CALGARY LOCAL IMMIGRATION PARTNERSHIP

A Profile of Immigrant Health in Calgary

Prepared by

Naomi Lightman, Ph.D.
University of Calgary
Department of Sociology and Newcomer Research Network

and

Sharon M. Stroick, Ph.D., MCIP
Calgary Local Immigration Partnership

Revised 2019 January 23

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Acknowledgements

Sincere thanks are extended to Courtney Baay for her assistance with the initial interpretation of the descriptive data in this report. In addition, we wish to thank Dina Lavorato and Stephanie Cantlay at the Prairie Regional Research Data Centre at the University of Calgary.

Executive Summary

It is well documented that immigrant and racialized groups often experience greater access barriers to health and social services in Canada, due to multiple factors including language, transportation, information, service fees, and discrimination. Given the growing numbers of immigrants who make Calgary their home, there is a need to explore the association between characteristics such as immigration status, mother tongue, and ethnocultural identities, and potential disparities in health care access, physical health status, and mental health status for Calgary's diverse immigrant populations.

This report provides a profile of immigrant health in Calgary, using pooled data from the Canadian Community Health Survey (CCHS) gathered in the Calgary Zone Community Health Region between January 2013 and December 2016. The CCHS is an annual cross-sectional survey, which collects information on health status, the use of health care services, and some key social determinants of health for the Canadian population. It includes questions about income, employment status, level of education, sense of belonging to the local community, and access to health care. The sample used for this report consists of **5,529** survey respondents who were residents of the Calgary Zone during the collection period.

Key findings include significant differences between immigrants and their Canadian-born counterparts in rates of unmet health care needs, physical health status, mental health status, sense of belonging to the local community, and the number and presence of chronic conditions experienced. The results often differ by immigrants' length of time in Canada, which is also associated with age. Specifically, our research finds the following for the Calgary Zone Community Health Region:

- **Unmet Health Care Needs** – When all immigrants are combined, their rate of *perceived* unmet health care needs is significantly *lower* than for non-immigrants.

- **Physical Health Status** – Rates of self-reporting health as "good" are significantly *higher* for recent immigrants (in Canada for 10 years or less) than for non-immigrants. However, rates of self-reporting health as "very good" or excellent" are significantly *lower* for long-term immigrants (in Canada 25 years or more) than for non-immigrants. When controlling for other factors, racialized immigrants have *lower* odds of reporting "good" or "excellent" health than non-racialized Canadian-born respondents. This is also true for people with more chronic conditions, lower income, and less than high school education.

- **Mental Health Status** – When compared to the Canadian-born population, rates of self-reported mental health for immigrants are not significantly different. However, when controlling for other relevant factors, people whose mother tongue is not English have *lower* odds of reporting "good" or "excellent" mental health than people whose mother tongue is English. This, in part, may reflect language barriers in accessing care.

- **Sense of Belonging** – When all immigrants are combined, they have a significantly *higher* rate of experiencing a "somewhat" or "very strong" sense of belonging to the local community than Canadian-born survey respondents.

- **Number and Presence of Chronic Conditions** – When all immigrants are combined, their rates of having three or more chronic conditions are significantly *lower* than for non-immigrants. Statistically significant differences between immigrants and their Canadian-born counterparts emerged for arthritis, asthma, diabetes, high blood pressure, and urinary incontinence, as well as for anxiety disorders and mood disorders. Conversely, there are no statistically significant differences between immigrants and non-immigrants in rates of bowel disorders, cancer, heart disease, stomach or intestinal ulcers, and Alzheimer's or dementia.

Significant differences between immigrants and the Canadian-born population in the Calgary Zone are also found in rates of racialized identity, having a mother tongue other than English, living arrangements, sexual orientation, employment, and educational attainment—often differing by immigrants' length of time in Canada. In addition, there are statistically significant differences between immigrants and their Canadian-born counterparts in terms of health care access and general health status, some of which may have implications for service provision and, ultimately, health outcomes.

In sum, this research demonstrates statistically significant differences in several of the social determinants of health, in health care access and general health status, and in the health outcomes experienced by immigrants as compared to Canadian-born individuals living in the Calgary Zone Community Health Region. These findings will help CLIP Council and its working groups to understand the impact of various factors on the mental and physical health of immigrants. This is important information to have as CLIP moves forward with its Action Plan and works toward the full inclusion and integration of newcomers in Calgary.

Contents

A Profile of Immigrant Health in Calgary

Introduction

The University of Calgary Newcomer Research Network (UCNRN) is an interdisciplinary community of researchers housed in faculties across the university. Together, they contribute to the university's strategic research theme of Human Dynamics in a Changing World, which informs the building of a vibrant civil society through respectful and fruitful human interactions in an inclusive and responsive multicultural society.

The Calgary Local Immigration Partnership (CLIP) is a multisector community partnership designed to improve the integration of immigrants in Calgary and strengthen the city's ability to better address newcomers' needs. CLIP has been a community member of the UCNRN since the spring of 2017.

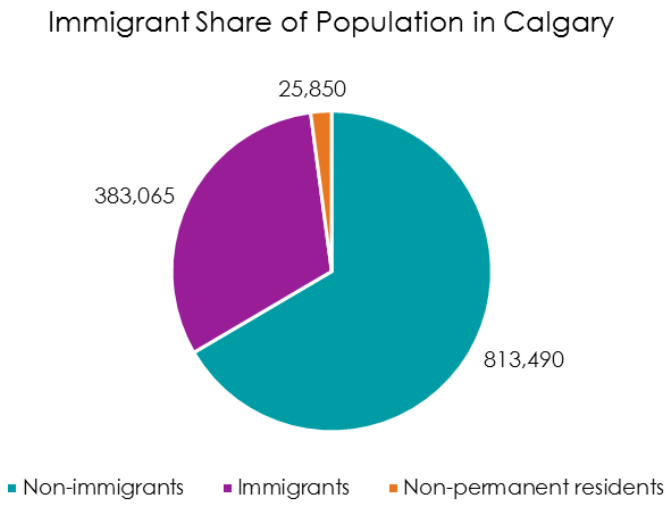
Both CLIP and the UCNRN have a mutual desire to develop and reinforce cooperation in the areas of research on immigration and intercultural practices when working with newcomers (e.g., immigrants, refugees, and international students). To that end, the Governors of the University of Calgary, represented by the UCNRN, and The City of Calgary, represented by CLIP, developed a Memorandum of Understanding to enable collaboration, which went into effect on May 1, 2018. This research project, *A Profile of Immigrant Health in Calgary*, is the first collaboration emerging from this partnership.

This research is intended to increase awareness of immigrant health outcomes in Calgary, using the lens of the social determinants of health. Social determinants are defined as "the conditions in which people are born, grow, live, work, and age that influence people's health positively and negatively over the life course." They are the root causes of health and health inequities (Um and Lightman, 2017: 3 citing Commission on Social Determinants of Health, 2008).

The results of this research will enable CLIP Council and its working groups to better understand the impact of various factors on the mental and physical health of immigrants, as well as the health care experiences of immigrants in Calgary. This is important information to have as CLIP moves forward with its Action Plan and works toward the full inclusion and integration of newcomers in Calgary. By promoting and circulating the research findings, the public will also learn more about the circumstances faced by immigrants living in Calgary.

Research Rationale

The share of immigrants in Canada has reached its highest level in almost a century, according to 2016 census figures. There are 7.5 million people—about 21.9% of the total population—who are foreign-born individuals who have immigrated to Canada (CBC News, 2017). In Calgary, the population of immigrants grew faster than the general population between 2011 and 2016, at 28% versus 13%. As of 2016, there were 383,065 immigrants in Calgary, up from 298,820 in 2011 (Statistics Canada, 2017*a*).



Source: Statistics Canada, 2017*a*.

The top five places of birth for immigrants in Calgary in 2016 were the Philippines, India, China, the United Kingdom, and Pakistan (Statistics Canada, 2017*b*). In addition, more than one-third of Calgarians (442,585 people or 36%) identified as a visible minority in 2016. This represents a 36% increase from 2011, when a total of 325,390 Calgarians identified as a visible minority (Statistics Canada, 2017*a*).

It has been well documented that immigrant and racialized groups often experience greater access barriers to health and social services due to multiple factors including language, transportation, information, service fees, and discrimination (Um and Lightman, 2017; Guruge, et al., 2015; Hansson, et al., 2010). Yet, until now, there has been a dearth of information available on immigrants' health and their access to health care in the Calgary area. This study is intended to address this shortcoming in existing Canadian research on immigrant health.

Given the growing numbers of immigrants who make Calgary their home, there is a clear need to explore the association between sociodemographic characteristics such as immigration status, mother tongue, and ethnocultural identities, and disparities in health care access, physical health status, and mental health status. It is also important to understand the extent to which some identified barriers to health care intersect with other sociodemographic characteristics and, ultimately, inform policy and practice.

Methodology

This study draws on secondary data from the Canadian Community Health Survey (CCHS), obtained through the Prairie Regional Research Data Centre at the University of Calgary. The CCHS is an annual cross-sectional survey administered by Statistics Canada that collects information on health status, the use of health care services, and some key social determinants of health for the Canadian population. It includes questions about household income, employment status, level of education, sense of belonging to the local community, and access to health care.

The CCHS relies on a large, random sample of respondents and provides representative data on health at the municipal and provincial levels. From this, Statistics Canada produces an annual microdata file, as well as a file combining two years of CCHS data. Researchers can also combine collection years to examine sub-populations including immigrants.

Given the scope of this project, access to the two most recent merged cycles of CCHS data (2013/2014 and 2015/2016) were used for the analysis. Pooling data in this way was done to increase the overall sample size of immigrants in Calgary and limit the suppression of variables. We initially requested data for the Calgary Census Metropolitan Area but were instead granted access to data for the slightly larger Calgary Zone Community Health Region. This produced a sample of **5,529** respondents aged 18 to 85 years who were residents of that geographic area when the surveys were administered. The CCHS variables that were analyzed are listed below. The research findings are presented in the same order.

CCHS Variables Examined

1. **Demographic and Diversity Variables:**
    a. Immigration status (immigrant or non-immigrant)
    b. Length of time in Canada among immigrants (recent = 10 years or less, mid-term = 11 to 25 years, and long-term = more than 25 years)
    c. Age (median age)
    d. Sex (male or female)
    e. Racialized identity (racialized or non-racialized)
    f. Mother tongue (English or not English)
    g. Living arrangements (living with others or living alone)
    h. Sexual orientation (homosexual/bisexual or heterosexual)

2. **Social Determinants of Health:**
    a. Income – personal median income and household median income
    b. Employment status and number of hours worked in the previous week
    c. Education – highest level attained
    d. Food security status
    e. Sense of belonging to the local community

3. **Health Care Access:**
    a. Unmet health care needs in the previous 12 months (self-perceived)
    b. Had a regular health care provider in the previous 12 months
    c. Consulted with a mental health professional in the previous 12 months
    d. Last health consultation – comprehensibility
    e. Last health consultation – overall quality rating

4. **Health Status:**
    a. Self-reported health status (ranked from fair to excellent)
    b. Self-reported mental health status (ranked from fair to excellent)
    c. Number of chronic health conditions
    d. Presence of specific chronic physical health conditions (arthritis, asthma, bowel disorder, cancer, diabetes, heart disease, high blood pressure, stomach or intestinal ulcers, and urinary incontinence), and
    e. Presence of specific chronic mental health conditions (Alzheimer's or dementia, anxiety disorder, and mood disorder).

Analyses and reporting of the results followed the guidelines outlined in the CCHS User Guide (Statistics Canada, 2014). This includes using survey weights, calculating bootstrap estimates, and following the guidelines for reporting based on the coefficient of variation of each estimate. A significance level of $p<0.05$ was applied for all descriptive data.

The primary method of data analysis was descriptive statistics, using cross-tabulation, to measure the differences among sub-population groups—non-immigrants and immigrants, based on length of time in Canada—in terms of: (1) health conditions and sociodemographic characteristics, (2) health care service use, and (3) perceived unmet care needs. The secondary form of analysis involved logistic regression for significance testing to examine the relationships between immigrant status, multiple predictors, and: (1) self-perceived health status, (2) self-perceived mental health status, and (3) sense of belonging to the local community. The data analysis was conducted using SAS software.

Appendix A contains a more detailed methodology. Appendix B presents detailed descriptive data tables with the results of the CCHS analyses. The results of the logistic regression models are provided in Appendices C, D, and E.

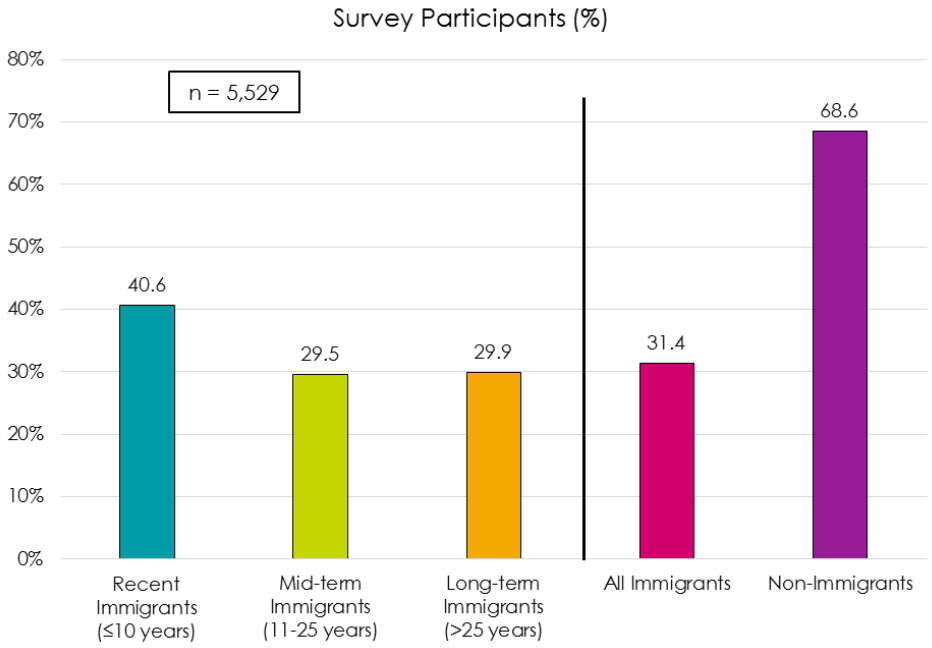
Research Findings

Survey Sample Size

Data from the Canadian Community Health Survey for the Calgary Health Region Zone was pooled for the period of January 1, 2013 through December 31, 2016 unless otherwise noted. This produced a sample of **5,529** survey respondents aged 18 to 85 years who were residents of the Calgary Zone when the surveys were administered.

For all results, immigrants' length of time in Canada is defined as follows:

- Recent immigrants have been in Canada for 10 years or less
- Mid-term immigrants have been in Canada for 11 to 25 years, and
- Long-term immigrants have been in Canada for more than 25 years.

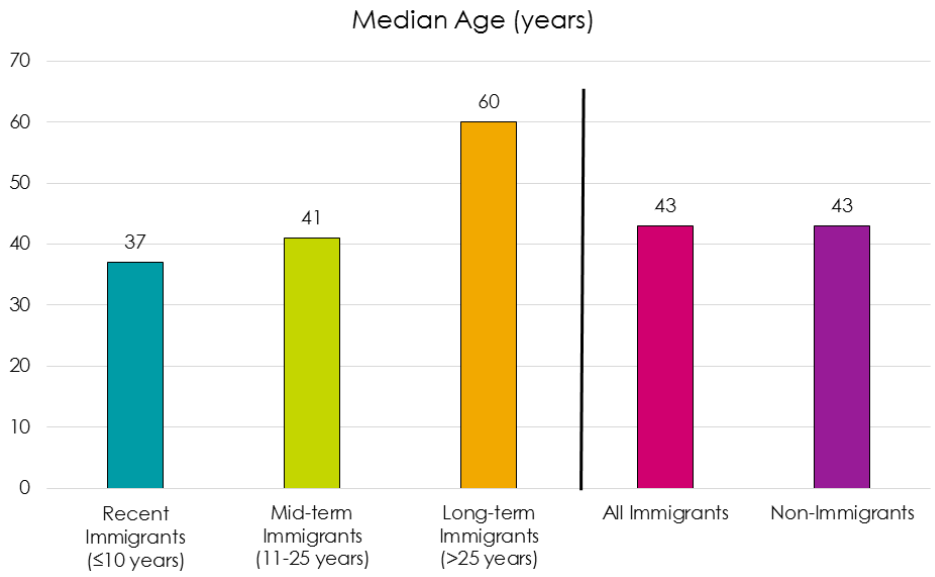


Source: Canadian Community Health Survey (pooled data 2013-2016).

Demographic and Diversity Variables

Age

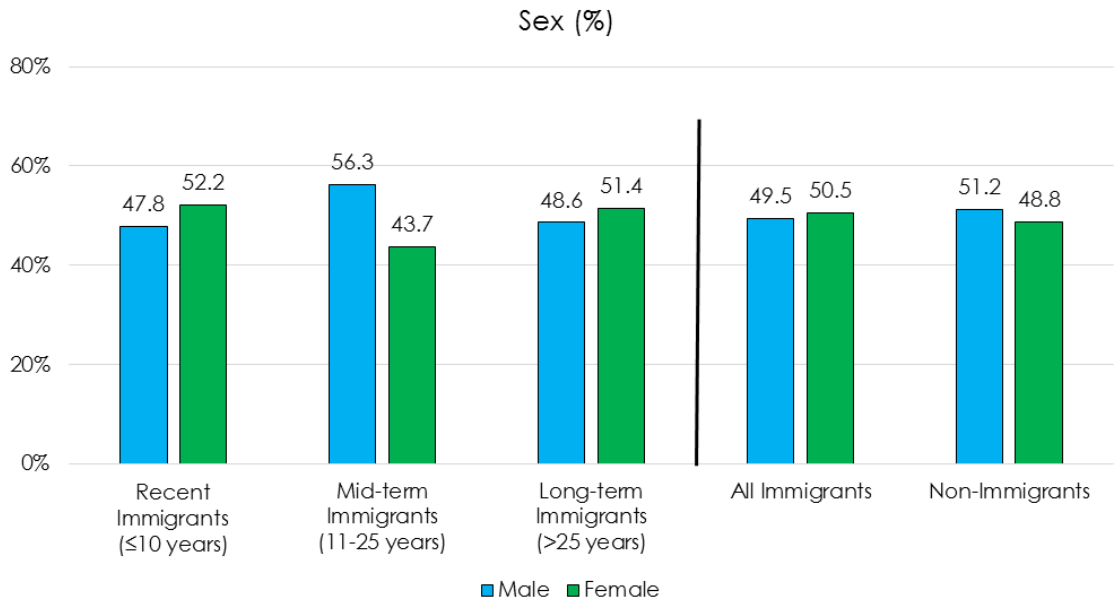
The median age of recent and mid-term immigrants in the Calgary Zone is 37 and 41 years respectively. In contrast, the median age of long-term immigrants is 60 years. When all immigrants are considered together, their median age is 43, which is the same as the median age for non-immigrants.



Source: Canadian Community Health Survey (pooled data 2013-2016).

Sex

The breakdown by sex for all categories is shown below.

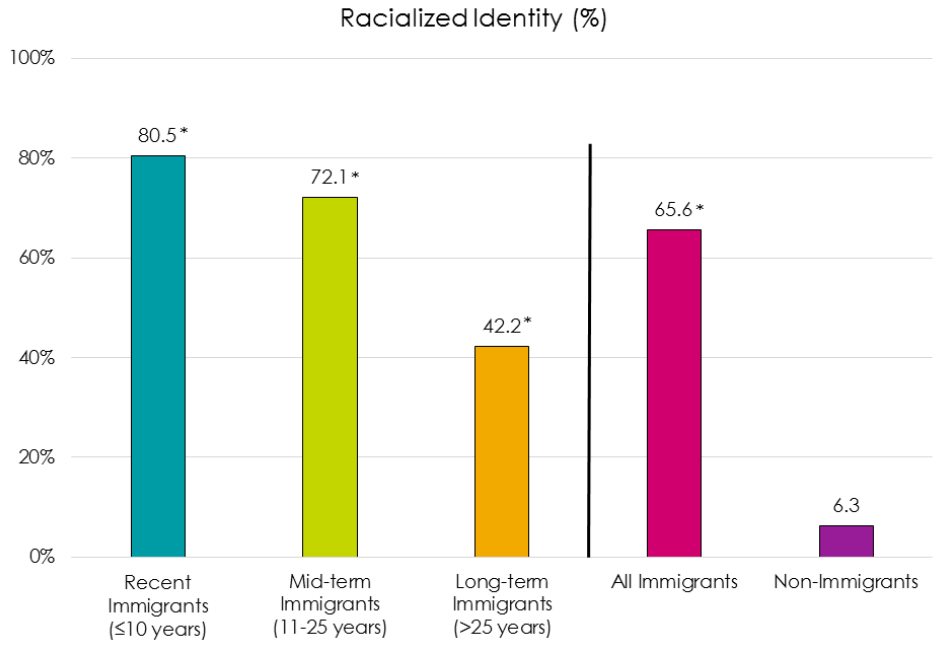


Source: Canadian Community Health Survey (pooled data 2013-2016).

Racialized Identity

Rates of racialized identity are significantly and substantively *higher* for all immigrants than for non-immigrants in the Calgary Zone, at 65.6% versus 6.3%. While this is true for all categories of immigrants, those who have been in Canada for longer have lower rates of racialized identity than immigrants who arrived more recently.

This finding is not surprising. Due to "shifts in Canada's immigration policies and various international events relating to movements of migrants and refugees, the percentage of recent immigrants born in Europe has decreased from one census to the next, falling from 61.6% in 1971 to 16.1% in 2006 and to 11.6% in 2016" (Statistics Canada, 2017c).



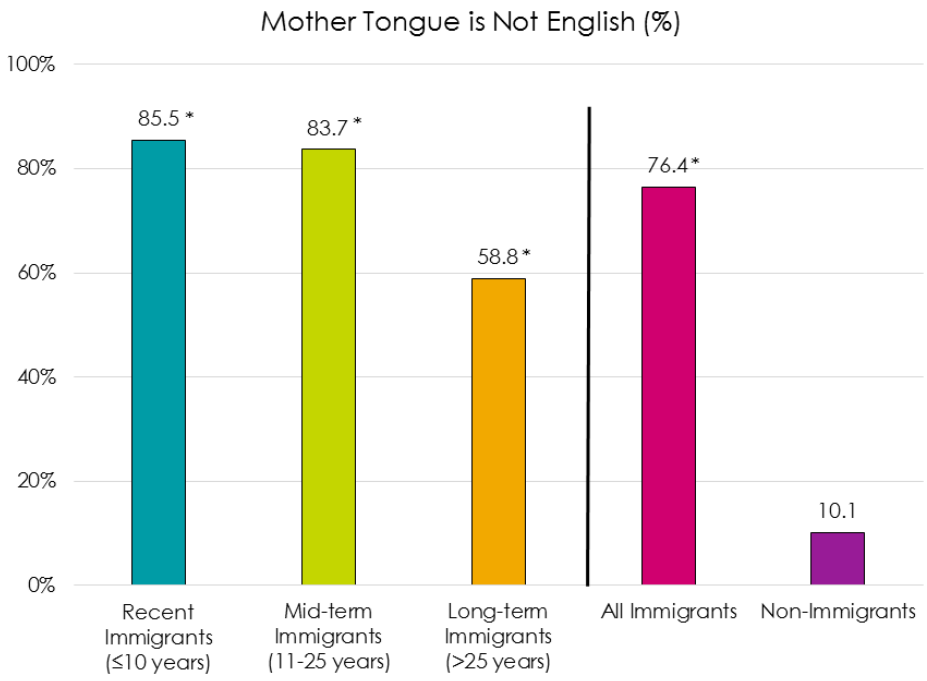
* Significantly different ($p<0.05$) from estimate for reference category (non-immigrants).

Source: Canadian Community Health Survey (pooled data 2013-2016).

Mother Tongue

Immigrants in the Calgary Zone are significantly and substantively more likely to have a mother tongue other than English than are non-immigrants, at 76.4% versus 10.1%. This is true for all categories of immigrants.

However, immigrants who have been in the country for more than 25 years have *lower* rates of having a non-English mother tongue than recent and mid-term immigrants. This reflects a growing trend of immigrants coming to Canada from Global South countries.

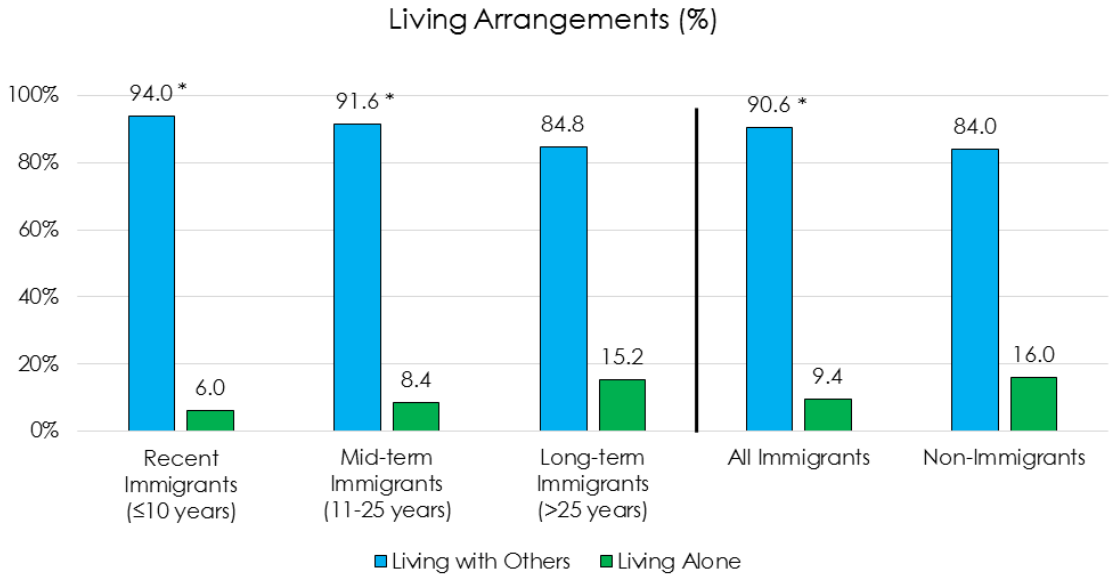


* Significantly different (p<0.05) from estimate for reference category (non-immigrants).

Source: Canadian Community Health Survey (pooled data 2013-2016).

Living Arrangements

When compared to the Canadian-born population, rates of living with others (versus living alone) are significantly *higher* for recent and mid-term immigrants, as well as for all immigrants combined.

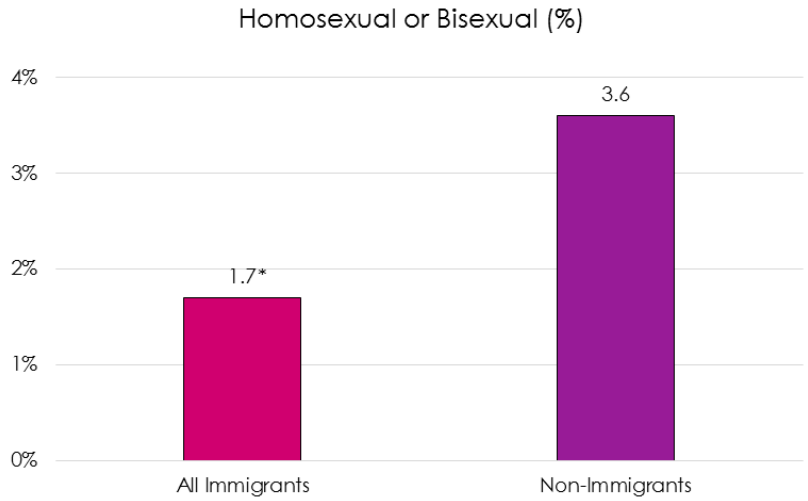


* Significantly different (p<0.05) from estimate for reference category (non-immigrants).

Source: Canadian Community Health Survey (pooled data 2013-2016).

Sexual Orientation

Rates of homosexual or bisexual self-identification are significantly *lower* for immigrants than for non-immigrants.



* Significantly different ($p<0.05$) from estimate for reference category (non-immigrants).

Source: Canadian Community Health Survey (pooled data 2013-2016).

Social Determinants of Health

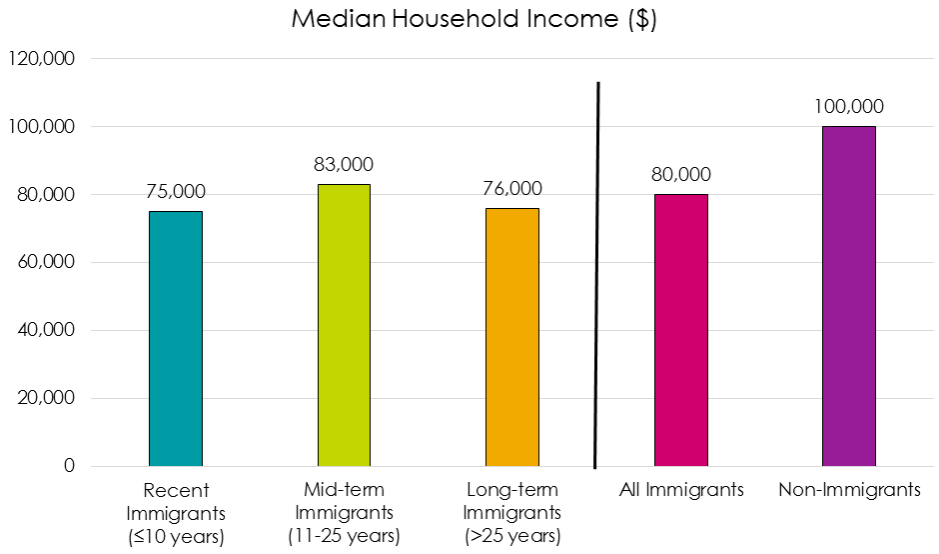
Personal Income

Median *personal* income is $15,000 *higher* for non-immigrants than for all immigrants in our sample. However, these results are not statistically significant.

Source: Canadian Community Health Survey (pooled data 2013-2016).

Household Income

Similarly, there is no significant difference in median *household* income between immigrants and non-immigrants in the Calgary Zone Community Health Region.



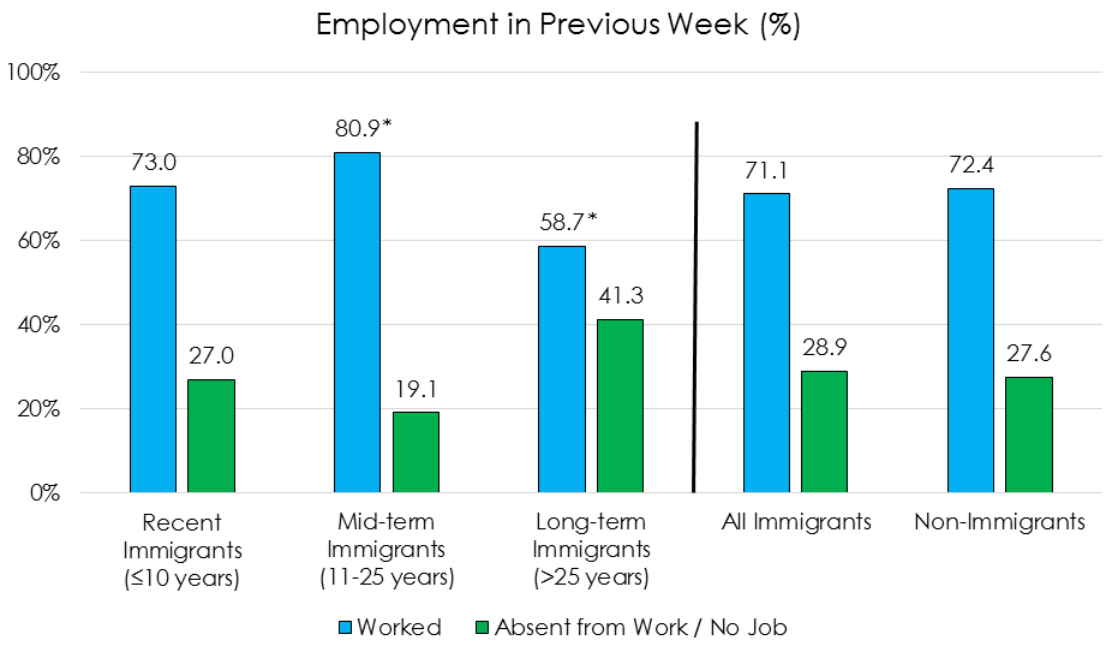
Source: Canadian Community Health Survey (pooled data 2013-2016).

Employment

When compared to the Canadian-born population, there is a significant difference in employment rates for both mid-term and long-term immigrants—but in opposite directions.

Mid-term immigrants have *higher* rates of employment than non-immigrants (at 80.9% versus 72.4%), whereas long-term immigrants have *lower* rates of employment (at 58.7% versus 72.4%). This latter finding is likely due to the higher median age (and greater incidence of retirement) among long-term immigrants.

Of note, rates of employment for recent immigrants are not significantly different than for non-immigrants.

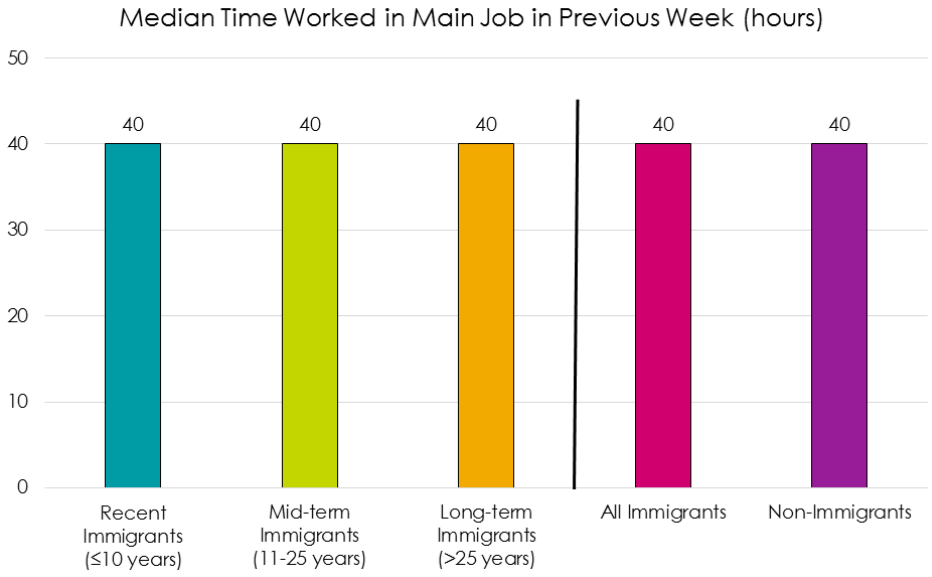


* Significantly different ($p<0.05$) from estimate for reference category (non-immigrants).

Source: Canadian Community Health Survey (pooled data 2013-2016).

Hours Worked

The median number of hours worked per week is the same for immigrants and non-immigrants.



Source: Canadian Community Health Survey (pooled data 2013-2016).

Education Level

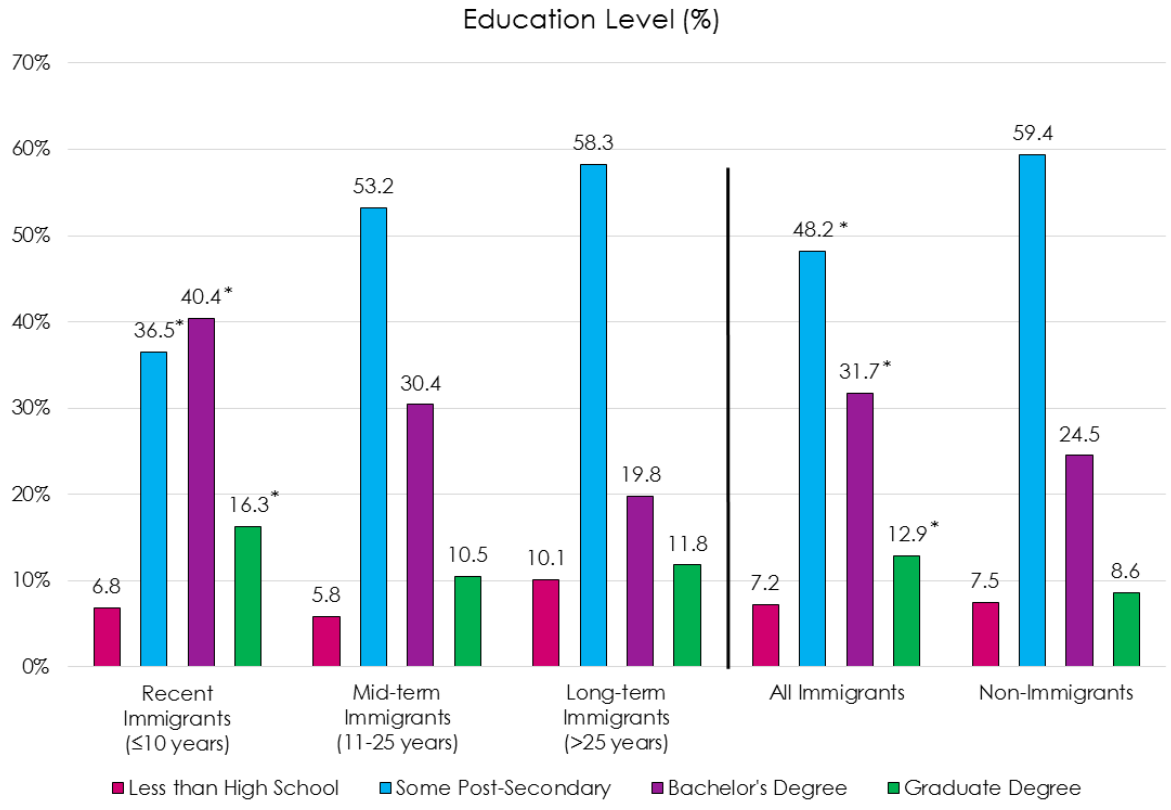
When compared to the Canadian-born population, rates of educational attainment among mid-term and long-term immigrants are not significantly different, regardless of the level of education achieved. However, recent immigrants have significantly higher levels of education, on average, than non-immigrants.

Less than high school: Rates of having less than a high school diploma are not significantly different between immigrants and non-immigrants, regardless of the length of time in Canada.

Some post-secondary: Rates of having *some* post-secondary education are significantly *lower* for recent immigrants than for non-immigrants, at 36.5% versus 59.4%. This is because, as shown below, rates of *completing* post-secondary education are higher among this group than for Canadian-born respondents.

Bachelor's degree: Rates of having completed a bachelor's degree are significantly *higher* for recent immigrants than for non-immigrants, at 40.4% versus 24.5%. However, rates of having completed a bachelor's degree are not significantly different for mid-term or long-term immigrants when compared to non-immigrants.

Graduate degree: Rates of having completed a graduate degree are significantly *higher* for recent immigrants than non-immigrants, at 16.3% versus 8.6%. Again, there is no significant different between mid-term and long-term immigrants and non-immigrants for this variable.



* Significantly different ($p<0.05$) from estimate for reference category (non-immigrants).

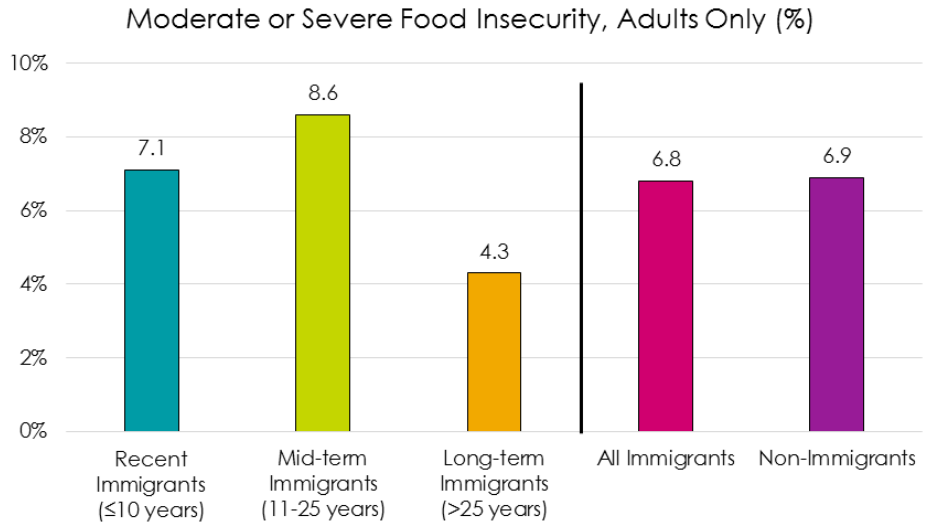
Source: Canadian Community Health Survey (pooled data 2013-2016).

The significantly higher rates of having completed a bachelor's degree or graduate degree among recent immigrants may relate to changes in Canadian immigration policy over time and an increasing emphasis on attracting highly skilled newcomers. There are three main reasons people are admitted to Canada—to "enhance and promote economic development; to reunite families; and to fulfill the country's international obligations and uphold its humanitarian tradition" (Statistics Canada, 2017c).

The 2016 census found that among recent immigrants, approximately 60% were admitted under the economic category. Among them, almost half were admitted through the skilled workers program and another quarter arrived under the provincial and territorial nominee program. This is notably different for immigrants who were admitted during the 1980s, when only about 40% were admitted to Canada as economic immigrants (Statistics Canada, 2017c).

Food Security

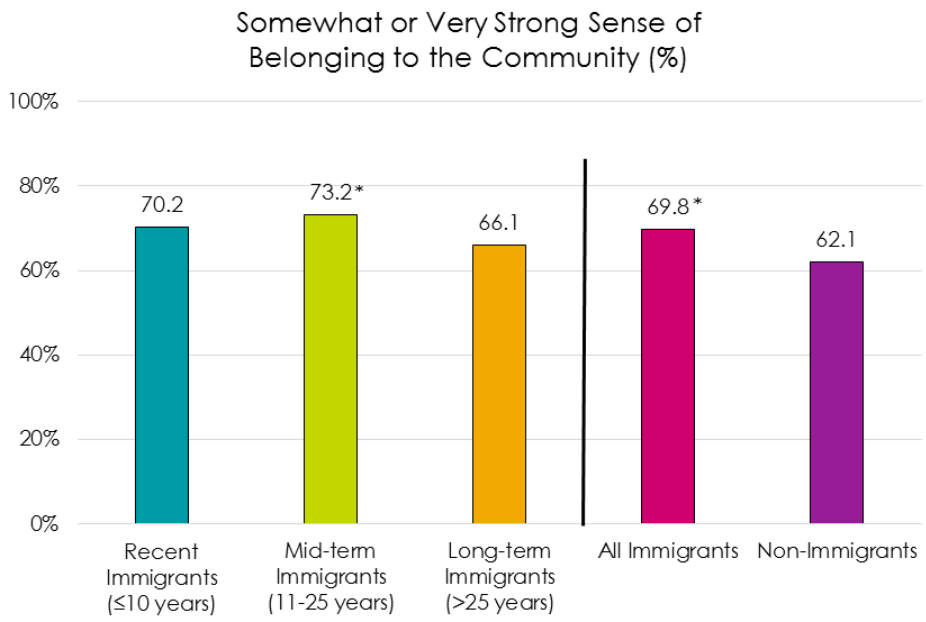
When compared to the Canadian-born population, rates of food insecurity for all immigrants are not significantly different, regardless of their length of time in Canada.



Source: Canadian Community Health Survey (pooled data 2013-2016).

Sense of Belonging

Mid-term immigrants have significantly *higher* rates of experiencing a "somewhat" or "very strong" sense of belonging to the local community compared to non-immigrants, at 73.2% versus 62.1%. In contrast, rates of experiencing a strong sense of belonging are not significantly different for recent or long-term immigrants, when compared to non-immigrants. However, when all immigrants are combined, they have a significantly *higher* rate of experiencing a "somewhat" or "very strong" sense of belonging to the local community than Canadian-born survey respondents, at 69.8% versus 62.1%.



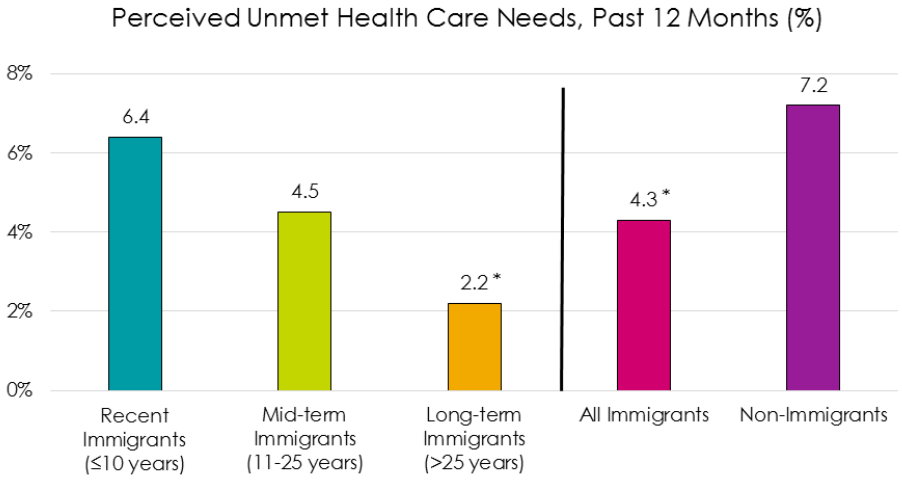
* Significantly different (p<0.05) from estimate for reference category (non-immigrants).

Source: Canadian Community Health Survey (pooled data 2013-2016).

Health Care Access

Perceived Unmet Health Care Needs

Rates of perceived unmet health care needs are significantly *lower* for long-term immigrants than for non-immigrants, at 2.2% versus 7.2%. Although rates of perceived unmet health care needs for mid-term and long-term immigrants are not significantly different than for Canadian-born survey respondents, when all immigrants are combined, their rate of perceived unmet health care needs is also significantly *lower* than for non-immigrants, at 4.3% versus 7.2%.

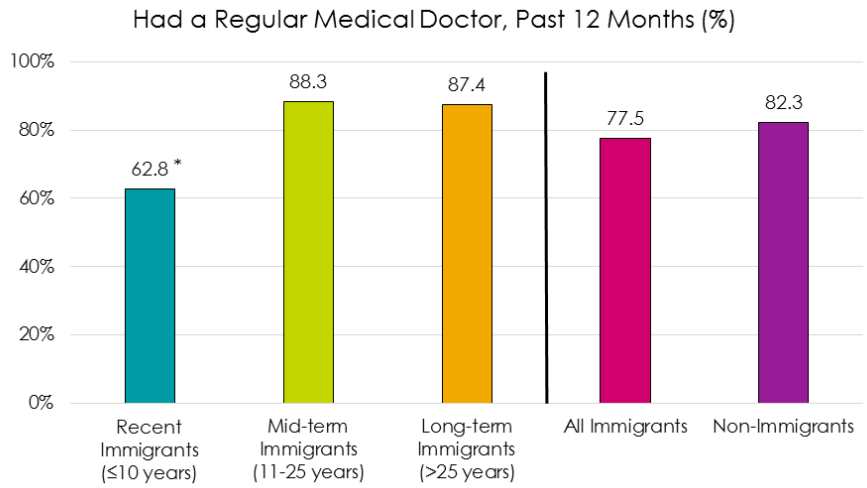


* Significantly different (p<0.05) from estimate for reference category (non-immigrants).

Source: Canadian Community Health Survey (pooled data 2013-2016).

Regular Medical Doctor

When compared to non-immigrants, rates of having a regular medical doctor among mid-term and long-term immigrants are not significantly different. In contrast, however, rates of having a regular medical doctor are significantly *lower* for recent immigrants than for non-immigrants, at 62.8% versus 82.3%. From this analysis, there is no way of knowing whether the number of recent immigrants without a regular medical doctor are very recent arrivals or if they have lived in Calgary for several years.

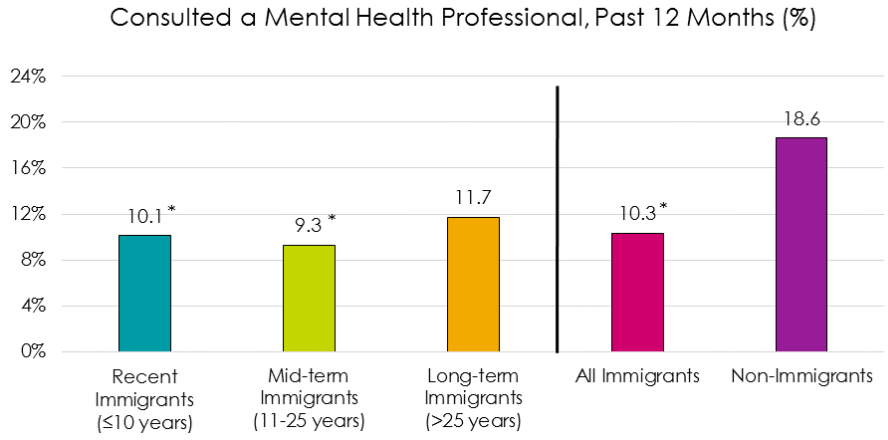


* Significantly different ($p<0.05$) from estimate for reference category (non-immigrants).

Source: Canadian Community Health Survey (pooled data 2013-2016).

Consulted a Mental Health Professional

Rates of having consulted with a mental health professional in the past year are significantly *lower* for recent and mid-term immigrants, at 10.1% and 9.3%, than for non-immigrants, at 18.6%. Although rates are not significantly different from the Canadian-born for long-term immigrants, when all immigrants are combined, their rate is significantly *lower* than for their Canadian-born counterparts, at 10.3% versus 18.6%.



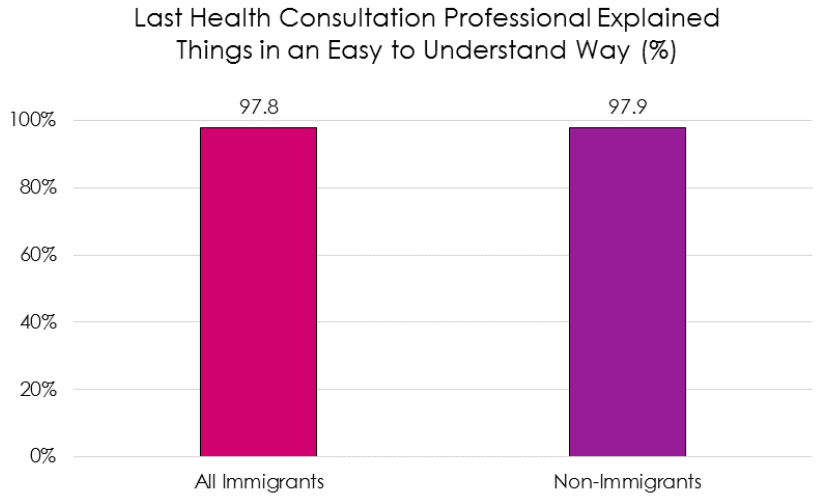
* Significantly different ($p<0.05$) from estimate for reference category (non-immigrants).

Note: Data are for 2015-2016 only.

Source: Canadian Community Health Survey (pooled data 2015-2016).

Last Health Consultation – Comprehensibility

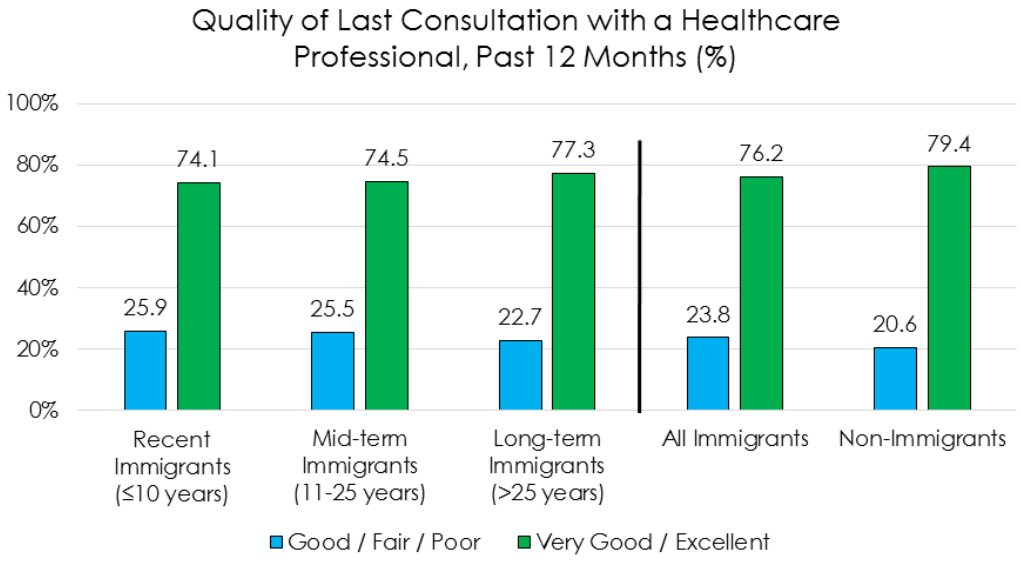
Rates of comprehensibility—meaning that at their last consultation, their health professional explained things in an easy to understand manner—were very high for immigrants and non-immigrants alike. The differences between them are not significantly different.



Note: Data are for 2015-2016 only.
Source: Canadian Community Health Survey (pooled data 2015-2016).

Last Health Consultation – Overall Quality Rating

More than three-quarters of all immigrants and non-immigrants in the Calgary Zone rated their last health consultation as being "very good" or "excellent." When compared to non-immigrants, the overall quality rating of an individual's last health consultation is not significantly different for immigrants, regardless of their time in Canada.



Source: Canadian Community Health Survey (pooled data 2013-2016).

Health Status

The Healthy Immigrant Effect

Before reporting results on the health status of immigrants in Calgary, it is important to understand a bit about the phenomenon known as the "healthy immigrant effect," which has been well-documented in Canada and other countries with large immigrant populations. This research shows that the foreign-born population enjoys higher levels of health compared to the national-born population. In Canada, this "has been attributed to a number of factors: (1) the rigorous health and medical screening process prior to qualifying for immigrant status in Canada; (2) lower prevalence rates of unhealthy lifestyle and diet behaviours in the countries of origin; and (3) the immigration selection process, which screens for younger and better educated immigrants, who are more likely to be healthier than their older and less educated counterparts" (Islam, 2013: 169).

One explanation for the healthy immigrant effect is government policy, which, as noted, can refuse admission to a country based on pre-immigration screening for factors such as the "possibility of excessive burden to the health care or social system" (Diaz, 2017: 5). Indeed, this was the case in Canada up until 2018, where about 1,000 people per year were found to be inadmissible on medical grounds (Government of Canada, 2018).[1] Some researchers, however, have explored the healthy immigrant effect outside the context of immigration policy. For example, a systematic review of the cross-sectional literature on the healthy immigrant effect was completed in 2015 "by grounding studies of migration and health in Canada within particular life-course stages" (Vang, et al., 2015: 1). Among the key findings were:

- The healthy immigrant effect is not a systemic phenomenon in Canada and is linked to immigrants' duration of residence in the country.
- Immigrants' health advantage varies across the life-course, and within each stage of the life course, by different health outcomes.
- The healthy immigrant effect is stronger for recent immigrants (10 or fewer years of residence in Canada) and vanishes among more established immigrants.
- Mortality studies suggest that the healthy immigrant effect is stronger for immigrants from poor or culturally distant countries.
- Future research needs to incorporate both pre- and post-migration experiences in order to better understand the healthy immigrant effect and its vanishing over time with increased length of residence in the receiving country.
- Policies must be targeted at specific life-course stages and, within each age group, at health outcomes for which immigrants are known to be at a disadvantage.

[1] In April 2018, the federal government announced changes to its medical inadmissibility policy to increase inclusion among applicants or their family members with certain health conditions or disabilities that can easily be addressed in Canada, For example, the need for certain social services, such as special education, will be removed as an exclusion. In addition, "the cost threshold for conditions that primarily require publicly funded prescription drugs (for example, HIV)" will be tripled, which means that most applicants "would likely become admissible because the cost of most of these medications, particularly the generic brands, would not typically exceed the new cost threshold." As a result, among approximately 1,000 people who are denied admission to Canada each year for medical reasons, "most people with disabilities would no longer be inadmissible" (Government of Canada, 2018).

Taking another approach, researchers used data from the United States, Canada, the United Kingdom, and Australia "to compare the health of migrants from each with the respective native born who choose not to migrate." The analysis found strong support for the healthy immigrant effect across all four destination countries. It also determined that "selectivity plays an important role in the observed better health of migrants vis à vis those who stay behind in their country of origin" (Kennedy, et al., 2015: 317).

In addition to physical health, there is also evidence for a healthy immigrant effect for mental health. Immigrants have "lower prevalence rates of depression and alcohol dependence, fewer depressive symptoms and major depressive episodes, and are less likely to commit suicide" compared to their Canadian-born counterparts. However, as with physical health, after about 10 years of living in Canada, the healthy immigrant effect "disappears and immigrant health deteriorates and converges to Canadian-born levels of mental health." Moreover, Canada's Mental Health Strategy "identifies the lack of detailed research data on mental health issues affecting the nation's diverse immigrant populations as a crucial knowledge gap that needs to be addressed" (Islam, 2013: 169-170).

A recent study explored whether immigrants had a lower prevalence of major depressive episodes in the previous year compared to non-immigrants, which would support the presence of the healthy immigrant effect in mental health. While evidence of the healthy immigrant effect on major depressive episodes was found, it disappeared with age. "The pattern of the HIE [healthy immigrant effect] by age was observed overall, and when the analysis was conducted by sex, country of birth, and time since immigration. Elder immigrants seem to be at similar or higher risk of MDE [major depressive episodes] than elder Canadian-born" (Diaz, 2017: ii).

This emerging body of research is important to keep in mind when reviewing the following results for physical and mental health status and particularly for chronic conditions. It should be noted, however, that these results do not control for age. Thus, where long-term immigrants have *higher* average rates of chronic conditions, it is likely due, in part, to their higher median age.

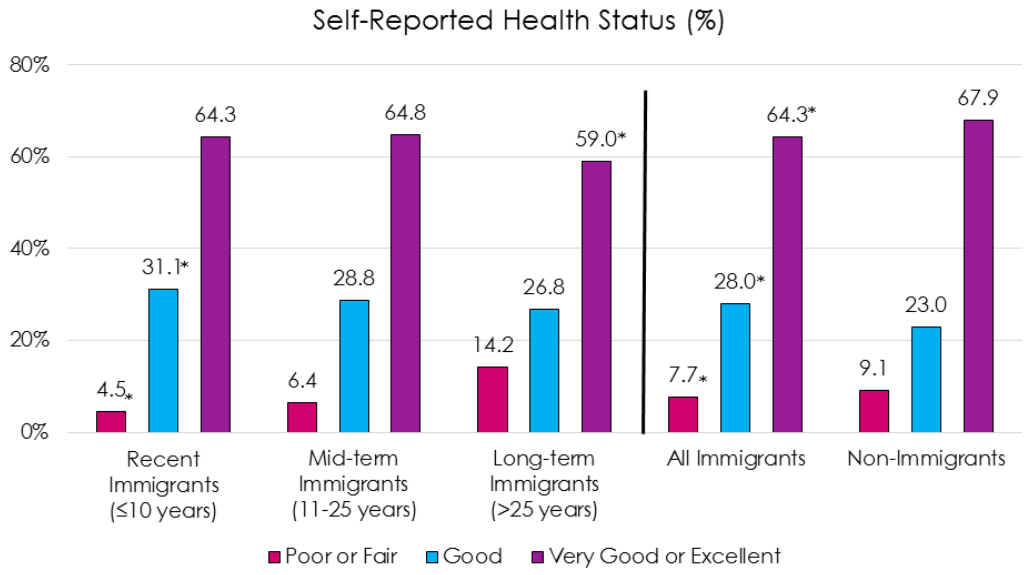
Physical Health Status

When compared to the Canadian-born population, rates of self-reported health for mid-term immigrants, across all categories, are not significantly different.

Poor or Fair Health: Rates of self-reporting health as "poor" or "fair" are significantly *lower* for recent immigrants than for non-immigrants in the Calgary Zone, at 4.5% versus 9.1%. Although rates for mid-term and long-term immigrants were not significantly different than for non-immigrants, when all immigrants are combined, they have a significantly *lower* rate of self-reporting health as "poor" or "fair" than their Canadian-born counterparts, at 7.7% versus 9.1%.

Good Health: Aligned with the previous assessment, rates of self-reporting health as "good" are significantly *higher* for recent immigrants than for non-immigrants, at 31.1% versus 23.0%. Although rates for mid-term and long-term immigrants were not significantly different than for the Canadian-born, when all immigrants are combined, they have a significantly *higher* rate of self-reporting health as "good" than non-immigrants, at 28.0% versus 23.0%.

Very Good or Excellent Health: Rates of self-reporting health as "very good" or "excellent" are significantly *lower* for long-term immigrants than for non-immigrants, at 59.0% versus 67.9%. This may reflect declines in the healthy immigrant effect based on length of time in Canada, as well the effects of aging. Although rates for recent and mid-term immigrants were not significantly different than for non-immigrants, when all immigrants are combined, they have a significantly *lower* rate of self-reporting health as "very good" or "excellent" than their Canadian-born counterparts, at 64.3% versus 67.9%.

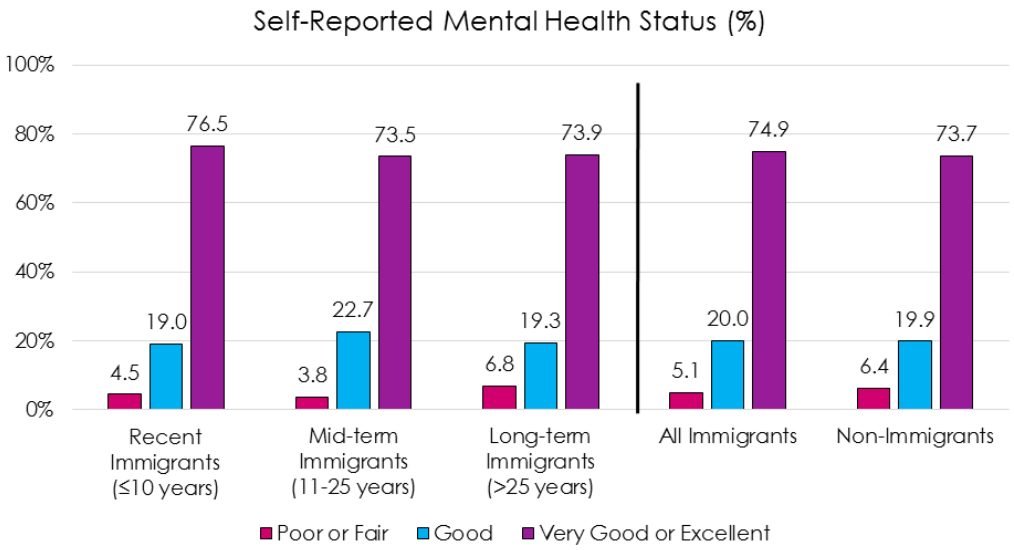


* Significantly different ($p<0.05$) from estimate for reference category (non-immigrants).

Source: Canadian Community Health Survey (pooled data 2013-2016).

Mental Health Status

When compared to the Canadian-born population, rates of self-reported mental health for immigrants across all categories are not significantly different.



Source: Canadian Community Health Survey (pooled data 2013-2016).

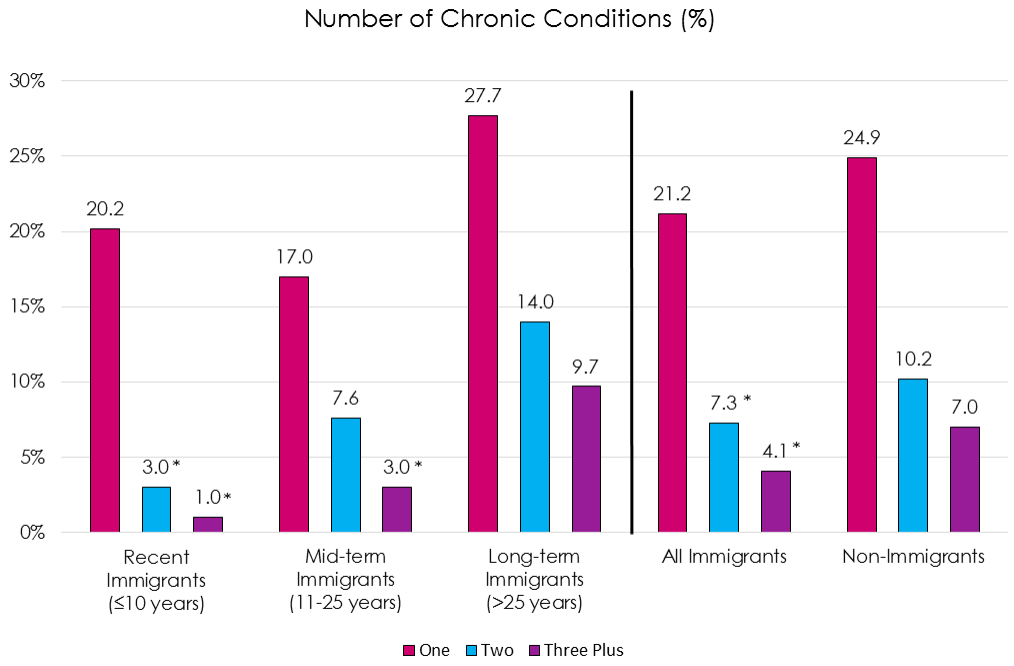
Number of Chronic Conditions

When compared to the Canadian-born population, rates of chronic conditions for long-term immigrants, across all categories, are not significantly different. This may support prior findings that the healthy immigrant effect disappears based on length of time in Canada but it may also reflect the effects of aging among long-term immigrants.

<u>One Chronic Condition</u>: Rates of having one chronic condition for all immigrants, regardless of length of time in Canada, are not significantly different from those of non-immigrants.

<u>Two Chronic Conditions</u>: Rates of having two chronic conditions are significantly *lower* for recent immigrants when compared to non-immigrants, at 3.0% versus 10.2%. Although rates for mid-term and long-term immigrants were not significantly different than for non-immigrants, when all immigrants are combined, they have a significantly *lower* rate of having two chronic conditions than their Canadian-born counterparts, at 7.3% versus 10.2%.

<u>Three or More Chronic Conditions</u>: Rates of having three or more chronic conditions are significantly *lower* for recent and mid-terms immigrants, at 1.0% and 3.0%, compared to their Canadian-born counterparts, at 7.0%. This again may be a reflection of the relative strength of the healthy immigrant effect among more recent immigrants, as well as aging effects among long-term immigrants. When all immigrants are combined, their rates of having three or more chronic conditions are also significantly *lower* than for non-immigrants, at 4.1% versus 7.0%.



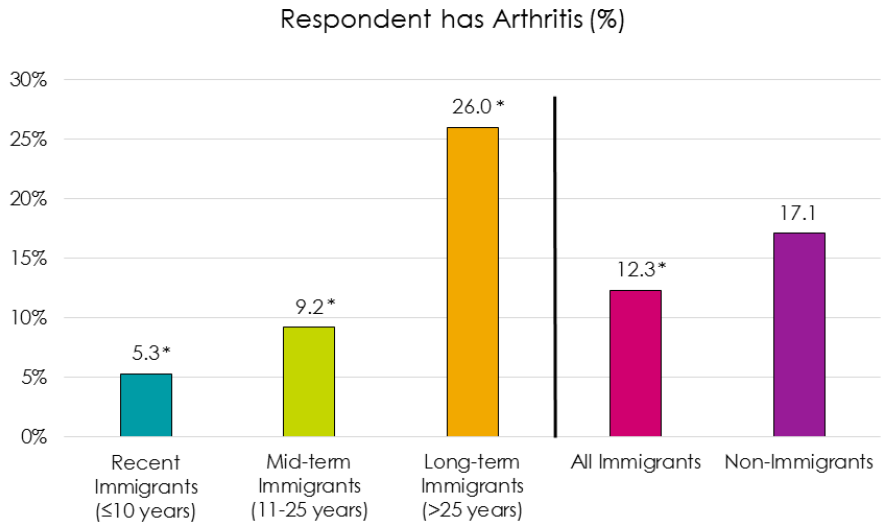
* Significantly different ($p<0.05$) from estimate for reference category (non-immigrants).

<u>Source</u>: Canadian Community Health Survey (pooled data 2013-2016).

Presence of Chronic Physical Health Conditions

Arthritis

In the Calgary Zone, rates of having arthritis are significantly *lower* for recent and mid-term immigrants, at 5.3% and 9.2%, versus non-immigrants, at 17.1%. Conversely, rates of arthritis are significantly *higher* for long-term immigrants than for non-immigrants, at 26.0% versus 17.1%.

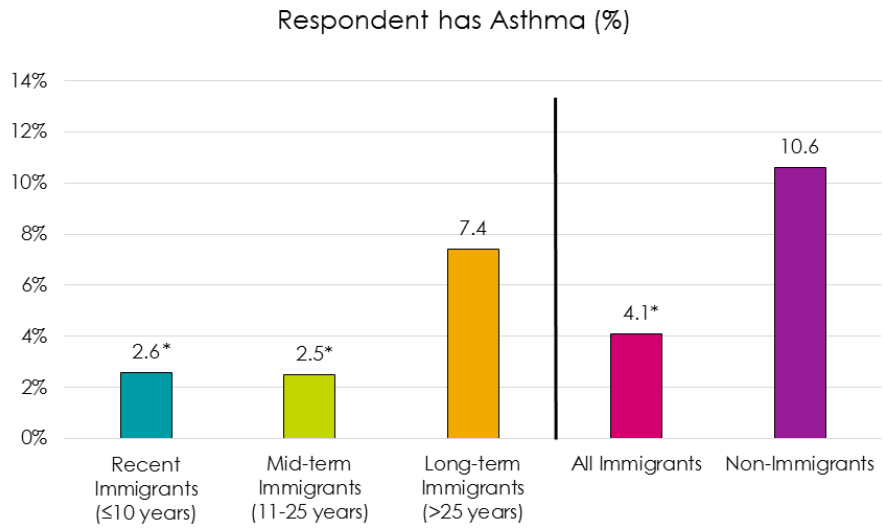


* Significantly different (p<0.05) from estimate for reference category (non-immigrants).

Source: Canadian Community Health Survey (pooled data 2013-2016).

Asthma

Rates of having asthma are significantly *lower* for recent and mid-term immigrants, at 2.6% and 2.5%, when compared to non-immigrants, at 10.6%. Although asthma rates are not significantly different for long-term immigrants versus non-immigrants, when all immigrants are combined, rates of asthma are significantly *lower* than for non-immigrants, at 4.1% versus 10.6%.

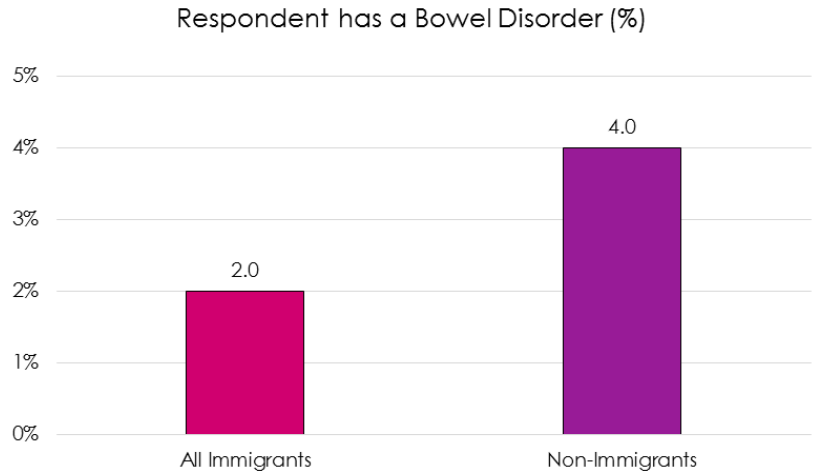


* Significantly different (p<0.05) from estimate for reference category (non-immigrants).

Source: Canadian Community Health Survey (pooled data 2013-2016).

Bowel Disorders

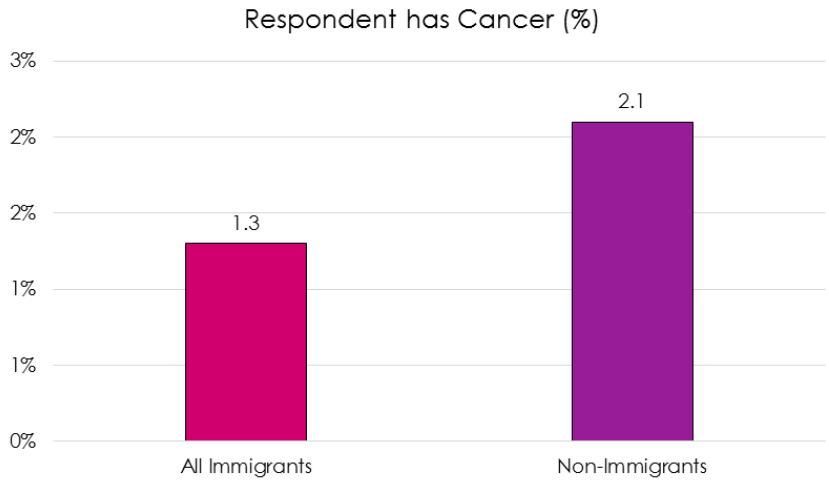
In the Calgary Zone Community Health Region, rates of having a bowel disorder are not significantly different for immigrants when compared to non-immigrants.



Source: Canadian Community Health Survey (pooled data 2013-2016).

Cancer

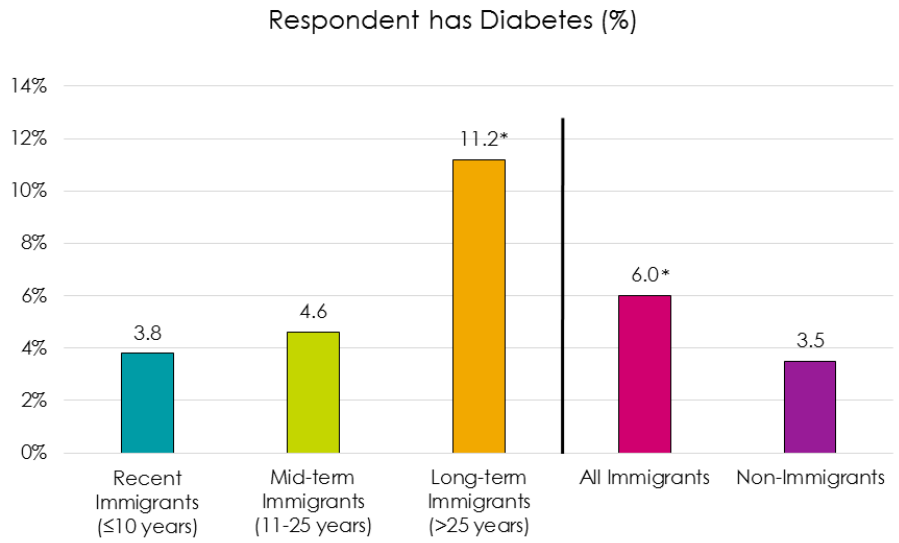
Rates of having cancer are not significantly different for immigrants when compared to non-immigrants.



Source: Canadian Community Health Survey (pooled data 2013-2016).

Diabetes

Rates of having diabetes are significantly *higher* for long-term immigrants than for non-immigrants, at 11.2% versus 3.5%. Although diabetes rates are not significantly different for recent or mid-term immigrants versus non-immigrants, when all immigrants are combined, rates of having diabetes are significantly *higher* than for their Canadian-born counterparts, at 6.0% versus 3.5%.

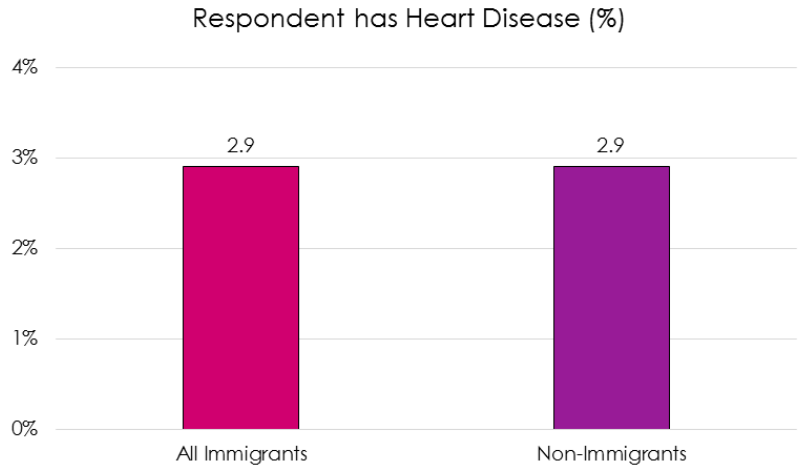


* Significantly different ($p<0.05$) from estimate for reference category (non-immigrants).

Source: Canadian Community Health Survey (pooled data 2013-2016).

Heart Disease

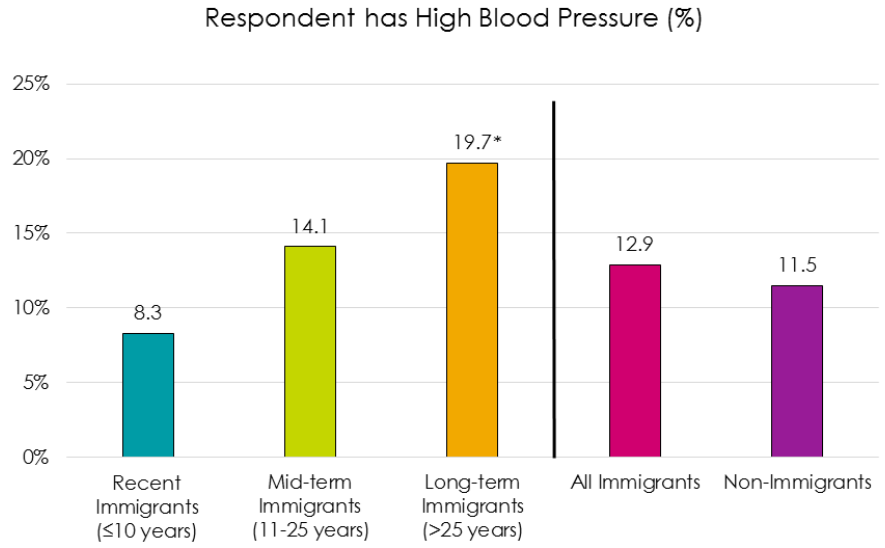
Rates of having heart disease are not significantly different for immigrants when compared to non-immigrants.



Source: Canadian Community Health Survey (pooled data 2013-2016).

High Blood Pressure

Rates of having high blood pressure are not significantly different for recent or mid-term immigrants, when compared to non-immigrants. However, rates of having high blood pressure are significantly *higher* for long-term immigrants than for non-immigrants, at 19.7% versus 11.5%.

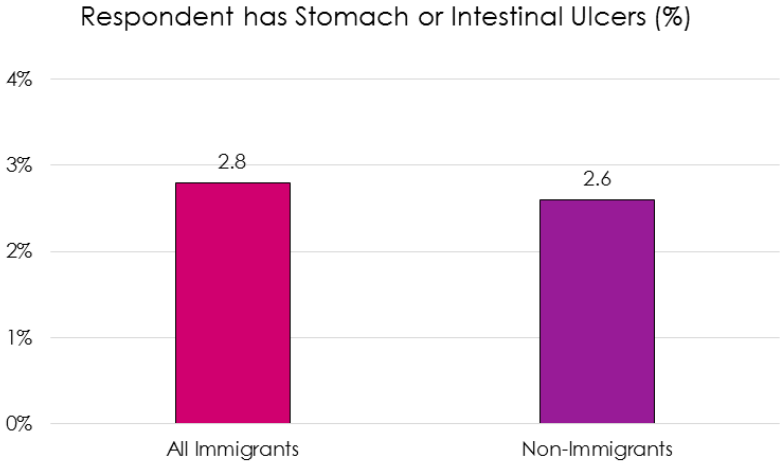


* Significantly different ($p<0.05$) from estimate for reference category (non-immigrants).

Source: Canadian Community Health Survey (pooled data 2013-2016).

Stomach or Intestinal Ulcers

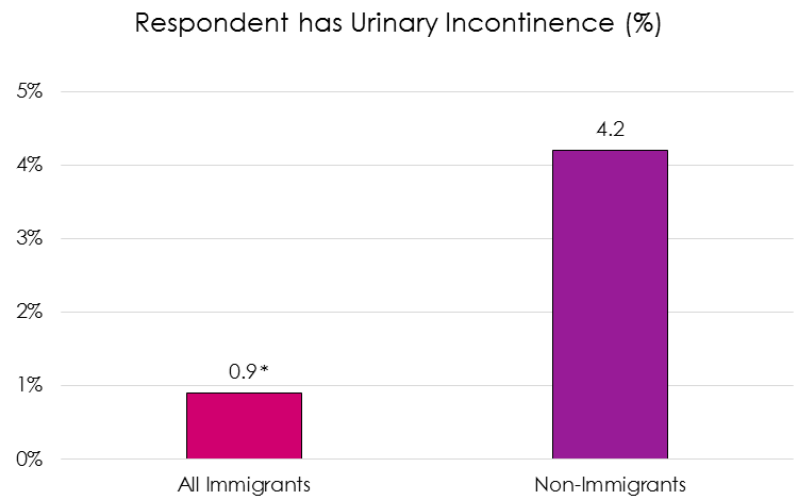
In the Calgary Zone Community Health Region, rates of having stomach or intestinal ulcers are not significantly different for immigrants when compared to non-immigrants.



Source: Canadian Community Health Survey (pooled data 2013-2016).

Urinary Incontinence

Rates of having urinary incontinence are significantly *lower* for immigrants than for non-immigrants, at 0.9% versus 4.2%.



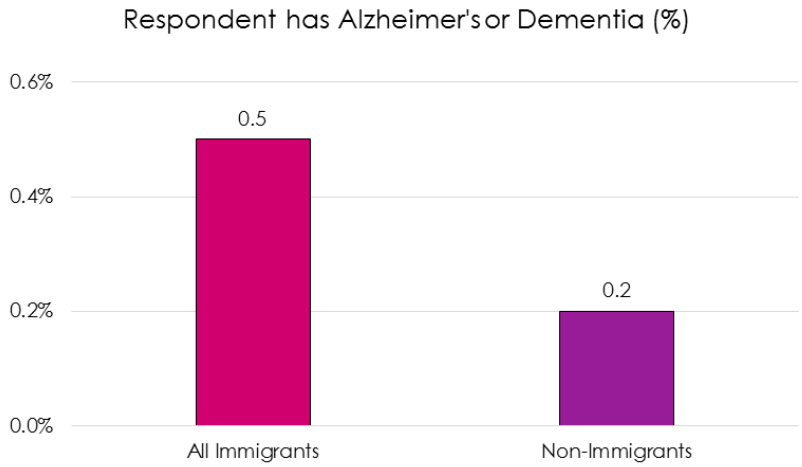
* Significantly different (p<0.05) from estimate for reference category (non-immigrants).

Source: Canadian Community Health Survey (pooled data 2013-2016).

Presence of Chronic Mental Health Conditions

Alzheimer's or Dementia

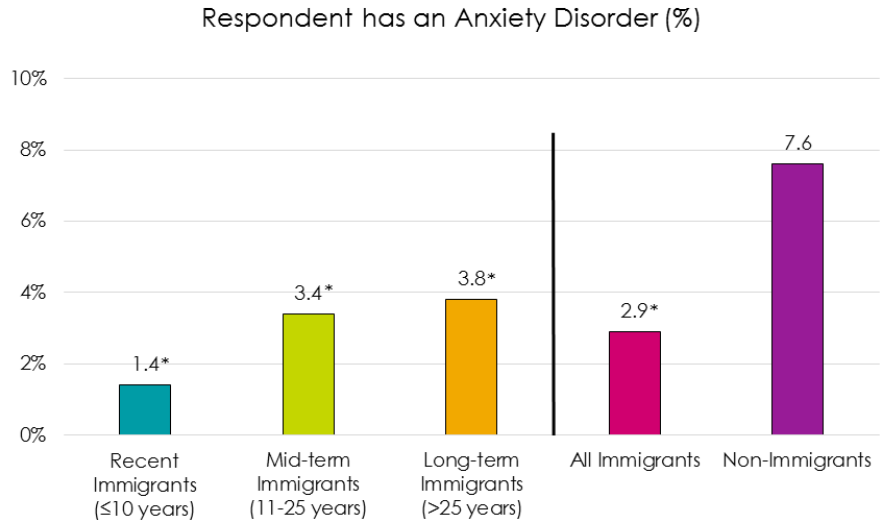
In the Calgary Zone Community Health Region, rates of having Alzheimer's or dementia are not significantly different for immigrants when compared to non-immigrants.



Source: Canadian Community Health Survey (pooled data 2013-2016).

Anxiety Disorder

When compared to their Canadian-born counterparts, rates of having an anxiety disorder are significantly *lower* for all immigrants, regardless of length of time in Canada.

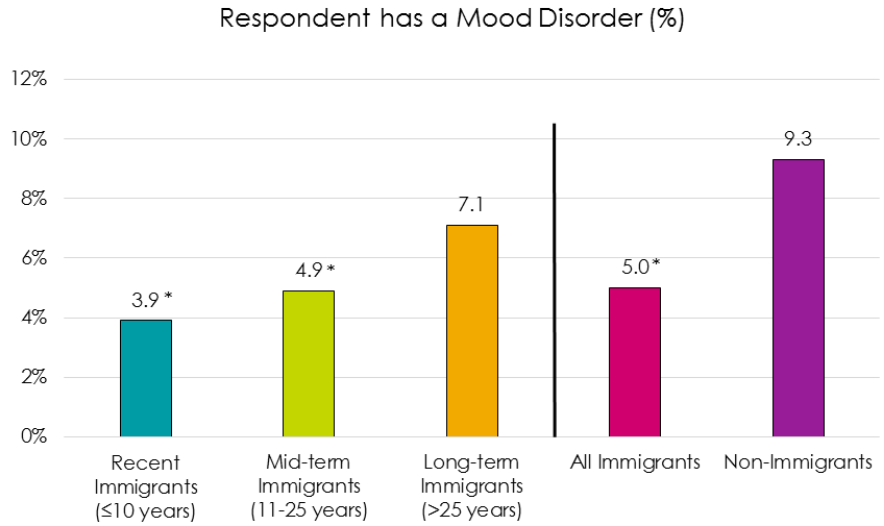


* Significantly different (p<0.05) from estimate for reference category (non-immigrants).

Source: Canadian Community Health Survey (pooled data 2013-2016).

Mood Disorder

Rates of having a mood disorder are significantly *lower* for recent and mid-term immigrants, at 3.9% and 4.9%, when compared to non-immigrants, at 9.3%. Although mood disorder rates are not significantly different for long-term immigrants versus non-immigrants, when all immigrants are combined, rates of having a mood disorder are significantly *lower* than for non-immigrants, at 5.0% versus 9.3%.



* Significantly different (p<0.05) from estimate for reference category (non-immigrants).

Source: Canadian Community Health Survey (pooled data 2013-2016).

Regression Analysis

Building on the results of the descriptive statistics, we next present results from multiple logistic regression analyses models for significance testing. These examined the relationships between multiple predictors and the following dependent variables: (1) self-perceived health status, (2) self-perceived mental health status, and (3) sense of belonging to the local community. The key findings from these analyses were:

- **Physical Health** – Controlling for other factors—including age, sex, education, income, and number of chronic conditions—racialized immigrants have *lower* odds of reporting "good" or "excellent" health than White Canadian-born individuals. This is also true for people with more chronic health conditions, lower income, and less than high school education. For more detailed information on this predictive model, please see Appendix C.
- **Mental Health** – Controlling for other factors, people whose mother tongue is not English have *lower* odds of reporting "good" or "excellent" mental health than people whose mother tongue is English. This is also true for individuals who are older, who have more chronic conditions, lower income, and less than high school education. For more detailed information on this predictive model, please see Appendix D.
- **Sense of Belonging** – Controlling for other factors, racialized individuals have *greater* odds of reporting a strong sense of belonging to the local community than non-racialized individuals, which is also true for older people. In contrast, people with more chronic conditions have *lower* odds of feeling a strong sense of belonging to the local community. For more detailed information on this predictive model, please see Appendix E.

Summary Conclusions

This research was intended to create a profile of immigrant health in Calgary using the lens of the social determinants of health. The descriptive statistics found statistically significant differences between immigrants and their Canadian-born counterparts in the following areas:

- Rates of racialized identity are substantively *higher* for all immigrants, but especially so for recent immigrants (in Canada for 10 years or less) and mid-term immigrants (in Canada for 11 to 25 years), compared to long-term immigrants (in Canada for more than 25 years). This is not unexpected given the changes made to immigration policy over time, as predominant migration from Europe was supplanted by migration from Asia and Africa.
- Rates of having a mother tongue other than English are substantively *higher* for all immigrants, but especially so for recent and mid-term immigrants.
- Recent and mid-term immigrants have *higher* rates of living with others rather than alone when compared to non-immigrants. This may be related to different kinship patterns or simply due to economic necessity. For example, this research found that median personal income for all immigrants in the sample was $15,000 *lower* than for non-immigrants and, similarly, median household income for all immigrants in the sample was $20,000 *lower* than for non-immigrants, although these differences were not statistically significant.
- Immigrants have significantly *lower* rates of identification as homosexual or bisexual.

- Mid-term immigrants have *higher* rates of employment than non-immigrants, whereas long-term immigrants have comparatively *lower* rates of employment, which is likely due, in part, to their higher median age. Despite these differences, the median hours worked is the same for immigrants (regardless of the length of time in Canada) and Canadian-born individuals.
- Recent immigrants have *higher* rates of educational attainment than their Canadian-born counterparts for completion of a bachelor's degree or a graduate degree. This likely reflects the shift in immigration policy that places a greater emphasis on welcoming skilled workers to Canada as economic immigrants. In previous decades, proportionately more immigrants were admitted for reasons of family reunification rather than economic development.
- Mid-term immigrants have significantly *higher* rates of experiencing a "somewhat" or "very strong" sense of belonging to the local community. As the regression analysis found, when controlling for other factors, racialized individuals have *greater* odds of reporting a strong sense of belonging to the local community, as do older people, whereas people with more chronic conditions have *lower* odds of feeling a strong sense of belonging to the community.

There were also statistically significant differences between immigrants and their Canadian-born counterparts in terms of health care access and general health status, some of which may have implications for service provision and, ultimately, health outcomes:

- Rates of perceived unmet health care needs are significantly *lower* for long-term immigrants than for non-immigrants.
- Rates of having a regular medical doctor are significantly *lower* for recent immigrants than for non-immigrants. However, there is no way of knowing from this analysis whether the number of recent immigrants without a regular medical doctor are very recent arrivals or if they have lived in Calgary for several years.
- Rates of having consulted with a mental health professional in the past year are significantly *lower* for both recent and mid-term immigrants than for non-immigrants.
- When compared to non-immigrants, rates of self-reporting health as "poor" or "fair" are significantly *lower* for recent immigrants, whose rates of self-reporting health as "good" are significantly *higher*. Rates of self-reporting health as "excellent" are significantly *lower* for long-term immigrants than for non-immigrants. These findings may reflect declines in the healthy immigrant effect based on length of time in Canada, as well as aging effects. As the regression analysis found, when controlling for other factors, racialized immigrants have *lower* odds of reporting "good" or "excellent" health, which is also true for people with more chronic conditions, lower income, and less than high school education.
- When compared to the Canadian-born population, rates of self-reported mental health for immigrants across all categories are not significantly different. However, as the regression analysis found, when controlling for other factors, people whose mother tongue is not English have *lower* odds of reporting "good" or "excellent" mental health, perhaps reflecting, in part, language barriers. This is also true for people with more chronic conditions, lower income, and less than high school education, as well as for older people.

- When compared to the Canadian-born population, rates of chronic conditions for long-term immigrants, across all categories, are not significantly different. This may support prior findings that the healthy immigrant effect disappears based on length of time in Canada. Rates of having two chronic conditions are significantly *lower* for recent immigrants than for non-immigrants, and rates of having three or more chronic conditions are significantly *lower* for recent and mid-term immigrants than for non-immigrants. This again may be a reflection of the relative strength of the healthy immigrant effect among more recent immigrants.

With respect to the *types* of chronic physical and mental health conditions experienced, there were statistically significant differences between immigrants and their Canadian-born counterparts in the following areas:

- Rates of having arthritis are significantly *lower* for recent and mid-term immigrants than for non-immigrants, whereas they are significantly *higher* for long-term immigrants.
- Rates of having asthma are significantly *lower* for recent and mid-term immigrants than for non-immigrants.
- Rates of having diabetes are significantly *higher* for long-term immigrants than for non-immigrants.
- Rates of having high blood pressure are significantly *higher* for long-term immigrants than for non-immigrants.
- Rates of having urinary incontinence are significantly *lower* for immigrants than for non-immigrants.
- Rates of having an anxiety disorder are significantly *lower* for all immigrants, regardless of length of time in Canada.
- Rates of having a mood disorder are significantly *lower* for recent and mid-term immigrants than for non-immigrants.

There are no statistically significant differences between immigrants and non-immigrants in the Calgary Zone in rates of bowel disorders, cancer, heart disease, or stomach or intestinal ulcers. Nor are there any statistically significant differences between immigrants and their Canadian-born counterparts in rates of Alzheimer's or dementia.

As summarized above, this research demonstrates statistically significant differences in several of the social determinants of health, in health care access and general health status, and in the health outcomes experienced by immigrants as compared to Canadian-born individuals living in the Calgary Zone Community Health Region. These findings will help CLIP Council and its working groups to understand the impact of various factors on the mental and physical health of immigrants. This is important information to have as CLIP moves forward with its Action Plan and works toward the full inclusion and integration of newcomers in Calgary.

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Appendix A. Detailed Methodology

This study draws on national survey data from the Canadian Community Health Survey (CCHS) in the Calgary Zone Community Health Region. The CCHS is a cross-sectional survey administered by Statistics Canada that collects information related to health status, health care utilization, and health determinants for the Canadian population. The CCHS covers individuals aged 12 or older who live in privately occupied dwellings in all provinces and territories, excluding residents of institutions, full-time members of the Canadian Forces, and persons living on reserves and other Aboriginal settlements in the provinces. As of 2007, CCHS data have been collected annually.

To increase our sample of immigrant Calgarians, we combined four cycles of CCHS data collected between January 2013 and December 2016. All analyses in this report are based on weighted percentages or odds ratios calculated from the 5,529 respondents aged 18 to 85 years who were residing in the Calgary Zone Community Health Region within these waves.

Weighted frequencies and cross-tabulations were used to estimate the percentage distribution of immigrant versus non-immigrant Calgary Zone residents, with regards to variables capturing their demographic profile, health status, health care access, and social determinants of health. For all analyses, 500 Statistics Canada bootstrap weights were applied to calculate variance on estimates and on differences between estimates. Results at the $p<0.05$ level were considered statistically significant for descriptive data. A significance level of $p<0.10$ was applied for the logistic regressions.

The **demographic variables** included in our analysis capture sex (male or female); age of respondent; immigrant status (born in Canada or elsewhere); racialized identity (self-identifying as non-white (i.e., racialized) or white); mother tongue (English or not English); sexual orientation (heterosexual or homosexual/bisexual); and living arrangements (living alone or with others).

The analyses of **health care access** and **social determinants of health** include:

- The median personal income and median household income (where income was greater than $0).
- The median number of hours worked in the week prior to the survey.
- The highest level of education, which was determined through an ordinal variable asking respondents to identify the highest certificate, diploma, or degree that they had completed, ranging from "less than high school diploma or equivalent" to "University certificate, diploma, or degree above the bachelor's level."
- The variable capturing community belonging asked respondents, "How would you describe your sense of belonging to your local community? Would you say it is...?" with response categories ranging from "very strong" to "very weak."
- The variable capturing health care access asked respondents whether or not they had "a regular medical doctor."
- The variable capturing food security is derived by Statistics Canada based on a set of 18 questions and indicates whether individuals were able to afford the food they needed in the previous 12 months.

- The variable capturing perceived unmet health care needs asked respondents, "During the past 12 months, was there ever a time when you felt that you needed healthcare, other than homecare services, but you did not receive it?" with the response categories of "yes" and "no."
- The variable capturing the comprehensibility of individuals' most recent health care interaction asked respondents about their last health consultation: "Did this [general practitioner / medical specialist / nurse / health professional] explain things in a way that was easy to understand?" with the response categories of "yes" and "no."
- The variable capturing the quality of individuals' most recent health care interaction asked respondents about their last health consultation: "Overall, how would you rate the quality of this consultation?" with response categories ranging from "excellent" to "poor."

The variables focusing on **health status** include self-reported health and mental health, as well as numerous variables capturing self-reported rates of various chronic conditions such as cancer or diabetes. Respondents were primed in the survey to define *health* broadly: "The next questions are about your health. By health, we mean not only the absence of disease or injury but also physical, mental and social well-being" (Statistics Canada, 2018*b*). The variables about health and mental health asked respondents "In general, would you say your (mental) health is...?" with five response categories ranging from "excellent" to "poor." The variables on chronic diseases were dichotomous, with responses either in the affirmative or the negative.

Our multivariate predictive modeling relied on three binomial logistic regression models. Our models predict the odds (exp(B)) of having "excellent" or "very good" self-reported health (Model 1) and mental health (Model 2), as compared to self-reporting "good," "fair," or "poor" health and mental health, and having a "very strong" or "somewhat strong" sense of belonging to the local community (Model 3), as compared to a "somewhat weak" or "very weak" sense of belonging.

An odds ratio (OR) above one and a significant p-value is associated with an increased probability of having "excellent/very good" self-reported health or mental health or a "very strong/somewhat strong" sense of belonging to the local community, as compared to the reference category. An OR of less than one and a significant p-value means the attribute is associated with a lower probability of having "excellent/very good" self-reported health or mental health or a "very strong/somewhat strong" sense of belonging to the local community than the reference category.

Each model includes variables for immigrant status and racialized identity, age, gender, mother tongue, number of chronic conditions, personal income, education level, and work status, as well as a dummy variable controlling for the wave of the respondent. Control variables were included in the models in order to specify and validate the impact of each of our focal variables.

All analyses were conducted at the Prairie Regional Research Data Centre at the University of Calgary and all results are presented according to Statistics Canada requirements. The 2016 CCHS questionnaire, now archived, is available at (Statistics Canada, 2018*a*):

http://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=assembleInstr&a=1&&lang=en&Item_Id=260675.

Appendix B. Descriptive Data Tables

The following tables provide the full descriptive data upon which the graphs in this report were based. All data is taken from the Canadian Community Health Survey (pooled data 2013-2016) unless otherwise noted.

Survey Sample Size

Survey Respondents (n = 5,529)	**Total (%)**
Recent Immigrants (≤10 years)	40.6
Mid-term Immigrants (11-25 years)	29.5
Long-term Immigrants (>25 years)	29.9
All Immigrants	**100.0**
All Immigrants	31.4
Non-Immigrants	68.6
Total Population Surveyed	**100.0**
Source: Canadian Community Health Survey (pooled data 2013-2016).	

Demographic and Diversity Variables

Age

Median Age (years)	**Age**
Recent Immigrants (≤10 years)	37
Mid-term Immigrants (11-25 years)	41
Long-term Immigrants (>25 years)	60
All Immigrants	43
Non-Immigrants	43
Source: Canadian Community Health Survey (pooled data 2013-2016).	

Sex

Sex (%)	**Male**	**Female**	**Total**
Recent Immigrants (≤10 years)	47.8	52.2	**100.0**
Mid-term Immigrants (11-25 years)	56.3	43.7	**100.0**
Long-term Immigrants (>25 years)	48.6	51.4	**100.0**
All Immigrants	49.5	50.5	**100.0**
Non-Immigrants	51.2	48.8	**100.0**
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Racialized Identity

Racialized Identity (%)	Racialized	Not Racialized	Total
Recent Immigrants (≤10 years)	80.5*	19.5	**100.0**
Mid-term Immigrants (11-25 years)	72.1*	27.9	**100.0**
Long-term Immigrants (>25 years)	42.2*	57.8	**100.0**
All Immigrants	65.6*	34.4	**100.0**
Non-Immigrants	6.3	93.7	**100.0**
* Significantly different (p<0.001) from estimate for reference category (non-immigrants).			
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Mother Tongue

Mother Tongue (%)	Not English	English	Total
Recent Immigrants (≤10 years)	85.5*	14.5	**100.0**
Mid-term Immigrants (11-25 years)	83.7*	16.3	**100.0**
Long-term Immigrants (>25 years)	58.8*	41.2	**100.0**
All Immigrants	76.4*	23.6	**100.0**
Non-Immigrants	10.1	89.9	**100.0**
* Significantly different (p<0.001) from estimate for reference category (non-immigrants).			
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Living Arrangements

Living Arrangements (%)	Living with Others	Living Alone	Total
Recent Immigrants (≤10 years)	94.0*	6.0	**100.0**
Mid-term Immigrants (11-25 years)	91.6*	8.4	**100.0**
Long-term Immigrants (>25 years)	84.8	15.2	**100.0**
All Immigrants	90.6*	9.4	**100.0**
Non-Immigrants	84.0	16.0	**100.0**
* Significantly different (p<0.001) from estimate for reference category (non-immigrants).			
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Sexual Orientation

Sexual Orientation (%)	Homosexual / Bisexual	Heterosexual	Total
All Immigrants	1.7*	98.3	**100.0**
Non-Immigrants	3.6	96.4	**100.0**
* Significantly different (p<0.05) from estimate for reference category (non-immigrants).			
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Social Determinants of Health

Personal Income

Median Personal Income (>$0)	Income ($)
Recent Immigrants (≤10 years)	36,000
Mid-term Immigrants (11-25 years)	45,000
Long-term Immigrants (>25 years)	40,000
All Immigrants	40,000
Non-Immigrants	55,000
Source: Canadian Community Health Survey (pooled data 2013-2016).	

Household Income

Median Household Income (>$0)	Income ($)
Recent Immigrants (≤10 years)	75,000
Mid-term Immigrants (11-25 years)	83,157
Long-term Immigrants (>25 years)	75,875
All Immigrants	80,000
Non-Immigrants	100,000
Source: Canadian Community Health Survey (pooled data 2013-2016).	

Employment

Employment in Previous Week (%)	Worked	Absent from Work / No Job	Total
Recent Immigrants (≤10 years)	73.0	27.0	**100.0**
Mid-term Immigrants (11-25 years)	80.9*	19.1	**100.0**
Long-term Immigrants (>25 years)	58.7*	41.3	**100.0**
All Immigrants	71.1	28.9	**100.0**
Non-Immigrants	72.4	27.6	**100.0**
* Significantly different (p<0.001) from estimate for reference category (non-immigrants).			
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Hours Worked

Median Hours Worked in Main Job in Previous Week	Hours
Recent Immigrants (≤10 years)	40
Mid-term Immigrants (11-25 years)	40
Long-term Immigrants (>25 years)	40
All Immigrants	40
Non-Immigrants	40
Source: Canadian Community Health Survey (pooled data 2013-2016).	

Education Level

Education Level (%)	Less than High School	Some Post-Secondary	Bachelor's Degree	Graduate Degree	Total
Recent Immigrants (≤10 years)	6.8	36.5*	40.4*	16.3*	**100.0**
Mid-term Immigrants (11-25 years)	5.8	53.2	30.4	10.5	**99.9**
Long-term Immigrants (>25 years)	10.1	58.3	19.8	11.8	**100.0**
All Immigrants	7.2	48.2*	31.7*	12.9*	**100.0**
Non-Immigrants	7.5	59.4	24.5	8.6	**100.0**
* Significantly different (p<0.001) from estimate for reference category (non-immigrants).					
Source: Canadian Community Health Survey (pooled data 2013-2016).					

Food Security

Food Security Status, Adults Only (%)	Moderately or Severely Food Insecure	Food Secure	Total
Recent Immigrants (≤10 years)	7.1	92.8	**99.9**
Mid-term Immigrants (11-25 years)	8.6	91.4	**100.0**
Long-term Immigrants (>25 years)	4.3	95.7	**100.0**
All Immigrants	6.8	93.2	**100.0**
Non-Immigrants	6.9	93.1	**100.0**
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Sense of Belonging

Sense of Belonging to the Local Community (%)	Somewhat or Very Strong	Somewhat or Very Weak	Total
Recent Immigrants (≤10 years)	70.2	29.8	**100.0**
Mid-term Immigrants (11-25 years)	73.2*	26.8	**100.0**
Long-term Immigrants (>25 years)	66.1	33.9	**100.0**
All Immigrants	69.8*	30.2	**100.0**
Non-Immigrants	62.1	37.9	**100.0**
* Significantly different (p<0.01) from estimate for reference category (non-immigrants).			
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Health Care Access

Perceived Unmet Health Care Needs

Perceived Unmet Health Care Needs, Past 12 Months (%)	Yes	No	Total
Recent Immigrants (≤10 years)	6.4	93.6	**6.4**
Mid-term Immigrants (11-25 years)	4.5	95.5	**4.5**
Long-term Immigrants (>25 years)	2.2*	97.8	**2.2**
All Immigrants	4.3*	95.7	**4.3**
Non-Immigrants	7.2	92.8	**7.2**
* Significantly different (p<0.05) from estimate for reference category (non-immigrants).			
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Regular Medical Doctor

Had a Regular Medical Doctor, Past 12 Months (%)	Yes	No	Total
Recent Immigrants (≤10 years)	62.8*	37.2	**100.0**
Mid-term Immigrants (11-25 years)	88.3	11.7	**100.0**
Long-term Immigrants (>25 years)	87.4	12.6	**100.0**
All Immigrants	77.5	22.5	**100.0**
Non-Immigrants	82.3	17.7	**100.0**
* Significantly different (p<0.001) from estimate for reference category (non-immigrants).			
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Consulted a Mental Health Professional

Consulted with a Mental Health Professional, Past 12 Months (%)[1]	Yes	No	Total
Recent Immigrants (≤10 years)	10.1*	89.9	**100.0**
Mid-term Immigrants (11-25 years)	9.3*	90.7	**100.0**
Long-term Immigrants (>25 years)	11.7	88.3	**100.0**
All Immigrants	10.3*	89.7	**100.0**
Non-Immigrants	18.6	81.4	**100.0**
* Significantly different (p<0.001) from estimate for reference category (non-immigrants).			
Note: 1 Data are for 2015-2016 only.			
Source: Canadian Community Health Survey (pooled data 2015-2016).			

Last Health Consultation – Comprehensibility

Last Health Consultation: Professional Explained Things in an Easy to Understand Way (%)[1]	Yes	No	Total
All Immigrants	97.8	2.2	**100.0**
Non-Immigrants	97.9	2.1	**100.0**
Note: 1 Data are for 2015-2016 only.			
Source: Canadian Community Health Survey (pooled data 2015-2016).			

Last Health Consultation – Overall Quality Rating

Last Health Consultation: Overall Quality Rating, Past 12 Months (%)	Poor / Fair /Good	Very Good / Excellent	Total
Recent Immigrants (≤10 years)	25.9	74.1	**100.0**
Mid-term Immigrants (11-25 years)	25.5	74.5	**100.0**
Long-term Immigrants (>25 years)	22.7	77.3	**100.0**
All Immigrants	23.8	76.2	**100.0**
Non-Immigrants	20.6	79.4	**100.0**
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Health Status

Physical Health Status

Self-Reported Physical Health Status (%)	Poor or Fair	Good	Very Good or Excellent	Total (%)
Recent Immigrants (≤10 years)	4.5*	31.1*	64.3	**99.9**
Mid-term Immigrants (11-25 years)	6.4	28.8	64.8	**100.0**
Long-term Immigrants (>25 years)	14.2	26.8	59.0*	**100.0**
All Immigrants	7.7*	28.0*	64.3*	**100.0**
Non-Immigrants	9.1	23.0	67.9	**100.0**
* Significantly different (p<0.05) from estimate for reference category (non-immigrants).				
Source: Canadian Community Health Survey (pooled data 2013-2016).				

Mental Health Status

Self-Reported Mental Health Status (%)	Poor or Fair	Good	Very Good or Excellent	Total (%)
Recent Immigrants (≤10 years)	4.5	19.0	76.5	**100.0**
Mid-term Immigrants (11-25 years)	3.8	22.7	73.5	**100.0**
Long-term Immigrants (>25 years)	6.8	19.3	73.9	**100.0**
All Immigrants	5.1	20.0	74.9	**100.0**
Non-Immigrants	6.4	19.9	73.7	**100.0**
Source: Canadian Community Health Survey (pooled data 2013-2016).				

Number of Chronic Conditions

Number of Chronic Conditions (%)	None	One	Two	Three Plus	
Recent Immigrants (≤10 years)	75.8*	20.2	3.0*	1.0*	**100.0**
Mid-term Immigrants (11-25 years)	72.4*	17.0	7.6	3.0*	**100.0**
Long-term Immigrants (>25 years)	48.6*	27.7	14.0	9.7	**100.0**
All Immigrants	67.3*	21.2	7.3*	4.1*	**99.9**
Non-Immigrants	57.9	24.9	10.2	7.0	**100.0**
* Significantly different (p<0.001) from estimate for reference category (non-immigrants).					
Source: Canadian Community Health Survey (pooled data 2013-2016).					

Presence of Chronic Physical Health Conditions

Arthritis

Has Arthritis (%)	Yes	No	Total
Recent Immigrants (≤10 years)	5.3*	94.7	**100.0**
Mid-term Immigrants (11-25 years)	9.2**	90.8	**100.0**
Long-term Immigrants (>25 years)	26.0	74.0	**100.0**
All Immigrants	12.3*	87.7	**100.0**
Non-Immigrants	17.1	82.9	**100.0**
* Significantly different (p<0.001) from estimate for reference category (non-immigrants).			
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Asthma

Has Asthma (%)	Yes	No	Total
Recent Immigrants (≤10 years)	2.6*	97.4	**100.0**
Mid-term Immigrants (11-25 years)	2.5*	97.5	**100.0**
Long-term Immigrants (>25 years)	7.4	92.6	**100.0**
All Immigrants	4.1*	95.9	**100.0**
Non-Immigrants	10.6	89.4	**100.0**
* Significantly different (p<0.001) from estimate for reference category (non-immigrants).			
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Bowel Disorders

Has a Bowel Disorder (%)	Yes	No	Total
All Immigrants	2.0	98.0	**100.0**
Non-Immigrants	4.0	96.0	**100.0**
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Cancer

Has Cancer (%)	Yes	No	Total
All Immigrants	1.3	98.7	**100.0**
Non-Immigrants	2.1	97.9	**100.0**
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Diabetes

Has Diabetes (%)	Yes	No	Total
Recent Immigrants (≤10 years)	3.8	96.2	**100.0**
Mid-term Immigrants (11-25 years)	4.6	95.4	**100.0**
Long-term Immigrants (>25 years)	11.2*	88.8	**100.0**
All Immigrants	6.0*	94.0	**100.0**
Non-Immigrants	3.5	96.5	**100.0**
* Significantly different (p<0.01) from estimate for reference category (non-immigrants).			
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Heart Disease

Has Heart Disease (%)	Yes	No	Total
All Immigrants	2.9	97.1	**100.0**
Non-Immigrants	2.9	97.1	**100.0**
Source: Canadian Community Health Survey (pooled data 2013-2016).			

High Blood Pressure

Has High Blood Pressure (%)	Yes	No	Total
Recent Immigrants (≤10 years)	8.3	91.7	**100.0**
Mid-term Immigrants (11-25 years)	14.1	85.9	**100.0**
Long-term Immigrants (>25 years)	19.7*	80.3	**100.0**
All Immigrants	12.9	87.1	**100.0**
Non-Immigrants	11.5	88.5	**100.0**
* Significantly different (p<0.001) from estimate for reference category (non-immigrants).			
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Stomach or Intestinal Ulcers

Has Stomach or Intestinal Ulcers (%)	Yes	No	Total
All Immigrants	2.8	97.2	**100.0**
Non-Immigrants	2.6	97.5	**100.1**
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Urinary Incontinence

Has Urinary Incontinence (%)	Yes	No	Total
All Immigrants	0.9*	99.1	**100.0**
Non-Immigrants	4.2	95.8	**100.0**
* Significantly different (p<0.001) from estimate for reference category (non-immigrants).			
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Presence of Chronic Mental Health Conditions

Alzheimer's or Dementia

Has Alzheimer's or Dementia (%)	Yes	No	Total
All Immigrants	0.5	99.5	**100.0**
Non-Immigrants	0.2	99.8	**100.0**
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Anxiety Disorder

Has an Anxiety Disorder (%)	Yes	No	Total
Recent Immigrants (≤10 years)	1.4*	98.6	**100.0**
Mid-term Immigrants (11-25 years)	3.4*	96.6	**100.0**
Long-term Immigrants (>25 years)	3.8*	96.1	**99.9**
All Immigrants	2.9*	97.1	**100.0**
Non-Immigrants	7.6	92.4	**100.0**
* Significantly different (p<0.01) from estimate for reference category (non-immigrants).			
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Mood Disorder

Has a Mood Disorder (%)	Yes	No	Total
Recent Immigrants (≤10 years)	3.9*	96.1	**100.0**
Mid-term Immigrants (11-25 years)	4.9*	95.1	**100.0**
Long-term Immigrants (>25 years)	7.1	92.9	**100.0**
All Immigrants	5.0*	95.0	**100.0**
Non-Immigrants	9.3	90.7	**100.0**
* Significantly different (p<0.01) from estimate for reference category (non-immigrants).			
Source: Canadian Community Health Survey (pooled data 2013-2016).			

Appendix C. Regression Analysis – Physical Health

Model 1. Logistic model predicting the coefficient (B) and odds ratio (exp(B)) of self-reporting excellent/very good health, Calgary Zone Community Health Region, 2013-2016.

Key: ns = No Significant Difference
* = Difference significant at $p \leq 0.1$
** = Difference significant at $p \leq 0.05$
*** = Difference is highly significant at $p \leq 0.01$

Category	Coef. (B)	Std. Error	Significance	OR (exp(B))
Racialized Immigrants	-0.64	0.36	*	0.52
White Immigrants	-0.01	0.21	ns	1
Racialized Canadian-born	-0.03	0.31	ns	0.97
Age	0.01	0	ns	1
Female	0.13	0.13	ns	1.14
Mother Tongue Not English	0.03	0.18	ns	1.03
Number of chronic conditions	-0.84	0.06	***	0.43
Personal income	2.27E-06	8.34E-07	**	1
Education (ref = grad degree)				
• Less than high school	-0.89	0.31	***	0.41
• High school diploma and some post-secondary	-0.29	0.19	ns	0.75
• Completed Bachelor's	0.24	0.21	ns	1.27
Absent from work/did not have job	0.06	0.13	ns	0.93
Wave dummy	-0.02	0.12	ns	0.98
Constant	1.39	0.29	***	
N	3044			
R Square (Cox and Snell)	0.14			
Max-rescaled R-Square	0.19			

Note: Models have been bootstrapped using Statistics Canada weights (500).

Source: Canadian Community Health Survey (pooled data 2013-2016).

Controlling for other factors, racialized immigrants have *lower* odds of reporting "good" or "excellent" health. This is also true for people with more chronic conditions, lower income, and less than high school education.

Appendix D. Regression Analysis – Mental Health

Model 2. Logistic model predicting the coefficient (B) and odds ratio (exp(B)) of self-reporting excellent/very good mental health, Calgary Zone Community Health Region, 2013-2016.

Key: ns = No Significant Difference
* = Difference significant at p ≤ 0.1
** = Difference significant at p ≤ 0.05
*** = Difference is highly significant at p ≤ 0.01

Category	Coef. (B)	Std. Error	Significance	OR (exp(B))
Immigrants	0.07	0.17	ns	1.07
Racialized	-0.01	0.21	ns	1
Age	0.01	0.01	*	1.01
Female	-0.05	0.15	ns	0.95
Mother Tongue Not English	-0.35	0.19	*	0.7
Number of chronic conditions	-0.66	0.07	***	0.51
Personal income	2.13E-06	1.08E-06	*	1
Education (ref = grad degree)				
• Less than high school	-0.69	0.34	**	0.5
• High school diploma and some post-secondary	-0.23	0.21	ns	0.79
• Completed Bachelor's	-0.18	0.23	ns	0.84
Absent from work/did not have job	0.01	0.16	ns	0.99
Wave dummy	0.24	0.13	*	1.27
Constant	1.09	0.28	***	
N	3014			
R Square (Cox and Snell)	0.08			
Max-rescaled R-Square	0.12			

Note: Models have been bootstrapped using Statistics Canada weights (500).

Source: Canadian Community Health Survey (pooled data 2013-2016).

Controlling for other factors, people whose mother tongue is not English have *lower* odds of reporting "good" or "excellent" mental health, as do older people. This is also true for people with more chronic conditions, lower income, and less than high school education.

Appendix E. Regression Analysis – Sense of Belonging

Model 3. Logistic model predicting the coefficient (B) and odds ratio (exp(B)) of self-reporting strong or very strong sense of belonging to the local community, Calgary Zone Community Health Region, 2013-2016.

Key: ns = No Significant Difference
* = Difference significant at $p \leq 0.1$
** = Difference significant at $p \leq 0.05$
*** = Difference is highly significant at $p \leq 0.01$

Category	Coef. (B)	Std. Error	Significance	OR (exp(B))
Immigrants	0.15	0.17	ns	1.16
Racialized	0.32	0.18	*	1.38
Age	0.02	0.01	***	1.02
Female	0.01	0.12	ns	1
Mother Tongue Not English	0.19	0.19	ns	1.21
Number of chronic conditions	-0.31	0.06	***	0.73
Personal income	6.03E-07	6.33E-07	ns	1
Education (ref = grad degree)				
• Less than high school	-0.32	0.29	ns	0.72
• High school diploma and some post-secondary	0.14	0.19	ns	1.15
• Completed Bachelor's	0.17	0.21	ns	1.19
Absent from work/did not have job	0.09	0.12	ns	1.09
Wave dummy	0.07	0.11	ns	1.08
Constant	-0.45	0.26	*	
N	2983			
R Square (Cox and Snell)	0.05			
Max-rescaled R-Square	0.07			

Note: Models have been bootstrapped using Statistics Canada weights (500).

Source: Canadian Community Health Survey (pooled data 2013-2016).

Controlling for other factors, racialized individuals have *greater* odds of reporting a strong sense of belonging to the local community, as do older people. In contrast, people with more chronic conditions have *lower* odds of feeling a strong sense of belonging to the local community.

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Twitter: @Calgarylip

Email: CLIP@Calgary.ca

Website: www.CalgaryLIP.ca

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