COMMUNITY HEALTH SNAPSHOT:

KEY DETERMINANTS OF POPULATION HEALTH AND HEALTH CARE UTILIZATION IN NOVA SCOTIAN COMMUNITIES

July 2026

nova scotia health | Public Health

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EXECUTIVE SUMMARY

This report presents the findings of an exploration of provincial- and community-level data on health indicators and social determinants of health in Nova Scotia.

Key takeaways from this report include:

a. There are clear differences in the distribution of health outcomes and social determinants of health at the community level across Nova Scotia. These differences are important to consider in health system planning, as well as programs and policies aimed at improving health outcomes.

b. Rates of multimorbidity and high-cost healthcare use increase with age. The rate of multimorbidity among 75+ year olds is 2.5x higher than in the overall population, while the rate of high-cost healthcare use is almost 4.5x higher than in the overall population.

c. Rates of multimorbidity and high-cost healthcare use also increase with community-level material deprivation.

d. Rates of health system non-use are higher in urban areas of the Halifax Regional Municipality, where the population, on average, tends to be younger and less materially deprived.

Future opportunities include expanding upon the list of included health indicators and social determinants of health, exploring differences in indicators at an even smaller geographic scale, and accounting for the complex interactions between social determinants of health and their impact on health outcomes.

The social determinants of health are non-medical factors that impact our health and well-being. They include the direct conditions into which we are born, live, age, and work, as well as the broader economic, political, and social environments.[1,2]

The relationship between key social determinants of health, such as socioeconomic status, and health status has been well established in the Canadian and global literature.[3-5] Health leadership in Nova Scotia has recognized the need to collect, analyze, and evaluate Nova Scotia-specific data on health disparities to guide planning to reduce health inequities.

The Government of Nova Scotia's Action for Health: 2022-2026 strategic plan contains six solutions aimed at improving our healthcare system and the health of Nova Scotians. Solution Six commits to enhancing "data collection to better understand the health of our communities to guide policy and investment decisions and support prevention efforts," and collecting "data needed to better understand and address health inequities."[6]

To advance Solution Six, the Nova Scotia Department of Health and Wellness' (DHW) Public Health branch has completed a population health assessment to provide an understanding of health and factors influencing health across the province. This report focuses on inequities across health zones, age, sex, and gender.[a]

The Nova Scotia Health (NSH) Priorities: 2023-2026 plan highlights the need for a population health assessment at the community level to inform decision making on programs, services, and supports to improve population health.[7] Having access to local-level data enables partner organizations to develop and implement targeted action to create positive change in their communities.

This companion report to the 2026 Nova Scotia Population Health Report[9] provides community-level data on key dimensions of our population's health and its social determinants.

[a] Sex and gender each have distinct meanings. Sex refers to biological attributes such as chromosomes, gene expression, and reproductive anatomy. Gender refers to socially constructed roles, behaviours, expressions and identities.[8] Sex and gender are both described in the referenced report, depending on data collection methods of the primary data source.

OBJECTIVES

ACROSS COMMUNITIES IN NOVA SCOTIA:

1) To describe differences in the distribution of six social determinants of health: gender, age, material deprivation, social deprivation, core housing need, and immigration.
2) To describe differences in rates of three population health indicators: multimorbidity, high-cost healthcare use, and health system non-use.

IN NOVA SCOTIA OVERALL:

3) To describe the relationship between population health indicators and age, gender, and community-level material deprivation.

RATIONALE

1) To advance knowledge of the relationship between health and its social determinants in a Nova Scotia context.
2) To encourage use of smaller-level geography health and social determinants of health data for planning within the health system.
3) To generate evidence that can be used by Community Health Boards and other local-level partners to guide action for creating positive change in the health and wellness of their communities.

METHODOLOGY

DATA SOURCES

MEDICAL SERVICES INSURANCE (MSI) INSURED PERSONS DATABASE

MSI maintains a database of all individuals registered as beneficiaries of provincial public health insured services. This dataset includes dates of birth and of death, and the period of MSI eligibility.[10,11] These variables were used to determine the Nova Scotian population to which the Canadian Institute for Health Information (CIHI) Population Grouping Methodology (described below) was applied.

MSI also provided health card numbers for linkage to clinical datasets, postal code of residence, and demographics.[11]

HEALTH SERVICE UTILIZATION (HSU) INDICATOR[b]

Health cards in Nova Scotia have an expiry and are renewed every four years. Some individuals may continue to renew their Nova Scotia health card despite not actively residing within the province. The HSU indicator was developed by DHW to identify these individuals. This indicator was created using similar clinical data sources to the CIHI Population Grouper (described below): CIHI Discharge Abstract Database (DAD),[12] National Ambulatory Care Reporting System (NACRS),[13] and Patient-Level Physician Billings (PLPB).[14]

Individuals were assigned a date on which they last accessed publicly insured services using their Nova Scotia health card, based on clinical encounters in these three databases. Individuals who had no recorded clinical encounters in these three databases for eight consecutive years (or two MSI renewal cycles) were excluded from analyses.

CIHI POPULATION GROUPER - Clinical Data Sources

The CIHI Population Grouping Methodology, Version 1.3, was designed to process two years of individual-level clinical information for a population of interest and assign health indicators based on their healthcare utilization patterns and clinical profile.[15,16]

In addition to the MSI Insured Persons Database, which was used to identify the population, the following clinical data sources were included, all linked by health card number:

- DAD inpatient and day surgery data[12],
- NACRS day surgery, emergency, and clinic data[13],
- PLPB data[14], and
- Home Care Reporting System Resident Assessment Instrument – Home Care (RAI-HC)[17] assessment data.

The three health indicators included in this report (multimorbidity, high-cost healthcare use, health system non-use) were derived from the CIHI Population Grouper output.

2021 CENSUS – Short- and Long-Form Questionnaires

The 2021 Statistics Canada Census counted both individuals and dwellings across the country, by their demographic, social and economic characteristics. The short-form questionnaire was delivered to all participants, while the long-form questionnaire was delivered to a 25% sample of respondents. Full details on the 2021 Census methodology are available from Statistics Canada.[18]

The 2021 Census served as our primary data source for describing social determinants of health.

[b] The HSU Indicator was developed during COVID-19 immunization reporting as part of defining "active clients" as per National Standards for Immunization Coverage Assessment.

POPULATION – CIHI Population Grouping Methodology (Study Population)

The CIHI Population Grouping Methodology was applied by the Performance, Planning & Data Branch of the DHW to all persons with a valid and unique Nova Scotia MSI health card number at any time between April 1, 2021, and March 31, 2023, a period of two fiscal years (FYs). Individuals who moved out-of-province or died during the two-year reporting period were still included, if they had a valid Nova Scotia health card for at least one day from April 1, 2021-March 31, 2023 (FY 2021-FY 2022).

Additional exclusion criteria to account for extended non-use of the healthcare system[c], late MSI death entries, and invalid or out-of-province postal codes, as described in Figure 1. These criteria were assessed on December 9, 2024.

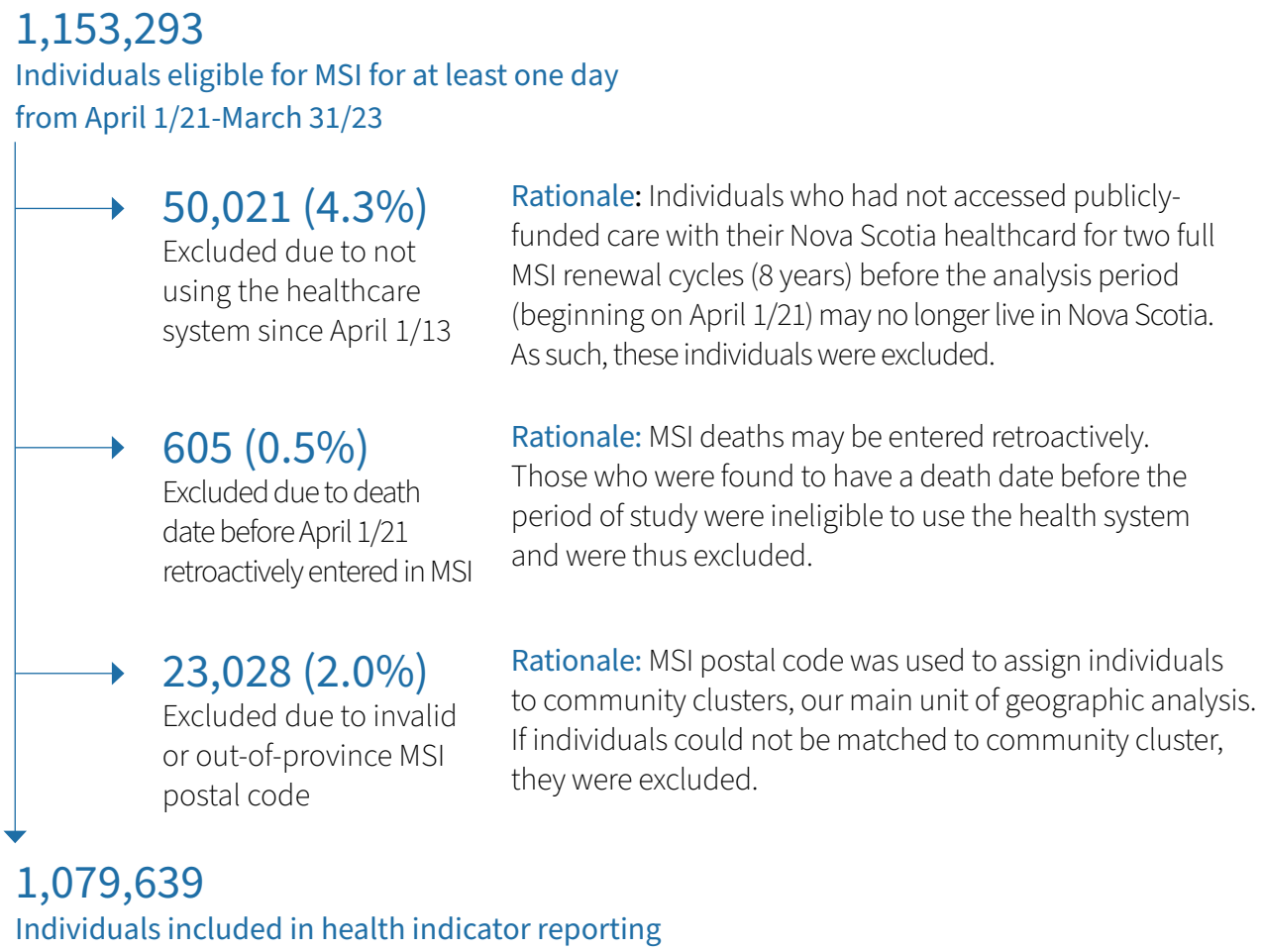


FIGURE 1. Flow-chart showing population, and inclusion and exclusion criteria applied.

[c]Those who did not use the health system for the 8-year period of April 1/13 to March 31/21, but did use the system during or after the study period up to the data that inclusion and exclusion criteria were assessed, were still included.

The final population included in this report consisted of 1,079,639 Nova Scotians, representing 93.6% of Nova Scotians eligible for MSI for at least one day during the two-year reporting period.

Given the specific inclusion and exclusion criteria applied that are unique to this data source, and the use of different data sources, the population described in this report is different than the population described in the 2026 Nova Scotia Population Health Report[9] report, and other population estimates such as the 2021 Statistics Canada Census (described below).[9,18]

POPULATION – 2021 CENSUS

The overall population count for Nova Scotia described in the 2021 Census is 969,383.[19] The denominator used for each social determinant of health indicator differs based on the analysis unit (individuals vs. households) and the questionnaire (short- vs. long-form). Details are described in Table 3, and details on provincial denominators for each question can be found in the Nova Scotia Census Profile.[19]

HEALTH INDICATORS

The CIHI Population Grouping Methodology mapped individuals to a list of 226 **health conditions** based on how and why they used the healthcare system over two years.[15,16] A range of acute and chronic health conditions are captured from minor to major severity. Some individuals used the health system but were not mapped to any conditions, while others did not use the health system at all during the two-year period of interest.

Each individual is also assigned a **resource intensity weight** based on their age, gender, their number of health conditions, and interactions between health conditions. This value represents their relative cost within the health system, with higher weights indicating higher costs. People who did not use the health system were assigned a value of 0. Further details can be found in CIHI's Population Grouping Methodology Notes.[15,16]

Three key health indicators were selected for their impact on an individual's health and the health system (Table 1).

TABLE 1. Health indicators, assessed at the individual level.

Health Indicator	Definition	Rationale
Rate of multimorbidity	Number of individuals having 2 or more of 82 health conditions classified as chronic[15,16] in a defined community, divided by the population of that community; expressed as a percentage (percentage of population living with multimorbidity)	Multimorbidity impacts an individual's well-being, functioning, quality of life, and lifespan.[20] Multimorbidity is associated with increased health system use including more frequent hospital admissions, longer hospital stays, and more specialist visits.[21]
Rate of high-cost healthcare use	Number of people in the top 5% of resource intensity weights provincially[22,23], based on their health conditions[24], in a defined community, divided by the population of that community; expressed as a percentage (percentage of population identified as high-cost healthcare users)	Previous studies in other parts of Canada have indicated that a small subset of the population account for a large portion of health system costs.[25-27] Understanding who these people are and where in Nova Scotia they are located is the first step in creating interventions aimed at improving health and reducing healthcare costs.[28]
Rate of health system non-use	Number of individuals who did not have any encounters in the included clinical datasets during the study period, in a defined community, divided by the population of that community; expressed as a percentage (percentage of population identified as health system non-users)	Describing who has not accessed the healthcare system in the past two years may provide an understanding those who did not have a need to access care, as well as potential gaps in services.[29]

SOCIAL DETERMINANTS OF HEALTH INDICATORS

AGE AND GENDER

Age and gender were determined at the individual-level, for each person who had the CIHI Population Grouping Methodology applied. Age and gender were determined from MSI records, as described in Table 2.

TABLE 2. Social determinants of health derived from MSI records.

Indicator	Definition
Age	Age of each individual on the last day of the study window, or date of death. Grouped into the following categories: 0-14 years; 15-29 years; 30-44 years; 45-59 years; 60-74 years; 75 years and older. Age is also presented as an average at the community level.
Gender[d]	Gender of each individual. While MSI requests that individuals report their gender at the start of each 4-year renewal cycle, the preset options provided are limited to one of two categories: Female; Male.[10]

MATERIAL AND SOCIAL DEPRIVATION

Material and social deprivation were derived from 2021 Census data, as described in Table 3.

It was not possible to link an individual's Census responses to their individual-level health indicator data from the CIHI Population Grouping Methodology, as a shared linking variable, such as health card number, was not available. This means for each person in the study population (see Figure 1), we did not know their individual level of material or social deprivation. Deprivation quintiles were instead determined for each community using Census data. Then, deprivation quintiles were assigned to individuals in the study population based on the level of deprivation in the community where the individual resided.

[d] Though "Female" and "Male" are expressions of sex, they are collected as gender on the MSI registration/renewal form.

This approach was consistent with previous studies, where community-level deprivation quintiles have been used to explore the impact of neighbourhood- or community-level living conditions on health.[30-33]

TABLE 3. Social determinants of health derived from 2021 Census.

Indicator	Definition	Analysis Details
Material Deprivation Index, Quintile	Measure of the economic situation in a community, at the community -level. Calculation includes: - Median individual income (15+ years of age) - Unemployment rate (25+ years of age) - Rate of persons without high school diploma (20+ years of age) Each community is assigned a quintile of 1 to 5 based on the index value calculated, where 1 represents the least materially deprived communities, and 5 represents the most. Detailed methodology is available from DHW.[34]	A score of 1 to 5 was assigned to each individual in the study population (see Figure 1) based on the community they resided in.[34]
Social Deprivation Index, Quintile	Measure of the personal social support situation in a community, at the community -level.	A score of 1 to 5 was assigned to each individual in the study population (see Figure 1) based on the community they resided in.[34]

Indicator	Definition	Analysis Details
	Calculation includes: - Rate of people who are separated, widowed, or divorced (15+ years of age) - Rate of single parents (15+ years of age) - Rate of people who live alone (15+ years of age) Each community is assigned a quintile of 1 to 5 based on the index value calculated, where 1 represents the least socially deprived communities, and 5 represents the most. Detailed methodology available from the DHW.[34]	
Percentage of households in core housing need	'Core housing need' is only assessed for private, non-farm, non-reserve, and owner- or renter-households with incomes greater than zero and shelter-cost-to-income ratios less than 100%. Private household refers to a person or group of persons who occupy the same dwelling and do not have a usual place of residence elsewhere in Canada or abroad.[35] Non-family households with at least one maintainer aged 15 to 29 attending school are considered not to be in 'core housing need' regardless of their housing circumstances, which may be transitional or temporary.[35]	This variable is calculated from the 25% sample of households that complete the long-form Census questionnaire.[18,19] Described overall in Nova Scotia, and by community.

Indicator	Definition	Analysis Details
	A household is in core housing need if one or more of the following conditions are met: - Is in need of major repairs, - Does not have enough bedrooms for the size and make-up of residents, - Costs more than 30% of the before-tax household income. Additionally, there is no acceptable alternative in local housing that the household's before-tax income would allow them to access.[36]	
Percentage of population who are immigrants to Canada	"Immigrants" includes persons who are, or who have ever been, landed immigrants or permanent residents. Such persons have been granted the right to live in Canada permanently by immigration authorities. Immigrants who have obtained Canadian citizenship by naturalization are included in this category. In the 2021 Census of Population, 'Immigrants' includes immigrants who were admitted to Canada on or prior to May 11, 2021.[18]	This variable is calculated from the 25% sample of households that complete the long-form Census questionnaire.[18] Described overall in Nova Scotia, and by community.

CORE HOUSING NEED AND IMMIGRATION

The percentage of households in core housing need, and the percentage of the population who were immigrants to Canada were also derived from 2021 Census data, as described in Table 3.

The association between community-level housing need and immigration with health indicators has been previously described in the literature.[37-43] However, the validity of categorizing these measures into community-level quintiles (as has been done with material and social deprivation for ease of presentation and interpretation) has not been extensively explored. This was deemed to be beyond the scope of the present report. Corresponding 2021 Census population denominators were used for these descriptive indicators.[18,19]

GEOGRAPHY

Communities were defined by community cluster geography. These 54 geographic units were designed to have boundaries that appropriately align with the delivery of health services across Nova Scotia.[44] Community clusters vary in population size. Using the study population described within in this report, the smallest cluster includes a population of 1,074 individuals, and the largest includes a population of 59,194 individuals. Each community cluster maps into one of the four operational Nova Scotia Health zones (Appendix 1):

- Western Zone (WZ): includes 12 community clusters and a population of 221,015 individuals (Figure A1.1);
- Northern Zone (NZ): includes 11 community clusters and a population of 165,403 individuals (Figure A1.2);
- Eastern Zone (EZ): includes 12 community clusters and a population of 178,367 individuals (Figure A1.3);
- Central Zone (CZ): includes 19 community clusters and a population of 514,854 individuals (roughly half of the total population of Nova Scotia; Figure A1.4).

The 2023 Postal Code Conversion File+ (PCCF+)[45] was used to assign individuals in the study population to community clusters based on their MSI postal code.

DATA ANALYSES

All visuals were created using Tableau 2023.3.[46]

The aggregation of 2021 Census data was completed by Statistics Canada at the request of Nova Scotia DHW. Access to this data was facilitated by the NSH Performance & Analytics and DHW Planning, Performance & Data teams. Material and social deprivation indices were calculated by the DHW Planning, Performance & Data team, using indicator data provided by Statistics Canada. The CIHI Population Grouping Methodology was applied by the DHW Planning, Performance & Data team. The analyses for this report were completed by the NSH Public Health Surveillance and Data Solutions team.

One-page profiles were created for each health indicator. Indicators were mapped by community cluster and compared across age, gender, and community-level material deprivation.

Maps were created to visualize the location of community clusters across the province (Appendix 1), as well as to visualize the spread of the six social determinants of health of interest (Appendix 2).

Tables with community cluster-level data on social determinants of health and health indicators are found in Appendix 3.

TABLE 4. Summary of indicators in Nova Scotia overall.

Indicator	Number of Individuals	Percentage of Population
Social Determinants of Health		
Gender		
Male	529,434	49.0
Female	550,205	51.0
Age (Average, Years)	44.2*	--
Age		
0-14 years	147,657	13.7
15-29 years	177,092	16.4
30-44 years	210,235	19.5
45-59 years	211,187	19.6
60-74 years	222,329	20.6
75+ years	111,139	10.3
Material Deprivation Quintile†		
Lowest	327,604	30.3
Low	223,231	20.7
Mid	270,323	25.0
High	138,868	12.9
Highest	119,613	11.1
Social Deprivation Quintile†		
Lowest	262,778	24.3
Low	132,970	12.3
Mid	174,852	16.2
High	279,582	25.9
Highest	229,457	21.3
Core Housing Need‡		
Households in Need	--	10.0
Immigration‡		
Immigrant to Canada	--	7.5
Health Indicators		
Multimorbidity	259,674	24.1
High-Cost Health Use§	53,981	5.0
Health System Non-Use	163,443	15.1

*Presents the average age of the population, in years, rather than a population count and percentage.
† For deprivation indices, counts represent the total count of the study population residing in communities with the corresponding deprivation.
‡ Based on Nova Scotia Census Profile 25% sample data, percentages only reported.
§ For this report, high-cost healthcare use was defined as the top 5% of health condition resource intensity weights provincially.

AGE AND GENDER

The average age of Nova Scotians was 44.2 years (Table 4). The largest 15-year age group in Nova Scotia was 60–74-year-olds (20.6% of the population). On average, the population tended to be younger in CZ communities. The oldest average age of 51.3 years was reported in South Cumberland (NZ), while the youngest of 39.3 years was reported in Fairview (CZ, Figure A2.1/Table A3.1).

Overall, 51.0% of Nova Scotians were female (Table 4). The breakdown of the population by gender was similar across communities (Figure A2.2/ Table A3.1).

MATERIAL DEPRIVATION

119,613 Nova Scotians (11.1%) resided in communities within the highest quintile of material deprivation (Table 4).

Communities with the highest levels of material deprivation were spread across WZ, NZ, and EZ. All five southernmost communities in the province (found in WZ), were identified as being in the highest quintile of material deprivation (Figure A2.3/Table A3.1).

SOCIAL DEPRIVATION

229,457 Nova Scotians (21.3%) resided in communities within the highest quintile of social deprivation (Table 4).

Overall, community-level social deprivation was highest in the urban core of Halifax (Figure A2.4/Table A3.1).

HOUSING

Ten percent of households across Nova Scotia were in core housing need, meaning their housing was either inadequate, not suitable, or not affordable, with no local affordable alternative (Table 4).[19] While housing issues are of concern across Nova Scotia, the urban Halifax core has the highest levels of core housing need. Dartmouth North had the highest percentage of households in core housing need, by community, at 21.8% (Figure A2.5/Table A3.1).

IMMIGRATION

In Nova Scotia, 7.5% of the population immigrated to Canada during their lifetime. Communities in CZ had the highest percentage of immigrants, with Clayton Park representing a provincial high of 24.2% of the population identifying as immigrants (Figure A2.6/Table A3.1).

HEALTH INDICATORS

24.1% of Nova Scotians experienced multimorbidity (Table 4). Rates of multimorbidity varied across communities from a high of 33.2% in Cheticamp to a low of 13.5% in Halifax Citadel (Profile -Multimorbidity/Table A3.2).

The percentage of the population who were identified as high-cost healthcare users, by community, ranged from a high of 7.3% in South Cumberland to a low of 3.0% in Fall River and Area (Profile - High-Cost Healthcare Use/Table A3.2)

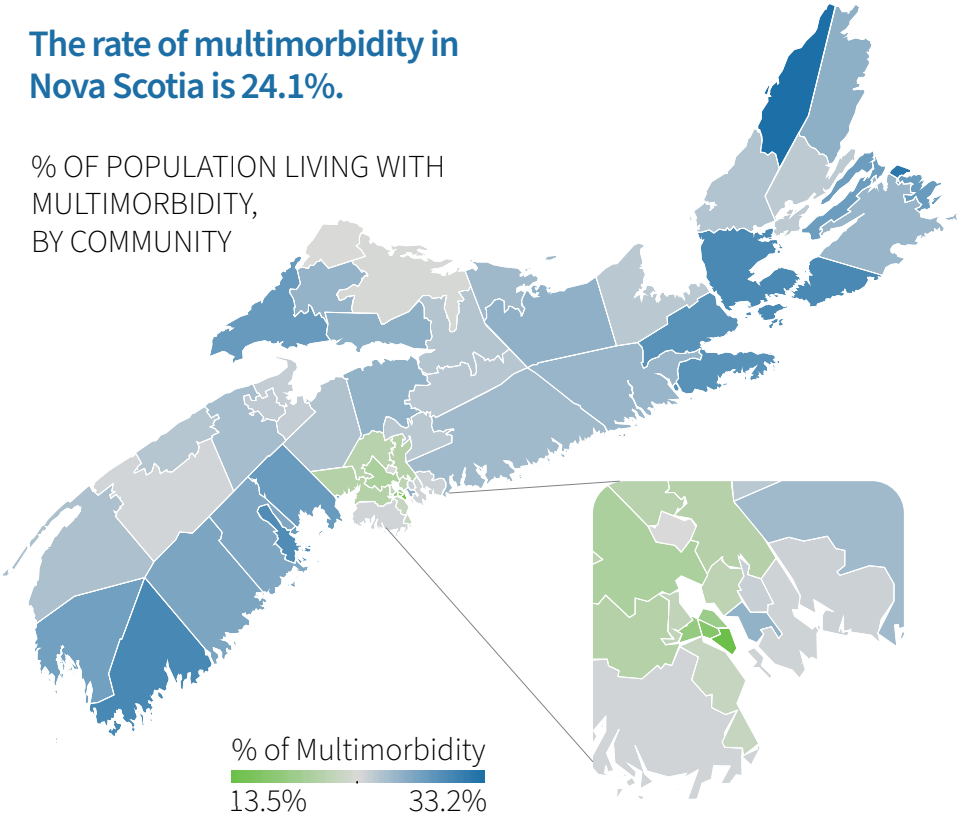
15.1% of the Nova Scotian population did not have any clinical encounters in the two years of included data (Table 4). These health system non-users were primarily concentrated on the Halifax peninsula, with 33.4% of the population not using the system in Halifax Citadel representing a provincial high (Profile - Health System Non-Use/Table A3.2).

MULTIMORBIDITY IN NOVA SCOTIA

Multimorbidity is defined as having two or more chronic conditions.

The rate of multimorbidity in Nova Scotia is 24.1%.

% OF POPULATION LIVING WITH MULTIMORBIDITY, BY COMMUNITY



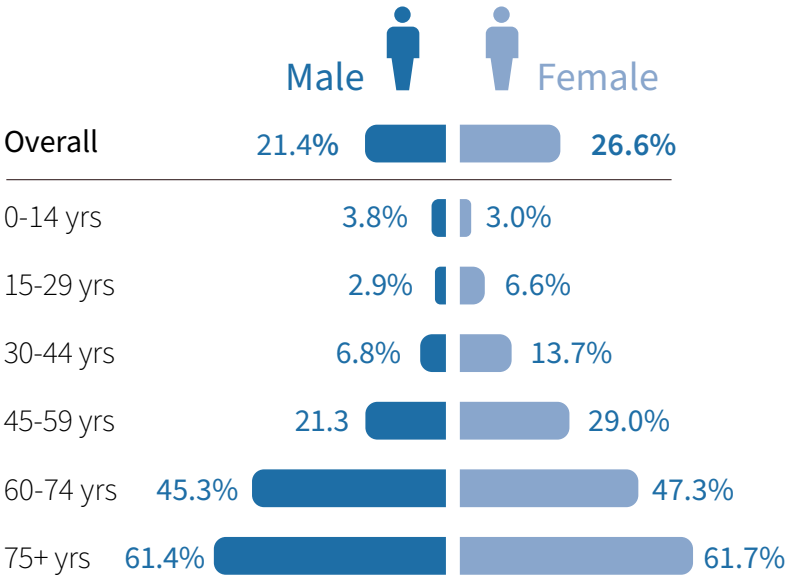
Three of the five communities with the highest multimorbidity rates are in Eastern Zone.

COMMUNITIES WITH THE HIGHEST % OF POPULATION LIVING WITH MULTIMORBIDITY

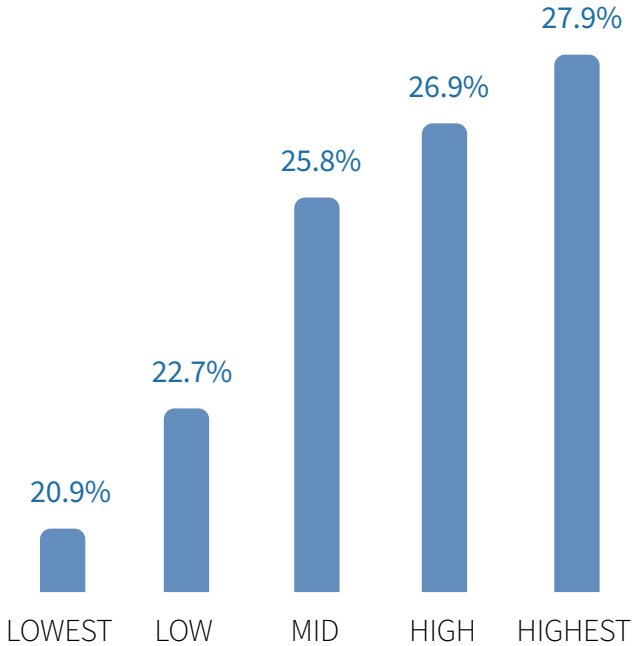
Cheticamp	33.2%
New Waterford	32.2%
Shelburne / Lockeport	30.5%
Port Hawkesbury / L'Ardoise / Isle Madame	30.3%
Lunenburg / Mahone Bay	30.0%

Rates of multimorbidity are higher among females, and tend to increase with age.

% OF POPULATION LIVING WITH MULTIMORBIDITY BY AGE GROUP AND GENDER



% OF POPULATION LIVING WITH MULTIMORBIDITY BY COMMUNITY-LEVEL MATERIAL DEPRIVATION QUINTILE



Rates of multimorbidity are highest in communities with higher material deprivation.

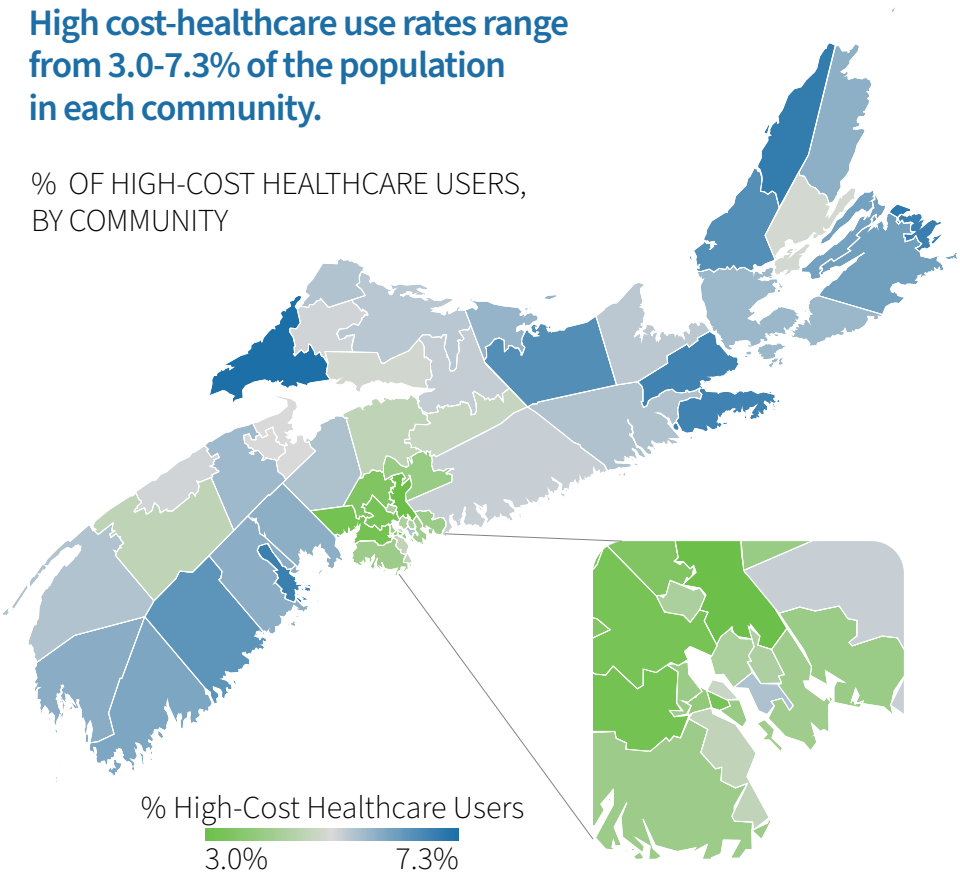
This profile is part of the 2026 Community Health Snapshot. Please consult the full report for methodological details.

HIGH-COST HEALTHCARE USE IN NOVA SCOTIA

High-cost healthcare use is defined as being in the top 5% of users of the healthcare system.

High cost-healthcare use rates range from 3.0-7.3% of the population in each community.

% OF HIGH-COST HEALTHCARE USERS, BY COMMUNITY



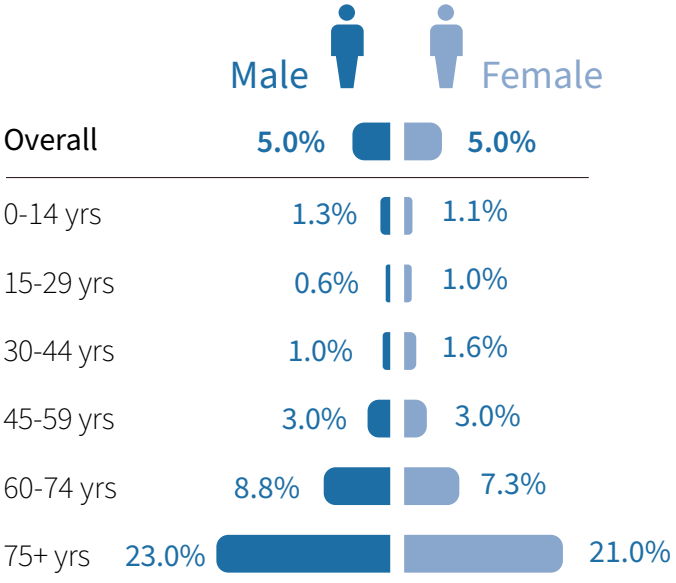
Three of the five communities with the highest rates of high-cost use are in Eastern Zone, none are in Central Zone.

COMMUNITIES WITH THE HIGHEST % OF HIGH-COST HEALTHCARE USERS

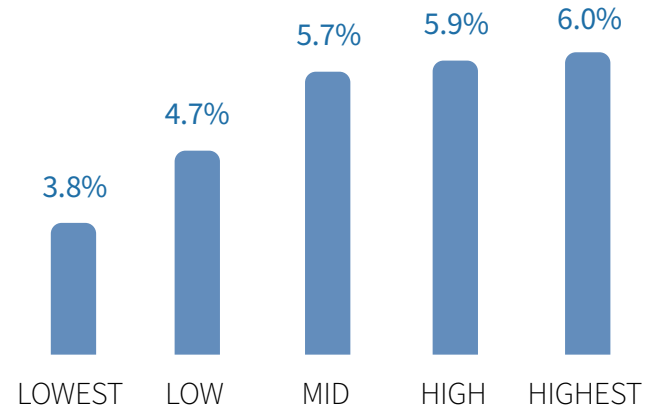
South Cumberland	7.3%
New Waterford	7.1%
Cheticamp	7.0%
Dominion / Glace Bay	6.9%
Lunenburg / Mahone Bay	6.9%

Rates of high-cost use are similar for males and females, and tend to increase with age.

% OF HIGH-COST HEALTHCARE USERS BY AGE GROUP AND GENDER



% OF HIGH-COST HEALTHCARE USERS BY COMMUNITY-LEVEL MATERIAL DEPRIVATION QUINTILE



Rates of high-cost healthcare use are highest in communities with higher material deprivation.

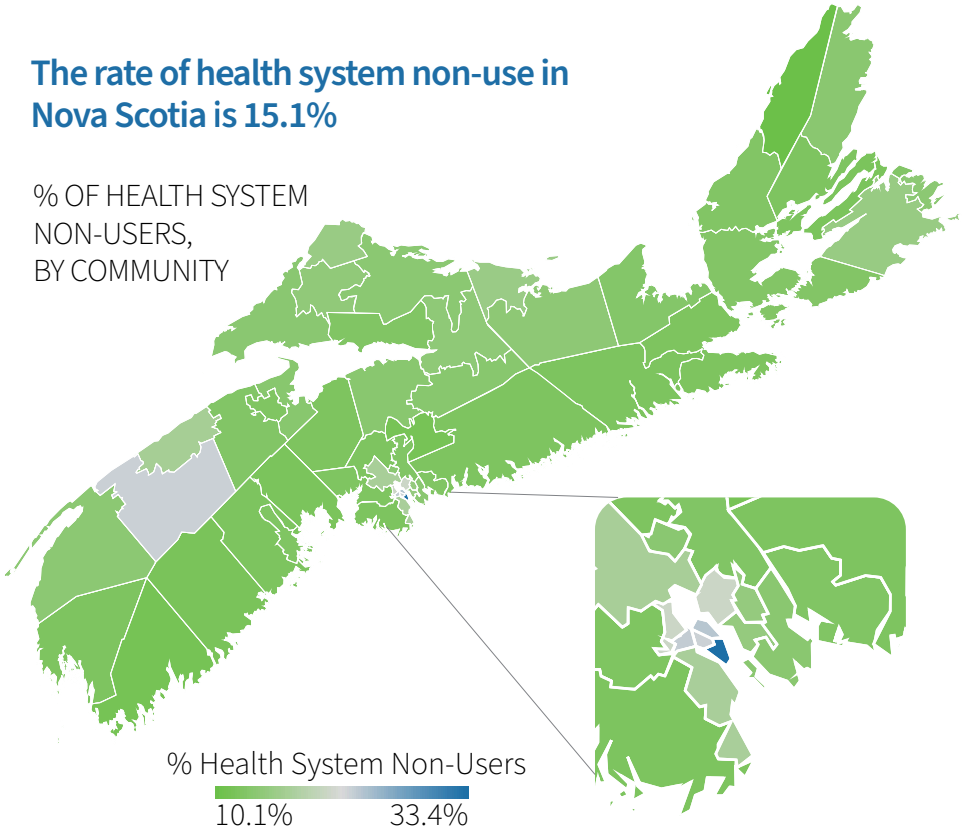
This profile is part of the 2026 Community Health Snapshot. Please consult the full report for methodological details.

HEALTH SYSTEM NON-USE IN NOVA SCOTIA

Health system non-use is defined as having no clinical encounters with the healthcare system based on the data available.

The rate of health system non-use in Nova Scotia is 15.1%

% OF HEALTH SYSTEM NON-USERS, BY COMMUNITY



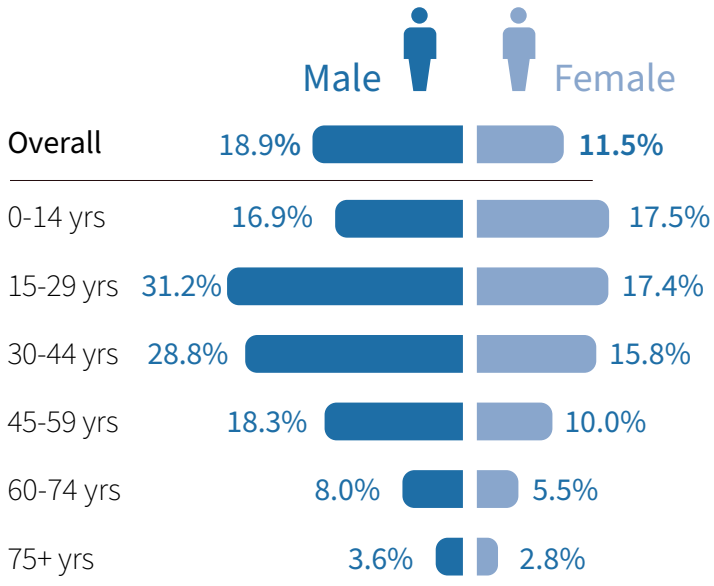
Four of the five communities with the highest rates of health system non-use are in Central Zone.

COMMUNITIES WITH THE HIGHEST % OF HEALTH SYSTEM NON-USERS

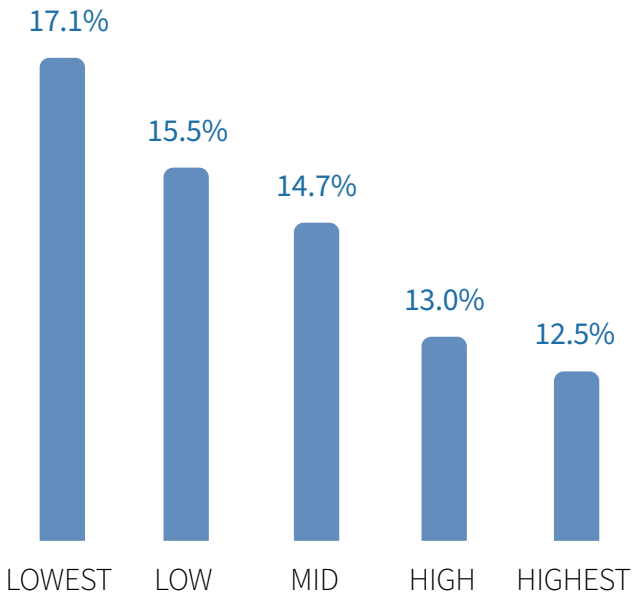
Halifax Citadel	33.4%
Halifax Needham	23.5%
Fairview	22.8%
Annapolis Royal	22.5%
Halifax Chebucto	22.4%

Rates of health system non-use were higher among males, and during young and middle adulthood.

% OF HEALTH SYSTEM NON-USERS BY AGE GROUP AND GENDER



% OF HEALTH SYSTEM NON-USERS BY COMMUNITY-LEVEL MATERIAL DEPRIVATION QUINTILE



Rates of health system non-use are highest in communities with lower material deprivation.

This report provides community-level data on key dimensions of our population's health and its social determinants. Additionally, it showed how these social determinants of health were distributed across people living with multimorbidity, high-cost healthcare users, and healthcare system non-users.

Overall, we found differences in multimorbidity, high-cost healthcare use, and health system non-use by community, age/gender, and community-level material deprivation. These findings contribute to the existing body of literature describing these associations, while providing data-specific to Nova Scotia that can be used to inform initiatives to improve health and well-being at the community level.

AGE, GENDER, AND HEALTH INDICATORS

Both the percentage of the population living with multimorbidity, and the percentage of high-cost healthcare use generally increased with increasing age group, for both males and females (Profile - Multimorbidity, and Profile - High-Cost Healthcare Use, respectively). Males aged 15-29 years were an exception to this trend, as they had slightly lower rates of both multimorbidity and high-cost healthcare use when compared to males aged 0-14 years (2.9% vs 3.8% and 0.6% vs 1.3% respectively). Females aged 15-29 years also had a slightly lower rate of high-cost healthcare use compared to females aged 0-14 years (1.0 %vs 1.1%). Overall, females had higher rates of multi-morbidity (26.6% compared to 21.4% among males).

The inverse was true for the percentage of individuals identified as health system non-users, where the rate decreased with increasing age-groups, for both males and females (Profile - Health System Non-Use). The only exception to this trend was among males aged 0-14 years, where the rate of health system non-use was lower than those in the age groups encompassing 15-59-year-olds.

These trends are to be expected as healthcare needs generally become more complex with age.[47] However, individuals in the first few years of life may interact more with the healthcare system due to higher health risks for severe illness from certain infections, and for such needs as routine immunizations.[48-50]

Overall, males had higher rates of health system non-use (18.9% compared to 11.5% among females). This aligns with previous studies that have found that females have a greater tendency to seek healthcare, when compared to males.[51,52]

Though only 10.3% of the population was aged 75+ in Nova Scotia (Table 4), they represent the largest group of individuals both living with multimorbidity and identified as high-cost healthcare users. About a quarter of all individuals living with multimorbidity (representing 64.4% of males and 61.7% of females in this age-group) were aged 75+, and about 45% of individuals identified as high-cost healthcare users (representing 23.0% of males and 21.0% of females in this age-group) were aged 75+. The rate of multimorbidity and high-cost healthcare use among the population aged 75+ is 2.5 times and 4.5 times higher than the rate in the overall population, respectively.

COMMUNITY-LEVEL MATERIAL DEPRIVATION AND HEALTH INDICATORS

This report shows that in Nova Scotia both rates of multimorbidity and high-cost healthcare use were highest in areas with higher community-level material deprivation (Profile - Multimorbidity, and Profile - High-Cost Healthcare Use, respectively). The inverse was true for individuals identified as non-users of the health system: that the least materially deprived communities had the highest percentage of system non-users (Profile - Health System Non-Use).

These findings are consistent with previous studies, that have found that measures of socioeconomic status, like material deprivation[e], are consistently one of the strongest predictors of health outcomes for individuals across the lifespan, households, and communities:[3-5]

- Income- and unemployment-related stress increase the risk of experiencing depression, anxiety and other mental health conditions, as well as physiological distress.[53-55]
- Income inadequacy impacts our ability to meet basic needs, like accessing sufficient and nutritious food, placing at individuals and households at risks of diet- and nutrition-related diseases, and a range of other physical and mental health issues.[33,56]
- Income strongly influences our access to safe and affordable housing, the health impacts of which are discussed later in this report.[37]
- Income inadequacy also impacts our ability to access healthcare, including essential medications and treatments not covered under MSI, travel expenses to and from medical appointments, ability to take time away from work for medical appointments, and more, leading to unmet health care needs.[57,58]
- More materially deprived neighbourhoods and communities tend to have less access to health-promoting and protecting neighbourhood features.[59-64]

Experiences of material deprivation, and specifically experiences of poverty, during childhood are associated with a range of short- and long-term adverse health outcomes.[65-70] However, early intervention can mitigate long-terms effects on development and well-being.[65] This is of particular concern in our province, as the 2024 Report Card on Child and Family Poverty in Nova Scotia reported that the child poverty rate in Nova Scotia has increased 16% over the past year, the highest single-year increase since measurement began in 1989.[65]

Effective policy levers to address income-health inequities, are described in the global[71-73] and Canadian literature.[74-80] More information specific to Nova Scotia is included in NSH Public Health's Income and Health Community Health Board planning tool.[81]

[e] While measures of material deprivation differ, at their core, they aim to capture conditions that make individuals and households less likely to be able to afford essential goods and services.

COMMUNITY-LEVEL SOCIAL DEPRIVATION AND HEALTH INDICATORS – MORE TO EXPLORE

This report did not describe the direct association between health indicators and community-level social deprivation in Nova Scotia.

Social connection and support impact physical and mental health, through reducing the impact of stress, the creation of a network that may improve health behaviours, and ability to access health services.[82,83]

While the measure of community-level social deprivation included in this report was designed to account for several dimensions of social disadvantage, there are some important considerations in applying this measure to Nova Scotia. Two of the factors included in the social deprivation index are the proportion of the population who are single and who are living alone. The areas with the "highest" level of deprivation are in the urban core of Halifax. Those who are single and living alone in Halifax may be younger and doing so by choice, rather than experiencing isolation or loneliness. Younger populations may also be more likely to access digital forms of social interactions to substitute for a lack of in-person connection.[84] This is consistent with literature that social deprivation may have a more significant impact on health of the older population.[85,86]

HOUSING – MORE TO EXPLORE

This report did not describe the direct association between health indicators and community-level core housing need in Nova Scotia.

Housing can impact health in a variety of ways[37]:

- Adequate housing that is safe for all occupants can reduce the risk of injury, illness, and exposure to harmful mold and hazardous materials that impact health.[87]
- Suitable housing allows people to live comfortably and peacefully, improving quality of life and mental health.[37] Housing with appropriate space for the number of occupants can reduce the risk of infectious disease spread.[88,89]
- Affordability allows individuals to better use financial resources to meet their other health needs and can reduce stressors like fear of displacement/loss of housing.[90]

While the core housing need indicator captures important dimensions of the potential impact of housing on health and wellbeing, there are other important factors to consider such as housing supply and availability of affordable options. Additionally, this measure does not capture those who are unhoused, a vulnerable group that faces some of the highest rates of illness and mortality in Canada.[38]

The Housing and Health Community Health Board planning tool, developed by NSH Public Health, outlines policy levels to secure safe, dignified, and stable housing for unhoused and precariously housed individuals.[81]

IMMIGRATION – MORE TO EXPLORE

This report did not describe the direct association between health indicators and community-level immigration in Nova Scotia. The health of newcomers is more relevant than ever in Nova Scotia. There has been an influx of new immigrants in recent years, with 28.6% of total immigrants in Nova Scotia arriving between 2016 and 2021.[19]

While newcomers may face several barriers to accessing healthcare[39], new immigrants are typically healthier than the native-born population upon their arrival.[40] However, these individuals may experience a decline in health outcomes over time.[91,92] One of the reasons for this decline is the many barriers immigrants face in accessing healthcare in Canada. Barriers to access include language or communication barriers, cultural beliefs, lack of information or familiarity about how to access or navigate services, socioeconomic barriers, and challenges in finding a preferred health care provider.[93-95] The decline in health outcomes is not limited to physical health but has also been noted in mental health.[91]

Not counted among immigrants as described in the measure used in this report are the 9,820 non-permanent residents of Nova Scotia, including asylum claimants, temporary foreign workers, and other work and study permit holders.[18,19] These individuals are more likely to have poor housing conditions, lower wages, and precarious working conditions, which may impact their physical and mental health. They are also more likely to have limited access to healthcare, and a lack of healthcare coverage.[96]

FUTURE OPPORTUNITIES

There are several opportunities to build upon the findings in this report.

1) Expand this analysis to include other social and structural determinants of health. These may include ethnicity, Indigeneity, education level, rurality, food security, adverse childhood events, access to a primary care provider and health services accessible within communities. This may require the inclusion of additional data sources and exploring the possibility of over-sampling[f] in existing population-based surveys.
2) Expand this analysis to include additional health indicators relevant to health system planning.
3) Account for the complex interactions between social determinants of health when describing how these variables impact health outcomes.
4) For community clusters with high rates of multimorbidity or high cost-healthcare use, determine whether there are any variations over smaller geographies, like community environs.[98] This will identify actionable areas of the province where programs and policies could be targeted

[f]Over-sampling means asking more people to respond to important population-based surveys. This will allow us to more reliably describe data from smaller geographic areas.[97]

There are important limitations to consider in the data sources, measures, and methodology used in this report.

The two-year period used in the population grouping methodology had some overlap with the COVID-19 pandemic, which impacted health service access and utilization. A two-year window, especially considering the access challenges related to the pandemic, may not be sufficient in fully capturing health conditions for an individual. Therefore, the percent of the population living with multimorbidity may be an underestimate, and the percent of the population identified as health system non-users may be an overestimate.

Furthermore, though the CIHI Population Grouper methodology pulls from many important sources of clinical information, there are interactions with the broader health system that are not captured.[15,16] For example, this methodology does not capture immunizations delivered by Public Health, especially considering the mass immunizations during the pandemic, or prescriptions dispensed. In considering all the above points, the grouping methodology likely overestimates the number of individuals classified as non-users of the health system.

The source of data for community-level social determinants of health was the Statistics Canada 2021 Census report. Between the Census data collection and the time this report was written, there may have been changes in the distribution of social determinants of health in the population, as well there has been population growth in Nova Scotia. The COVID-19 pandemic may have impacted some of the variables collected in the Census.[99]

Though the Census is meant to capture information from all individuals residing in Canada, it is important to consider groups that are not, or are under, represented; for example, individuals who are unhoused or precariously housed. Such groups are likely to be more vulnerable by measure of their social determinants of health and experience worse health outcomes. Furthermore, some measures of social determinants of health that were included descriptively in this report were taken from the long-form Census, that only samples 25% of the population.[18] The Census data was available to us at the community-level only, not the individual-level. While our neighbourhoods and communities play an important role in shaping who we are, there are differences among individuals in any community.[100-102] It is important to be cautious and not draw definitive conclusions about individuals based on data about the community in which they live.[103]

The level of geography selected for this report was community clusters. This required use of the PCCF+ in assigning individuals (and their data), as well as community-level data, to community clusters. Researchers have evaluated the application of the PCCF+ in Nova Scotia and noted the misallocation of individuals, especially in rural areas.[104] If postal codes were on the boundary between community clusters, individuals may not have been allocated to the community cluster most appropriate to where they reside. The aggregation of community-level information from Census Dissemination Areas to community clusters also risks combining very heterogenous communities together, further stressing the importance of not drawing definitive conclusions about individuals based on data about the community in which they reside.[103]

Though this report highlighted communities that may benefit most from interventions to improve economic and health conditions of its residents, it was not possible to quantify the individual-level association between material deprivation and key health indicators. The analyses between the key health indicators and social determinants of health were descriptive, and therefore did not explore the complex interactions between these factors. It is also important to consider that although several social determinants of health were included in this report, there are many other factors that influence health, often in interconnected ways. These include social determinants of health such as food insecurity, and early childhood development, as well as structural determinants of health like experiences of stigma and impacts of systemic racism and colonialism.[105,106]

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ABBREVIATIONS

CCHS	Canadian Community Health Survey
CZ	Central Zone
DAD	Discharge Abstract Database
DHW	Department of Health and Wellness
EZ	Eastern Zone
MSI	Medical Service Insurance
NACRS	National Ambulatory Care Reporting System
NSH	Nova Scotia Health
NZ	Northern Zone
PCCF+	Postal Code Conversion File
PLPB	Patient-Level Physician Billings
RAI-HC	Resident Assessment Instrument - Home Care
WZ	Western Zone

FIGURE A1.1: MAP OF COMMUNITIES IN WESTERN ZONE

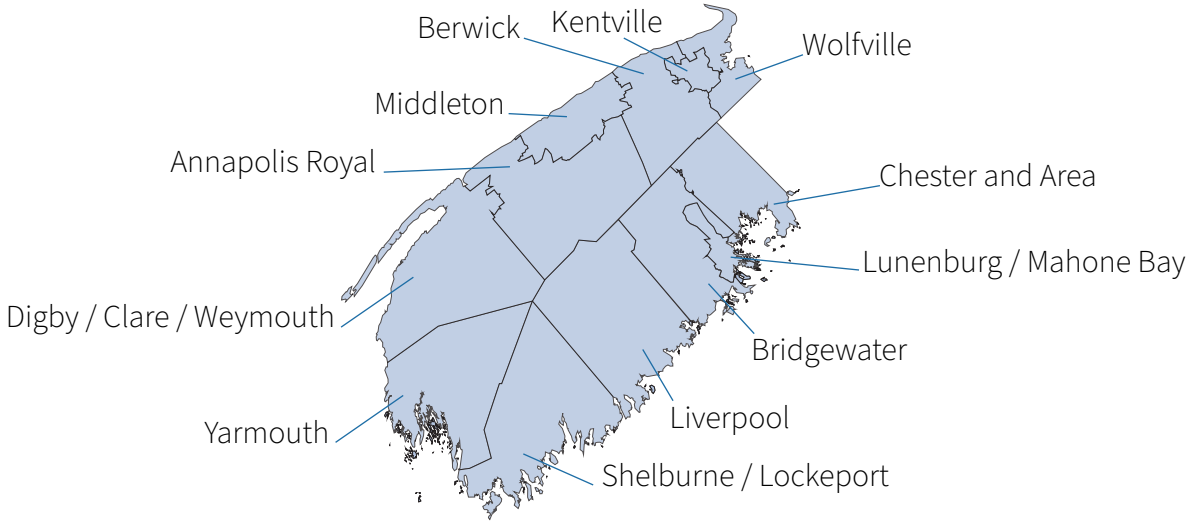


FIGURE A1.2: MAP OF COMMUNITIES IN NORTHERN ZONE

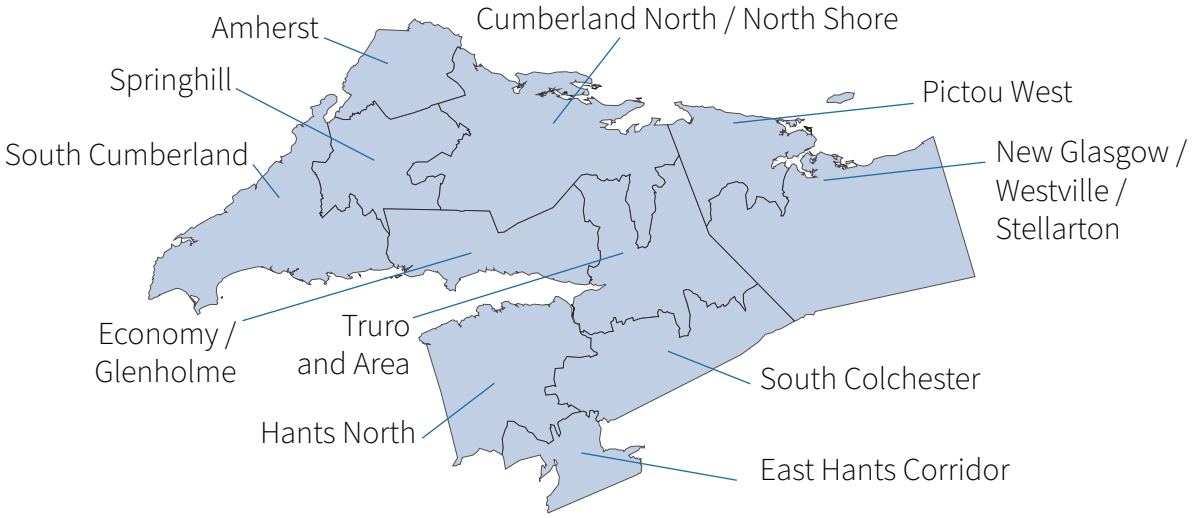


FIGURE A1.3: MAP OF COMMUNITIES IN EASTERN ZONE

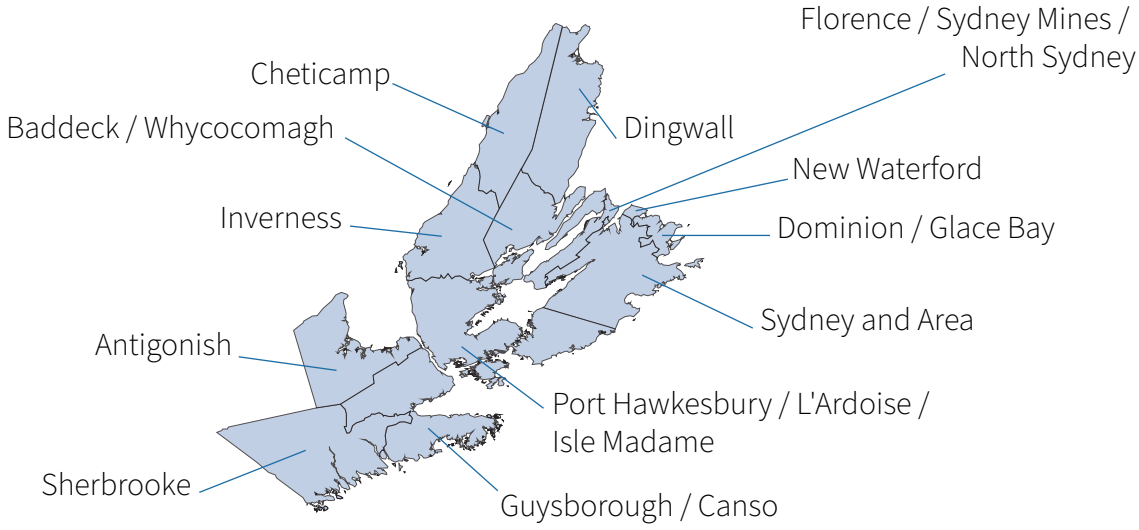


FIGURE A1.4: MAP OF COMMUNITIES IN CENTRAL ZONE

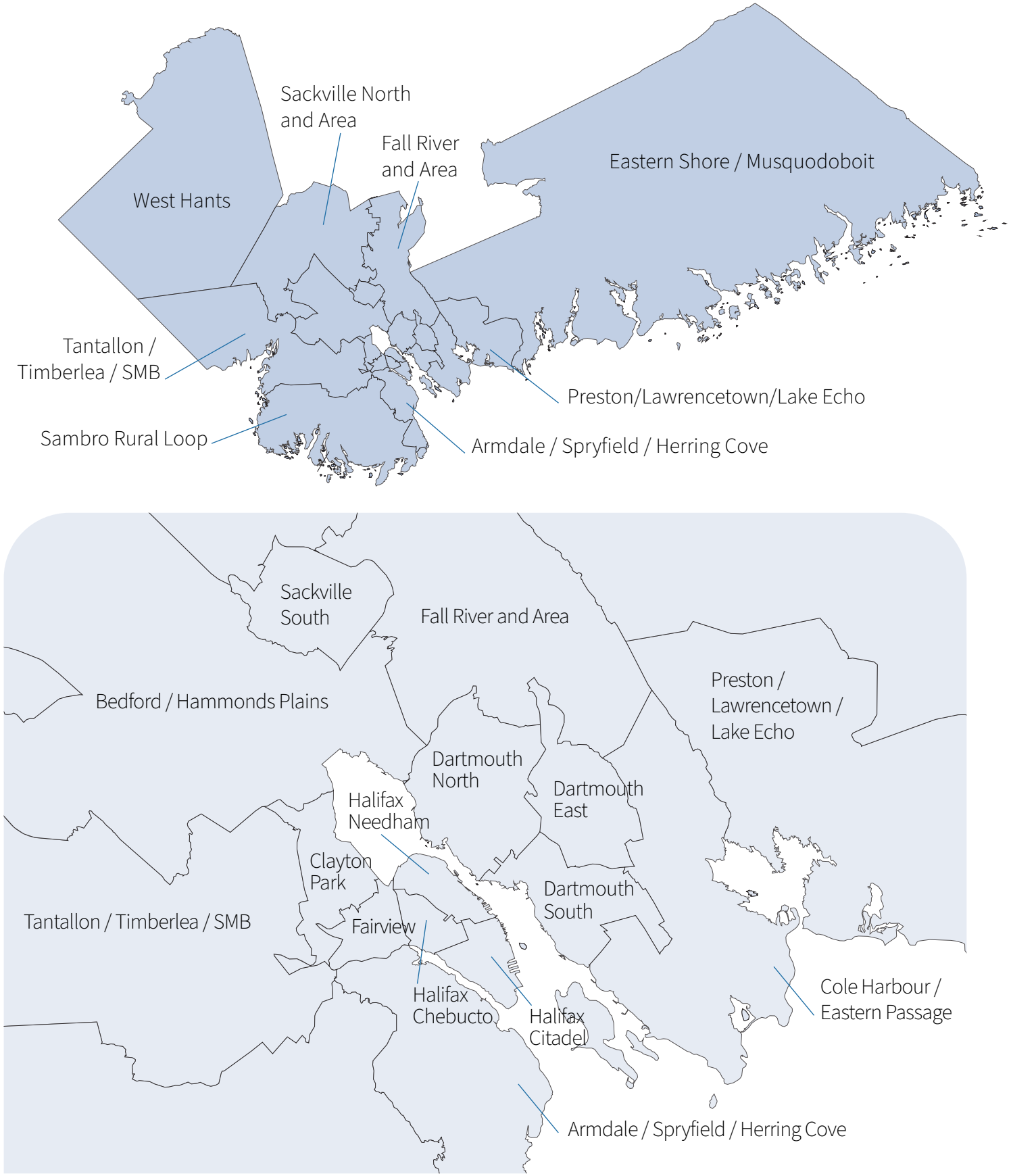
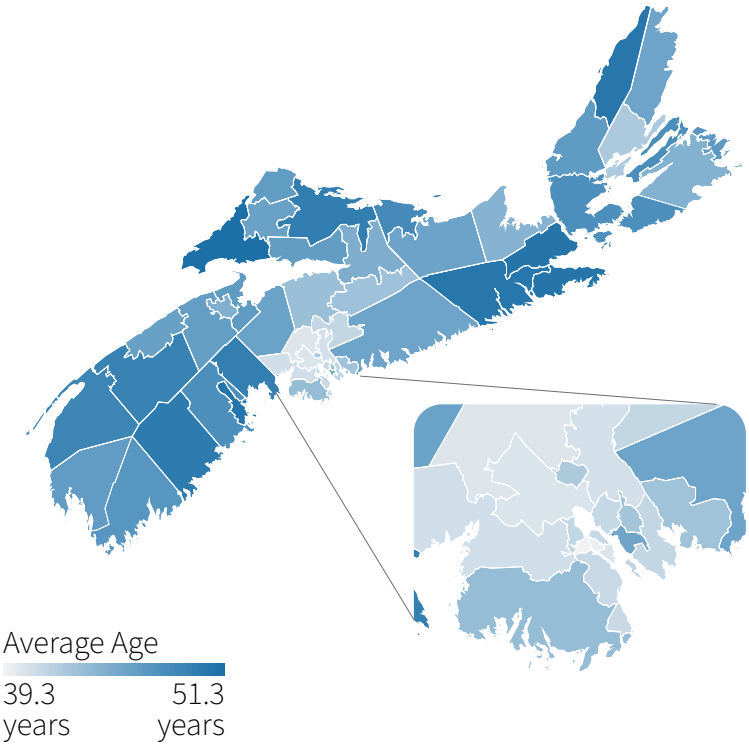


FIGURE A2.1: AVERAGE AGE, BY COMMUNITY



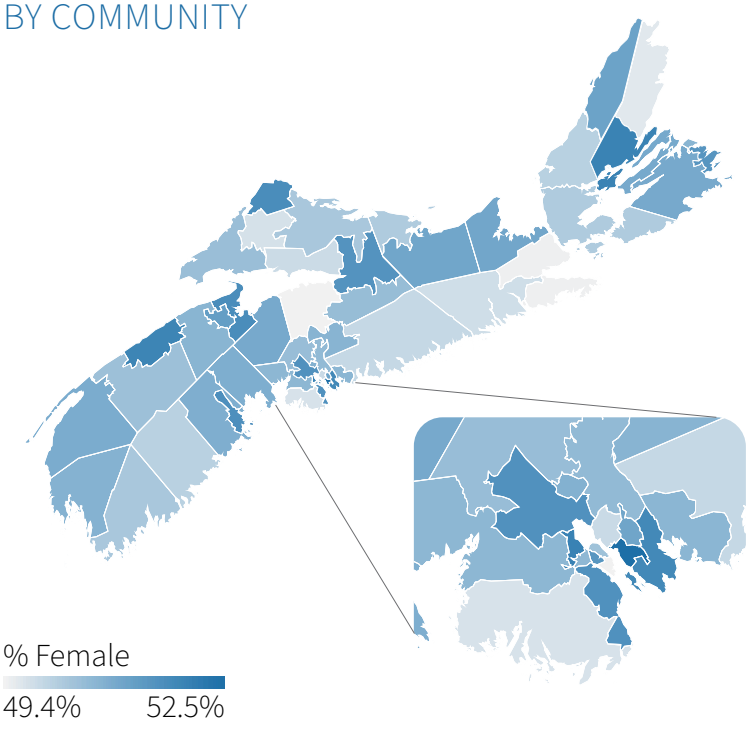
COMMUNITIES WITH HIGHEST AVERAGE AGE

South Cumberland	51.3
Lunenburg / Mahone Bay	50.7
Guysborough / Canso	50.7
Sherbrooke	50.5
Cheticamp	50.0
Liverpool	49.6
Cumberland North / North Shore	49.6
Chester and Area	49.6
Annapolis Royal	49.2
Digby / Clare / Weymouth	48.9

The population in more rural areas of the province tended to be older, on average.

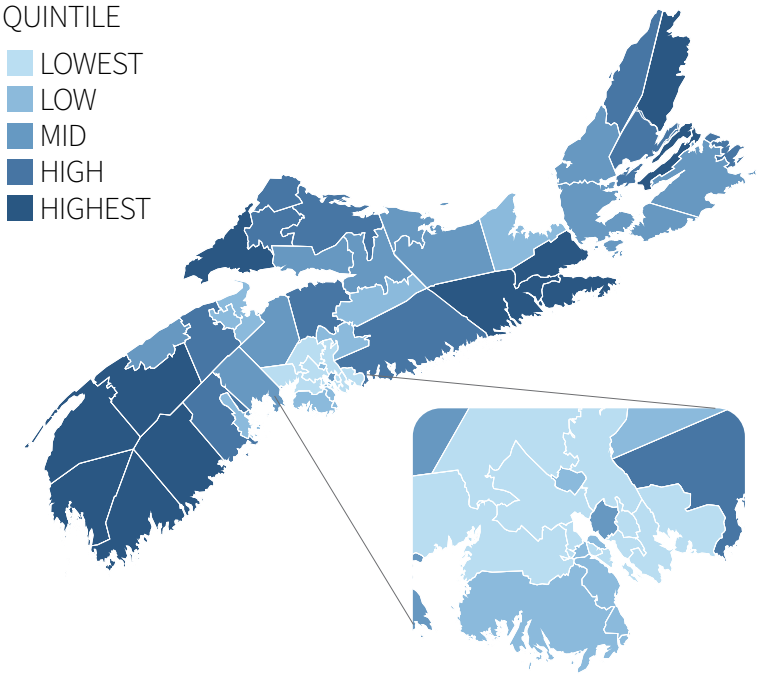
Of the ten communities with the highest average ages, 5 were in Western Zone, and none were in Central Zone.

FIGURE A2.2: PERCENT FEMALE, BY COMMUNITY



All community clusters have roughly 50/50 split of females and males.

FIGURE A2.3: MATERIAL DEPRIVATION QUINTILE, BY COMMUNITY



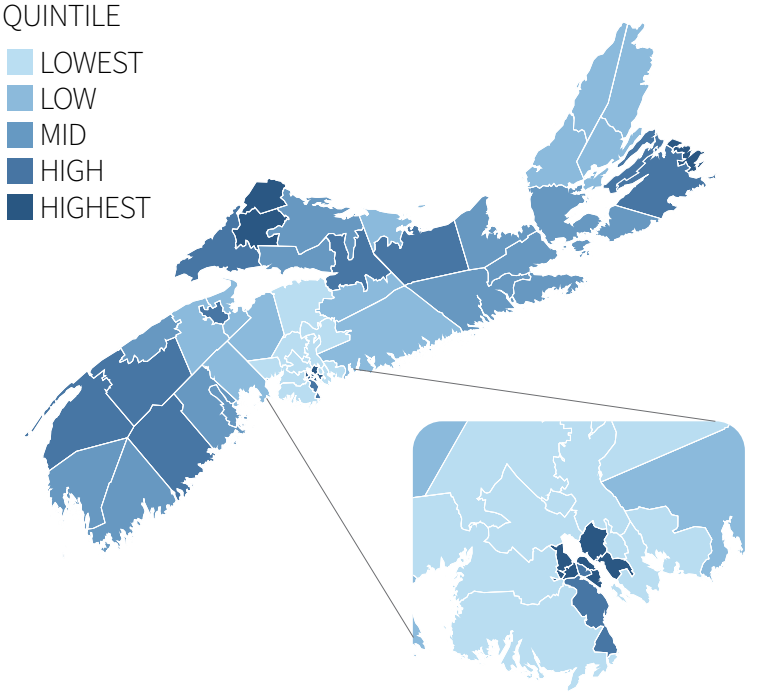
COMMUNITIES IN THE HIGHEST MATERIAL DEPRIVATION QUINTILE, WITH RANK

Dingwall	1
Digby / Clare / Weymouth	2
Guysborough / Canso	3
Shelburne / Lockeport	4
Annapolis Royal	5
South Cumberland	6
Sherbrooke	7
Yarmouth	8
Liverpool	9
Florence / Sydney Mines / North Sydney	10

Material deprivation was higher in coastal community clusters.

Of the 10 communities in the most deprived quintile, five were in Western Zone, and none were in Central Zone.

FIGURE A2.4: SOCIAL DEPRIVATION QUINTILE, BY COMMUNITY



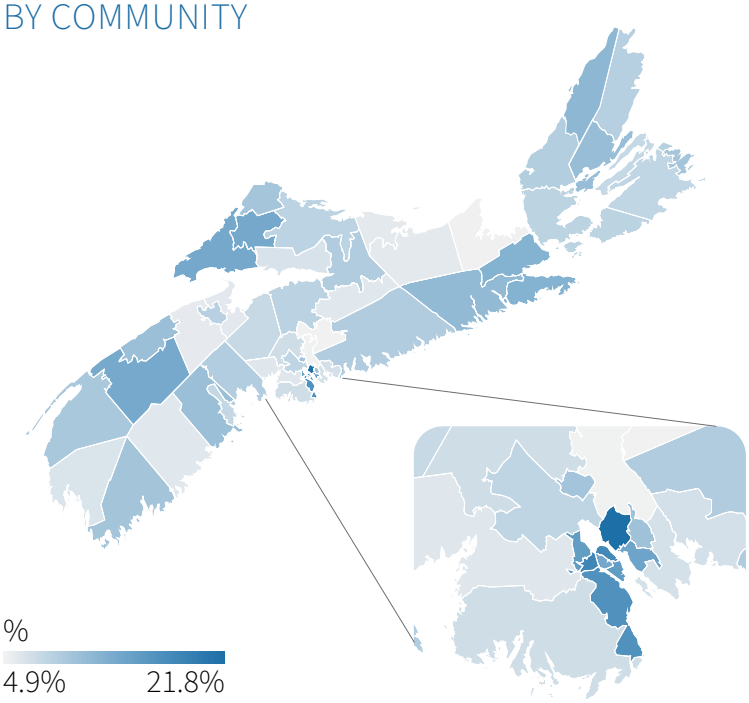
COMMUNITIES IN THE HIGHEST SOCIAL DEPRIVATION QUINTILE, WITH RANK

Dartmouth North	1
Halifax Needham	2
Halifax Citadel	3
Fairview	4
Dartmouth South	5
Amherst	6
Dominion / Glace Bay	7
New Waterford	8
Clayton Park	9
Springhill	10

Social deprivation was higher, overall, in the Halifax area.

Of the 10 communities in the most deprived quintile, six were in Central Zone, and none were in Western Zone.

FIGURE A2.5: PERCENTAGE OF POPULATION IN CORE HOUSING NEED, BY COMMUNITY



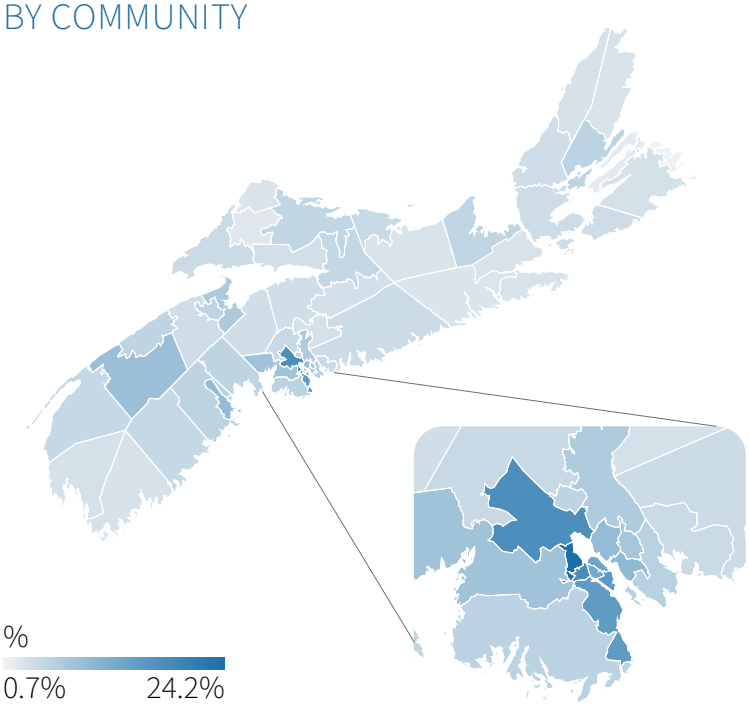
COMMUNITIES WITH HIGHEST CORE HOUSING NEED

Dartmouth North	21.8%
Fairview	18.3%
Halifax Needham	17.9%
Armdale / Spryfield / Herring Cove	16.7%
Halifax Citadel	15.2%
Clayton Park	15.2%
Dartmouth South	14.2%
Halifax Chebucto	13.7%
South Cumberland	13.6%
Springhill	13.6%

Population levels of core housing need were highest in Central Zone.

Of the 10 communities with the highest percentage of core housing need, 8 were in Central Zone, and two were in Northern Zone.

FIGURE A2.6: PERCENTAGE OF POPULATION THAT ARE IMMIGRANTS, BY COMMUNITY



COMMUNITIES WITH HIGHEST IMMIGRANT POPULATION

Clayton Park	24.2%
Fairview	18.0%
Bedford / Hammonds Plains	17.5%
Halifax Citadel	15.8%
Armdale / Spryfield / Herring Cove	15.2%
Halifax Needham	13.5%
Halifax Chebucto	12.7%
Dartmouth South	9.9%
Lunenburg / Mahone Bay	9.4%
Dartmouth North	9.4%

Population levels of immigration were highest in Central Zone.

Of the 10 communities with the highest percentage of immigrants, 9 were in Central Zone, and 1 was in Western Zone.

APPENDIX 3 TABLE A3.1

Zone	Cluster	Average Age	% Female	Community Material Deprivation Quintile	Community Social Deprivation Quintile	Community % Core Housing Need	Community % Immigrant
Western	Annapolis Royal	49.2	50.4%	5	4	13.4%	8.8%
	Berwick	46.4	50.7%	4	2	5.6%	3.9%
	Bridgewater	47.8	50.9%	4	3	10.7%	5.5%
	Chester and Area	49.6	50.9%	3	2	9.0%	5.4%
	Digby / Clare / Weymouth	48.9	50.9%	5	4	9.6%	4.6%
	Kentville	44.8	51.3%	2	4	8.6%	5.3%
	Liverpool	50.0	50.1%	5	4	5.9%	4.7%
	Lunenburg / Mahone Bay	50.7	51.6%	2	3	7.8%	9.4%
	Middleton	46.2	51.9%	3	3	10.7%	5.3%
	Shelburne / Lockeport	47.2	50.3%	5	3	10.0%	3.1%
	Wolfville	46.7	51.7%	2	2	5.9%	6.9%
	Yarmouth	46.6	50.8%	5	3	6.3%	3.2%
Northern	Amherst	46.6	51.7%	4	5	9.9%	2.8%
	Cumberland North / North Shore	49.6	50.3%	4	3	8.4%	5.0%
	East Hants Corridor	41.4	50.7%	2	1	4.9%	3.2%
	Economy / Glenholme	46.5	49.8%	3	3	6.5%	3.4%
	Hants North	43.3	49.4%	4	1	8.4%	3.7%
	New Glasgow / Westville / Stellarton	45.9	51.1%	3	4	5.8%	2.9%
	Pictou West	48.3	50.2%	3	2	5.8%	4.5%
	South Colchester	43.1	50.5%	2	2	5.9%	3.4%
	South Cumberland	51.3	50.5%	5	4	13.6%	4.2%
	Springhill	46.1	49.7%	4	5	13.6%	2.3%
	Truro and Area	44.9	51.5%	3	4	9.1%	4.8%
Eastern	Antigonish	44.5	51.0%	2	3	5.0%	5.2%
	Baddeck / Whycocomagh	42.5	52.0%	4	2	10.9%	5.5%
	Cheticamp	50.5	51.1%	4	2	11.7%	3.2%
	Dingwall	45.8	49.6%	5	2	8.7%	3.0%
	Dominion / Glace Bay	46.9	51.5%	4	5	9.9%	1.0%

APPENDIX 3 TABLE A3.1

	Florence / Sydney Mines / North Sydney	48.0	51.0%	5	4	7.7%	1.8%
	Guysborough / Canso	50.7	49.4%	5	3	12.4%	3.0%
	Inverness	46.7	50.1%	3	2	8.9%	3.9%
	New Waterford	47.2	50.7%	4	5	8.7%	0.7%
	Port Hawkesbury / L'Ardoise / Isle Madame	47.9	50.2%	3	3	8.3%	4.0%
	Sherbrooke	50.5	49.8%	5	3	11.3%	2.7%
	Sydney and Area	44.6	51.0%	3	4	8.0%	3.2%
Central	Armdale / Spryfield / Herring Cove	41.1	51.6%	2	4	16.7%	15.2%
	Bedford / Hammonds Plains	40.3	51.6%	1	1	8.0%	17.5%
	Clayton Park	41.4	52.0%	1	5	15.2%	24.2%
	Cole Harbour / Eastern Passage	41.4	51.8%	1	1	6.7%	5.8%
	Dartmouth East	42.9	51.1%	1	1	10.3%	7.5%
	Dartmouth North	41.2	49.9%	3	5	21.8%	9.4%
	Dartmouth South	45.7	52.5%	1	5	14.2%	9.9%
	Eastern Shore / Musquodoboit	45.8	49.9%	4	2	9.1%	4.0%
	Fairview	39.3	50.6%	2	5	18.3%	18.0%
	Fall River and Area	40.6	50.6%	1	1	5.0%	6.7%
	Halifax Chebucto	39.5	51.4%	1	4	13.7%	12.7%
	Halifax Citadel	40.2	49.4%	1	5	15.2%	15.8%
	Halifax Needham	41.3	50.4%	2	5	17.9%	13.5%
	Preston/ Lawrencetown/ Lake Echo	43.0	50.7%	1	1	6.7%	4.1%
	Sackville North and Area	40.2	50.5%	1	1	7.1%	4.4%
	Sackville South	42.4	50.8%	2	1	10.1%	5.4%
	Sambro Rural Loop	43.6	49.7%	2	1	7.1%	5.7%
	Tantallon / Timberlea / SMB	40.8	50.6%	1	1	6.0%	8.1%
	West Hants	46.0	51.0%	3	2	7.6%	3.7%

APPENDIX 3 TABLE A3.2

Zone	Cluster	% Multimorbidity	% High-Cost Healthcare Use	% Health System Non-Use
Western	Annapolis Royal	23.6%	4.7%	22.5%
	Berwick	25.6%	5.7%	12.6%
	Bridgewater	27.5%	5.9%	12.0%
	Chester and Area	28.7%	5.9%	11.8%
	Digby / Clare / Weymouth	25.3%	5.5%	13.8%
	Kentville	24.5%	5.1%	12.4%
	Liverpool	27.6%	6.4%	11.6%
	Lunenburg / Mahone Bay	30.0%	6.9%	12.4%
	Middleton	24.9%	5.2%	16.6%
	Shelburne / Lockeport	30.5%	6.1%	11.2%
	Wolfville	24.2%	5.1%	13.3%
	Yarmouth	28.1%	5.9%	12.2%
Northern	Amherst	23.3%	5.5%	15.2%
	Cumberland North / North Shore	23.0%	5.5%	13.7%
	East Hants Corridor	24.7%	3.9%	11.3%
	Economy / Glenholme	26.8%	5.0%	12.5%
	Hants North	26.5%	4.7%	13.4%
	New Glasgow / Westville / Stellarton	26.7%	6.6%	13.4%
	Pictou West	25.9%	5.8%	13.9%
	South Colchester	24.8%	4.8%	15.4%
	South Cumberland	28.7%	7.3%	13.3%
	Springhill	26.4%	5.2%	13.6%
	Truro and Area	24.9%	5.3%	14.3%
Eastern	Antigonish	24.6%	5.4%	12.9%
	Baddeck / Whycocomagh	24.5%	5.0%	12.2%
	Cheticamp	33.2%	7.0%	10.1%
	Dingwall	26.7%	5.9%	13.5%
	Dominion / Glace Bay	28.7%	6.9%	13.8%
	Florence / Sydney Mines / North Sydney	28.4%	6.2%	11.8%
	Guysborough / Canso	29.4%	6.8%	12.1%
	Inverness	25.0%	6.5%	12.6%
	New Waterford	32.2%	7.1%	12.7%
	Port Hawkesbury / L'Ardoise / Isle Madame	30.3%	5.7%	12.7%
	Sherbrooke	26.3%	5.5%	12.1%
	Sydney and Area	26.2%	6.2%	15.1%

APPENDIX 3 TABLE A3.2

Central	Armdale / Spryfield / Herring Cove	21.7%	4.7%	16.9%
	Bedford / Hammonds Plains	19.6%	3.2%	16.8%
	Clayton Park	21.4%	4.0%	20.4%
	Cole Harbour / Eastern Passage	23.8%	4.1%	13.5%
	Dartmouth East	24.0%	4.4%	14.7%
	Dartmouth North	21.0%	4.3%	20.3%
	Dartmouth South	26.5%	5.6%	14.7%
	Eastern Shore / Musquodoboit	25.8%	5.3%	12.1%
	Fairview	17.6%	3.8%	22.8%
	Fall River and Area	20.4%	3.0%	12.5%
	Halifax Chebucto	16.0%	3.2%	22.4%
	Halifax Citadel	13.5%	4.0%	33.4%
	Halifax Needham	18.1%	4.9%	23.5%
	Preston / Lawrencetown / Lake Echo	23.9%	4.0%	12.5%
	Sackville North and Area	20.7%	3.4%	12.2%
	Sackville South	23.3%	4.3%	13.5%
	Sambro Rural Loop	23.7%	4.0%	12.1%
	Tantallon / Timberlea / SMB	20.2%	3.2%	12.2%
	West Hants	25.2%	5.6%	12.1%