

Methodology

This appendix describes the concepts, data sources and methodology used to produce the population estimates included in this CD-ROM. Population estimates are produced to measure the population counts according to various characteristics and geographies between two censuses. Population estimates are the official figures used for the count of the population at the national, provincial and territorial levels.

Differences between census counts and population estimates

The population estimates included in this CD-ROM differ from the 2006 Census results published on March 13, 2007, in two respects. First, the estimates are based on 2001 Census counts, adjusted for net census undercoverage (NCU) and updated between censuses using data on births, deaths and migration from administrative sources.

Second, the 2006 Census provides population figures on May 16, 2006, whereas the population estimates present population counts for a later date. Population estimates based on 2006 Census counts adjusted for NCU will be released in the fall of 2008. For further information on this subject, please refer to the [detailed explanation](#).

Population Estimates

Estimates of the total population and estimates by age and sex

Types of estimates

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

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

Levels of estimates

Updating 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 to four 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 in the CD-ROM 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 in taking the population figures from the most recent census, adjusted for net census undercoverage (NCU) (census undercoverage minus census overcoverage), and adding or subtracting the number of births, deaths, and components of international and internal 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.

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

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

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 (NCU), 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;

ΔN = net interprovincial migration.

B. Provincial / territorial estimates by age and sex

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

C. Levels of estimates

The difference between preliminary¹ and final postcensal population estimates lies in the timeliness of the components. When all the components are preliminary, the 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).

Population estimates are final intercensal up to June 2001, final postcensal from July 2001 to July 2003, updated postcensal from October 2003 to April 2006, and preliminary postcensal from July 2006 on.

1. In this case, the term *preliminary* include both preliminary and updated estimates.

D. Subprovincial estimates of total population

Population estimates for census metropolitan areas and census divisions

The component method is also used to produce estimates for census metropolitan areas (CMAs) and census divisions (CDs).

Prorating is used to ensure that the province's total population equals the sum of the populations of the subprovincial areas. The technique adjusts the total population counts and the components of subprovincial areas. It implies that the difference between the province's total population and the sum of the populations of the subprovincial areas is distributed proportionally across those areas.

The component-method formula for estimating the total populations of CMAs and CDs is as follows:

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

where, for each subprovincial area:

- (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 net census undercoverage (NCU), 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;
- ΔN = net interprovincial migration;
- $\Delta Ninfra$ = net intraprovincial migration.

Population estimates for economic regions

A different method is used to produce population estimates for economic regions (ERs): the census division (CD) aggregation method. First, the ERs are defined in terms of CDs using Standard Geographical Classification (SGC) specifications. When the geographic delineation of the CDs matches that of the ER, no adjustment is required; the population estimates for the CDs that make up the ER are simply added together.

However, when the geographic delineation of the CD does not match that of the ER. – i.e., when a CD is in more than one ER – allocation of the CD's demographic components is prorated on the basis of its proportion of each ER's population. The proportions are referred to as *conversion factors*. They are calculated using the most recent census counts.

Thus, demographic components (births, deaths and migration) initially measured at the CD level can be allocated to each ER. In other words, the population and demographic components of ERs can be estimated by aggregating the CD data based on the ERs' geographic delineation.

However, using CD aggregation to estimate the components of intraprovincial migration for ERs does not produce the right numbers of in-migrants and out-migrants. It overestimates those figures. In-migrants to a given CD from another CD in the same ER should not be counted, since the migration occurred within the ERs' boundaries. They are false in-migrants. The same is true for out-migrants from one CD to another CD in the same ER. They are false out-migrants. However, combining the in-migration and out-migration figures produced by the CD aggregation method produces a consistent result since the false in-migrants and false out-migrants cancel out. Hence, only the net intraprovincial migration of ER's can be estimated accurately by the CD aggregation method. That is why the numbers of intraprovincial in-migrants and out-migrants are not available for ER.

Special treatment for preliminary postcensal estimates for Quebec and British Columbia

A different method is used to calculate preliminary postcensal population estimates for census division (CDs) and census metropolitan areas (CMAs) in Quebec and British Columbia. For Quebec, the total population estimates produced by the “*Institut de la statistique du Québec (ISQ)*” are used. Those estimates are based on data from the insured persons “*Fichier d’inscription des personnes assurées (FIPA) de la Régie de l’assurance-maladie du Québec (RAMQ)*”. They are controlled to Demography Division’s estimate of Quebec’s total population. The same approach is followed for the ISQs’ economic region (ER)-level estimates, which are derived from its CD-level estimates.

For British Columbia, preliminary postcensal estimates are computed using CD and CMA growth rates provided by *British Columbia’s Statistical Agency (BC STATS)*, for total population only. To produce new population estimates for each CD and CMA, the rates are applied to Demography Division’s estimates of total population for the previous year. Prorating is used to ensure that the province’s total population equals the sum of the populations of the subprovincial areas.

The British Columbia population estimates used to calculate the rates are produced using the difference-correlation method, a regression model based on residential electrical (Hydro) connections and *Old Age Security (OAS)* data as symptomatic indicators.

E. Subprovincial estimates by age and sex

Postcensal estimates by age and sex for census divisions (CDs), census metropolitan areas (CMAs) and economic regions (ERs) are produced by applying the component method to each age-sex cohort in the base population.

Two-way raking¹ is used to ensure consistency between subprovincial estimates and provincial / territorial estimates by age and sex. It maintains consistency between subprovincial and provincial / territorial estimates for each age-sex combination.

Special treatment for preliminary postcensal estimates for Quebec and British Columbia

A different method is used to calculate preliminary postcensal population estimates for census divisions (CDs), census metropolitan areas (CMAs) and economic regions (ERs) in Quebec. The population estimates by age and sex produced by the “*Institut de la statistique du Québec (ISQ)*” are used. Those estimates are based on data from the insured persons registration file “*Fichier d’inscription des personnes assurées (FIPA) de la Régie de l’assurance-maladie du Québec (RAMQ)*”. They correspond to Statistics Canada Demography Division’s total estimate by age and sex for Quebec.

For British Columbia, the estimates by age and sex are produced by applying the age-sex distribution derived by the component method to the total population estimates for CMAs and CDs obtained by applying the growth rates supplied by *British Columbia’s statistical agency (BC STATS)*.

Two-way raking¹ is used to ensure that the estimates are consistent with the provincial totals by age and sex. The same approach is followed for the ER-level estimates, which are derived from the CD-level estimates.

1. *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).

F. Levels of estimates

For Quebec and British Columbia, the methods described in sections **D** and **E** of **Calculation of postcensal population estimates**, use only for preliminary postcensal estimates. For updated and final postcensal estimates, the component method is used.

For the other provinces, the difference between preliminary¹ 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).

Population estimates are final intercensal up to 2000, final postcensal from 2001 to 2003, updated postcensal for 2004 and 2005, and preliminary postcensal for 2006.

Base population and components of population growth

A. Base population

The base populations are derived from the quinquennial censuses between 1971 and 2001. The population universe of the 2001 Census includes the following groups:

- Canadian citizens (by birth or by naturalization) and landed immigrants with a usual place of residence in Canada;
- Canadian citizens (by birth or by naturalization) and landed immigrants who are abroad, either on a military base or attached to a diplomatic mission;
- Canadian citizens (by birth or by naturalization) and landed immigrants at sea or in port aboard merchant vessels under Canadian registry;
- persons with a usual place of residence in Canada who are claiming refugee status and members of their families living with them;
- persons with a usual place of residence in Canada who hold student authorizations (student visas or student permits) and members of their families living with them;
- persons with a usual place of residence in Canada who hold employment authorizations (or work permits) and members of their families living with them;
- persons with a usual place of residence in Canada who hold Minister's permits (including extensions) and members of their families living with them.

For census purposes, the last four groups in this list are referred to as non-permanent residents (NPR). For further information, please refer to the [glossary](#).

Foreign residents have not been enumerated since 1991. 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 members of their families 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).

1. In this case, the term *preliminary* include both preliminary and updated estimates.

These populations are adjusted as follows (unless otherwise noted, adjustments to the base population apply to both provincial / territorial and subprovincial levels):

- Adjustment of the population for net undercoverage (NUC);
- addition of independent estimates for incompletely enumerated Indian reserves in 1991, 1996 and 2001;
- adjustment for early enumeration in 1991 and 1996 in parts of northern Quebec, Newfoundland and Labrador, the Yukon Territory and the Northwest Territories;
- addition of estimates of NPRs in 1971, 1976, 1981 and 1986. Since 1991, NPRs 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. At the subprovincial level, the estimate of the July 1 base population is obtained by applying the subprovincial age-sex distribution of the adjusted census to the provincial / territorial population estimate.

Adjustment for net census undercoverage (NCU)

The adjustment for NCU is important. NCU 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](#) and [2001](#) 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 three censuses (1991, 1996 and 2001). 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 NCU for the Yukon Territory and the Northwest Territories prior to 1991 was estimated by assuming that the ratio between the NCU for each territory and the 10 provinces for each census between 1971 and 1986 was the same as in 1991.

For consistency, 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 the NCU in all censuses between 1971 and 1986. Similarly, 1996 Census undercoverage and overcoverage were revised in 2003.

Various methods were used to produce the estimates of NCU by age and sex for 1991, 1996 and 2001. First, the national estimates of NCU based on the coverage studies by age and sex were smoothed. Then an Empirical Bayes regression model was used to generate provincial and territorial estimates of NCU by broad age groups, and a synthetic model produced estimates by single year of age. Lastly, two-way raking¹ was used to ensure that the NCU estimates were consistent with the provincial and territorial NCU totals and the national estimates by age and sex.

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

To estimate NCU at the subprovincial level, provincial and territorial NCU rates by age and sex were applied to all geographic regions (census metropolitan areas (CMAs) and census divisions (CDs) in the province).

¹ *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).

B. Births and deaths

Provincial / territorial estimates

Numbers of births and deaths are derived directly from the vital statistics database of Statistics Canada's Health Statistics Division. 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 the information to Statistics Canada.

The vital statistics universe closely parallels the census universe. Both universes include births and deaths of all Canadians, immigrants and non-permanent residents (NPR) and exclude foreign residents.

Vital statistics by province or territory of residence are used to produce our final estimates of births and deaths.

When there are no vital statistics, the number of births is estimated using fertility rates by mother's age. The number of deaths is estimated using mortality rates by age and sex. These methods are used to calculate preliminary¹ estimates.

Special treatment for preliminary estimates for Quebec and British Columbia

Quebec and British Columbia provide their most recent estimates of births and deaths. The figures are used to produce preliminary¹ estimates. For the final estimates, the two provinces' births and deaths are derived from the vital statistics compiled by Health Statistics Division.

Levels of estimates

For information on the differences between preliminary¹ and final estimates, see sections **B. Births and Deaths**, above.

Estimates of births are final up to December 2004, updated from January 2005 to March 2006, and preliminary from April 2006 on. Estimates of deaths are final up to December 2003, updated from January 2004 to March 2006, and preliminary from April 2006 on.

Subprovincial estimates

As is the case for provincial and territorial estimates, the numbers of births and deaths at the census metropolitan area (CMA) and census division (CD) levels are taken directly from the database of Statistics Canada's Health Statistics Division. Where appropriate, the estimates of births and deaths are categorized as final. To ensure their consistency, the estimates are subsequently controlled to the provincial totals using two-way raking².

When no data are available for births and deaths, subprovincial estimates are produced by disaggregating the preliminary¹ provincial or territorial estimates on the basis of the most recent subprovincial distribution derived from Health Statistics Division's vital statistics. In such case, the estimates of births and deaths are categorized as preliminary¹. To ensure their consistency, the estimates are subsequently controlled to the provincial totals using two-way raking².

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

2. *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).

Levels of estimates

For information on the differences between preliminary¹ and final estimates, see section **B. Births and Deaths** above.

Estimates of births are final up to 2003-2004, updated for 2004-2005 and preliminary for 2005-2006. Estimates of deaths are final up to 2002-2003, updated for 2003-2004 and 2004-2005, and preliminary for 2005-2006.

C. Immigration*Provincial / territorial estimates*

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. *Citizenship and Immigration Canada* (CIC) collects and processes immigrants' administrative files. It then provides Statistics Canada with information from *Field Operational Support System* (FOSS) files. 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 Demography Division, 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.

Levels of estimates

The difference between preliminary¹ and final postcensal estimates lies in the timeliness of the source used to estimate this component. Since the FOSS file is continually being updated, new calculations are carried out each year to update the immigration estimates. Immigration estimates are preliminary the first year and updated the following year. They become final two years after the reference year.

The numbers of immigrants are final up to December 2004, updated from January 2005 to March 2006, and preliminary from April 2006 on.

Subprovincial estimates

Since *Citizenship and Immigration Canada's* (CIC's) subprovincial immigration data are not used, subprovincial estimates are produced by disaggregating the preliminary¹ and final provincial or territorial estimates on the basis of the most recent subprovincial distribution derived from T1FF². The data are available only by broad age groups and must be disaggregated by sex and single year of age based on the provincial distribution. To ensure their consistency, they are subsequently controlled to the provincial totals using two-way raking³.

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

2. The T1 family file (*T1FF*) is derived from the *Canada Revenue Agency* (CRA) T1 file by Small Area and Administrative Data Division of Statistics Canada.

3. *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).

Levels of estimates

The difference between preliminary¹ and final estimates lies in the timeliness of the sources used to estimate this component. Since the estimates of the number of immigrants are derived from provincial / territorial estimates, the level of the subprovincial estimates will be the same. Immigration estimates are preliminary the first year and updated the following year. They become final two years after the reference year.

The numbers of immigrants are final up to 2003-2004, updated for 2004-2005, and preliminary for 2005-2006.

D. Net non-permanent residents*Provincial / territorial estimates*

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. *Citizenship and Immigration Canada* (CIC) collects and processes the administrative files of immigrants and NPRs in Canada. It then provides Statistics Canada with information from *Field Operational Support System* (FOSS) files. The information is used to estimate the number and characteristics of people granted or permanent resident status by the federal government.

Non-permanent residents (NPR) 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. Non-permanent residents (NPR) 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 Demography Division, the terms non-permanent resident and temporary resident are equivalent.

Estimates of the number of NPR are based on population estimates. The number of people in CIC's system is estimated on a specific date in each year of observation. First, the end-of-period population is estimated, and then the start-of-period population is subtracted from that estimate. That yields the net number of NPR.

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 the FOSS file is continually being updated, the figures are recalculated for each new release period to update the estimates of the net number of NPRs in Canada. Non-permanent residents (NPR) estimates are preliminary the first year and updated the following year. They are finalized two to three years after the reference year, when all other components are also final.

Levels of estimates

The difference between preliminary¹ and final estimates lies in the timeliness of the source used to estimate this component. Since the FOSS file is continually being updated, the figures are recalculated for each new release period to update the estimates of the net number of NPRs. Non-permanent residents (NPR) estimates are preliminary the first year and updated the following year. They become final two to three years after the reference year.

Estimates of the net number of NPR are final up to June 2003, updated from July 2003 to March 2006, and preliminary from April 2006 on.

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

Subprovincial estimates

At the subprovincial level, there are no reliable administrative data available to estimate NPRs. To compensate for the lack of data, the provincial / territorial estimates by age and sex are disaggregated by subprovincial area on the basis of the subprovincial distribution in the most recent census. To ensure their consistency, they are subsequently controlled to the provincial totals using two-way raking¹.

Levels of estimates

Since the estimates of the net number of NPR are derived from provincial / territorial estimates, the level of the subprovincial estimates will be the same. For information on the differences between preliminary and final estimates, see section **D. Net non-permanent residents** above.

Estimates of the net number of NPR are final up to 2002-2003, updated for 2003-2004 and 2004-2005, and preliminary for 2005-2006.

E. Emigration

Provincial / territorial estimates

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 Tax Benefit (CCTB)* program, and data from the *T1 Family File (T1FF)*². The first source is used to estimate emigration to the United States. CCTB data are used to estimate emigration to other countries. The estimates of the number of child emigrants have to be adjusted because the CCTB is not universal and does not provide direct information on the number of adult 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 CCTB. Since it seems to take four years after the reference period for CCTB administrative files to become complete, the adjustment is made if the estimates are finalized after two years. The factor is derived from the two-year ratios of emigrant children based on two versions of the CCTB files;
- the program's partial coverage, that is, people who do not apply for the CCTB or are not *eligible*. This factor is obtained by comparing the estimated number of children in the population with the number of children in CCTB files;
- the differential propensity to emigrate between children who are *eligible* for the CCTB and children who are not. This factor is obtained by comparing the emigration rates of CCTB-eligible children with the rates for all children (aged 0-17). This factor is calculated for each province and territory and is based on the last three available years of T1FF²;
- 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 T1FF² 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.

1. *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).

2. The T1 family file (*T1FF*) is derived from the *Canada Revenue Agency (CRA)* T1 file by Small Area and Administrative Data Division of Statistics Canada.

The adult emigration rate is applied to the adult population to generate the number of adult emigrants, which is then added to the number of child emigrants to produce 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.

Estimates of the number of emigrants by age and sex are obtained by (1) disaggregating the broad age groups in the T1FF¹ into five-year age groups based on data from the Office of *Immigration Statistics, U.S. Department of Homeland Security*, and (2) disaggregating those estimates into single years of age using Sprague coefficients. The same distribution is used for all provinces and territories.

Levels of estimates

The difference between preliminary² and final estimates lies in the timeliness of the sources used to estimate this component. The same estimation method is used.

The numbers of emigrants are final up to June 2003, updated from July 2003 to March 2006, and preliminary from April 2006 on.

Subprovincial estimates

As in the case of immigrants, the number of emigrants at the subprovincial level is derived from the T1FF¹. The estimates are available only by broad age groups and must be disaggregated by sex and single year of age based on the provincial distribution. To ensure their consistency, they are subsequently controlled to the provincial totals using two-way raking³.

Levels of estimates

The difference between preliminary² and final estimates lies in the timeliness of the sources used to estimate this component. Since the estimates of the number of emigrants are derived from provincial / territorial estimates, the level of the subprovincial estimates will be the same.

The numbers of emigrants are final up to 2002-2003, updated for 2003-2004 and 2004-2005, and preliminary for 2005-2006.

F. Net temporary emigration

Provincial / territorial estimates

Some people leave Canada to live temporarily in another country; others who were temporarily outside 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 Demography Division's 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 Demography Division'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 Demography Division) yield an estimate of net temporary emigration.

1. The T1 family file (T1FF) is derived from the *Canada Revenue Agency (CRA)* T1 file by Small Area and Administrative Data Division of Statistics Canada.

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

3. *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).

That 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 is calculated first for the national level. It is then disaggregated by province or group of provinces based on the 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.

Net temporary emigration can be estimated only for the intercensal period preceding the most recent census. Net temporary emigration in the current period is assumed to be the same as in the previous period for each province and territory.

The emigration distribution is applied to obtain the age and sex of the net temporary emigration.

Levels of estimates

The difference between preliminary¹ 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.

The estimates of net temporary emigration are final up to June 2003, updated from July 2003 to March 2006, and preliminary from April 2006 on.

Subprovincial estimates

At the subprovincial level, provincial / territorial net temporary emigration is disaggregated on the basis of the age-sex distribution of subprovincial emigrants. To ensure their consistency, the estimates are subsequently controlled to the provincial totals using two-way raking².

Levels of estimates

Since the census is the only data source, there is no difference between the preliminary¹ and final estimates for this component.

The estimates of net temporary emigration are final up to 2002-2003, updated for 2003-2004 and 2004-2005, and preliminary for 2005-2006.

G. Returning emigrants

Provincial / territorial estimates

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 Tax Benefit* (CCTB) file and the *Canada Revenue Agency's* (CRA) 's T1FF³ are used to estimate the number of returning emigrants. Adjustment factors are applied to compensate for the fact that the CCTB program is not universal, and an adult/child ratio is used to estimate the number of adult returning emigrants. As a result, three adjustment factors are used to take into account:

- The program's partial coverage, that is, people who do not apply for the CCTB or are not *eligible*. This factor is obtained by comparing the estimated number of children in the population with the number of children in CCTB files;

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

2. *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).

3. The T1 family file (*T1FF*) is derived from the *Canada Revenue Agency* (CRA) T1 file by Small Area and Administrative Data Division of Statistics Canada.

- the differential propensity to emigrate between children who are *eligible* for the CCTB and children who are not. This factor is obtained by comparing the emigration rates of CCTB-*eligible* children with the rates for all children (aged 0-17). This factor is calculated for each province and territory and is based on the last three available years of T1FFs¹;
- the adult / child ratio, which is based on the census used in estimating the base population.

Levels of estimates

The difference between preliminary² and final estimates lies in the timeliness of the sources used to estimate this component. The same estimation method is used.

The numbers of returning emigrants are final up to June 2003, updated from July 2003 to March 2006, and preliminary from April 2006 on.

Subprovincial estimates

To estimate the numbers of returning emigrants at the subprovincial level, provincial numbers of returning emigrants are disaggregated on the basis of the age-sex distribution of subprovincial immigrants. To ensure their consistency, they are subsequently controlled to the provincial totals using two-way raking³.

Levels of estimates

The difference between preliminary² and final estimates lies in the timeliness of the sources used to estimate this component. Since the estimates of the number of returning emigrants are derived from provincial / territorial estimates, the level of the subprovincial estimates will be the same.

The numbers of returning emigrants are final up to 2002-2003, updated for 2003-2004 and 2004-2005, and preliminary for 2005-2006.

H. Interprovincial migration

Provincial / territorial estimates

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 Tax Benefit* (CCTB) of *Canada Revenue Agency* (CRA) and the T1FF¹.

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 taxfilers' dependants has to be imputed. An adjustment is also required to take into account migrants who do not file income tax returns. For 2001-2002 and subsequent years, the adjustment was slightly modified (for further information, see [Wilkinson, 2004](#))

Since income tax returns are not available at the time preliminary estimates are produced, the estimation of preliminary¹ interprovincial migration is based on CCTB administrative files, which provide counts of child migrants (aged 0-17) *receiving benefits* under the program. The estimates have to be adjusted later for children who are not receiving the CCTB. Finally, the number of adult migrants is calculated using the number of child migrants and factors derived from the T1FF³. As a result, three adjustment factors are used to take into account:

1. The T1 family file (*T1FF*) is derived from the *Canada Revenue Agency* (CRA) T1 file by Small Area and Administrative Data Division of Statistics Canada.
 2. Unless otherwise noted, the term *preliminary* include both preliminary and updated estimates
 3. *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).

- The program's partial coverage, that is, people who do not apply for the CCTB or are not receiving *benefits*. This factor is obtained by comparing the estimated number of children in the population with the number of children in CCTB files;
- the differential propensity to migrate between children who are receiving the CCTB and children who are not. This factor is obtained by comparing the out-migration rates of children receiving the CCTB with the rates for all children (aged 0-17). This factor is calculated for each province and territory and is based on the last available year of T1FFs¹;
- 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 T1FFs¹.

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.

Levels of estimates

For information on the differences between preliminary² and final estimates of total interprovincial migration, see section **H. Interprovincial migration** above. For all levels of estimates, the age-sex distribution is based on the 2001 Census one-year mobility question and data from the T1FF¹.

The estimate of interprovincial migration is final up to June 2005 and preliminary from July 2005 on.

Subprovincial estimates

Interprovincial migration by broad age group and sex for subprovincial areas is derived from the T1FF¹. The estimates by broad age group and sex are disaggregated into single years of age using distributions from the 2001 Census one-year mobility question. To ensure their consistency, they are subsequently controlled to the provincial totals using two-way raking³.

Data from the T1FF are used to produce the final estimates.

Levels of estimates

The difference between preliminary² and final estimates lies in the timeliness of the sources used to estimate this component. Since the estimates of the number of migrants are derived from provincial / territorial estimates, the level of the subprovincial estimates will be the same.

The estimate of interprovincial migration is final up to 2004-2005 and preliminary for 2005-2006.

I. Intraprovincial migration

As in the case of interprovincial migration, the components of intraprovincial migration by broad age group and sex are derived from the T1FF¹. The estimates by broad age group and sex are disaggregated into single years of age using distributions from the 2001 Census one-year mobility question.

These sources are used for both preliminary and final estimates.

1. The T1 family file (*T1FF*) is derived from the *Canada Revenue Agency (CRA)* T1 file by Small Area and Administrative Data Division of Statistics Canada.
 2. Unless otherwise noted, the term *preliminary* include both preliminary and updated estimates
 3. *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).

Levels of estimates

The difference between preliminary¹ and final estimates lies in the timeliness of the T1FF² data used to estimate this component.

The estimate of intraprovincial migration is final up to 2004-2005 and preliminary for 2005-2006.

Intercensal population estimates**A. Provincial / territorial 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.

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

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

Error of closure is defined as the difference between the postcensal population estimates on Census Day and the population enumerated in that census (after adjustment for net census undercoverage (NCU)).

The error of closure is spread uniformly over the intercensal period.

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.

B. Subprovincial estimates

To produce subprovincial intercensal estimates for the 1986-2001 period, the base populations and components of population growth from 1986 to 2001 had to be adjusted for the 2001 Census boundaries. For areas whose boundaries changed between the two censuses (1996 and 2001 Standard Geographical Classification (SGC), *conversion factors* based on 2001 Census subdivisions were used. In general, the corrections to census divisions (CDs), census metropolitan areas (CMAs) and economic regions (ERs) were minor (see the "[Quality of Demographic Data](#)" section).

From that point on, the process was the same as for the provincial / territorial estimates.

Like the postcensal estimates, the subprovincial intercensal estimates by age and sex are adjusted to ensure consistency with the provincial estimates using two-way raking³.

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

2. The T1 family file (T1FF) is derived from the Canada Revenue Agency (CRA) T1 file by Small Area and Administrative Data Division of Statistics Canada.

3. *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).

Population estimates by marital status and legal marital status

Types of estimates

There are two series of population estimates by marital status, the main difference between them being the treatment of persons living in *common law* unions. One of them is the series of estimates by legal marital status, i.e., a person's conjugal status under the law (e.g., single, married, widowed or divorced). On the basis of this definition, people living *common law* are categorized by their legal marital status. If a person has never *married* and is living *common law*, he or she is regarded as *single* under this definition.

The other is the series of estimates by marital status, (i.e., a person's de facto conjugal status). For example, a person who reports being legally *widowed* and is living with another person as a couple but is not married to that person will be counted as *common law* in the marital status series and *widowed* in the legal marital status series.

Categories of estimates

Population estimates by marital status or legal marital status can be intercensal or postcensal. Intercensal estimates are produced using counts from two consecutive censuses adjusted for net census undercoverage (NCU) and postcensal estimates by age and sex. The production of intercensal estimates makes it possible to update the postcensal estimates using the counts from a new census adjusted for NCU.

Postcensal estimates of legal marital status are produced using data from the most recent census adjusted for NCU and the components of population growth. In terms of component timeliness, postcensal estimates are clearly more up-to-date than data from the most recent census adjusted for NCU, but as they get farther from the date of that census, they become more variable.

Population estimates by marital status are derived using ratios from the most recent census. The ratios are applied to the population estimates by legal marital status.

Levels of estimates

Updating population estimates by marital status or legal marital status 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 to four months for the preliminary estimates and two to three years for the 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 in the CD-ROM indicate the level of the estimates they contain.

Calculation of postcensal population estimates by marital status and legal marital status

Population estimates by legal marital status are produced by the component method. This method takes into account events that result in a change of legal marital status.

Population estimates by marital status are derived using ratios from the most recent census. The ratios are applied to the population estimates by legal marital status.

A. Legal marital status

Calculating postcensal estimates by legal marital status involves taking the population figures from the most recent census, adjusted for net census undercoverage (NCU), and adding the number of births, subtracting the number of deaths, and adding or subtracting the net impact of international and interprovincial migration and the components of legal marital status (marriage, divorce and new widowhoods).

Like postcensal estimates of the total population, these estimates are produced by the component method, but in this case, the method is applied to each age-sex-marital status cohort in the base population.

The component-method formula for estimating the population by legal marital status of single persons is as follows:

When $x = 0$

$$P_{t+i}^1 = P_t^0 + B_{t,t+i} - D_{t,t+i}^0 + I_{t,t+i}^0 - (E_{t,t+i}^0 + \Delta TE_{t,t+i}^0) + RE_{t,t+i}^0 + \Delta NPR_{t,t+i}^0 + \Delta N_{t,t+i}^0$$

When $x \neq 0$

$$P_{t+i}^{x+i} = P_t^x - D_{t,t+i}^x + I_{t,t+i}^x - (E_{t,t+i}^x + \Delta TE_{t,t+i}^x) + RE_{t,t+i}^x + \Delta NPR_{t,t+i}^x + \Delta N_{t,t+i}^x - MAR_{t,t+i}^x$$

The component-method formula for estimating the population by legal marital status of married persons is as follows:

$$P_{t+i}^{x+i} = P_t^x - D_{t,t+i}^x + I_{t,t+i}^x - (E_{t,t+i}^x + \Delta TE_{t,t+i}^x) + RE_{t,t+i}^x + \Delta NPR_{t,t+i}^x + \Delta N_{t,t+i}^x + Mar_{t,t+i}^x - Veu_{t,t+i}^x - Div_{t,t+i}^x$$

The component-method formula for estimating the population by legal marital status of widowed persons is as follows:

$$P_{t+i}^{x+i} = P_t^x - D_{t,t+i}^x + I_{t,t+i}^x - (E_{t,t+i}^x + \Delta TE_{t,t+i}^x) + RE_{t,t+i}^x + \Delta NPR_{t,t+i}^x + \Delta N_{t,t+i}^x - Mar_{t,t+i}^x + Veu_{t,t+i}^x$$

The component-method formula for estimating the population by legal marital status of divorced persons is as follows:

$$P_{t+i}^{x+i} = P_t^x - D_{t,t+i}^x + I_{t,t+i}^x - (E_{t,t+i}^x + \Delta TE_{t,t+i}^x) + RE_{t,t+i}^x + \Delta NPR_{t,t+i}^x + \Delta N_{t,t+i}^x - Mar_{t,t+i}^x + Div_{t,t+i}^x$$

where, for each province and territory:

x = Age at time t ;

$(t,t+i)$ = interval between the reference dates of the base population and the estimate, where $i=1, \dots, 6$;

P_{t+i}^{x+i} = estimate of the population at time $t+i$ at age $x+i$;

P_t^x = base population at time t (census adjusted for net census undercoverage (NCU), or most recent estimates) at age x ;

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;
Δ NPR	=	net non-permanent residents;
Δ N	=	net interprovincial migration;
Mar	=	number of marriages;
Div	=	number of divorces;
Ve	=	new widowhoods.

The components of population growth are disaggregated by legal marital status as follows:

- **Deaths** by age and sex are disaggregated by legal marital status using the latest death statistics published by Health Statistics Division;
- **interprovincial migration** is disaggregated by legal marital status using the counts from the census used in calculating the base population (one-year mobility question);
- **immigration** and **non-permanent residents** are disaggregated by legal marital status using the estimates derived from the files of *Citizenship and Immigration Canada's (CIC) Field Operational Support System (FOSS)*;
- **emigration** and **net temporary emigration** are disaggregated by legal marital status using the latest available data from the *Office of Immigration Statistics, U.S. Department of Homeland Security*;
- the **number of returning emigrants** is disaggregated by legal marital status using the census counts used in the base population (one-year mobility question);
- **marriages** are disaggregated by age, sex and legal marital status using the latest marriage statistics published by Health Statistics Division. The totals are estimated beforehand by Demography Division;
- **divorces** are disaggregated by age, sex and legal marital status using the latest Justice Canada divorce statistics published by Health Statistics Division. The totals are estimated beforehand by Demography Division;
- **new widowhoods** are derived from estimates of deaths of married persons and husband-wife families based on the census counts used in calculating the base population. Census data are used to determine the widowed person's age.

Levels of estimates

The difference between preliminary¹ and final postcensal estimates of the population by legal marital status lies in the timeliness of the components. When all the components are preliminary, the 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).

Population estimates by legal marital status are final intercensal from 1991 to 2000, final postcensal from 2001 to 2003, updated postcensal for 2004 and 2005, and preliminary postcensal for 2006.

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

B. Marital status

Since there are no reliable and timely sources of data on annual formations and dissolutions of common-law unions, postcensal estimates by marital status have to be produced by a different method. The number of persons living common-law is estimated using estimates by legal marital status and proportions based on population counts from the census used in calculating the base population adjusted for net census undercoverage (NCU). The proportion of single persons living common-law is calculated by dividing the number of single persons living common-law by the total number of single persons. The same procedure is used to calculate the proportions of divorced and widowed persons living common-law. The proportions are then multiplied by the number of single, divorced and widowed persons respectively to produce the number of persons living common-law. The number of persons living common-law by marital status is then subtracted from the estimate by legal marital status and added to the married category to produce the population by marital status.

The marital-status proportions are generated for each year of age, sex, province and territory.

As is the case for the estimates by age and sex, the base populations by marital status and legal marital status are adjusted to July 1 for NCU. Non-permanent residents (NPR) were added to the population counts of pre-1991 Censuses, since they have only been included in the census universe since 1991.

Levels of estimates

The difference between preliminary¹ and final postcensal estimates stems from the estimate by legal marital status. The same estimation method is used.

As a result, the estimates by marital status have the same revision level as the estimates by legal marital status from which they are derived.

Population estimates by marital status are final intercensal from 1971 to 2000, final postcensal from 2001 to 2003, updated postcensal for 2004 and 2005, and preliminary postcensal for 2006.

Intercensal population estimates by marital status and legal marital status

Intercensal estimates by age, sex and marital status/legal marital status are produced using estimates by age and sex and adjusted census distributions by age, sex and marital status/legal marital status. The census distributions are linearly interpolated and applied to the age-sex estimates.

Estimates of the number of census families

The definition of a census family² used in these estimates is the same as the 2001 Census definition: a married couple or a couple living common-law, with or without children, or a single parent living with at least one child in the same dwelling. A couple living common-law can be an opposite-sex couple or a same-sex couple. The "children" in a family² include grandchildren living in the household of at least one grandparent where there are no parents present.

For the 2001 Census, the "children" concept includes married sons and daughters, as long as there is no spouse, common-law partner or child living in the household. In addition, grandchildren living with their grandparents (with no parents present) are now considered part of their grandparents' family.

The 2001 Census definition notwithstanding, same-sex couples living common-law are excluded from family² estimates.

The estimates of the number of families² cover the period from 1986 to 2006 and are produced for Canada, the provinces and territories. The base populations are derived from the 1986 to 2001 Censuses adjusted for net census undercoverage (NCU) of families².

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

2. Unless otherwise indicated, the term *family* means *census families*.

Categories of estimates

Estimates of the number of families¹ can be either intercensal or postcensal. Intercensal estimates are produced using family¹ counts from two consecutive censuses adjusted for net census undercoverage (NCU). The production of intercensal estimates makes it possible to update the postcensal estimates using the family¹ counts from a new census adjusted for NCU.

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

Levels of estimates

Updating estimates of the number of families¹ between censuses entails the use of data from administrative files or surveys. The quality of estimates of families¹ 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 five to six months for the preliminary estimates and two to three years for the 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 in the CD-ROM indicate the level of the estimates they contain.

Calculation of postcensal estimates of the number of census families

Estimates of the number of families¹ are produced by the component method. This method takes into account the events that result in the formation of new families, the dissolution of existing families¹ and the migration of families¹.

The component-method formula for estimating the number of families¹ is as follows:

$$F_{(t+i)} = F_t + \left(F_{(t,t+i)}^{MAR} + F_{(t,t+i)}^I + F_{(t,t+i)}^{\Delta N} + F_{(t,t+i)}^{RE} \right) - \left(F_{(t,t+i)}^E + F_{(t,t+i)}^{\Delta TE} + F_{(t,t+i)}^V + F_{(t,t+i)}^{Dmar} + F_{(t,t+i)}^{Dw} + F_{(t,t+i)}^{Dv} \right) + \Delta F_{(t,t+i)}^{UL} + F_{(t,t+i)}^{\Delta NPR}$$

where, for each province and territory:

$(t,t+i)$ = interval between the reference dates of the base population and the estimate where $i=1, \dots, 6$;

$F_{(t-i)}$ = estimated number of families¹ at time $t-i$;

$F_{(t)}$ = estimated base number of families¹ at time t (census adjusted for net census undercoverage (NCU), or most recent estimates);

F^{MAR} = number of new families formed by marriage;

F^I = number of immigrant families;

$F^{\Delta N}$ = net interprovincial migration of families;

F^{RE} = number of returning emigrant families;

F^E = number of emigrant families;

$F^{\Delta TE}$ = net number of families temporarily abroad;

F^V = number of families dissolved due to divorce;

F^{Dmar} = number of families dissolved due to death of married persons;

1. Unless otherwise indicated, the term *family* means *census families*.

F^{Dw}	=	number of families dissolved due to death of widowed persons;
F^{Dv}	=	number of families dissolved due to death of divorced persons;
$F^{\Delta UL}$	=	net number of common-law unions;
$F^{\Delta NPR}$	=	net number of NPR families.

Base number of families and components of population growth

The base for the estimates of the number of families¹ is the census count of families adjusted for net census undercoverage (NCU).

A. Base number of census families

The base numbers of families¹ were derived from the quinquennial censuses from 1986 to 2001. Those family¹ counts were adjusted as follows:

- Adjustment of families¹ for net census undercoverage (NCU);
- extrapolation of the growth between the two censuses to adjust the estimates of families¹ from Census Day to July 1;
- addition of estimates of non-permanent residents in 1986. Since 1991, non-permanent residents have been included in the census universe.

Adjustment for net census undercoverage

The adjustment for NCU is important. Net census undercoverage (NCU) is the difference between the number of families¹ that should have been enumerated but were missed (undercoverage) and the number of families¹ that were enumerated but should not have been or that were counted more than once (overcoverage).

For the 1991 and 1996 Censuses, the NCU of families¹ is based on the coverage studies. The 1986 adjustment was calculated by multiplying the 1991 ratio of the NCU of families¹ to the NCU of the total population by the revised NCU of the 1986 total population.

Since the NCU of families¹ could not be estimated on the basis of the 2001 Census coverage studies, another method had to be used. The 2001 NCU rate for families¹ is based on the ratios of the 1996 NCU rates for families¹ and married persons (estimates weighted by province and territory). The ratios of the 1996 rates offered the best correlation between the NCU of families¹ and the NCU of a subpopulation for which a 2001 estimate was available. The 1996 ratios were then applied to the 2001 NCU rates for married persons to obtain the 2001 NCU rates for families¹ for the provinces and territories.

B. Components of the population growth of census families

Changes in the number of families¹ are determined by events that result in the formation of new families¹, the dissolution of existing families¹ and the migration of families¹. Table 8 in the appendix contains a list of those events categorized by their potential impact on the number of families¹. For the most part, postcensal estimates of families¹ are produced in the same way as population counts, i.e., using the family counts from the previous census adjusted for net census undercoverage (NCU) of families¹ and estimates of the components of growth in the number of families¹ since that census.

To produce estimates of the total number of census families¹, the component data used for the population estimates by age, sex and marital status are disaggregated as follows:

1. Unless otherwise indicated, the term *family* means *census families*.

- **Net family formation by marriage** is obtained by disaggregating the number of marriages for all possible statuses of each spouse by age, sex and marital status using population counts from the census used to estimate the base number of families¹;
- the **dissolution of families due to divorce** is estimated by multiplying the number of divorces by the proportion of divorces not involving dependant children based on data published by Health Statistics Division;
- the **dissolution of families due to death of married persons** is derived from the number of deaths of married persons by age and sex multiplied by the probability of dissolution based on census counts used to estimate the base number of families¹;
- the **dissolution of families due to death of widowed or divorced persons** is derived from the number of deaths of widowed or divorced persons by age and sex multiplied by the probability of dissolution of families¹ based on family counts from the census used to estimate the base number of families¹;
- **immigration and emigration of families** are based on the assumption that for each married female immigrant or emigrant there is one family. The same approach is used to estimate the net temporary emigration of families¹;
- the **number of returning emigrant families** is calculated using the proportion of returning emigrants living in a family¹ and the average number of returning emigrants per family according to the census used to estimate the base number of families¹ (one-year mobility). This ratio is applied to the estimated total number of returning emigrants;
- the estimated number of **non-permanent resident families** is based on the same assumption as the estimated number of immigrating and emigrating families; that is, for each married female non-permanent resident there is one non-permanent resident family. The annual net numbers of families¹ are based on the estimated number of married female non-permanent residents on July 1 of two consecutive years;
- the base data used to produce estimates of the **interprovincial migration of families** are taken from the *Canada Revenue Agency's (CRA)'s Canada Child Tax Benefit (CCTB)* file. To compensate for the CCTB's partial coverage, the ratio of the child-migrant matrix adjusted for program incompleteness to the child-migrant matrix was applied to monthly family interprovincial migration matrices :

$${}^m M_{adj}^{fam} = {}^m M_{CCTB}^{fam} * \frac{{}^m M_{adj}^{child}}{{}^m M_{CCTB}^{child}}$$

$${}^{j-j} M_{adj}^{fam} = \sum_{m=July}^{June} M_{adj}^{fam}$$

where:

- ${}^m M_{adj}^{fam}$ = Interprovincial family-migrant matrix adjusted for month m;
- ${}^m M_{CCTB}^{fam}$ = family-migrant matrix based on the CCTB for month m;
- ${}^m M_{adj}^{child}$ = adjusted child-migrant matrix for month m;
- ${}^m M_{CCTB}^{child}$ = child-migrant matrix based on the CCTB for month m;
- ${}^{j-j} M_{adj}^{fam}$ = adjusted family interprovincial migration matrix for the period from July to June.

1. Unless otherwise indicated, the term *family* means *census families*.

The estimates are also adjusted to take into account families with no children and with no children under 18. The adjustment is based on the family counts from the census used to estimate the base number of families¹ adjusted to July 1 and on the estimates for July of the same year from the CCTB;

- the **net number of common-law families** is obtained by extrapolating the population counts from the census used to estimate the base number of families¹; and the previous census.

For each province and territory and each five-year age group, the estimate for year t is generated by:

$$U_t = \frac{U_{2001}}{P_{2001}} + \left(\frac{t-2001}{5} \right) * \left(\frac{U_{2001}}{P_{2001}} - \frac{U_{1996}}{P_{1996}} \right) * P_t$$

$$\Delta U_{(t-1,t)} = U_t - U_{t-1}$$

where:

U_t = Number of common-law unions at time t;

P_t = population at time t;

$\Delta U_{t-1,t}$ = net change in common-law unions between times t-1 and t.

C. Levels of estimates

The difference between preliminary² and final postcensal estimates of the number of families¹ lies in the timeliness of the components. When all the components are preliminary, the estimate of families¹ 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).

Estimates of the number of families¹ are final intercensal from 1986 to 2001, final postcensal for 2002 and 2003, updated postcensal for 2004 and 2005, and preliminary postcensal for 2006.

Intercensal estimates of the number of census families

Intercensal estimates are produced by linear interpolation between the counts of families¹ in two consecutive censuses adjusted for net census undercoverage (NCU) and growth between Census Day and July 1.

Characteristics of census families

Based on proportions derived from the census used to estimate the base number of families¹, the estimates of the number of families are disaggregated by the following characteristics³:

- Size of family and total number of persons living in families¹;
- type of family: husband-wife or lone-parent;
- broad age group of children;
- broad age group of husband and wife;
- broad age group and sex of lone parent.

1. Unless otherwise indicated, the term *family* means *census families*.

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

3. *Characteristics* are available for provinces only.

Intercensal estimates of the number of families¹ by their characteristics² are produced by linear interpolation of proportions derived from two consecutive censuses. Those proportions are applied to the intercensal estimates of the number of families¹.

Census family concepts in 2001

For the 2001 Census, a number of changes were made in the concept of the census family¹.

Children in a census family can have been previously married (as long as they are not currently living with a spouse or common-law partner). Previously, they had to be single.

A grandchild living in a three-generation household where the parent (middle generation) has never married will, in contrast to previous censuses, now be considered a member of his or her parent's census family, provided the grandchild is not living with his or her own spouse, common-law partner or child. Previously, the census family usually consisted of the two older generations.

A grandchild of another household member, where a middle-generation parent is not present, will now be considered a member of his or her grandparent's census family, provided the grandchild is not living with his or her own spouse, common-law partner or child. Previously, such a grandchild was not considered a member of the census family.

Two persons living in a same-sex common-law relationship, along with any of their children residing in the household, will be considered a census family.

Since it is impossible to establish trends with regard to the increase in same-sex common-law couples, this group has been excluded from census family estimates

1. Unless otherwise indicated, the term *family* means *census families*.

2. *Characteristics* are available for provinces only.

Appendix

Table 1 Estimated net census undercoverage of population 1996 and 2001 Censuses, Canada, provinces and territories				
Area	1996		2001	
	number	percentage	number	percentage
Canada	712,119	2.41	958,968	3.10
Newfoundland and Labrador	8,840	1.58	9,401	1.80
Prince Edward Island	896	0.66	1,325	0.97
Nova Scotia	21,126	2.27	24,521	2.63
New Brunswick	14,073	1.87	20,095	2.68
Quebec	102,680	1.42	152,880	2.07
Ontario	304,139	2.75	452,309	3.81
Manitoba	19,052	1.68	31,013	2.70
Saskatchewan	28,599	2.81	21,812	2.18
Alberta	71,971	2.60	74,834	2.45
British Columbia	137,446	3.56	164,805	4.05
Yukon Territory	467	1.50	1,422	4.72
Northwest Territories	1,979	4.75	3,295	8.10
Nunavut	851	3.33	1,256	4.49

Table 2 Estimated net census undercoverage of population by age group and sex, 1996 and 2001 Censuses, Canada, provinces and territories				
Sex and age group	1996		2001	
	number	percentage	number	percentage
Both sexes	712,119	2.41	958,968	3.10
0-4	44,677	2.28	63,236	3.59
5-9	21,548	1.07	43,659	2.16
10-14	13,484	0.67	21,778	1.05
15-19	48,138	2.40	61,586	2.91
20-24	101,342	5.07	148,916	7.08
25-29	123,305	5.72	17,617	8.25
30-34	111,240	4.31	142,469	6.36
35-39	70,790	2.71	121,761	4.60
40-44	43,504	1.84	70,929	2.68
45-49	32,349	1.52	34,927	1.47
50-54	21,777	1.33	27,676	1.31
55-59	21,861	1.65	18,160	1.13
60-64	18,884	1.57	8,598	0.67
65+	39,220	1.10	24,656	0.63
Male	454,894	3.11	629,548	4.10
0-4	22,917	2.28	32,371	3.59
5-9	11,075	1.07	22,321	2.16
10-14	6,895	0.67	11,207	1.05
15-19	28,520	2.76	35,664	3.28
20-24	64,875	6.38	94,364	8.76
25-29	81,543	7.50	114,637	10.92
30-34	80,449	6.18	97,995	8.68
35-39	51,992	3.97	88,142	6.61
40-44	31,410	2.67	54,161	4.08
45-49	20,886	1.97	24,609	2.09
50-54	10,289	1.26	18,387	1.75
55-59	11,917	1.82	12,028	1.50
60-64	12,048	2.03	6,082	0.97
65+	20,078	1.33	17,580	1.05
Female	257,225	1.72	329,420	2.11
0-4	21,760	2.27	30,865	3.59
5-9	10,473	1.07	21,338	2.16
10-14	6,589	0.67	10,571	1.04
15-19	19,618	2.01	25,922	2.52
20-24	36,467	3.71	54,552	5.31
25-29	41,762	3.91	55,980	5.50
30-34	30,791	2.41	44,474	4.01
35-39	18,798	1.44	33,619	2.56
40-44	12,094	1.02	16,768	1.27
45-49	11,463	1.08	10,318	0.87
50-54	11,488	1.40	9,289	0.87
55-59	9,944	1.49	6,132	0.76
60-64	6,836	1.11	2,516	0.38
65+	19,142	0.93	7,076	0.32

Table 3 Estimated net census undercoverage of population applied at the census division and census metropolitan area levels, 1996 and 2001 Censuses, Canada, provinces and territories				
Area	1996		2001	
	number	percentage	number	percentage
Canada	662,542	2.25	924,429	2.99
Newfoundland and Labrador	8,837	1.58	9,401	1.80
Prince Edward Island	721	0.53	1,325	0.97
Nova Scotia	21,126	2.27	24,521	2.63
New Brunswick	13,555	1.80	20,095	2.68
Quebec	90,177	1.25	140,232	1.90
Ontario	283,290	2.57	436,349	3.68
Manitoba	18,737	1.65	30,903	2.69
Saskatchewan	28,013	2.75	21,231	2.12
Alberta	60,684	2.20	69,857	2.29
British Columbia	134,310	3.48	164,542	4.04
Yukon Territory	465	1.49	1,422	4.72
Northwest Territories	1,854	4.46	3,295	8.10
Nunavut	773	3.03	1,256	4.49

Note: For the population estimates at the CD and CMA levels, persons living on incompletely enumerated Indian reserves, and for 1996, cases related to early enumeration were added independently.

Table 4 Estimates of the number of persons not counted on incompletely enumerated Indian reserves by census division, 1991, 1996 and 2001 Censuses, Canada							
Geography	1991	1996	2001	Geography	1991	1996	2001
Canada	41,451	49,293	34,539	Manitoba	817	315	110
Prince Edward Island	...	175	...	Division No. 2	590	...	...
Kings	...	22	...	Division No. 8	...	...	...
Queens	...	153	...	Division No. 9	...	98	110
Nova Scotia	...	...	...	Division No. 15	...	...	...
Queens	...	...	...	Division No. 16	227	...	...
New Brunswick	2,139	518	...	Division No. 17	...	...	...
Kent	...	64	...	Division No. 19	...	217	...
Northumberland	1,204	454	...	Saskatchewan	424	586	581
Victoria	616	...	...	Division No. 6	...	...	...
York	319	...	...	Division No. 9	...	...	...
Quebec	10,636	12,427	12,648	Division No. 17	424	586	581
Communauté-Urbaine-de-Québec	1,255	1,462	...	Alberta	7,421	11,287	4,977
Deux-Montagnes	795	1,188	1,333	Division No. 3	...	...	...
La Vallée-de-la-Gatineau	345	...	269	Division No. 6	...	...	...
Le Haut-Saint-Laurent	1,735	2,369	2,667	Division No. 8	3,093	4,776	...
Les Laurentides	...	...	4	Division No. 11	990	2,259	1,709
Roussillon	6,506	7,408	8,375	Division No. 12	2,511	3,168	2,974
Ontario	16,443	20,849	15,960	Division No. 15	...	...	...
Algoma	2,150	2,720	864	Division No. 16	430	...	...
Brant	4,825	5,722	5,755	Division No. 17	397	1,084	294
Bruce	...	619	...	British Columbia	3,472	3,136	263
Cochrane	...	...	4	Capital	246	853	96
Durham	...	34	758	Cariboo	237	822	...
Haldimand-Norfolk	648	796	...	Central Coast	67	...	...
Hastings	1,021	1,257	1,389	Columbia-Shuswap	...	...	...
Kenora	2,995	2,161	2,260	Comox-Strathcona	201	2	...
Lambton	957	923	...	Cowichan Valley	126	...	...
Manitoulin	201	866	...	Fraser Valley	...	34	...
Middlesex	2,079	2,421	2,676	Greater Vancouver	...	21	...
Muskoka	...	168	190	Mount Waddington	...	3	...
Nipissing	181	...	188	North Okanagan	...	...	...
Parry Sound	111	129	...	Okanagan-Similkameen	...	49	...
Rainy River	...	205	...	Powell River	799	...	...
Renfrew	280	346	...	Squamish-Lilloonet	1,670	1,352	89
Stormont, Dundas & Glengarry	875	1,342	1,485	Sunshine Coast	50	...	...
Sudbury	...	178	...	Thompson-Nicola	76	...	78
Thunder Bay	100	962	391	Yukon Territory	99	...	...
Timiskaming	20	...	...		

Table 5 Estimated net census undercoverage of population by sex and marital status, 1996 and 2001 Censuses, Canada				
Sex and marital status	1996		2001	
	number	percentage	number	percentage
Both sexes	662,542	2.25	924,429	2.99
Married	219,932	1.53	248,435	1.64
Widowed	25,506	1.76	24,228	1.61
Divorced	52,448	4.29	64,966	4.76
Single	364,656	2.93	586,800	4.55
Under 15 years old	61,925	1.04	117,166	2.01
15 years and over	302,731	4.66	469,634	6.65
Male	429,225	2.94	611,782	3.99
Married	134,200	1.87	169,396	2.23
Widowed	7,443	2.99	14,999	5.47
Divorced	37,650	7.28	42,948	7.52
Single	249,932	3.75	384,439	5.58
Under 15 years old	31,702	1.04	60,012	2.01
15 years and over	218,230	6.06	324,427	8.33
Female	233,317	1.56	312,647	2.00
Married	85,732	1.19	79,039	1.04
Widowed	18,063	1.51	9,229	0.75
Divorced	14,798	2.09	22,018	2.77
Single	114,724	1.98	202,361	3.36
Under 15 years old	30,223	1.04	57,154	2.00
15 years and over	84,501	2.92	145,207	4.58

Note: Excludes early enumeration in the North for 1996 and persons living on incompletely enumerated Indian reserves for 1996 and 2001

Table 6 Estimated net census undercoverage of population by sex and legal marital status, 1996 and 2001 Censuses, Canada				
Sex and marital status	1996		2001	
	number		number	percentage
Both sexes	662,542	2.25	924,429	2.99
Married	174,802	1.39	189,024	1.46
Widowed	25,502	1.70	22,350	1.43
Divorced	60,942	3.56	66,110	3.44
Single	401,296	2.93	646,945	4.46
Under 15 years old	61,925	1.04	117,166	2.01
15 years and over	339,371	4.39	529,779	6.11
Male	429,225	2.94	611,782	3.99
Married	104,043	1.65	127,007	1.97
Widowed	7,437	2.76	13,881	4.66
Divorced	43,380	5.65	44,508	5.21
Single	274,365	3.77	426,386	5.53
Under 15 years old	31,702	1.04	60,012	2.01
15 years and over	242,663	5.75	366,374	7.77
Female	233,317	1.56	312,647	2.00
Married	70,759	1.12	62,017	0.96
Widowed	18,065	1.46	8,469	0.67
Divorced	17,562	1.86	21,602	2.02
Single	126,931	1.98	220,559	3.24
Under 15 years old	30,223	1.04	57,154	2.00
15 years and over	96,708	2.76	163,405	4.13

Note: Excludes early enumeration in the North for 1996 and persons living on incompletely enumerated Indian reserves for 1996 and 2001

Table 7 Estimated net census undercoverage of census families, 1996 and 2001 Censuses, Canada, provinces and territories

Area	1996		2001	
	number	percentage	number	percentage
Canada	147,957	1.85	158,486	1.87
Newfoundland and Labrador	1,661	1.06	1,949	1.25
Prince Edward Island	217	0.60	251	0.65
Nova Scotia	2,656	1.04	4,212	1.58
New Brunswick	3,502	1.66	3,162	1.45
Quebec	22,445	1.14	28,217	1.38
Ontario	67,167	2.24	72,162	2.22
Manitoba	3,844	1.30	4,044	1.32
Saskatchewan	4,087	1.55	3,916	1.46
Alberta	12,877	1.76	12,311	1.50
British Columbia	28,789	2.78	27,238	2.46
Yukon Territory	198	2.39	349	4.30
Northwest Territories	372	3.70	493	4.85
Nunavut	142	2.62	182	2.79

Note: For 1996 Statistics Canada, Social Survey Methods Division unpublished data. For 2001 Statistics Canada, Demography Division.

Table 8 Events and hypothesis used to reconstruct changes in the number of census families

Events	Effect		
	Increase	No changes	Decrease
Marriages and common-law unions ¹	If neither spouse is a family head	If one spouse is a family head	If both spouses are family heads
Divorces, separations ² , and annulments ² of legal marriages and dissolution ² of common-law unions	If there is more than one child and custody is shared	If there is at least one child and one parent has custody	If the couple is childless
Deaths of married persons ¹ and of persons living in common-law unions ²		If one spouse in a husband-wife family with children dies, or if a "non-family" married person dies	If one spouse in a childless husband-wife family, or both spouses in a husband-wife family with or without children, or a married lone-parent family head dies
Deaths of widows, widowers, or divorcees ¹		If a non-family person dies	If a lone-parent family head dies
Death ² or leaving home ² of a lone-parent family child		If at least another child still lives at home	If a lone child dies or leaves home
Births ¹	If a child is born to a non-family person or to a child at home	If a child is born to a head of a lone-parent family or to a husband and wife	
International migration ¹	If a family immigrates, or a non-permanent resident family enters to reside in Canada		If a family emigrates, or a non-permanent resident family leaves Canada
Interprovincial migration ¹	If a family arrives from another province ³		If a family leaves for another province ³

1. Refers to events for which insufficient information is available.

2. Refers to events for which no statistical information is available.

3. Applies only at the provincial level.