MAPPING NEIGHBOURHOODS
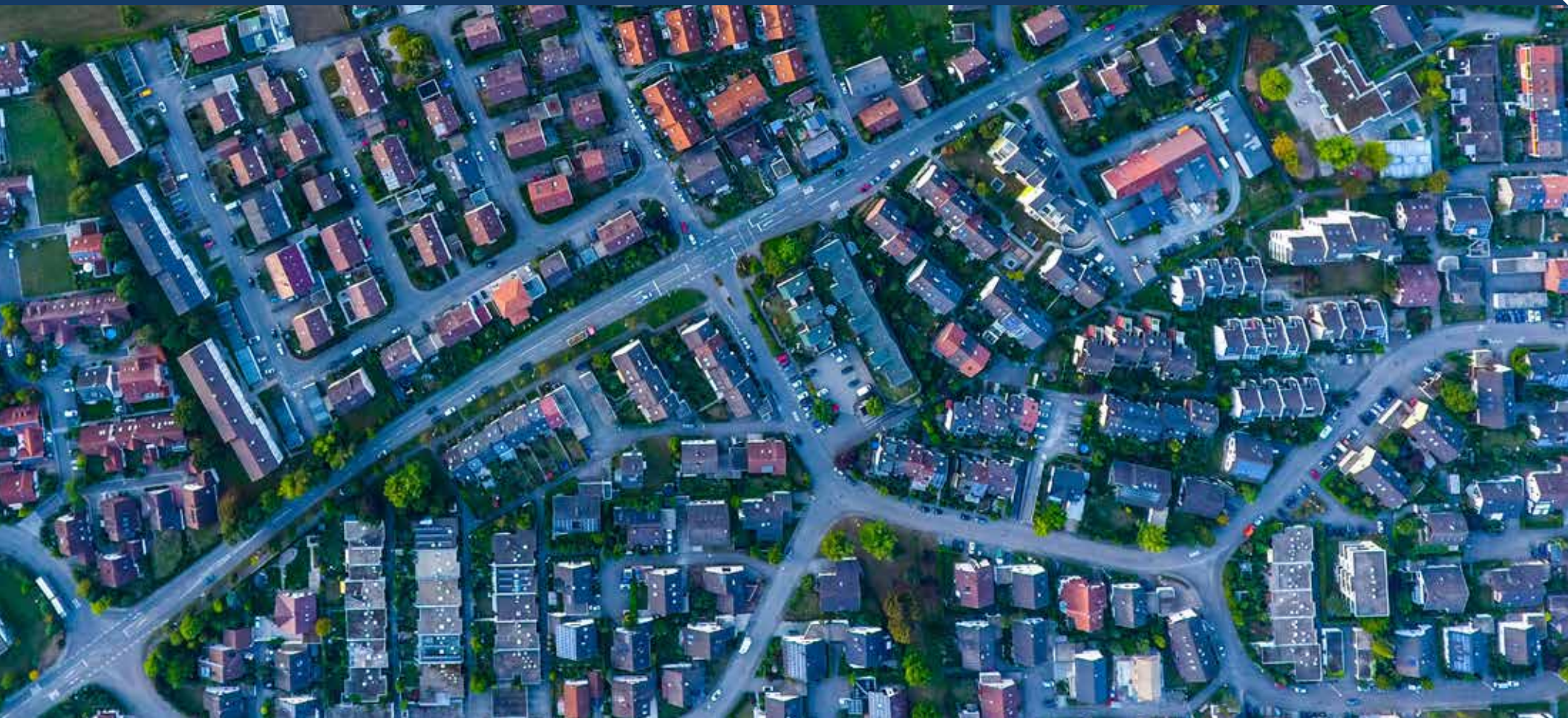
A FIELD GUIDE FOR CREATING TOOLS TO ANALYZE NEIGHBOURHOOD-LEVEL DATA

HEALTH COMMONS SOLUTIONS LAB

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Development Partners

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» Population Health Analytics Laboratory (Dalla Lana School of Public Health, University of Toronto)
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» Center for Urban Health Solutions

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» County of Middlesex
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» Haldimand Norfolk Health Unit
» Halton Region Public Health
» Hamilton Niagara Haldimand Brant LHIN
» Human Environments Analysis Laboratory (HEAL)
» Middlesex-London Health Unit
» Niagara Region Public Health Department
» South West LHIN
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» City of Toronto - Social Development Finance and Administration, Social Research
» Durham Region Health Department
» Ottawa Neighbourhood Study
» Statistics Canada – Central Region, Census, Operations and Communications Field

Contents

Intro

Making the best use of health care resources involves planning that is informed by data.

Local-level data can tell you about the characteristics of a community, what shapes health care utilization, and where the biggest opportunities exist for improving health.

In most regions, health and social data are available at a national, provincial, and municipal level to inform planning. However, it's easy for the needs of local communities to get 'averaged out' when planners do not have access to neighbourhood-level data. Neighbouring communities can have drastically different pictures of health and well-being, despite their close physical proximity. These differences are only visible in the data when we are able to break down the information and look at each neighbourhood separately.

Across Ontario, many communities still need to define neighbourhood geographies. Doing this work requires technical expertise, consensus building and a road map. A multi-sector approach helps ensure that at the end of this hard work, partners such as municipalities, public health units can join their data to give a comprehensive picture of health in the community. This guide provides a standard methodology for creating neighbourhood geographies.

Over the past year, **HEALTH COMMONS SOLUTIONS LAB** has been working in communities across Ontario to fast-track the development of neighbourhood geographies.

10
Municipalities or regions

169
Neighbourhoods

14,000
Average neighborhood population size

2,361,047
Total population coverage

Informed by our experiences and of the great work by others throughout the province, we have developed the *Mapping Neighbourhoods Field Guide* to support others that are interested in using neighbourhood-level data for planning.

Neighbourhood-level data helps decision makers:

Understand who lives in a community

Uncover how social determinants impact access to services and health outcomes

Engage in collaborative planning and multi-sector partnerships

Target investments and customize services

Identify populations at risk

Evaluate current efforts and guide improvements

What do we mean by *neighbourhoods?*

Using the term "neighbourhoods" can be confusing because it can mean different things to different people. We define neighbourhoods as geographically localized communities that, when created, allow analysts to stratify data into geographic units smaller than an entire city or town.

How to use this Field Guide

This *Field Guide* summarizes our approach and learnings. It provides practical advice on how you, your team, and your partners can prototype neighbourhood geographies.
We have also included a number of tools and resources to support you, including a Technical Guide () that outlines methodological considerations.

A COUPLE OF POINTS TO NOTE:

The Lab is creating this guide after mapping nearly 170 neighbourhoods across Ontario. Our learnings through that process informed the development of a road map. This road map is a loose guide. This is what worked for us and our partners. You may want to – and should - modify steps, resources and tools to fit your context.

DEFINE ACCORDINGLY

Use terminology that best represents your local context. The term 'neighbourhood' might not resonate with everyone around the table. Individuals may have different ideas on how to define their local neighbourhood based on how they see their community. The purpose of this work is to define areas (at a sub-municipality level) for health planning to suit your local context. For instance, maybe your area is very rural; geographies will need to span large geographic areas. Using the term neighbourhood may be confusing. Or maybe in your area, neighbourhoods have already been defined for the purposes of community activation. Other terms, such as 'health planning areas' or 'social planning units' may resonate more with your stakeholders.

KEY INSIGHTS

Key Insights are integrated throughout the entire guide to draw your attention to important ideas or considerations as you begin to map neighbourhoods in your area.

AFTER REVIEWING THIS FIELD GUIDE, YOU WILL BE ABLE TO:

» Assemble the right team and engage with local partners and stakeholders on the development of neighbourhoods.

» Scope the work and understand what success looks like both in the short and long-term.

» Create, validate, and test neighbourhoods.

LET'S GET STARTED!

Case Studies Power of neighbourhood-level data in planning

Case Study 1

Case Study 2

City of Durham | Health Neighbourhoods Project

A great example of the power of analyzing and reporting comprehensive health and social data to support local collective action.

In 2015, the Durham Region Health Department publicly launched Health Neighbourhoods. Through this work, they created health profiles for 50 neighbourhoods. The profiles compare 88 health and social indicators on a variety of topics such as breastfeeding, chronic disease, early child development, immunization, income, and injury, to name a few. A MapViewer helps people to explore community assets in the neighbourhoods.

Durham Region Health Department uses neighbourhood-level data to inform the planning of programs and services, increase awareness of the local impact of determinants of health, and strengthen and build partnerships across multiple sectors to support collective action. Any sector, group or community can use the information to create healthier neighbourhoods in Durham Region.

Click here to learn more about *Durham's Health Neighbourhoods.*

City of Toronto | Neighbourhood Improvement Strategy

A great example of how residents can use local data to highlight and address inequities at a neighbourhood level.

The City of Toronto has 140 social planning neighbourhoods and a Neighbourhood Equity Score to compare how Toronto's neighbourhoods were faring across five domains of neighbourhood well-being. In 2014, City Council designated 31 neighbourhoods as Neighbourhood Improvement Areas (NIAs). Through the Toronto Strong Neighbourhoods Strategy (TSNS 2020), each NIA has a neighbourhood Planning Table, which was allocated $12 million in funding over 4 years. One of their key functions is to create a Neighbourhood Action Plan. This Plan describes local priorities, solutions, leaders and stakeholders, resources available, additional resources needed, and intended outcomes. Having access to neighbourhood-level data is key to the Planning Table's work. Local data helps Neighbourhood Planning Tables identify gaps, prioritize needs and evaluate their efforts.

To learn more, visit online *TSNS 2020 & Neighbourhood Action Plans.*

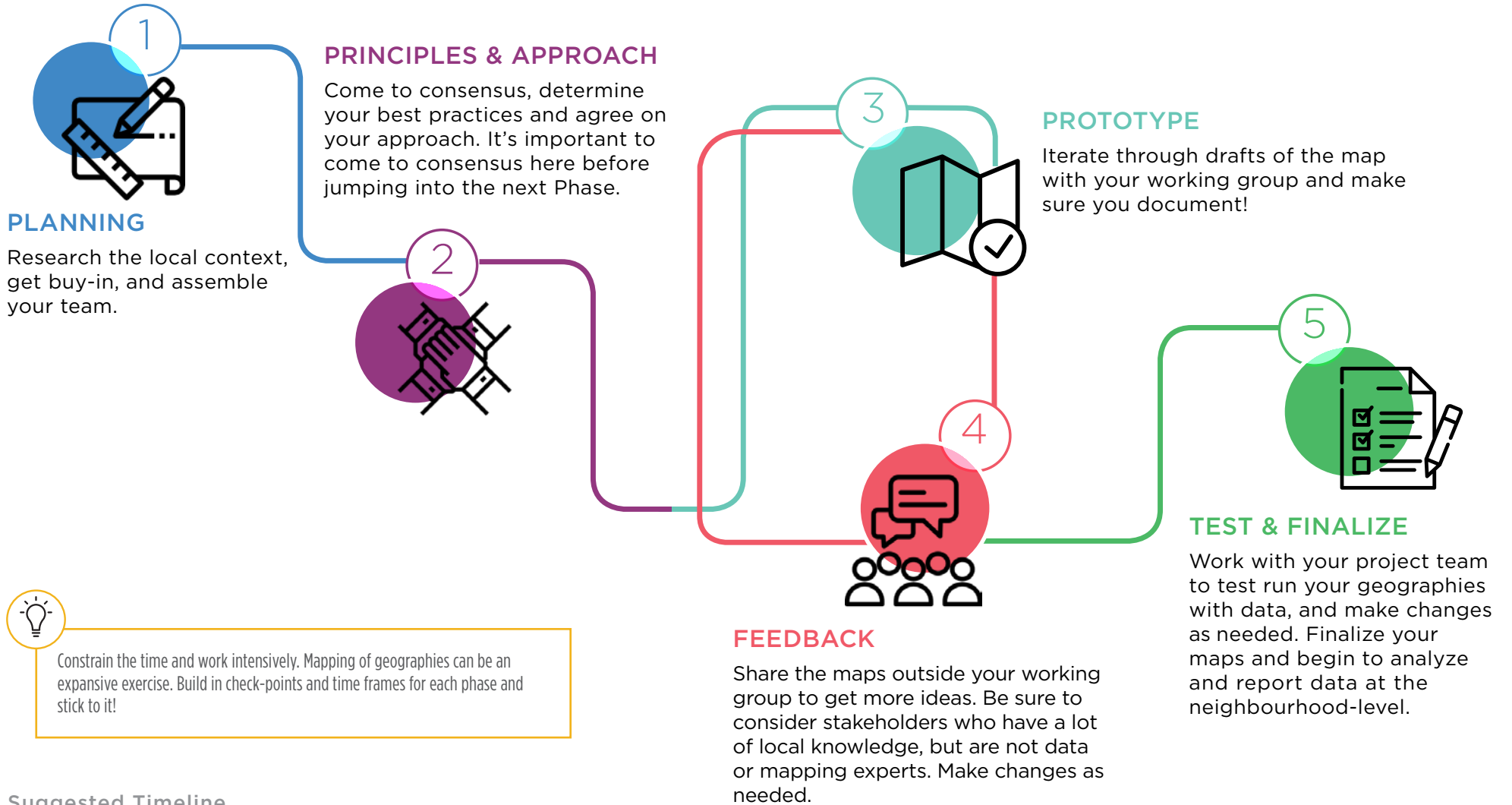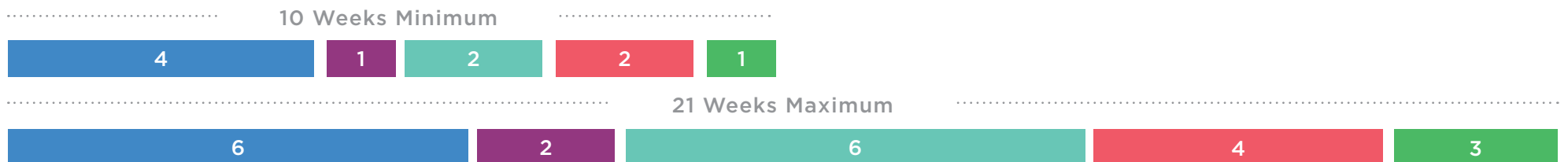*Process*

Process for Mapping Neighbourhoods

Here is a road map for how to do this work. More details are available in the following sections.

FIVE PHASES WITH KEY STEPS, RESOURCES AND TOOLS

1

PLANNING

Research the local context, get buy-in, and assemble your team.

PRINCIPLES & APPROACH

Come to consensus, determine your best practices and agree on your approach. It's important to come to consensus here before jumping into the next Phase.

2

3

PROTOTYPE

Iterate through drafts of the map with your working group and make sure you document!

4

FEEDBACK

Share the maps outside your working group to get more ideas. Be sure to consider stakeholders who have a lot of local knowledge, but are not data or mapping experts. Make changes as needed.

5

TEST & FINALIZE

Work with your project team to test run your geographies with data, and make changes as needed. Finalize your maps and begin to analyze and report data at the neighbourhood-level.

Constrain the time and work intensively. Mapping of geographies can be an expansive exercise. Build in check-points and time frames for each phase and stick to it!

Suggested Timeline

10 Weeks Minimum

| 4 | 1 | 2 | 2 | 1 |

21 Weeks Maximum

| 6 | 2 | 6 | 4 | 3 |

Planning Phase

1. RESEARCH YOUR LOCAL CONTEXT

Take time and learn about what related work already exists in your area. If similar work has been done, note the processes and stakeholders involved. As you gather information, be sure to:

» Speak with stakeholders and request any relevant information. For example, ask about existing geographies that have already been defined through a similar process (e.g. city planning) and could serve as a starting point for your work.

» Review similar projects in other jurisdictions and learn about their processes and maps.

Document the information gathered from your research in case you need to refer back to it in later Phases of the project. Use this information to discern whether you will be able to leverage and build off existing work.

2. ENGAGE LEADERSHIP AND GET BUY-IN

Once you have completed scoping, you will need to secure the required resources, capacity and support to complete and sustain the project. To help ensure success:

Assess organizational readiness. Creating neighbourhood geographies for planning purposes should not be a political exercise, but it may be perceived as such by stakeholders (both internal and external) if introduced at the wrong time.

» Align the project with your organization's strategic objectives. Remember to clearly communicate the objective and potential benefits of this work.

» Use examples from other areas with neighbourhood geographies to give your stakeholders a tangible example of why neighbourhood-level data is important.

» Engage Indigenous partners ()

» Think about other priority populations who are relevant to your local context and should be engaged in this work.

» Before getting started, scope the work and think about what you are capable of doing. Secure internal resources and expertise.

Resources

» **Key Questions for Environmental Scan:** Questions regarding related work and local context

» **Pitch Deck:** Introduce project, engage leadership and get buy-in

» **Project Charter:** Outline project roles and tasks

» **Collaboration Agreement:** Consider signing an agreement with partners

» **Staff Role Descriptions & Time:** A description of job roles, plus an estimate of the needed staff time and contingencies

Suggested Timeline

4 - 6 weeks					

Planning Phase

3. ASSEMBLE YOUR WORKING GROUP

» Ensure you have the right mix of partners and expertise on your work team. You will need people who are comfortable with data, maps, planning, and the local context.

» Recruit technical and non-technical staff from your organization (e.g. people who analyze data or create maps, people who use data to inform planning, people who plan services/programs in the community).

» Recruit technical staff from external partner organizations (e.g. people who have expertise in data and/or mapping). This can include academic partners or partners from sectors outside of health (e.g. City Planning, social services).

» Define the roles and responsibilities of all team members.

💡 Think outside the box to leverage local expertise. In addition to your usual partners, consider if there are geospatial or data experts from other departments, sectors, or settings like academia or community organizations that could add valuable perspective.

4. DECIDE WHO ELSE WILL GIVE FEEDBACK

💡 Although this group will not be actively engaged until the Feedback Phase, think about who may belong in this group at the beginning of your process. Consider what background this group will need to be able to provide useful feedback.

» Recruit other stakeholders (both internal and external) who can provide feedback on prototype maps to help you refine them. These stakeholders do not need to have technical expertise but should be familiar with the local context and communities.

💡 This is also a good time to engage senior leadership who may have an interest in the end product, but are more removed from the technical conversations.

Project Roles

Working Group

Internal

External

Internal & External

Feedback Group
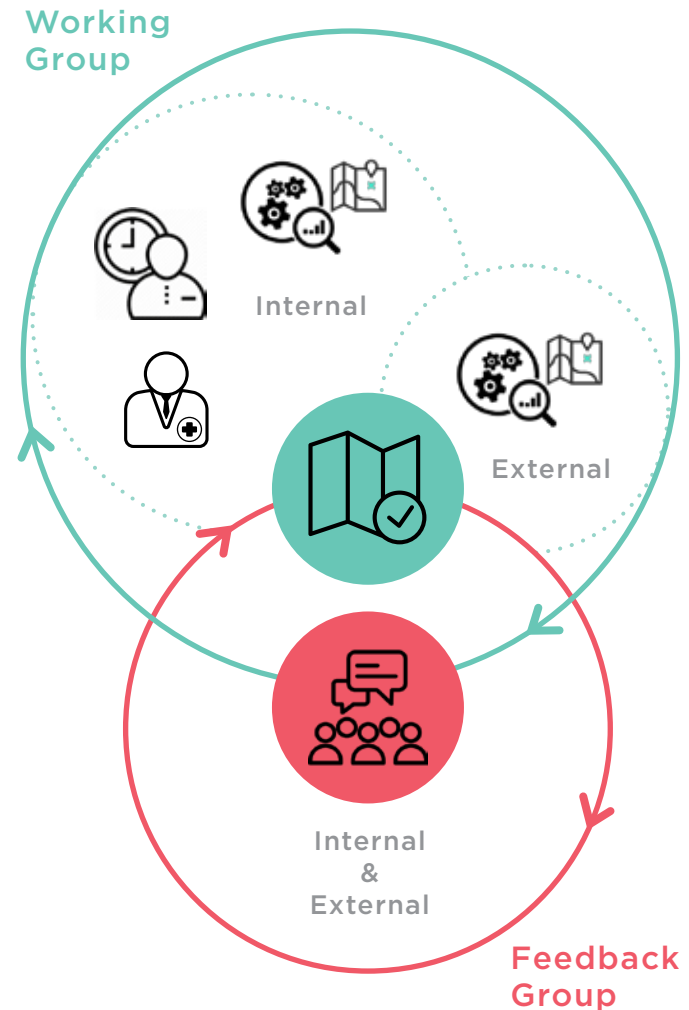
Suggested Timeline

| 4 - 6 weeks | | | | |

Principles & Approach Phase

1. DEVELOP PRINCIPLES TO GUIDE YOUR WORK

» Establishing principles will help your team work better together to produce a great product. Principles should reflect your values – how you wish to conduct your project.

» Meet with your working group to talk about what you are doing and why. Develop your principles together; write them up and formalize.

Our Principles

INFUSE LOCAL KNOWLEDGE AND EXPERTISE

If you want different sectors and organizations to use your neighbourhoods, they must be meaningful and make sense to local stakeholders.

LEVERAGE EXISTING WORK

In some parts of the province, municipalities and regional governments may have already developed geographies for similar planning purposes. Public health units often stratify health and social data to monitor the health of populations. In other areas, academic partners or community organizations like the United Way, may be leaders in this space. Engage local players and build off of what has already been done rather than creating another layer of geography.

COLLABORATE AND CO-CREATE YOUR MAPS WITH CROSS-SECTOR PARTNERS AND COMMUNITY MEMBERS

In addition to infusing local knowledge and expertise, ensure that a collaborative approach is taken to developing the maps. If you develop the maps alone, you may miss important ideas and key considerations. This approach will allow your local stakeholders to be involved every step away and communicate shared values and ideas for mapping neighbourhoods in a particular area.

INCLUDE VOICES OF INDIGENOUS AND PRIORITY COMMUNITIES THROUGHOUT EVERY PHASE OF WORK

Consider what Indigenous or other priority communities (e.g. francophone, immigrant, refugee, religious minority groups, etc.) exist locally. Creating maps of these communities should be respectful of how they view their communities. Engage early and often while doing this work. More information on Indigenous engagement is on page 13.

Resources

» **Sample Approach:** Learn more about mapping approaches and prototyping

» **Technical Guide:** View the appended guide to learn more about the technical considerations for developing neighbourhoods

Suggested Timeline

| | 1 - 2 weeks | | | |

Principles & Approach Phase

2. INDIGENOUS ENGAGEMENT

Engagement with Indigenous communities is an ongoing process built on a solid understanding of the Indigenous peoples' distinct place in Canadian society with each community having its own unique history, culture, language and traditions. Engagement requires a sincere desire to build respectful relationships and ensure that Indigenous leaders have a meaningful role in activities that affect their community. Meaningful engagement starts well before the outset of an initiative so that the community can influence and shape the discussions and plans – it also extends beyond the life-cycle of any one initiative.

The Lab has worked with the LHINs and LHIN partners to engage Indigenous community leaders, many of whom were involved in local health system planning tables. The Lab supported partners by providing materials, doing presentations, and listening to how this work fits into the broader context for local First Nations communities' health system planning.

As you prepare to work with an Indigenous Community, consider the following activities:

» Reach out first to elected or hereditary leaders of the community - in many instances' community leaders will request an introductory meeting with senior project leaders

» Ask community leaders the terms they prefer to use as a variety of terms have been used to refer to Canada's Indigenous peoples – First Nations, Aboriginal, Indigenous

» Refresh your understanding of Indigenous data sovereignty principles, such as the First Nations principles of ownership, control, access and possession - *The First Nations Principles of OCAP®*.

» Determine if the community has ways of describing or mapping their community. Here is an example of a *community profile* from Six Nations of the Grand River.

» Identify Indigenous community leaders who will lead the engagement and mapping process; secure agreement on the scope, timing, and principles for the initiative

» Acknowledge and respect the unique capacities, needs, and realities of each Indigenous community

Some resources that may be helpful include:

» Population and Public Health Division. (2018). *Relationship with Indigenous Communities Guideline.* ON: Ministry of Health and Long-Term Care.

» Talking Together to Improve Health Project Team. (2017). T*alking Together to Improve Health: Literature Review.* Sudbury, ON: Locally Driven Collaborative Projects.

» Institute for Clinical Evaluative Sciences. (2019). *Indigenous Portfolio.*

» *Government of Canada.* Geographies of First Nations reserves and communities

IF YOU ARE AN INDIGENOUS LEADER AND HOPE TO MAP YOUR COMMUNITY...

Our Lab remains interested in the opportunity to support neighbourhood mapping work with all communities. We recognize that Indigenous leaders will establish the timelines and process that is meaningful to their community and it may differ from what is proposed in later sections of this guide.

Contact us (email) if you are interested in receiving support to adapt this process to your community's interests and needs.

1. When analyzing data, any postal codes that relate to First Nation reserves should be treated as markers of Indigenous data. Indigenous data sovereignty principles should be respected in such cases.

2. Boundaries for First Nations reserves, as outlined under the Indian Act, should be respected when mapping local neighbourhoods. Engage local partners to better understand how or if they would like to be reflected on your maps.

Suggested Timeline

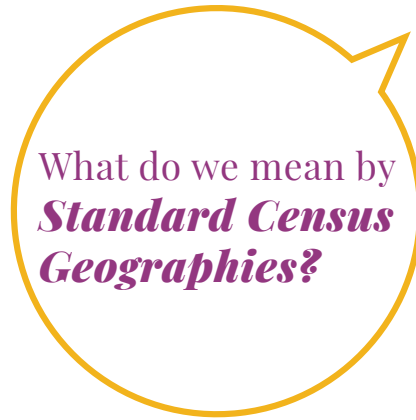| | 1 - 2 weeks | | | |

Principles & Approach Phase

3. DECIDE ON YOUR APPROACH

Before launching into creating maps with your partners, you will need to come to a consensus on your approach:

Additional methodological information included in the Technical Guide (*see page 22*).

💡 Get inspired! Review how neighbourhoods have been defined in other areas.

What do we mean by *Standard Census Geographies?*

Standard Census geographies are boundaries defined by Statistics Canada. These geographies are used as part of the Census to ensure that all households can be located during the data collection phase, and that data is then coded to the appropriate geographic area when reported. The most relevant types of Census geographies for this work are dissemination areas (DAs) which are small units of 400 to 700 people, and census tracts (CTs) which are only found in urban centres and range from 2,500 to 8,000 people. Source: Statistics Canada

· · · · · · · · · Our Approach · · · · · · · · ·

1 **USE STANDARD CENSUS GEOGRAPHIES TO CREATE YOUR BUILDING BLOCKS FOR NEIGHBOURHOODS.**

We highly recommend using standard Census geographies as building blocks for your maps because it makes analyzing and reporting data more accessible and efficient. Custom geographies (e.g. areas defined by the street grid) can also be used, but will require you to request and purchase custom Census data from Statistics Canada.

2 **THERE IS NO "RIGHT" POPULATION SIZE FOR DEVELOPING NEIGHBOURHOODS.**

Population size can only be determined through discussions with local partners. If possible, we advise keeping the size above 7,000 to prevent data suppression (due to privacy concerns), and smaller than 50,000 to make sure the neighbourhoods capture the local picture.

💡 There is no perfect number! But units around 10,000 to 20,000 seem to be the best for reporting local-level data and avoiding data suppression.

3 **USE DATA TO INFORM YOUR GROUPINGS OF BUILDING BLOCKS.**

Consider what data may inform the creation of your neighbourhoods. Indicators that measure socioeconomic status or ethnicity may be useful for determining which areas belong together and which should be separate because these factors are very closely tied to our understanding of neighbourhood context. There may also be existing groupings of building blocks that were created for similar purposes, such as city planning, that you can use to base your approach. For instance, in Windsor and Hamilton, we used city planning districts as a starting point to group Census geographies because this was a commonly used boundary within the municipality.

💡 Think about estimates of population growth as you create your neighbourhoods! This might help guide some of your decision-making.

💡 Being able to roll up building blocks into larger units, in a systematic way, was a decision that really resonated with our partners.

Suggested Timeline

| | 1 - 2 weeks | | | |

Prototype Phase

1. START MAKING MAPS

» Gather and compile existing shapefiles and data sources that you've identified to be important as part of your approach.

» Pick an area of the map that seems 'easy' and get started by applying your approach. There will always be some 'problem areas' that are harder to define, but the momentum of starting to make decisions will propel the group forward.

» Start making prototypes. Iterate through multiple drafts of the map until you come to consensus. If there are points of contention between the groups, flag them, and move on to other issues. Continue to re-visit the points by approaching the problem from different angles.

» Don't be afraid to change your initial approach if after starting to apply it, you run into additional road blocks. Collaboratively refine your approach and try again!

Consider using a visual tool that allows working group members to view the different geospatial layers that you will use to create geographies. If available, a web-based tool is a good option.

Many municipalities and regions have Open Data initiatives where geospatial layers can be downloaded. Some layers that may be relevant include: city planning areas, former township or municipal boundaries, and service related boundaries.

In-person meetings work best for prototyping so everyone can have access to the same visuals. However, if not possible, consider using screen sharing or videoconferencing to prototype remotely.

What do we mean by *Prototyping?*

Prototyping is a design thinking concept that involves the end-user and focuses on their experience. It is a process of creating draft versions of a product (in this case, neighbourhood maps) that allows you to explore different ideas, refine them quickly and co-create an end product that will ultimately have higher value and best fit to the end users' needs.

Using prototyping for this work will allow you to achieve a map that is meaningful and suitable to the local context and needs.

Resources

» **Sample Web Tool:** A visual tool to help create neighbourhoods

Suggested Timeline

		2 - 6 weeks		

Feedback Phase

1. GATHER FEEDBACK FROM STAKEHOLDERS

Determine how you are going to get input from your feedback group. There are many factors (e.g., time, resources, and familiarity with subject) that impact how you will connect with people. Making a plan will depend on:

» Whose feedback you are looking to collect. Do the stakeholders convene regularly (e.g. standing monthly meeting)? Would it be easier (and faster) to meet 1-on-1?

» How much time and resources you have for this Phase. You may hold a half-day workshop or send an email with a feedback form/ worksheet.

» How familiar your stakeholders are with this work and with maps in general. Some audiences may need more context to be able to give meaningful feedback.

» How much time/resources you have to design the required tools to support your feedback process. If hosting an in-person workshop, large format posters work well. If getting feedback individually (via in-person or email), other tools like a feedback form or worksheet may need to be created.

Remind stakeholders that this is not a political exercise or a task to create service-related boundaries.

Some of the maps you are trying to get feedback on may span a large and complicated geography. Ensure your map has the right level of detail to make it easier for people to understand where and what they are viewing. Consider splitting your map into smaller, more digestible pieces, to allow for more focused review.

This is a great stage to get feedback on names for your neighbourhoods. Crowd source name suggestions from your stakeholders and pick your favorite ones.

2. REVIEW THE FEEDBACK

» After reviewing qualitative feedback from your stakeholders, consider what modifications you will make to your neighbourhood. This may involve reconvening your working group to get more insights.

» Some of the recommendations may not be possible due to technical decisions or constraints that were made in the early stages of your project. As an example, we received feedback to further divide a neighbourhood into smaller units to reflect the uniqueness of two distinct communities. However, as a result of the small population sizes in each, the communities had to remain amalgamated to prevent issues with data (i.e. suppression and privacy concerns).

Resources

» **Sample Qualitative Feedback Worksheet:** An example of how to get feedback on your maps

Suggested Timeline

2 - 4 weeks

Case Studies II Power of neighbourhood-level data in planning

Case Study 3

City of Ottawa | The Ottawa Neighbourhood Study (ONS)

A great example of how a multidisciplinary data sharing partnership can form around a common definition of neighbourhoods and the ability to analyze and report data in a consistent way.

Based at the Centre for Research and Education in Community Services (CRECS) at the University of Ottawa, ONS collects a variety of data to better understand the physical and social pathways by which neighbourhoods affect health and well-being and reports. ONS collects data on a variety of health and social indicators for 103 neighbourhoods in Ottawa. This information is shared with a number of stakeholders, including the City of Ottawa, health service providers, social service agencies, community organizations and residents to help them identify what is working well, and where additional supports are needed. The ONS has created one of the most comprehensive place-based databases in Canada.

Check them out at *www.neighbourhoodstudy.ca*

Test and Finalize Phase

1. TEST

» Once neighbourhood geographies are final, run some initial analyses to test them with data.

» Identify areas to troubleshoot and work with technical experts to problem solve. If data analyzed at the neighbourhood-level yields small cell sizes for indicators of interest, consider revising neighbourhood maps or grouping smaller areas into larger ones to resolve this issue.

Testing is your first opportunity to use the neighbourhood geographies. Use this step to ensure there are no errors in the files.

Have all end users test the neighbourhoods with the data most relevant to them and their organization. For more information about testing, see **Appendix for our Technical Guide.**

Your working group should decide how much testing is needed for you to feel comfortable with the neighbourhoods. Split up the indicators of shared interest and work together to test for usability of your neighbourhoods. Many hands make light work.

2. FINALIZE

» Finalize the geo-conversion files and update shapefiles to reflect the finalized neighbourhoods.

» Write up your work. It's important to capture your principles, approach, feedback, and testing results for future users of the map.

Consider all of your working group members when finalizing neighbourhoods. It may be best to build functionality into the geo-conversion files that lets you easily isolate a subset of the neighbourhood geographies.

Resources

» **Sample Qualitative Feedback Summary:** An example of how to synthesize feedback and recommendations

» **Testing Worksheet:** Test your maps to ensure that there are no issues with the neighbourhoods you have created

Suggested Timeline

1 - 3 weeks

Summary of Resources

This section provides a summary of the various resources that have been mentioned throughout the guide, for each of the respective project phases.

For an example of how to create relevant documents, select **"pdf"**. For a downloadable template to get started on this work, select **"template"** (where applicable).

① PLANNING

» **Key Questions for Environmental Scan:** Questions regarding related work and local context (*pdf*)

» **Pitch Deck:** Introduce project, engage leadership and get buy-in (*pdf* / *template*)

» **Project Charter:** Outline project roles and tasks (*pdf* / *template*)

» **Collaboration Agreement:** Consider signing an agreement with partners (*pdf* / *template*)

» **Staff Role Descriptions & Time:** A description of job roles, plus an estimate of the needed staff time and contingencies (*pdf*)

② PRINCIPLES & APPROACH

» **Sample Approach:** Learn more about mapping approaches and prototyping (*pdf*)

» **Technical Guide:** View the appended guide to learn more about the technical considerations for developing neighbourhoods (*see page 22*)

③ PROTOTYPE

» **Sample Web Tool:** A visual tool to help create neighbourhoods (*pdf*)

④ FEEDBACK

» **Sample Qualitative Feedback Worksheet:** An example of how to get feedback on your maps (*pdf*)

⑤ TEST & FINALIZE

» **Sample Qualitative Feedback Summary:** An example of how to synthesize feedback and recommendations (*pdf*)

» **Testing Worksheet:** Test your maps to ensure that there are no issues with the neighbourhoods you have created (*pdf* / *template*)

Suggested Timeline

4 - 6 weeks	1 - 2 weeks	2 - 6 weeks	2 - 4 weeks	1 - 3 weeks

Success &
Sustainability

Success

This Field Guide outlined five Phases and a number of key steps, tools and resources to help you be successful. As previously mentioned, it is not meant to be prescriptive – you should adapt the steps or tools to suit your needs – but there are a few key steps that will help ensure success. Based on our experience, be sure to:

HAVE THE "RIGHT" PEOPLE AROUND THE TABLE

Team members should have the required skills and knowledge, but also need to be committed to the process and end result. There may be differing opinions, but if everyone is committed to the end result you will find a way to problem solve together. Agreeing upfront to best practices and an approach as a group can help.

ALIGN THE PROJECT WITH EXISTING WORK AND RESOURCES

In the realm of public sector work, there never seems to be enough money, resources or time. Everyone feels tapped out. However, creating neighbourhood geographies will benefit everyone – from providers, to planners, to clients – as better data can lead to better information, and by extension, better health. Make the case for this work by keeping everyone focused on a shared end vision.

CONSULT WIDELY AND GET FEEDBACK

Reach out to a broad range of stakeholders, including Indigenous communities, to ensure multiple perspectives have been considered. Input from people helps contextualize data and is an essential source of information that shouldn't be ignored.

TEST, TEST, TEST

Be sure to test newly created neighbourhoods with data before going live. Ensuring the neighbourhoods you've created work for all local partners is key to their long-term success.

Sustainability

Ok, so you have successfully developed neighbourhoods **(CONGRATS!)**, now how do you keep the data up-to-date and relevant to end users? As a team, spend some time planning and thinking about:

HOW WILL YOU SPREAD AWARENESS ABOUT THIS WORK TO YOUR PARTNERS?

Once your project is up and running, draft a communication strategy to introduce others to your work. For ideas, check out the case studies in this guide.

HOW WILL YOU UPDATE THE NEIGHBOURHOOD MAPS/TOOLS?

From time to time, it may be necessary to make minor updates to your neighbourhoods (e.g., when Statistics Canada makes changes to Census Geographies). Decide who will be responsible for this work.

HOW WILL PARTNERS ACCESS THE NEIGHBOURHOOD MAPS/TOOLS?

Think about where the tools will be hosted and how your partners will get access.

HOW OFTEN WILL YOU UPDATE THE NEIGHBOURHOOD MAPS/TOOLS?

While minor changes may need to be made, we recommend not making extensive changes too often. Every time a change is made there will be a need to go back and re-analyze historic data (which is often not feasible). The best projects of this kind tend to update every 10-20 years. Updates are often made to accommodate changes in population dynamics and growth.

20%

Technical
Guide

Appendix: Technical Guide for Mapping Neighbourhoods

This Technical Guide provides additional information about the Prototyping and Testing Phases of developing neighbourhoods for health planning.

The following information pertains to the
Approach Phase

BUILDING BLOCKS

» In order to facilitate efficient data analysis, we strongly recommend the use of standard Census geographies as the building blocks for neighbourhoods. This places limitations on the process because some Census geographies may be irregularly shaped polygons and/or may split smaller communities or major physical barriers like roads or streets. However, for sustainability purposes, Census geographies should be strongly considered.

» Before deciding to use custom geographies, consider whether your area has access to custom geography requests through the Community Data Program (or Statistics Canada). If partnerships and community data groups or initiatives are well established, custom geographies for neighbourhoods would be more feasible and may be a great option.

» If CT's are not available... We recommend against using a census tract (CT) + dissemination area (DA) mixture for a new level of geography because it will add too much complexity.

» Aggregated Dissemination Areas (ADAs) are aggregations of DAs from Statistics Canada. Before beginning to manually aggregate DAs, review ADAs to determine if they serve as a suitable stating point.

» If possible, the aggregating process should reflect already existing local areas, such as historical neighbourhoods or administrative political boundaries.

ALIGNMENT

» Consider the importance of creating a layer of geography that can be nested within other layers. For example, you could use municipalities (Census sub-divisions, or CSDs) as your starting point, and further divide CSDs into smaller units (neighbourhoods) by DAs. This would allow DAs to aggregate nicely into neighbourhoods, which would aggregate nicely into municipalities. Having this level of alignment will allow for ease of analysis, especially in instances where data from multiple levels of geography are needed.

» Avoid using service-related boundaries for this work. Neighbourhood geographies that are used for planning purposes (health or otherwise) need to have some consistency over time to allow you to study time trends in your data. As a result, the criteria used to create neighbourhood geographies may differ from other boundaries that have been created for service delivery. For example, service boundaries may be updated often to account for changes in supply and demand (e.g. operational boundaries which allocate home care workers may exist within a health planning organization).

The following information pertains to the
Approach Phase

The following information pertains to the
Prototype Phase

POPULATION SIZE

» For the purposes of this Field Guide, we have put some guidelines around recommended population size of neighbourhoods. There is no magic number for population size. There will always be a need to be flexible in approach, keep neighbourhoods relatively consistent in size, and test with data to ensure that there will be minimal suppression for indicators of interest. See Testing below for further information.

» Our recommendation is to create neighbourhoods with a population size of no less than 7,000, but ideally in the range of 10,000 - 20,000, to size based on local context (i.e. City of Toronto has neighbourhoods in the 50,000 range). This decision was informed by existing work in this area, as well as our experiences working with ten municipalities/ regions across three Local Health Integration Networks (LHINs).

»
In order to achieve adequate population size in rural areas, it will be necessary to develop neighbourhoods that span considerable geographies. However, expansive neighbourhoods may not provide the desired level of granularity. For some indicators with sufficiently large numerators/denominators, you may be able to supplement your neighbourhood-level reporting by analysis at DAs.

SUGGESTED GEOSPATIAL LAYERS

Once the project team has been assembled, gather any geospatial data that may be of interest to your group. This could include:

☐ Standard Census geographies (e.g., DAs, CTs, ADAs, subdivisions).

☐ Any operational or organizational boundaries that have been defined (e.g. municipal planning areas, former townships or municipalities).

☐ Points of interest, such as hospitals, schools, community centers, etc.

☐ Street grid layer with labels.

☐ Geospatial imagery layer and/or topographical map (provides insight into the built and physical environment).

☐ Measure of population size and density.

☐ Measure of historic population growth (e.g. percent change from 2011 to 2016).

☐ Measure of future population projection (not always available at a neighbourhood level. Check with municipal/regional planning departments).

☐ Measure of socio-economic status (we recommend the *2016 Ontario Marginalization Index* material deprivation dimension which combines Census indicators on income, quality of housing, educational attainment and family structure characteristics).

☐ Measure of ethnic diversity, if relevant (e.g. 2016 Ontario Marginalization Index ethnic concentration dimension).

The following information pertains to the

Test and Finalize Phase

TESTING

Technical validation of neighbourhoods using key indicators and data sources is necessary to ensure:

» Geo-conversion and shapefiles are error-free before sharing with partners.

» Cells with low counts do not prohibit release of data at the neighbourhood-level due to data privacy restrictions.

» Sufficient sample size to allow for stratification by age group and sex.

» Stability of data over time and ability to account for changes in population dynamics within a neighbourhood.

HOW SHOULD NEIGHBOURHOODS BE VALIDATED WITH DATA?

This recommendation for how to test neighbourhoods with data is based on the following assumptions:

• Analytic resources of local partners are limited and there is a need to not create additional work. The ideal testing process will consume the minimum amount of analytic resources possible while still being comprehensive. Local analysts should use their discretion to indicate if additional data sources or indicators should be tested.

• There are a finite number of data sources that will be used to report neighbourhood-level data. Moreover, any technical or methodological issue uncovered in one data source, will likely appear with subsequent data sources.

• The risk of cells with low counts (which would lead to suppression) is minimal because restrictions were placed on the range of population size per neighbourhood.

• The actual computed value of an indicator (E.g. rate per 100,000) is not an essential part of the testing. Review of the count for common numerator and denominator data sources by neighbourhood geography should indicate problem areas.

• There is a need to test the age and sex structure of neighbourhoods to ensure sufficient population size, as indicators are commonly stratified by these factors and some indicators are more specific to particular populations (e.g. injury among children, seniors living alone, etc.).

Note that for areas where neighbourhood geographies have been adopted from existing geographies (typically as defined by public health partners), a condensed version of this testing may be sufficient.

WHAT DATA SHOULD BE USED TO TEST NEIGHBOURHOODS?

We recommend using the following as a starting place for validation:

DENOMINATOR	
» Data source: Statistics Canada » Measure: Census count » Dates: 2006 and 2016	» Stratification: Age (E.g. 0-9, 10-19, 20-44, 45-64, 65+ or other groupings you typically use) and Sex (Male/Female)
NUMERATOR (HEALTH SERVICE UTILIZATION)	
» Data source: Discharge Abstracts Database, CIHI » Measure: Number of hospitalizations for all causes (Inpatient discharges)	» Dates: 2015, 2016, 2017 (may need to be combined) » Stratification: Age (E.g. 0-9, 10-19, 20-44, 45-64, 65+ or other groupings you typically use) and Sex (Male/Female)
NUMERATOR (VITAL STATISTICS)	
» Data source: Ontario Office of Registrar General (ORG), Service Ontario » Measure: Number of premature deaths from all causes	» Dates: 2013, 2014, 2015 (may need to be combined)

The following information pertains to the success and sustainability section.

Using the Data

INDICATORS

Data on a number of health and social indicators can be analyzed at the neighbourhood-level. Indicators can include:

» **Social demographic:** Data on age, sex, education, migration background and ethnicity, marital status, household, employment, and income.

» **Mortality:** Data on premature mortality.

» **Primary Care:** Data on visits to primary care, enrollment, attachment, and continuity.

» **Hospitalizations:** Data on admissions for all causes, specific causes (E.g. mental health, addiction, ambulatory care sensitive conditions, medical hospital admissions, surgical hospital admissions, prenatal, delivery and postnatal conditions), and alternate level of care (ALC) days.

» **Emergency department visits:** Data on all visits, specific causes (E.g. mental health, addiction, injuries, palliative care) and visits by high and low urgency.

» **Health system performance:** Data on readmission and wait times.

» **Chronic Health:** Data on prevalence of chronic health conditions (E.g. diabetes, asthma, high blood pressure, chronic obstructive pulmonary disease).

» **Prevention:** Data on cancer screening (E.g. mammogram, pap smear, colonoscopy, fecal occult blood testing).

» **Child and reproductive health:** Data on fertility, births and birth outcomes, and vulnerability in early childhood development.

» **Infectious diseases:** Data on incidence of specific infectious disease (E.g. Chlamydia, Gonorrhea).

» **Health survey data:** Data on self-rated health, health behaviors, risk factors from the Canadian Community Health Survey.

For more information on indicator definitions see:
» Association of Public Health Epidemiologists in Ontario **Core Indicators**
» Locally Driven Collaborative Project: Indicators from **'Strengthening a population approach for health system planning'**
» Ontario Community Health Profiles Partnership **technical documentation**

DENOMINATOR DATA

» For health indicators, the Census population estimate is often the recommended measure to be used for the denominator. Population estimates are based on Census counts but are further adjusted to account for census net under coverage and incomplete enumeration of populations such as those living on First Nations reserve. Population estimates are not available at the CT or DA level. For small areas, Census count can be used as a measure of how many people live in a particular area, however, this count will not be adjusted for under-coverage and will thus be an undercount of the actual population.

» For some health indicators, Registered Persons Database (RPDB) can be used as the denominator (i.e. using the number of individuals with a health card as a proxy for the number of individuals who live in a community). This was done to address a mismatch between the numerator (based on health card data) and denominator (traditionally from the Census count).

» However, this change has not been tested provincially to see if the access provided to RPDB through IntelliHEALTH is suitable for use as a denominator. Analyses done at the Institute for Clinical Evaluative Sciences (ICES) with the RPDB allow the analyst to place additional restrictions on the extraction that are not possible in IntelliHEALTH (e.g., removing individuals with no contact with the health system in 10-years, linking the data with sources that have more up-to-date address information for individuals, ensuring deceased individuals are removed). Numbers from the RPDB that can be accessed via IntelliHEALTH do not have the same rigor applied, and may significantly overestimate the population. Further testing is needed to finalize this recommendation.

LINKING TO POSTAL CODE DATA

» Many data sources for health indicators are available at the postal code level and require geocoding of postal codes to Census geographies. These can then be rolled up to neighbourhoods.

» The Postal Code Conversion File (PCCF) is a file that allocates Canada Post Corporation (CPC) six-character postal codes to Statistics Canada's standard geographies. The PCCF provides 1:1 matching (i.e. one postal code allocated to one Census geography). However, in reality, a single postal code may be linked to multiple Census geographies. The Postal Code Conversion File Plus (PCCF+) was created to address this issue. When the association between the postal code and census geography is not unique, the PCCF+ allows for a proportional allocation based on the population count (source: *https://crdcn.org/datasets/ pccf-postal-code-conversion-file*). However, due to the cost of the PCCF+ programs (and the associated cost of necessary software), the PCCF+ is not widely available across Ontario. Before you start to create neighbourhoods based on Census geographies, review the postal code allocation within the area you are trying to map and figure out what postal code linkage file you will be able to access **(see Case Study on page for additional guidance)**.

Haldimand, Ontario

Ontario Community Health Profiles Partnership (OCHPP) conducted testing of newly developed neighbourhood geographies in Haldimand, Ontario.

Haldimand is a rural community in Southwestern Ontario of approximately 45,000. Using dissemination areas as building blocks, four neighbourhoods were defined and validated with local stakeholders. Testing was done at the OCHPP at the Institute for Clinical Evaluative Sciences.

For more information on this case study or support on neighbourhood geography testing, contact OCHPP at: HealthProfiles@smh.ca

Testing Case Study

Testing was done to assess several factors, including:

TEST THE AGE STRUCTURE OF THE NEIGHBOURHOOD TO ENSURE THERE WOULD BE SUFFICIENT POPULATION SIZE ACROSS RELEVANT AGE GROUPS

In the prototyping phase, constraints on population size were only applied to the total population count. Counts of neighbourhood sub-populations, segmented by demographic characteristics, were not considered. Consequently, it was important to examine the potential for data suppression after segmentation (due to small cell counts) in the testing phase. Age was considered a primary factor to test for, as communities may naturally differ in their age structure because of how the neighbourhood has developed over time (e.g. 'young' neighbourhoods with lots of families versus 'aging' neighbourhoods with more older adults).

In Haldimand, all neighbourhoods had a sufficient population size (i.e. cell size) for age groups of interest. Note that for the 65 and older age group, there were fewer individuals than in other age groups, most notably in neighbourhood 40607 when compared to neighbourhood 40610. Caution should be used when looking at indicators specific to the 65 and older population (e.g. seniors living alone, seniors living below the low-income measure, etc.), due to the potential for lower counts for this age group.

Table 1: Number of individuals by age group, Census count, 2016

Neighbourhood ID	Age 0-19	Age 20-64	Age 65+
40607	2,170	5,490	1,750
40608	3,310	7,595	1,770
40609	2,255	6,465	2,010
40610	2,885	7,105	2,705
Neighbourhoods Sum	10,620	26,655	8,235

Data source: Statistics Canada. 2016 Census. Population count. Neighbourhoods Sum may differ from census subdivision total due to rounding or data suppression procedures used by Statistics Canada at the dissemination area level.

DEMONSTRATE THAT DATA SUPPRESSION DUE TO SMALL CELL COUNTS WOULD NOT BE AN ISSUE FOR LESS COMMON HEALTH INDICATORS

Health indicators that represent less common outcomes may be subject to data suppression if the count is less than 6. Experts also consider denominator count values between 6 and 29 (or numerator values between 6 and 19) to warrant caution, since any rate that is subsequently derived may be unstable.

Caution should be exercised when a comparatively small neighbourhood population is further segmented by other variables, such as by income or by living arrangements, because small cell sizes may result. Where the population is comparatively small, it is recommended to combine at least two years of data to prevent data suppression. The results of combining two years of neighbourhood hospitalizations data (2014/2015 and 2016/2017) for Haldimand is tabulated on the next page.

In Haldimand, the number of hospitalizations by neighbourhood when combining two years of data (2014/2015 and 2016/2017) well exceeded cut-offs for data suppression. Note that it is recommended to combine (at least) two years of data, so that further stratification of this indicator (e.g. by cause of hospitalization, by age group, etc.) can be accommodated without data suppression.

Table 2: Number of hospitalizations by neighbourhood, Haldimand, 2014/2015 – 2015/2016*

Neighbourhood ID	Number of hospitalizations*
40607	2,061
40608	1,523
40609	1,360
40610	1,962
Neighbourhoods Sum	6,906

*Includes all unscheduled Hospital admissions for 2-year observation period. Using the Postal Code Conversion File Plus.

Data source: Canadian Institute for Health Information (CIHI). Discharge Abstracts Database. Analyzed by Ontario Community Health Profiles Partnership.

QUANTIFY THE DIFFERENCE BETWEEN METHODS USING THE POSTAL CODE CONVERSION FILE SINGLE LINK INDICATOR (SLI) AND THE POSTAL CODE CONVERSION FILE PLUS (PCCF+) FOR DATA SOURCES WITH A POSTAL CODE GEOGRAPHIC IDENTIFIER

For a full description of the difference between using SLI versus PCCF+, of the Technical Guide. Not all local analysts have access to the PCCF+ for postal code linkage. A test was done to compare the SLI (more commonly available) to the PCCF+.

In Haldimand, there was considerable difference between the results of the SLI and PCCF+ methodology when considering the number of hospitalizations per neighbourhood. In neighbourhood 40607, the SLI underestimated the number of hospitalizations by 28%, whereas in neighbourhood 40609 the SLI overestimated the number of hospitalizations by 62%. The differences in methods for neighbourhood 40608, neighbourhood 40610, as well as the neighbourhood sum were negligible.

This highlights the need to understand how postal codes are assigned in the geography that you are seeking to map. If the SLI is the only available methodology, consider checking how postal codes are assigned in your area. It is also important to ensure that the methodology used to analyze data is explicitly stated, so that any discrepancies can be easily understood.

Table 3: Number of hospitalizations by neighbourhood, Haldimand, 2014/2015 – 2015/2016*

Neighbourhood ID	SLI	PCCF+	Percent Difference
40607	1,482	2,061	28.1%
40608	1,543	1,523	-1.3%
40609	2,204	1,360	-62.1%
40610	1,884	1,962	4.0%
Neighbourhoods Sum	7,113	6,906	-3.0%

*Includes all unscheduled Hospital admissions for 2 year observation period.

Data source: Canadian Institute for Health Information (CIHI). Discharge Abstracts Database. Analyzed by Ontario Community Health Profiles Partnership. Formula: ((PCCF+) - (SLI) / (PCCF+)) * 100

SLI: Single link indicator postal code conversion methodology
PCCF+: Postal Code Conversion File Plus methodology

DETERMINE THE MOST APPROPRIATE DENOMINATOR DATA SOURCE FOR HEALTH INDICATORS THAT USE POSTAL CODE GEOGRAPHIC IDENTIFIERS

With health indicators, it is common practice to use the Population Estimate from the Census as the denominator data source for health indicators. However, Population Estimates are not available at a small area-level. Census count is often used as a proxy. However, for health indicators, this poses a challenge because the method of assigning people to a neighbourhood is not consistent (i.e. the Census uses dissemination areas whereas health administrative data sources use postal codes).

As we saw in the previous example (Table 3), using the SLI rather than the PCCF+ overestimated the number of hospitalizations (numerator) by 62% in neighbourhood 40609. Selecting the Census count here as the denominator for this indicator would overinflate the rate of hospitalizations since the Census count (n=10,725) is much less than the number of individuals from the RPDB (n=16,649). This highlights the need to be consistent in the methodology used for the numerator and denominator when analyzing health indicators at a neighbourhood-level.

Table 4: Number of individuals by neighbourhood, Haldimand, 2016

Neighbourhood ID	RPDB**		
	Census count*	SLI	PCCF+
40607	9,410	9,442	13,709
40608	12,670	12,338	12,182
40609	10,725	16,649	10,263
40610	12,775	12,784	13,475
Neighbourhoods Sum	45,580	51,213	49,629

*Data source: Statistics Canada. 2016 Census. Population count.

**Data source: Canadian Institute for Health Information (CIHI). Registered Persons Database. Analyzed by Ontario Community Health Profiles Partnership.

SLI: Single link indicator postal code conversion methodology
PCCF+: Postal Code Conversion File Plus methodology

WE RECOMMEND USING THE FOLLOWING DATA SOURCES/METHODOLOGIES FOR ANALYZING **HEALTH INDICATORS** AT A NEIGHBOURHOOD-LEVEL:

1) Numerator: Discharge Abstract Database linked using the PCCF+ methodology

Denominator: Registered Persons Database linked using the PCCF+ methodology

If the PCCF+ is not available, we recommend:

2) Numerator: Discharge Abstract Database linked using the SLI methodology

Denominator: Registered Persons Database linked using the SLI methodology

Note that for **Census indicators,** the Census count would likely be the most relevant data source for the denominator. However, it is important to be cautious that the Census count is not adjusted for under-counting by the Census and may introduce bias/under-counting into the analysis.