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Notice to readers

The estimates released in this publication are based on 2016 Census counts adjusted for census net undercoverage (CNU) and incompletely enumerated reserves (IER), to which are added the population growth estimates for the period from May 10, 2016 to the date of the estimate.

These estimates are not to be confused with the 2021 Census counts which were released earlier in 2022. Total population estimates based on the 2021 Census counts, adjusted for census net undercoverage and incompletely enumerated reserves, will be available in September 2023.

The analysis in this publication is based on preliminary data. These data will be revised over the coming year, and it is possible that some trends described in this publication will change as a result of these revisions. Therefore, this analysis should be interpreted with caution.

Most of the components, used to produce preliminary population estimates, are estimated using demographic models or based on data sources less complete or reliable, albeit more timely, than those used for updated or final estimates.

Some of the estimation methods typically used were adjusted to account for the impact of the COVID-19 pandemic. Given that the adjustments are similar to what was done for the second quarter of 2020, (see [Technical Supplement: Production of Demographic Estimates for the Second Quarter of 2020 in the Context of COVID-19](#)), no technical supplement has been produced for this quarter. Some exceptions to be highlighted for the current quarter:

- The usual method was used for the components of emigration to reflect the relaxation of travel restrictions.

Acknowledgements

The completion of this publication and the dissemination of the annual demographic estimates rests on the assiduous and meticulous work of the members of the Population Estimates Section of the Centre for Demography.

The contribution of editorial, communications, translation and dissemination services staff of Statistics Canada was essential to the project's achievement and is appreciated.

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Demographic estimates, annual and by age and sex, for Canada, the provinces and the territories are available in Tables [17-10-0005-01](#), [17-10-0006-01](#), [17-10-0008-01](#), [17-10-0014-01](#), [17-10-0015-01](#), [17-10-0016-01](#), [17-10-0021-01](#) and [17-10-0022-01](#).

Interactive dashboards are available (71-607-X):

- [Interprovincial migration indicators, provinces and territories: Interactive dashboard](#)
- [Interprovincial migrants by province or territory of origin and destination: Interactive dashboard](#)

Highlights

Total population, July 1, 2022

- In 2021/2022, Canada's population grew by a record 703,404 people (+1.8%) to reach an estimated 38,929,902 on July 1, 2022. This growth greatly surpasses the preceding high observed one year before the pandemic (2018/2019), when the population grew by 536,146 people (+1.4%).
- After a year of record low growth at the start of the COVID-19 pandemic (+0.6% in 2020/2021), Canada's growth rate in 2021/2022 (+1.8%) reached a level that has not been seen in more than 50 years (since 1965/1966, +1.9%), when the country was witnessing the end of the baby boom.
- For the first time in Canadian history, the population of Ontario surpassed 15 million people during 2021/2022. Over the same time period, the population of Nova Scotia passed the one million-mark, New Brunswick surpassed 800,000 residents and Nunavut now has more than 40,000 residents.
- The growth observed for 2021/2022 was mainly due to increased international migration as a result of easing COVID-19 border restrictions, increased immigration targets by Immigration, Refugees, and Citizenship Canada (IRCC), and the welcoming of people fleeing the Russian invasion of Ukraine.
- Population growth due to international migration in 2021/2022 (+657,833) was at its highest since at least the beginning of the current demographic accounting system (July 1971). It was more than four times the level seen at the height of the pandemic in 2020/2021 (+164,184).
- International migration accounted for 93.5% of Canada's growth in 2021/2022, up from 74.9% in 2020/2021 and surpassing the previous high of 83.2% in 2018/2019. This is a result of higher immigration targets in 2021/2022 and could also result from catch-up growth following lower immigration during the height of the pandemic.
- For the first time since at least 1971/1972, Ontario gained more than 300,000 people from international migration.
- Higher levels of growth due to international migration were due in part to a higher than usual net gain of non-permanent residents (+205,238) for 2021/2022 after a year of net loss of non-permanent residents in 2020/2021 (-42,377).
- In addition to Ontario (+117,403), two other provinces set record highs for the increase in the number of non-permanent residents: New Brunswick (+4,836) and Newfoundland and Labrador (+2,338).
- The number of immigrants in 2021/2022 (492,984) was also higher than what was seen during the height of the pandemic (226,308 in 2020/2021) which also contributed to the increased growth from international migration.
- For the 2021/2022 period, the population growth rate was the highest among the Maritime provinces, with Prince Edward Island (+3.5%), Nova Scotia (+2.8%) and New Brunswick (+2.7%) recording the highest population growth rates across all provinces and territories. Newfoundland and Labrador, for the first time in the last six years, recorded positive population growth in 2021/2022 (+1.1%).
- All provinces and territories saw historical gains from immigration, with the exception of British Columbia, which saw the second highest gains ever (after 2015/2016). The Atlantic provinces more than doubled the number of immigrants from the year prior: Newfoundland and Labrador (2,843), Prince Edward Island (3,436), Nova Scotia (13,816) and New Brunswick (8,401).

- Ontario (-47,212) and Manitoba (-10,203) each saw among their highest net losses to other provinces and territories through interprovincial migration on record.
- By far, Ontario supplied the majority of interprovincial migrants to its eastern neighbours: Quebec (62.1%), New Brunswick (59.5%), Nova Scotia (57.4%), Prince Edward Island (68.0%) and Newfoundland and Labrador (49.7%). A substantial number of Ontario migrants elected to move to Alberta (29,422) and British Columbia (22,750). Rising cost of housing in Ontario and increasing ability to telework post-pandemic may be contributing forces.
- Alberta (+21,660), British Columbia (+15,869) and Nova Scotia (+14,079) saw the highest net gains in interprovincial migrants across the country. Alberta recorded positive net interprovincial migration in 2021/2022 for the first time since 2014/2015.

Population by age and sex

- On July 1, 2022, 18.8% of Canadians (7,329,910 people) were at least 65 years of age. The gap is widening between the number of people in this age group and that of children aged 0 to 14 years (6,070,741 people, or 15.6% of population).
- Population aging continues, a result of fertility being below the replacement level since the early 1970s and an almost continuous increase in life expectancy. The advancing age of baby boomers—large cohorts of those born between 1946 and 1965—is accelerating this demographic aging. On July 1, 2022, almost two in three people aged 65 and older (63.8%) were baby boomers (aged 65 to 76) and more than half (50.8%) of all baby boomers were aged 65 and older.
- In 2022, the average age of Canadians was 41.7. The average age has increased by 3.9 years since 2002, when it was 37.8 years.
- At the provincial and territorial level, Newfoundland and Labrador was the province with the highest average age (45.3 years), while the lowest average age was recorded in Nunavut (29.3 years).
- On July 1, 2022, for every 100 people of working age (15 to 64 years), Canada had 52.5 people aged 0 to 14 or 65 and older. The demographic dependency ratio has been rising steadily since 2007 (44.0).
- Particularly because of the increase in life expectancy, the number of centenarians has close to quadrupled from 2002 to 2022, increasing from 3,764 to 13,484 people. In comparison, for every 100,000 people, there were 12 centenarians in 2002—now 35 in 2022.

Analysis: Total population

The estimates in this publication are based on 2016 Census counts, adjusted for census net undercoverage and incompletely enumerated reserves, plus the estimated population growth for the period from May 10, 2016, to the date of the estimate. The analysis in this publication is based on preliminary data. These data will be revised over the coming years, and some trends described in this publication could change as a result of these revisions. Therefore, this publication should be interpreted with caution.

The estimates in this publication should not be confused with the results of the [2021 Census](#), which are being released throughout 2022.

The analyses in this document focus on the period July 1, 2021 to June 30, 2022. The estimates for some demographic components were adjusted to take into account the effect of the global COVID-19 pandemic on the population of Canada.

For an explanation of how the population estimates have taken COVID-19 into account, please see: [Technical Supplement: Production of Demographic Estimates for the Second Quarter of 2020 in the Context of COVID-19](#).

This section presents the population estimates for Canada, the provinces and territories on July 1, 2022, along with a concise analysis of the various components of population growth between July 1, 2021 and June 30, 2022.

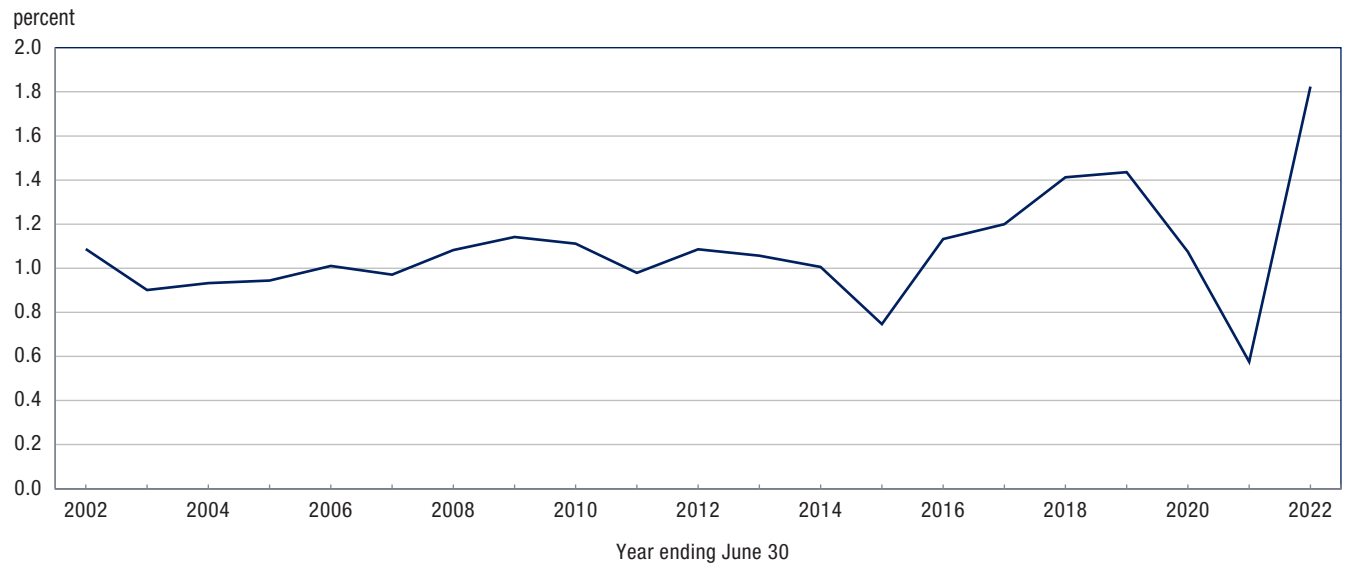
Canada's population approaches 39 million

On July 1, 2022, Canada's population was estimated at 38,929,902, up 703,404 from July 1, 2021 (+1.8%).

This is the largest annual growth in number in Canadian history and the highest growth rate since 1965/1966 (+1.9%, +370,900), at the end of the baby boom. This high growth is due almost entirely to international migration (representing 93.5% of growth in 2021/2022), reflecting the easing of international border restrictions, increasing Immigration, Refugees, and Citizenship Canada targets,¹ and the welcoming of people coming to Canada following the Russian invasion of Ukraine. Further, as of July 1, 2022, Canada was on track to exceed the target for 2022 (was at 53.7% of the target), which could include some catch-up following lower immigration levels during the height of the pandemic.

1. [Notice – Supplementary Information for the 2022-2024 Immigration Levels Plan - Canada.ca](#)

Chart 1.1
Population growth rate, 2001/2002 to 2021/2022, Canada



Source: Statistics Canada, Centre for Demography.

International migration is the main source of population growth

Population growth at the national level is based on two factors: natural increase² and international migratory increase,³ while provincial and territorial population estimates also factor in interprovincial migration.

In 2021/2022, estimated deaths were higher than the year prior (323,221 compared to 306,465 in 2020/2021, +5.5%) due to the ongoing COVID-19 pandemic, a growing population and population aging.

Natural increase totalled +45,571, which is the difference between estimated births (368,792) and estimated deaths (323,221). This is lower than the year prior (+55,148), due to higher number of deaths. This figure for 2021/2022 continues a trend of decreasing natural increase over time, reflecting decreasing fertility rates⁴ and higher numbers of deaths. As such, population growth for 2021/2022 was primarily driven by international migration.

Since 1995/1996, international migration has consistently been the main driver of population growth in Canada. In the past year, over 93% of population growth stemmed from international migratory growth (93.5%), a level unmatched in recent Canadian history.

Between July 1, 2021, and July 1, 2022, international migratory increase was 657,833, the highest level estimated to date. This figure exceeds the last peak of 446,169 recorded in 2018/2019 by more than 210,000.

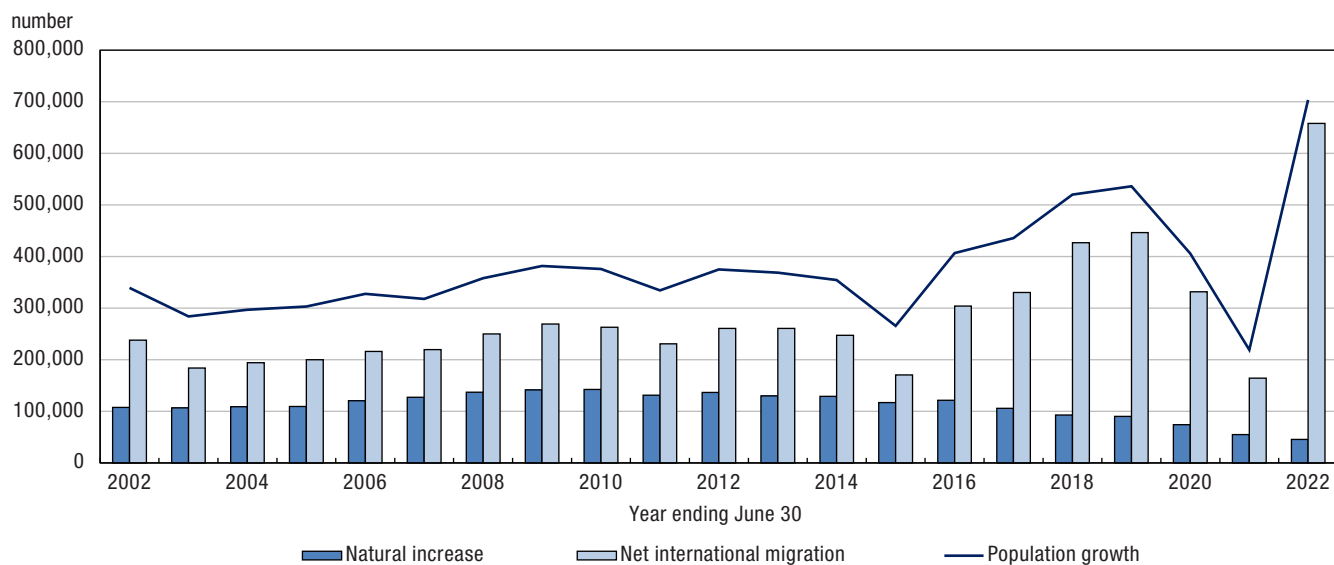
Emigration levels returned to pre-pandemic levels for 2021/2022 with 49,769 emigrants. For comparison, the emigration level 10-years prior was 65,393 in 2011/2012; 47,337 in 2018/2019 before the pandemic; and 35,838 in 2020/2021 during the pandemic. Returning emigration also returned to pre-pandemic levels (40,326 in 2021/2022 in comparison to 34,933 in 2020/2021) highlighting the role of easing travel restrictions on emigrants and returning emigrants.

2. Natural increase is the difference between the number of births and deaths.

3. International migratory increase refers to the total number of moves between Canada and abroad that result in a change in the usual place of residence. It is calculated by adding immigration, returning emigration and net non-permanent residents, then subtracting emigration and net temporary emigration.

4. [Crude birth rate, age-specific fertility rates and total fertility rate \(live births\) \(statcan.gc.ca\)](https://www150.statcan.gc.ca/n1/pub/28-263-x/2021001/article/00001-eng.htm)

Chart 1.2
Factors of population growth, 2001/2002 to 2021/2022, Canada



Note: Until 2016 inclusively, population growth is not equal to the sum of natural increase and international migratory increase because residual deviation must also be considered in the calculation. For further information, please see publication *Population and Family Estimation Methods at Statistics Canada*, Catalogue No. 91-528.

Source: Statistics Canada, Centre for Demography.

International migration records in several provinces

International migration refers to the total number immigrants, returning emigrants and net non-permanent residents, less emigrants and net temporary emigrants. 2021/2022 saw high international migration in all provinces and territories, with the exception of Nunavut. All provinces (except Quebec) and Yukon saw record levels of international migration, in particular the Western provinces: Manitoba (+24,666), Saskatchewan (+18,202), Alberta (+59,998) and British Columbia (+103,674). For the first time since at least 1971/1972, Ontario gained more than 300,000 people from international migration.

Record highs for non-permanent residents in several provinces

There are three main categories of non-permanent residents (NPRs): asylum claimants, work permit holders, and study permit holders. The net number of NPRs can rise or fall depending on the economic context of the country of origin and the host country, as well as the direction of certain programs in Canada and in the provinces and territories. The net number of NPRs can vary, particularly depending on the political context in their country of origin, but also on certain decisions made in Canada.

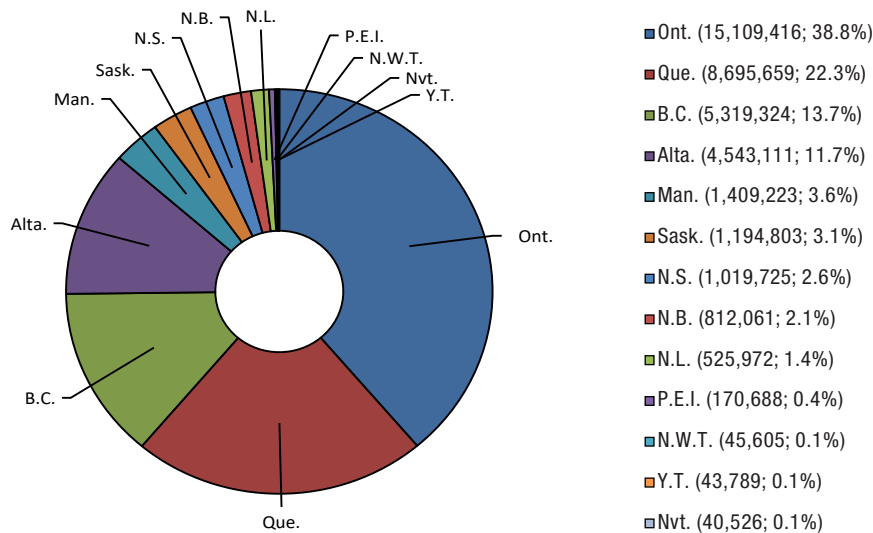
In 2021/2022, Canada and three provinces saw record gains in the net number of non-permanent residents after a year of losses in most parts of Canada during the height of the pandemic. The number of non-permanent residents in Canada increased by a record 205,238 in 2021/2022. In comparison, Canada had a net gain of 168,501 non-permanent residents in 2018/2019.

In addition to Ontario (+117,403), two other provinces set record highs for the net number of non-permanent residents: New Brunswick (+4,836) and Newfoundland and Labrador (+2,338).

Various factors may have had an impact on the international migratory growth and trends observed. For example, as Canada is committed to supporting those affected by the Russian invasion of Ukraine, the net numbers of non-permanent residents is reflective of this event. The first quarter of 2022 saw the onset of the crisis in Ukraine, which led to the arrival of Ukrainians and their families within the non-permanent resident population in the second quarter of 2022. Moreover, beginning in the second quarter of 2020, COVID-19 travel restrictions made it difficult

for those holding non-permanent resident permits to enter the country for non-essential reasons. After significant border restrictions during the height of the pandemic in 2020/2021, there was a large increase in net number of study permit holders and modest gains in the net number of work permit holders in 2021/2022 (both of which make up the vast majority of non-permanent residents in Canada). In combination, these components contributed to the increase in international migratory growth observed during the year.

Chart 1.3
Population distribution by province or territory, July 1, 2022



Source: Statistics Canada, Centre for Demography.

Slowly shifting demographic weight and population growth in Atlantic Canada

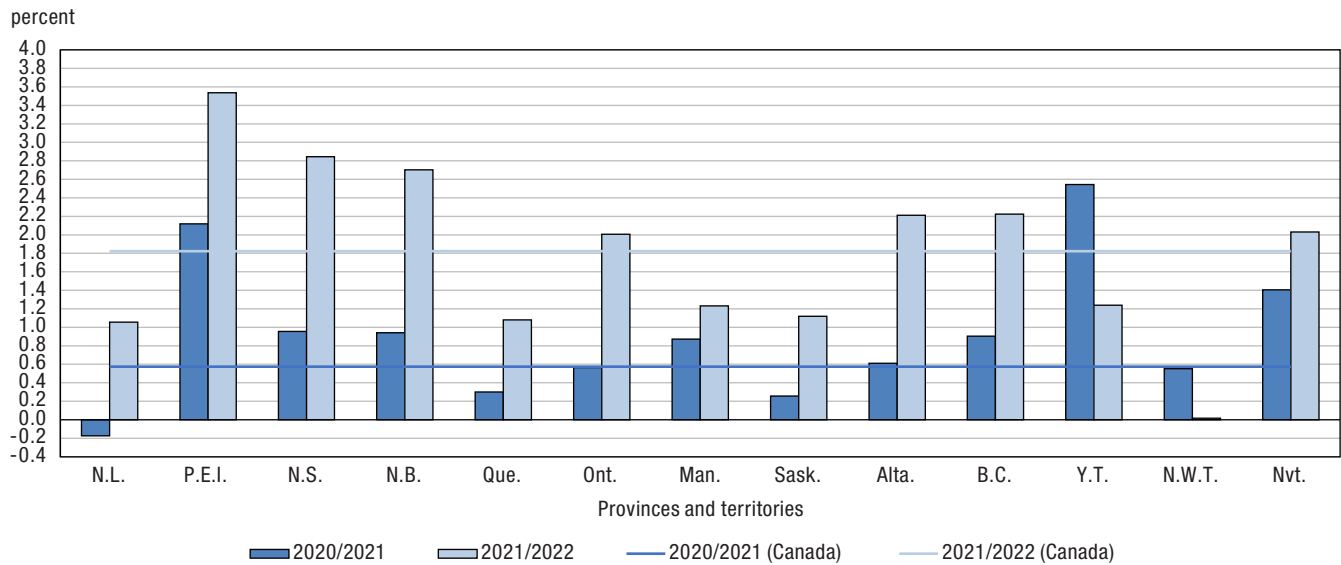
On July 1, 2022, more than 33.6 million Canadians (86.5%) resided in one of the four most populous provinces: Ontario (38.8%), Quebec (22.3%), British Columbia (13.7%) and Alberta (11.7%).

Ontario remained the country's most populated province, with 15,109,416 people, followed by Quebec (8,695,659), British Columbia (5,319,324) and Alberta (4,543,111). Provinces and territories west of Ontario accounted for 32.4% of total population, ahead of provinces east of Ontario that accounted for 28.8% of Canada's population.

All of Atlantic Canada saw positive population growth in 2021/2022. With the exception of Newfoundland and Labrador, positive population growth has been an observable trend in all the Atlantic provinces since 2015/2016. Newfoundland and Labrador, for the first time in the last six years, recorded positive population growth in 2021/2022 (+1.1%). Prince Edward Island (+3.5%), Nova Scotia (+2.8%) and New Brunswick (+2.7%) had the highest population growth rates across all provinces and territories in 2021/2022.

In a landmark event, Nova Scotia reached a milestone in passing the one million mark in population during the last quarter of 2021. Ontario also crossed the 15 million people mark, which occurred during the second quarter of 2022. In addition, New Brunswick reached 800,000 residents in the first quarter of 2022. Moreover, Nunavut recorded more than 40,000 residents, which occurred during the last quarter of 2021. Canada tripled the population growth rate from the year prior (+0.6%) with a growth rate of 1.8% reported for 2021/2022.

Chart 1.4
Population growth rate, 2020/2021 and 2021/2022, Canada, provinces and territories



Source: Statistics Canada, Centre for Demography.

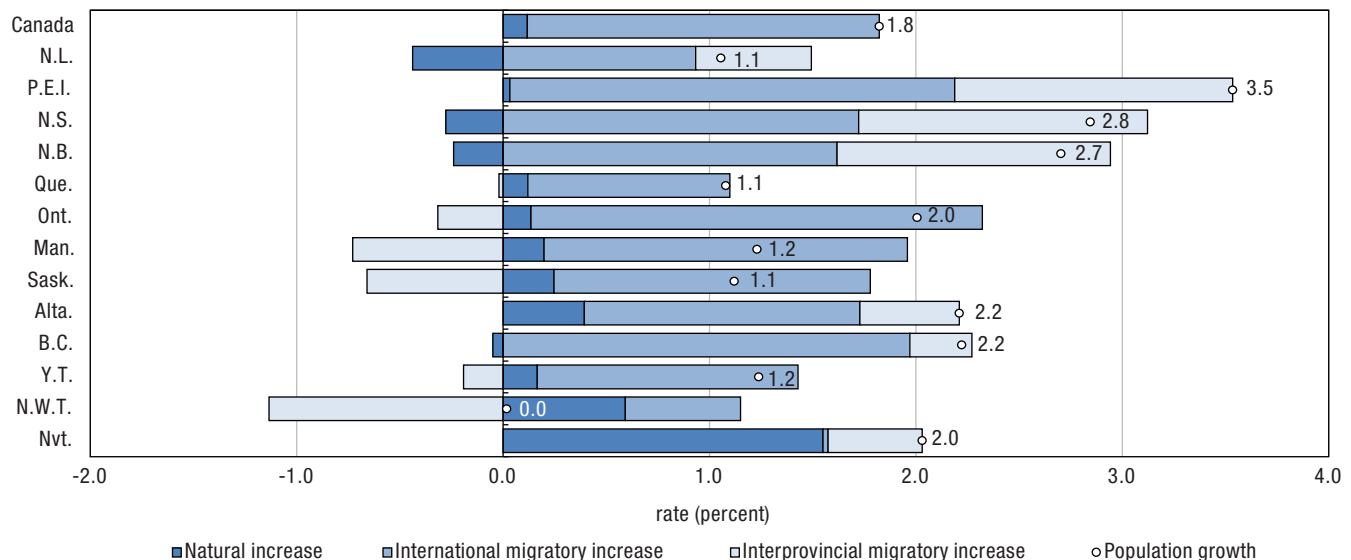
International migration strongest driver of population growth

Population growth in the provinces and territories can be attributed to three key factors: natural increase, international migratory increase, and interprovincial migratory increase. Among these three population growth factors, international migration remains the strongest driver of population growth across all provinces, a trend that has been observed over the last few decades.

The Atlantic provinces, with the exception of Prince Edward Island, had a negative natural increase, meaning that there were more deaths in 2021/2022 than births. In a trend that began in 2011/2012, Newfoundland and Labrador continued to experience losses from natural increase (-2,294). However, after five continuous years of population loss, Newfoundland and Labrador saw an increase in total population in 2021/2022 (+5,520) meaning that gains in international and interprovincial migration were able to compensate for losses from natural increase. Prince Edward Island, for a second year in a row, recorded more births than deaths in 2021/2022 (+56).

Among the territories, Yukon and Northwest Territories saw record lows in natural increase (+72 and +270, respectively) and high gains from international migration (+550 and +255). For Nunavut, natural increase (+622) continues to remain the predominant contributor to population growth in the territory. In 2020/2021, Nunavut lost population due to interprovincial migration (-169), a trend which reversed in 2021/2022 (+183).

Chart 1.5
Factors of population growth, 2021/2022, Canada, provinces and territories



Source: Statistics Canada, Centre for Demography.

Record immigration levels in the vast majority of provinces and territories

Across the country, every province and territory welcomed more immigrants in 2021/2022 compared with the previous year, with record numbers of new immigrants in the vast majority of provinces. The Atlantic provinces in particular saw historic gains from immigration with Newfoundland and Labrador (2,843, +221.6%), Prince Edward Island (3,436, +184.2%), Nova Scotia (13,816, +290.3%) and New Brunswick (8,401, +212.4%) more than, or close to, tripling the number of immigrants from the year prior.

While the record number of immigrants welcomed this year can be partially attributed to the catch-up growth to compensate for record low migration in 2020/2021, all provinces and territories, with the exception of Alberta, saw historic gains in the number of immigrants. Among the provinces, Nova Scotia saw the highest increase in the number of immigrants (from 3,540 in 2020/2021 to 13,816 in 2021/2022, or +290.3%). British Columbia also saw a high number of immigrants (83,200), almost 30,000 more than the year with the second highest number of immigrants (1996/1997, 53,235). Ontario also set a record, welcoming more than 200,000 (277,235) immigrants for the first time since at least 1931/1932.

Canada’s new 2021 and 2022 immigration targets are in part responsible for the increase in the number of immigrants seen in the second half of 2021 and first half of 2022.⁵ In 2021/2022, Canada continued to welcome Afghan refugees in its commitment towards the resettlement of individuals and families from Afghanistan.⁶ However, even without this category of immigrants, immigration would have reached record levels for a second quarter due to the increasing immigration targets set by Immigration, Refugees and Citizenship Canada (IRCC). This could also be the result of catch-up growth following lower levels during the height of the pandemic.

The estimated number of immigrants by province and territory is based on their intended province or territory of residence, as collected by Immigration, Refugees and Citizenship Canada (IRCC). This also applies to the calculation of international migratory growth and provincial and territorial population growth.

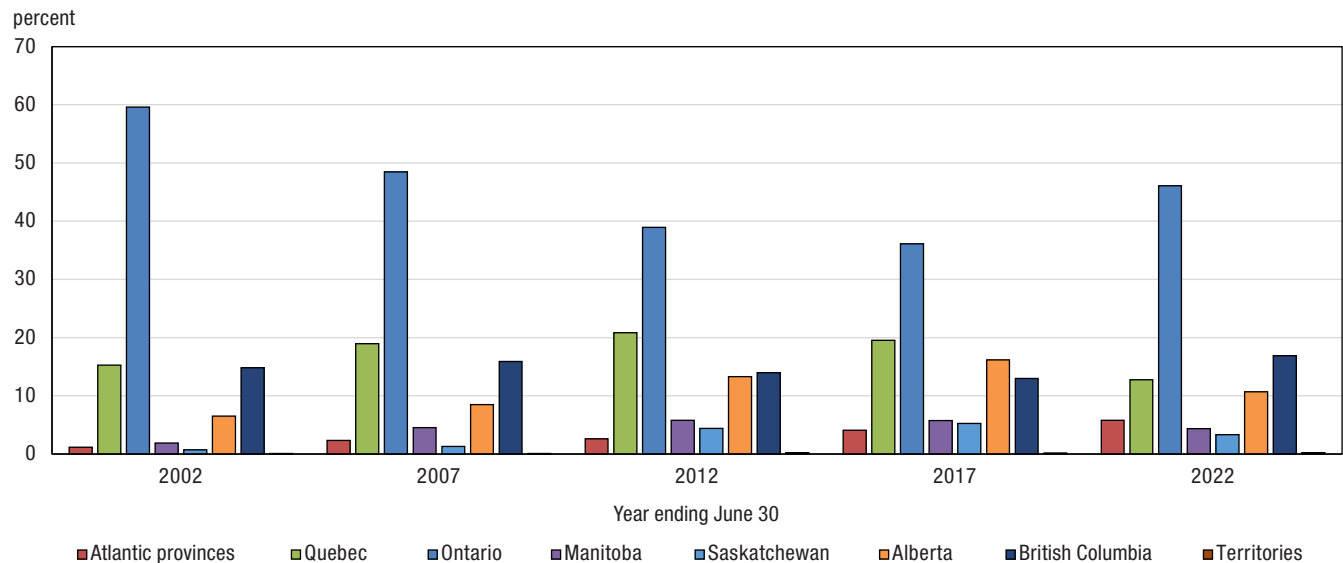
5. [Notice – Supplementary Information for the 2021-2023 Immigration Levels Plan - Canada.ca](#)

6. [Canada’s response to the situation in Afghanistan - Canada.ca](#)

Ontario continues to attract the most immigrants

In 2021/2022, 46.1% of all immigrants to Canada settled in Ontario, a slight decrease from the previous year (47.7%), which exceeds the demographic weight of the province (38.8%). The Prairie provinces⁷ welcomed 18.3% of immigrants to Canada, which is a similar proportion as the year prior (18.4%), but a decrease from 2019/2020 (22.4%). British Columbia saw an increase in the proportion of immigrants in comparison to the prior year (16.9% from 15.2% in 2020/2021). The Atlantic provinces saw an increase in proportion of immigrants in 2021/2022 (5.8%) while these four provinces received 3.7% of all immigrants to Canada during the height of the pandemic in 2020/2021. A smaller proportion of immigrants settled in Quebec (12.7% of all immigrants to Canada), down from 14.9% in 2020/2021 and lower than the demographic weight of the province (22.3%).

Chart 1.6
New immigrants distribution by province or territory, 2001/2002 to 2021/2022



Source: Statistics Canada, Centre for Demography.

Ontario supplies the majority of interprovincial migrants to its eastern neighbours

At the provincial and territorial level, population growth is the result of not only natural increase and international migration, but also migratory exchanges between provinces and territories. The Atlantic provinces gained population through interprovincial migration (Nova Scotia, +14,079; New Brunswick, +10,612; Newfoundland and Labrador, +2,930; and Prince Edward Island, +2,260) as did Alberta (+21,660), British Columbia (+15,869) and Nunavut (+183). Ontario (-47,212), Manitoba (-10,203), Saskatchewan (-7,829), Quebec (-1,749), the Northwest Territories (-517) and Yukon (-83) all lost population to other provinces and territories through interprovincial migration in 2021/2022. Ontario continued to experience a net loss in interprovincial migrants: this net loss through interprovincial migration is Ontario's largest since at least 1971/1972, with the previous highest net loss recorded being in 1980/1981 (-33,247).

By far, Ontario supplied the majority of interprovincial migrants to its eastern neighbours: Quebec (62.1%), New Brunswick (59.5%), Nova Scotia (57.4%), Prince Edward Island (68.0%) and Newfoundland and Labrador (49.7%). For Quebec, despite the largest levels of in-migrants in the last three decades (27,861 in 2021/2022 compared to 30,035 in 1989/1990), the province continued to experience a net loss of interprovincial migrants (-1,749). This has been a consistent trend since the beginning of the current demographic accounting system (1971/1972), meaning that more people moved away from the province than those who moved to the province. However, the net loss

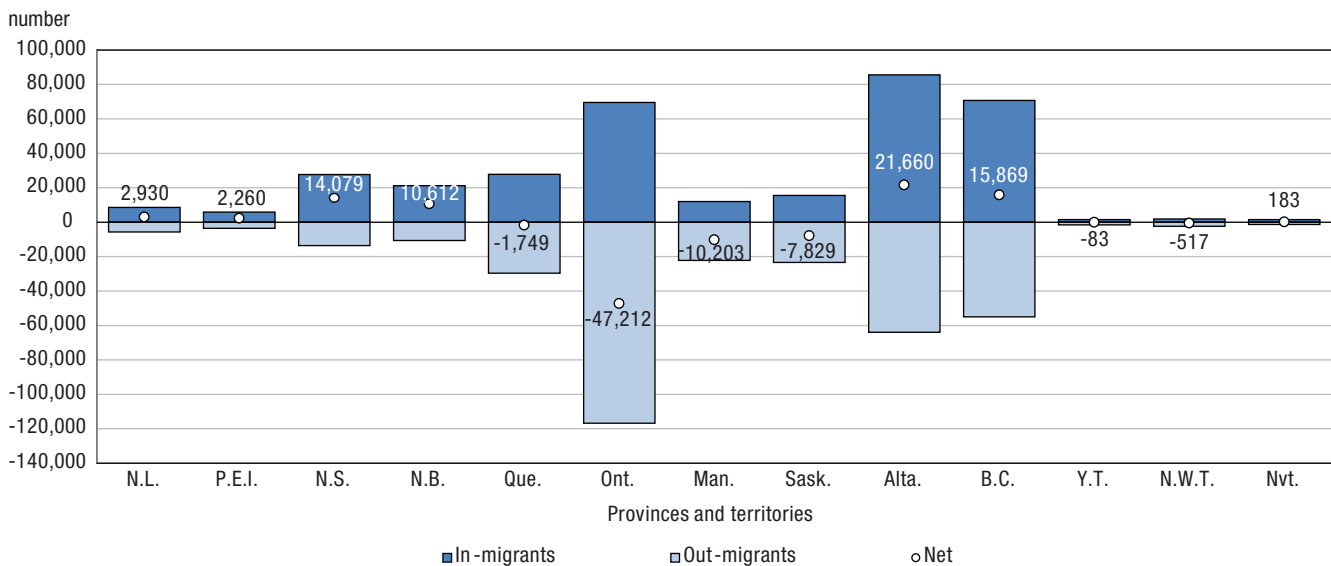
7. Manitoba, Saskatchewan and Alberta.

in 2021/2022 in Quebec was the second smallest loss over the same time period, with only 2003/2004 having a smaller net loss (-822).

To the west of Ontario, Manitoba (-10,203) and Saskatchewan (-7,829) continued to experience net losses to interprovincial migration, a trend that has been observed since at least 1971/1972 in Manitoba (with the exception of 1982/1983 and 1983/1984) and since 2013/2014 in Saskatchewan. In a reversal of trends, Alberta recorded positive net interprovincial migration in 2021/2022 (+21,660) for the first time since 2014/2015. Population and economic growth are often interrelated. As the pandemic hit, Alberta saw increased unemployment rates reaching 15.3% in May 2020 and the province saw net losses of 9,458 people to other provinces in 2020/2021. With the unemployment rate decreasing to 7.8% at the beginning of the third quarter in 2021 (October 2021) and continuing the downward trajectory to 4.9% by the end of the second quarter in 2022 (June 2022),⁸ the net gain in population in 2021/2022 could be due to improved economic conditions in the province.⁹ In 2021/2022, Alberta received the greatest number of in-migrants (85,625) of any province or territory, a number more in line with the figures seen prior to the drop in oil prices, which began in the fall of 2014¹⁰ (81,540 in 2014/2015).

After Alberta, British Columbia reported the next highest net gain from interprovincial migration (+15,869). While lower than the year prior (+25,376), the positive increase in interprovincial migration is consistent with trends from the last decade in the province. Together, Alberta and Ontario supplied over 73% of the in-migrants to British Columbia in 2021/2022 (73.7%).

Chart 1.7
Interprovincial migration by province or territory, 2021/2022



Source: Statistics Canada, Centre for Demography.

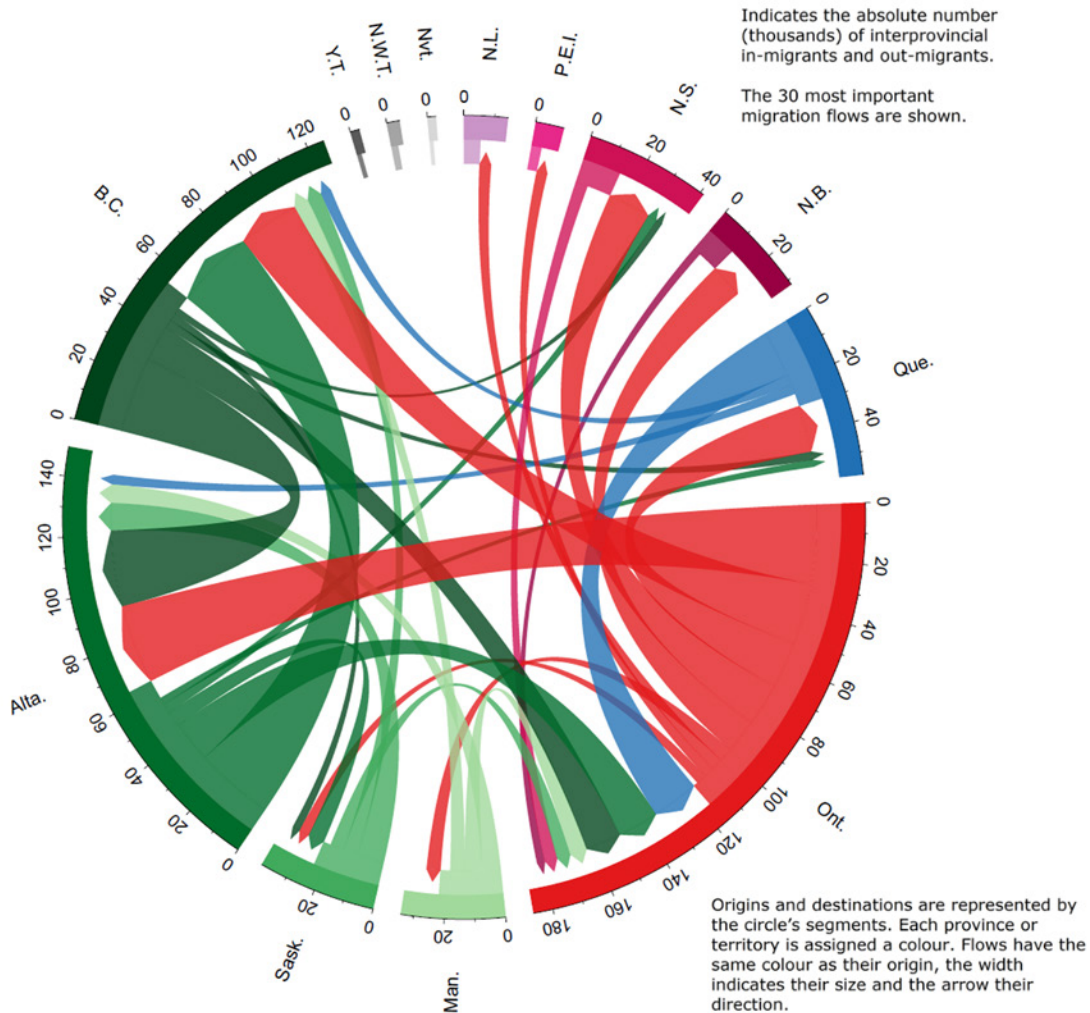
The largest migration flows originate from Ontario

The 30 largest migration flows are shown in Chart 1.8, in which each province or territory is assigned a colour. Migration origins and destinations are represented by the circle's segments. Flows are the same colour as their origin, the width indicates their size and the arrow their direction.

8. [Labour force characteristics, monthly, seasonally adjusted and trend-cycle, last 5 months \(statcan.gc.ca\)](https://www150.statcan.gc.ca/n1/pub/75-662-x/2021001/article/00001-eng.htm)
 9. [The Daily — Gross domestic product by industry: Provinces and territories, 2021 \(statcan.gc.ca\)](https://www150.statcan.gc.ca/n1/pub/64-629-x/2021001/article/00001-eng.htm)
 10. [Oil Prices \(alberta.ca\)](https://www.alberta.ca/oil-prices)

Chart 1.8

Largest interprovincial migration flows, by province or territory of origin and destination, 2021/2022



Source: Statistics Canada, Centre for Demography.

Over the past year, the largest interprovincial migration flows were from Ontario to Alberta (29,422). The next highest exchanges occurred from Alberta to British Columbia (29,413) and from British Columbia to Alberta (28,238), making the net exchange relatively small (+1,175 to British Columbia). While 22,750 people moved from Ontario to British Columbia, a little over half did the same to Ontario (13,335) providing British Columbia with a net gain of 9,415 people from Ontario. Consistent with previous years, Ontario and Quebec exchanged roughly the same number of interprovincial migrants (17,487 from Quebec to Ontario and 17,315 from Ontario to Quebec).

Similarly, Ontario served as an origin source for the majority of migrants to the Atlantic provinces, with 58.0% of the migrants to Atlantic Canada originating from Ontario. This is consistent with the trends observed during the height of the pandemic in 2020/2021 during which 49.0% of all migrants to the Atlantic provinces were from Ontario. Purchasing power and migration are often interrelated and one key contributor to the observed migration trends could be the rising cost of housing in Ontario. For example, the shelter price index year-over-year change for Ontario at the onset of the pandemic was 1.3% in April 2020, which increased to 4.2% in April 2021 and further increased to 7.6% in April 2022. In addition, the pandemic increasingly afforded individuals with the ability to work remotely. For example, 32% of Canadian employees between the ages of 15-69 worked most of their hours from home at the beginning of 2021 (versus only 4% in 2016). The increased ability for individuals to telework may have contributed to increased migration from Ontario to other parts of Canada where housing may be relatively more affordable.

Table 1.1-1
Annual population estimates, July 1, Canada, provinces and territories - Population

	Canada	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nvt.
	number													
2016	36,109,487	529,426	146,969	942,790	763,350	8,225,950	13,875,394	1,314,139	1,135,987	4,196,061	4,859,250	38,547	44,649	36,975
2017	36,545,236	528,249	150,402	950,108	766,621	8,302,063	14,070,141	1,334,790	1,150,331	4,241,100	4,929,384	39,610	44,891	37,546
2018	37,065,084	525,560	153,396	958,406	770,301	8,401,738	14,308,697	1,352,825	1,161,767	4,298,275	5,010,476	40,519	44,981	38,143
2019	37,601,230	523,427	157,419	970,243	777,128	8,503,483	14,544,701	1,369,954	1,172,479	4,362,576	5,094,796	41,362	45,070	38,592
2020	38,007,166	521,359	161,305	981,691	782,996	8,576,595	14,726,022	1,379,888	1,178,467	4,416,682	5,155,495	42,163	45,346	39,157
2021	38,226,498	520,452	164,758	991,117	790,398	8,602,335	14,809,257	1,391,979	1,181,493	4,443,773	5,202,378	43,250	45,597	39,711
2022	38,929,902	525,972	170,688	1,019,725	812,061	8,695,659	15,109,416	1,409,223	1,194,803	4,543,111	5,319,324	43,789	45,605	40,526

Note: Estimates are final postcensal from 2016 to 2020, updated postcensal for 2021 and preliminary postcensal for 2022.

Source: Statistics Canada, Centre for Demography.

Table 1.1-2
Annual population estimates, July 1, Canada, provinces and territories - Total growth rates

	Canada	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nvt.
	rates per 1,000													
2016/2017	12.00	-2.23	23.09	7.73	4.28	9.21	13.94	15.59	12.55	10.68	14.33	27.20	5.41	15.32
2017/2018	14.12	-5.10	19.71	8.70	4.79	11.93	16.81	13.42	9.89	13.39	16.32	22.69	2.00	15.78
2018/2019	14.36	-4.07	25.89	12.27	8.82	12.04	16.36	12.58	9.18	14.85	16.69	20.59	1.98	11.70
2019/2020	10.74	-3.96	24.38	11.73	7.52	8.56	12.39	7.23	5.09	12.33	11.84	19.18	6.11	14.53
2020/2021	5.75	-1.74	21.18	9.56	9.41	3.00	5.64	8.72	2.56	6.12	9.05	25.45	5.52	14.05
2021/2022	18.23	10.55	35.36	28.45	27.04	10.79	20.06	12.31	11.20	22.11	22.23	12.39	0.18	20.31

Note: Total growth is final from 2016/2017 to 2019/2020, updated for 2020/2021 and preliminary for 2021/2022.

Source: Statistics Canada, Centre for Demography.

Table 1.1-3
Annual population estimates, July 1, Canada, provinces and territories - Total growth

	Canada	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nvt.
	number													
2016/2017	435,749	-1,177	3,433	7,318	3,271	76,113	194,747	20,651	14,344	45,039	70,134	1,063	242	571
2017/2018	519,848	-2,689	2,994	8,298	3,680	99,675	238,556	18,035	11,436	57,175	81,092	909	90	597
2018/2019	536,146	-2,133	4,023	11,837	6,827	101,745	236,004	17,129	10,712	64,301	84,320	843	89	449
2019/2020	405,936	-2,068	3,886	11,448	5,868	73,112	181,321	9,934	5,988	54,106	60,699	801	276	565
2020/2021	219,332	-907	3,453	9,426	7,402	25,740	83,235	12,091	3,026	27,091	46,883	1,087	251	554
2021/2022	703,404	5,520	5,930	28,608	21,663	93,324	300,159	17,244	13,310	99,338	116,946	539	8	815

Note: Total growth is final from 2016/2017 to 2019/2020, updated for 2020/2021 and preliminary for 2021/2022.

Source: Statistics Canada, Centre for Demography.

Table 1.2
Annual population estimates and factors of demographic growth - Canada

	Population at beginning period	Natural increase	Net interprovincial migration	Net international migration	Total net migration	Total growth	Population growth rate
	number						per 1,000
2016/2017	36,109,487	105,643	0	330,106	330,106	435,749	12.00
2017/2018	36,545,236	92,990	0	426,858	426,858	519,848	14.12
2018/2019	37,065,084	89,977	0	446,169	446,169	536,146	14.36
2019/2020	37,601,230	74,253	0	331,683	331,683	405,936	10.74
2020/2021	38,007,166	55,148	0	164,184	164,184	219,332	5.75
2021/2022	38,226,498	45,571	0	657,833	657,833	703,404	18.23
2022/2023	38,929,902	...	...	...	...	...	...

... not applicable

Note: See "Data quality, concepts and methodology — Explanatory notes for the tables" section.

Source: Statistics Canada, Centre for Demography.

Table 1.3
Annual estimates of components of demographic growth - Canada

	Natural increase		Interprovincial migration		International migration				
	Births	Deaths	In-migrants	Out-migrants	Immigrants	Emigrants	Returning emigrants	Net temporary emigrants	Net non-permanent residents
	number								
2016/2017	379,906	274,263	260,393	260,393	272,707	58,630	39,756	26,970	103,243
2017/2018	376,750	283,760	260,751	260,751	303,325	50,580	39,117	27,294	162,290
2018/2019	372,868	282,891	254,143	254,143	313,601	47,337	39,091	27,687	168,501
2019/2020	371,059	296,806	284,782	284,782	284,157	34,835	30,126	25,109	77,344
2020/2021	361,613	306,465	250,297	250,297	226,308	35,838	34,933	18,842	-42,377
2021/2022	368,792	323,221	349,563	349,563	492,984	49,769	40,326	30,946	205,238

Note: See "Data quality, concepts and methodology — Explanatory notes for the tables" section.

Source: Statistics Canada, Centre for Demography.

Table 1.4
Annual estimates of interprovincial migrants by province or territory of origin and destination, Canada, July 1, 2021 to June 30, 2022

Origin	Destination												Nvt.
	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	
	number												
N.L.	...	79	714	440	303	1,849	93	67	1,630	383	0	93	52
P.E.I.	96	...	670	318	128	1,482	5	5	533	315	11	0	0
N.S.	957	394	...	1,998	938	4,628	223	334	2,316	1,567	71	87	48
N.B.	593	311	2,091	...	2,003	2,970	205	126	1,441	599	26	129	83
Que.	194	258	1,037	1,856	...	17,487	617	436	3,510	3,917	25	132	141
Ont.	4,290	3,962	15,862	12,607	17,315	...	5,167	3,759	29,422	22,750	474	507	697
Man.	168	34	454	366	702	6,316	...	1,690	6,863	5,461	22	27	96
Sask.	73	48	578	211	453	5,076	1,189	...	10,186	5,411	69	34	56
Alta.	1,568	452	3,494	1,976	2,606	15,279	2,203	6,005	...	29,413	229	503	237
B.C.	508	257	2,449	1,276	3,127	13,335	2,112	2,901	28,238	...	436	221	59
Y.T.	8	19	21	0	63	211	34	82	514	543	...	64	8
N.W.T.	164	9	127	102	118	363	100	62	893	303	108	...	30
Nvt.	14	0	143	39	105	604	48	88	79	126	13	65	...
In-migrants	8,633	5,823	27,640	21,189	27,861	69,600	11,996	15,555	85,625	70,788	1,484	1,862	1,507
Out-migrants	5,703	3,563	13,561	10,577	29,610	116,812	22,199	23,384	63,965	54,919	1,567	2,379	1,324
Net	2,930	2,260	14,079	10,612	-1,749	-47,212	-10,203	-7,829	21,660	15,869	-83	-517	183
Total number of migrants:	349,563												

... not applicable

Note: Preliminary estimates based on data from the Canada child benefit (CCB) program and jkF factors calculated using 2018/2019, 2019/2020 and 2020/2021 tax file data from Canada Revenue Agency.

Source: Statistics Canada, Centre for Demography.

Analysis: Population by age and sex

For the purposes of this article, various indicators are used to measure population aging. These include number, proportion and distribution of the population aged 0 to 14 and 65 and older, the demographic dependency ratio and the average age. The average age of a population is the average age of all its members.

This document refers to [sex at birth](#), reflecting the terminology used in the 2016 Census. The demographic estimates will be rebased in 2023 using the 2021 Census. At that point, [gender](#) will be used (where applicable).

This section presents an analysis of the population estimates by age and sex for Canada, the provinces and territories on July 1, 2022, compared with the July 1 estimates in previous years.

The aging of baby boomers accelerates Canada's population aging

Population aging continues to be the major force of change on Canada's age and sex structure. An aging population shapes many aspects of society and the economy. The demographic aging process is currently accelerating as individuals born between 1946 and 1965—the large baby boomer cohort—reach more advanced ages. This aging process is also explained by the combination of a fertility rate below the replacement level (2.1 children per woman) since 1972¹¹ and an almost-continuous increase in life expectancy for both males and females.¹²

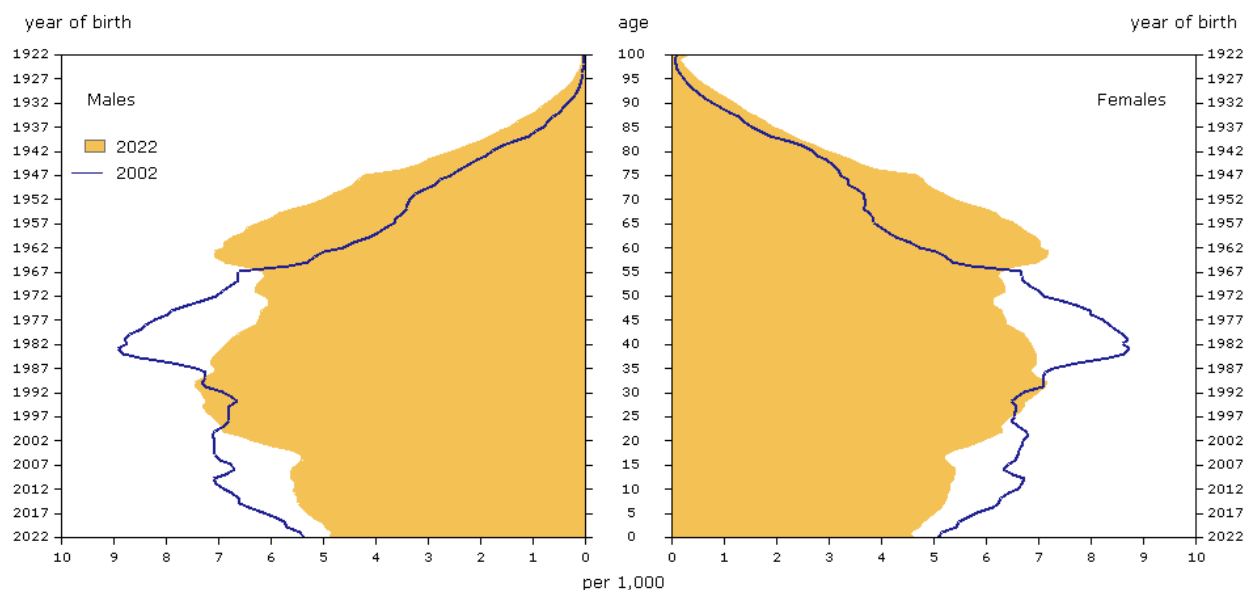
The population pyramid (Figure 2.1) illustrates the aging of Canada's population in recent decades by comparing the age and sex structure of the population on July 1 in 2002 and 2022.

On July 1, 2002, baby boomers were in their mid-30s to mid-50s, as can be seen in the bulge in the pyramid at these ages. On July 1, 2022, individuals in the baby boomer generation were aged 56 to 76, as illustrated by the upward shift in the large bulge in the pyramid observed 20 years earlier. Therefore, the number of people aged 55 and older was proportionally higher in 2022 (32.4%) than in 2002 (22.6%). In contrast, the number of younger people, particularly people in their mid-30s to early 50s, as well as individuals aged 0 to 20, has proportionally decreased.

11. Statistics Canada, [Fertility: Overview, 2012 to 2016](#), in the *Report on the Demographic Situation in Canada*, Catalogue no. 91-209-X and [Crude birth rate, age-specific fertility rates and total fertility rate \(live births\) \(statcan.gc.ca\)](#) (accessed August 30, 2022).

12. The [most recent data](#) show that life expectancy at birth has increased from 75.4 to 82.0 years from 1982 to 2020.

Figure 2.1
Population pyramid estimates as of July 1, 2002 and 2022, Canada



Source: Statistics Canada, Centre for Demography.

The gap widens between children and older people

Since 2011, baby boomers have contributed significantly to the increase in the number of people aged 65 and older. People aged 65 and older started to outnumber children aged 0 to 14 between July 1, 2015 and July 1, 2016. In 2021/2022, the difference between the number of people in these two age groups continued to increase.

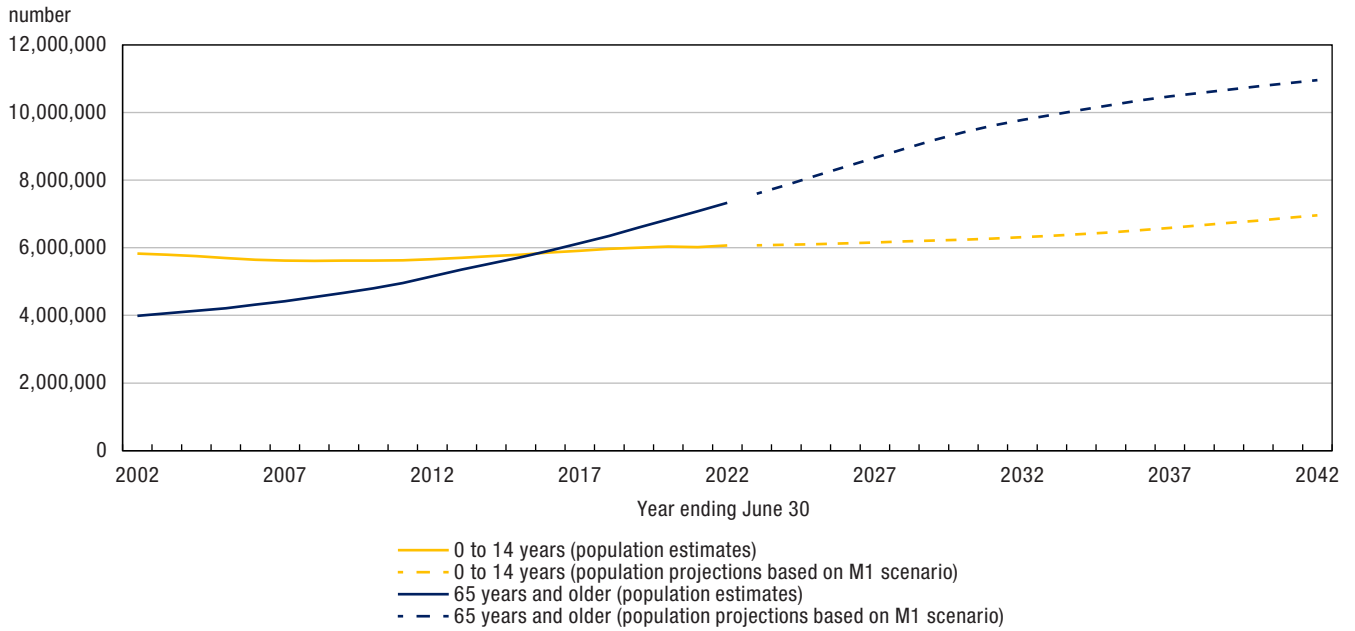
On July 1, 2022, a record number of 7,329,910 Canadians—18.8% of the population—were 65 years of age or older.

In comparison, there were 6,070,741 children aged 0 to 14 (15.6%) in Canada, an increase in number following the decrease seen the year prior. However, the proportion of children in this age group has been declining since 2016.

Since the number of older people is growing faster than the number of children, the demographic weight of children has decreased in recent years. In comparison, there were two to three times more children aged 0 to 14 than people aged 65 and older before 1987. According to the medium growth (M1) scenario of the most recent population projections,¹³ the proportion of people 65 and older should exceed 20% between July 1, 2024, and July 1, 2025, and reach 25% in 2059/2060. Meanwhile, the proportion of children aged 0 to 14 should remain relatively stable at around 14% to 15% over the same period.

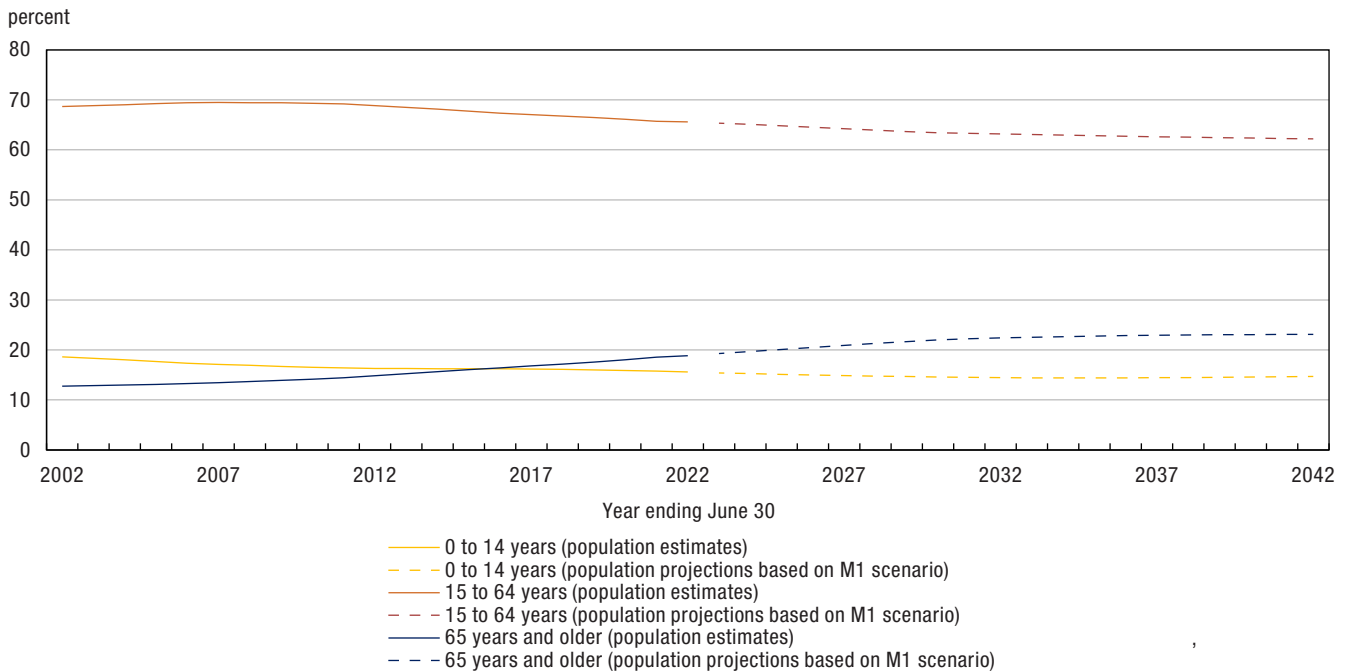
13. Statistics Canada. [Table 17-10-0057-01 Projected population, by projection scenario, age and sex, as of July 1 \(x 1,000\)](#) (accessed August 27, 2022). Calculations made by the author, using the M1 medium growth scenario.

Chart 2.1
Population aged 0 to 14 years and 65 years and older, 2002 to 2042, Canada



Note: From 2002 to 2022, population estimates. From 2023 to 2042, *Projected population by scenario, age and sex, as of July 1 (x1,000)*, Table no. 17-10-0057-01.
Source: Statistics Canada, Centre for Demography.

Chart 2.2
Proportion of the population aged 0 to 14 years, 15 to 64 years and 65 years and older, 2002 to 2042, Canada



Note: From 2002 to 2022, population estimates. From 2023 to 2042, *Projected population by scenario, age and sex, as of July 1 (x1,000)*, Table no. 17-10-0057-01.
Source: Statistics Canada, Centre for Demography.

From July 1, 2021 to July 1, 2022, the growth rate of the persons aged 65 and older was 3.4%, almost twice the growth rate of the population as a whole (+1.8%). The growth rate of children aged 0 to 14 years was 0.8% over the same annual period. Since the beginning of the period covered by the current demographic accounting system (July 1971), the population growth rate for children has always remained lower than that of older persons, thereby contributing to population aging.

During 2021/2022, pandemic related border restrictions were lifted and the number of international flights increased. More immigrants were able to come to Canada as well as non-permanent residents, including people fleeing the Russian invasion of Ukraine and the political situation in Afghanistan. Because of this, the growth rate of people aged 15 to 64 (1.6%) was the highest it has been since 1988/1989 (1.7%).

Children still outnumber older persons in the Prairie provinces and the territories

Population aging affects all regions of the country; however, this process is unfolding at an unequal pace, and certain provinces are aging faster than others. Consequently, the proportion of people aged 65 and older and that of children aged 0 to 14 varies significantly from east to west and from north to south.

In Canada's eastern and central provinces and in British Columbia, the proportion of people 65 years and older was higher than the proportion of children aged 0 to 14 years on July 1, 2022. However, the Prairie provinces and the territories showed the reverse, with higher proportions of children aged 0 to 14 than people 65 years and older. Thirteen years ago, on July 1, 2009, Nova Scotia and New Brunswick were the first two provinces where the proportion of people aged 65 and older exceeded that of children aged 0 to 14.

On July 1, 2022, Newfoundland and Labrador had the highest proportion of people aged 65 and older (23.6%). This proportion increased 7.2 percentage points over 10 years, the largest increase among all provinces and territories. In contrast, Alberta (14.8%) had the lowest proportion of people aged 65 and older among the provinces. As for children aged 0 to 14, the highest proportion among the provinces was observed in Saskatchewan (19.3%), and the lowest was in Newfoundland and Labrador (13.0%). Differences in the fertility, immigration and interprovincial migration rates largely explain gaps in the age structure between provinces and territories.

The age structure of the population of the territories differs from that of the provinces. High fertility¹⁴ and mortality,^{15,16} explain why the demographic weight of children is larger than that of older people. In particular, Nunavut stood out with children aged 0 to 14 making up 30.7% of the population and a low proportion of people aged 65 and older (4.5%). Population aging is still happening in Nunavut, albeit at a slower pace. Ten years ago, on July 1, 2012, 31.6% of the population was aged 0 to 14 while 3.3% were aged 65 and older.

More than one in two baby boomers are aged 65 and older

Like the rest of the population, the baby boomer cohorts are aging. For the first time in 2021/2022, more than half of baby boomers were aged 65 and older on July 1, 2022, up from 5.9% ten years ago. By 2031, the entire baby boomer cohort, whose youngest members were born in 1965, will have turned 65.

The demographic composition of the group aged 65 and older is changing rapidly. Before 2011, there were no members of the baby boomer generation in this group. Since 2011, as the first baby boomers started turning 65, growth of this group has accelerated. On July 1, 2022, baby boomers made up almost two-thirds (63.8%) of people aged 65 and older. However, their demographic weight within the overall population is decreasing, down to 23.7% in mid 2022, compared with 28.0% in 2012. Given their advancing age, they become more and more at risk of dying.

14. Statistics Canada. [Table 13-10-0418-01 Crude birth rate, age-specific fertility rates and total fertility rate \(live births\)](#) (accessed August 27, 2022).

15. Statistics Canada. [Table 13-10-0140-01 Life expectancy and other elements of the life table, Prince Edward Island and the territories](#) (accessed August 27, 2022).

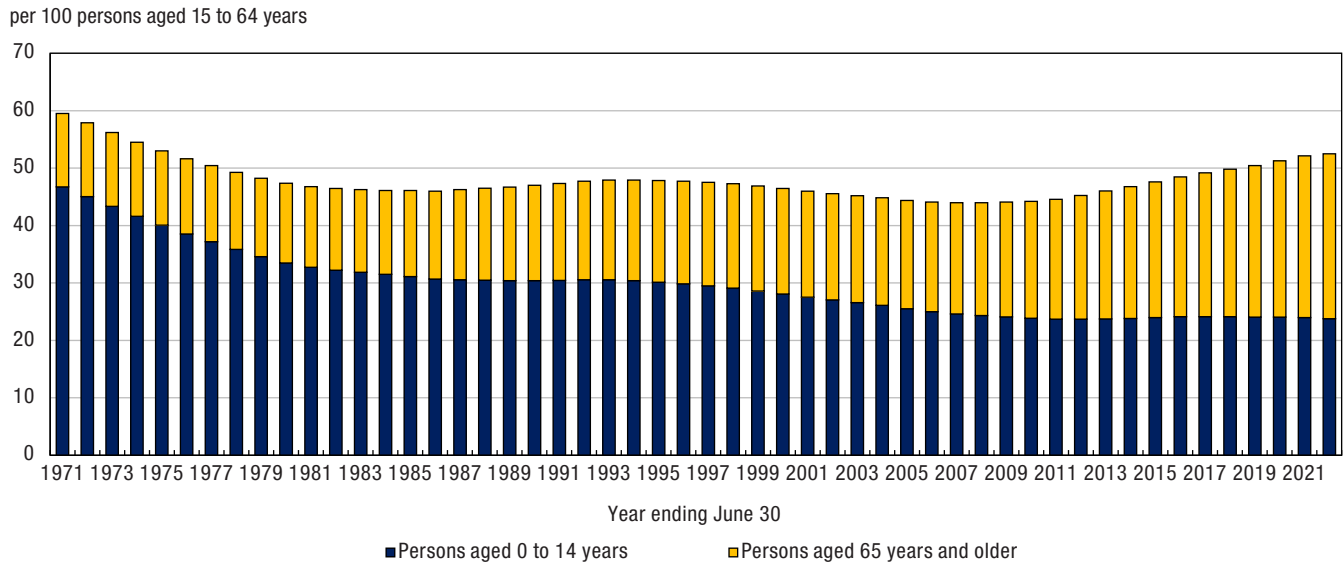
16. Statistics Canada. [Table 13-10-0114-01 Life expectancy and other elements of the life table, Canada, all provinces except Prince Edward Island](#) (accessed August 27, 2022).

Canada has just over one child or older person for every two working-age people

The demographic dependency ratio represents the number of children (0 to 14 years) and older people (65 years and older) per 100 working-age people (15 to 64 years). On July 1, 2022, the ratio was 52.5. This indicator has been rising steadily since reaching a record low in 2007 (44.0).

It could continue to rise beyond 2031, when the youngest baby boomers will turn 65. According to the medium growth (M1) scenario in the most recent population projections, the demographic dependency ratio should be 58.0 in 2031 and 68.2 in 2068.

Chart 2.3
Demographic dependency ratio, 1971 to 2022, Canada



Source: Statistics Canada, Centre for Demography.

Given their numbers, since their birth, baby boomers have always had a noticeable impact on the demographic dependency ratio. In 1971, the beginning of the period covered by the current demographic accounting system, a good number of baby boomers were still children. At that time, the demographic dependency ratio was 59.5. However, as the baby boomers reached adulthood, that ratio gradually dropped and remained low from 1980 to 2011, while all members of this generation were of working age. The recent increase in the demographic dependency ratio is explained by the baby boomers turning 65.

The number of people aged 55 to 64 compared with youth aged 15 to 24 dropped lately, due to high international migration

People aged 55 to 64 are often on the cusp of or in retirement. In contrast, individuals aged 15 to 24 generally have recently or are about to enter the labour market for the first time.

On July 1, 2022, there were 114 people potentially leaving the labour market for every 100 potential entrants. Those people aged 55 to 64 years consist of the youngest baby boomers and the oldest year of Generation X. In 1984, Canada had two people aged 15 to 24 per person aged 55 to 64, which demonstrates the major reversal in Canada over the last four decades. Subsequent years were marked by a steady decrease in this ratio, such that starting in 2013, the number of people potentially leaving began to outnumber the number of those potentially entering the labour market. This number rose to 118 on July 1, 2021, but dropped to 114 one year later. This could be due to these two main trends: fewer younger people able to enter the country during 2020/2021 due to the COVID-19 pandemic and the high rate of international migration in 2021/2022, bringing in younger people to Canada. Also, it may be being impacted by the fact that people turning 55 in 2021/2022, who are the first cohorts

of Generation X, are less numerous than those of the baby boom generation, exiting the age group of the 55-to-64 years olds.¹⁷

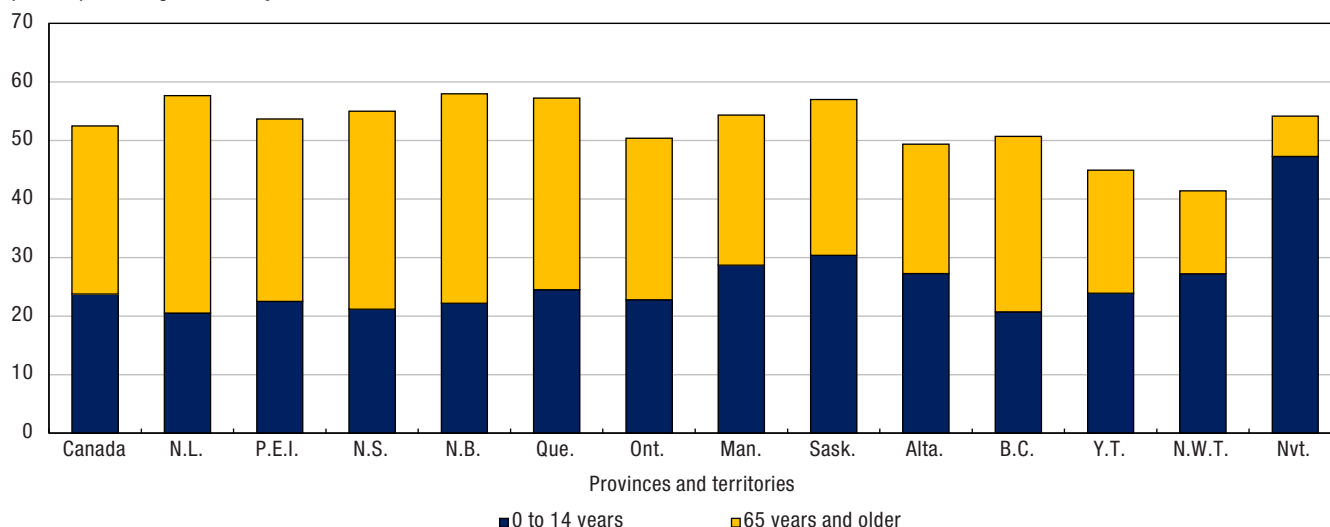
The demographic dependency ratio varies from one province and territory to another

In 2022, the Atlantic provinces and Quebec had a higher demographic dependency ratio than Canada (52.5) because of an increasing number of people aged 65 and older. In addition, the demographic dependency ratio was also higher in Manitoba (54.3) and Saskatchewan (57.0) than it was for the country. This situation was mainly because of the slightly higher proportion of children aged 0 to 14 in these provinces. Nunavut (54.1) also had a higher demographic dependency ratio than Canada, but differed from the other provinces and territories, as it had a high number of children and a low number of older persons.

17. [A generational portrait of Canada's aging population from the 2021 Census \(statcan.gc.ca\)](#)

Chart 2.4
Demographic dependency ratio, 2022, Canada, provinces and territories

per 100 persons aged 15 to 64 years



Source: Statistics Canada, Centre for Demography.

Text Table 2.1
Population estimates¹, age distribution, median age and average age as of July 1, 2022, Canada, provinces and territories

	Population	0 to 14 years 15 to 64 years 65 years and older			Median age	Average age
	number	percent			years	
Canada	38,929,902	15.6	65.6	18.8	41.0	41.7
Newfoundland and Labrador	525,972	13.0	63.4	23.6	47.8	45.3
Prince Edward Island	170,688	14.6	65.1	20.3	41.7	42.2
Nova Scotia	1,019,725	13.7	64.5	21.8	44.2	43.8
New Brunswick	812,061	14.1	63.3	22.7	45.7	44.3
Quebec	8,695,659	15.6	63.6	20.8	43.1	43.0
Ontario	15,109,416	15.1	66.5	18.4	40.4	41.5
Manitoba	1,409,223	18.6	64.8	16.6	37.7	39.3
Saskatchewan	1,194,803	19.3	63.7	17.0	38.2	39.4
Alberta	4,543,111	18.2	67.0	14.8	38.1	39.0
British Columbia	5,319,324	13.7	66.4	19.9	42.0	42.8
Yukon	43,789	16.5	69.0	14.5	39.5	39.9
Northwest Territories	45,605	19.3	70.7	10.0	35.8	36.7
Nunavut	40,526	30.7	64.9	4.5	26.9	29.3

1. Preliminary postcensal estimates.

Note: Figures in percent may not add up to 100% as a result of rounding.

Source: Statistics Canada, Centre for Demography.

The number of centenarians is growing rapidly

On July 1, 2022, preliminary estimates indicate that there were 13,484 centenarians in Canada, a 4.4% increase from the same date the year before (12,906). The number of centenarians in Canada is constantly growing, mainly because of increasing life expectancy.

In the past 20 years (or since 2002), the number of centenarians has almost quadrupled. In the latest annual period (2021/2022), the growth rate of centenarians was 4.4%, almost 2.5 times the growth rate for the entire population (1.8%). However, this growth rate has been decreasing since 2018/2019, when it was at 11.2% and was down from 8.8% in 2020/2021. This could be a result of the COVID-19 pandemic having a higher numbers of deaths in oldest-

old Canadians¹⁸ and the preponderance of deaths in nursing care facilities and residences for senior citizens at the start of the pandemic (second quarter 2020).¹⁹

The population growth of centenarians was the second highest of each five-year population age group, following the 75-79 age group (+7.6%). In relative numbers, there were 35 centenarians per 100,000 population in Canada. In 2002, the proportion was 12 centenarians per 100,000 population.

Female population is older on average than the male population

The main population aging indicators are all higher for females. On July 1, 2022, the proportion of people aged 65 and older was higher among females (20.2%) than among males (17.5%), although the gap had been narrowing since 1993, there were slight increases every year since 2018. The average age was also higher for females (42.6 years) than for males (40.9 years). Furthermore, the centenarian group comprised mostly females (80.5%).

These differences are mainly because females, at all ages, have lower mortality levels than males. These mortality levels create a persistent yet narrowing gap in life expectancy in favour of females. The most recent data (2018 to 2020) show that the life expectancy at birth of females was 84.1 years, compared with 79.8 years for males, with females living an average of 4.3 years longer than males. Twenty years earlier, this gap was 5.3 years.²⁰ Life expectancy at birth for both females and males was slightly lower than from 2017 to 2019 (female: 84.1 years, male: 79.9 years), reflecting the impact of the COVID-19 pandemic on the older population.²¹

The average age of the Canadian population continues to increase

On July 1, 2022, the average age²² of Canadians was 41.7 years. The average age has increased by 3.9 years since 2002, when it was 37.8 years.

Average age varies considerably from province to province. On July 1, 2022, there was a difference of 6.3 years between the province with the highest average age (45.3 years in Newfoundland and Labrador) and the province with the lowest average age (39.0 years in Alberta). Taking the territories into consideration, Nunavut had the lowest average age at 29.3 years.

In 2002, the differences between the provinces were much smaller, with a gap of 3.4 years. The highest average age was in Nova Scotia (39.0 years), and the lowest was in Alberta (35.6 years).

Differences in age structure between provinces and territories have tended to increase over the past 20 years, even though all regions of the country are experiencing a relatively rapid aging of the population.

The situation in Newfoundland and Labrador indicates an especially rapid aging of its population. In just over 15 years, the average age in the province went from the province with the lowest average age in the country (32.5 on July 1, 1989) to the province with the highest average age (40.4 years on July 1, 2006, tied with Nova Scotia). During most of this period, the province saw negative population growth. The main contributing factors are the departure of many young adults to other provinces and territories, along with lower fertility.

Conversely, the Prairie provinces were the youngest provinces on July 1, 2022, with an average age of 39.0 years in Alberta, 39.3 years in Manitoba and 39.4 years in Saskatchewan. This is mainly because of a higher proportion of Indigenous populations (Manitoba, Saskatchewan),²³ who are generally younger and with higher fertility rates, as well as a greater migratory inflow of young adults and families from other provinces (Alberta).

18. [COVID-19 epidemiology update: Detailed data, maps, charts – Canada.ca](#)

19. [Impacts of the COVID-19 pandemic in nursing and residential care facilities in Canada \(statcan.gc.ca\)](#)

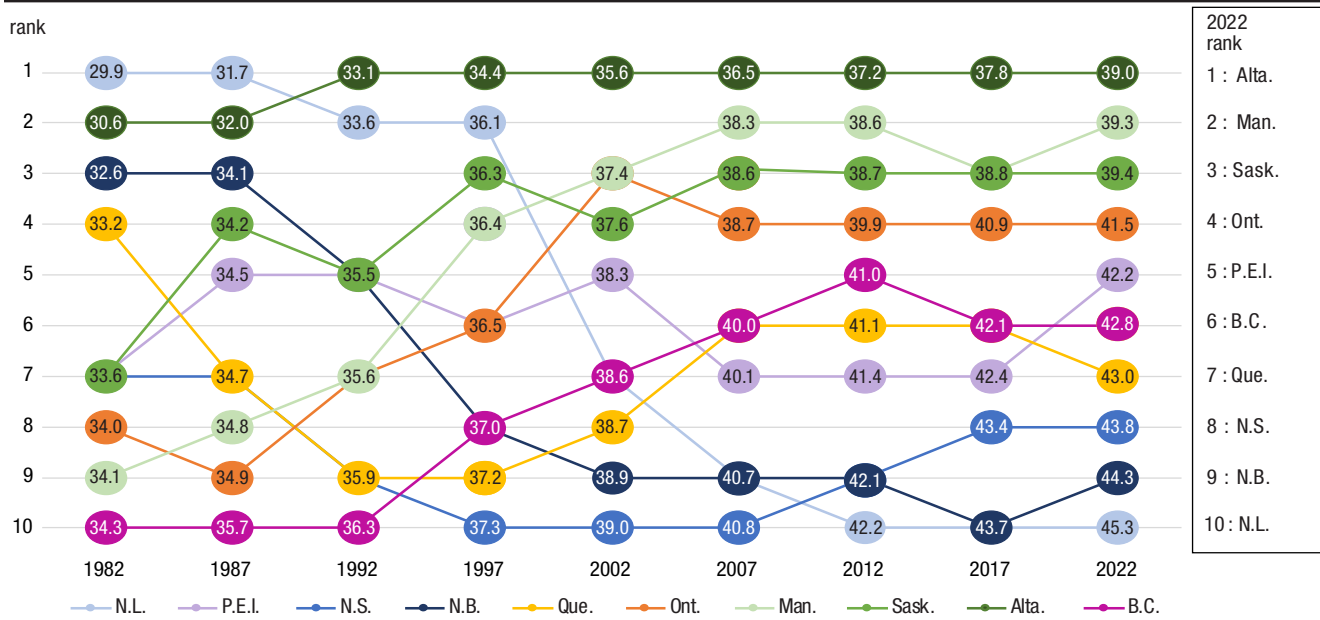
20. Statistics Canada. [Table 13-10-0114-01 Life expectancy and other elements of the life table, Canada, all provinces except Prince Edward Island](#) (accessed August 28, 2022).

21. [Reductions in life expectancy directly associated with COVID-19 in 2020 \(statcan.gc.ca\)](#)

22. The average age of a population is the average age of all its members.

23. Statistics Canada. [Aboriginal Population Profile, 2016 Census \(statcan.gc.ca\)](#) (accessed August 28, 2022), calculations by author.

Chart 2.5
Average age ranking on July 1, 1982 to 2022 (quinquennial years), Canadian provinces



Source: Statistics Canada, Centre for Demography.

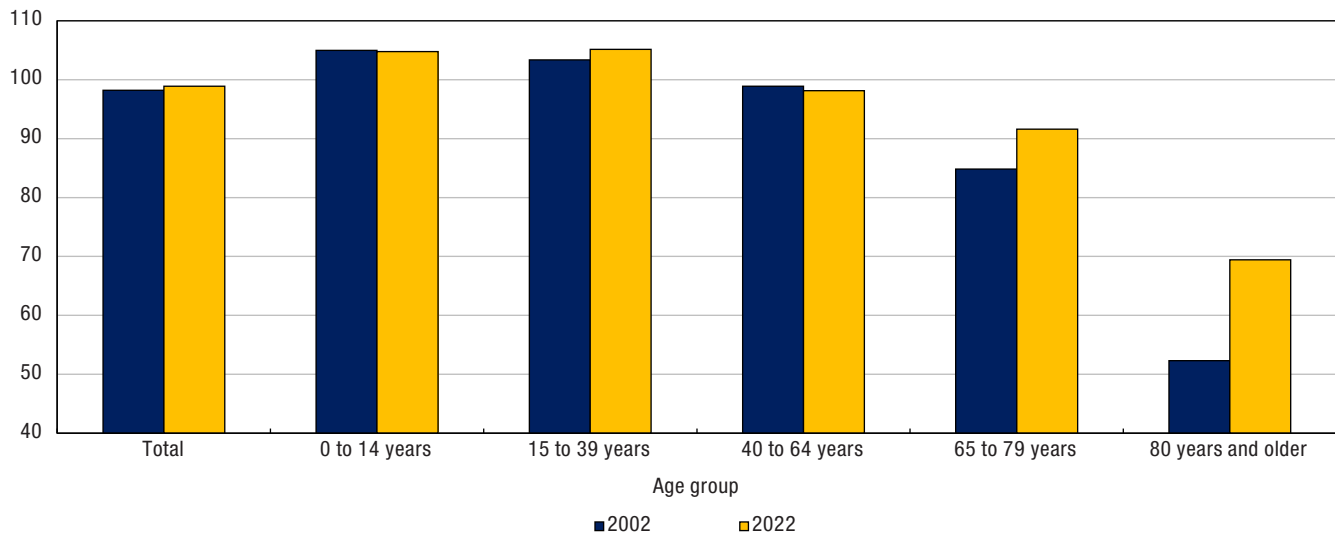
Males slightly outnumbered by females

On July 1, 2022, the sex ratio for the entire Canadian population was estimated at 98.9 males per 100 females. This ratio has been rising very slowly in most years since 1998 (98.0). Males outnumber females up to the age of 39, mainly because of the sex ratio at birth, which averages 105 males per 100 females. When people reach their mid-60s, the number of males starts to fall significantly below the number of females because of excess mortality among males. This gap widens at more advanced ages: among those aged 65 to 79, there were an estimated 91.6 males per 100 females on July 1, 2022.

However, the gap between the sexes seems to be narrowing over time. Thirty years ago, the sex ratio for people aged 65 to 79 was 78.8 males per 100 females. Among those aged 80 and older, there were an estimated 69.4 males per 100 females on July 1, 2022, compared with a sex ratio of 52.0 on July 1, 1992. On July 1, 2022, centenarians were predominantly female, with a ratio of 24.3 males per 100 females. This ratio was down slightly from July 1, 2021 (25.0).

Chart 2.6
Sex ratio by age group, 2002 and 2022, Canada

number of males for 100 females



Source: Statistics Canada, Centre for Demography.

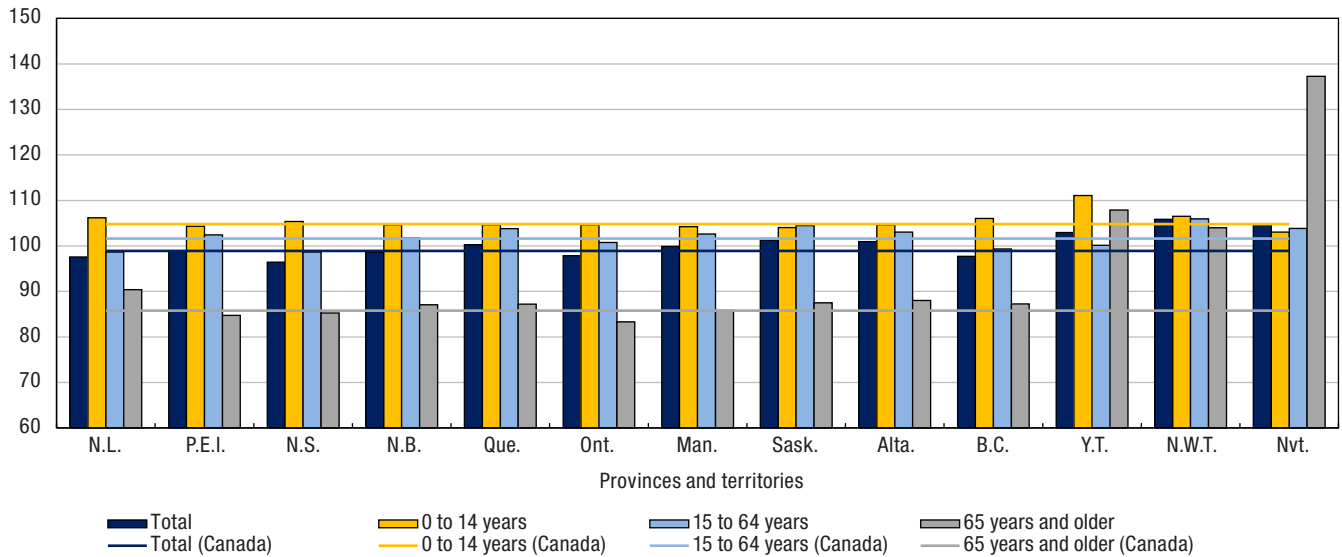
The sex ratio is higher in the Prairie provinces and Quebec

There are some differences between the provinces in terms of the sex structure of the population. On July 1, 2022, the province with the lowest sex ratio in the country was Nova Scotia (96.5 males per 100 females), and the province with the highest sex ratio was Saskatchewan (101.3 males per 100 females). The sex ratios in the Atlantic provinces, Ontario, and British Columbia were below the national average (98.9 males per 100 females), while they were all higher in the Prairie provinces and in Quebec. Among other factors, this situation can be attributed to differences in the aging of Canada's regions: a younger population is usually slightly more male, and an older population is usually more female.

On July 1, 2022, males outnumbered females in all the territories because they are home to younger populations than elsewhere in Canada. The main differences between the sex structure in the territories and in Canada as a whole are at higher ages. For ages 65 and older, the sex ratios for the territories were 107.9 males per 100 females for Yukon, 104.0 for the Northwest Territories and 137.3 for Nunavut, compared with 85.8 males per 100 females nationally.

Chart 2.7
Sex ratio by age group, 2022, Canada, provinces and territories

number of males for 100 females



Source: Statistics Canada, Centre for Demography.

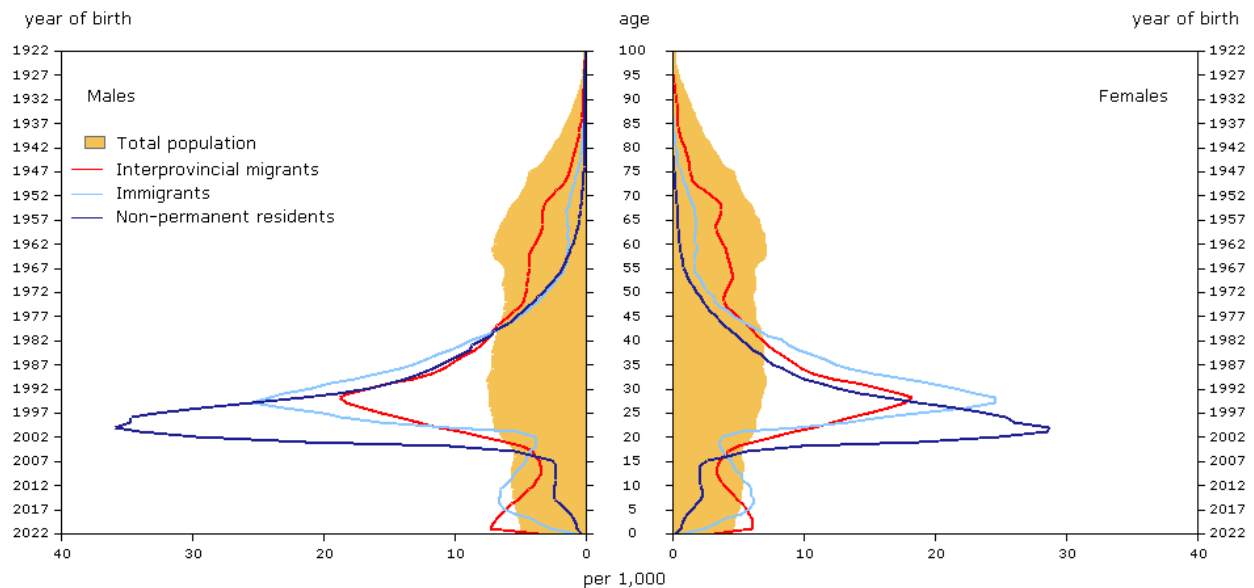
Migrants are much younger than the entire population

The population pyramid (Figure 2.2) highlights the differences in the age and sex structure of interprovincial migrants, new immigrants, non-permanent residents and the total population.²⁴ On July 1, 2022, the proportion of the working-age population (aged 15 to 64) was considerably higher among immigrants (81.9%), interprovincial migrants (77.8%) and non-permanent residents (94.1%) compared with the total population (65.6%).

These groups also had a high concentration of young adults. A majority of non-permanent residents (70.7%) were between 18 and 34 years of age. In comparison, immigrants were slightly older, and less concentrated in some age groups, with 69.4% aged 20 to 45. Among interprovincial migrants, 61.9% were aged 20 to 50. Similarly, the average ages of interprovincial migrants (34.0 years), non-permanent residents (28.6 years) and immigrants (30.6 years) were lower than the average age of the Canadian population (41.7 years) on July 1, 2022.

24. Interprovincial migrants and immigrants are those who migrated between July 1, 2021 and June 30, 2022, while non-permanent residents and the population are those accounted for on July 1, 2022.

Figure 2.2
Population pyramid of total population, interprovincial migrants, immigrants and non-permanent residents, 2022, Canada



Source: Statistics Canada, Centre for Demography.

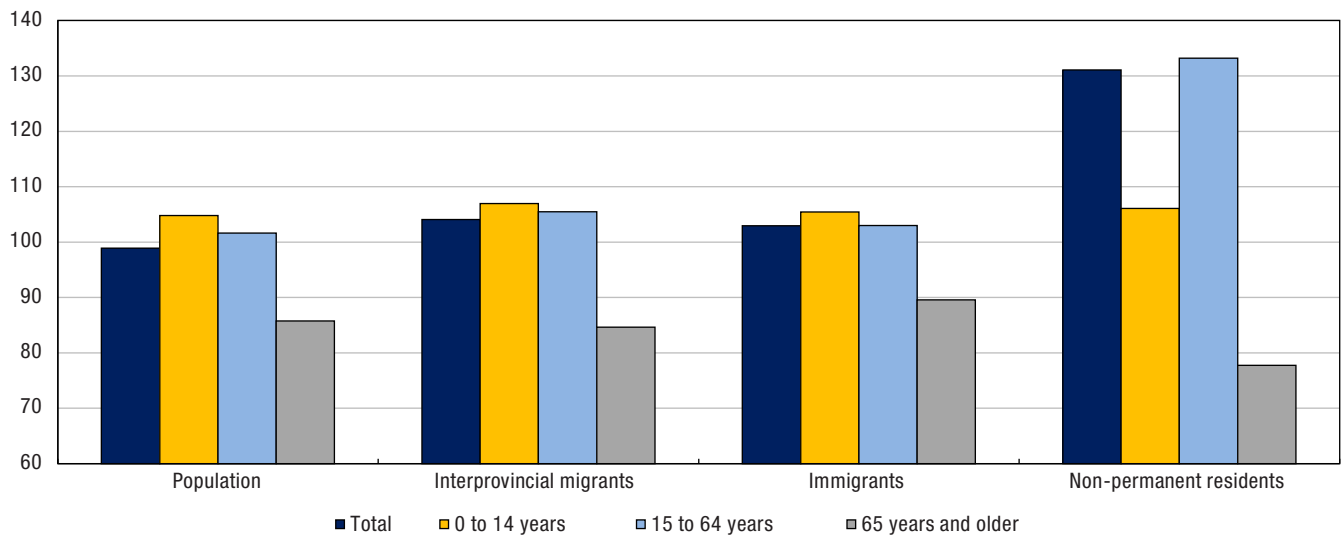
Immigrants stood out for having a demographic weight of children aged 0 to 14 (14.8%) similar to the total Canadian population (15.6%), particularly because of family migration. The proportion of immigrants aged 65 and older (3.2%) can be explained by the migration of the parents of immigrants. In comparison, 5.1% of non-permanent residents were aged 0 to 14 in 2022. The distinct age structure of non-permanent residents is because those who come to Canada mainly do so for work or to study, and are often young adults with no children. Moreover, interprovincial migration among those 65 and older (7.7%) was partly associated with retirement migrations.

Males outnumber females among immigrants, non-permanent residents and interprovincial migrants

The sex structure also differs between each of the three subgroups. Males were overrepresented among non-permanent residents (131.1 males per 100 females). However, among interprovincial migrants (104.1 males per 100 females) and immigrants (103.0 males per 100 females), the sex ratios were closer to that of the overall Canadian population (98.9 males per 100 females).

Chart 2.8
Sex ratio by age group of the population, interprovincial migrants, immigrants and non-permanent residents, 2022, Canada

number of males for 100 females



Source: Statistics Canada, Centre for Demography.

Table 2.1
Annual population estimates by age group and sex at July 1 - Canada

	2015	2016	2017	2018	2019	2020	2021	2022
	number							
Both sexes	35,702,908	36,109,487	36,545,236	37,065,084	37,601,230	38,007,166	38,226,498	38,929,902
0 to 4 years	382,102	383,216	378,918	376,127	372,056	369,839	360,185	368,644
5 to 9 years	383,421	385,775	386,225	382,732	379,706	374,985	370,545	363,975
10 to 14 years	386,608	388,255	389,132	390,726	387,048	383,336	376,371	375,419
15 to 19 years	388,123	391,702	391,897	393,870	395,223	391,198	384,855	381,827
20 to 24 years	388,624	393,843	395,666	397,028	398,751	399,512	393,154	391,290
25 to 29 years	396,474	394,434	398,049	401,050	402,149	403,462	401,809	400,715
30 to 34 years	399,561	402,550	398,672	403,551	406,301	406,854	406,025	410,045
35 to 39 years	401,027	405,083	406,671	403,680	408,621	410,840	409,223	414,422
40 to 44 years	391,009	405,371	409,100	411,504	408,276	412,854	412,872	417,064
45 to 49 years	381,421	395,785	409,072	413,528	415,931	412,197	414,722	420,380
50 to 54 years	375,990	386,484	399,381	413,363	417,762	419,631	413,858	421,877
55 to 59 years	381,012	381,692	389,905	403,441	417,377	421,307	421,216	420,415
60 to 64 years	375,476	385,258	385,031	393,670	407,213	420,736	422,596	427,641
65 to 69 years	378,510	381,421	388,643	388,837	397,493	410,576	422,119	428,836
70 to 74 years	384,475	384,955	385,721	393,078	393,463	401,206	412,023	428,191
75 to 79 years	399,229	392,960	390,654	392,191	399,064	398,668	403,156	418,782
80 to 84 years	401,963	408,362	401,338	399,307	400,750	405,823	401,292	412,744
85 to 89 years	411,278	412,636	417,818	412,104	408,966	407,538	407,759	412,023
90 to 94 years	426,044	425,046	429,734	439,939	433,219	425,563	410,851	428,235
95 to 99 years	454,447	444,839	451,054	462,854	472,651	463,033	434,166	453,266
100 years and older	467,346	463,679	461,118	471,727	482,125	487,850	470,029	476,703
Males	17,712,801	17,916,496	18,136,188	18,406,284	18,682,725	18,885,776	18,999,384	19,357,753
0 to 4 years	195,773	196,177	194,619	192,974	190,494	189,474	185,113	189,172
5 to 9 years	196,009	197,521	197,705	196,577	194,791	191,978	189,824	187,063
10 to 14 years	198,341	198,359	199,293	200,067	198,722	196,590	192,702	192,336
15 to 19 years	198,167	200,595	200,236	201,758	202,358	200,817	197,384	195,483
20 to 24 years	198,386	200,928	202,649	202,892	204,360	204,591	201,842	200,673
25 to 29 years	202,108	201,256	203,122	205,481	205,541	206,735	205,765	205,716
30 to 34 years	203,821	205,079	203,502	206,006	208,173	207,906	208,060	209,999
35 to 39 years	203,867	206,310	207,227	206,135	208,631	210,532	209,120	212,398
40 to 44 years	199,206	206,007	208,526	209,695	208,531	210,778	211,554	213,139
45 to 49 years	194,136	201,308	207,939	210,845	211,935	210,590	211,795	215,477
50 to 54 years	191,817	196,543	203,214	210,184	213,049	213,909	211,492	215,509
55 to 59 years	194,280	194,522	198,333	205,281	212,266	215,011	214,739	214,865
60 to 64 years	191,575	196,093	196,272	200,301	207,215	214,006	215,673	217,920
65 to 69 years	193,668	194,546	197,883	198,222	202,219	208,914	214,663	218,851
70 to 74 years	197,564	196,840	196,775	200,179	200,644	204,152	209,604	217,718
75 to 79 years	205,550	201,737	199,770	200,071	203,238	203,250	205,070	212,876
80 to 84 years	207,204	210,056	205,935	203,951	204,415	206,582	204,456	209,544
85 to 89 years	211,478	212,788	214,820	211,157	208,837	207,852	207,564	209,626
90 to 94 years	220,877	219,036	221,940	226,614	222,381	217,647	209,818	218,158
95 to 99 years	235,182	231,201	233,643	240,446	244,487	238,815	222,459	232,546
100 years and older	243,675	240,486	240,328	245,333	251,136	253,258	243,012	246,153

Table 2.1
Annual population estimates by age group and sex at July 1 - Canada

	2015	2016	2017	2018	2019	2020	2021	2022
	number							
Females	17,990,107	18,192,991	18,409,048	18,658,800	18,918,505	19,121,390	19,227,114	19,572,149
0 to 4 years	186,329	187,039	184,299	183,153	181,562	180,365	175,072	179,472
5 to 9 years	187,412	188,254	188,520	186,155	184,915	183,007	180,721	176,912
10 to 14 years	188,267	189,896	189,839	190,659	188,326	186,746	183,669	183,083
15 to 19 years	189,956	191,107	191,661	192,112	192,865	190,381	187,471	186,344
20 to 24 years	190,238	192,915	193,017	194,136	194,391	194,921	191,312	190,617
25 to 29 years	194,366	193,178	194,927	195,569	196,608	196,727	196,044	194,999
30 to 34 years	195,740	197,471	195,170	197,545	198,128	198,948	197,965	200,046
35 to 39 years	197,160	198,773	199,444	197,545	199,990	200,308	200,103	202,024
40 to 44 years	191,803	199,364	200,574	201,809	199,745	202,076	201,318	203,925
45 to 49 years	187,285	194,477	201,133	202,683	203,996	201,607	202,927	204,903
50 to 54 years	184,173	189,941	196,167	203,179	204,713	205,722	202,366	206,368
55 to 59 years	186,732	187,170	191,572	198,160	205,111	206,296	206,477	205,550
60 to 64 years	183,901	189,165	188,759	193,369	199,998	206,730	206,923	209,721
65 to 69 years	184,842	186,875	190,760	190,615	195,274	201,662	207,456	209,985
70 to 74 years	186,911	188,115	188,946	192,899	192,819	197,054	202,419	210,473
75 to 79 years	193,679	191,223	190,884	192,120	195,826	195,418	198,086	205,906
80 to 84 years	194,759	198,306	195,403	195,356	196,335	199,241	196,836	203,200
85 to 89 years	199,800	199,848	202,998	200,947	200,129	199,686	200,195	202,397
90 to 94 years	205,167	206,010	207,794	213,325	210,838	207,916	201,033	210,077
95 to 99 years	219,265	213,638	217,411	222,408	228,164	224,218	211,707	220,720
100 years and older	223,671	223,193	220,790	226,394	230,989	234,592	227,017	230,550

Note: Estimates are final intercensal up to 2015, final postcensal from 2016 to 2020, updated postcensal for 2021 and preliminary postcensal for 2022.

Source: Statistics Canada, Centre for Demography.

Table 2.2
Annual population estimates and factors of demographic growth by age group and sex, 2021/2022¹ - Canada

	Natural increase			Net interprovincial migration	Net international migration	Total net migration	Total growth
	Births	Deaths					
	number						
Both sexes	368,792	323,221		0	657,833	657,833	703,404
-1 year	368,792	1,543		0	1,395	1,395	368,644
0 to 4 years	...	196		0	3,986	3,986	3,790
5 to 9 years	...	75		0	4,949	4,949	4,874
10 to 14 years	...	60		0	5,516	5,516	5,456
15 to 19 years	...	50		0	6,485	6,485	6,435
20 to 24 years	...	37		0	7,598	7,598	7,561
25 to 29 years	...	42		0	8,278	8,278	8,236
30 to 34 years	...	33		0	8,430	8,430	8,397
35 to 39 years	...	30		0	7,871	7,871	7,841
40 to 44 years	...	24		0	7,532	7,532	7,508
45 to 49 years	...	27		0	7,182	7,182	7,155
50 to 54 years	...	42		0	6,599	6,599	6,557
55 to 59 years	...	32		0	6,457	6,457	6,425
60 to 64 years	...	46		0	6,286	6,286	6,240
65 to 69 years	...	41		0	6,113	6,113	6,072
70 to 74 years	...	71		0	6,830	6,830	6,759
75 to 79 years	...	93		0	9,681	9,681	9,588
80 to 84 years	...	123		0	10,854	10,854	10,731
85 to 89 years	...	159		0	20,635	20,635	20,476
90 to 94 years	...	199		0	42,614	42,614	42,415
95 to 99 years	...	242		0	42,779	42,779	42,537
100 years and older	...	247		0	25,455	25,455	25,208

Table 2.2
Annual population estimates and factors of demographic growth by age group and sex, 2021/2022¹ - Canada

	Natural increase		Net interprovincial migration	Net international migration	Total net migration	Total growth
	Births	Deaths				
				number		
Males	189,290	167,389	0	336,468	336,468	358,369
-1 year	189,290	847	0	729	729	189,172
0 to 4 years	...	111	0	2,061	2,061	1,950
5 to 9 years	...	36	0	2,548	2,548	2,512
10 to 14 years	...	36	0	2,817	2,817	2,781
15 to 19 years	...	30	0	3,319	3,319	3,289
20 to 24 years	...	17	0	3,891	3,891	3,874
25 to 29 years	...	22	0	4,256	4,256	4,234
30 to 34 years	...	19	0	4,357	4,357	4,338
35 to 39 years	...	18	0	4,037	4,037	4,019
40 to 44 years	...	12	0	3,935	3,935	3,923
45 to 49 years	...	15	0	3,729	3,729	3,714
50 to 54 years	...	22	0	3,395	3,395	3,373
55 to 59 years	...	16	0	3,197	3,197	3,181
60 to 64 years	...	27	0	3,205	3,205	3,178
65 to 69 years	...	22	0	3,077	3,077	3,055
70 to 74 years	...	42	0	3,314	3,314	3,272
75 to 79 years	...	61	0	4,535	4,535	4,474
80 to 84 years	...	78	0	5,248	5,248	5,170
85 to 89 years	...	111	0	10,705	10,705	10,594
90 to 94 years	...	137	0	22,865	22,865	22,728
95 to 99 years	...	172	0	23,866	23,866	23,694
100 years and older	...	173	0	13,801	13,801	13,628
Females	179,502	155,832	0	321,365	321,365	345,035
-1 year	179,502	696	0	666	666	179,472
0 to 4 years	...	85	0	1,925	1,925	1,840
5 to 9 years	...	39	0	2,401	2,401	2,362
10 to 14 years	...	24	0	2,699	2,699	2,675
15 to 19 years	...	20	0	3,166	3,166	3,146
20 to 24 years	...	20	0	3,707	3,707	3,687
25 to 29 years	...	20	0	4,022	4,022	4,002
30 to 34 years	...	14	0	4,073	4,073	4,059
35 to 39 years	...	12	0	3,834	3,834	3,822
40 to 44 years	...	12	0	3,597	3,597	3,585
45 to 49 years	...	12	0	3,453	3,453	3,441
50 to 54 years	...	20	0	3,204	3,204	3,184
55 to 59 years	...	16	0	3,260	3,260	3,244
60 to 64 years	...	19	0	3,081	3,081	3,062
65 to 69 years	...	19	0	3,036	3,036	3,017
70 to 74 years	...	29	0	3,516	3,516	3,487
75 to 79 years	...	32	0	5,146	5,146	5,114
80 to 84 years	...	45	0	5,606	5,606	5,561
85 to 89 years	...	48	0	9,930	9,930	9,882
90 to 94 years	...	62	0	19,749	19,749	19,687
95 to 99 years	...	70	0	18,913	18,913	18,843
100 years and older	...	74	0	11,654	11,654	11,580

... not applicable

1. Period from July 1 to June 30.

Note: Preliminary estimates.

Source: Statistics Canada, Centre for Demography.

Table 2.3
Annual estimates of demographic components by age group and sex, 2021/2022¹ — Canada

	Natural increase		Interprovincial migration		International migration				
	Births	Deaths	In-migrants	Out-migrants	Immigrants	Emigrants	Returning emigrants	Net temporary emigrants	Net non-permanent residents
	number								
Both sexes	368,792	323,221	349,563	349,563	492,984	49,769	40,326	30,946	205,238
-1 year	368,792	1,543	2,348	2,348	730	335	321	206	885
0 to 4 years	...	196	4,659	4,659	2,477	683	648	415	1,959
5 to 9 years	...	75	4,620	4,620	3,385	691	616	417	2,056
10 to 14 years	...	60	4,500	4,500	4,060	692	584	420	1,984
15 to 19 years	...	50	4,313	4,313	5,218	689	552	417	1,821
20 to 24 years	...	37	4,089	4,089	5,986	675	523	411	2,175
25 to 29 years	...	42	3,823	3,823	6,286	657	495	398	2,552
30 to 34 years	...	33	3,543	3,543	6,364	637	472	386	2,617
35 to 39 years	...	30	3,274	3,274	6,102	612	450	368	2,299
40 to 44 years	...	24	3,005	3,005	6,206	581	430	350	1,827
45 to 49 years	...	27	2,765	2,765	5,914	548	419	332	1,729
50 to 54 years	...	42	2,568	2,568	5,475	524	411	316	1,553
55 to 59 years	...	32	2,415	2,415	5,336	493	407	295	1,502
60 to 64 years	...	46	2,347	2,347	4,948	439	410	264	1,631
65 to 69 years	...	41	2,383	2,383	4,700	361	418	217	1,573
70 to 74 years	...	71	2,522	2,522	4,457	286	433	172	2,398
75 to 79 years	...	93	2,714	2,714	4,218	216	448	127	5,358
80 to 84 years	...	123	2,930	2,930	4,013	170	459	101	6,653
85 to 89 years	...	159	3,442	3,442	3,643	197	501	117	16,805
90 to 94 years	...	199	4,282	4,282	3,641	293	591	182	38,857
95 to 99 years	...	242	5,445	5,445	3,771	411	713	257	38,963
100 years and older	...	247	6,570	6,570	5,191	533	827	333	20,303
Males	189,290	167,389	178,286	178,286	250,100	25,636	19,746	15,932	108,190
-1 year	189,290	847	1,258	1,258	363	174	166	108	482
0 to 4 years	...	111	2,537	2,537	1,285	356	335	216	1,013
5 to 9 years	...	36	2,473	2,473	1,757	359	322	216	1,044
10 to 14 years	...	36	2,375	2,375	2,058	359	308	218	1,028
15 to 19 years	...	30	2,252	2,252	2,630	357	293	216	969
20 to 24 years	...	17	2,111	2,111	3,098	350	280	213	1,076
25 to 29 years	...	22	1,963	1,963	3,232	340	264	206	1,306
30 to 34 years	...	19	1,807	1,807	3,276	329	251	200	1,359
35 to 39 years	...	18	1,663	1,663	3,159	317	239	190	1,146
40 to 44 years	...	12	1,517	1,517	3,206	301	228	181	983
45 to 49 years	...	15	1,395	1,395	3,024	284	220	172	941
50 to 54 years	...	22	1,294	1,294	2,825	272	213	164	793
55 to 59 years	...	16	1,216	1,216	2,707	255	207	153	691
60 to 64 years	...	27	1,183	1,183	2,577	228	205	135	786
65 to 69 years	...	22	1,189	1,189	2,391	184	209	111	772
70 to 74 years	...	42	1,249	1,249	2,260	144	218	86	1,066
75 to 79 years	...	61	1,331	1,331	2,190	106	227	62	2,286
80 to 84 years	...	78	1,433	1,433	2,096	80	234	46	3,044
85 to 89 years	...	111	1,686	1,686	1,839	95	252	56	8,765
90 to 94 years	...	137	2,130	2,130	1,867	148	284	92	20,954
95 to 99 years	...	172	2,735	2,735	1,890	215	328	135	21,998
100 years and older	...	173	3,326	3,326	2,597	282	369	178	11,295

Table 2.3
Annual estimates of demographic components by age group and sex, 2021/2022¹ — Canada

	Natural increase		Interprovincial migration		International migration				
	Births	Deaths	In-migrants	Out-migrants	Immigrants	Emigrants	Returning emigrants	Net temporary emigrants	Net non-permanent residents
Females	179,502	155,832	171,277	171,277	242,884	24,133	20,580	15,014	97,048
-1 year	179,502	696	1,090	1,090	367	161	155	98	403
0 to 4 years	...	85	2,122	2,122	1,192	327	313	199	946
5 to 9 years	...	39	2,147	2,147	1,628	332	294	201	1,012
10 to 14 years	...	24	2,125	2,125	2,002	333	276	202	956
15 to 19 years	...	20	2,061	2,061	2,588	332	259	201	852
20 to 24 years	...	20	1,978	1,978	2,888	325	243	198	1,099
25 to 29 years	...	20	1,860	1,860	3,054	317	231	192	1,246
30 to 34 years	...	14	1,736	1,736	3,088	308	221	186	1,258
35 to 39 years	...	12	1,611	1,611	2,943	295	211	178	1,153
40 to 44 years	...	12	1,488	1,488	3,000	280	202	169	844
45 to 49 years	...	12	1,370	1,370	2,890	264	199	160	788
50 to 54 years	...	20	1,274	1,274	2,650	252	198	152	760
55 to 59 years	...	16	1,199	1,199	2,629	238	200	142	811
60 to 64 years	...	19	1,164	1,164	2,371	211	205	129	845
65 to 69 years	...	19	1,194	1,194	2,309	177	209	106	801
70 to 74 years	...	29	1,273	1,273	2,197	142	215	86	1,332
75 to 79 years	...	32	1,383	1,383	2,028	110	221	65	3,072
80 to 84 years	...	45	1,497	1,497	1,917	90	225	55	3,609
85 to 89 years	...	48	1,756	1,756	1,804	102	249	61	8,040
90 to 94 years	...	62	2,152	2,152	1,774	145	307	90	17,903
95 to 99 years	...	70	2,710	2,710	1,881	196	385	122	16,965
100 years and older	...	74	3,244	3,244	2,594	251	458	155	9,008

... not applicable

1. Period from July 1 to June 30.

Note: Preliminary estimates.

Source: Statistics Canada, Centre for Demography.

Methodology

This document describes the concepts, data sources and methodology used to produce the population estimates. Population estimates are produced to measure the population counts according to various characteristics and geographies between two censuses. The demographic estimates are the official population estimates at the national, provincial and territorial levels.

Postcensal estimates are based on the 2016 Census.

Specific information regarding age and sex distributions is provided in boxes.

Population Estimates

Estimates of the total population

Types of estimates

Population estimates can be either intercensal or postcensal. Intercensal estimates are produced using the counts from two consecutive censuses adjusted for census net undercoverage (CNU)¹ and postcensal estimates. The production of intercensal estimates involves updating the postcensal estimates using the counts from a new census adjusted for CNU.¹

Postcensal estimates are produced using data from the most recent census adjusted for CNU¹ and the components of demographic growth. In terms of timeliness, postcensal estimates are more up-to-date than data from the most recent census adjusted for CNU,¹ but as they get farther from the date of that census, they become more variable.

Levels of estimates

The production of the population estimates between censuses entails the use of data from administrative files or surveys. The quality of population estimates therefore depends on the availability of a number of administrative data files that are provided to Statistics Canada by Canadian and foreign government departments. Since some components are not available until several months after the reference date, three kinds of postcensal estimates are produced preliminary postcensal (PP), updated postcensal (PR) and final postcensal (PD). The time lag between the reference date and the release date is three months for preliminary estimates and two to three years for final estimates. Though it requires more vigilance on the part of users, the production of three successive series of postcensal estimates is the strategy that best satisfies the need for both timeliness and accuracy of the estimates. All tables indicate the level of the estimates they contain.

Calculation of postcensal population estimates

Population estimates – preliminary, updated and final – are produced by the component method. This method consists of taking the population figures from the most recent census, adjusted for the CNU¹ (census undercoverage minus census overcoverage), and adding or subtracting the number of births, deaths, and components of international and interprovincial migration.

A. Provincial / territorial estimates of total population

Population estimates are produced for the provinces and territories first; then they are summed to obtain an estimate of the population of Canada.

1. In this case, the adjustment for the census net undercoverage also includes the incompletely enumerated reserves (IER) and the demographic adjustment (for the estimates by age and sex).

The component-method formula for estimating the total provincial / territorial populations is as follows:

$$P_{(t+i)} = P_{(t)} + B_{(t,t+i)} - D_{(t,t+i)} + I_{(t,t+i)} - [E_{(t,t+i)} + \Delta TE_{(t,t+i)}] + RE_{(t,t+i)} + \Delta NPR_{(t,t+i)} + \Delta Ninter_{(t,t+i)} - Resid_{(t,t+i)}$$

where, for each province and territory:

$(t, t + i)$	= interval between times t and t+i;
$P_{(t+i)}$	= estimate of the population at time t+i;
$P_{(t)}$	= base population at time t (census adjusted for (CNU) ¹ or most recent estimate);
B	= number of births;
D	= number of deaths;
I	= number of immigrants;
E	= number of emigrants;
ΔTE	= net temporary emigration;
RE	= number of returning emigrants;
ΔNPR	= net non-permanent residents;
$\Delta Ninter$	= net interprovincial migration;
$Resid$	= residual deviation (for intercensal estimates).

B. Provincial / territorial estimates by age and sex

Population estimates by age and sex are produced by applying the component method to each age-sex cohort in the base population.

At age 0:

$$P_{(t+1)}^0 = B_{(t,t+1)} - D_{(t,t+1)}^{-1} + I_{(t,t+1)}^{-1} - [E_{(t,t+1)}^{-1} + \Delta TE_{(t,t+1)}^{-1}] + RE_{(t,t+1)}^{-1} + \Delta NPR_{(t,t+1)}^{-1} + \Delta Ninter_{(t,t+1)}^{-1} - Resid_{(t,t+1)}^{-1}$$

From 1 to 99 years:

$$P_{(t+1)}^{a+1} = P_{(t)}^a - D_{(t,t+1)}^a + I_{(t,t+1)}^a - [E_{(t,t+1)}^a + \Delta TE_{(t,t+1)}^a] + RE_{(t,t+1)}^a + \Delta NPR_{(t,t+1)}^a + \Delta Ninter_{(t,t+1)}^a - Resid_{(t,t+1)}^a$$

For 100 years and older:

$$P_{(t+1)}^{100+} = P_{(t)}^{99+} - D_{(t,t+1)}^{99+} + I_{(t,t+1)}^{99+} - [E_{(t,t+1)}^{99+} + \Delta TE_{(t,t+1)}^{99+}] + RE_{(t,t+1)}^{99+} + \Delta NPR_{(t,t+1)}^{99+} + \Delta Ninter_{(t,t+1)}^{99+} - Resid_{(t,t+1)}^{99+}$$

where, for each province and territory:

$(t, t + 1)$	=	interval between times t and $t+1$;
a	=	age;
$P_{(t+1)}$	=	estimate of the population at time $t+1$;
$P_{(t)}$	=	base population at time t (census adjusted for (CNU) ¹ , or most recent estimate);
B	=	number of births;
D	=	number of deaths;
I	=	number of immigrants;
E	=	number of emigrants;
ΔTE	=	net temporary emigration;
RE	=	number of returning emigrants;
ΔNPR	=	net non-permanent residents;
$\Delta Ninter$	=	net interprovincial migration;
$Resid$	=	residual deviation (for intercensal estimates).

C. Levels of estimates

The difference between preliminary² and final postcensal population estimates lies in the timeliness of the components. When all the components are preliminary, the population estimate is described as preliminary postcensal (PP). When they are all final, the estimate is referred to as final postcensal (PD). Any other combination of levels is referred to as updated postcensal (PR).

Base population and components of demographic growth**A. Base population**

The base populations are derived from the quinquennial censuses between 1971 and 2016. The population universe of the 2016³ Census includes the following groups:

- Canadian citizens (by birth or by naturalization) and immigrants with a usual place of residence in Canada;
- Canadian citizens (by birth or by naturalization) and immigrants who are abroad either on a military base or attached to a diplomatic mission;
- Canadian citizens (by birth or by naturalization) and immigrants at sea or in port aboard merchant vessels under Canadian registry or Canadian government vessels;
- persons with a usual place of residence in Canada who are claiming refugee status and the family members living with them;
- persons with a usual place of residence in Canada who hold study permits and the family members living with them;
- persons with a usual place of residence in Canada who hold work permits and the family members living with them.

2. Unless otherwise noted, the term preliminary include both preliminary and updated estimates.

3. From 1991 to 2001 Census, "persons with a usual place of residence in Canada who hold Minister's permits (including extensions) and members of their families living with them" were included in the census universe.

For census purposes, the last three groups are referred to as non-permanent residents (NPR). They have been included in the census universe since 1991 but foreign residents are not included. Foreign residents are persons who belong to the following groups:

- government representatives of another country attached to the embassy, high commission or other diplomatic body of that country in Canada, and members of their families living with them;
- members of the Armed Forces of another country who are stationed in Canada, and family members living with them;
- residents of another country visiting Canada temporarily (for example, a foreign visitor on vacation or on business, with or without a visitor's permit).

These base populations are adjusted as follows:

- adjustment of the population for CNU;
- addition of independent estimates for incompletely enumerated reserves in 1991, 1996, 2001, 2006, 2011 and 2016;
- adjustment for early enumeration in 1991 and 1996 in parts of Northern Quebec, Newfoundland and Labrador, the Yukon and the Northwest Territories;
- addition of estimates of NPRs in 1971, 1976, 1981 and 1986. Since 1991, NPRs are included in the census universe;
- estimation of the July 1 base population by addition or subtraction of the components of growth between Census Day and June 30;
- demographic adjustment for old age population is an age structure adjustment of censal estimates for 2001, 2006, 2011 and 2016 by sex for each province and territory. An adjustment for the population at age zero is also done for the same period.

Adjustment for the census net undercoverage (CNU)

The adjustment for CNU is important. CNU is the difference between the number of persons who should have been enumerated but were missed (undercoverage) and the number of persons who were enumerated but should not have been or who were counted more than once (overcoverage).

Coverage studies provide undercoverage estimates for the 1991, [1996](#), [2001](#), [2006](#), [2011](#) and [2016](#) censuses at the provincial and territorial levels, and for the 1971, 1976, 1981 and 1986 censuses at the provincial level only. Estimates of overcoverage at the provincial and territorial levels are available only for the last six censuses (1991 to 2016). Overcoverage for previous censuses was estimated by assuming that the overcoverage-to-undercoverage ratio for each census between 1971 and 1986 was the same as in 1991. The CNU for the Yukon and the Northwest Territories prior to 1991 was estimated by assuming that the ratio between the CNU for each territory and the 10 provinces for each census between 1971 and 1986 was the same as in 1991.

For consistency, the 1991 Census undercoverage and overcoverage were revised in 1998 to take into account the methodological improvements made in the 1996 Census coverage studies. This revision altered CNU in all censuses between 1971 and 1986. Similarly, the 1996 Census undercoverage and overcoverage were revised in 2003.

Various methods were used to produce the estimates of CNU by age and sex for 1991, 1996, 2001, 2006, 2011 and 2016. First, the national estimates of CNU based on the coverage studies by age and sex were smoothed. Then an Empirical Bayes regression model was used to generate the provincial and territorial estimates of CNU by broad age groups, and a synthetic model produced estimates by single year of age. Lastly, two-way raking⁴ was used to ensure that CNU estimates were consistent with the provincial and territorial CNU totals and the national estimates by age and sex.

For the 1971 to 1986 period, CNU estimates by age and sex were simply prorated to the revised CNU estimates for the total population.

Demographic adjustment at age 0

To minimize inconsistencies with vital statistics information, it was decided to adjust the censal population estimates at age 0 to the postcensal estimates at the same age.

Demographic adjustment for very elderly populations

An analysis of the age and sex structure of recent census counts and postcensal population estimates reveals that the very elderly population, particularly people aged 95 and older, can be affected by overestimation or underestimation that coverage studies do not manage to correct. For very elderly populations, the types of errors and their magnitude can vary from one census to another, from misreporting errors (voluntary and involuntary) to data capture and/or process errors.

On 2016 Census Day, postcensal estimates of the number of centenarians, still based on the 2011 Census, were significantly lower than the 2016 Census counts, translating into significant errors of closure. Specifically, among women, the postcensal estimates of the number of centenarians corresponded to only 59% of the 2016 Census counts and, among men, to only 4%. Historically, the enumerated centenarian population has often been overestimated; however, gaps of this size between census counts and postcensal estimates are symptomatic of a defect. This could indicate that the downward adjustment to the 2011 Census counts was too aggressive for the population aged 95 and older, the group that made up the centenarian population in 2016.

When the 2011 Census cycle was rebased, Statistics Canada's Population Estimates Program reviewed its demographic adjustment method for very elderly populations using the extinct cohort method and the survival ratio method. The resulting observations revealed that these approaches, although tested in the scientific literature, are highly sensitive to the choice of certain parameters, such as assumptions on the future evolution of survival rates. This could partially account for the unsatisfactory results recently observed following a comparison of the number of centenarians between the postcensal estimates and the 2016 Census counts.

In light of these findings, the demographic adjustment for very elderly populations for rebasing the 2016 Census cycle used a more holistic strategy to make use of a vast range of available data sources. First, administrative data from the Office of the Chief Actuary of Canada (OCA) as well as from the T1 Family File (T1FF) were considered to compare them with the census counts. Next, we also used the most recent life tables published by Statistics Canada. Using the mortality rates in these tables and deaths, as measured in vital statistics, enabled us to calculate a theoretical population centred on the date of the four most recent censuses. The very elderly populations were also calculated using the extinct cohort method and the survival ratio method, as a point of comparison.

For the entire period from 2001 to 2016, we simulated different scenarios, using the data sources and methods identified in the previous paragraph on their own or combined with others. Next, the age and sex structures produced by each scenario chosen were examined in detail, particularly to detect possible inconsistencies. Special attention was given to evaluating the ratios between men and women, given that the adjustments

4. *Two-way raking* is also referred to as the "Deming method", the "method of iterative proportions", and calibration (see Shryock, Siegel *et al.*, 1976: 547-549).

were calculated independently for each sex. A similar analysis was done on the basis of the probabilities of death calculated for each scenario chosen. Finally, a detailed analysis of errors of closure rounded out the comparative analysis of the scenarios being studied.

For the two most heavily populated provinces in Canada, Ontario and Quebec, the method that performed the best was the one based on the calculation of a theoretical population using data from the life tables and vital statistics. In the other provinces and territories, this method did not perform optimally, likely because the number of observations for deaths in very elderly populations drawn from vital statistics was too limited. The administrative data from OCA helped to produce a more consistent portrait of very elderly populations in terms of their age and sex structure and their death probabilities and generated the biggest error of closure decreases. The universe of these administrative data is more or less the universe of Old Age Security (OAS) program beneficiaries. For Quebec and Ontario, the administrative data from OCA were also used to revise the calculation of potential outliers. The adjusted censal estimate was therefore systematically capped to correspond to the value obtained using administrative data from OCA. This approach is based on the assumption that OCA has very complete data, which are more likely characterized by a very slight overestimation than by underestimation. Similarly, the adjusted censal estimate was systematically replaced by administrative data from the T1FF if the latter were higher than the former. This approach is based on the assumption that the T1FF data are characterized by slightly incomplete coverage, and therefore, constitute a lower limit.

To ensure the best possible consistency of estimates by cohort, the demographic adjustment for very elderly populations was carried out on the 2001, 2006, 2011 and 2016 census populations, by age and sex for each province⁵. These adjustments were performed from age 90 on. The surplus populations were redistributed among the population aged 5 to 74 years, by their relative weight per province or territory and by sex.

The robustness of this new adjustment method will be monitored throughout the 2016 cycle and research to improve its accuracy and coherence will continue.

B. Births and deaths

The numbers of births and deaths are derived directly from the vital statistics database of Statistics Canada's Centre for Population Health Data. Although Statistics Canada manages the National system of vital statistics, the central vital statistics registries of the provinces and territories are responsible for collecting and processing the information from those administrative files. Under provincial / territorial vital statistics statutes (or similar legislation), all live births and all deaths must be registered, and all provinces and territories provide this information to Statistics Canada.

The vital statistics universe applied to the population estimates includes births and deaths occurring in Canada, in which the usual place of residence of either the birth mother or the deceased is Canada. Any death or birth occurring outside of Canada, even if the mother or the deceased is Canadian, is excluded from the vital statistics population.

Vital statistics by province or territory of residence are used to produce our final estimates of births and deaths. However, before 2011, the final estimates may differ from the data released by the Centre for Population Health Data due to the imputation of certain unknown values. In addition, for estimates of deaths, the age represents age at the beginning of the period (July 1st) and not the age at the time of occurrence, as with the Centre for Population Health Data data. The Centre for Population Health Data releases preliminary data that the Centre for Demography will use. However, this data will not be final.

When there are no vital statistics, the number of births is estimated using quarterly fertility rates by the mother's age group. The number of deaths is estimated by using quarterly mortality rates by age group and sex. These methods are used to calculate preliminary² estimates.

5. Demographic adjustment was not deemed necessary in the territories.

Special treatment for preliminary² estimates for Quebec, British Columbia and Yukon

Quebec, British Columbia and Yukon provide their most recent estimates of births and deaths. The figures are used to produce preliminary² estimates. For the final estimates, births and deaths for Quebec and British Columbia are derived from the vital statistics compiled by the Centre for Population Health Data. As of 2017, the total number of births and deaths for Yukon come from their statistical agency.

With regard to the preliminary² estimates, the number of births by sex is derived by applying an average proportion by sex for each province and territory to the total births. These proportions are calculated using the births from vital statistics from the past 10 years.

With regard to the preliminary² estimates, the number of deaths by age and sex is derived by applying mortality rates by age and sex for each province and territory to the total deaths. These mortality rates are calculated using the deaths from vital statistics from the past 2 final years.

Quebec provides its most recent estimates of births by sex and deaths by age and sex. They are used for the preliminary² estimates.

In the absence of births and deaths from vital statistics for Yukon, the 2016 distribution is used to generate births by sex and deaths by age and sex.

Levels of estimates

For information on the differences between preliminary² and final estimates, see section **B. Births and Deaths**, above.

C. Immigration

Like the numbers of births and deaths, Canadian immigration statistics must be kept by law. In Canada, immigration is regulated by the *Immigration and Refugee Protection Act* (IRPA) of 2002. This statute superseded the *Immigration Act*, which was passed in 1976 and amended more than 30 times in the years thereafter. Immigration, Refugees and Citizenship Canada (IRCC) collects and processes immigrants' administrative files. It then provides Statistics Canada with information from Global Case Management System (GCMS) files (until December 2010, data come from the Field Operational Support System files (FOSS)). The information is used to estimate the number and characteristics of people granted permanent resident status by the federal government on a given date. For the Centre for Demography, the terms immigrant and permanent resident are equivalent.

An immigrant is a person who is not a Canadian citizen by birth, but has been granted the right to live in Canada permanently by Canadian immigration authorities. The number of immigrants does not include persons born abroad to Canadian parents who are only temporarily outside the country.

Immigrants are usually counted on or after the date on which they are granted permanent resident status or the right to live in Canada.

The estimates of immigrants by age and sex are derived from the Global Case Management System (GCMS).

Levels of estimates

The difference between preliminary² and final postcensal estimates lies in the timeliness of the source used to estimate this component. Since the GCMS files are continually being updated, new calculations are carried out each year to update the immigration estimates. Immigration estimates are preliminary the first year and final the second year.

D. Net non-permanent residents

Like the numbers of births and deaths, Canadian immigration statistics must be kept by law. In Canada, the non-permanent residents (NPR) are regulated by the *Immigration and Refugee Protection Act* (IRPA) of 2002. This statute superseded the *Immigration Act*, which was passed in 1976 and amended more than 30 times in the years thereafter. Immigration, Refugees and Citizenship Canada (IRCC) collects and processes the administrative files of immigrants and NPRs in Canada. It then provides Statistics Canada with information from Global Case Management System (GCMS) files (until June 2011, data come from the Field Operational Support System files (FOSS)). The information is used to estimate the number and characteristics of people granted non-permanent resident status by the federal government.

NPRs are persons who are lawfully in Canada on a temporary basis under the authority of a temporary resident permit, along with members of their family living with them. NPRs include foreign workers, foreign students, the humanitarian population and other temporary residents. The humanitarian population includes refugee claimants and temporary residents who are allowed to remain in Canada on humanitarian grounds and are not categorized as either foreign workers or foreign students. For the Centre for Demography, the terms non-permanent resident and temporary resident are equivalent.

The number of people in IRCC's administrative system is estimated on a specific date in each period of observation. First, the end-of-period number of NPR is estimated, and then the start-of-period number of NPR is subtracted from that estimate. That yields the net NPRs used in the calculation of the population estimates.

Anyone who received non-permanent resident status prior to the observation date is counted. For refugee claimants, the date of their application is used. Permit holders and refugee claimants are excluded from the population if their permit has expired, if they receive permanent resident status, or if they are deported. In addition, refugee claimants are excluded if their file has been inactive for two years.

Since GCMS files are continually being updated, the figures are recalculated each year until the estimates of net NPR are final.

The estimates of net non-permanent residents by age and sex are derived from the Global Case Management System (GCMS).

Levels of estimates

The difference between preliminary² and final estimates lies in the timeliness of the source used to estimate this component. Since the GCMS files are continually being updated, the figures are recalculated each year to update the estimates of the net number of NPRs. Non-permanent resident (NPR) estimates are preliminary the first year and updated the following year. They become final two to three years after the reference year, when all other components are also final.

E. Emigration

The number of emigrants is estimated using data from the Office of Immigration Statistics, U.S. Department of Homeland Security, data collected by the Canada child benefit (CCB) program and data from the T1 Family File (T1FF⁶). The first source is used to estimate emigration to the United States. CCB data are used to estimate emigration to other countries. The estimates of the number of child emigrants have to be adjusted because the CCB is not universal and does not provide direct information on the number of adult emigrants. As a result, four adjustment factors are taken into account:

- incomplete coverage due to a delay in the receipt and processing of the files of children eligible for the CCB. Since it seems to take four years after the reference period for CCB administrative files to become complete, the adjustment is made when the estimates are used before this date. The factor is derived from the two-year ratios of emigrant children based on two versions of the CCB files;

6. The T1 family file (T1FF) is derived from the Canada Revenue Agency (CRA) T1 file by Statistics Canada Centre for Income and Socioeconomic Well-being Statistics.

- the program's partial coverage, that is, people who do not apply for the CCB or who are not eligible. This factor is obtained by comparing the estimated number of children in the population with the number of children in CCB files;
- the differential propensity to emigrate between children who are eligible for the CCB and children who are not. This factor is obtained by comparing the emigration rates of CCB-eligible children with the rates for all children (aged 0 to 17). This factor is calculated for each province and territory and is based on the last three available years of T1FF;⁶
- the differential propensity to emigrate between adults and children. This factor generates the emigration rate for the population aged 18 and over. It is obtained by (1) calculating the average ratio over three years of the adult and child emigration rates based on T1FF⁶ data, (2) calculating the average ratio over three years of the adult and child emigration rates based on data from the Office of Immigration Statistics, U.S. Department of Homeland Security, and (3) taking the average of the two rates. This factor is calculated for Canada only.

The adult emigration rate is applied to the adult population. Adult emigration is distributed by province and territory using data from the T1FF⁶ file. We calculate a ratio of the number of emigrant adults to the number of emigrant children from the T1FF⁶ file. We then apply this ratio to the number of emigrant children from the CCB by province, which yields the number of adult emigrants whose provincial distribution will differ from that of the children.

The number of adult emigrants combined with the number of child emigrants (once adjusted for the coverage and differential emigration factors) generate the number of emigrants for the entire population.

Emigration is disaggregated by province and territory based on the number of child emigrants adjusted for coverage and differential emigration.

Please note that the estimates for the most recent periods are expected to be very similar. In the absence of more up-to-date data sources, the emigration rate of the last available year is applied to the beginning of the year population estimate to be estimated.

The estimates of the emigrants by age and sex are obtained by using the data by five-year age group, sex, province and territory from T1FF⁶ files adjusted for the coverage. We distribute these estimates by single year of age using Sprague coefficients.

Levels of estimates

For information on the differences between preliminary² and final estimates, see section **E. Emigration**, above.

F. Net temporary emigration

Some people leave Canada to live temporarily in another country while others who were temporarily outside of Canada return. The net result of those departures and returns is the component known as "net temporary emigration". Estimates of the number of departures are derived from the Reverse Record Check (RRC), the most important census coverage study. The RRC provides an estimate of the number of people who left Canada temporarily during an intercensal period and are still out of the country at the end of the period. Estimates of the number of returns are based on two sources: the census and the Centre for Demography estimates of returning emigrants. The census provides the number of people who were outside Canada at the time of the previous census and returned during the intercensal period. That number includes all returning emigrants. Then the Centre for Demography's estimate of the returning emigrants component is subtracted to produce the number of returning temporary emigrants. The estimated numbers of departures (RRC) and returns (census and Centre for Demography) yield an estimate of net temporary emigration.

The five-year net temporary emigration is calculated first at the national level. It is then disaggregated by province or group of provinces based on RRC estimates of temporary emigration. For the Atlantic provinces and the territories, the estimate for the group is disaggregated on the basis of each province / territory's proportion of the group's total population.

This estimate is for the whole intercensal period; it is disaggregated into estimates for each of the five years in the period and then into monthly estimates using a seasonal adjustment that is an average between zero seasonality and the seasonality of emigration.

Net temporary emigration can be estimated only for the intercensal period preceding the most recent census. For the postcensal period, the rate of the last available year (2015/2016) is applied to the beginning of the year population estimate to be estimated.

The age and sex distribution of the net temporary emigration is derived from the emigration age and sex distribution.

Levels of estimates

The difference between preliminary² and final estimates lies in the timeliness of the emigration estimate used to calculate the seasonal adjustment for the net temporary emigration. The same estimation method is used.

G. Returning emigrants

A returning emigrant is a person who returns to Canada after having been classified as an emigrant. In a manner similar to the procedure used to calculate the number of emigrants, data from the Canada child benefit (CCB) file from Canada Revenue Agency (CRA) and T1FF⁶ file are used to estimate the number of returning emigrants. Adjustment factors are applied to compensate for the fact that the CCB program is not universal, and an adult/child ratio is used to estimate the number of adult returning emigrants. As a result, four adjustment factors are used to take into account:

- incomplete coverage due to a delay in the receipt and processing of the files of children eligible for the CCB. Since it seems to take four years after the reference period for CCB administrative files to become complete, the adjustment is made when the estimates are used before this date. The factor is derived from the two-year ratios of returning emigrant children based on two versions of the CCB files;
- the program's partial coverage, that is, people who do not apply for the CCB or who are not eligible. This factor is obtained by comparing the estimated number of children in the population with the number of children in CCB files;
- the differential propensity to emigrate between children who are eligible for the CCB and children who are not. This factor is obtained by comparing the emigration rates of CCB-eligible children with the rates for all children (aged 0 to 17). This factor is calculated for each province and territory and is based on the last three available years of T1FFs;⁶

1. the adult / child ratio, which is based on the data from the 2016 Census.

Please note that the estimates for the most recent periods are expected to be identical or very similar. In the absence of more up-to-date data sources, the assumption is made that levels remain similar.

The age and sex distribution of returning emigrants is based on the census at the national level. Characteristics of returning emigrants are derived from the census question on location of residence one year ago, after excluding non-permanent residents and immigrants. From 2016/2017, the distribution by age and sex derived from the 2016 Census is used.

Levels of estimates

For information on the differences between preliminary² and final estimates, see section **G. Returning emigrants**, above.

H. Interprovincial migration

Interprovincial migration represents movements from one province or territory to another, involving a change in usual place of residence. As is the case for emigration, there is no provision for recording interprovincial migration in Canada. Consequently, such movements have to be estimated using data from the Canada child benefit (CCB) of Canada Revenue Agency (CRA) and T1FF.⁶

Final estimates of interprovincial migration are obtained by comparing addresses indicated on personal income tax returns over two consecutive tax years. However, the migration status of tax filers' dependants has to be imputed. An adjustment is also required to take into account migrants who do not file income tax returns. From 2001/2002 to 2005/2006, the adjustment was slightly modified (for further information, see [Wilkinson, 2004](#)). From 2006/2007, this adjustment has been slightly modified (Cyr, 2008 – Internal document).

Since income tax returns are not available at the time preliminary² estimates are produced, the estimation of preliminary² interprovincial migration is based on CCB administrative files, which provide counts of child migrants (aged 0 to 17) registered to the program. The estimates have to be adjusted later for children who are not registered to the CCB program. Finally, the number of adult migrants is calculated using the number of child migrants and factors derived from the T1FF.⁶ As a result, three adjustment factors are used to take into account:

- the program's partial coverage, that is, people who are not registered to the CCB program. This factor is obtained by comparing the estimated number of children in the population with the number of children in CCB files;
- the differential propensity to migrate between children who are registered to the CCB program and children who are not. This factor is obtained by comparing the out-migration rates of children registered to the CCB program with the rates for all children (aged 0 to 17). This factor is calculated for each province and territory and is based on the last available year of T1FF;⁶
- the differential propensity to migrate between adults and children. This factor generates the out-migration rate of the population aged 18 and over for each province / territory of origin and destination. It is obtained by calculating the ratio of the central migration rate for adults to the rate for children. It is estimated using data from the last three available years of T1FF.⁶

The adult migration rate is then applied to the estimated adult population. The number of adult migrants is then added to the number of child migrants to produce the number of interprovincial migrants for the entire population.

Since 2015, the method to estimate the interprovincial migration has been modified. This new method is applied from July 2011 onward. In order to reduce the differences between the preliminary annual series (which was derived from the sum of 12 monthly migration matrices) and the final annual series, CCB microdata have been used. Using microdata is allowing estimating migration for various periods (monthly, quarterly and annually). It also allows improving the comparability between preliminary and final estimates. Final annual estimates (T1FF)⁶ are now distributed by quarter on the basis of preliminary² quarterly estimates derived from CCB microdata. It is important to note that, as a result of using CCB microdata, it is not possible to add the quarterly interprovincial in-migrants and out-migrants estimates to get the annual estimates. It is however possible to add the quarterly net interprovincial migration estimates to get the annual estimates.

Interprovincial migration by age and sex is derived from T1FF⁶ data and counts from the last available census (question on location of residence one year ago). From 2016/2017, the 2016 Census age and sex distribution is used to split the broad age groups of the T1FF⁶ file.

Levels of estimates

For information on the differences between preliminary² and final estimates of total interprovincial migration, see section **H. Interprovincial migration** above.

Intercensal population estimates

Intercensal estimates – population estimates for reference dates between two censuses – are produced following each census. They reconcile previous postcensal estimates with the new census counts adjusted for the CNU¹.

There are two main steps in the production of intercensal estimates:

- calculation of the error of closure;
- linear distribution of the error of closure.

The error of closure is defined as the difference between the postcensal population estimates on Census Day and the population enumerated in that census adjusted for CNU.¹

The error of closure is spread uniformly over the intercensal period of days within each month.

Intercensal estimates by age and sex are adjusted in the same way, i.e., by distributing the error of closure uniformly across the age-sex cohorts.

Quality of demographic data

The estimates contain certain inaccuracies stemming from two types of errors:

- errors in the census data;
- imperfections in other data sources and the method used to estimate the components.

Census data

A. Coverage, response and imputation errors

The errors attributable to census data can be divided into two groups: response and processing errors, and coverage errors. The first group implies non-response error, misinterpretation by respondents, incorrect coding and non-response imputation. Errors in the second group primarily result from undercoverage and, to a lesser extent, overcoverage. It should be noted that both types of errors are intrinsic to any survey data.

The coverage errors occur when dwellings and/or individuals are missed, incorrectly included (except for the 2006, 2011 and 2016 censuses, where people incorrectly included were not considered in the Census Overcoverage Study) or counted more than once. Following each census, Statistics Canada undertakes coverage studies to measure these errors. The main studies are the Reverse Record Check Survey (RRC) and the Census Overcoverage Study (COS). Based on these studies, estimates of census undercoverage and overcoverage are produced. The Centre for Demography adjusts the population enumerated in the census by province and territory using these estimates.

When creating base populations, the Demographic Estimates Program (DEP) corrects the census populations only for coverage errors. This correction, which is based on the findings of coverage studies, is primarily subject to sampling errors, and to a lesser extent, processing errors. Statistical tests indicate that coverage adjustments improve the quality of census data. The DEP uses the estimates from coverage studies for the provinces and territories. However, given the size of the samples in these studies, estimates by age and sex are modelled. Furthermore, it is assumed that the coverage rates estimated for a province or territory apply to the regions within that geographic area. Prior to 1993⁷, the DEP used census data that was unadjusted for coverage errors. Coverage studies had been done to measure undercoverage, but none measured overcoverage. Following the decision to integrate a correction for the coverage to the enumerated population in 1991, the DEP had to revise the population estimates for the period from 1971 to 1992. The correction is based on the findings of the coverage studies conducted during this period and on hypotheses regarding the ratio between the overcoverage and undercoverage levels based on the findings of subsequent coverage studies.

The corrections to the census data due to CNU improved, in general, the quality of the estimates by compensating for the differential undercoverage by age, sex and by province/territory across censuses.

7. In September 1993, the DEP took advantage of the integration of the 1991 Census counts to produce a series of estimates beginning in 1971 and including census net undercoverage.

Text table 1

Estimated census net undercoverage, Canada, provinces and territories, 2001 to 2016 censuses

Geography	Census population	Census net undercoverage	Incompletely enumerated reserves	Adjusted population	Rate
	A	B	C	D=A+B+C	(B+C)/D*100
	number				percent
2016¹					
Canada	35,151,728	849,727	27,790	36,029,245	2.44
Newfoundland and Labrador	519,716	9,774	0	529,490	1.85
Prince Edward Island	142,907	3,464	0	146,371	2.37
Nova Scotia	923,598	17,809	0	941,407	1.89
New Brunswick	747,101	15,735	0	762,836	2.06
Quebec	8,164,361	35,191	11,985	8,211,537	0.57
Ontario	13,448,494	381,542	11,640	13,841,676	2.84
Manitoba	1,278,365	31,895	0	1,310,260	2.43
Saskatchewan	1,098,352	34,844	0	1,133,196	3.07
Alberta	4,067,175	115,968	4,043	4,187,186	2.87
British Columbia	4,648,055	197,267	122	4,845,444	4.07
Yukon	35,874	2,370	0	38,244	6.20
Northwest Territories	41,786	2,939	0	44,725	6.57
Nunavut	35,944	929	0	36,873	2.52
2011¹					
Canada	33,476,688	759,125	37,392	34,273,205	2.32
Newfoundland and Labrador	514,536	10,192	0	524,728	1.94
Prince Edward Island	140,204	3,386	0	143,590	2.36
Nova Scotia	921,727	21,911	0	943,638	2.32
New Brunswick	751,171	3,930	0	755,101	0.52
Quebec	7,903,001	73,240	16,882	7,993,123	1.13
Ontario	12,851,821	369,874	14,926	13,236,621	2.91
Manitoba	1,208,268	21,698	608	1,230,574	1.81
Saskatchewan	1,033,381	29,580	768	1,063,729	2.85
Alberta	3,645,257	128,584	4,094	3,777,935	3.51
British Columbia	4,400,057	91,280	114	4,491,451	2.03
Yukon	33,897	1,356	0	35,253	3.85
Northwest Territories	41,462	1,977	0	43,439	4.55
Nunavut	31,906	2,117	0	34,023	6.22
2006¹					
Canada	31,612,897	868,658	40,115	32,521,670	2.79
Newfoundland and Labrador	505,469	5,046	0	510,515	0.99
Prince Edward Island	135,851	1,903	0	137,754	1.38
Nova Scotia	913,462	24,558	0	938,020	2.62
New Brunswick	729,997	16,059	0	746,056	2.15
Quebec	7,546,131	60,751	16,600	7,623,482	1.01
Ontario	12,160,282	465,824	15,391	12,641,497	3.81
Manitoba	1,148,401	34,330	0	1,182,731	2.90
Saskatchewan	968,157	22,594	739	991,490	2.35
Alberta	3,290,350	111,353	7,272	3,408,975	3.48
British Columbia	4,113,487	121,551	113	4,235,151	2.87
Yukon	30,372	1,805	0	32,177	5.61
Northwest Territories	41,464	1,620	0	43,084	3.76
Nunavut	29,474	1,264	0	30,738	4.11
2001¹					
Canada	30,007,094	924,430	34,539	30,966,063	3.10
Newfoundland and Labrador	512,930	9,401	0	522,331	1.80
Prince Edward Island	135,294	1,325	0	136,619	0.97
Nova Scotia	908,007	24,521	0	932,528	2.63
New Brunswick	729,498	20,095	0	749,593	2.68
Quebec	7,237,479	140,232	12,648	7,390,359	2.07
Ontario	11,410,046	436,349	15,960	11,862,355	3.81
Manitoba	1,119,583	30,903	110	1,150,596	2.70
Saskatchewan	978,933	21,231	581	1,000,745	2.18
Alberta	2,974,807	69,857	4,977	3,049,641	2.45
British Columbia	3,907,738	164,542	263	4,072,543	4.05
Yukon	28,674	1,423	0	30,097	4.73
Northwest Territories	37,360	3,295	0	40,655	8.10
Nunavut	26,745	1,256	0	28,001	4.49

1. The levels and rates are based on the Reverse Record Check (RRC) and the Overcoverage Study and include non-permanent residents.

Source: Statistics Canada, Centre for Demography.

The adjustment also incorporates the results of a study on the estimates of the number of people living on incompletely enumerated reserves to complete the corrections for coverage errors in the census. The results of the coverage studies contain mainly sampling errors.

These adjustments have a direct impact on:

- the error of closure and its distribution by age and sex within a province or a territory as well as by province/territory as the CNU¹ and its distribution vary from one census to another;
- within-cohort consistency of population estimates. If for example, the male cohort of children in age group 0 to 4 in 1981 was tracked up to the 2001 Census (unadjusted for CNU)¹ the age group 20 to 24 would be noticeably smaller in 2001 than the age group 15 to 19 in 1996. Since Canada receives many immigrants within these age groups, the opposite would be expected. However, only after adjustment for CNU,¹ the cohort size increases from 1996 to 2001.

Text table 2
Census adjustment rates by age group, 2001 to 2016 censuses, Canada

	2001	2006	2011	2016
All ages	3.10	2.79	2.32	2.44
0 to 4 years	3.38	1.91	0.95	2.14
5 to 9 years	2.18	0.96	-0.25	-0.94
10 to 14 years	1.07	0.95	0.08	-0.36
15 to 19 years	2.93	3.14	2.90	2.90
20 to 24 years	7.09	7.56	6.76	5.98
25 to 29 years	8.26	8.88	8.26	6.97
30 to 34 years	6.38	6.83	6.70	6.09
35 to 39 years	4.62	4.95	4.12	4.66
40 to 44 years	2.70	4.14	2.51	3.55
45 to 49 years	1.49	1.73	1.91	2.93
50 to 54 years	1.33	0.66	0.98	2.36
55 to 59 years	1.14	0.00	0.03	1.53
60 to 64 years	0.69	-0.08	-0.27	0.51
65 to 69 years	0.75	-0.48	-0.41	-0.35
70 to 74 years	0.83	-0.73	-0.52	-0.99
75 to 79 years	0.48	-0.48	-0.51	-1.36
80 to 84 years	0.54	-0.70	-0.51	-1.15
85 to 89 years	0.38	-0.33	-0.49	-0.89
90 to 94 years	-0.14	-3.67	1.48	-0.76
95 to 99 years	-1.99	-7.66	0.91	2.55
100 years and older	-8.27	-6.07	1.42	3.40

Note: The census adjustment represents the sum of census net undercoverage, incompletely enumerated reserves and demographic adjustment

Source: Statistics Canada, Centre for Demography.

For further information regarding the main coverage studies, please see the following document on Statistics Canada's web site: [1996](#), [2001](#), [2006](#), [2011](#) and [2016](#) Census Technical Report on Coverage.

Components

Errors due to estimation methodologies and data sources other than the census can also be significant.

A. Births and deaths

Since the law requires the recording of vital statistics, the final estimates for births and deaths data meet very high standards. Nevertheless, since preliminary² estimates are derived, they can be slightly different from final estimates.

B. Immigration and non-permanent residents

With respect to immigrants and non-permanent residents, Immigration, Refugees and Citizenship Canada (IRCC) administers special data files on both of these components. Since immigration is controlled by law, data on immigrants and NPRs are compiled upon arrival in Canada. These data represent only “legal” immigration and exclude illegal immigrants. Thus, for the “legal” part of international movement into Canada, the data are considered to be of high quality. However, some biases such as the difference between the stated province of intended residence at the time of arrival and the actual province of residence, may persist. Finally, since information provided by the Visitor Data System (VDS) from IRCC is not complete (age and sex of dependents, province of residence for certain groups of permit holders), estimates of NPRs are more prone to error than data on immigrants.

C. Emigration, returning emigration and net temporary emigration

Of all the demographic components that are used by the DEP, the emigration, returning emigration and net temporary emigration are the most difficult to estimate with precision. Canada does not have a complete border registration system. While immigration and non-permanent residents (NPRs) are well documented by the federal government, Statistics Canada has always used indirect techniques for the estimation of the number of persons leaving the country. For this reason, available statistics regarding these three components have historically been of a lower quality than other components.

Estimates of the number of emigrants and returning emigrants are both derived using Canada child benefit (CCB) data provided by Canada Revenue Agency (CRA). Estimates must be adjusted to take into account the incomplete coverage of the program and to derive the emigration and returning emigration of adults.

These adjustments and the delay in obtaining the data are the two main sources of errors. As current information on the number of persons living temporarily abroad does not exist, estimates are based on the Reverse Record Check (RRC) and the census. Estimates for the intercensal period are distributed equally among the five years. Moreover, assumptions were made to allow for the distribution of national estimates by province and territory and of annual estimates to a quarterly level. Assumptions must also be made to establish the variation for the postcensal period. Any geographical or quarterly variation may introduce error in the estimation of these components.

D. Interprovincial migration

Since July 1993, preliminary² interprovincial migration estimates have been based on Canada child benefit (CCB) files. As this program covers only children, various adjustments must be done in order to derive the migration of adults. Consequently, preliminary² CCB based estimates are subject to larger error than final estimates derived from Canada Revenue Agency (CRA) tax files.

E. Level of detail of components

As a more detailed breakdown of the data introduces a greater risk of inaccuracy into the estimates, the possibility of error in the components is augmented by the method used to distribute the estimates by age and sex. It seems that, in general, the initial errors should be minimal where the distribution of annual estimates of births, deaths and immigrants is concerned, and more significant with regard to the distribution of other components (non-permanent residents, emigrants, returning emigrants, net temporary emigrants and interprovincial migrants). Finally, the size of error due to the age and sex distribution may vary by period and errors in some components may have a greater impact on a given age group or sex.

Quality assessment

In order to assess the quality of our estimates, two evaluation measures are used: precocity errors and errors of closure.

A. Precocity error

The quality of preliminary estimates of components is evaluated using precocity errors. Precocity error is defined as the difference between preliminary and final estimates of a particular component in terms of its relative proportion of the total population for the relevant geographical area. The precocity error can be calculated for both population and component estimates. The precocity error measures the impact of the trade-off of accuracy in favour of timeliness on the estimated population. The annual precocity error of a component is calculated as:

$$PE_{(t-1,t)} = \frac{\left(N_{(t-1,t)}^{preliminary} - N_{(t-1,t)}^{final} \right)}{P_{(t-1)}^{postcensal}} \times 1,000$$

where,

- $PE_{(t-1,t)}$ = the precocity error for the period from t-1 to t;
- $N_{(t-1,t)}^{preliminary}$ = the preliminary estimate of a component of demographic change;
- $N_{(t-1,t)}^{final}$ = the final estimate of a component of demographic change;
- $P_{(t-1)}^{postcensal}$ = postcensal estimates of population for the relevant geographical area at time t-1.

Precocity error allows for useful comparisons between components, as well as between provinces and territories having different population size. Precocity error can either be positive or negative. A positive precocity error denotes that the preliminary estimate is larger than the final estimate while a negative precocity error indicates the opposite. As precocity errors measure differences between preliminary and final estimates, small precocity errors refer to those that are close to zero per thousand.

Precocity error by component for Canada

At the national level, the immigration component yielded the smallest precocity errors in absolute values, with error values close to zero per thousand throughout the years under consideration. On the other hand, interprovincial in-migrants and out-migrants⁸ yielded the largest precocity errors in absolute values, ranging between 0.17 per thousand and 0.98 per thousand during the period 2017/2018 to 2020/2021 (see Table 3).

8. At the national level, net interprovincial migration equals to zero as the sum of interprovincial in-migrants is equivalent to the sum of interprovincial out-migrants.

Text table 3
Most up-to-date annual precocity errors for components, Canada, provinces and territories

Year/Component	Canada	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nvt.
	per thousand													
Births														
2016/2017	0.28	0.05	0.42	0.26	0.11	0.00	0.44	0.52	0.24	0.62	-0.05	-0.70	1.48	1.11
2017/2018	0.25	0.68	0.96	0.39	0.20	0.00	0.30	0.05	0.40	0.79	-0.03	0.33	0.22	-0.08
2018/2019	0.26	0.15	0.59	0.53	0.25	0.00	0.39	0.50	0.65	0.42	-0.01	0.62	-0.09	0.58
2019/2020	0.10	0.04	0.06	0.22	0.11	-0.02	0.16	0.09	-0.02	0.28	-0.02	1.91	0.07	-0.54
Deaths														
2016/2017	0.12	0.25	0.68	0.28	-0.21	-0.04	0.26	-0.18	0.24	0.19	-0.05	-0.10	-0.49	1.22
2017/2018	-0.10	0.10	-1.23	-0.39	-0.21	-0.04	-0.16	-0.05	0.06	-0.08	-0.05	0.28	0.27	0.35
2018/2019	0.13	0.32	0.47	0.19	0.25	-0.04	0.22	0.32	0.13	0.28	-0.05	-0.20	0.56	-1.18
2019/2020	0.09	-0.11	-0.24	-0.11	0.47	0.02	0.23	-0.03	0.08	0.02	-0.05	-0.34	-0.13	0.10
Immigration														
2017/2018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2019/2020	0.01	0.00	0.02	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.02	0.00	0.00	0.00
2020/2021	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00
Emigration														
2016/2017	0.24	-0.01	0.32	0.21	0.29	0.19	0.31	0.29	0.04	0.16	0.28	-1.53	-0.56	0.00
2017/2018	0.52	0.28	0.36	0.07	-0.14	0.39	0.69	0.26	0.33	0.63	0.51	0.66	-0.25	0.05
2018/2019	0.39	0.23	0.04	0.39	0.04	0.35	0.40	0.36	0.04	0.39	0.60	0.39	0.42	0.34
2019/2020	0.11	-0.02	-0.01	0.31	0.26	0.10	0.07	0.08	-0.14	0.08	0.33	-0.05	0.22	-0.03
Returning emigration														
2016/2017	-0.02	-0.02	-0.23	-0.20	-0.04	-0.07	-0.03	0.00	-0.15	0.19	0.01	-0.26	-0.22	0.00
2017/2018	0.04	-0.08	-0.13	0.08	-0.11	0.07	-0.01	0.13	-0.03	0.05	0.17	0.08	-0.42	0.00
2018/2019	0.05	0.11	-0.04	0.21	-0.01	0.03	0.05	0.08	0.11	0.01	0.09	-0.07	-0.18	0.39
2019/2020	0.10	0.01	0.01	0.03	0.10	0.02	0.22	0.17	0.03	0.11	-0.11	-0.27	0.11	0.00
Net temporary emigration														
2016/2017	-0.24	-0.03	-0.03	-0.02	-0.03	-0.29	-0.46	0.05	-0.25	0.01	0.10	-0.26	-0.20	-0.24
2017/2018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
2018/2019	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	0.02	0.00
2019/2020	-0.17	-0.06	-0.06	-0.06	-0.06	-0.12	-0.21	-0.06	-0.10	-0.12	-0.24	-0.15	-0.18	-0.18
Net non-permanent residents														
2016/2017	0.08	0.58	0.76	0.55	0.36	-0.23	0.42	0.50	0.69	0.57	-1.28	-0.91	0.25	0.11
2017/2018	0.09	0.55	0.34	0.64	0.38	-0.41	0.58	0.61	0.41	0.00	-0.78	-0.30	0.16	-0.03
2018/2019	0.08	0.25	-0.87	0.23	0.23	-0.39	0.66	0.70	0.28	-0.05	-0.91	-1.18	-0.73	-0.03
2019/2020	0.00	0.04	0.16	-0.30	-0.05	-0.41	0.41	-0.13	0.03	-0.06	-0.37	-1.11	-0.33	-0.10
In-migrants														
2017/2018	0.67	0.92	2.01	1.16	0.92	0.21	0.71	0.36	1.67	1.73	-0.09	7.30	1.31	11.91
2018/2019	0.98	0.55	2.35	1.64	1.46	0.37	0.72	0.68	2.43	3.02	0.43	-0.07	2.73	14.13
2019/2020	-0.17	0.51	-7.65	-1.37	-0.35	0.03	-0.36	-0.33	0.44	0.83	-0.56	-6.46	0.40	12.75
2020/2021	0.94	1.45	2.11	1.46	1.76	0.43	0.61	-2.33	1.39	1.98	2.24	-1.00	4.39	9.45
Out-migrants														
2017/2018	0.67	2.67	6.15	1.57	1.61	0.34	0.15	1.90	2.20	0.63	1.17	8.00	12.05	4.85
2018/2019	0.98	4.18	5.82	1.98	2.84	0.25	0.36	2.08	2.64	1.26	1.87	13.94	5.60	10.88
2019/2020	-0.17	-0.53	2.59	0.35	0.76	-0.34	-0.20	-0.04	0.30	-0.21	-0.30	0.07	3.51	7.70
2020/2021	0.94	0.95	3.53	0.40	2.66	0.26	0.53	2.66	3.29	2.51	0.51	4.86	6.24	16.29
Net interprovincial migration														
2017/2018	...	-1.75	-4.14	-0.41	-0.69	-0.13	0.56	-1.54	-0.53	1.10	-1.26	-0.71	-10.74	7.06
2018/2019	...	-3.62	-3.47	-0.34	-1.38	0.13	0.36	-1.40	-0.21	1.76	-1.44	-14.02	-2.87	3.25
2019/2020	...	1.05	-10.24	-1.72	-1.11	0.38	-0.17	-0.29	0.14	1.05	-0.25	-6.53	-3.11	5.05
2020/2021	...	0.49	-1.43	1.07	-0.90	0.17	0.09	-4.99	-1.90	-0.54	1.73	-5.86	-1.85	-6.84

... not applicable

Source: Statistics Canada, Centre for Demography.

Precocity errors for births were positive for the entire period under consideration, ranging from 0.10 per thousand in 2019/2020 to 0.28 per thousand in 2016/2017. Precocity errors for deaths were positive for three of the past four years under consideration. Only the year 2017/2018 had a negative precocity error at -0.10 per thousand, the other years ranging from 0.09 per thousand (2019/2020) to 0.13 per thousand (2018/2019).

Precocity errors for emigration and returning emigration were mostly positive. During the years under consideration, precocity error in absolute values for emigration was lowest in 2019/2020 (0.11 per thousand) and largest in 2017/2018 (0.52 per thousand). For returning emigration, the absolute value of the error ranged from 0.02 per thousand in 2016/2017 to 0.10 per thousand in 2019/2020. In 2016/2017, the precocity error for net temporary emigration was -0.24 per thousand and it was -0.17 per thousand in 2019/2020. In 2017/2018 and 2018/2019 it was close to zero per thousand.

Over the period 2016/2017 to 2019/2020, precocity error of the net non-permanent residents ranged from close to zero per thousand in 2019/2020 to 0.09 per thousand in 2017/2018.

Precocity error by component for provinces and territories

In general, precocity error is typically more prone to higher volatility for smaller provinces or territories as it is an error measurement relative to the population size. At the provincial and territorial level, precocity errors in absolute values for births ranged from close to zero per thousand (Quebec from 2016/2017 to 2018/2019)⁹ to 1.91 per thousand (in Yukon for 2019/2020).

Overall, precocity errors for deaths were slightly more often positive than negative. For the years under consideration, the largest precocity error in absolute value for deaths was 1.23 per thousand (Prince Edward Island in 2017/2018).

Compared to the other demographic components, precocity errors for immigration were low among the provinces and territories. The largest absolute error value was 0.02 per thousand in Prince Edward Island and in British Columbia in 2019/2020. Otherwise, the precocity error values for all provinces and all territories for the years from 2017/2018 and 2018/2019 was close to zero per thousand. For 2020/2021, the precocity errors for most provinces and territories were also about zero per thousand, with the exception of Prince Edward Island (0.01 per thousand) and Saskatchewan (-0.1 per thousand).

Precocity errors in absolute values for the net change in the number of non-permanent residents were less than or equal to 1.28 per thousand across the provinces and territories, during the years 2016/2017 to 2019/2020.

Precocity errors in absolute values for emigration ranged from close to zero per thousand (in Nunavut for 2016/2017) to 1.53 per thousand (in Yukon for 2016/2017). The absolute values of precocity errors for returning emigration ranged from close to zero per thousand for some years in Manitoba and Nunavut to 0.42 per thousand for the Northwest Territories in 2017/2018. Precocity errors for net temporary emigration were negative during the year 2016/2017 (with the exception of Manitoba, Alberta and British Columbia) and the year 2019/2020. The precocity errors were close to zero per thousand for all provinces and all territories in 2017/2018, except for Nunavut (-0.03 per thousand) and for the year 2018/2019, except for Newfoundland and Labrador (-0.01 per thousand), Prince Edward Island (-0.01 per thousand), Yukon (-0.02 per thousand), and the Northwest Territories (0.02 per thousand).

Most of the time, precocity errors for interprovincial in-migrants and out-migrants were positive during the years under consideration, meaning that final estimates were mostly lower than preliminary estimates. Precocity errors for these two components were comparatively larger at the territorial level than for the provinces mainly due to the smaller population size of the territories.

At the provincial level, the largest absolute precocity error value for net interprovincial migration was 10.24 per thousand (Prince Edward Island in 2019/2020), while the smallest was 0.09 per thousand (Ontario in 2020/2021). At the territorial level, precocity errors for net interprovincial migration were comparatively higher, the smallest absolute precocity error was 0.71 per thousand for Yukon in 2017/2018 and the largest was 14.02 per thousand also in Yukon but for the year 2018/2019.

Contribution of components to the sum of precocity errors

When looking at aggregated estimates of precocity errors, there is the potential for a “netting-out” effect, referring to negative precocity errors in one component canceling out positive errors in another component. The analysis of the contribution of each component to the sum of precocity errors without the netting-out effect can be done

9. As mentioned in the Methodology Section, the provincial statistical agencies of Quebec, British Columbia, and Yukon provide their most recent estimates of births and deaths to Statistics Canada. The figures are used to produce preliminary estimates.

by using absolute values of the precocity errors. A mean absolute percentage precocity error by component is calculated by dividing the mean absolute precocity error by component by its sum and expressed in percentage. In this case, the mean absolute precocity error by component is the mean of the absolute precocity errors for the 2015/2016 to 2019/2020 period, the latest 5-year period that annual precocity errors by all components are available.

At the national level, the mean absolute precocity error for the total emigration¹⁰ component contributed the most to the sum of mean absolute precocity errors (50.92%), followed by the errors related to births (25.79%) and deaths (14.37%) between 2015/2016 and 2019/2020. Immigration (1.64%) and net non-permanent residents (7.28%) accounted the least to the sum of mean absolute precocity errors (refer to Table 4).

Text table 4

Mean absolute percentage precocity error by components¹, 2015/2016 to 2019/2020, Canada, provinces and territories

	Births	Deaths	Immigration	Total emigration ²	Net non-permanent residents	Net interprovincial migration
	percent					
Canada	25.79	14.37	1.64	50.92	7.28	0.00
Newfoundland and Labrador	10.42	7.13	0.25	8.30	13.19	60.71
Prince Edward Island	6.66	10.16	0.19	4.46	5.44	73.10
Nova Scotia	13.01	7.96	0.48	12.60	15.47	50.49
New Brunswick	7.13	11.53	0.33	11.00	11.00	59.02
Quebec	0.69	3.62	0.77	42.00	30.51	22.42
Ontario	17.04	11.85	0.59	29.16	20.95	20.42
Manitoba	13.94	6.53	1.21	14.49	18.26	45.56
Saskatchewan	23.29	9.38	1.92	24.15	20.90	20.36
Alberta	17.91	6.18	0.95	16.36	6.23	52.38
British Columbia	1.34	2.22	1.02	24.97	32.87	37.59
Yukon	5.20	2.02	0.00	7.31	4.88	80.59
Northwest Territories	6.03	3.67	0.06	8.10	3.72	78.42
Nunavut	9.67	10.64	0.00	5.43	0.98	73.28

1. Figures in percent may not add up to 100% as a result of rounding.

2. Total emigration includes emigration, returning emigration and net temporary emigration.

Source: Statistics Canada, Centre for Demography.

At the provincial and territorial level, the contribution of the individual components to the sum of mean absolute precocity errors was not uniform across the country. Net interprovincial migration accounted for the largest share of the sum of mean absolute precocity errors in ten out of the thirteen provinces and territories, ranging for those ten provinces between 37.59% in British Columbia to 80.59% in Yukon. In Quebec (42.00%), Ontario (29.16%) and Saskatchewan (24.15%), it is total emigration that explains the largest share of the mean absolute precocity errors (refer to Table 4).

On the other hand, immigration accounted for the smallest share of the sum of mean absolute precocity errors in almost all provinces and territories, ranging from close to zero per thousand in Nunavut to 1.92% in Saskatchewan. The province of Quebec was the sole exception, where births (0.69%) were the smallest share, followed by immigration (0.77%).

Precocity errors by age and sex are not currently available.

10. Mean absolute percentage precocity error for total emigration includes the mean absolute percentages for emigration, returning emigration and net temporary emigration.

B. Error of closure

The error of closure measures the accuracy of the final postcensal estimates. It is defined as the difference between the final postcensal population estimates on Census Day and the enumerated population of the most recent census adjusted for census net undercoverage (CNU¹). A positive error of closure means that the postcensal population estimates have overestimated the population.

The error of closure comes from three sources: errors primarily due to sampling when measuring the starting (2011) and end of period (2016) censuses coverage and errors related to the components of population growth over the intercensal period. For each five-year intercensal period, the error of closure can only be calculated following the release of census data and estimates of CNU.¹ The error of closure can be calculated for the total population of each province and territory as well as by age and sex. For the moment, the error is only available for total population by province and territory.

Text table 5 shows postcensal population estimates on May 10, 2016 and census counts adjusted for CNU¹ and the errors of closure for Canada, provinces and territories from 2001 to 2016.

For Canada as a whole, the error of closure was estimated at 110,310 or 0.31% in 2016. This is a decrease over the error for 2011 (0.42%).

The population estimates overestimated the population of eight provinces, one territory and Canada as a whole. Five provinces posted errors of closure greater than 1% or less than -1%. Of these jurisdictions, only British Columbia's estimated population differed from the adjusted census population by more than 2% (-2.07%). In 2011, four provinces and two territories posted errors of closure greater than 1% or less than -1%.

By considering the variance in CNU, it is possible to identify errors of closure that are statistically significant. Text table 5 shows the results of this analysis.

The error of closure is statistically significant for Canada and seven provinces. This means that the population estimates significantly overestimated or underestimated the adjusted census population in these jurisdictions. As noted above, these results are due to both the sampling for census coverage studies and errors in the components of population growth over the intercensal period. Among these components, interprovincial migration and emigration are mostly associated with large errors of closure.

Text table 5
Error of closure of the population estimates, Canada, provinces and territories, 2001 to 2016

Geography	Postcensal estimate	Census adjusted	Error of closure		CNU standard	t value ³
	on Census Day	for CNU ¹			error ²	
	A	B	C=A-B	D=C/B*100	E	
	number		percent		number	
2016						
Canada	36,139,555	36,029,245	110,310	0.31	43,844	2.52
Newfoundland and Labrador	530,465	529,490	975	0.18	2,015	0.48
Prince Edward Island	149,116	146,371	2,745	1.88	870	3.16
Nova Scotia	948,080	941,407	6,673	0.71	3,042	2.19
New Brunswick	756,736	762,836	-6,100	-0.80	2,777	-2.20
Quebec	8,297,802	8,211,537	86,265	1.05	20,613	4.18
Ontario	13,902,359	13,841,676	60,683	0.44	33,316	1.82
Manitoba	1,313,904	1,310,260	3,644	0.28	4,829	0.75
Saskatchewan	1,145,156	1,133,196	11,960	1.06	4,651	2.57
Alberta	4,231,285	4,187,186	44,099	1.05	13,530	3.26
British Columbia	4,745,041	4,845,444	-100,403	-2.07	16,561	-6.06
Yukon	37,927	38,244	-317	-0.83	191	-1.66
Northwest Territories	44,667	44,725	-58	-0.13	257	-0.23
Nunavut	37,017	36,873	144	0.39	229	0.63

Text table 5

Error of closure of the population estimates, Canada, provinces and territories, 2001 to 2016

Geography	Postcensal estimate on Census Day	Census adjusted for CNU ¹	Error of closure		CNU standard error ²	t value ³
	A	B	C=A-B	D=C/B*100	E	F=C/E
	number		percent		number	
2011						
Canada	34,417,759	34,273,205	144,554	0.42	57,546	2.51
Newfoundland and Labrador	513,622	524,728	-11,106	-2.12	2,912	-3.81
Prince Edward Island	145,759	143,590	2,169	1.51	923	2.35
Nova Scotia	948,457	943,638	4,819	0.51	5,346	0.90
New Brunswick	756,547	755,101	1,446	0.19	3,335	0.43
Quebec	7,968,651	7,993,123	-24,472	-0.31	23,660	-1.03
Ontario	13,345,467	13,236,621	108,846	0.82	44,121	2.47
Manitoba	1,251,999	1,230,574	21,425	1.74	6,104	3.51
Saskatchewan	1,055,858	1,063,729	-7,871	-0.74	6,306	-1.25
Alberta	3,774,557	3,777,935	-3,378	-0.09	18,046	-0.19
British Columbia	4,543,807	4,491,451	52,356	1.17	19,494	2.69
Yukon	35,356	35,253	103	0.29	303	0.34
Northwest Territories	44,139	43,439	700	1.61	323	2.17
Nunavut	33,540	34,023	-483	-1.42	608	-0.79
2006						
Canada	32,553,799	32,521,670	32,129	0.10	53,926	0.60
Newfoundland and Labrador	508,874	510,515	-1,641	-0.32	2,710	-0.61
Prince Edward Island	137,746	137,754	-8	-0.01	701	-0.01
Nova Scotia	933,692	938,020	-4,328	-0.46	4,885	-0.89
New Brunswick	748,737	746,056	2,681	0.36	3,105	0.86
Quebec	7,644,701	7,623,482	21,219	0.28	24,077	0.88
Ontario	12,657,808	12,641,497	16,311	0.13	41,363	0.39
Manitoba	1,176,744	1,182,731	-5,987	-0.51	6,469	-0.93
Saskatchewan	987,706	991,490	-3,784	-0.38	4,805	-0.79
Alberta	3,357,637	3,408,975	-51,338	-1.51	16,091	-3.19
British Columbia	4,296,518	4,235,151	61,367	1.45	16,591	3.70
Yukon	31,146	32,177	-1,031	-3.20	194	-5.31
Northwest Territories	42,160	43,084	-924	-2.14	236	-3.92
Nunavut	30,330	30,738	-408	-1.33	176	-2.32
2001						
Canada	31,016,011	30,966,063	49,948	0.16	44,749	1.12
Newfoundland and Labrador	533,712	522,331	11,381	2.18	1,782	6.39
Prince Edward Island	138,102	136,619	1,483	1.09	775	1.91
Nova Scotia	941,533	932,528	9,005	0.97	4,170	2.16
New Brunswick	754,180	749,593	4,587	0.61	3,555	1.29
Quebec	7,390,137	7,390,359	-222	0.00	21,033	-0.01
Ontario	11,873,643	11,862,355	11,288	0.10	33,472	0.34
Manitoba	1,149,561	1,150,596	-1,035	-0.09	5,423	-0.19
Saskatchewan	1,016,762	1,000,745	16,017	1.60	4,333	3.70
Alberta	3,051,245	3,049,641	1,604	0.05	11,308	0.14
British Columbia	4,068,196	4,072,543	-4,347	-0.11	15,598	-0.28
Yukon	29,737	30,097	-360	-1.20	372	-0.97
Northwest Territories	41,152	40,655	497	1.22	362	1.37
Nunavut	28,051	28,001	50	0.18	411	0.12

1. Census net undercoverage includes the incompletely enumerated reserves.

2. Census net undercoverage excludes the incompletely enumerated reserves.

3. An error of closure with a t value greater than 1.96 or less than -1.96 is statistically significant at the 95% confidence level.

Source: Statistics Canada, Centre for Demography.

The error of closure can be calculated for total population estimates and for age and sex.

Text table 6**Error of closure of the estimates of population by age and sex, 2016, Canada**

	Both sexes		Male		Female	
	number	percent	number	percent	number	percent
All ages	110,310	0.31	46,349	0.26	63,961	0.35
0 to 4 years	-6,932	-0.36	-955	-0.10	-5,977	-0.63
5 to 9 years	-22,391	-1.12	-5,447	-0.54	-16,944	-1.73
10 to 14 years	-34,237	-1.79	-11,105	-1.14	-23,132	-2.46
15 to 19 years	-13,941	-0.67	-9,851	-0.91	-4,090	-0.41
20 to 24 years	75,634	3.17	21,255	1.71	54,379	4.75
25 to 29 years	43,111	1.75	-2,018	-0.16	45,129	3.77
30 to 34 years	32,547	1.31	7,727	0.62	24,820	2.01
35 to 39 years	36,817	1.53	27,234	2.29	9,583	0.79
40 to 44 years	-409	-0.02	8,378	0.72	-8,787	-0.74
45 to 49 years	-19,783	-0.81	-3,663	-0.30	-16,120	-1.32
50 to 54 years	-29,205	-1.06	-9,376	-0.68	-19,829	-1.45
55 to 59 years	-18,258	-0.69	-3,759	-0.28	-14,499	-1.08
60 to 64 years	-15,130	-0.66	-394	-0.03	-14,736	-1.26
65 to 69 years	-1,060	-0.05	2,821	0.30	-3,881	-0.38
70 to 74 years	21,606	1.54	6,827	1.01	14,779	2.02
75 to 79 years	22,059	2.19	6,915	1.49	15,144	2.79
80 to 84 years	12,374	1.67	2,968	0.92	9,406	2.25
85 to 89 years	13,578	2.84	4,376	2.38	9,202	3.13
90 to 94 years	7,159	3.23	2,226	3.26	4,933	3.21
95 to 99 years	5,908	10.19	1,905	14.13	4,003	8.99
100 years and older	863	10.13	285	20.85	578	8.08

Source: Statistics Canada, Centre for Demography.

Explanatory notes for the tables

Text table 7

Annual population estimates and factors of demographic growth

Period	Population at beginning period	Natural increase	Net interprovincial migration	Net international migration	Total net migration	Total growth
2016/2017	PD	D	D	D	D	D
2017/2018	PD	D	D	D	D	D
2018/2019	PD	D	D	D	D	D
2019/2020	PD	D	D	D	D	D
2020/2021	PD	R	D	R	R	R
2021/2022	PR	P	P	P	P	P
2022/2023	PP	...	...	...	...	...
Modified since ¹	2020/2021	2019/2020	2020/2021	2019/2020	2019/2020	2019/2020

... not applicable

¹Modified since indicates the year from which the data were revised since the last release. Last year's data were not modified as they are released for the first time.

Note: D: Final estimates. PD: Final postcensal estimates. R: Updated estimates. PR: Updated postcensal estimates. P: Preliminary estimates. PP: Preliminary postcensal estimates.

Source: Statistics Canada, Centre for Demography.

Text table 8

Annual estimates of components of demographic growth

Period	Births	Deaths	In-migrants	Out-migrants	Immigrants	Emigrants	Returning emigrants	Net temporary emigrants	Net non-permanent residents
2016/2017	D	D	D	D	D	D	D	D	D
2017/2018	D	D	D	D	D	D	D	D	D
2018/2019	D	D	D	D	D	D	D	D	D
2019/2020	D	D	D	D	D	D	D	D	D
2020/2021	R	R	D	D	D	R	R	R	R
2021/2022	P	P	P	P	P	P	P	P	P
Modified since ¹	2019/2020	2019/2020	2020/2021	2020/2021	2020/2021	2019/2020	2019/2020	2019/2020	2019/2020

¹Modified since indicates the year from which the data were revised since the last release. Last year's data were not modified as they are released for the first time.

Note: D: Final estimates. R: Updated estimates. P: Preliminary estimates.

Source: Statistics Canada, Centre for Demography.

Appendix A – Glossary

Age

Age as of July 1.

Aging (of a population)

An increase in the **number of old persons** as a percentage of the total population.

Average age

The average age of a population is the average age of all its members.

Census coverage

Census net undercoverage: Difference between undercoverage and overcoverage.

Overcoverage: Number of persons who should not have been counted in the census or who were counted more than once.

Undercoverage: Number of persons who were intended to be enumerated in a census but were not.

Cohort

Represents a group of persons who have experienced a specific demographic event during a given year. In the cast of births, persons born within a specified year are referred to as a generation.

Components of demographic growth

Any of the classes of events generating population movement variations. Births, deaths and migrations are the components responsible for the variation since they alter either the total population or the age and sex distribution of the population.

Demographic dependency ratio

The **ratio of the combined population** aged from **0 to 14 years old** and the population **aged 65 years** and older to the population aged from **15 to 64 years old**.

Emigrant

Canadian citizen or **immigrant** who has left Canada to establish a residence in another country, involving a change in usual place of residence. Emigration may be either temporary or permanent. Where the term is used alone, it references to a person's permanent emigration which involves severing residential ties with Canada and acquiring permanent residency in another country.

Error of closure

Difference between the **postcensal estimate** at the census date and the results of the census adjusted for **census net undercoverage** (including adjustment for incompletely enumerated reserves).

Generation

Unless otherwise specified, refers here to a group of persons born within a given period. The 2001 generation represents people born during the year 2001.

Immigrant

Within the framework of this publication, the terms immigrant, landed immigrant and permanent resident are equivalent. An immigrant refers to a person who is or has ever been a landed immigrant (permanent resident) and who has been granted the right to live in Canada permanently by immigration authorities. Immigrants are either Canadian citizens by naturalization (the citizenship process) or permanent residents under Canadian legislation. Some immigrants have resided in Canada for a number of years, while others have arrived recently. Most immigrants are born outside Canada, but a small number are born in Canada. Also, children born in other countries to parents who are Canadian citizens that reside temporarily in another country are not included in the category as they become Canadian citizens at birth.

International migration

International migration represents movement of population between Canada and a foreign country which involves a change in the usual place of residence. A distinction is made with regard to **immigrants, emigrants, returning emigrants, net temporary emigration** and **net non-permanent residents**.

Interprovincial migration

Interprovincial migration represents all movement from one province or territory to another involving a change in the usual place of residence. A person who takes up residence in another province or territory is an **out-migrant** with reference to the province or territory of origin and an **in-migrant** with reference to the province or territory of destination.

Median age

The median age is an age “x”, such that exactly one half of the population is older than “x” and the other half is younger than “x”.

Natural increase

Variation in the population size over a given period as a result of the difference between the numbers of births and deaths.

Net international migration

Net international migration is obtained according to the following formula: **Immigrants + returning emigrants + net non-permanent residents – (emigrants + net temporary emigrants)**.

Net interprovincial migration

Net interprovincial migration represents the difference between **in-migrants** and **out-migrants** for a given province or territory.

Net non-permanent residents

Net non-permanent residents represent the variation in the number of non-permanent residents between two dates.

Non-permanent residents

A non-permanent resident is a person who is lawfully in Canada on a temporary basis and who holds a work, study or other (excluding visitor visas) permit issued for that person along with members of their family living with them. This group also includes individuals who seek refugee status upon or after their arrival in Canada and remain in the country pending the outcome of processes relative to their claim. Note that Immigration, Refugees and Citizenship Canada uses the term temporary resident rather than non-permanent resident.

Net temporary emigration

Net temporary emigration represents the variation in the number of temporary emigrants between two dates. Temporary emigration includes Canadian citizens and **immigrants** living temporarily abroad who have not maintained a usual place of residence in Canada.

Population

Estimated population and population according to the census are both defined as being the number of Canadians whose usual place of residence is within that area, regardless of where they happened to be on Census Day. Also included are any Canadians staying in a dwelling in that area on Census Day and having no usual place of residence elsewhere in Canada, as well as those considered **non-permanent residents**.

Population estimate

- a. **Postcensal:** Population estimate produced by using data from the most recent available census adjusted for **census net undercoverage** (including adjustment for incompletely enumerated reserves) and estimate of the **components of demographic growth** since that last census. This estimate can be preliminary, updated or final.
- b. **Intercensal:** Population estimate derived by using **postcensal estimates** and data adjusted for **census net undercoverage** (including adjustment for incompletely enumerated reserves) of censuses preceding and following the year in question.

Population growth or total growth

Variation of population size between two dates. It can also be obtained by summing the **natural increase**, **total net migration** and if applicable, subtract **residual deviation**. It can be positive or negative.

Precocity error

Difference between preliminary and final estimate in terms of its relative proportion of the total population for the relevant geographical area. It can be calculated for either population estimates or components of population growth.

Rate

Refers to the ratio of the number of events estimated in a year ($t, t+1$) to the average populations at the beginning and the end of the period. In this regard, births, deaths, immigration rates, etc are calculated. Generally, the rates are expressed in per 1,000.

Census net undercoverage of population rate: Difference between the census undercoverage rate and the census overcoverage rate.

Demographic growth rate or population growth rate: Ratio of population growth between the year t and $t+1$, to the average **population** of both these years. The rate is generally expressed in per 1,000.

Overcoverage of population rate: The ratio of the number of persons who should not have been counted in the census or who were counted more than once to the total number of persons that should have been enumerated in the census. Generally, the rate is expressed in percentage.

Undercoverage of population rate: The ratio of the estimated number of persons not enumerated in the census (who were intended to have been enumerated) to the total number of persons that should have been enumerated in the census. Generally, the rate is expressed in percentage.

Residual deviation

Difference between demographic **population growth** calculated using **intercensal estimates** of population between two dates and that obtained by the sum of the components for the same period. This deviation results from the distribution of the **error of closure** (based on the number of days) over the months related to the five-year period.

Returning emigrant

Canadian citizen or **immigrant** having previously emigrated from Canada and subsequently returned to the country.

Sex ratio

The ratio of the number of men to the number of women. This is not to be confused with the sex ratio at birth, which is the ratio of the number of live-born boys to the number of live-born girls. This ratio is usually expressed as an index, with the number of females taken to be a base of 100.

Sprague coefficients

Series of factors which, when multiplied to a population distributed by multiples age groups, give a distribution of the same population by single years of age.

Total net migration

Sum of **net international** and **net interprovincial** migration.

Vital statistics

Includes all the demographic events (births, deaths, marriages and divorces) for which there are a legal requirement to inform the Provincial or Territorial Registrar's Office.

Year

Unless otherwise specified, the term "year" refers to the period beginning July 1 of a given year and ending June 30 of the following year.

Appendix B – Sources and remarks

Base population:

May 10, 2016 Census of Population adjusted for census net undercoverage and incompletely enumerated reserves.

2016 Census: Statistics Canada, Census of Canada, 2016, Catalogue no. [98-501-X](#).

Census net undercoverage: See The Daily, September 27, 2018.

Incompletely enumerated reserves: See The Daily, September 27, 2018.

Births and deaths

Statistics Canada, the Centre for Population Health Data.

Statistics Canada, the Centre for Demography, Catalogue no. 91-215-X, annual.

Births

Fertility rates for 2021 based on preliminary count of births by age group of the mother provided by the Centre for Population Health Data applied to the female population estimates by age group at the beginning of the quarter. Births for Quebec, British Columbia and Yukon were provided by their respective agencies.

Note: Births for 2021 provided by the Centre for Population Health Data were incomplete for Nova Scotia for November and December 2021 and for Manitoba for all of 2021. For these two places, birth counts were replaced by estimates based on the fertility rates from 2020. The distribution of births by sex for Manitoba for 2021 were based on the sex ratio in Manitoba in 2020.

Deaths

Mortality rates for 2019 based on preliminary count of deaths by age group and sex provided by the Centre for Population Health Data applied to the population estimates by age group and sex at the beginning of the quarter. Deaths for Quebec, British Columbia and Yukon were provided by their respective agencies.

Note: For the provinces and territories where the usual method was adjusted (data from Quebec, British Columbia, and Yukon were not adjusted), the number of deaths was estimated from two sources: the provisional death counts from the Centre for Population Health Data (CPHD) when available, and the usual method with the addition of the number of COVID-19 deaths as published by the Public Health Agency of Canada (PHAC) when CPHD data were not available.

The age and sex structure of deaths was adjusted to account for COVID-19 using CPHD data when available and by the usual method when CPHD data were not available. Data for Quebec were not adjusted.

Immigration

Estimates are based on the immigrant files provided by Immigration, Refugees and Citizenship Canada (IRCC) received on August 16, 2022.

For methodological reasons, the total numbers of immigrants by province and territory released by the Demographic Estimates Program may differ from those released by IRCC. In the event of a discrepancy between the two sources, the official numbers of immigrants remain those released by IRCC.

Note: No adjustments related to COVID-19 were made to the usual estimating method as IRCC data were received as usual and were of normal quality.

Emigration

The estimates are produced by the Centre for Demography using:

- data from Canada Revenue Agency (CRA) Canada child benefit files (CCB) program. The last year of data used is 2019/2020
- tax data calculated using T1FF file provided by Statistics Canada Centre for Income and Socioeconomic Well-being Statistics. The last year of data used was 2019/2020
- data provided by the U.S. Department of Homeland Security, Office of Immigration Statistics. The last year of data used was 2019/2020
- data on the number of adult and children emigrants from T1FF file used for the provincial distribution of adults. The last year of data used was 2019/2020.

For estimates after 2019/2020, we:

- calculated the 2019/2020 emigration rate for Canada
- applied this rate to Canada's population on July 1st at the beginning of the period to be estimated
- distributed the number of emigrants for Canada by the province and territory according to the provincial distribution of 2019/2020
- distributed these data by month according to the provincial or territorial emigration seasonality of 2019/2020.

Note: Adjustments were made to the usual estimation method in order to take into account the travel restrictions, in Canada and in other countries, imposed within the COVID-19 context. The adjustment was applied from July 2020 to December 2021.

For 2020, it was calculated using the number of emigrants from T1 Family File (T1FF). The monthly ratios between the number of emigrants from the 2018 T1FF and the 2019 final estimates of emigration were applied to the number of emigrants from 2019 T1FF from July 2020 to December 2020. This adjustment resulted in lower estimates of emigration for this period compared with the usual method.

For 2021, the adjustment was only made on the seasonality of emigration. This adjustment was based on the pre-preliminary 2021 T1 data. Adjusted data show slightly less emigrants compared with the usual method from January to September 2021 and more emigrants from October to December.

In 2022, the travel restrictions put in place have been relaxed or abolished over time and successive waves of COVID-19. These changes could indicate a return to emigration levels similar to those observed before the pandemic. To reflect this situation, the usual method was used since the first quarter of 2022.

Returning emigration

The estimates are produced by the Centre for Demography using:

- data from Canada Revenue Agency (CRA) Canada child benefit files (CCB) program. The last year of data used was 2019/2020
- 2016 Census – 1 year mobility.

For estimates after 2019/2020, we:

- calculated the 2019/2020 returning emigration rate for Canada
- applied this rate to Canada's population on July 1st at the beginning of the period to be estimated
- distributed the number of returning emigrants for Canada by the province and territory according to the provincial distribution of 2019/2020
- distributed these data by month according to the provincial or territorial returning emigration seasonality of 2019/2020.

Note: An Adjustment was made to the usual estimation method in order to take into account the travel restrictions, in Canada and in other countries, imposed within the COVID-19 context. The adjustment was applied from July 2020 to December 2020. It was calculated using the number of children returning emigrants from the Canada Child Benefit (CCB). The monthly ratios between the number of children returning emigrants from the 2019 CCB and the 2019 final estimates of returning emigration were applied to the number of children returning emigrants from the CCB from July 2020 to December 2020. This adjustment resulted in lower estimates of returning emigration for this period compared with the usual method.

The travel restrictions put in place have been relaxed or abolished over time and successive waves of COVID-19. These changes could indicate a return to levels of returning emigration similar to those observed before the pandemic. To reflect this situation, the usual method was used since January 2021.

Net temporary emigration

The intercensal estimates are produced by the Centre for Demography using:

- data from the Reverse Record Check (RRC) of the 2016 Census
- 2016 Census – question on the place of residence 5 years ago
- estimates of returning emigrants for 2011 to 2016 intercensal period.

For the postcensal estimates, we:

- calculated the 2015/2016 net temporary emigration rate for Canada
- applied this rate to Canada's population on July 1st at the beginning of the period to be estimated
- distributed the result for the year into monthly estimates using an applied seasonality that is an average between zero seasonality and the seasonality of emigration
- distributed by province and territory the monthly estimates according to the provincial distribution of the intercensal data.

Note: Adjustments were made to the usual estimation method in order to take into account the travel restrictions, in Canada and in other countries, imposed within the COVID-19 context. The adjustments were applied from April 2020 to December 2021. Temporary departures and returns were adjusted independently. Monthly net temporary emigration was divided into departures and returns based on the 2016 Reverse Record Check (RRC) temporary departures and temporary returns estimated by the 2016 Census and the DEP. Then, monthly ratios between the number of permanent emigrants and temporary departures were calculated from 2017 to 2019. These ratios were applied to the estimated number of permanent emigrants from April 2020 to December 2021 (these numbers of permanent emigrants were adjusted as mentioned above). A similar strategy was used to model the number of temporary returns. The adjustments resulted in lower estimates of net temporary emigration compared with the usual method from April 2020 to August 2021 and an increase from September to December 2021.

The travel restrictions put in place have been relaxed or abolished over time and successive waves of COVID-19. These changes could indicate a return to temporary emigration levels similar to those observed before the pandemic. To reflect this situation, the usual method was used since January 2022.

Net non-permanent residents

The estimates are produced by the Centre for Demography using the Global Case Management System (GCMS) files from IRCC. These files, received on August 16, 2022, document the number of permit holders and asylum claimants.

Since March 17, 2022, persons with a Canada-Ukraine authorization for emergency travel who are on Canadian soil are included.

Note: No adjustments related to COVID-19 were made to the usual estimating method as IRCC data were received as usual and were of normal quality.

Interprovincial migration

The estimates are produced by the Centre for Demography using:

- adjusted migration data for children from Canada child benefit (CCB) program from Canada Revenue Agency (CRA)
- factors (G_j) corresponding to the ratio of the migration rate of all children to the migration rate of who are registered to the CCB program children calculated using 2020/2021 tax file data
- factors (F_{jk}) used to calculate adult migration and corresponding to the ratio of the adult to child migration rates, calculated on a three-year basis using tax file data for 2018/2019, 2019/2020 and 2020/2021.

Notes: Due to a change in methodology, we remind you that the in- and out- interprovincial migrants cannot be summed in order to obtain a different period (for example, the sum of the quarterly estimates is not equal to the annual estimates). This method has been applied starting with July 2011.

No adjustments related to COVID-19 were made to the usual estimating method.

Related products

Publications

91-003-X	Canadian Demographics at a Glance
91-209-X	Report on the Demographic Situation in Canada
91-214-X	Annual Demographic Estimates: Subprovincial Areas
91-215-X	Annual Demographic Estimates: Canada, Provinces and Territories
91-520-X	Population Projections for Canada, Provinces and Territories
91-528-X	Population and Family Estimation Methods at Statistics Canada

Tables

17-10-0005-01	Population estimates on July 1 st , by age and sex
17-10-0006-01	Estimates of deaths, by age and sex, annual
17-10-0008-01	Estimates of the components of demographic growth, annual
17-10-0009-01	Population estimates, quarterly
17-10-0014-01	Estimates of the components of international migration, by age and sex, annual
17-10-0015-01	Estimates of the components of interprovincial migration, by age and sex, annual
17-10-0016-01	Estimates of births, by sex, annual
17-10-0020-01	Estimates of the components of interprovincial migration, quarterly
17-10-0021-01	Estimates of the components of interprovincial migration, annual
17-10-0022-01	Estimates of interprovincial migrants by province or territory of origin and destination, annual
17-10-0040-01	Estimates of the components of international migration, quarterly
17-10-0060-01	Estimates of population as of July 1 st , by marital status or legal marital status, age and sex
17-10-0045-01	Estimates of interprovincial migrants by province or territory of origin and destination, quarterly
17-10-0061-01	Estimates of the number of census families as of July 1 st
17-10-0059-01	Estimates of the components of natural increase, quarterly
13-10-0708-01	Deaths, by month
13-10-0709-01	Deaths, by age group and sex
13-10-0415-01	Live births, by month
13-10-0416-01	Live births, by age of mother
13-10-0417-01	Mean age of mother at time of delivery (live births)
13-10-0418-01	Crude birth rate, age-specific fertility rates and total fertility rate (live births)
13-10-0710-01	Deaths and mortality rates, by age group

Surveys

3231	Statistics Canada, Canadian Vital Statistics - Birth database (CVSB)
3233	Statistics Canada, Canadian Vital Statistics - Death database (CVSD)
3601	Quarterly Demographic Estimates (QDE)
3604	Annual Demographic Estimates: Canada, Provinces and Territories
3605	Estimates of population, by marital status or legal marital status, age and sex for July 1 st , Canada, provinces and territories
3606	Estimates of the number of census families for July 1 st , Canada, provinces and territories