Recommending Easy-to-Use Community Decision-Making Tools to Help Achieve Housing Goals

Prepared for: The Community Data Program

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Executive Summary

This project is intended to support the Community Data Program ("the client")'s work in a Housing Solutions Lab funded by the Canada Mortgage and Housing Corporation. This report details our findings from a meta-analysis of data on affordable housing and homelessness at the local level. From our analysis, we produced an Environmental Scan Report that identified key housing and homelessness issues and preliminary data gaps. After completing further research, we have written this final report to explain the current state of the data and make recommendations for a local housing and homelessness reporting system based on best practices.

Our research covered the Eastern Canadian provinces and a portion of Québec, while our partner team (Haus of Planners) researched the Western Canadian provinces and the other portion of Québec. In our chosen provinces, we sourced documents that fit the categories listed in the Terms of Reference. After feedback from the client on our list of documents, the list was refined to include 35 documents.

The most common indicators found in the analyzed documents were homelessness indicators, housing market indicators, housing need indicators, demographic indicators, and funding indicators. We found that while many of the documents examined used municipally sourced data, the documents predominately used data from separate organizations like Statistics Canada, the Canada Mortgage and Housing Corporation, and provincial organizations.

Out of all the documents examined, Simcoe County and The City of Gatineau stood out as having the best combination of programs. Simcoe County provides municipally funded rent subsidies, an urban native housing program, a secondary suites program, and an affordable homeownership program. The City of Gatineau has a land reserve associated with their Social Housing Fund and they provide funding for affordable housing through the AccèsLogis program, a homeownership program, renovation programs, and a downtown residential construction subsidy program.

Indicators were found to have vastly diverse benefits and limitations. An example is an indicator's ability to be utilized over a period of time to be used to evaluate the efficacy of planning policies or programs. While indicators provide different depths or variety of data they can inform,

analysing the overlap and accumulative benefits provides a solid foundation on which to construct a resilient indicator framework.

The majority of organizations do not produce complementary progress reporting to their programs and policies. Some organizations produce consistent reports, while most do not. This results in less clarity of program and policy successfulness. Reporting on progress is important to ensure consistency among monitoring tools and to enable effective project comparisons. Our analysis points to the City of Toronto (and the Toronto Community Foundation), the City of Ottawa, and Simcoe County as the leaders in progress reporting. These organizations produce consistent progress reports and collect a host of other relevant, publicly accessible data.

Our analysis also identified gaps in homelessness reporting. Due to inconsistencies in the definitions of homelessness and in the data collection methods, different statistics are collected which can lead to different prevention and intervention methods. It is also ineffective to compare data from different regions with these discrepancies.

We found that appropriate data visualization was utilized in most cases. Reviewed documents generally displayed tabular and geoinformation data, the common methods of data visualizations were bar graphs, pie charts, and pictographs. The graphs that we found to be inadequate fell into five trends: potentially misleading, issues with legibility, human error, issues with labeling, and bland/outdated aesthetics. We made recommendations to address these trends based on data visualization studies and established graphic design related online publications.

The common indicators have proven to be valuable in the understanding of housing and homeless issues. In turn, we have developed a framework that maximizes the use of such indicators by promoting collaboration between the different indicator categories and consistency between jurisdictions. We recommend annual progress reports on housing and homelessness programs and policies that focus on quantity, quality, and effect or impact to evaluate project success. These reports should look at a combination of the common indicators to inform whether the program or policy is reducing chronic homelessness or not. We also recommend that a universal definition of homelessness is determined and that data collection methods are refined. This will ensure that data is more accurate, which will inform more effective policies and programs and ensure that data is more comparable across jurisdictions.

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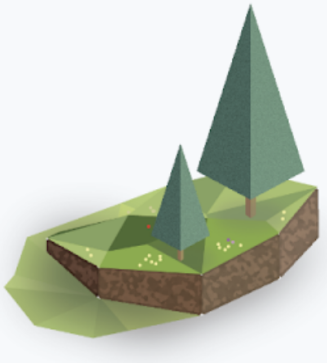
introduction



1.0 Introduction

1.1 Project Background

The Community Data Program ("CDP" or "the client") is participating in a housing-focused Solutions Lab in association with the Canada Mortgage and Housing Corporation to strengthen evidence-based planning and decision-making. In-House Group is supporting the CDP's work by performing a meta-analysis of data on affordable housing and homelessness at the local level. We researched the key issues surrounding housing and homelessness and how the data is presented. Upon completion of this analysis, we have recommended a local housing and homelessness reporting system.

In-House Group is focusing on the Eastern Canadian provinces, while the other team on this project, Haus of Planners, will be covering the Western Canadian provinces. Due to language capability constraints, the teams are splitting coverage of Québec. Our team is working closely with Haus of Planners to ensure that our analyses are complementary to one another.

Figure 1: Map of Provincial Distribution Between Groups

1.2 Research Process

The project's Terms of Reference provided a list of document categories to cover in this project. It also requested that the sources be varied by geographic region. Our team divided the document categories and used Google to search for our individual document types in a variety of regions. Following this search, a source list was compiled for client approval. After discussions with the client team, the source list was refined to include 35 documents across 6 document type categories with 15 more specific document type sub-categories (see Figure 2).

1. Collection of sources from several predetermined categories of interest expressed by the client
2. Assess and quantify the presence of data types in the collected resources
3. Refine and replace sources, removing those that do not provide useful information and adding additional sources to inform an Environmental Scan Report
4. Summarize findings, note interesting housing and homelessness approaches, and identify indicators of housing/homelessness strategy effectiveness in a Final Report

1.3 Research Limitations

This project examined a wide range of document types which allowed us to see a general picture of housing and homelessness in our chosen provinces. However, as we were only able to analyze 35 documents in depth, we were not able to get a holistic view of the current state in every region examined.

1.4 CDP Survey

The CPD survey was sent, prioritizing distribution to parties that authored sources utilized to conduct the research in this report. Appropriate contact avenues were found for 15 parties, consisting of public planning staff, organizations and information centers, media, and a foundation. Most of these contacts were public planning staff, comprising eight of the recipients. Results were not accessible to In-House Group but were collected through Google Forms.

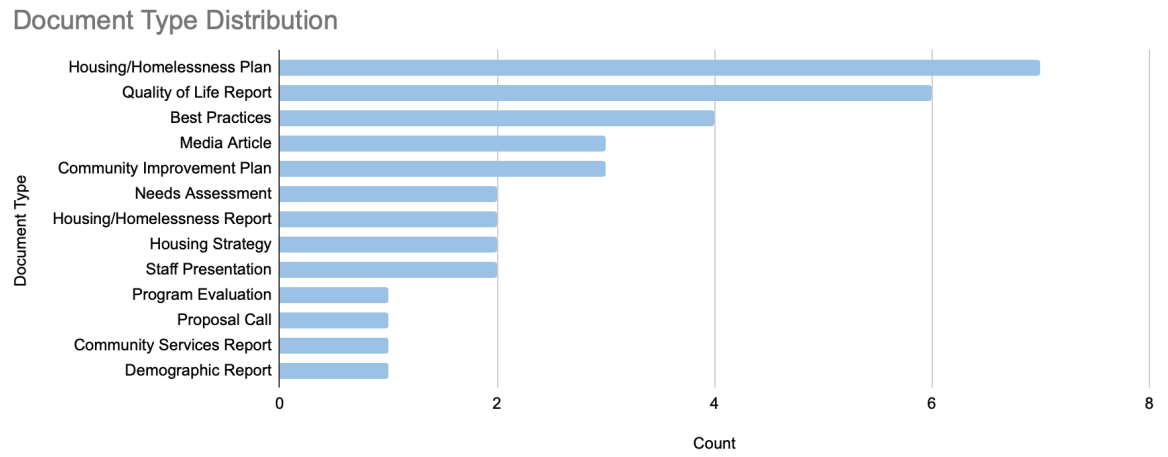
examination of the current state

2.0 Examination of the Current State

2.1 Documents Reviewed

The 35 main documents that In-House Group analyzed included quality of life reports, municipal (and provincial) documents, community organization documents, best practice documents, media articles, and staff presentations. These types of documents were chosen based on the categories outlined in the Terms of Reference. Figure 2 outlines the distribution of the types of documents.

Figure 2: Document Type Distribution



Most of the documents analyzed were produced by the local government or a community organization, while others were produced by provincial governments and media companies. The documents covered a range of cities and regions in the previously identified provinces. These include but are not limited to Toronto and other municipalities in the Greater Toronto Area, Waterloo Region, Simcoe Muskoka, Hastings County, Grey Highlands, Windsor-Essex, Ottawa, Gatineau, Montréal, Laval, Nunavik, and regions in Nova Scotia, New Brunswick, and Newfoundland and Labrador.

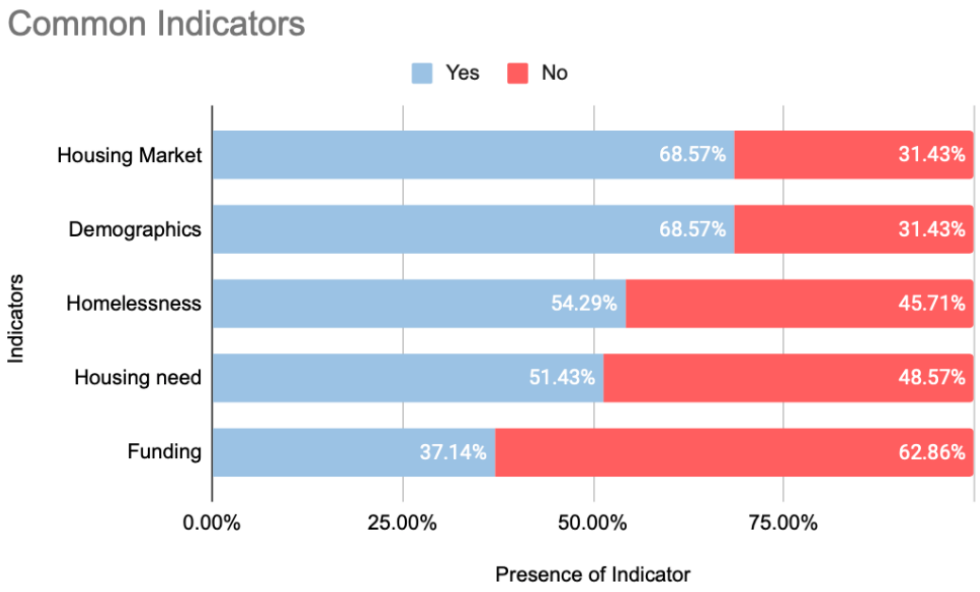
2.2 Common Indicators

The most common indicators found in the reports analyzed for this project were:

- Homelessness indicators were very common and often included shelter counts, counts of individuals “turned away” from shelters, street counts, types of homelessness, and causes of homelessness.

- Housing market indicators included rental vacancy rates, housing prices and rents, counts of affordable housing units produced, and eviction counts.
- Housing need indicators included average numbers of people on housing waitlists, core housing need counts, repair need counts, and housing turnover rates.
- Demographic indicators included population, income, age, marginalized groups, and child poverty rates.
- Funding indicators included grant amounts, forgivable loan amounts, funding amounts for housing repairs, shelter funding amounts.

Figure 3: Common Indicators Distribution



2.3 Common Data Sources

As demographic indicators are reported on extensively by Statistics Canada, l'Institut du Québec, and other organizations, the most important indicators for CDP to collect data for would be homelessness, housing market, and housing need indicators.

While many of the documents examined used municipally sourced data, the documents overwhelmingly used data from separate organizations like Statistics Canada, the Canada Mortgage and Housing Corporation, and provincial organizations. This points to the conclusion that municipalities and local organizations are not able to collect all of the housing and

homelessness data that they require, but that they are willing to use outside data. There is a clear need for supplementary data.

2.4 Case Studies of Promising Local Program and Policy Structures

2.4.1 Simcoe County

Simcoe County uses a variety of interventions to address housing issues. They provide municipally funded rent subsidies, an urban native housing program, a secondary suites program, and an affordable homeownership program (County of Simcoe, n.d.).

Providing such a wide variety of programs seems like it would be successful, though there is seldom data available on some of the programs. The program variety addresses many different issues and levels of affordable housing. In 2020, 563 people were counted as experiencing homelessness compared to the 697 in 2018 (County of Simcoe, 2020). Furthermore, the County is 70% of the way to their target of creating 2,685 new affordable housing units by 2024 (County of Simcoe, 2019). 1,873 have been built as of 2019 (County of Simcoe, 2019). Of the 585 new units created in 2019, 265 were secondary suites, which seems to be the most popular program (County of Simcoe, 2019). It is clear that Simcoe County is on track to meet their affordable housing provision goal in large part due to the programs they provide.

Figure 4: Simcoe County Programs

Source: Simcoe County, n.d.

2.4.2 City of Gatineau

The City of Gatineau also uses a variety of interventions to address housing issues. They have a land reserve associated with their Social Housing Fund and they provide funding for affordable housing through the AccèsLogis program, a homeownership program, renovation programs, and a downtown residential construction subsidy program (City of Gatineau, n.d.).

As of 2012, all land in the reserve was donated and the reserve contained no land (Communauté métropolitaine de Montréal, 2012). This demonstrates that the land is actually being used and the program is being implemented, rather than collecting land and then stalling. 1,000 affordable housing units have been built in Gatineau since 2002 (Communauté métropolitaine de Montréal, 2012). The City of Gatineau provided $11,803,000 in financial assistance for the construction of 706 social and affordable housing units between 2006 and 2009 (Communauté métropolitaine de Montréal, 2012). Gatineau also provided $12,600,000 to build 700 affordable housing between 2010 and 2013 (Communauté métropolitaine de Montréal, 2012). While the progress seems small, the programs in place in Gatineau are clearly working. They cover a range of affordable housing issues including protecting the existing stock of affordable housing, supporting homeownership, and supporting the construction of new social and affordable units.

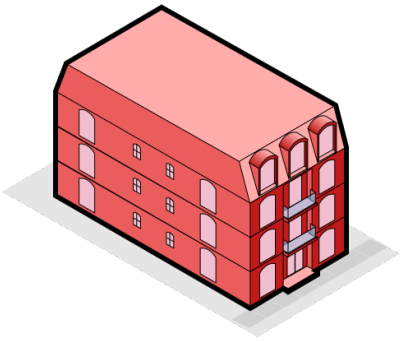
Figure 5: City of Gatineau Programs

Source: City of Gatineau, n.d.; Communauté métropolitaine de Montréal, 2012

indicator analysis

3.0 Indicator Analysis

3.1 General Affordable Housing and Homelessness Indicators



The data sources explored generated a variety of information that was best categorized into a series of indicators that can be utilized to gain useful information about the results of program or policy implementation. Although indicators do reflect the consequences of such implementations, each portrays different information at varying levels of efficacy. The indicators found from the sources explored are described below.

The first common indicator is the quantity of units produced or affected by a given policy or program. This allows for effective measuring housing availability and supply and is a direct product of a shift in policy or creation of an incentive. This makes this indicator excellent at directly evaluating such implementations' performance. This indicator does not address long-term affordability and rent increases but provides a snapshot only of prices at the date of evaluation. This indicator can also be difficult to explore in literature (Freemark, 2018). It is also difficult to distinguish if units are part of supplementing a general housing demand or specifically targeted or even restricted purchasing to homeless or people below the poverty line.

Cost per unit is an effective metric to compare and contrast against average market rates. It is a solid measure to compare against other indicators in an attempt to evaluate affordability. Insert Quote (Lee, 2019). Cost per unit is generally limited in time, lacking utility for long-term indications of affordability in more volatile housing markets. Cost is not the primary determinant of affordability. This indicator is also missing the ability to compare price to unit size and in turn track the success of particular housing strategies, such as tiny homes. (Riggs et al., 2020). The threshold of affordability is often considered to be 30% of one's income, meaning that cost per unit may not be the most accurate indicator without the context of local income-level.

The longevity of impacts is a meta-indicator, where other indicators are measured after an elapsed period of time has occurred since the implementation of a policy or program. While it serves as an effective way of evaluating these decision-making interventions, it is not without its individual limitations. It requires tuning and consideration of changing demographics if that is a targeted consideration of the policy or program. It is also difficult to track longer-term impacts as

there is a lack of sufficient national data available to provide a solid baseline to measure progress (Gaetz et al., 2013). It is also an indicator that is underrepresented in academic literature (Government of Ontario, 2019)

Using environmental impacts as an indicator provides a surprising number of benefits. It describes the ancillary benefits that might increase support for addressing homelessness and affordable housing issues. It can also be used to evaluate environmental policies, allowing for multi-faceted approaches to smart city policies. To some extent, impact on environmental accessibility to homeless individuals and those living in affordable housing can help describe the quality of affordable housing and shelter quality. Environmental accessibility can also help identify equity issues (Demarco et al., 2020). However, this indicator lacks a direct reflection of homelessness prevalence and severity.

Social equity is best evaluated as its own indicator of policy and program efficacy. It can gauge the presence and extent of inequity within homelessness and housing issues independently and is an effective metric of examining the efficacy of programs and policies directly targeted at addressing discrimination and inequities experienced by specific disadvantaged people. Despite these explicit benefits, shifting landscapes of inequity may require constant monitoring of this indicator to ensure appropriate application (Stuart, 2014). It can also be difficult to gauge the multi-dimensional problem of homelessness and such studies are underrepresented in academic literature (Government of Ontario, 2019).

Utilizing jobs created as an indicator has a considerable number of weaknesses but is ideal for gauging decision-makers' ability to provide additional job supply as a method of mitigating homelessness. It does not consider non-unemployment reasons for homelessness and does not evaluate the direct impact this indicator has on the population it is trying to evaluate efficacy for. Stigma surrounding homeless people can also result in jobs being created, but not utilized by those they were created for (Groton et al., 2017).

Evaluated policy and program accessibility is a broad and informative indicator to evaluate program and policy efficacy. It can be paired with social equity impacts to locate driving factors of inequity within public policy and programs. It is also useful in determining how context-sensitive and flexible public policy and programs are. This indicator also requires little monitoring

over time. Using this indicator to evaluate physical accessibility of public homeless shelters is a metric that can assist in ensuring equitable use of hard shelter services. It also accounts for potential additional costs of physical accessibility systems that may be required during construction of affordable housing units that may make the projects less affordable after implementation. This indicator generally requires evaluation from third parties to provide unbiased evaluation of public policy. Additionally, while policies and programs can be technically accessible, lack of information on public resources is critical and must be specified as part of the indicator.

While each of these indicators has its own advantages and shortcomings, they can be utilized in tandem to cover a wider variety of information. This is demonstrated in Table 1:

Table 1: Indicator Benefits Cross-Analysis

	Indicator Benefits								
	Describes Current Landscape	Evaluates Policy/Program Efficacy	Evaluates Affordability	Considers Temporal Change	Evaluates Ancillary Benefits	Evaluates Quality of Affordable Housing	Evaluates Inequity	Evaluates Policy/Program Context	Evaluates Physical Accessibility
Units Produced	■	■							
Cost/Unit	■		■						
Longevity		■		■					
Env. Impacts					■	■	■		
Social Equity	■	■					■		■
Jobs Created		■							
Program Accessibility				■			■	■	■
Shelter Beds							■	■	
# Stayed in Shelter									
# of Shelter Beds Used	■	■						■	
Length of Stay								■	
# People Turned Away	■						■	■	
# of Food Banks							■		
# of Soup Kitchens							■		

3.2 Homelessness-Specific Indicators

In addition to the common indicators used to evaluate both affordable housing and homelessness issues, several indicators focused explicitly on homelessness. These indicators, in contrast to the general indicators, are explicitly quantitative and require statistical evaluation requiring resources and time beyond the capacity of our investigation. Correlation coefficient and analysis of variance studies are recommended to be conducted before and after policy and program implementation to determine the efficacy of adjusting these parameters within homelessness strategies.

Number of emergency shelter beds is effective for establishing a supply in a given area, although not all homeless people opt to stay in a shelter, so it is not indicative of the true scope of the homelessness problem in a given area. The number of individuals who stayed in a shelter allows for collection of demographic data and can be used to predict which demographics are subject to disproportionate homelessness. The number of times shelter beds were used is useful as a trackable quantitative indicator for shelter usage. Average length of stay in emergency shelter in days is effective in evaluating how chronic homelessness is to individuals. Lastly, a number of individuals turned away from homeless shelters highlights the weaknesses of the homelessness programs in a given area and can be used to effectively measure demand for the construction of additional shelters.

data gaps

4.0 Data Gaps

4.1 Progress Reporting Gap

Out of the 35 documents analyzed for this project, only 7 had complementary progress updates. This demonstrates a significant data gap, as it is unclear how successful the majority of the programs and policies have been. There is also inconsistency among monitoring tools which results in data that cannot be compared effectively.

There is great variety in the frequency of reporting. For example, the Toronto Community Foundation, Windsor-Essex Community Foundation, and the Strait Region Community Foundation release a Vital Signs Report every year (sometimes more than one), while other community foundations like Fredericton and Greater Montréal release reports inconsistently (the most recent Fredericton report is from 2014). Releasing consistent reports helps to keep track of how things are changing.

The City of Toronto (and the Toronto Community Foundation), the City of Ottawa, and Simcoe County appear to do the best job of keeping track of data and reporting on progress of the organizations examined. Effective progress reporting ensures transparency, provides information to focus efforts for the remainder of the project and/or for future projects, and can encourage funding providers to continue providing funding.

4.1.1 Progress Reporting Best Practice Case Studies

4.1.1.1 Toronto

The City of Toronto provides shelter data on their website that is updated on a monthly basis. This website tracks how many homeless people have been moved to supportive housing each month in comparison to the previous year, people experiencing homelessness, the number of people that entered/exited the shelter system, the change between months, and other socioeconomic information that would be valuable in understanding the scope of the homelessness issues (City of Toronto, 2021).

Approximately one year after the Toronto City Council adopted the HousingTO 2020-2030 Action Plan and the Toronto Housing Charter, the HousingTO Implementation Plan was presented to Council. The Implementation Plan provided an update to the Action Plan, including a list of achievements from 2020 and the impacts of COVID-19. The list of achievements focused

primarily on the creation of new units and the number of households supported (City of Toronto, 2020).

This data tracking and the HousingTO Implementation Plan are complementary to the presentation to the City of Toronto Disability, Access, and Inclusion Advisory Committee that was analyzed for this project.

The Toronto Community Foundation has released a Vital Signs Report every year since 2006, including a 2020 Fallout Report on the effects of Covid-19 half a year into the pandemic (Toronto Community Foundation, n.d.). The reports do change from year to year in terms of aspects of housing that are focused on most heavily. However, these reports still provide an annual update on the general state of housing in Toronto (sometimes the GTA as a whole), social housing waitlist counts, vacancy rates, and average house prices and rents (Toronto Community Foundation, n.d.). They also look at other aspects of life that influence someone's housing situation like health and wellness, work, and getting around (Toronto Community Foundation, n.d.).

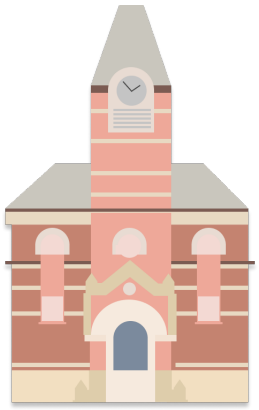
4.1.1.2 City of Ottawa

The 10-Year Housing and Homelessness Plan Progress Report: 2014-2017 examines the progress of the first 5 years of the City's 10-Year Housing and Homelessness Plan. This document was analyzed as part of this project and demonstrates a best practice in terms of progress reporting. The report details the new units that have been built, the units that have been repaired, and the new subsidies that have been introduced as part of the Plan (City of Ottawa, 2018). It also provides shelter and homelessness data, demographic data, and funding amounts from all three levels of government (City of Ottawa, 2018).

In addition to the Housing and Homelessness Plan Progress Report, the City of Ottawa has an entire website dedicated to progress reports. It is a useful tool as it provides recent updates (2019/2020) as well as archived versions of progress reports dating back to 2004 to measure the scope of the changes in the past decade (City of Ottawa, n.d.).

4.1.1.3 Prince Edward Island

This Housing Action Plan Progress Report complements the Homelessness Hub's report card on homelessness for Prince Edward Island that was analyzed for this project. The progress report aims to highlight the progress made on housing initiatives in Prince Edward Island since the province released its five-year housing action plan in July of 2018. The report summarizes the progress made up to December 2019 and then indicates new areas of focus moving forward (Government of Prince Edward Island, 2018). The plan provides tables highlighting the progress in different areas including availability, affordability, sustainable communities, coordination/collaboration, and leadership (Government of Prince Edward Island 2018).



4.1.1.4 Fredericton

The most recent Vital Signs Report for Fredericton is from 2014. Most other Community Foundations produce these reports every few years so there is a clear gap in progress reporting in the Fredericton Community Foundation's reporting. However, other organizations in Fredericton provide progress updates that can supplement the outdated Vital Signs Report. The Community Action Group on Homelessness's 2017 Annual Progress Report on Homelessness is one of such reports. It reports on the organization's multi-year plan to end homelessness and was published when the province was 3-years deep into their multi-year plan to combat homelessness (Community Action Group on Homelessness, 2017). The progress report provided useful indicators (such as: number of families on waiting lists for rent subsidies, market rental vacancy, average market rental cost for 1/2 bedroom apartments, social assistance rate, etc.) and displayed the data for 4 years between 2014 and 2017 (Community Action Group on Homelessness, 2017). The report also provides data on specific shelters in the area for the purpose of highlighting notable changes throughout the years (Community Action Group on Homelessness, 2017).

4.1.1.5 Saint John's

The Human Development Council's Saint John's 2016 Progress Report on Homelessness serves as a progress report for the homeless initiatives taking place in Saint John's, New Brunswick. Similar to the aforementioned sources, this report provides indicators related to homelessness and compares them throughout the years (Human Development Council, 2017). The report highlights housing indicators at large, as well as data from specific shelters (Human Development Council, 2017).

4.1.1.6 Simcoe County

Simcoe County has a publicly accessible online database with rental subsidy statistics, emergency shelter database analyses, homelessness enumerations, centralized waitlist reports, and annual housing reports (County of Simcoe, n.d.). There is only one document related to rental subsidy statistics and while it provides useful information, it only covers a program from 2015-2017 (County of Simcoe, n.d.). Three homelessness enumerations are available (from 2016, 2018, and 2020). The documents provided for each year present different information making it more challenging to compare them and to see how successful programs and policies have been (County of Simcoe, n.d.). Two centralized waitlist reports are available (2014 and 2015). These documents report on the number of people on the social housing waitlist, what kind of household they are, how many people were housed, what the wait times are, and distributions across municipalities (County of Simcoe, n.d.).

The annual report highlights the 10-Year Affordable Housing and Homelessness Prevention Strategy and provides clear and helpful information on the subject. They track performance by reporting on the quantity produced, the quality of what was produced, and the effect or impact of what was produced for each of the 5 strategic themes of the Strategy (County of Simcoe, 2019). Overall, Simcoe County does a good job with progress reporting, though they could be more consistent and report more frequently. These progress reports supplement and complement the 2016 Simcoe Muskoka's Vital Signs Report by providing more detailed and updated information.

4.2 Homelessness Reporting

Based on our analysis of the chosen documents, there is a clear gap in the data collection and reporting on homelessness. While this data gap is partially due to shortcomings in the data collection methods, the discrepancies in definitions of homelessness is also a major factor that needs to be addressed moving forward. Not all organizations that collect primary data on homeless people use the same definition. Many organizations only focus on the “on-street” population (which includes the shelter population). Other groups consider people who have homes but not adequate utilities as “homeless”, they also include those with housing insecurity (the “at risk” population) in this count. Not only does using different definitions lead to very different statistics, but it can also lead to different prevention and intervention methods and makes it challenging to compare these methods and their success rates.

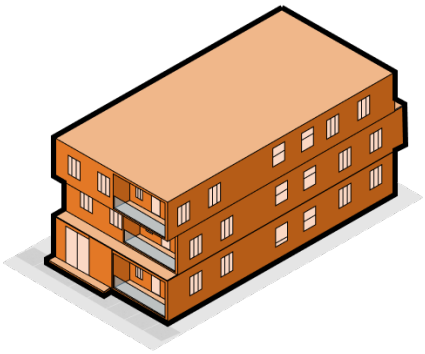
Based on our analysis of the chosen documents, homelessness reports and plans had a tendency to rely on shelter counts and point-in-time counts to determine the homelessness population and to identify the corresponding housing needs (Toronto Foundation, 2020; Fredericton Community Foundation, 2014; Huronia Community Foundation, 2016; Affordable Housing Association of Nova Scotia, 2018; City of Toronto, 2018). Shelter counts only address the homeless population that access shelters and while this is important data to collect, it does not account for people experiencing different kinds of homelessness on its own. Furthermore, simply counting the number of people accessing shelters does not inherently address the factors that cause homelessness. There are a variety of factors outside of the common economic factors like domestic violence, custody disputes, and mental illnesses that can contribute to homelessness. Simply counting the number of people who use shelters and building housing for that number does not address these issues. For example, programs that focus on the on-street population can help temporarily get individuals off of the streets, but they do not give the individuals the tools to actually escape homelessness (such as employment assistance, rent subsidies, or mental health supports). Very few of the documents analyzed for this report addressed the common non-economic factors that contribute to homelessness.

Although many government homelessness programs in Canada do include the at-risk population in their definition of homelessness, the data collecting methods in the documents examined do not reflect this, as their main focus tended to be the on-street population. The current data

collection methods on their own, are not sufficient as they do not provide a holistic picture of homelessness. More comprehensive data collection methods and a longitudinal model would be better suited to capturing a representation of homeless populations and understanding the full scope of the homelessness issue. The following section demonstrates in more detail how point-in-time counts do not provide a holistic representation of the homeless population.

4.2.1 Homelessness Reporting Case Study

City of Toronto



Toronto conducts the Street-Needs Assessment (City of Toronto, 2018) every year in the hopes of collecting both qualitative and quantitative homeless demographics, but they use an inaccurate point-in-time method to collect the data.

The first part is a "Windshield Street Survey" where city employees and volunteers literally approach people on the street who appear to be homeless. These individuals are asked to do a quick questionnaire, each questionnaire counts as one homeless individual, and those who cannot answer or choose not to answer are also counted as homeless individuals. The first problem is that it is impossible to survey each and every street in a city which results in a incomplete street survey; moreover, 44% of the city volunteers did not show up on the day of the street count for the 2018 assessment. Next, it is impossible to identify who is homeless based on appearance alone, this fact means that much of the street population on the day of the count was excluded. Third, the street population varies depending on the season, it is impossible to survey the entire population in one night.

The next part of Toronto's Street-Needs Assessment involves a Service-Based counting technique, this "indoor count" section involves identifying services that the homeless use (such as emergency shelters, transitional shelters and individuals identifying as homeless in correctional institutes) and conducting surveys in those locations. Similar to the street count, those who volunteered to do a questionnaire were included in the count, and those who were unable to or chose not to complete the questionnaire were also included in the count. The first problem with this technique is that not every service that the homeless population uses was surveyed. Next, many non-homeless individuals (such as those living in poverty or temporarily

escaping from an abusive home) often use these services as well. Resulting in inaccuracies by including the individuals who did not fill out the survey in the homeless count.

data visualization

5.0 Data Visualization

Good data visualization helps the viewer see relationships between data points that would be too difficult to analyze with numbers alone. It can help the reader understand the main takeaways of data faster and can make sharing the data easier. The reviewed documents displayed several types of data with different visualization methods. We did not find any overarching issues around data visualization among the documents, there were a few graphs that we found to be problematic. Overall, the data was presented in a way that is easy for the public to understand. Furthermore, the different types of data were generally displayed with the most appropriate visualization method. Lastly best practices were followed for the most part.

The reviewed documents mainly displayed tabular and geoinformation data, and the bar graph was the most commonly used visualization method. Some documents relied heavily on pictographs/icon arrays, such as the Simcoe Muskoka's Vital Signs document and the Region of Waterloo Community Services Annual Report. Lastly, pie charts and stacked bar graphs were also common. Given that the reviewed documents are for public use, the chosen data visualization methods were very appropriate. Studies on data visualization methods for non-expert audiences list bar graphs as the most effective and preferred method, as they require “relatively little cognitive effort” for comprehension (Smerecnik et al.) Another study found that pie charts are more effective at communicating data with smaller numerators than other methods (K. J. McCaffery et al., 2012). The same study also found pictographs to be similarly successful. The documents generally displayed data in a manner that is appropriate for a public audience.

The small proportion of data visualizations that we consider to be inadequate fall into three categories: potentially misleading, not following best practices, and human error. In addition, we found that many graphs did not include the necessary labeling.

5.1 Potentially Misleading

A misleading data visualization, also called distorted graphs, are graphs that misrepresent data. Distorted graphs are not always blatantly dishonest, but the way that the data is arranged or represented can often lead to false conclusions. Documents created for the public need to be especially aware of this possibility, as the public may not have the time or graph literacy to derive the correct conclusions. Advocacy type documents may use graphs to sway public opinion, a close review of this category of documents did not reveal any major biases. Our research did not

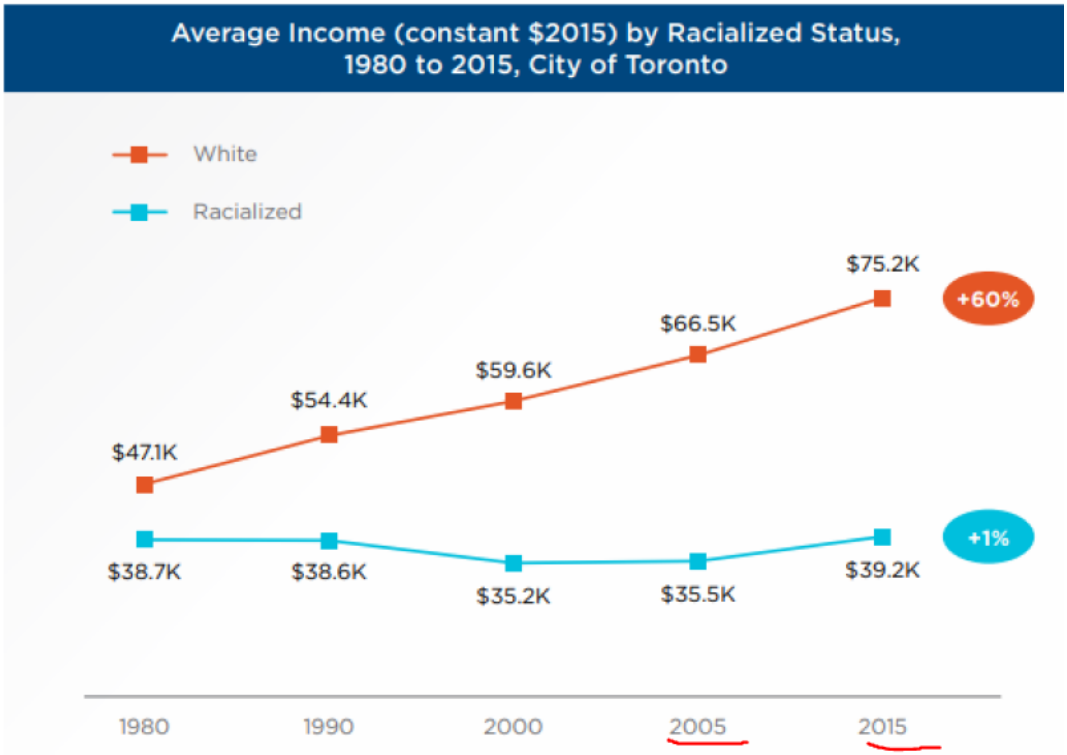
identify any trends of highly distorted/manipulative graphs among the documents. However, we did find one trend that many resources on data visualization would deem to be distorted, the trends being irregular axis numbers/improper intervals. To reiterate, these example graphs are not blatantly dishonest, but the continuation of these trends can eventually lead to manipulative graphs. Lastly, we found one graph that is potentially misleading due to comparing datasets with different sample sizes, this was not a trend, but it is worth mentioning.

5.1.1 Irregular Axis Numbers / Improper Intervals

Irregular axis numbers or improper intervals can be used to manipulate a graph to either emphasize or deemphasize trends. Several graphs through the documents used irregular axis numbers. The data is not necessarily misrepresented in these graphs, but the graphs should still use an axis break to make the skipped numbers more apparent (McCready, 2021).

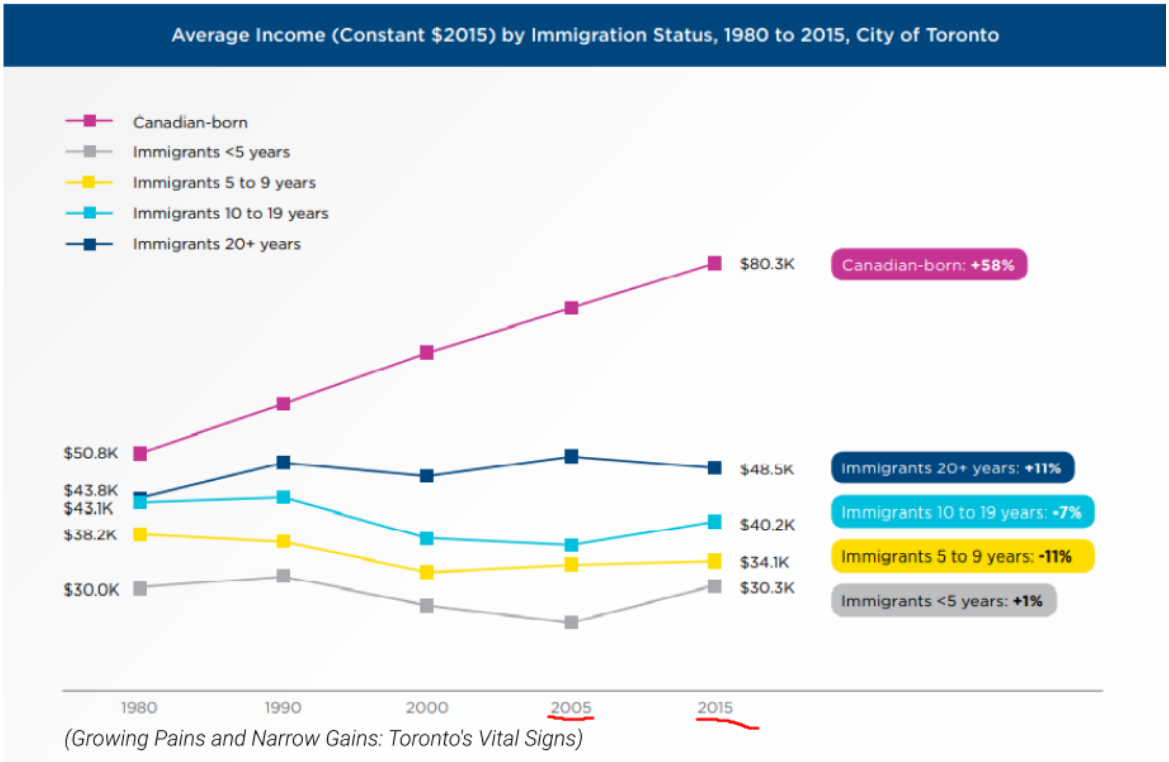
The two graphs below show temporal trends. The x-axis is regular at first but makes a big jump between 2005 and 2015. Perhaps the trend would look different if 2005 data was also displayed. Although this criticism may be nit-picky, these graphs should still use axis breaks to adhere to best practice.

Figure 6: Figure from Toronto's Vital Signs Report



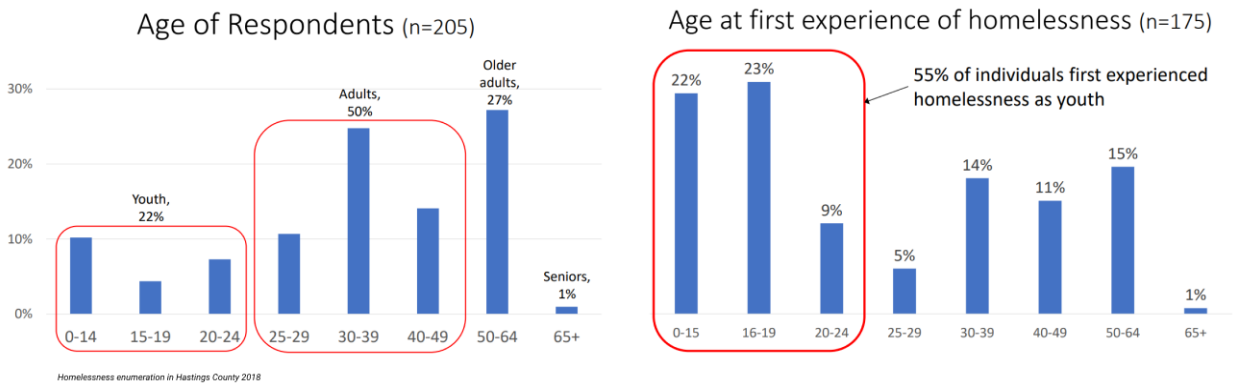
(Growing Pains and Narrow Gains: Toronto's Vital Signs)

Figure 7: Figure from Toronto's Vital Signs Report



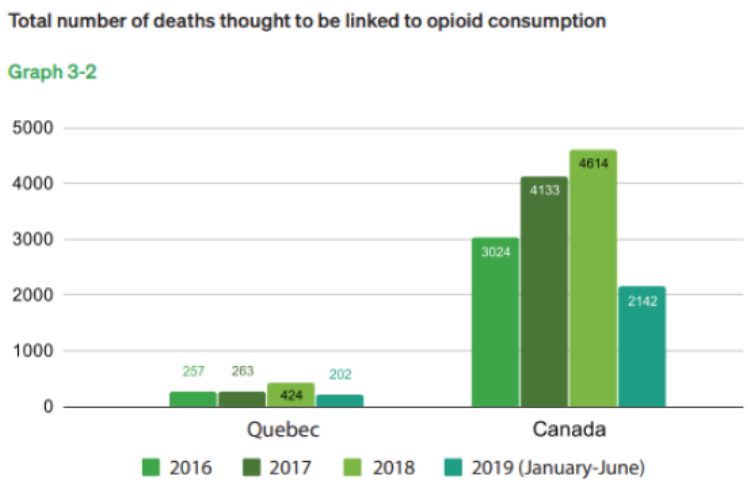
The next two graphs are using data straight from a survey that was not designed to create a graph. We presume that the age range options in the survey reflect different age classifications, 0-14 would be children, 15-19 as late teens, 20-24 as young adults and so on. These data collection methods end up creating irregular improper intervals. Perhaps a consistent 5-year age range would create more opportunities for analysis. Furthermore, the red markings came with the graph, likely a part of a Microsoft PowerPoint slide show. Public documents should receive more polish.

Figure 8: Figure from Hastings County Report



5.1.2 Comparing Different Sample Sizes

Figure 9: Figure from Montreal's Vital Signs Report



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A quick glance at the graph on the right might lead to the conclusion that there are less opioid connected deaths in Quebec than in Canada on average. However, this would be a false conclusion. This graph numerically compares two sets of data with different sample sizes, furthermore the "Canada" data set would also contain the opioid related deaths inside Quebec as well. Putting these data sets beside one another in this manner leads human intuition to directly compare the two data sets. Simply converting the data set to be the percentage of the specific regions' population would create a more honest and effective graph. Also, changing the data set to "Quebec" and "All "Other Provinces and Territories" would help. This potentially misleading graph was likely not created with manipulative intent, however more care should be put into making graphs that are for the public eye.

5.2 Issues with Legibility

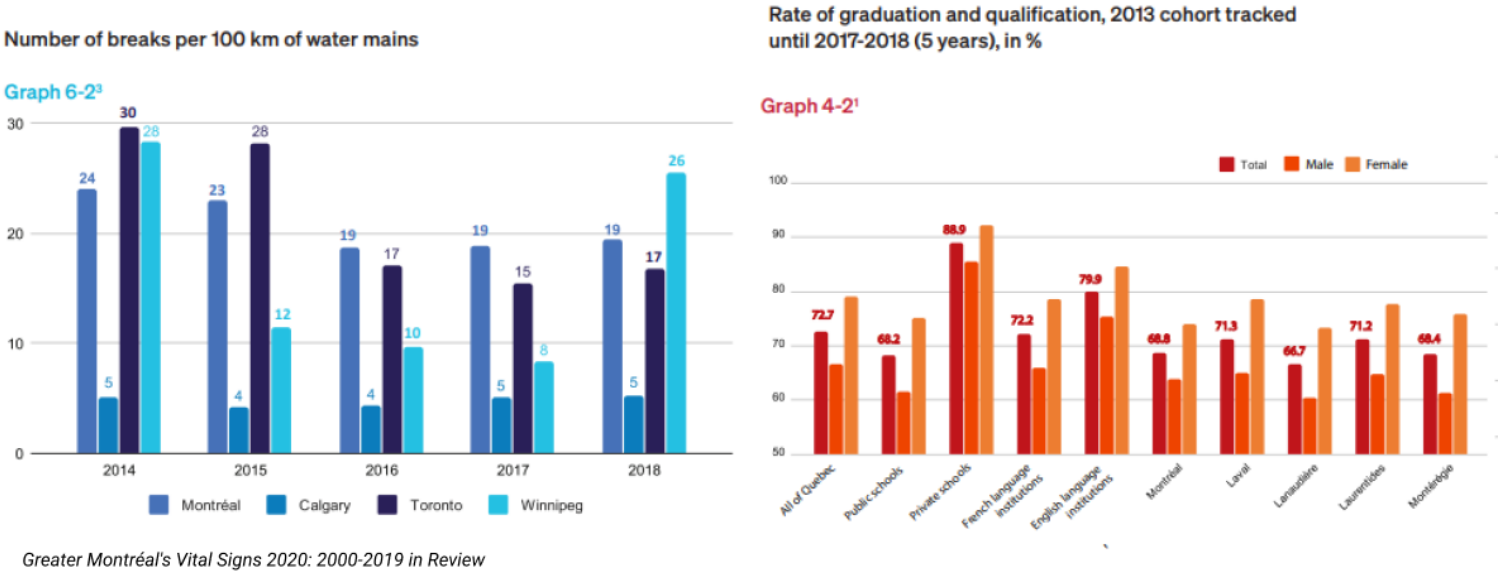
The goal of data visualization is to make numbers and statistics become easier to understand in a visually digestible format; best practices guide us towards legible graphs. Graphs that ignore some of these best practices are sometimes still able to convey relationships in data, but they miss out on the opportunity to be more effective. This report will not include the long and well documented list of best practices for data visualization that aid in creating legible graphs, instead we will show examples of the trends of overlooked best practices within the reviewed papers that lead to legibility issues.

5.2.1 Use Distinct Colours

Using distinct colors in graphs assure that the viewer will not need to constantly look back and forth from the graph and the legend. Colors that are easy to identify in relation to one another will help the viewer associate a specific color with a data set, "green for Toronto, blue for Montreal". Using similar colors can confuse the viewer, "light blue for Calgary, dark blue for Toronto, baby

blue for...". Although the graphs below did a great job at differentiating the data sets using groups and spaces, more distinct colors would make the graphs more digestible (Yi, 2019).

Figure 10: Figure from Montreal's Vital Signs Report



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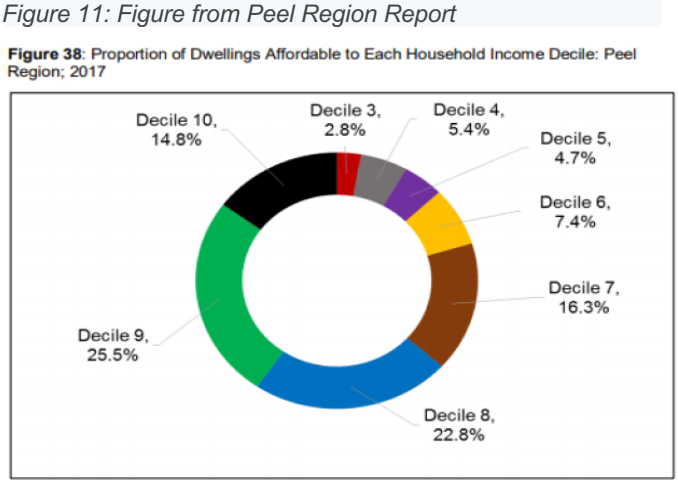
5.2.2 Pie Chart Best Practices

We used a study that found pie charts to be an efficient data visualization method, the caveat is that pie charts are only efficient when the number of slices are below 5 (Datawrapper, 2021). Above 5 pieces, the human brain has a difficult time judging the proportion in a circle. The percent value should also be specified numerically, either inside or beside the pie piece. Furthermore, the slices should start at 12 o'clock and then be arranged from largest to smallest or vice versa, this helps the viewer extrapolate the relationships better (Act-on, 2020). Several pie charts in the reviewed documents did not follow these guidelines.

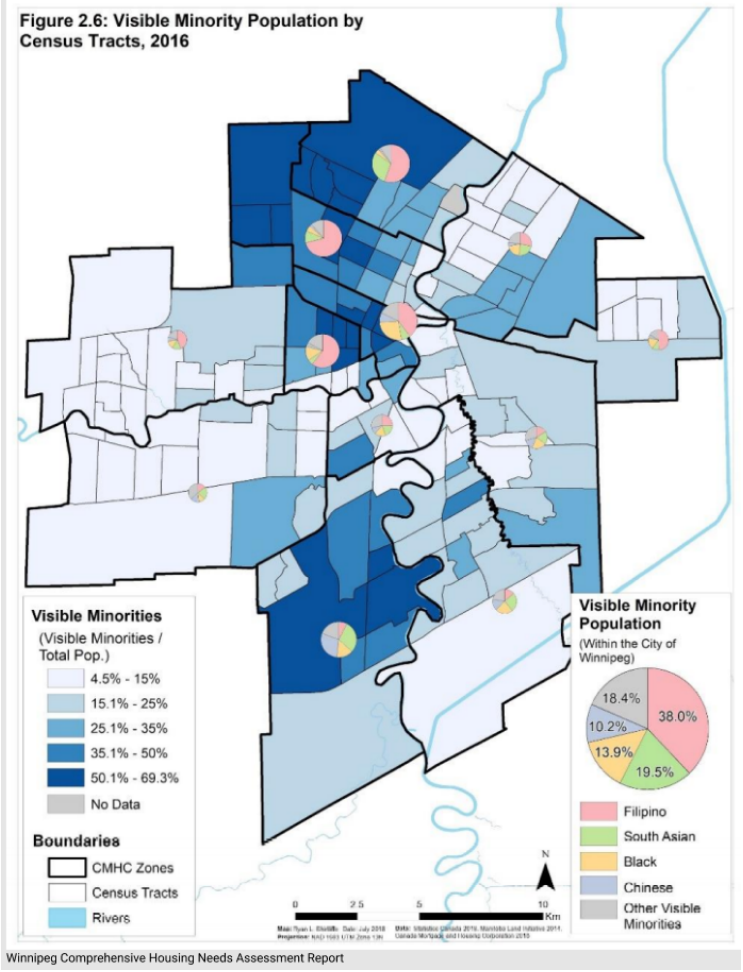
Figure 11: Figure from Peel Region Report



The pie chart on the left has too many pieces. Next, the pie slices are not arranged from largest to smallest, instead they are arranged in decile order. This dataset may be better represented in a stacked bar graph.

Figure 12 demonstrates an ineffective use of pie charts. The big pie chart on the bottom right is effective, but the several charts layered on top of the map create a

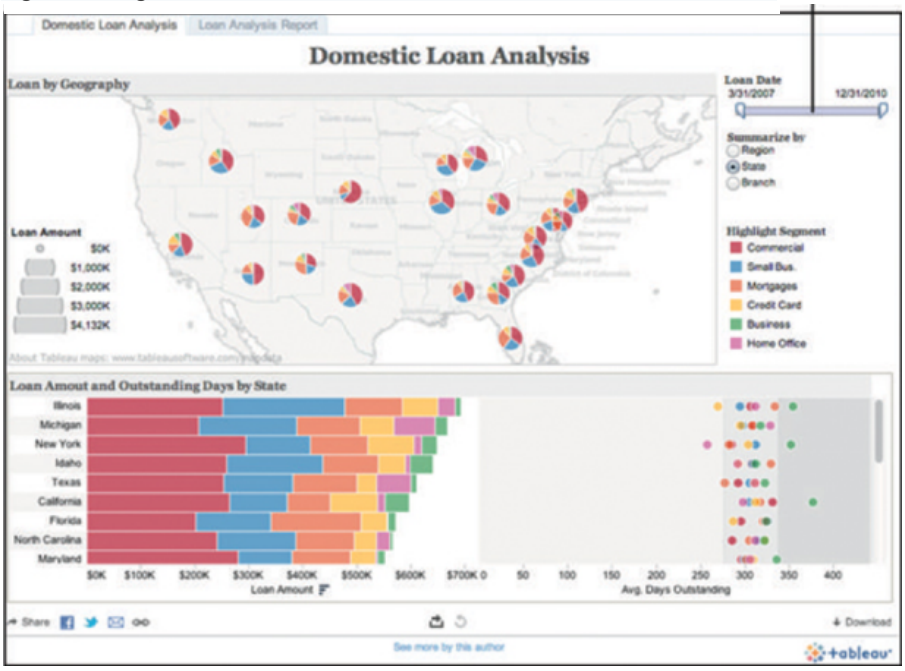
Figure 12: Figure from Winnipeg Comprehensive Housing Needs Assessment Report



problem. It appears that the relative size of the charts on the map are used to communicate the overall population of the respective region, this decision ended up making some charts too small to see. Furthermore, they don't show numeric percentage values. This data set could be more effectively displayed using a stacked bar graph, see example below.

The graph in Figure 13 deals with a similar type of data as the previous Winnipeg Comprehensive Housing Needs Assessment Report graph. The top part displays the geoinformation data with pie charts; it fails to be effective in a similar way. However, the lower half shows the same data with stacked bar graphs. The 2nd way is much more effective as the proportion of loans between the states can be accurately measured.

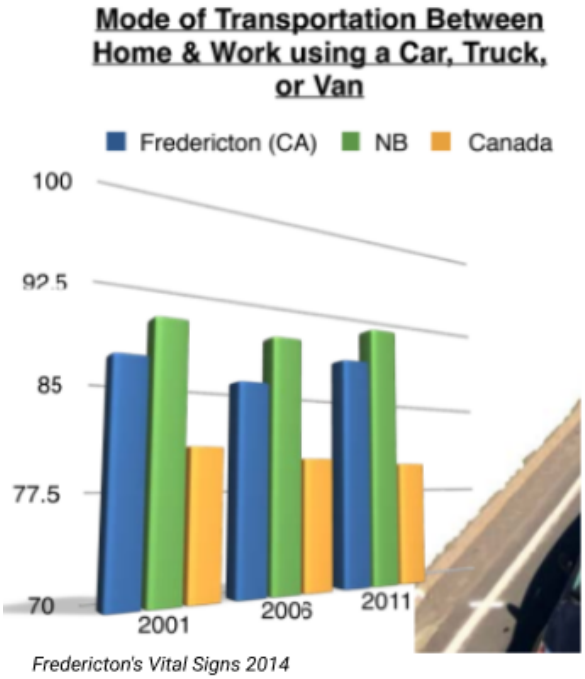
Figure 13: Figure made in Tableau



5.2.3 Avoid 3D

Adding a third dimension to graphs may seem like an attractive choice as it adds visual flare, but generally the third dimension is entirely superfluous (Finan, n.d.). 3D can delude the relationship between data, as the eye perceives closer objects to be larger than objects further away.

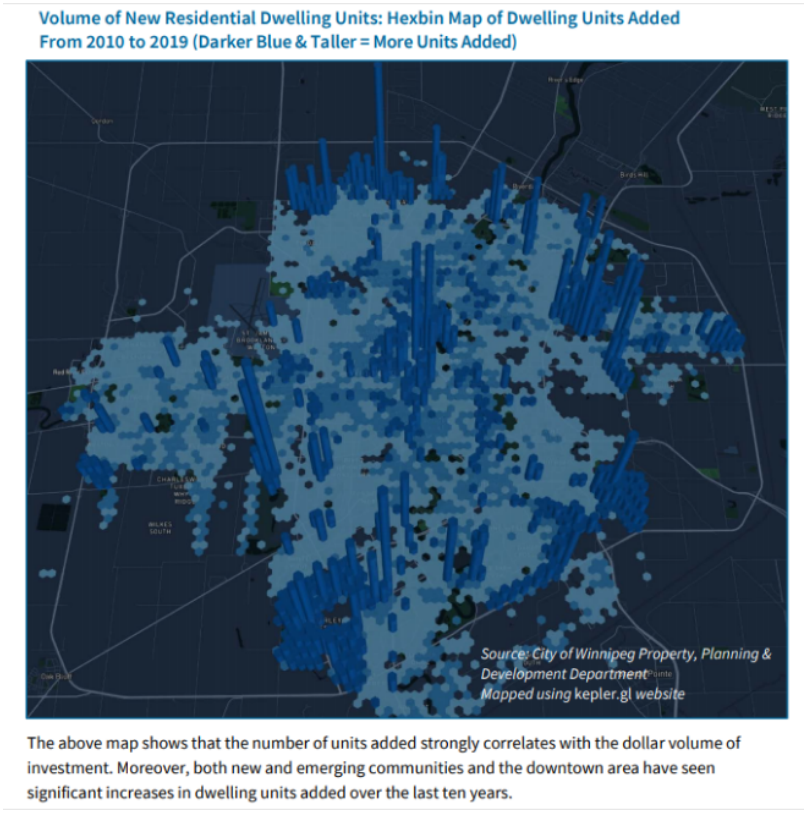
Figure 14: Figure from Fredericton's Vital Signs Report



Fredericton's Vital Signs 2014

In the Figure 14 graph, the 3D creates difficulty when trying to compare the datasets, the bars for NB in 2001 and 2006 look about the same from this angle. Not showing the bar values numerically makes the problem worse. A 2D graph would have been a better choice.

Figure 15: Figure from Winnipeg Property, Planning, & Development Department



The above map shows that the number of units added strongly correlates with the dollar volume of investment. Moreover, both new and emerging communities and the downtown area have seen significant increases in dwelling units added over the last ten years.

The graph in Figure 15 breaks two guidelines, using non-distinct colors and using 3D. It is impossible to compare the relative size of the 3D hexagons that are below the camera to the hexagons the furthest away. This graph may work if it was an online interactive space, but it does not work on 2D paper. This set of spatial distribution data can be more effective when displayed with choropleth saturation or gradient.

5.2.4 Human Error

Simple mistakes are prone to happen in any type of work, sometimes these mistakes make data visualizations more difficult to comprehend. The mistakes we spotted were nothing major, but there were more cases of human error than we had expected. Public documents should receive

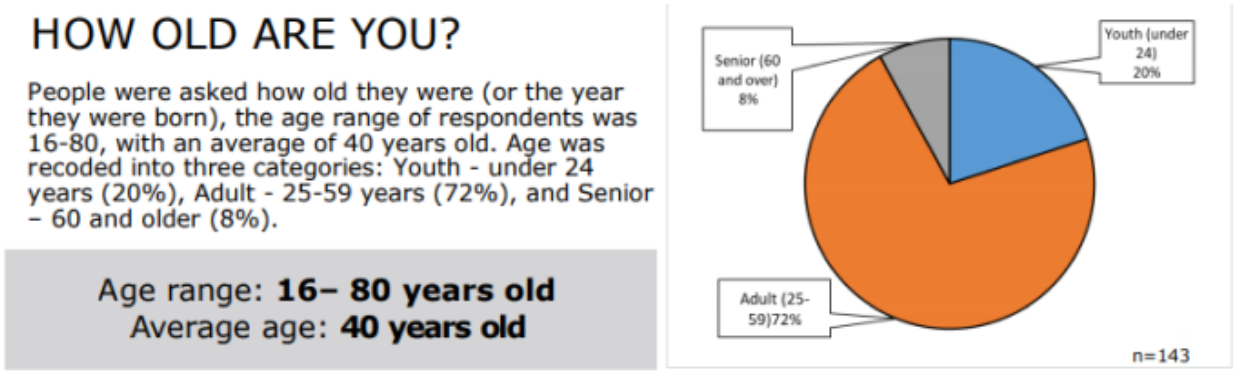
more polish in general, avoiding these types of mistakes can help the public trust their government more. The following examples have incomplete axis labels and overlapping text.

5.2.5 Issues with Labelling

Creating legible graphs is very important, but the features surrounding the graph should be given equal consideration. These supporting features can dramatically help improve comprehension and shareability. Good placement/use of graph elements means that the viewer can quickly understand the main takeaways without reading deeply into the body of text. In addition, adequate periphery elements can make the graph easier to share as all the necessary information will be included in a single screen shot.

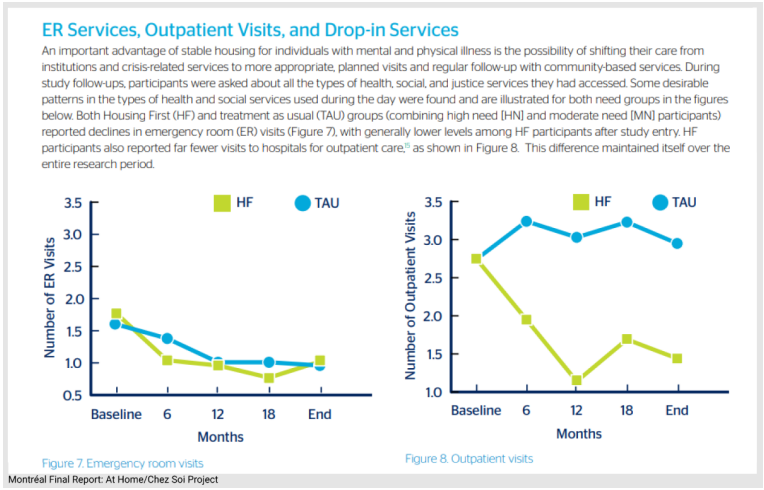
First, we found many graphs that simply don't have a title, the layout suggested that they share a title with their respective paragraph (graph below). One document put the graph titles in small text below the graph (graph on left). A descriptive title placed on top of the graph communicated necessary context.

Figure 16: Figure from Halifax Point in Time Count



Nova Scotia - EVERYONE COUNTS Report on the 2018 Halifax Point in Time Count

Figure 17: Figure from Montreal At Home Report



Next, the graph axis should be clearly labeled, no matter how obvious it may seem. Moving on to another shortfall, sources of data should be placed in smaller text below the graph. In addition, stating the numerical value directly on the data point is sometimes appropriate, it reduces the need to estimate the exact value. The lack of these elements was a trend among the reviewed documents.

To repeat, clearly labeled titles, axes, sources, and data points help the viewer understand the graph without needing to read into the body of text. We also suggest writing the main takeaway of the graph either as the title, or directly below the title.

Figure 18: Figure Depicting Labelling Issues

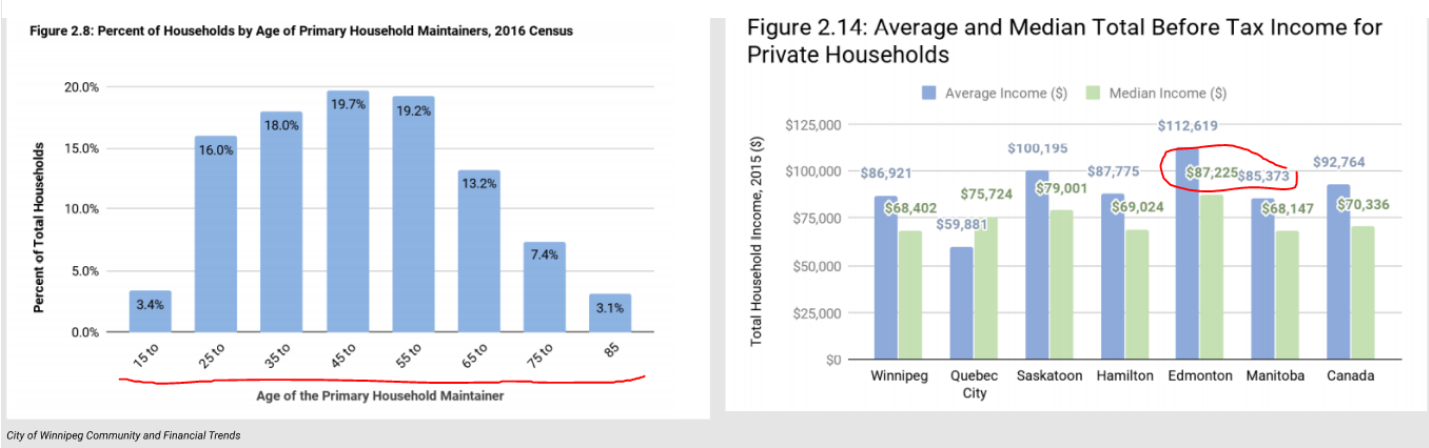
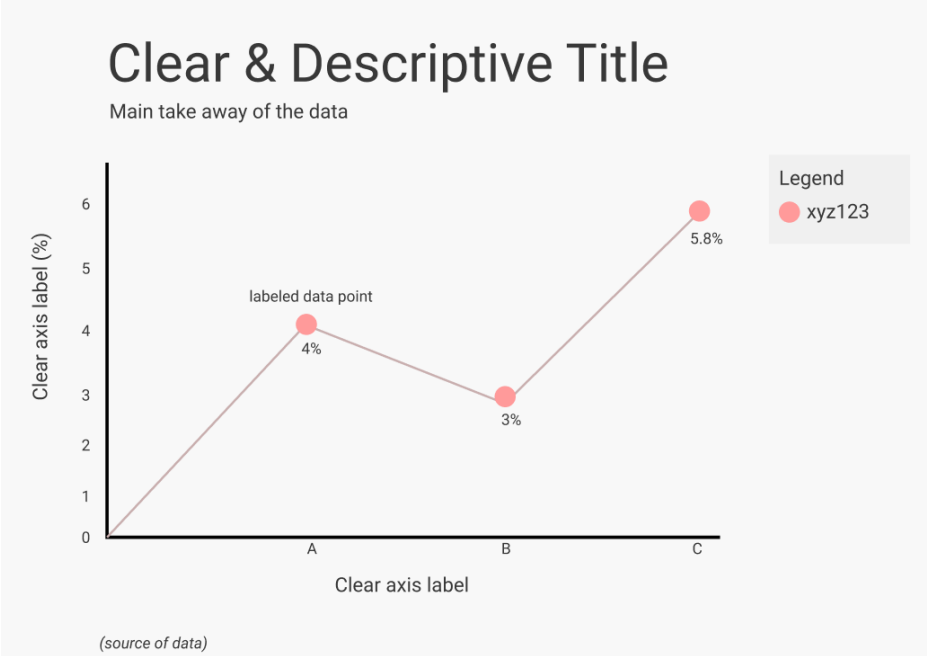


Figure 19: Figure Depicting Proper Titling

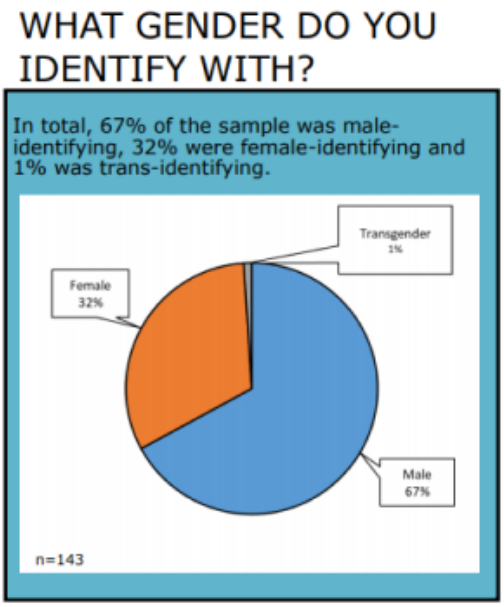


5.2.6 Bland/Outdated Aesthetics

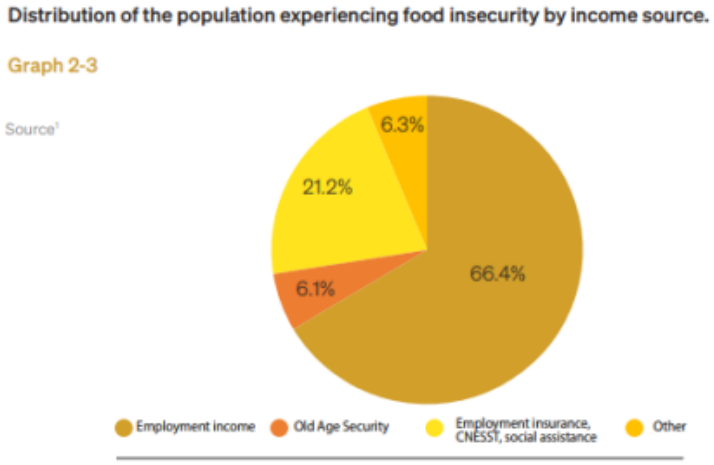
We did not judge the graphs based on their aesthetics so far, but this is a subject that deserves consideration as well. Aesthetically pleasing graphs are more engaging, a harmonious balance of color, line weight, and proportions appeals to the eye and invites analysis. Viewers will always appreciate this added level of care. Furthermore, graphs that adhere to the changing visual landscape tells the viewer that the respective organization or government keeps up with the times,

that they deeply understand recent events beyond just data points. The two graphs below both follow many of the guidelines for effective graphs, most would agree that both graphs can successfully communicate data. However, the graph below on the left is lacking in aesthetic value (unconventional use of comic book type speech bubbles as a label, title outside of the box), while the graph on the right is following modern graphical language (such as using muted colors).

Figure 20: Figure Comparing Aesthetics



Nova Scotia - EVERYONE COUNTS Report on the 2018 Halifax Point in Time Count



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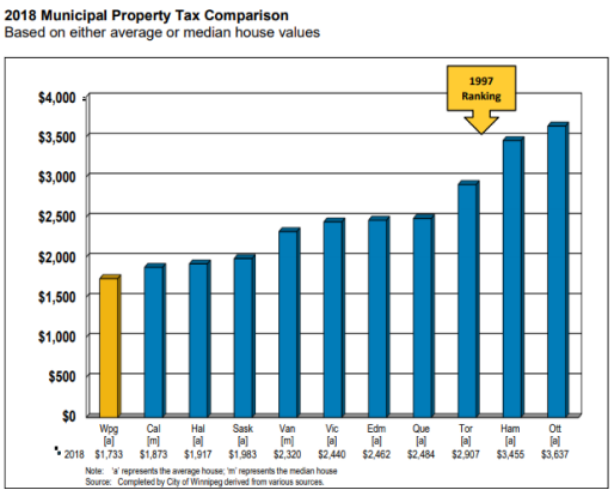
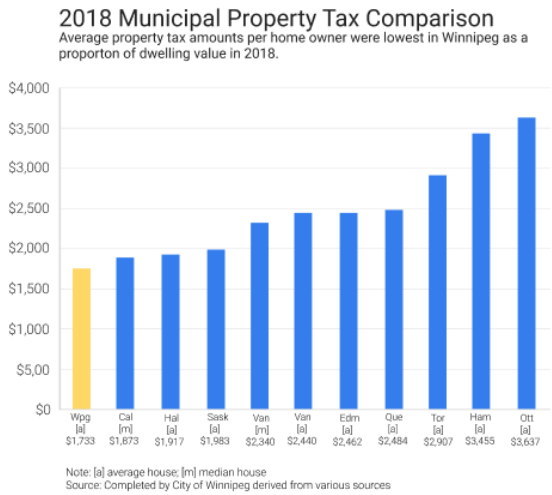
The more aesthetically pleasing graph signals a high level of professionalism, which is something that all governments and organizations aim for. Budget constraints are a barrier to hiring professional graphic designers to create aesthetically pleasing graphs. However, today's technology can help anyone create pleasing graphs in a short amount of time and for free. We recommend putting the graphs created in typical software such as Microsoft Office or ArcGIS into a free tool like Figma, or a paid tool like Tableau. These graphic tools add more control to the aesthetic elements of graphs. An untrained person can easily recreate a graph using simple shapes, lines, and text, with full control over all these building blocks. We followed this suggested workflow and created a more aesthetically pleasing graph in Figma in about 10 minutes, see image below.

Figure 21: Figure Comparing Aesthetics





conclusions and recommendations

6.0 Conclusions and Recommendations

6.1 Conclusions

In conclusion, many useful indicators are currently being used, though their prevalence is inconsistent. Practitioners need to be consistent in the data they collect and use in order to make comparisons and inform effective policies and programs. When indicators are combined, most drawbacks are eliminated, and a comprehensive system can be generated to better understand complex issues like homelessness and affordable housing. Based on the documents we analyzed, data is not always being presented in the most effective way. The following section details our recommendations to mitigate these issues, which will hopefully result in more effective affordable housing policies and programs that will reduce homelessness.

6.2 Recommendations

6.2.1 Recommended Indicator Framework

The documents reviewed throughout the research process suggest that the most common types of indicators can be subdivided into the following categories: homelessness, housing market, housing need, demographic, service provision, and funding. From these categories, several indicators reappeared throughout the documents, including the quantity of units produced or affected, cost per unit, longevity of impacts, environmental impacts, social equity, jobs created, and program accessibility. These indicators are valuable tools used to understand housing and homelessness conditions on municipal, provincial, and national levels. It is important to capitalize on these indicators to generate a comprehensive system to best understand housing and homelessness issues at large. As a result, our proposed framework represents an approach that is both collaborative between indicators and consistent between jurisdictions.

The collaborative approach of the framework was inspired by the notion that the weaknesses of the individual indicators would be mitigated – or perhaps eliminated entirely – if they were used in conjunction with one another. This can be attributed to the fact that many of the indicator categories are interconnected and are often dependent on one another, so the most logical approach would be to combine the indicators to highlight the most beneficial information. To illustrate, units produced and affected and cost per unit are both housing market indicators that directly impact homelessness levels. The indicators both provide valuable insight on the availability of housing units in a specific area. The cost per unit indicator is a helpful tool to compare rent and housing prices against average market rates, which could be used as a

determinant of homelessness levels if the data indicates a lack of affordable housing stock in the respective area.

This data should be used in conjunction with the homelessness-specific indicators to establish connections between market conditions and the prevalence of homelessness and generate appropriate solutions to address the issue moving forward. Some valuable homelessness-specific indicators to include in the framework include number of emergency shelter beds, number of individuals who stayed in a shelter (subdivided into men, women, children, and families), number of times shelter beds were used, average length of stay in emergency shelter, number of individuals turned away from shelters (Homeless Hub, 2010). The number of food banks, and the number of soup kitchens have also been identified as valuable homelessness-specific indicators, though they are currently not as prevalent in homelessness reporting (Homeless Hub, 2010). We recommend these service provision indicators for the following reasons:

- The number of food banks and soup kitchens could be indicative of the homeless population in an area, and it would be valuable to record how many people use these resources on a daily/weekly/monthly basis.
- The people using these resources may not necessarily be homeless - find a means of tracking the living situation of those using food banks (i.e., homeless, low-income, etc.).

This represents one example of the collaborative approach proposed under the recommended framework. To maximize the efficacy of the framework, policymakers should strive to consider all indicator categories collaboratively to mitigate any gaps present in the data.

In addition to being collaborative, it is critical to ensure that the indicator framework remains consistent between jurisdictions. The documents reviewed throughout the research process varied in the amount and type of data collected by the publishing organization. The lack of a uniform framework makes it difficult to compare data between jurisdictions as they utilize different indicators inspired by inconsistent definitions. Streamlining an indicator framework would ensure that the data collected by practitioners in various jurisdictions remains consistent, which would be highly advantageous from both an academic and policymaking perspective. The streamlined data from different cities, regions, and provinces can be used to drive research and

policymaking. Such a framework represents a unique opportunity to strengthen the quality of housing and homelessness data available in Canada, which can then be used to inform innovative research and policymaking on a multitude of levels.

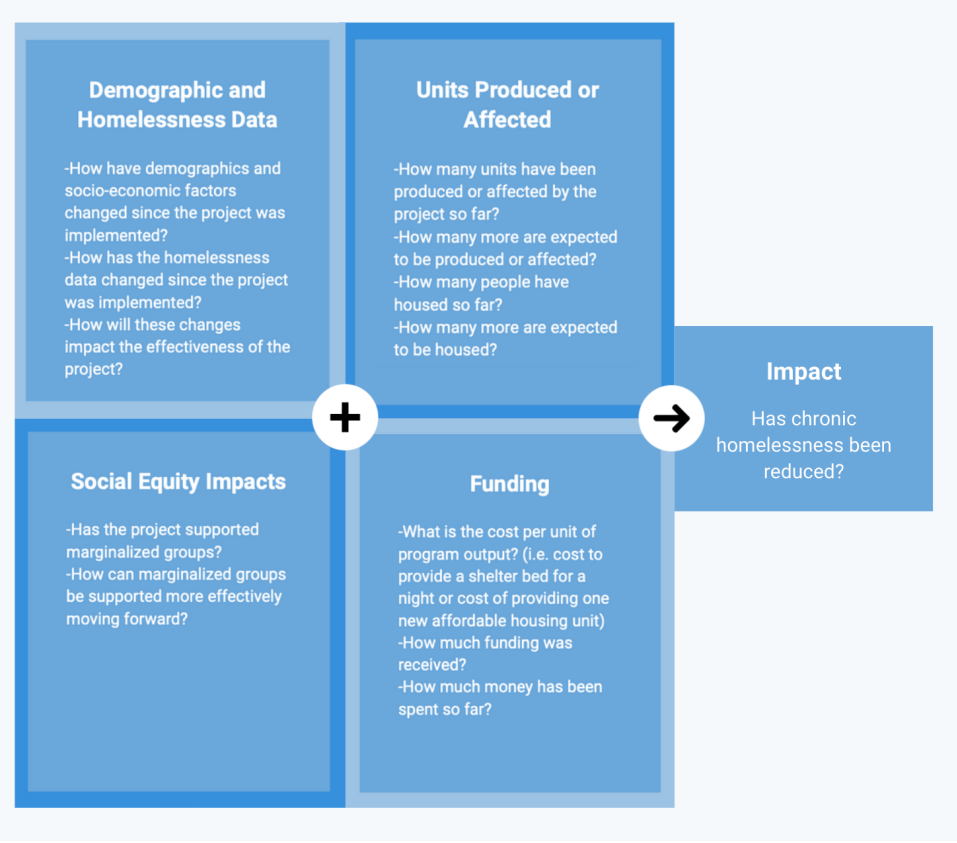
6.2.2 Strategies to Fill Gaps

6.2.2.1 Progress Reporting Gap

In order to fill the progress reporting gap, we recommend providing organizations with a reporting framework. A reporting framework would increase consistency between organizations, making it easier to compare progress from one program or policy to another. Furthermore, using a reporting framework rather than starting from scratch would likely take less time and therefore, would free up time to be spent on other initiatives or to be spent diving deeper into the progress report than would otherwise be possible.

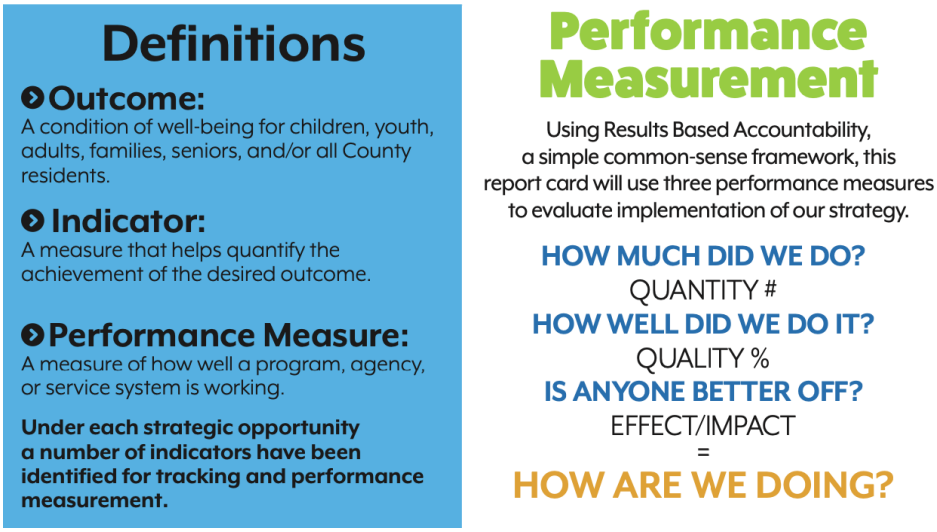
In addition to a summary of the project, various indicators should be included in a progress report. While not all of the important indicators will be relevant to every program or policy, there are several that will apply to the majority. Some key indicators to include are as follows:

Figure 22: Recommended Progress Report Framework



Addressing these questions will help to inform whether the program or policy is reducing chronic homelessness or not, which should be one of their overarching focuses. We recommend reporting progress using this framework with the approach of Simcoe County's annual housing progress report. In their housing progress report, they focus on quantity, quality, and effect or impact to evaluate how they are doing. See Simcoe County's approach in Figure 23 below.

Figure 23: Simcoe County Progress Reporting Framework



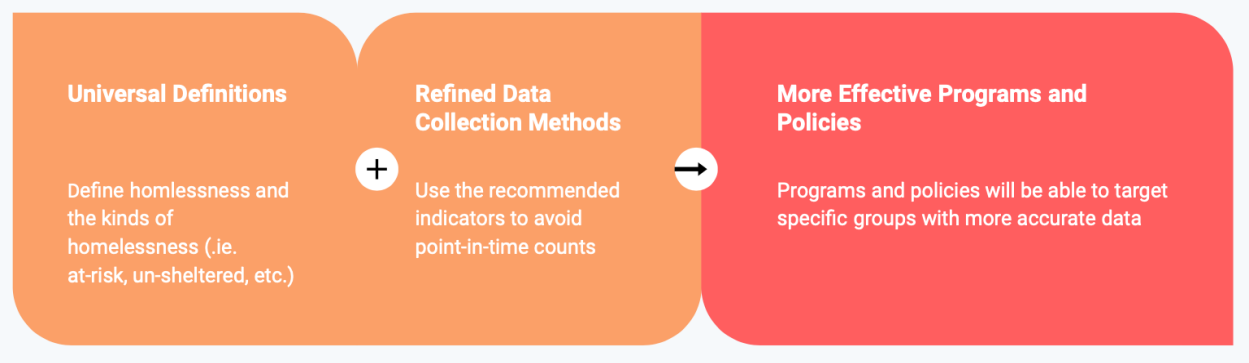
Source: Simcoe County, 2019

6.2.2.2 Homelessness Reporting Gap

To fill the gap in homelessness reporting effectively, universal definitions of homelessness and the different kinds of homelessness are necessary. Universal definitions will support comparison between regions and will support more accurate data collection which will likely result in programs and policies that better meet the needs of the community.

Once specific definitions have been confirmed, data collection methods should be refined. As detailed above, the point-in-time count method results in inaccurate counts that misinform programs and policies. To supplement point-in-time counts, we recommend using the homelessness-specific indicators covered in the recommended indicator framework to inform this step. Although, those do not account for individuals who do not make use of shelters or those who are at-risk.

Figure 24: Recommended Homelessness Reporting Strategy



6.2.3 Recommended Data Visualization Methods

The reviewed documents used appropriate data visualization methods in the majority of cases. It is important to pause and think about how a graph will be perceived by someone who is not familiar with the data or data visualization in general. Creating graphs for an audience with low graph literacy should be the goal, and as such, we support the frequent use of bar graphs, pie charts (with 5 or less categories) and pictographs within the analyzed documents. Furthermore, best practices should be followed as much as possible, they should only be omitted after careful considerations of the audience's perspective. In addition to creating more legible graphs, following the guidelines will reduce the chances of accidentally creating manipulative graphs. In addition, adequate labels should be included as they assist with graph comprehension and allow for increased shareability. Lastly, we found aesthetics to sometimes be an overlooked factor in graph making, we recommend using simple free tools online to elevate the aesthetics of graphs.

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