

Methodology

Related methodology notes

The two-way raking method is also referred to as the “Deming method”, the “method of iterative proportions”, and calibration (see Shryock, Siegel et al., 1976: 547-549).

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

The T1 family file (T1FF) is derived from the Canada Revenue Agency (CRA) T1 file by Income Statistics Division of Statistics Canada.

This document describes the concepts, data the sources and the 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, territorial and subprovincial levels.

Population Estimates

Types of estimates

Population estimates can either be intercensal or postcensal. Intercensal estimates are produced using counts from two consecutive censuses adjusted for net census undercoverage (NCU) (including adjustment for incompletely enumerated Indian reserves (IEIR)) and postcensal estimates. The production of intercensal estimates consists of 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 less reliable.

Levels of estimates

Updating population estimates between censuses requires 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.

Calculation of postcensal population estimates

Population estimates – preliminary, updated and final – are produced using the component method. This method consists in taking the population figures from the most recent census, adjusted for net census undercoverage, and adding or subtracting the number of births, deaths, and components of international and internal migration.

A. Subprovincial estimates of total population

Population estimates for census metropolitan areas and census divisions

The component method is used to produce estimates for census metropolitan areas (CMAs) and census divisions (CDs) by age and sex. This is applied to each age and sex cohort of the base population.

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

For age 0:

$$P^0_{(t+1)} = \frac{B_{(t,t+1)} - D^{-1}_{(t,t+1)} + I^{-1}_{(t,t+1)} - [E^{-1}_{(t,t+1)} + \Delta TE^{-1}_{(t,t+1)}] + RE^{-1}_{(t,t+1)} + NPR^0_{(t,t+1)} + \Delta NTER^{-1}_{(t,t+1)} + \Delta NFRA^{-1}_{(t,t+1)}}{\Delta NTER^{-1}_{(t,t+1)} + \Delta NFRA^{-1}_{(t,t+)}}$$

Ages 1 to 89:

$$P^{a+1}_{(t+1)} = \frac{P^a_{(t)} - D^a_{(t,t+1)} + I^a_{(t,t+1)} - [E^a_{(t,t+1)} + \Delta TE^a_{(t,t+1)}] + RE^a_{(t,t+1)} - NPR^a_{(t,t+1)} + \Delta NTER^a_{(t,t+1)} + \Delta NFRA^a_{(t,t+1)}}{\Delta NTER^a_{(t,t+1)} + \Delta NFRA^a_{(t,t+1)}}$$

For age 90 and over:

$$P^{90+}_{(t+1)} = \frac{P^{89+}_{(t)} - D^{89+}_{(t,t+1)} + I^{89+}_{(t,t+1)} - [E^{89+}_{(t,t+1)} + \Delta TE^{89+}_{(t,t+1)}] + RE^{89+}_{(t,t+1)} - NPR^{89+}_{(t,t+1)} + \Delta NTER^{89+}_{(t,t+1)} + \Delta NFRA^{89+}_{(t,t+1)}}{\Delta NTER^{89+}_{(t,t+1)} + \Delta NFRA^{89+}_{(t,t+1)}}$$

where, for each subprovincial region:

- $(t,t+i)$ = interval between time t and $t+i$;
- $P_{(t+i)}$ = Population estimates at time $t+i$;
- $P_{(t)}$ = Base population at time t (censuses adjusted for net census undercoverage or the most recent estimate);
- B = number of births;
- D = number of deaths;
- I = number of immigrants;
- E = number of emigrants;
- ΔTE = net temporary emigrants;
- RE = number of returning emigrants;
- NPR = non-permanent residents;
- $\Delta NTER$ = net interprovincial migration;
- $\Delta NFRA$ = net subprovincial migration.

In order to ensure the concordance between the subprovincial and provincial and territorial population estimate by age and sex, we use the prorating technique. This method ensures the coherence between subprovincial and provincial/territorial population estimates for each age and sex combination.

Population estimates for economic regions

A different method is used to produce population estimates for economic regions (ERs) called 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. These are false in-migrants. The same is true for out-migrants from one CD to another CD in the same ER. These 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 ERs can be estimated accurately by the CD aggregation method. This is why the estimates of intraprovincial in-migrants and out-migrants are not available for ERs.

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 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)*” of the *Régie de l’assurance-maladie du Québec (RAMQ)*”.

In the case of British Columbia, preliminary postcensal estimates at the CMA and CD level are obtained by applying the total population growth rate to Demography Division’s estimates of total population for the previous year. These growth rates are provided by *British Columbia’s Statistical Agency (BC STATS)*. Afterward, the preliminary postcensal estimates are split by age and sex using the age and sex distribution obtained using the component method of Demography Division. The British Columbia population estimates used to calculate the rates are produced using a regression model based on residential electrical (Hydro) connections and *Ministry of Health Client Registry* data as symptomatic indicators.

In order to ensure the concordance between the subprovincial and provincial population estimates by age and sex, a prorating technique is used. This method ensures the coherence between subprovincial and provincial population estimates for each age and sex combination.

B. Levels of estimates

For Quebec and British Columbia, the methods described in the previous section for the calculation of postcensal population estimates, are only used for preliminary postcensal estimates. For updated and final postcensal estimates, the component method is used.

The difference between preliminary 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).

C. Base population and components of population growth

Base population

The base populations are derived from the quinquennial censuses between 1996 and 2006. The population universe of the 2006 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;
- 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 permits and members of their families living with them;
- Persons with a usual place of residence in Canada who hold work permits and members of their families living with them;

For census purposes, the last three groups in this list are referred to as non-permanent residents (NPR).

These base populations are adjusted as follows:

- Adjustment of the population for net census undercoverage (NCU);
- Addition of independent estimates for incompletely enumerated Indian reserves in 1996, 2001 and 2006;

- Adjustment for early enumeration in parts of northern Quebec, Newfoundland and Labrador, the Yukon Territory and the Northwest Territories in 1996;
- At the provincial level, the estimate of the July 1 base population is obtained 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 to the annual components of growth, a fraction of the year that corresponds to the period between Census Day and June 30. These are adjusted to the provincial and territorial components.

Adjustment for net census undercoverage (NCU)

The 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, 2001 and 2006 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 four censuses (1991, 1996, 2001 and 2006). 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.

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.

D. Births and deaths

The numbers of births and deaths at the census division (CD) and for the census metropolitan areas (CMAs) levels 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 preliminary estimates.

A different method is used to produce estimates of births for census metropolitan areas (CMAs) in 2006-2007 called the census division conversion method. According to this method, each CMA is first defined in terms of CDs (complete or in part) using the Standard Geographical Classification (SGC) specifications.

In cases when the geographic delineation of a group of CDs matches that of a CMA, no adjustment is required; the births and deaths of each CD that make up the CMA are simply added together.

However, when the geographic delineation of the CD does not match that of the CMA – *i.e.* when a CD is not totally included in a CMA – a proportion of the CD's births is allocated to the CMA. This proportion is equal to the fraction of the CD's population living in the CMA territory.

These proportions are referred to as *conversion factors*. They are calculated using the most recent census counts. With these factors and the census division conversion method, it is possible to allocate to each CMA, the number of births initially measured at the CD level.

Levels of estimates

Estimates of births and deaths are categorized as final when they are directly taken from Health Statistics Division's vital statistics. To ensure their consistency, the estimates are subsequently controlled to the provincial totals using two-way raking.

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

Special treatment for preliminary postcensal estimates for Quebec and British Columbia

Quebec and British Columbia provide their most recent estimates of births and deaths. These estimates are used for the preliminary estimates. However, the final estimates of births and deaths for these provinces are derived directly from the vital statistics database of Statistics Canada's Health Statistics Division.

E. 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. *Citizenship and Immigration Canada* (CIC) collects and processes administrative files of immigrants. CIC then provides Statistics Canada with information from *Field Operational Support System* (FOSS) files. The information is used to estimate at provincial and territorial level 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.

Since *Citizenship and Immigration Canada's* (CIC's) subprovincial immigration data are not used, subprovincial estimates are produced by disaggregating the preliminary and final provincial or territorial estimates on the basis of the most recent subprovincial distribution derived from T1FF. The data are available only by broad age groups (0-17, 18-24, 25-44, 45-64, 65+) and must be disaggregated by sex and single year of age based on the census distribution. The distribution is made with the 2006 Census one-year mobility question. Note that in certain cases, when the census vector of CDs were small or contain aberration those were modeled by using provincial vectors. To ensure their consistency, they are subsequently controlled to the provincial totals using two-way raking.

Levels of estimates

The difference between preliminary 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.

F. Net non-permanent residents

In Canada, data collection on non-permanent residents (NPRs) is also 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 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 NPR 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. Non-permanent residents 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 net number of NPRs are calculated using estimates of their stocks. At the provincial and territorial levels, the number of people in CIC's administrative system is estimated for specific dates in each period of observation. First, the end-of-period NPR stock is estimated, and then the start-of-period stock is subtracted from that estimate. That yields the net number of NPRs.

Anyone who received non-permanent resident status prior to the observation date is counted. For the refugee claimants we use the date of their demand. Permit holders and refugee claimants can be excluded for different reasons and those criteria are different for each category. Permit holders are excluded from the population if their permit has expired or if they receive permanent resident status.

Refugees are excluded from the population if they receive permanent resident status, if they are deported or if their file is inactive for more than 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. Estimates of the net number of NPRs 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.

At the subprovincial level, there are no reliable administrative data available to directly estimate net number of NPRs. To compensate for the lack of data, the provincial / territorial estimates by age and sex are disaggregated by subprovincial area, age and sex on the basis of the distribution coming from the most recent census. It is to note that in certain cases of distributions including outliers, census information was modelled, single-year of age distributions being replaced by 5-year age groups distributions. To ensure their consistency, subprovincial estimates are subsequently controlled to the provincial and territorial totals using two-way raking.

Levels of estimates

The difference between preliminary and final estimates lies in the timeliness of the sources 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. These estimates are preliminary the first year and updated the following year. They become final two to three years after the reference year.

Since the estimates of the net number of NPRs are derived from provincial / territorial estimates, the level of the subprovincial estimates will be the same.

G. Emigration

The number of emigrants at provincial or territorial level 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). 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 takes 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 T1FF;

- 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 T1FF 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 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.

As in the case of immigrants, the number of emigrants at the subprovincial level is derived from the T1FF. The estimates are available only by broad age groups (0-17, 18-24, 25-44, 45-64, 65+) and must be disaggregated by sex and single year of age based on the census distribution. The distribution is made with the 2006 Census one-year mobility question. Note that in certain cases, when the census vector of CDs were small or contain aberration those were modeled by using provincial vectors. To ensure their consistency, they are subsequently controlled to the provincial totals using two-way raking.

Levels of estimates

The difference between preliminary 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.

H. Net temporary emigration

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.

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 is calculated first for the national level. It is then disaggregated by province or by groups 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.

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

Levels of estimates

The difference between preliminary and final estimates lies in the timeliness of the estimate of the Net temporary emigration.

I. 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 Tax Benefit* (CCTB) file and the *Canada Revenue Agency's* (CRA) T1FF are used to estimate the number of returning emigrants at provincial or territorial level. 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;
- 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 T1FFs;
- The adult/child ratio, which is based on the census used in estimating the base population.

To estimate the numbers of returning emigrants at the subprovincial level, provincial numbers of returning emigrants are disaggregated on the basis of the age and sex distribution of subprovincial returning emigrants (T1FF). To ensure their consistency, they are subsequently controlled to the provincial totals using two-way raking.

Levels of estimates

The difference between preliminary 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.

J. Interprovincial migration

Interprovincial migration by broad age group and sex for subprovincial areas is derived from the T1FF for each subprovincial area. The estimates by broad age group and sex are disaggregated into single years of age using distributions from the 2006 Census one-year mobility question. Note that in certain cases, when the census vector of CDs were small or contain aberration those were modeled by using

provincial vectors. To ensure their consistency, they are subsequently controlled to the provincial totals using two-way raking.

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

Levels of estimates

The difference between preliminary 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.

K. Intraprovincial migration

As in the case of interprovincial migration, the components of intraprovincial migration by broad age group and sex are derived from the T1FF for each subprovincial area. The estimates by broad age group and sex are disaggregated into single years of age using distributions from the 2006 Census one-year mobility question. Note that in certain cases, when the census vector of CDs were small or contain aberration those were modeled by using provincial vectors.

These sources are used for both preliminary and final estimates.

Levels of estimates

The difference between preliminary and final estimates lies in the timeliness of the T1FF data used to estimate this component.

Given the fact there are no reliable data for preliminary intraprovincial migration estimates, the data of the most recent year, for which final estimates are available, is used. We adopt the hypothesis that intraprovincial migratory behaviors of the current year are similar to those of the last year for which final estimates are available.

L. 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.

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

- The correspondence of the boundaries between both censuses;
- Calculation of the error of closure;
- Linear distribution of the error of closure.

To ensure the correspondence of the boundaries for the 1996/2006 period, the base populations and components of population growth from 1996 to 2006 had to be adjusted for the 2006 Census boundaries. For areas whose boundaries changed between the two censuses (2001 and 2006 Standard Geographical Classification (SGC)), *conversion factors* based on 2006 Census subdivisions were used.

In general, the corrections to census divisions (CDs), census metropolitan areas (CMAs) and economic regions (ERs) are minor (see the “Quality of estimates” section).

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 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 and sex cohorts.

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