Analyzing 211 Rural Unmet Service Needs

A Joint Rural Ontario Institute-Ontario 211 Services Exploratory Research Project

- November 2018 -

RURAL ONTARIO INSTITUTE

211 Ontario®

Prepared By:

DILLON CONSULTING

Foreword

We are pleased to share this report, which reflects the outcome of a collaborative partnership between the Rural Ontario Institute (ROI) and Ontario 211 Services (211 Ontario).

Where You Are Matters

The exploratory data analysis of 211 user needs originating in different jurisdictions points to differences in per-capita call volumes and types of needs between remote, rural and urban geographies. For example, the analysis includes results that utility assistance and transportation needs are more prevalent in calls from the more rural regions than urban centres. It also shows that the absence of available services was a more common reason for a need being unmet in more remote areas. In and of itself, the project illustrates that the Index of Remoteness provides a new and useful way of thinking about human services delivery in different geographies. Where you are *does* matter when it comes to service accessibility.

211 Data: A Resource to Complement Other Data Sources

There has been a high degree of support for this work, notwithstanding that the 211 data clearly has a self-selection bias. For example, people who have needs but do not know about 211, people who are disinclined to use central support services like 211, or people who are told there are no services, do not call. As a result, statistics from this database should not be extrapolated to the population of people who might be 'in need' at large. With this caveat in mind, the database is a unique information resource for policy and social planners. We believe that many types of municipal, health and social services agencies, as well as the non-profit organizations that provide specific services across varying geographies, will be interested in such findings and will seek continued access to the underlying information that 211 Ontario is able to gather and share. What also will become clear to the reader is the conclusion that such information needs to be interpreted in the context of local knowledge of service delivery, regional levels of awareness/use of the 211 service, and in terms of other supplementary socio-economic data or service-user statistics. Greater awareness of the three-digit phone number 2-1-1 will increase the value of the data.

Ongoing Use of 211 Data

The process of preparing the analysis, which you will find in the report, and the accompanying stakeholder engagement pointed toward many additional avenues of research, lines of questioning and other opportunities to better leverage the data through improved data collection methods, data sharing and linkages to additional datasets. As illustrated in the recommendations, for 211 to be a useful complementary data set, it must align with other data sets; e.g., in the use of standard geography such as census division and subdivision to allow for comparative analysis or data layering as a means of exploring community needs. Examples of complementary data, e.g., low income by census subdivision, which was modelled at the workshop, can be found at www.ruralontarioinstitute.ca/knowledge-centre/focus-on-rural-ontario. Those that were involved have provided enthusiastic encouragement to further engage interested parties in the management and use of this rich data resource.

For people interested in the rural implications of this work, please contact Tanya Stuart, Communications Manager, ROI, tstuart@ruralontarioinstitute.ca.

For those with 211 data inquiries, please contact Laura Smith, Data Analyst, Ontario 211 Services, lsmith@211ontario.ca.

To download the full report and analysis go to: www.ruralontarioinstitute/knowledge-centre or https://211ontario.ca/about-211-ontario/news/rural-ontario-institute-and-ontario-211-services-release-report-on-needs-and-unmet-needs-in-rural-communities.

To join a Trillium Foundation hosted community of practice discussion forum on using the data go to: https://share.otf.ca/c/open-data.

Sincerely

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The participation of a group of advisors and workshop participants was crucial in helping us answer the key question about the potential utility of 211 Unmet Needs information for human services planning and program design. We thank them for freely sharing their expertise, perspectives and suggestions:

Advisory Group Members

Doriano Calvano, County of Simcoe
Michael Cullen, United Way Centraide North East Ontario, represented by Katherine Cockburn
Blair Dimock, Ontario Trillium Foundation
Cristina DiTomossa, Western Ottawa Community Resource Centre
Melissa Dunbar and Linda Terry, Social Planning Council of Cambridge and North Dumfries
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Bonnie Krysowaty, Lakehead Social Planning Council
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Elisa McFarlane, Ontario Municipal Social Services Association
Donna Stewart, Manitoulin-Sudbury District Services Board
Erica Woolf, Ministry of Municipal Affairs and Ministry of Housing, Thunder Bay

In addition to Advisory Group members, ROI, 211 team members and Dillon Consulting participants, were:

Guests at the July 26th 2018 workshop

Andrew Benson, Transformation Solutions Architect
Katherine Cockburn, United Way Centraide North East Ontario
Mike Ditor, Community Data Program
Mike Florio, OMAFRA
Amber Gillespie, Wellington, Waterloo Local Health Integration Network
Benjamin McNamee, Ontario Trillium Foundation
Maja Mikarovska and Laura McDonough, United Way Great Toronto

Dave Montague, 211 Central Ontario/Findhelp Information Services
Sarah Owens, 211 Central East Ontario/Community Connection
Paul Steeves, United Way Ottawa
Jordann Thirgood, Mowat Centre

The Rural Ontario Institute and 211 Ontario also gratefully recognize the financial support of the Ontario government which enabled us to undertake this initiative for the potential benefit of rural municipal stakeholders and agencies involved in human service planning. We acknowledge that the Province bears no responsibility for any errors and omissions in this work nor does it imply any endorsement of the information, findings or conclusions of any related reports which are solely the responsibility of the Rural Ontario Institute and Ontario 211 Services.

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About the Study Partners

Rural Ontario Institute

ROI is a non-profit, charitable organization which has a mandate of developing leaders and facilitating collaboration on issues facing rural and northern Ontario. It works to connect partners and stakeholders in building a shared understanding of trends and conditions in rural geographies and in exchanging knowledge of emerging solutions to common challenges.

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Ontario 211 Services

211 is the source Canadians trust when seeking information and services to deal with life's challenges. 211's award-winning telephone helpline (2-1-1) and website provide a gateway to community, social, non-clinical health and related government services. 211 helps to navigate the complex network of human services quickly and easily, 24 hours a day, 7 days a week, in over 150 languages.

211 in Ontario is governed by Ontario 211 Services, a non-profit agency with six full-time staff and a dedicated Board of Directors. They work in collaboration with six Regional 211 Service Providers, and a unique network of data contributors to deliver 211 services though the phone and through online channels to all Ontario residents.

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Dillon Consulting

As an employee-owned Canadian consulting firm, Dillon Consulting Limited has been working for decades to achieve project outcomes that lead to better communities. Established in 1946, Dillon has evolved into a professional services firm providing a wide range of consulting services in community planning and engagement, environmental management, landscape architecture and environmental design, transportation and engineering. With over 700 employees, Dillon provides these services from centres across Canada, working from coast to coast to coast and internationally.

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Executive Summary

As a free telephone helpline and online search service that connects inquirers to community, health, social and government services, 211 Ontario records a variety of detailed caller demographics and needs information that could be of use for policy-makers in the provincial and municipal sector. In early 2018, the Rural Ontario Institute (ROI), in collaboration with 211 Ontario, received financial assistance from the Ministry of Municipal Affairs and Housing Research and Analysis grant program to analyze data records of 211 caller needs originating in rural Ontario jurisdictions and those needs logged as "unmet needs". Dillon Consulting was retained to undertake the exploratory research project, working with nearly a half a million needs records to develop a standardized, extensible approach to analysis of recent 211 call centre data and to examine insights related to the planning and delivery of programs and services in Ontario, with a focus on the rural context.

Through a process of data analysis, including the use of a suite of web-based mapping and data visualization tools and a participatory stakeholder workshop, the project team answered a number of initial analysis questions, uncovered new lines of inquiry, and developed a number of recommendations for improving both the utility of 211 data and the opportunities to work with potential partners to share and extend the capabilities of the data.

Recommendations for future lines of inquiry, suggestions for optimizing how data is collected and stored, and recommendations for how the data can be better shared with others to open up new collaboration opportunities and insights can be summarized as follows:

Recommendation #1: Explore Opportunities for Additional Analysis

Through the project's stakeholder engagement process, a number of additional lines of inquiry were identified. Although beyond the scope of the present study, additional questions related to what service gaps exist and where and opportunities for a deeper exploration of why some needs go "unmet" could be uncovered with further analysis, particularly by linking the 211 dataset with other data sources.

Recommendation #2: Suggestions for Data Collection and Storage

By modifying the way in which call records are tracked by 211 Ontario, there may be opportunities to make data analysis and sharing more efficient going forward. In particular, maintaining concordance between nomenclature recorded during calls and the official nomenclature used in standard geographic units, as well as recording full postal codes, will allow for easier linking to other datasets and more detailed analytics.

Recommendation #3: Enabling Better Data Sharing

There are a number of opportunities for extending the 211 dataset through data sharing/open data initiatives, including through the use of specific platforms. Web-based mapping and analytical tools offer a way to empower stakeholders to explore the data themselves. However, data privacy and security must remain paramount. Access to data should be supported by an updated Terms and Conditions for Use. Sharing through an accessible platform should be supported by webinars, conference presentations, and possibly an online guide.

1 Introduction

The Analyzing 211 Rural Unmet Service Needs study is a joint project of the Rural Ontario Institute (ROI) and Ontario 211 Services (211 Ontario) to undertake an exploratory analysis of 211-caller needs data, focusing on those originating in rural Ontario jurisdictions and those needs logged as "unmet needs".

211 is a telephone helpline and website that provides callers with information and referrals to services regarding community, social, non-clinical health, and related government services. 211 helps people to navigate the complex network of human services quickly and easily, 24 hours a day, 7 days a week, in over 150 languages. The reason for the call to 211 is defined as the "'need" and "unmet needs" are defined as needs for which 211 was not able to provide the caller with a referral. The reason a need is unmet can be that no resource was available, or that a resource was available, but the caller did not meet eligibility requirements.

This project provided program developers and policy-makers in the provincial, municipal and non-profit sector with an analysis of 211 data in order to gather their perspective on how the data might be leveraged to aid in delivering programs and services, especially in the rural context. The project engaged 211 service providers and partners with an opportunity to consider the potential value of the information created by the project for program planning. The recommendations and outcomes of the study may also be used internally by 211 to consider the desirability of any process changes or adjustments to call record protocols.

ROI and 211 Ontario retained Dillon Consulting to assist with this undertaking. In conjunction with guidance from the project management team and with input from a project advisory committee, Dillon utilized a suite of GIS tools and a process of exploratory data analysis that allowed for iterative views of the data and the exploration of a series of research questions and testing of a variety of hypotheses.

Working with over 480,000 needs records from 211 call data collected between January 2016 and March 2018, Dillon undertook a process of data cleanup and analysis, using 211 and other datasets to answer a series of initial research questions. These findings were presented to members of the project advisory committee and other key stakeholders during an exploratory workshop, where additional lines of inquiry were explored, new research questions were raised, and a number of recommendations from potential partners on how to best build on 211 data were uncovered.

This report outlines the goals of the 211 Rural Unmet Service Needs project; describes the study methodology; details findings from the data analysis through a series of maps and tables; summarizes the outcome of the stakeholder engagement process; and forwards a series of recommendations related to additional research questions uncovered, suggested

modifications to 211 data collection practices, and potential avenues to make 211 data more accessible to partners to better support human services planning in Ontario. A series of maps illustrating various 211 data analyses is included in the appendices of this report.

The Rural Ontario Institute and 211 Ontario gratefully recognize the financial support of the Ontario government which enabled us to undertake this initiative for the potential benefit of rural municipal stakeholders and agencies involved in human service planning. We acknowledge that the Province bears no responsibility for any errors and omissions in this work nor does it imply any endorsement of the information, findings or conclusions of any related reports which are solely the responsibility of the Rural Ontario Institute and 211 Ontario.

2 Research Goals and Objectives

The primary goal of the research project was to develop a standardized, extensible approach to analysis of the currently-available 211 call centre data that will offer insights and analysis related to the planning and delivery of programs and services in Ontario, with a focus on the rural context.

The data model developed through this project was structured in such a way as to readily allow for others to perform further analysis for ends not considered in the original scope of work and in a manner that allows for comparability between outputs.

Through this process, data limitations and challenges were also identified, some of which led to recommended adjustments to 211 call record protocols and recommendations that may increase the value of the data for potential end users.

3 Methodology

This section details the methodology adopted for the exploratory research process, including a description of 211 data, the efforts undertaken to prepare and link the data for effective geographical and rural analysis, as well as the stakeholder engagement process, which helped surface additional research questions and recommendations.

3.1 211 Data

The call centre dataset made available by 211 Ontario for this research included the following types of fields:

- Date of call (month and year);
- Location of the 211 call centre that took the call;
- Region and city of the caller (when provided by the caller);
- Postal code of the caller (when provided by the caller);
- Needs resolution status (i.e. whether the request was fulfilled or remained 'unmet');
- For calls that resulted in an unmet need, the reason why the operator was unable to fulfill the request (categorized);
- Identified need, categorized according to each of the Alliance of Information and Referral Systems (AIRS) taxonomy levels 1 to 5;
- Age of the client (recorded either as a numeric range or as a qualitative category);
- Gender of the client;
- Language spoken by the client;
- An identifier for whether the call was initiated by, or on behalf of, the prospective client; and
- Categorization of the apparent intent and nature of the call ("call type").

Records in the dataset ranged from January 2016 to March 2018.

Each record in the dataset provided described a single need for service as articulated by the caller. Records as provided in the dataset did not include any unique identifier by which to associate them with a particular call. Since more than one need could be articulated in the course of a single call, and with no way to aggregate records on the basis of call identifiers, the dataset offers an understanding of the volume and type of services being demanded as opposed to the volume and type of calls being serviced by 211 Ontario.

3.2 Data Limitations and Considerations

There are some recognized limitations of the 211 Ontario data to note, which have an impact on how the data can be used for analysis. Some of the limitations as well as other considerations that were identified at the outset, or were uncovered through the course of the analysis, include:

- Whether a need is recorded as "met" or "unmet" relates to whether 211 was able to make a referral, but no claims are made about whether a caller's need was ultimately met or not (i.e. when they followed up with the referral).
- Call volume to 211 is low in some parts of Ontario as a result of low awareness of the availability of 211 as a service. Any interpretation of the data must take this into consideration. As awareness and use of 211 increases, the data will become ever more useful.
- In the analysis in this report "Inquirer refused referral" is included as an unmet need. However recently, as part of continuous clean-up of 211 data, Ontario 211 has determined that when a caller declines a referral, this is not an unmet need and will not be included as an unmet need in future data.
- All social service terms used by 211 align with the AIRS Taxonomy (Canadian Version) and may not be common usage. E.g., "Holiday programs" refers to providing food/food baskets to individuals and families during the holidays, providing vouchers, clothing, toys for kids, "adopt-a-family" programs, etc. This category also includes holiday donations.
- Finally, it should be noted that each data record provided by Ontario 211 for this study was a needs record – i.e. one of the needs identified by a caller to 211. Any one caller might have a number of needs. The needs record has been referred to as a "record" throughout this report. 211 data is also organized by call record, but as this study focussed on needs and unmet needs, the need record was determined to be the most suitable data format.

3.3 Data Preparation and Cleanup

Notwithstanding the limitations noted above, the call centre dataset made available by 211 Ontario was well-structured, although it did require a certain amount of preparation and cleanup in order to make it readily usable in the fashion proposed. In particular, concordance between the geographic categorization used in the dataset and Statistics Canada's standard geographic units was needed. Achieving concordance with standard geographic units allows users of the dataset to perform rigorous analysis using the wealth of data that is made available through various Statistics Canada programs (particularly census data). Concordance also allows for analysis to be undertaken longitudinally while maintaining comparability over time.

In order to achieve the goal of extensibility as well as spatial and temporal comparability, the spatial data needed to correspond with the standard geographic classification system employed by Statistics Canada. In particular, records with spatial attributes needed to be associated with the correct census division (CD) and census subdivision (CSD), where possible.[1]

The 211 data was structured using three spatial frames: region, city and postal code. A brief review of the dataset showed that the values used in the "region" and "city" geographic frames did not perfectly align with CSD or CD nomenclature. It was also apparent that data entry errors were present within the dataset. As an illustrative example, two different record entries could be logged within the same apparent geographic frame, but show inconsistent geographic nomenclature between each other. Furthermore, the nomenclature used in the dataset provided did not always match that which is used in the list of municipalities published by the Ministry of Municipal Affairs and Housing or the corresponding entries used by Statistics Canada.

While 37% of the records had postal codes attached (34% with full 6-digit postal codes, 3% with 3-digit Forward Sortation Area codes), the remaining entries needed to have their geographic entries checked and associated properly.

Throughout the data preparation and cleanup process, the project team was mindful to consider recommendations for business process improvements for consideration by 211 which could support future data analysis needs.

3.4 Initial Analysis Questions

Early in the project, a series of initial analysis questions were developed in order to explore at a high level how the 211 telephone service is being used, and by whom, as well as how users and needs are distributed geographically, with particular attention to contextualizing use of 211 services and recorded needs and unmet needs in rural geographies. An Analysis Plan was developed and shared with the project advisory group for comment. The following list of research questions was developed (findings are detailed in Section 4 of this report).

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[1] Census divisions generally correspond with regional-level administrative boundaries, while census subdivision boundaries generally correspond to single or lower-tier municipal boundaries. Accordingly, census divisions are comprised of one or more census subdivisions. In some cases, such as Toronto or Hamilton, the boundary of a given census subdivision may match that of the corresponding census division. For technical information regarding the hierarchical aspect of the standard geographic classification system, see: Statistics Canada. (2016). *Standard Geographical Classification (SGC) Volume I. The Classification, 2016* (No. 12-571– X). Retrieved from https://www.statcan.gc.ca/eng/subjects/standard/sgc/2016/introduction

Overall Analysis Questions:

1) Who is calling 211?
    - Call volume (absolute and share of total) by age category
    - Call volume (absolute and share of total) by gender
    - Call volume (absolute and share of total) by language spoken

2) Why are people calling 211?
    - Call volume (absolute and share of total) by 1-digit AIRS category

3) To what degree are caller's needs met when they call 211?
    - Call volume (absolute and share of total) by status of resolution (i.e., need met or unmet)

4) Why are caller's needs *not* met?
    - Call volume (absolute and share of total) categorized by 'Reason need unmet'

Geographic Distribution of Calls, Needs, and Unmet Needs:

5) How are calls distributed geographically?
    - Call volume (absolute and per-capita) by CD
    - Call volume (absolute and per-capita) by CSD

6) How are calls distributed between urban and rural locations?
    - Call volume (absolute and per-capita) by CD categorized by relative rurality (i.e., metro, partially non-metro, non-metro)
    - Call volume (absolute and per-capita) by CSD categorized by Index of Remoteness value

7) How are caller needs distributed geographically?
    - Call volume (absolute and per-capita) categorized by 3-digit AIRS category by CD
    - Call volume (absolute and per-capita) categorized by 3-digit AIRS category by CSD

8) How are caller needs distributed between urban and rural locations?
    - Call volume (absolute and per-capita) categorized by 3-digit AIRS category by CD categorized by relative rurality (i.e., metro; partially non-metro; non-metro)
    - Call volume (absolute and per-capita) categorized by 3-digit AIRS category by CSD categorized by Index of Remoteness value

9) How are calls which result in an unmet need distributed geographically?
   - Call volume (absolute and per-capita) categorized by 'Reason need unmet' by CD
   - Call volume (absolute and per-capita) categorized by 'Reason need unmet' by CSD

10) How are calls which result in an unmet need distributed between urban and rural locations?
   - Call volume (absolute and per-capita) categorized by 'Reason need unmet' by CD categorized by relative rurality (i.e., metro; partially non-metro; non-metro)
   - Call volume (absolute and per-capita) categorized by 'Reason need unmet' by CSD categorized by Index of Remoteness value

In cases of per-capita analysis, analytical findings were intentionally limited to records from 2016 due to the fact that publicly-accessible population data pertaining to the CD and CSD levels were only available for that year (as opposed to values for 2017 and 2018, which would require use of commercially-available data).

3.5 Using the Index of Remoteness

Portions of the analysis make use of a method of spatial categorization recently employed by Alasia et al (2017) at Statistics Canada.[2] The authors developed a gravity model which uses the estimated financial cost of travel between a given community and nearby population centres as a proxy measure for geographic remoteness in order to indicate the degree to which a given community is functionally remote. The model was used to compute an index of remoteness value for almost all CSDs in Canada, with a value of zero being as non-remote as possible and a value of 1.0 being as remote as possible. The index of remoteness offers a useful measure of relative remoteness for almost any given community in Canada.

The index of remoteness dataset was used to categorize records in the 211 dataset.

3.6 Data Presentation

A suite of web-based mapping tools were used to visually communicate geospatial patterns and trends in the 211 data and support deeper analysis, data linkages, and visual exploration. Figure 1 provides a visual summary of the elements of the approach to data analysis and collaborative review, supported by the integrated cloud-based GIS system.

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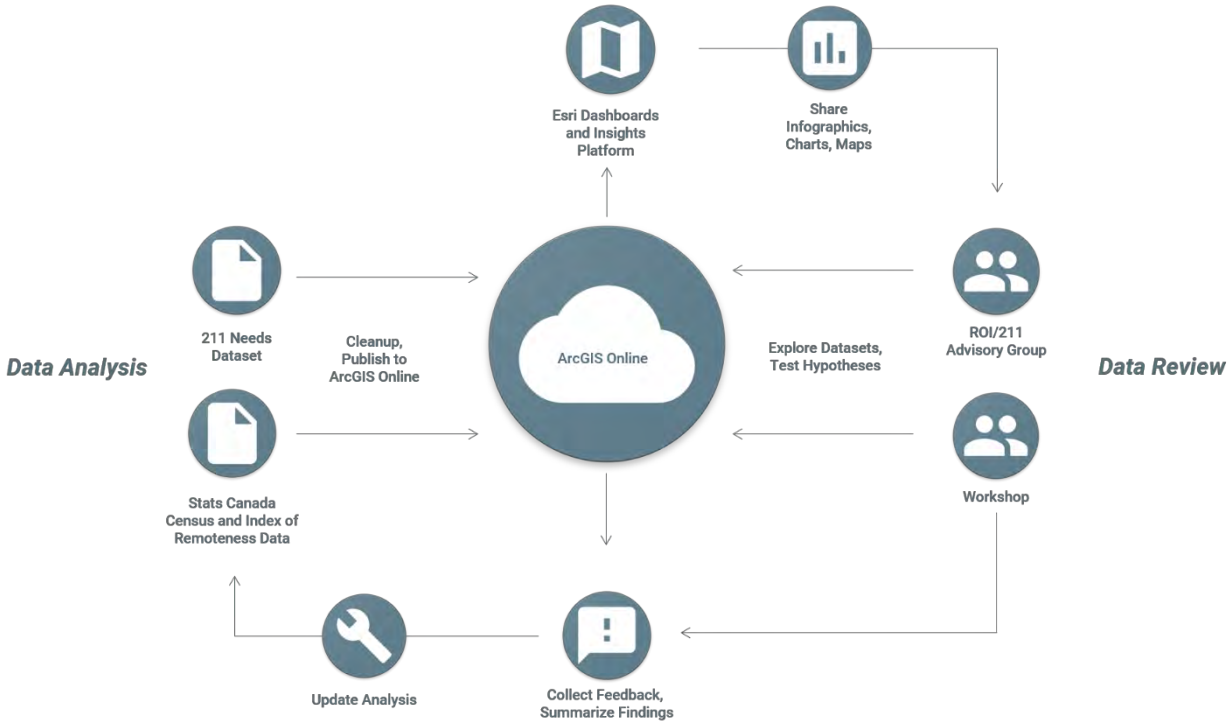
[2] See: Alasia, A., Bédard, F., Bélanger, J., Guimond, E., & Penney, C. (2017). *Measuring remoteness and accessibility: A set of indices for Canadian communities* (Reports on Special Business Projects No. 18- 001–X). Statistics Canada. Retrieved from https://www150.statcan.gc.ca/n1/pub/18-001-x/18-001-x2017002-eng.htm

Figure 1: Data Analysis and Review Process



An Operations Dashboards web application (Figure 2), powered by Esri ArcGIS Online was provided to stakeholders for geospatial and visual exploration of unmet needs data. This easy-to-use online tool allowed the stakeholders to explore the data at their own pace using dynamic charts/graphs and interactive mapping, enabling them to query a subset of the data (or variable) and plot results on a density heat map. Variables that could be explored in the Dashboard app included: Unmet Needs by Reason; Unmet Needs by AIRS Category; Unmet Needs by CMA Type; and Unmet Needs by Index of Remoteness. This online tool was key in preparing the stakeholders for the workshop (described below) and familiarizing them with the topics to be discussed.

Throughout the analysis and during the stakeholder workshop, an advanced web-based mapping tool was used to further explore the data as a group and perform real-time analysis. Insights for ArcGIS, also powered by Esri ArcGIS Online was used to dive deeper into the data and perform exploratory analysis within an intuitive online environment (Figure 3).

Figure 2: 211 Unmet Needs Interactive Dashboard

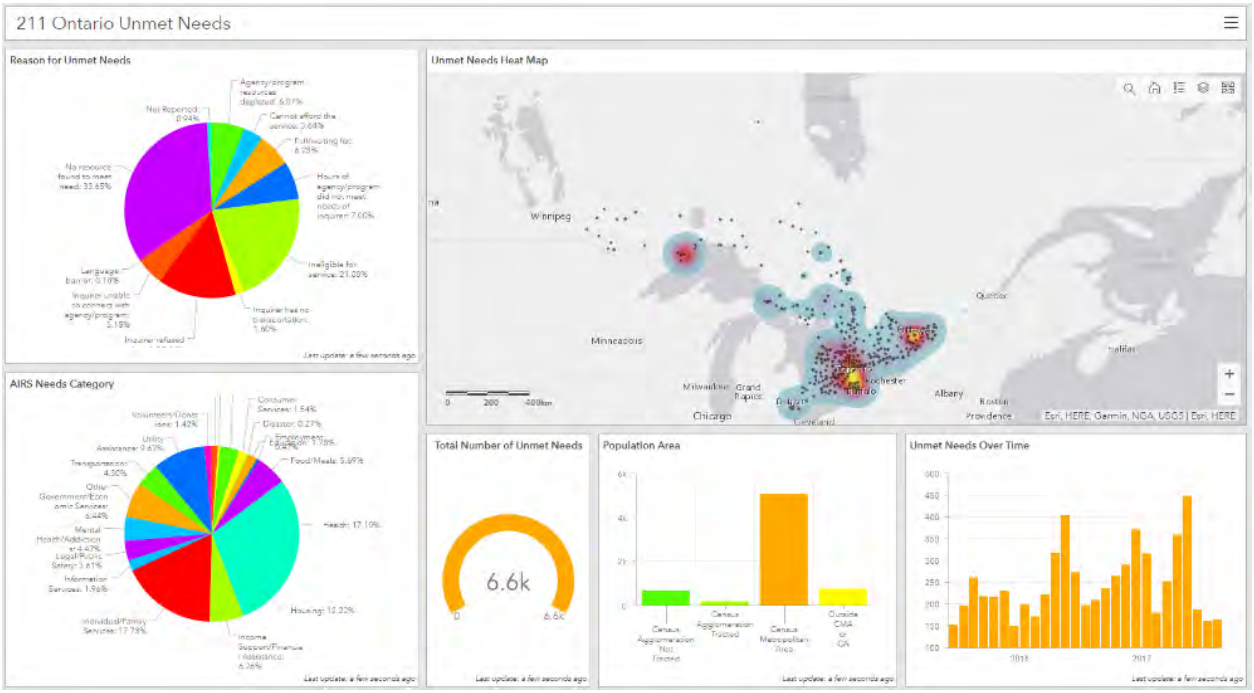


Figure 3: Sample 211 Data Visualizations on the Insights Platform

3.7 Stakeholder Engagement

Central to the 211 Rural Unmet Service Needs study was engagement with key stakeholders and potential data users. Members of the project advisory committee and other key stakeholders were given the opportunity to comment on the Analysis Plan that guided this study process and were also engaged in a full-day interactive data exploration workshop. The purpose of the workshop was to familiarize participants with 211 data and the kinds of questions it may be able to answer, generate feedback on important questions participants would like this data to answer, and uncover other opportunities and limitations of 211 data. The workshop helped to build interest and excitement in the potential of 211 data and open up new collaboration opportunities.

During the workshop, Dillon Consulting worked with attendees to examine caller needs records data interactively and discussed the potential utility of the findings for service planning and program design. A short context-setting presentation and introduction to the data was followed by an interactive demonstration of the initial analysis completed by Dillon Consulting. This was followed by a consensus building exercise to uncover the collective priorities for additional questions and hypotheses the group would like to explore, followed by breakout sessions to pursue these additional lines of inquiry in real time using the web-based Esri GIS tools. Dillon facilitated the interactive session on June 26, 2018 from 10:00am-3:00pm.

A consensus building collaborative brainstorm exercise resulted in the identification of eight priority themes related to the kinds of questions stakeholders would like to explore using this data (on its own or linked to other data sets), as well as further questions and commentary about how to best leverage the data. These themes are listed below along with a number of specific questions/considerations identified throughout the workshop. Through a quick voting exercise, workshop participants also prioritized the themes most warranting further exploration. Themes are listed below in order of highest priority to lowest. Some of these questions and lines of inquiry were pursued during the workshop while others would require further exploration.

Theme #1: Need Predictions

- What is the socioeconomic status of the caller?
- Can we project demographic trends?
- What changes can we see over time? Can we use this to identify emerging needs?
- Do men and women ask about same issues, but from different perspectives?
- Can we see the types of needs associated with socioeconomic factors? E.g., education.

Theme #2: Service Gaps

- Is transportation a barrier to service? Is it a bigger barrier in remote areas?
- If we know a service does not exist in a Census Division (CD), does it show up as an unmet need, reason: "no service"?
- Can we determine needs vs. available services and programs?
- What are the gaps in service by municipality?
- What service gaps exist, and where? E.g., mental health/addictions.

Theme #3: Analysis of Unmet Needs

- Why is the need unmet? E.g., income eligibility brackets, programs fully subscribed or annual resources are depleted (e.g., utility assistance)
- What is follow-up data telling us about: needs met and needs unmet
- Are there enough services in the Census Subdivision (CSD) to support the needs logged as "met" (referrals)?
- Why are callers not eligible for service?
- Is there consistency and alignment between one issue and another? E.g., lack of employment, Hydro support, foodbank.
- Can we unpack the "resource not available" reason for unmet need? Similarly, the "ineligibility" category?

Theme #4: Penetration Rates

- Can we identify rural locations where 211 penetration is high?
- What is special about 211 in the regions with higher penetration rates?
- Is there information available on 211 awareness?
- How does penetration rate correlate with CSD population size ranges?

Theme #5: Equity-Seeking Groups (i.e. communities that face barriers or other forms of discrimination and disadvantage)

- Looking specifically at those who commonly face barriers to equal access, who is calling, about what, and are their needs being met? E.g., racialized people, people with disabilities, Indigenous, lesbian, gay, bisexual, transgender.

Theme #6: Rural vs Urban

- What does 211 data say about needs of rural communities?
- How can we best define rural?
- How do needs differ between rural and urban areas?
- In less urban areas, are unmet needs more common?
- Is the profile of caller different between: urban and rural; needs met vs. unmet
- Hypothesis: There is a larger distance between the location of the caller and the service in rural vs. urban regions.
- How do rural needs vary by level of region/and remoteness? Explore by Alliance of Information and Referral Systems (AIRS) category.

- What are the differences within specific regions? E.g., Toronto-York-Peel and smaller geographies.
- Are there geographic areas that surface the same needs that would lend themselves to communities working together for solutions?

Theme #7: Data Sharing

- What are the best channels to use to make this data available to those who will use it? E.g., policy makers, agencies (public/private), planners, open data.
- More demonstration data would be valuable
- Challenge that public-facing dashboards must be available in English and French

Theme #8: Potential Limitations of the Data

- Can we better understand the statistical significance of the data? E.g., in instances when there are very few callers.
- Does first time vs. repeat callers' data get recorded? If yes, can we filter it?
- Can we distinguish between the original reason for the call and the resources ultimately recommended?
- How consistent is the data entry at 211 call centres?
- More records with postal codes would be valuable
- There is a need to combine this data with other external data sets, particularly more socioeconomic data

The results of the workshop had significant bearing on refining the direction for analysis (presented in the Findings below), and shaping the recommendations outlined in Section 5, including identifying a number of additional lines of inquiry that were beyond the scope of the present study.

4 Findings

Following the initial data cleanup process and linkages to census and Index of Remoteness data, as described in the methodology, the analysis process explored a number of high-level questions related to how the 211 telephone service is being used, by whom and where. Findings from this analysis are addressed below. The appendices of this report present a number of these findings spatially.

4.1 Call records by demographic characteristics

Needs records in the 211 call database can be grouped by various demographic characteristics pertaining to the caller, including age, gender, and language spoken.

4.1.1 Age Category

Records in the dataset are categorized according to age ranges as follows:

- Adult, which includes ages 25 to 59;
- Child/Youth, which includes those up to and including 24 years of age;
- Older Adult, which includes those aged 60 to 80; and
- Unknown, which applies to records where age information was not recorded.

The distribution of call records by age category is given in Table 1.

Table 1: Needs records by age category of caller

Age Category	Count of Records	Share of All Records
Adult	362,975	74.2%
Child/Youth	2,803	0.6%
Older Adult	52,449	10.7%
Unknown	70,764	14.5%
Total	488,991	100.0%

Nearly three-quarters of all needs records in the dataset are attributed to callers categorized as “Adult” (74%), followed by “Older Adult” (11%), with very few records categorized as “Child/Youth” (<1%). A sizeable portion of the records do not bear any age categorization (15%); this may be a result of 211’s practice of recording age-related information when it relates to determining service needs or whether one qualifies for services.

4.1.2 Gender

Records in the dataset are categorized according to reported gender of the caller as follows:

- Female;
- Male; and
- Other/Unknown.

The distribution of call records by reported gender is given in Table 2.

Table 2: Needs records by gender of caller

Gender	Count of Records	Share of All Records
Female	335,547	68.6%
Male	142,643	29.2%
Other/Unknown	10,801	2.2%
Total	488,991	100.0%

More than two-thirds of all needs records in the dataset are attributed to callers who reported their gender as female (69%), followed by slightly less than one-third of records associated with callers who reported being male (29%). Very few call records were associated with a caller reporting a gender which did not fall into the aforementioned categories (2%).

4.1.3 Language

Records in the dataset are categorized according to the primary language spoken by the caller. Forty-six language categories exist in the dataset, most of which correspond with distinct languages (some correspond to generalized language groups, such as "Siouan languages (Dakota/Sioux)".

The distribution of call records by language spoken by the caller is given in Table 3. Only the five most-frequently reported languages are given in the table, as these collectively account for more than 99.9% of all records.

Table 3: Needs records by language spoken by caller

Language of Caller	Count of Records	Share of All Records
English	479,109	97.98%
French	8,792	1.80%
Arabic	257	0.05%
Spanish	230	0.05%
Mandarin	123	0.03%
All other languages	480	0.10%
Total	488,991	100.0%

English accounts for almost all records (98%), with the remainder largely made up of French-speaking callers (2%). All other languages accounted for only a fraction of all call records (<1%).

4.2 Needs records by category

Records are categorized into a series of tiered taxonomic classifications according to the type of issue or service a caller may be requesting; there are five tiers, with each tier offering a progressively more granular classification of caller needs. The five tiers can be described as follows:

- Level 1, which contains 19 distinct categories;
- Level 2, which contains 97 distinct categories;
- Level 3, which contains 1,130 distinct categories;
- Level 4, which contains 4,538 distinct categories; and
- Level 5, which contains 3,496 distinct categories.

The distribution of needs records by Level 1 category is given in Table 4.

Table 4: Needs records by Level 1 needs category

Level 1 Needs Category	Count of records	Share of all records
Health	65,312	13.4%
Other Government/Economic Services	54,100	11.1%
Housing	48,770	10.0%
Individual/Family Services	44,895	9.2%
Legal/Public Safety	41,827	8.6%
Information Services	41,521	8.5%
Mental Health/Addictions	29,200	6.0%

Consumer Services	28,073	5.7%
Income Support/Financial Assistance	27,627	5.6%
Food/Meals	24,406	5.0%
Community Services	17,665	3.6%
Utility Assistance	16,213	3.3%
Transportation	15,291	3.1%
Arts, Culture and Recreation	9,011	1.8%
Education	7,029	1.4%
Volunteers/Donations	5,970	1.2%
Employment	5,525	1.1%
Citizenship/Immigration	4,741	1.0%
Disaster	1,815	0.4%
Grand Total	488,991	100.0%

The top five most-frequently reported needs categories account for slightly more than half of all records. Requests relating to health issues and services account for the most-frequently cited need category (13%), followed closely by government/economic services not otherwise categorized (11%), housing (10%), while individual/family services and legal/public safety matters each account for 9%. Employment and citizenship/immigration matters each accounted for only one percent of all records.

4.3 Needs records by resolution status

Each single call can result in multiple "needs" being identified; each record in the call database is equal to one discrete need that has been identified. Each need identified can then be considered to have been "met" or "unmet"; this needs resolution status describes whether the 211 call taker was able to connect the caller to an appropriate service or otherwise resolve the request in the course of the call.

The distribution of needs records by resolution status is given in Table 5.

Table 5: Needs records by resolution status

Needs Resolution Status	Count of records	Share of all records
Met	481,869	98.5%
Unmet	7,122	1.5%
Total	488,991	100.0%

It is notable that almost all records are reported as resulting in the identified need being met (99%). It was noted in the workshop that 211 operators are solution oriented and clearly endeavour to link people with services. The result can be that occasionally the service that is available and referred to the caller is not necessarily what the caller may have initially been looking for. E.g., food, utility assistance or housing programs may be relevant to a caller who was initially seeking income assistance.

4.4 Needs resolution

Records are categorized not only by the needs resolution status, but also by why a need could not be resolved.

The distribution of needs records by resolution reason is given in Table 6.

Table 6: Needs records by reason need unmet

Reason Need Unmet	Count of records	Share of records with needs unmet	Share of all records
No resource found to meet need	2,398	33.7%	0.5%
Ineligible for service	1,469	20.6%	0.3%
Inquirer refused referral*	1,011	14.2%	0.2%
Hours of agency/program did not meet needs of inquirer	555	7.8%	0.1%
Full/waiting list	442	6.2%	0.1%
Agency/program resources depleted	427	6.0%	0.1%
Inquirer unable to connect with agency/program	360	5.1%	0.1%
Cannot afford the service	254	3.6%	0.1%
Inquirer has no transportation	114	1.6%	0.0%
Not Reported	78	1.1%	0.0%
Language barrier	14	0.2%	0.0%
Total	7,122	100.0%	1.5%

* Note that "inquirer refused referral" has recently been removed as a reason for unmet needs, as it does not fall within the definition of an unmet need.

Relative to the records which were associated with an unmet need, the lack of resolution most frequently stemmed from an inability to connect the caller to a relevant service for the particular need (34%), followed by the caller's ineligibility for services that were available (21%), or the refusal of the inquirer to accept the referral (14%); collectively, these reasons account for more than two-thirds of all records recorded as being unmet.

4.5 Geographic Distribution of Needs and Unmet Needs

Building on an understanding of how the 211 telephone service is being used, the next stage of analysis focused on how needs are distributed geographically. Particular attention was paid to contextualizing use of the 211 services in rural geographies. The following outlines research questions and findings related to geographic distribution.

4.5.1 Geographic distribution of records by census division

Each record was assigned to a corresponding census division (CD) as a geographic unit of analysis. The distribution of needs records by census division for the entire time period of the 211 call dataset (2016-2018) is given for the top ten census divisions in Table 7.

Table 7: Needs records by census division

Census Division	Count of records	Share of all records
Toronto	141,244	28.9%
Ottawa	67,220	13.7%
Niagara	60,297	12.3%
Essex	53,507	10.9%
Thunder Bay	31,985	6.5%
Simcoe County	31,522	6.4%
City of Hamilton	10,792	2.2%
Grey	9,604	2.0%
Peel	6,675	1.4%
Middlesex	6,442	1.3%
All other census divisions	69,703	14.3%
Total	488,991	100.0%

Records were associated predominantly with four census divisions: Toronto (29%); Ottawa (14%); Niagara (12%) and Essex (11%); these four regions accounted for two-thirds of all needs records.

However, when needs records are counted on a per-capita basis in proportion to the population of each census division, a different picture becomes apparent. Across all census divisions in 2016, each block of one thousand people corresponded to 16.5 needs records. The distribution of records by census division for 2016 for the top ten census divisions is given in Table 8.

Table 8: Needs records per 1,000 people by census division, 2016

Census Division	Count of records, 2016	Pop., 2016	Count of records per 1,000 pop., 2016
Thunder Bay	17,608	146,048	120.6
Niagara	28,754	447,888	64.2
Essex	24,979	398,953	62.6
Grey	4,537	93,830	48.4
Ottawa	33,342	934,243	35.7
Simcoe County	13,771	479,650	28.7
Bruce	1,785	68,147	26.2
Algoma	2,539	114,094	22.3
Toronto	58,533	2,731,571	21.4
Muskoka	1,004	60,599	16.6
All other census divisions	35,660	7,973,471	4.5
Total	222,514	13,448,494	16.5

On a per-capita basis, the Thunder Bay census division represents the greatest proportionate frequency of needs records (121 per 1,000 residents), followed by Niagara (64 per 1,000 residents) and Essex (63 per 1,000 residents). Most census divisions – accounting for more than half of the total population of the areas in the call record database – were associated with far lower rates of records per-capita (5 per 1,000 residents). Note that caution was expressed about interpreting call volume as necessarily implying higher needs in particular geographies since the 211 service may be better promoted and utilized in some regions than in others. See discussion below about data limitations and the value of additional data sets.

4.5.2 Geographic distribution of records by census subdivision

Where possible, records were assigned to a corresponding census subdivision (CSD) as a geographic unit of analysis; records which did not have enough information to allow for geocoding were labelled “Unknown”. The distribution of records by census subdivision for the

entire time period of the 211 call dataset (2016-2018) for the top ten census subdivisions is given in Table 9.

Table 9: Needs records by census subdivision

Census Subdivision	Count of records	Share of all records
Toronto	99,128	20.3%
Ottawa	63,809	13.0%
Windsor	49,809	10.2%
Thunder Bay	29,733	6.1%
St. Catharines	24,089	4.9%
Niagara Falls	18,493	3.8%
Barrie	10,699	2.2%
Hamilton	10,128	2.1%
Collingwood	7,107	1.5%
Welland	6,081	1.2%
Unknown	56,939	11.6%
All other census subdivisions	112,976	23.1%
Total	488,991	100.0%

Records were associated predominantly with three census subdivisions: Toronto (20%), Ottawa (13%), and Windsor (10%); these municipalities accounted for nearly half of all records. Records which did not have a known census subdivision associated accounted for twelve percent of all records.

However, when needs records are counted on a per-capita basis in proportion to the population of each census subdivision, a different picture becomes apparent. Across all census subdivisions in 2016, each block of one thousand people corresponded to 14.7 records. The distribution of records per capita for the top ten census subdivisions in 2016 is given in Table 10.[3]

[3] Note: These values exclude six census subdivisions for which census population values were not reported in 2016: Flying Post 73; Oneida 41; Pikangikum 14; Rankin Location 15D; Six Nations (Part) 40; and Wahta Mohawk Territory.

Table 10: Needs records per 1,000 people by census subdivision, 2016

Census Subdivision	Count of records, 2016	Pop., 2016	Count of records per 1,000 pop., 2016
Collingwood	3,393	21,793	155.7
Thunder Bay	16,487	107,909	152.8
Opasatika	29	226	128.3
Owen Sound	2,705	21,341	126.8
Windsor	23,268	217,188	107.1
Niagara Falls	8,571	88,071	97.3
St. Catharines	12,175	133,113	91.5
Gros Cap 49	5	77	64.9
Port Colborne	1,132	18,306	61.8
Wasaga Beach	1,217	20,675	58.9
All other census subdivisions	126,948	12,741,749	10.0
Total	195,930	13,370,448	14.7

On a per-capita basis, the Collingwood census subdivision represents the greatest proportionate frequency of needs records (156 per 1,000 residents), followed by Thunder Bay (153 per 1,000 residents), Opasatika (128 per 1,000 residents) and Owen Sound (127 per 1,000 residents). Most census subdivisions – accounting for more than four-fifths of the total population of the areas in the call record database – were associated with far lower rates of records per-capita (7 per 1,000 residents).

4.5.3 Geographic distribution of records between urban and rural locations

Records were categorized according to the relative "rurality" of the geographic unit to which records were assigned. Two methods were applied: (1) categorization of census divisions as being "metro," "partially non-metro" or "non-metro"; and (2) categorization of census subdivisions by index of remoteness values.

The first method involves categorizing census divisions using the following taxonomy:

- Metro, wherein all of the component census subdivisions are found within a census metropolitan area;
- Partially non-metro, wherein some of the component census subdivisions are found within a census metropolitan area and some without; and
- Non-metro, wherein all of the component census subdivisions are found outside a census metropolitan area.

Census divisions associated with records in the database were categorized using the above method, originally developed by Bollman (2017) as part of work for the Rural Ontario Institute.[4] The distribution of all records in the dataset by rural classification using this method is given in Table 11.

Table 11: Needs records by rurality of census divisions

Census Division category	Count of records	Share of all records
Metro	240,984	49.3%
Partially non-metro	208,211	42.6%
Non-metro	39,796	8.1%
Total	488,991	100.0%

Records were split almost evenly between metro (49%) and partially non-metro census divisions (43%), with only eight percent of all records being associated with non-metro census divisions.

However, when needs records are counted on a per-capita basis in proportion to the population of each census division category, a different picture becomes apparent. Across all census divisions in 2016, each block of one thousand people corresponded to 16.5 records. The distribution of records per capita for each census division category in 2016 is given in Table 12.

Table 12: Needs records per 1,000 people by rurality of census division, 2016

Census Division category	Count of records, 2016	Share of all records, 2016	Pop., 2016	Count of records per 1,000 pop., 2016
Metro	104,884	47.1%	7,539,269	13.9
Partially non-metro	99,089	44.5%	4,161,989	23.8
Non-metro	18,541	8.3%	1,747,236	10.6
Total	222,514	100.0%	13,448,494	16.5

[4] See: Bollman, R. (2017). *Rural Ontario's Demography: Census Update 2016* (Focus on Rural Ontario). Rural Ontario Institute. Retrieved from http://www.ruralontarioinstitute.ca/uploads/userfiles/files/Rural%20Ontario%E2%80%99s%20Demography_Census%20Update%202016.pdf

On a per-capita basis, needs records were most frequently associated with calls from partially non-metro census divisions (24 per 1,000 people), with similar per-capita frequency rates in both metro (14 per 1,000 people) and non-metro census divisions (11 per 1,000 people).

The second method of categorization involved aggregation of census subdivisions by their index of remoteness values, making use of a method recently employed by Alasia et al (2017) at Statistics Canada. All census subdivisions in Canada were scored on their relative remoteness, with zero being as non-remote as possible and 1.0 being as remote as possible.

For reference, Table 13 includes a number of example communities for each Index of Remoteness class. For those very remote communities, the census division name is included in brackets. Appendix I presents the Index of Remoteness by census subdivision.

Table 13: Index of Remoteness example communities

Index of Remoteness value	Example Communities
Zero to 0.1	Toronto, Ottawa, Mississauga
0.1 to 0.2	Windsor, Kingston, Chatham-Kent
0.2 to 0.3	Greater Sudbury / Grand Sudbury, Thunder Bay, North Bay
0.3 to 0.4	Sault Ste. Marie, Timmins, Kenora
0.4 to 0.5	Kapuskasing, Dryden, Fort Frances
0.5 to 0.6	Sioux Lookout (Kenora), Greenstone (Thunder Bay), Red Lake (Kenora)
0.6 to 0.7	Moosonee (Cochrane), Hornepayne (Algoma), Dubreuilville (Algoma)
0.7 to 0.8	Cat Lake 63C (Kenora), Osnaburgh 63A (Thunder Bay), Slate Falls (Kenora)
0.8 to 0.9	Pikangikum 14 (Kenora), Sandy Lake 88 (Kenora), Kasabonika Lake (Kenora)
0.9 to 1	Attawapiskat 91A (Kenora), Fort Albany Part 67 (Kenora), Peawanuck (Kenora)

The distribution of records in the dataset which could be associated with a census subdivision by remoteness index value is given in Table 14.

Table 14: Needs records by remoteness of census subdivision

Index of Remoteness value	Count of records associated with CSDs	Share of all records associated with CSDs
Zero to 0.1	266,627	61.7%
0.1 to 0.2	108,765	25.2%
0.2 to 0.3	46,086	10.7%
0.3 to 0.4	8,331	1.9%
0.4 to 0.5	1,569	0.4%
0.5 to 0.6	538	0.1%
0.6 to 0.7	47	0.0%
0.7 to 0.8	19	0.0%
0.8 to 0.9	33	0.0%
0.9 to 1	37	0.0%
Total	432,052	100.0%

The overwhelming majority of needs records associated with census subdivisions were associated with census subdivisions classified as having an index of remoteness value of 0.3 or less (97.5%); almost two-thirds were associated with census subdivisions classified as having a remoteness index value of less than 0.1 – indicating a minimal degree of relative remoteness. Similarly, the average remoteness index value for all records associated with census subdivisions was 0.110, again indicating a low degree of relative remoteness.

When needs records are counted on a per-capita basis in proportion to the population of census subdivisions categorized by average index of remoteness value, a similar picture becomes apparent. Across all census subdivisions in 2016, each block of one thousand people corresponded to 14.7 records. The distribution of records per capita for each census subdivision in 2016, further categorized by average index of remoteness value, is given in Table 15.

Table 15: Needs records per 1,000 people by average index of remoteness value, 2016

Index of Remoteness value	Count of records associated with CSDs, 2016	Share of all records associated with CSDs, 2016	Pop., 2016	Count of records per 1,000 people, 2016
Zero to 0.1	116,330	59.4%	9,869,213	11.8
0.1 to 0.2	50,536	25.8%	2,403,343	21.0
0.2 to 0.3	24,208	12.4%	678,468	35.7
0.3 to 0.4	3,906	2.0%	284,069	13.8
0.4 to 0.5	627	0.3%	76,820	8.2
0.5 to 0.6	257	0.1%	45,503	5.6
0.6 to 0.7	34	0.0%	4,082	8.3
0.7 to 0.8	8	0.0%	1,122	7.1
0.8 to 0.9	17	0.0%	4,164	4.1
0.9 to 1	7	0.0%	3,664	1.9
Total	195,930	100.0%	13,370,448	14.7

Again, most records which would be associated with census subdivisions in 2016 were associated with census subdivisions rated as having an index of remoteness value of 0.3 or less, indicating a low degree of relative remoteness. The highest per-capita count of records (36 per 1,000 people) – more than double the overall average – is associated with census subdivisions categorized as having an index of remoteness value of between 0.2 and 0.3. Records associated with communities ranking far higher in terms of relative remoteness were associated with far fewer records per-capita than average. Overall, the most remote communities seem to be associated with the lowest per-capita frequency of needs records.

4.5.4 Geographic distribution of needs by census division

For each of the top five most frequently cited needs categories, the distribution of records by census division for the entire time period of the 211 call dataset (2016-2018) for the top three census divisions is given in Table 16.

Table 16: Needs records by Level 1 needs category by census division

Level 1 Needs Category	Census Division	Count of records	Share of records per category	Share of all records
Health		65,312		13.4%
	Toronto	18,989	29.1%	3.9%
	Niagara	10,203	15.6%	2.1%
	Ottawa	6,103	9.3%	1.2%
Other Government/Economic Services		54,100		11.1%
	Niagara	12,168	22.5%	2.5%
	Toronto	10,896	20.1%	2.2%
	Ottawa	7,190	13.3%	1.5%
Housing		48,770		10.0%
	Toronto	19,363	39.7%	4.0%
	Niagara	5,009	10.3%	1.0%
	Ottawa	4,368	9.0%	0.9%
Individual/Family Services		44,895		9.2%
	Ottawa	17,309	38.6%	3.5%
	Toronto	7,899	17.6%	1.6%
	Simcoe	3,584	8.0%	0.7%
Legal/Public Safety		41,827		8.6%
	Toronto	13,476	32.2%	2.8%
	Essex	5,598	13.4%	1.1%
	Niagara	5,325	12.7%	1.1%
Total (top 5 categories)		254,904		52.1%

The top five most-frequently reported needs categories account for slightly more than half of all records. Within this subset of categories, the Toronto census division was consistently present in the top three census divisions by volume of records. The Niagara Falls and Ottawa census divisions also appeared frequently. This pattern of populous census divisions was not entirely consistent: Simcoe census division ranked third in the volume of records pertaining to individual/family services needs, and Essex census division ranked second in the volume of records pertaining to legal/public safety needs.

A different pattern emerges when records are counted on a per-capita basis in proportion to the population of each census division. Across all census divisions in 2016, each block of one thousand people corresponded to 8.6 call records pertaining to the top five most-frequently recorded needs categories. The distribution of records by census division for 2016 for the top three census divisions, categorized by the top five Level 1 needs categories, is given in Table 17.

Table 17: Needs records per 1,000 population by Level 1 needs category by census division, 2016

Level 1 Needs Category	Census Division	Count of records, 2016	Pop., 2016	Count of records per 1,000 pop., 2016
Health		29,641	13,448,494	2.20
	Thunder Bay	2,952	146,048	20.21
	Niagara	4,976	447,888	11.11
	Essex	2,314	398,953	5.80
Other Government/Economic Services		24,268	13,448,494	1.80
	Thunder Bay	2,972	146,048	20.35
	Niagara	5,311	447,888	11.86
	Essex	3,293	398,953	8.25
Housing		20,071	13,448,494	1.49
	Grey	507	93,830	5.40
	Niagara	2,199	447,888	4.91
	Essex	1,860	398,953	4.66
Individual/Family Services		22,834	13,448,494	1.70
	Thunder Bay	2,189	146,048	14.99
	Ottawa	9,744	934,243	10.43
	Essex	1,524	398,953	3.82
Legal/Public Safety		18,600	13,448,494	1.38
	Thunder Bay	1,033	146,048	7.07
	Essex	2,696	398,953	6.76
	Niagara	2,662	447,888	5.94
Total (top 5 categories)		115,414	13,448,494	8.58

The Thunder Bay census division consistently ranks at the top of the list for the greatest proportionate frequency of records in four out of the top five most frequently cited needs categories, save for housing. Contrary to the absolute counts noted earlier, census divisions with large urban centres do not dominate top three per-capita frequency counts.

4.5.5 Geographic distribution of needs by census subdivision

The distribution of records by census subdivision categorized by the top five most frequently cited Level 1 needs categories for the entire period of the 211 call dataset (2016-2018) is given in Table 18. The table gives values for the top three census subdivisions by frequency.

Table 18: Needs records by Level 1 needs category by census subdivision

Level 1 Needs Category	Census Subdivision	Count of records	Share of records per category	Share of all records
Health		57,983	13.4%	13.4%
	Toronto	13,584	23.4%	3.1%
	Ottawa	5,727	9.9%	1.3%
	Thunder Bay	5,586	9.6%	1.3%
Other Government/ Economic Services		49,750	11.5%	11.5%
	Toronto	7,706	15.5%	1.8%
	Ottawa	6,888	13.8%	1.6%
	Windsor	6,599	13.3%	1.5%
Individual/Family Services		41,807	9.7%	9.7%
	Ottawa	16,940	40.5%	3.9%
	Toronto	5,834	14.0%	1.4%
	Thunder Bay	3,139	7.5%	0.7%
Housing		40,500	9.4%	9.4%
	Toronto	12,668	31.3%	2.9%
	Ottawa	4,077	10.1%	0.9%
	Windsor	4,051	10.0%	0.9%
Legal/Public Safety		36,407	8.4%	8.4%
	Toronto	9,426	25.9%	2.2%
	Windsor	5,201	14.3%	1.2%
	Ottawa	3,188	8.8%	0.7%
Total (top 5 categories)		226,447		52.4%

The top five most-frequently reported needs categories account for slightly more than half of all records. Within this subset of categories, of the records which had valid CSD attributes, the Toronto census subdivision was consistently present in the top three census subdivisions by volume of records. The Ottawa and Windsor census divisions also appeared frequently.

However, when records are counted on a per-capita basis in proportion to the population of each census subdivision, a very different pattern emerges. The distribution of records per-capita categorized by the top five most frequently cited Level 1 needs categories for 2016 is given in Table 19. The table gives values for the top three census subdivisions by per-capita frequency.[5]

In most of the needs categories listed, the census subdivisions with the highest per-capita frequency rates are those of smaller mid-size or relatively rural communities.

[5] Note: These values exclude five census subdivisions for which census population values were not reported in 2016: Flying Post 73; Pikangikum 14; Rankin Location 15D; Six Nations (Part) 40; and Wahta Mohawk Territory.

Table 19: Needs records per 1,000 population by Level 1 needs category by census subdivision, 2016

Level 1 Needs Category	Census Subdivision	Count of records, 2016	Pop., 2016	Count of records per 1,000 pop., 2016
Health		26,235	13,022,579	2.0
	Opasatika	10	226	44.2
	Collingwood	580	21,793	26.6
	Wahnapitei 11	3	116	25.9
Other Government/Economic Services		22,214	12,888,150	1.7
	Thunder Bay	2,871	107,909	26.6
	Niagara Falls	2,103	88,071	23.9
	St. Catharines	1,955	133,113	14.7
Individual/Family Services		21,268	12,844,742	1.7
	Collingwood	520	21,793	23.9
	Thunder Bay	2,066	107,909	19.1
	Conmee	9	819	11.0
Housing		16,564	12,940,188	1.3
	Northwest Angle 33B	2	95	21.1
	Owen Sound	334	21,341	15.7
	Collingwood	311	21,793	14.3
Legal/Public Safety		16,191	13,032,918	1.2
	Opasatika	3	226	13.3
	Munsee-Delaware Nation 1	2	153	13.1
	Gros Cap 49	1	77	13.0
Total (top 5 categories)		102,472	13,309,073	7.7

4.5.6 Geographic distribution of needs between urban and rural locations

The relative demand for different needs topics can be categorized on the basis of rurality and remoteness using the methods outlined in Section 4.5.3 of this report.

The top five most-frequently cited need subjects (using level 3 taxonomic categories) for each of the three rurality categories as defined by Bollman (2017) are given in Table 20.

Table 20: Most frequently cited needs by rurality of census division

Needs category	Count of records	Share of all records in census division category
Metro Census Divisions		
Information Lines	15,563	6.5%
Holiday Programs	15,255	6.3%
Emergency Food	19,939	4.5%
Emergency Shelter	8,615	3.6%
Tax Preparation Assistance	6,504	2.7%
Partially Non-metro Census Divisions		
Tax Preparation Assistance	9,797	4.7%
Records/Licenses/Permits	8,224	3.9%
Information Lines	6,978	3.4%
Tax Information	6,454	3.1%
Utility Assistance	5,439	2.6%
Non-metro Census Divisions		
Utility Assistance	4,285	10.8%
Local Transportation	1,163	2.9%
Student Services and Campus Life	1,079	2.7%
Records/Licenses/Permits	1,021	2.7%
Emergency Food	1,013	2.6%

While several needs categories are repeated across all domains of rurality, patterns of difference are apparent. Those in metro census divisions most frequently used the 211 service to obtain information about information lines and holiday programs, followed by emergency food and shelter. Callers in census divisions categorized as partially non-metro most often sought assistance with tax preparation and other administrative undertakings. However, callers

from non-metro census divisions – those expected to be most rural in nature – predominantly sought assistance with the provision of utility services (i.e., heating, electricity, water).

The most frequently-cited needs subjects (using level 3 taxonomic categories), categorized by the index of remoteness values for the records that could be associated with census subdivisions, are given in Table 21.

Table 21: Most frequently cited needs by remoteness of census subdivision

Index of Remoteness Value	Most cited needs category (level 3)	Count of records	Share of all records in census subdivision category
Zero to 0.1	Holiday Programs	15,193	3.5%
0.1 to 0.2	Records/Licenses/Permits	5,850	5.4%
0.2 to 0.3	Utility Assistance	2,933	6.4%
0.3 to 0.4	Utility Assistance	589	7.1%
0.4 to 0.5	Utility Assistance	138	8.8%
0.5 to 0.6	Utility Assistance	85	15.8%
0.6 to 0.7	Utility Assistance	9	19.1%
0.7 to 0.8	Records/Licenses/Permits	3	15.8%
0.8 to 0.9	Records/Licenses/Permits	2	6.1%
0.9 to 1	In Home Assistance	7	18.9%

Similar to the earlier findings, callers in the least remote communities are primarily concerned with information regarding holiday programs and administrative records or licensing/permitting. Assistance regarding utility services is the most frequently cited need subject for a broad cross-section of community types, ranging from those of relatively low degree of remoteness (remoteness index values of 0.2 to 0.3) to communities that bear a high degree of remoteness (0.7 to 0.8 on the remoteness index). Records associated with communities categorized as having a high degree of remoteness are most frequently related to administrative records of licensing/permitting, and in the most remote communities, in home assistance.

4.5.7 Geographic distribution of unmet needs by census division

For each of the five most-frequently cited reasons for why a caller's need could not be met, the distribution of records which resulted in an unmet need is given by census division for the entire time period of the 211 call dataset (2016-2018) in Table 22. The table gives values for the top three census divisions by frequency.

Table 22: Most frequently cited reason for needs going unmet by census division

Reason Need Unmet	Census Division	Count of records	Share of records per category
No resource found to meet need		2,398	
	Thunder Bay	340	14.2%
	Ottawa	310	12.9%
	Toronto	286	11.9%
Ineligible for service		1,469	
	Ottawa	171	11.6%
	Niagara	161	11.0%
	Thunder Bay	147	10.0%
Inquirer refused referral		1,011	
	Niagara	207	20.5%
	Ottawa	144	14.2%
	Toronto	125	12.4%
Hours of agency/program did not meet needs of inquirer		555	
	Toronto	157	28.3%
	Ottawa	81	14.6%
	Niagara	81	14.6%
Full/waiting list		442	
	Niagara	115	26.0%
	Ottawa	113	25.6%
	Toronto	46	10.4%
Total (top 5 categories)		5,875	

The Ottawa census division was consistently present in the top three census divisions by volume of records. The Niagara and Toronto census divisions also appeared frequently.

A different pattern emerges when records are counted on a per-capita basis in proportion to the population of each census division. The distribution of records by census division for 2016, categorized by the top five most frequently-cited reasons why a caller's need could not be met, is given in Table 23. The table gives values for the top three census divisions by frequency.

Table 23: Frequency of needs records with unmet needs per 1,000 residents by census division, 2016

Reason Need Unmet	Census Division	Count of records, 2016	Pop., 2016	Count of records per 1,000 pop., 2016
No resource found to meet need		907	13,239,412	0.07
	Thunder Bay	114	146,048	0.78
	Grey	36	93,830	0.38
	Prince Edward	9	24,735	0.36
Inquirer refused referral		714	12,952,059	0.06
	Thunder Bay	64	146,048	0.44
	Niagara	148	447,888	0.33
	Kenora	8	65,533	0.12
Ineligible for service		577	13,228,371	0.04
	Thunder Bay	95	146,048	0.65
	Grey	26	93,830	0.28
	Sudbury	5	21,546	0.23
Hours of agency/program did not meet needs of inquirer		209	9,878,221	0.02
	Thunder Bay	37	146,048	0.25
	Sudbury	2	21,546	0.09
	Niagara	25	447,888	0.06
Inquirer unable to connect with agency/program		141	10,964,910	0.01
	Thunder Bay	25	146,048	0.17
	Niagara	31	447,888	0.07
	Frontenac	7	150,475	0.05
Total (top 5 categories)		2,548		

The Thunder Bay census division consistently ranks at the top of the list for the greatest proportionate frequency of records in all of the top five most frequently-reported categories.

Contrary to the absolute counts noted earlier, census divisions with large urban centres do not dominate the top three per-capita frequency counts.

4.5.8 Geographic distribution of unmet needs by census subdivision

For each of the five most-frequently cited reasons for why a caller's need could not be met, the distribution of records which resulted in an unmet need is given by census subdivision for the entire time period of the 211 call dataset (2016-2018) in Table 24. The table gives values for the top three census subdivisions by frequency.

Table 24: Most frequently cited reason for needs going unmet by census subdivision

Reason Need Unmet	Census Subdivision	Count of records	Share of records per category
No resource found to meet need		2,398	
	Thunder Bay	317	13.2%
	Ottawa	302	12.6%
	Toronto	195	8.1%
Ineligible for service		1,469	
	Ottawa	169	11.5%
	Thunder Bay	134	9.1%
	Toronto	95	6.5%
Inquirer refused referral		1,011	
	Ottawa	144	14.2%
	Toronto	97	9.6%
	St. Catharines	82	8.1%
Hours of agency/program did not meet needs of inquirer		555	
	Toronto	99	17.8%
	Ottawa	70	12.6%
	Thunder Bay	61	11.0%
Full/waiting list		442	
	Ottawa	112	25.3%
	Niagara Falls	75	17.0%
	Toronto	33	7.5%
Total (top 5 categories)		5,875	

The Ottawa and Toronto census subdivisions were consistently present in the top three census subdivisions by volume of records. The Thunder Bay census subdivision also appeared frequently.

A different pattern emerges when records are counted on a per-capita basis in proportion to the population of each census subdivision. The distribution of records in 2016 which resulted in a caller's need not being met, categorized by the top five most frequently-reported reasons for a why a need could not be met, is given in Table 25.[6] The table gives values for the top three census subdivisions by frequency, and only includes values for records with valid census subdivision attributes.

With the exception of two categories, the census subdivisions representing very small and rural communities dominate the top three per-capita frequency counts.

[6] These values exclude one census subdivision for which census population values were not reported in 2016: Six Nations (Part) 40.

Table 25: Frequency of needs records with unmet needs per 1,000 residents by census subdivision, 2016

Reason Need Unmet	Census Subdivision	Count of records, 2016	Pop., 2016	Count of records per 1,000 pop., 2016
No resource found to meet need		824	10,901,061	0.1
	Wahnapitei 11	1	116	8.6
	Opasatika	1	226	4.4
	Johnson	1	751	1.3
Inquirer refused referral		677	10,218,275	0.1
	Sheguiandah 24	1	134	7.5
	Opasatika	1	226	4.4
	Dorion	1	316	3.2
Ineligible for service		551	10,778,885	0.1
	Saug-a-Gaw-Sing 1	1	98	10.2
	Ginoogaming First Nation	2	210	9.5
	Dorion	2	316	6.3
Hours of agency/program did not meet needs of inquirer		166	7,781,699	0.0
	South River	1	1,114	0.9
	St.-Charles	1	1,269	0.8
	Thunder Bay	29	107,909	0.3
Inquirer unable to connect with agency/program		136	6,913,631	0.0
	Killarney	1	386	2.6
	Wawa	1	2,905	0.3
	Thunder Bay	25	107,909	0.2
Total (top 5 categories)		2,354	12,201,851	0.2

4.5.9 Geographic distribution of unmet needs between urban and rural locations

The recorded reasons why a caller's request could not be filled can be categorized on the basis of rurality and remoteness using the methods outlined in Section 4.5.3 of this report.

The top five most-frequently cited reasons for 'unmet needs' for each of the three rurality categories as defined by Bollman (2017) are given in Table 26.

Table 26: Most frequently cited reason for needs going unmet by rurality of census division

Reason Need Unmet	Count of records	Share of all records classified as being unmet in census division category
Metro Census Divisions		
No resource found to meet need	846	30.4%
Ineligible for service	507	18.2%
Inquirer refused referral	407	14.6%
Hours of agency/program did not meet needs of inquirer	272	9.8%
Full/waiting list	202	7.3%
Partially Non-metro Census Divisions		
No resource found to meet need	1,118	34.4%
Ineligible for service	670	20.6%
Inquirer refused referral	489	15.0%
Hours of agency/program did not meet needs of inquirer	237	7.3%
Full/waiting list	206	6.3%
Non-metro Census Divisions		
No resource found to meet need	434	39.9%
Ineligible for service	292	26.8%
Inquirer refused referral	115	10.6%
Agency/program resources depleted	64	5.9%
Hours of agency/program did not meet needs of inquirer	46	4.2%

Reasons for needs going unmet were very similar across categories of rurality. Across all census divisions, regardless of their rurality, the most frequently cited explanation for a call resulting in an unmet need was simply that 211 was unable to find a resource which would meet the need as defined by the caller. Ineligibility for and refusal of referral for the suggested service or resource similarly constituted the second and third most frequently cited reason for needs being unmet across types of census divisions.

The most frequently-cited reasons for need going unmet, categorized by the index of remoteness values for the records that could be associated with census subdivisions, are given in Table 27.

Table 27: Most frequently cited reasons for unmet needs by remoteness of census subdivision

Index of Remoteness Value	Most cited reason for unmet need	Count of records	Share of all records classified as being unmet in census subdivision category
Zero to 0.1	No resource found to meet need	1,055	29.2%
0.1 to 0.2	No resource found to meet need	498	37.0%
0.2 to 0.3	No resource found to meet need	519	40.0%
0.3 to 0.4	No resource found to meet need	115	40.1%
0.4 to 0.5	No resource found to meet need	36	55.4%
0.5 to 0.6	Ineligible for service	9	40.9%
0.6 to 0.7	Ineligible for service	1	100.0%
0.7 to 0.8	N/A	N/A	N/A
0.8 to 0.9	No resource found to meet need	1	50.0%
0.9 to 1	N/A	N/A	N/A

Similar to the earlier findings, the primary reason for a needs record being classified as unmet was the inability to find a relevant service to address the need. Ineligibility was cited most frequently in communities classified as being on the middle-to-high end of the remoteness scale.

5 Recommendations

The exploratory analysis process and stakeholder engagement described in this report have pointed to a series of recommendations for improving both the utility of 211 data and the opportunities for more effective use in human services planning.

Broadly, our recommendations relate to suggestions for future lines of inquiry, suggestions for optimizing how data is collected and stored, and recommendations for how the data can be better shared with others to open up new collaboration opportunities and insights.

5.1 Opportunities for Additional Analysis

This section includes a number of data observations and opportunities for additional analysis as identified through the stakeholder engagement process. While much of the analysis stakeholders were interested in was not within the scope of the present study, the opportunities that are the priority of stakeholders for future work are outlined here.

For example, at the workshop the Insights platform was used to import, integrate and visualize data stored on a participating organization's website in Excel format on percentage of low income households by CSD. This was to test the feasibility of other organizations potentially employing their own data to supplement the 211 data. In this instance with respect to the hypothesis that geographies with lower levels of income may correlate with more calls to 211. The "proof of concept" was successful not only because of the capabilities of the Insights platform but because the CSD identifiers in both the 211 data set and the supplementary data set were consistent.

While the 211 dataset by itself may not be able to directly answer the questions noted below, it can be used in conjunction with further analysis to be undertaken by 211 or others, using a broader 211 dataset or combining 211 data with other sources. A number of the questions noted below may require further clarification and scoping before a determination can be made regarding how they might be operationalized using the 211 dataset.

5.1.1 Outstanding Service Gap Questions

Some additional analysis may shed light on the following questions identified in the workshop, at least in part:

- Is transportation a barrier to service?
- Is transportation a bigger barrier to service in rural locations?
- What are the gaps in service by municipality?
- What service gaps exist, and where?

- If we know a service is not provided in a given census division, does it show up as an unmet need?
- Can we determine needs vs. available services?

5.1.2 Analysis of Unmet Needs

Questions related to unmet needs identified by stakeholders that may be explored with additional analysis include:

- Why do needs go unmet?
- Is there a consistent pattern wherein the same needs are reported together (or not) in the same place?
- Can we unpack the "Resource not available" reason for needs going unmet?
- Can we unpack the "Ineligible for service" reason for needs being recorded as unmet?
- What does follow-up data tell us about needs met vs. needs unmet?
- Are there enough services in each census subdivision to support/deliver the needs identified as met?
- Why are callers not eligible for service?

5.2 Call Record Data Collection and Storage

Several recommendations can be made in relation to the way in which call records are tracked by 211 Ontario, which will assist with more efficient data analysis going forward:

1. 211 Ontario should maintain a concordance list to maintain consistency between the colloquial municipal and regional nomenclature recorded during calls and the official nomenclature used in standard geographic units (e.g., census divisions, census subdivisions).
2. Caller geography recorded at the regional and city level should be recorded using standard geographic unit nomenclature, such that entries can be associated with census divisions and census subdivisions. Given that call operators likely record regions and cities using common placenames, a backend concordance list should be maintained to allow for association between common placenames and standard geographic unit nomenclature.
3. Where possible, full postal code information should be obtained as often as possible so as to allow for improved geographic resolution while still maintaining a reasonable degree of caller privacy. While full information is preferred, collection of three-digit postal code information is still valuable if full information is refused or unavailable.
4. Explore the potential for linking website needs data to caller needs data to provide a fuller picture of the distribution of needs.

The degree to which 211 call operators are able to collect high quality geographic information should be viewed as having a meaningful impact on service provision. Besides the obvious

need for such information to be able to pinpoint available services, call operators should understand how such information can feed into macro-level analytics which may ultimately drive policymaking decisions.

5.3 Data Sharing

A central element of the feedback obtained from stakeholders through this process was the discussion around data sharing and how to best make this data available to those who will use it. The following recommendations suggest opportunities for extending the 211 dataset through data sharing/open data initiatives and offer specific platform recommendations or other opportunities and challenges with continuing access to the data.

1. Web-based mapping and analytical tools are key in empowering stakeholders to explore the data at their own pace, allowing them to generate and answer their own questions using intuitive graphics/charts and density mapping, as well as linking the dataset with other data sources to show relationships. To facilitate this, it is recommended that 211 and its partners publish the dataset to a common cloud platform, such as ArcGIS Enterprise or ArcGIS Online. Since many current and potential 211 partners are running Esri ArcGIS Online products, sharing and collaboration can be streamlined by leveraging common software and tools that are regularly used.
2. Data security and privacy should be taken seriously and discussed with Information Technology (IT) professionals in order to mitigate risks. Running ArcGIS Online may be an issue for some IT organizations since the 211 data would be stored on foreign US servers. ArcGIS Enterprise may offer a better privacy solution since it can run on domestic servers owned and operated by 211.
3. ArcGIS Online applications, such as Insights, Dashboards and Story Maps will have maintenance fee implications. Licensing of these products should be discussed with an Esri Canada representative to understand additional costs that may arise. Esri Canada can also provide additional solutions and training to maximize integration with the Business Intelligence Platform currently being used by 211.
4. Unrolling data sharing opportunities and an accessible platform should be supported by webinars and/or an online guide for potential partners, as well as conference presentations that highlight the opportunities for accessing and leveraging 211 Ontario data.
5. Accompanying any new platform for accessing 211 Ontario data should be an updated Terms and Conditions of Use for 211 Ontario Call/Contact Data. Because the Insights platform currently offers an English-only interface, this revised data use contract could include an agreement that the user understands that the platform is limited to English-only.

6 Conclusion

The Analyzing 211 Rural Unmet Service Needs exploratory research project leveraged new web-based software tools for geographically-based large dataset analysis. Data preparation and cleanup efforts were undertaken to ensure concordance between the geographic categorization used in the 211 dataset and Statistics Canada's standard geographic units. This enabled a focus on rural unmet needs by supporting linkages to Statistics Canada Ontario 2016 CSD census data and the Statistics Canada Remoteness Study. Through spatial analysis, these datasets were aggregated and enriched to better quantify patterns and distributions of the data, and to help answer how 211 needs are met across remote or rural communities.

The data preparation, linkages and use of the new Esri Insights platform enabled an exploratory analysis of a number of research questions related to the demographics, geographic distribution and needs of 211 callers as well as information on which needs were unmet and the opportunity for some hypothesis-testing as to why certain needs were going unmet.

The exploratory data analysis for this project did indeed point to differences in per capita call volumes and in the types of needs between remote, rural and urban geographies. This implies that those making plans for targeting services to particular populations at various scales or identifying service gaps could find this information valuable. It demonstrates that attention to structuring the 211 data to enable various avenues of geographic aggregation and disaggregation should remain an objective for 211 data retrieval. However, given that population numbers and overall call volumes shrink as population density declines and remoteness increases, caution needs to be exercised in interpreting this information and comparing jurisdictions. Feedback regarding the utility of the preliminary analysis emphasized that the information needed to be understood in the context of local knowledge of service delivery, regional levels of awareness/use of the 211 service and in term of other supplementary socio-economic data or service user statistics. Increased use of the 211 service itself over time and availability of time series data in the future will strengthen the reliability of the 211 data in conjunction with these other sources.

This research process and the accompanying stakeholder engagement pointed toward a host of additional avenues of research, lines of questioning and other opportunities to better leverage the data through improved data collection methods, data sharing and linkages to additional datasets. Although beyond the scope of the present study, these additional opportunities are outlined in this report's recommendations section, offering new lines of research and collaboration for potential future projects and partnerships. The geographic lens is but one potentially fruitful line of enquiry.

The feedback from stakeholders suggest that further investment in data sharing and data quality is warranted by the potential utility of the data. This feedback included perspectives from funding agencies, provincial representatives and service planning data users such as District Social Services Administration Boards (DSSABs) and Local Health Integration Network (LHINs). However, there were also concerns that the power of the information technology in terms of enabling graphs, tables and maps to be generated so readily held some potential pitfalls. There was discussion of the desirability of coordinating a "community of practice" surrounding the accessibility and use of the data, at least in the near term, in order to ensure that data analysts were exchanging findings and being careful not to extend the interpretation of results beyond the significance of the underlying data sets.

Appendices

ROI RURAL ONTARIO INSTITUTE

211 Ontario

Analyzing 211 Rural Unmet Needs

Needs by Census Division, 2016-2018

Appendix A

Number of Records

- 140 - 2,000
- 2,001 - 7,000
- 7,001 - 20,000
- 20,001 - 50,000
- 50,001 - 99,128

0 50 100 200 km

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY 211 ONTARIO AND STATISTICS CANADA

MAP CREATED BY: PFM
MAP CHECKED BY: MB
MAP PROJECTION: WGS 1984 WEB MERCATOR AUXILIARY SPHERE

FILE LOCATION:
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DILLON CONSULTING

PROJECT: 187544

STATUS: FINAL

DATE: 2018-10-12

ROI RURAL ONTARIO INSTITUTE

211 Ontario

Analyzing 211 Rural Unmet Needs

Needs by Census Subdivision, 2016-2018

Appendix B

Number of Records

- 1 - 2,000
- 2,001 - 7,000
- 7,001 - 2,0000
- 20,001 - 50,000
- 50,001 - 99,128
- Unknown/No Data

0 50 100 200 km

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY 211 ONTARIO AND STATISTICS CANADA

MAP CREATED BY: PFM
MAP CHECKED BY: MB
MAP PROJECTION: WGS 1984 WEB MERCATOR AUXILIARY SPHERE

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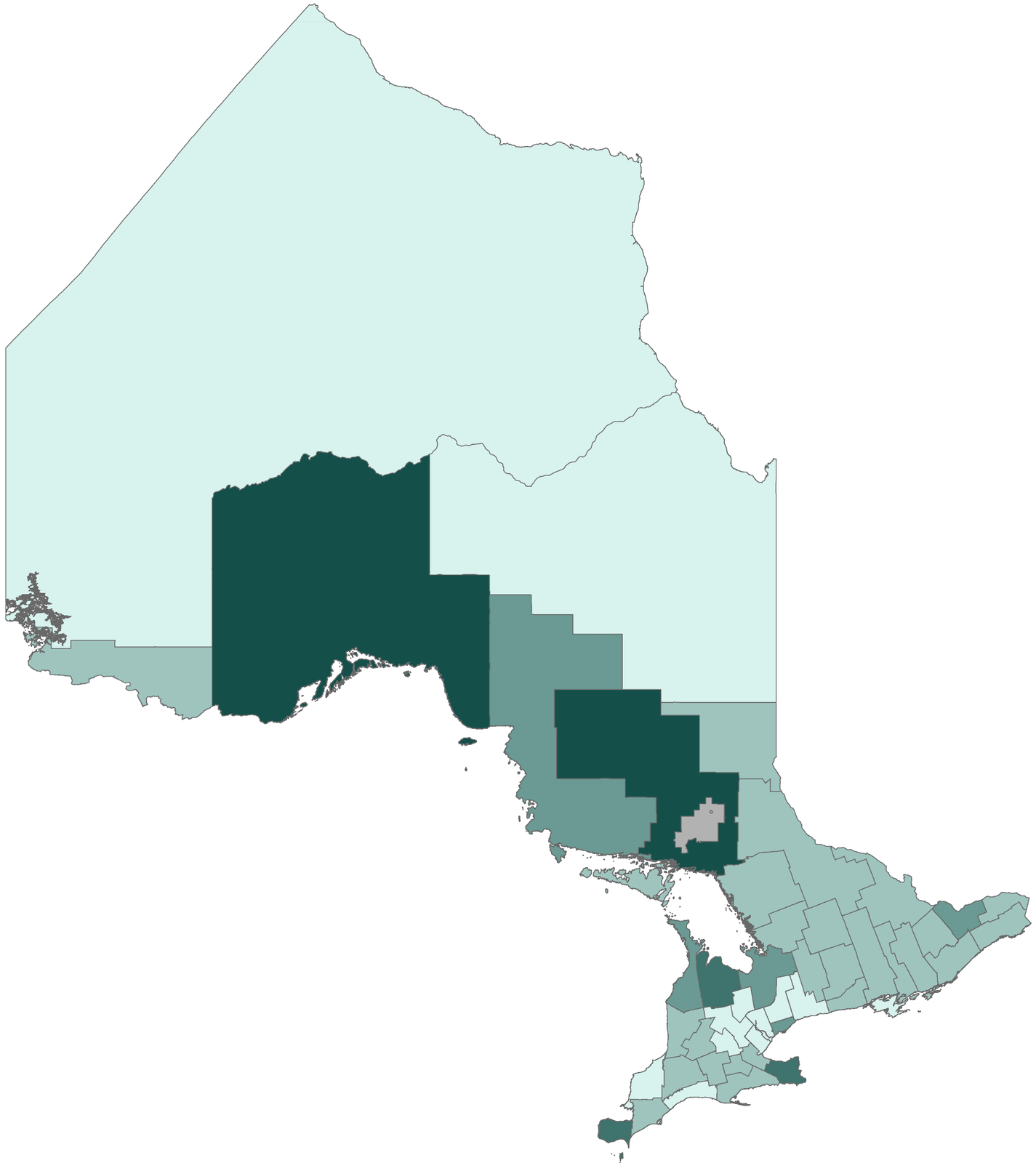
DILLON CONSULTING

PROJECT: 187544

STATUS: FINAL

DATE: 2018-10-12



RURAL ONTARIO INSTITUTE

211 Ontario

Analyzing 211 Rural Unmet Needs

Needs per Capita by Census Division, 2016

Appendix C

Number of Records per 1,000 Population

- 1 - 5
- 6 - 20
- 21 - 40
- 41 - 70
- 71 - 121
- Unknown/No Data

0 50 100 200 km

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY 211 ONTARIO AND STATISTICS CANADA

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MAP CHECKED BY: MB
MAP PROJECTION: WGS 1984 WEB MERCATOR AUXILIARY SPHERE

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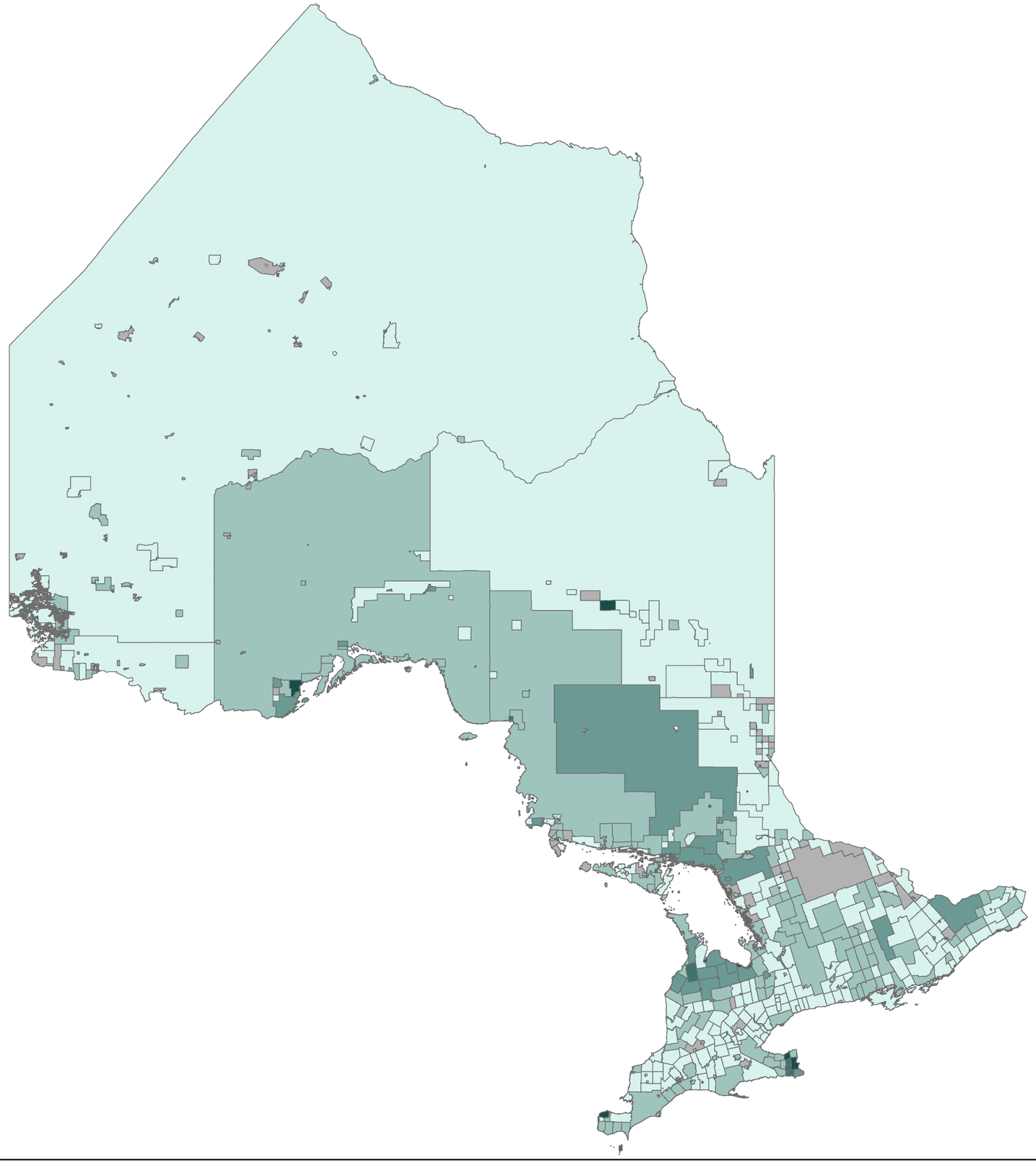
DILLON CONSULTING

PROJECT: 187544

STATUS: FINAL

DATE: 2018-10-12



ROI RURAL ONTARIO INSTITUTE

211 Ontario

Analyzing 211 Rural Unmet Needs

Needs per Capita by Census Subdivision, 2016

Appendix D

Number of Records per 1,000 Population

- 0 - 5
- 6 - 20
- 21 - 40
- 41 - 70
- 71 - 156
- Unknown/No Data

0 50 100 200 km

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY 211 ONTARIO AND STATISTICS CANADA

MAP CREATED BY: PFM
MAP CHECKED BY: MB
MAP PROJECTION: WGS 1984 WEB MERCATOR AUXILIARY SPHERE

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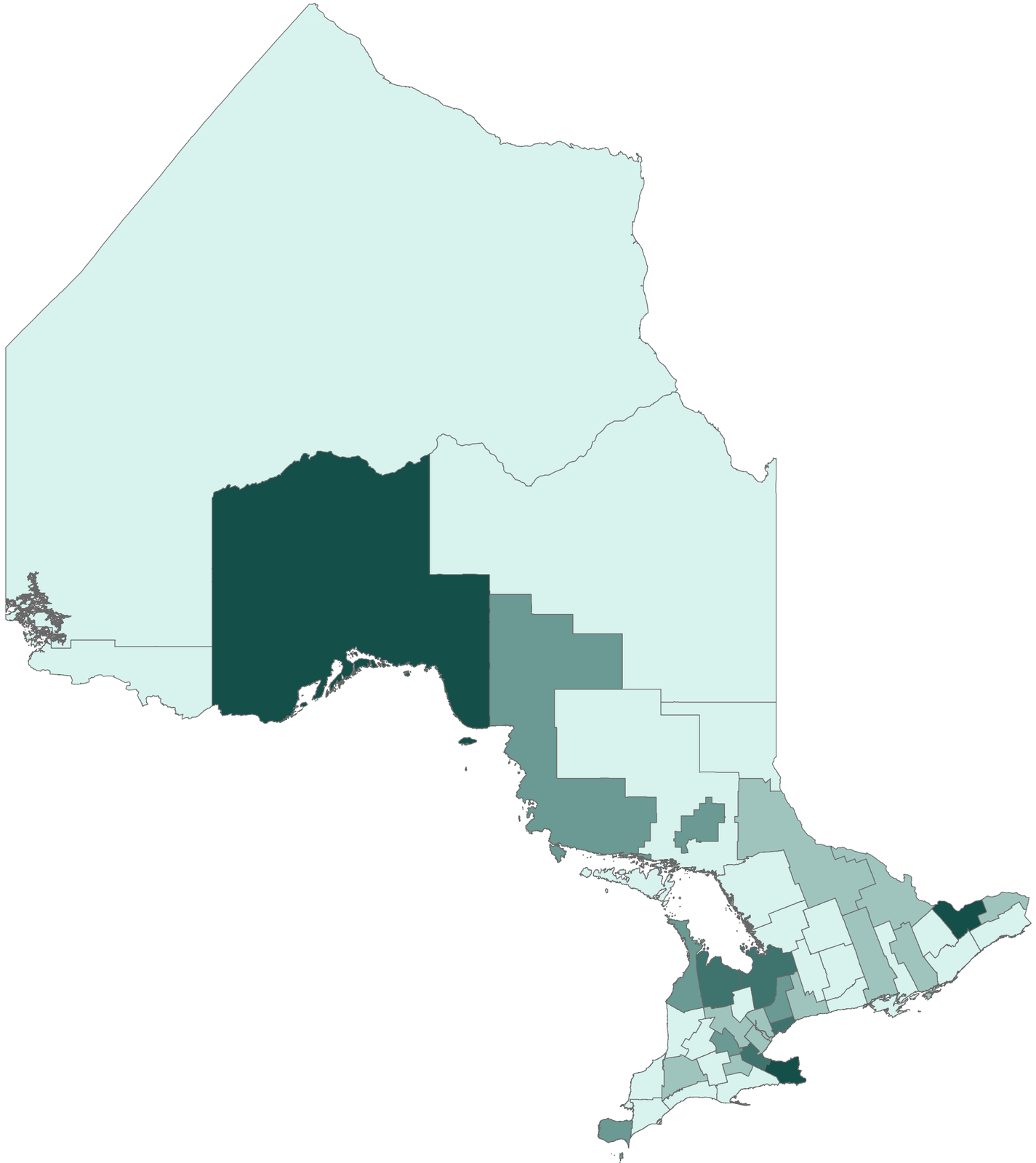
STATUS: FINAL

DATE: 2018-10-12



RURAL ONTARIO INSTITUTE

211 Ontario

Analyzing 211 Rural Unmet Needs

Unmet Needs by Census Division, 2016-2018

Appendix E

Number of Records

- 2 - 50
- 51 - 100
- 101 - 200
- 201 - 700
- 701 - 1,033

0 50 100 200 km

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY 211 ONTARIO AND STATISTICS CANADA

MAP CREATED BY: PFM
MAP CHECKED BY: MB
MAP PROJECTION: WGS 1984 WEB MERCATOR AUXILIARY SPHERE

FILE LOCATION:
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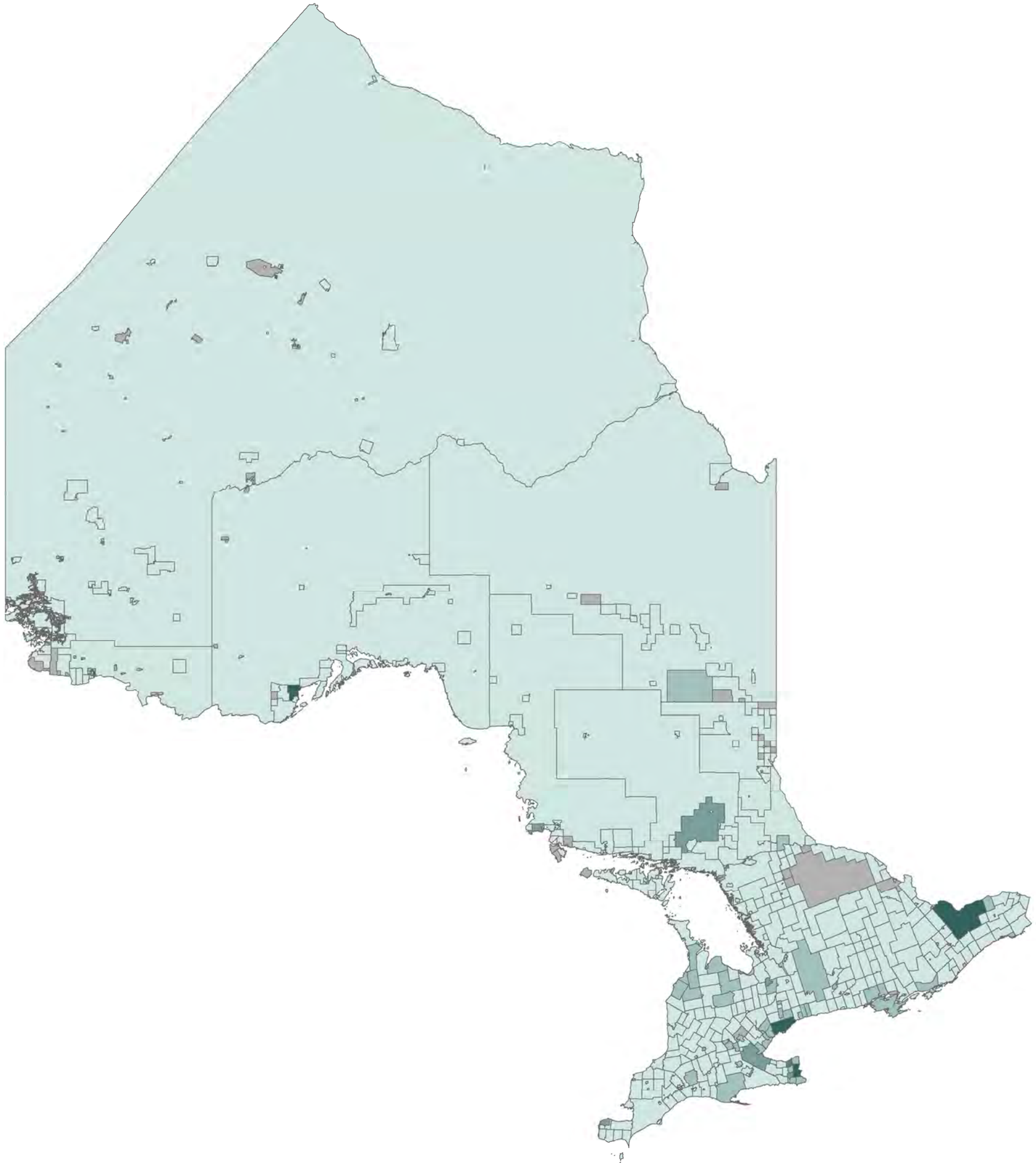
DILLON CONSULTING

PROJECT: 187544

STATUS: FINAL

DATE: 2018-10-12



RURAL ONTARIO INSTITUTE

211 Ontario

Analyzing 211 Rural Unmet Needs

Unmet Needs by Census Subdivision, 2016-2018

Appendix F

Number of Records

- 0 - 15
- 16 - 75
- 76 - 250
- 251 - 350
- 351 - 1,033
- Unknown/No Data

0 50 100 200 km

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY 211 ONTARIO AND STATISTICS CANADA

MAP CREATED BY: PFM
MAP CHECKED BY: MB
MAP PROJECTION: WGS 1984 WEB MERCATOR AUXILIARY SPHERE

FILE LOCATION:
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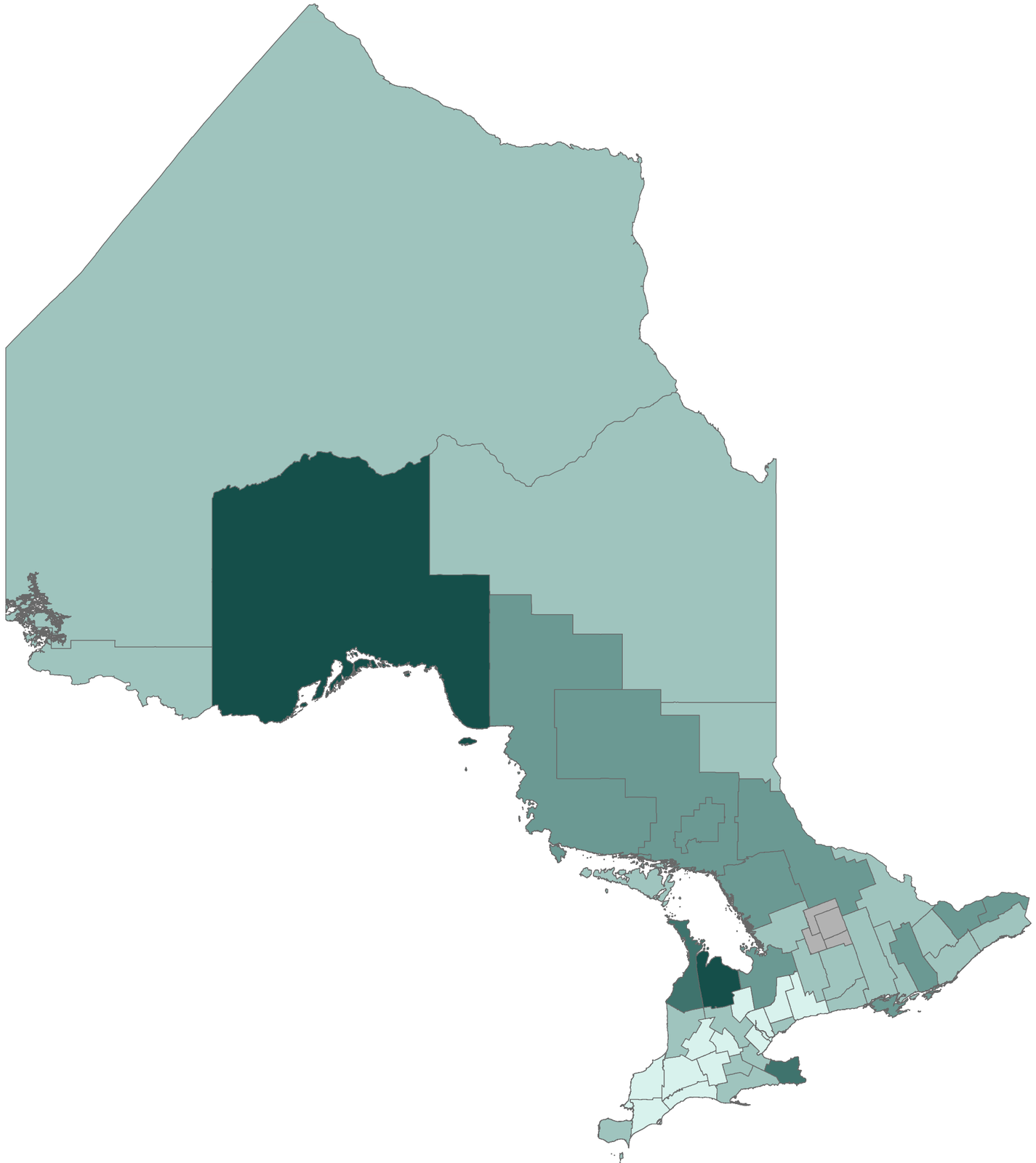
DILLON CONSULTING

PROJECT: 187544

STATUS: FINAL

DATE: 2018-10-12



RURAL ONTARIO INSTITUTE

211 Ontario

Analyzing 211 Rural Unmet Needs

Unmet Needs per Capita by Census Division, 2016

Appendix G

Number of Records per 1,000 Population

- 0.02 - 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 1.0
- 1.00 - 2.62
- Unknown/No Data

0 50 100 200 km

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY 211 ONTARIO AND STATISTICS CANADA

MAP CREATED BY: PFM
MAP CHECKED BY: MB
MAP PROJECTION: WGS 1984 WEB MERCATOR AUXILIARY SPHERE

FILE LOCATION:
G:\GIS\187544 ROI 211 Unmet Needs\GIS Data\MXD\20181005 Report\Unmet Needs per capita by census division, 2016.mxd

DILLON CONSULTING

PROJECT: 187544

STATUS: FINAL

DATE: 2018-10-12

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211 Ontario

Analyzing 211 Rural Unmet Needs

Unmet Needs per Capita by Census Subdivision, 2016

Appendix H

Number of Records per 1,000 Population

- 0.00 - 0.50
- 0.50 - 1.60
- 1.60 - 3.00
- 3.00 - 7.00
- 7.00 - 10.20
- Unknown/No Data

0 50 100 200 km

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY 211 ONTARIO AND STATISTICS CANADA

MAP CREATED BY: PFM
MAP CHECKED BY: MB
MAP PROJECTION: WGS 1984 WEB MERCATOR AUXILIARY SPHERE

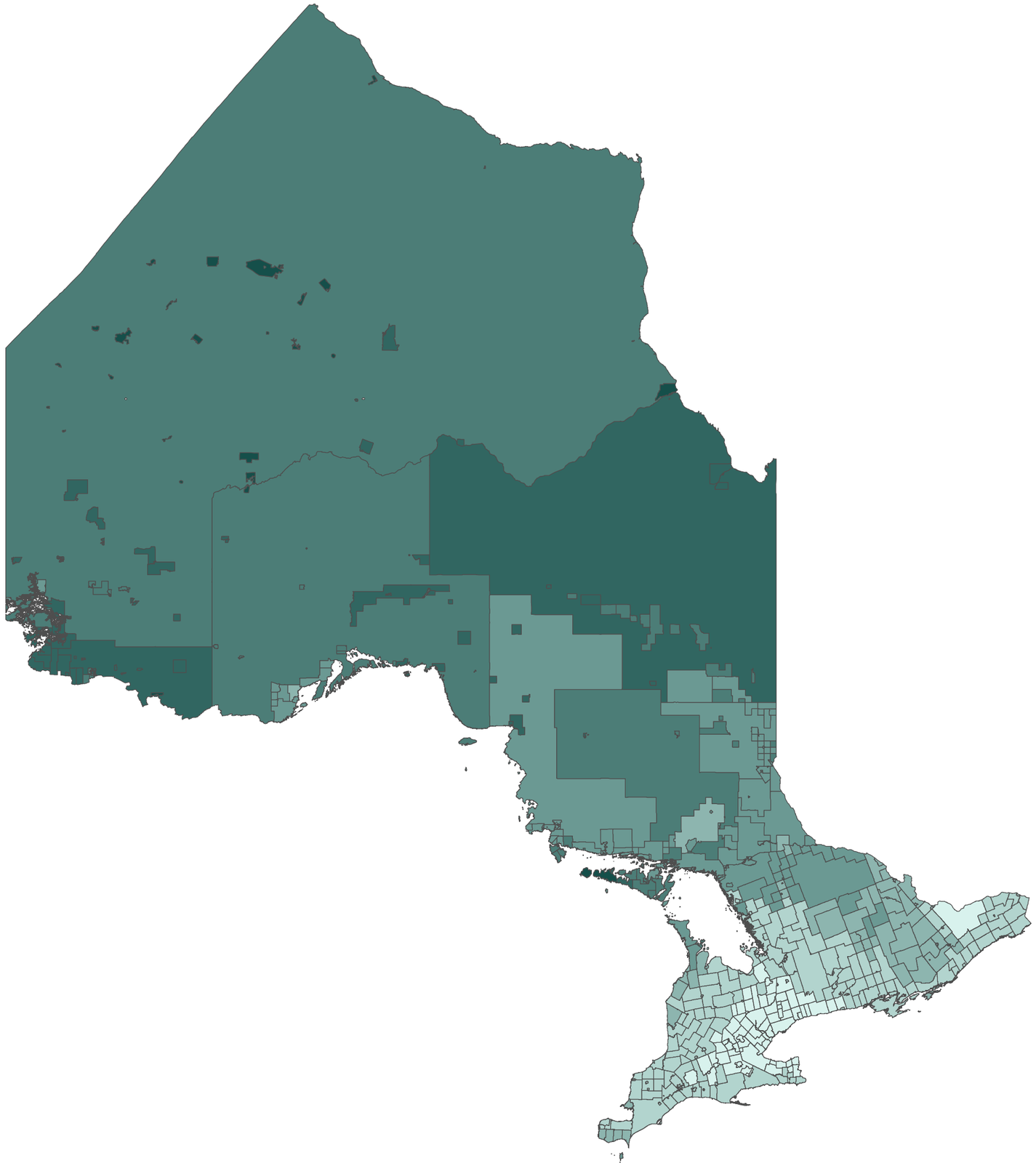
FILE LOCATION:
G:\GIS\187544 ROI 211 Unmet Needs\GIS Data\MXD\20181005 Report\Unmet Needs per capita by census subdivision, 2016.mxd

DILLON CONSULTING

PROJECT: 187544

STATUS: FINAL

DATE: 2018-10-12



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Analyzing 211 Rural Unmet Needs

Relative Remoteness by Census Subdivision, 2016

Appendix I

Index of Remoteness Value

- 0.00 - 0.10
- 0.10 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- 0.50- 0.70
- 0.70 - 1.0

0 50 100 200 km

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY 211 ONTARIO AND STATISTICS CANADA

MAP CREATED BY: PFM
MAP CHECKED BY: MB
MAP PROJECTION: WGS 1984 WEB MERCATOR AUXILIARY SPHERE

FILE LOCATION:
G:\GIS\187544 ROI211 Unmet Needs\GIS Data\MXD\20181005 Report\Relative remoteness of census subdivisions, 2016.mxd

DILLON CONSULTING

PROJECT: 187544

STATUS: FINAL

DATE: 2018-10-12