6 percent; TIME_a = 23.8 percent

POP

This component of the RIO awards points, in a linear fashion, to communities with a population lower than 45,000 persons

TIME_a and TIME_b

Basic referral centre is a minimum of Level 2 referral centre as defined by the Provincial Coordinating Committee on Community and Academic Health Science Centre Relations (PCCCAR).

Advanced referral centre is a minimum of Level 4 referral centre as defined by PCCCAR.

Travel times, measured in minutes, were calculated using RouteView (routing and catchment analysis software), based on the quickest route via roads and highways.

POPCTR/SAC hybrid method¹⁴

The POPCTR/SAC hybrid method for measuring geographic stratification was adapted by the Ministry of Health and Long Term-Care (MOHLTC) from methods developed by Statistics Canada:

- Population centre (POPCTR); and,
- Statistical Area Classification (SAC);

and the Ontario Ministry of Finance:

- Rural and Small Community Measure (RSCM).

By adapting these three methods into one, the POPCTR/SAC hybrid method provides a detailed classification along an urban/rural gradient for all communities that accounts for population size, population density, and whether they are a component of a census metropolitan area, a census agglomeration or a census metropolitan influenced zone (MIZ). It creates 14 categories (and has also been expanded into 18 categories, or collapsed into 8, 4 or 2 categories), and is able to distinguish between communities of different sizes and integration within and outside of census metropolitan areas (CMA) and census agglomerations (CA).

The standard POPCTR/SAC hybrid method classifies communities into 14 categories. Communities are classified by their population size, population density and level of integration with a census metropolitan area (CMA) or census agglomeration (CA).

1. Large POPCTR (at least 100,000 people) with at least 400 people/km² within a CMA
2. Medium POPCTR (30,000 to 99,999 people) with at least 400 people/km² within a CMA
3. Small POPCTR (10,000 to 29,999 people) with at least 400 people/km² within a CMA
4. Small fringe POPCTR (1,000 to 9,999 people) with at least 400 people/km² within a CMA
5. Rural area (less than 1,000 people) within a CMA
6. Medium POPCTR (30,000 to 99,999 people) with at least 400 people/km² within a CA
7. Small POPCTR (10,000 to 29,999 people) with at least 400 people/km² within a CA
8. Small fringe POPCTR (1,000 to 9,999 people) with at least 400 people/km² within a CA
9. Rural area (less than 1,000 people) within a CA
10. Small POPCTR (1,000 to 29,999 people) with at least 400 people/km² classified as Strong MIZ (at least 30% of the CSD's resident employed labour force commute to work in any CMA or CA)
11. Small POPCTR (1,000 to 29,999 people) with at least 400 people/km² classified as Moderate MIZ (at least 5% but less than 30% of the CSD's resident employed labour force commute to work in any CMA or CA)
12. Small POPCTR (1,000 to 29,999 people) with at least 400 people/km² classified as Weak MIZ (more than 0% but less than 5% of the CSD's resident employed labour force commute to work in any CMA or CA)
13. Small POPCTR (1,000 to 29,999 people) with at least 400 people/km² classified as No MIZ (none of the CSD's resident employed labour force commute to work in any CMA or CA)
14. Rural area (less than 1,000 people) outside of a CMA or CA

Table 2: Population centre (POPCTR)/Statistical Area Classification (SAC) hybrid method

Urban-rural categories, detailed											1 SAC type code			
SAC type	Census Metropolitan Area Areas with minimum population of 100,000; where at least 50,000 live in a core				Census Agglomeration Areas with minimum population of 10,000; where at least 10,000 live in a core				Areas outside of CMA and CA (outside of metropolitan and agglomerated communities)					
	Urban Area (at least 400 people /sq km)			Rural	Urban Area (at least 400 people /sq km)			Rural	Urban, Small Communities (1,000 – 29,999) (at least 400 people /sq km)			Rural		
POP centre	Large 100,000+	Medium 30,000-99,999	Small 1,000 – 29,999		Rural	Medium 30,000-99,999	Small 1,000 – 29,999		Metropolitan Influenced Zone (MIZ) category					
	Strong MIZ 4	Moderate MIZ 5	Weak MIZ 6	No MIZ 7										
	Could be a primary or secondary core	Could be a primary or secondary core	10,000-29,999 Secondary core	<10,000 fringe		Could be a primary or secondary core	10,000-29,999 Primary or Secondary core	<10,000 fringe		Municipalities where at least 30% of the area's resident employed labour force commute to work in any CMA or CA	Municipalities where at least 5-29% of the area's resident employed labour force commute to work in any CMA or CA	Municipalities where at least 0-5% of the area's resident employed labour force commute to work in any CMA or CA	None of areas resident employed labour force commute to work in any CMA or CA. Also includes municipalities with <40 persons in employed labour force.	

Appendix D: Core Set of Health System Performance Indicators

Defining Element of Quality Care	Indicator
Effective	Emergency Department as a First Contact for a Mental Health or Addictions Condition, 2015/16
Effective/Patient-centred	Location of death in hospital (inpatient, ED, CCC, rehab, inpatient mental health), 2015/16
Effective/Timely	Follow-up with a doctor within 7 days of discharge following hospitalization for chronic obstructive pulmonary disease (COPD) or congestive heart failure (CHF), 2015/16
Effective/Timely	Overdue for Colorectal Cancer Screening, 2015/16
Efficient	Rate of hospitalizations for Ambulatory Care Sensitive Conditions (ACSC), 2015/16
Patient-centred	Percentage of people aged 12 and older who rated their general health as poor, 2014
Patient-centred	Percentage of people aged 12 and older who report cigarette smoking (daily or occasionally), 2014
Effective	Premature Mortality (<75 years)
Effective	Potential years of life lost prematurely (<75 years)
Effective	Continuity of care to the same primary care doctor, 2016

References

1. Excellent Care for All Act, 2010, S.O. 2010, c. 14. Retrieved from the Government of Ontario website:
https://www.ontario.ca/laws/statute/10e14?_ga=2.24361017.2071447937.1534341923-877985399.1534183690
2. <http://www.hqontario.ca/System-Performance/Yearly-Reports>
3. Health Quality Ontario (HQO) (2015). *Quality Matters: Realizing Excellent Care for All*. Retrieved from the Health Quality Ontario (HQO) website:
<http://www.hqontario.ca/Portals/0/documents/health-quality/realizing-excellent-care-for-all-en.pdf>
4. Health Quality Ontario (HQO) (2016). *Health Quality Ontario's Health Equity Plan*. Retrieved from the Health Quality Ontario (HQO) website:
http://www.hqontario.ca/Portals/0/documents/health-quality/Health_Equity_Plan_Report_En.pdf
5. <http://www.hqontario.ca/System-Performance/Specialized-Reports>
6. Canadian Institute for Health Information (CIHI) (April 2018). *In Pursuit of Health Equity: Defining Stratifiers for Measuring Health Inequality*. Retrieved from the Canadian Institute for Health Information (CIHI) website:
<https://www.cihi.ca/sites/default/files/document/defining-stratifiers-measuring-health-inequalities-2018-en-web.pdf>
7. Canadian Institute for Health Information (CIHI) (September 2006). *How Healthy Are Rural Canadians? An Assessment of Their Health Status and Health Determinants*. Retrieved from the Canadian Institute for Health Information (CIHI) website:
https://secure.cihi.ca/free_products/rural_canadians_2006_report_e.pdf
8. Health Quality Ontario (HQO) (2015). *Better has no limit: Partnering for a Quality Health System*. Retrieved from the Health Quality Ontario (HQO) website:
<http://www.hqontario.ca/Portals/0/Documents/about/strategic-plan-2016-en.pdf>
9. <https://www.ahrq.gov/professionals/quality-patient-safety/talkingquality/create/sixdomains.html>
10. <https://www12.statcan.gc.ca/census-recensement/2011/ref/dict/geo049a-eng.cfm>
11. <https://www12.statcan.gc.ca/census-recensement/2011/ref/dict/geo045-eng.cfm>
12. <https://www12.statcan.gc.ca/census-recensement/2011/ref/dict/geo010-eng.cfm>
13. Kralj, Boris (January 2008). *Measuring Rurality – RIO2008_BASIC: Methodology and Results*. Retrieved from the Ontario Medical Association (OMA) website: <https://www.oma.org/wp-content/uploads/2008rio-fulltechnicalpaper.pdf>.
14. Ministry of Health and Long-Term Care (MOHLTC), Health Analytics Branch (May 2016). *Urban rural classifications and categories*.
15. <https://www12.statcan.gc.ca/census-recensement/2011/ref/dict/geo014-eng.cfm>
16. Statistics Canada (2017). *Postal Code^{OM} Conversion File (PCCF), Reference Guide*. Retrieved from the Canada Post website:
<https://www.canadapost.ca/cpc/assets/cpc/uploads/files/marketing/2017-postal-code-conversion-file-reference-guide-en.pdf>.
17. <https://www.canada.ca/en/health-canada/services/food-nutrition/food-nutrition-surveillance/health-nutrition-surveys/canadian-community-health-survey-cchs.html>.
18. <https://www150.statcan.gc.ca/n1/pub/18-001-x/18-001-x2017002-eng.htm>