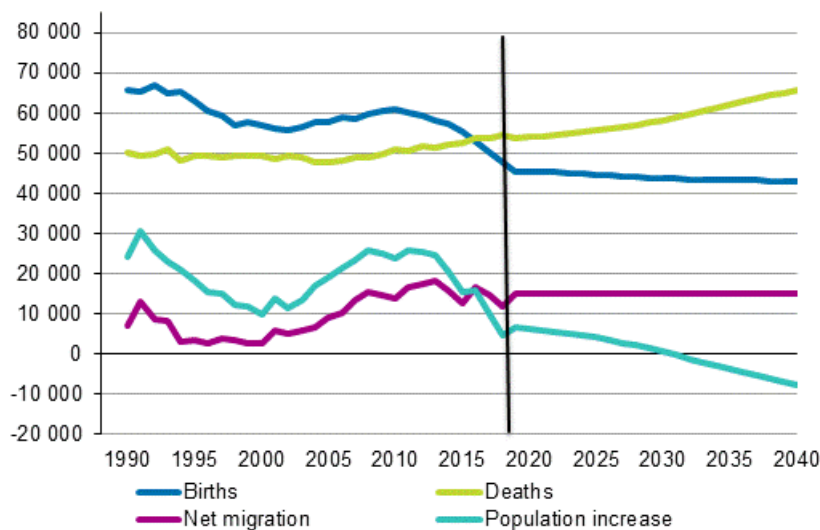


Population projection 2019–2070

The decline in the birth rate is reflected in the population development of areas

According to Statistics Finland's latest population projection, if the birth rate remains at the current level there will be no regions in Finland where births exceed deaths in 15 years. Based on the current development, Finland's population will start decreasing in 2031. In 2050, the population would be some 100,000 lower than today.

Births, deaths, net immigration and population change in 1990 to 2018 and projection for 2019 to 2040



In 2040, the population in Mainland Finland will only grow in the region of Uusimaa

In 2018, the population increased in four regions and in Åland. According to the projection, the population would only grow in the regions of Uusimaa and Pirkanmaa, and in Åland in 2035. In 2040, the population in Mainland Finland would only grow in the region of Uusimaa and even there only due to migration gain.

In 2018, there were 60 municipalities in Finland where births exceeded deaths. According to the projection, there would be 35 municipalities in Finland where births would exceed deaths in 2030 and by 2040 only 12.

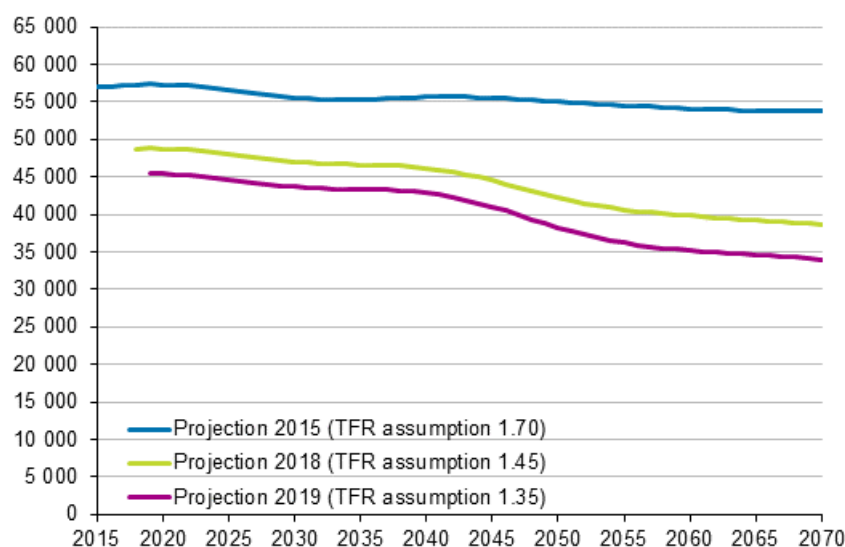
Assumptions of the 2019 population projection

Statistics Finland's latest population projection assumes that the birth rate would remain constant in future. The imputed number of children that women give birth to during their lifetime, i.e. the total fertility rate is assumed to be 1.35. The assumption is drastic but reflects the current birth rate. According to the preliminary statistics, total fertility is estimated to be 1.32 to 1.34 in Finland in 2019.

The birth rate assumption has been higher in previous projections and they contribute to the picture of what the population development would be like if the birth rate would be higher.

[\(Population by age and sex in population projections for different years, whole country\)](#)

Birth projection based on the projections made in 2015, 2018 and 2019



The projection assumes that Finland's annual migration gain from abroad will be 15,000 persons.

Mortality is assumed to continue declining similarly to what has been detected when comparing the mortality for 1987 to 1991 and 2014 to 2018. The life expectancy of men is estimated to rise by good five years and that of women by close on four years by 2040. More detailed information about the forecasting method can be found in the quality description.

Comparison with previous projections

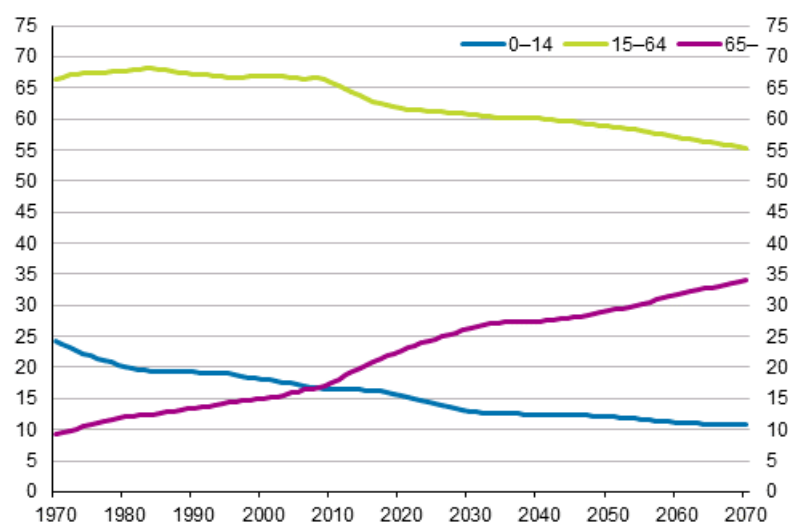
When comparing the 2019 population projection with the ones made in 2015 and 2018 the biggest differences, in addition to the population development, are seen in the projected development of young people in the short term and of the working age population in the long term.

According to the 2019 projection, the number of persons aged under 15 would be 688,000 in 2040 which is 178,000 less than in the 2015 projection and 47,000 less than in the 2018 projection.

The number of the working age population (aged 15 to 64) was highest in Finland in 2009, when there were 3.55 million such persons. During 2010 to 2018, the number of working-age people has fallen by 122,000 persons. During the next two decades, the working age population is expected to decrease more slowly or by 111,000 persons by 2040.

The reduction in the number of working age people would accelerate in the 2040s due to a drop in the birth rate. During 2041 to 2050, the working age population would decrease by 132,000 persons and in 2051 to 2060 further by 163,000 persons. At the end of 2060, the working age population would be 3.19 million persons, which is good 400,000 fewer than currently.

Age groups' share of the population 1970–2018 and projected share 2019–2070, per cent



The proportion of working age people in the population is currently 62 per cent. According to the projection, the proportion will drop to 60 per cent by 2040 and to 57 per cent by 2060. In the 2019 projections, the proportion of people of working age in total population is higher than in the two previous projections until 2060 because the population makes a downturn earlier due to the lower birth rate.

The projection is a trend calculation and gives decision-makers a chance to react

Statistics Finland's population projections are demographic trend calculations based on observations on past development in the birth rate, mortality and migration. The projections do not seek to estimate the effect of economic, socio-political regional policy and other such factors on population development.

According to the character of trend calculations, the projection expects past developments to continue into the future. The projections do not take a stand on how the size of the population should develop. Therefore, population projection figures should be examined bearing in mind that the projection only indicates the expected population development if the past development continues unchanged into the next decades.

The task of a population projection is to provide tools with which decision-makers can assess whether measures need to be taken to try to influence the population development. Decision-makers should assess the advisability of the population development indicated by the projection and, if necessary, take action

to prevent the materialisation of the projection if the population development indicated by the projection is not desired.

The projection has been made for the whole country up to 2070 and regionally up to 2040.

The next population projection will be published in autumn 2021.

Statistics Finland's population projections always include a regional projection, unless otherwise indicated.

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Appendix tables

Appendix table 1. Population and demographic dependency ratio at the end of 2030 in population projections compiled in different years

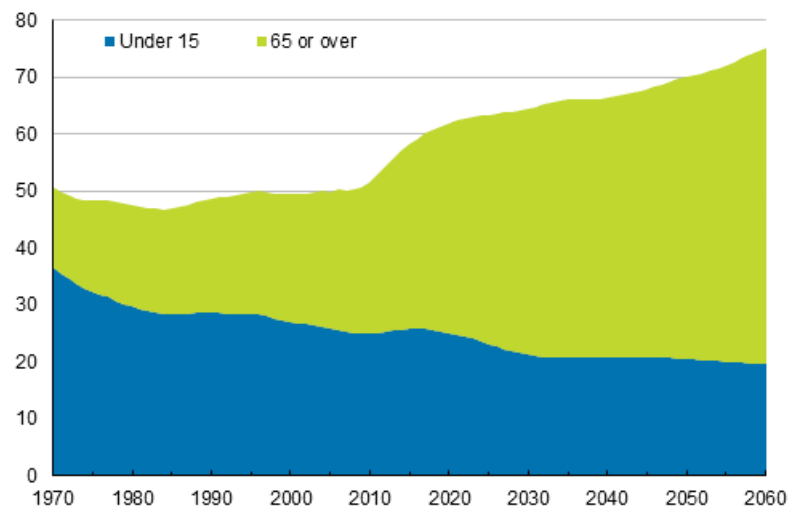
Population in population projections compiled in different years	Year of compilation								
	1998	2001	2004	2007	2009	2012	2015	2018	2019
Population at the end of 2030	5 249 755	5 290 563	5 442 841	5 683 182	5 850 097	5 847 678	5 769 032	5 611 987	5 566 685
Dependency ratio	70,1	70,9	71,8	73,3	73,0	71,2	69,2	65,7	64,5
Number of persons aged 65 and over	1 348 502	1 389 126	1 420 395	1 494 360	1 525 155	1 495 624	1 478 426	1 465 435	1 462 251
Proportion of persons aged 65 and over (per cent)	25,7	26,3	26,1	26,3	26,1	25,6	25,6	26,1	26,2
Number of persons aged 85 and over	152 754	169 022	178 503	220 505	242 156	226 001	219 209	216 624	216 003
Proportion of persons aged 85 and over (per cent)	2,9	3,2	3,3	3,9	4,1	3,9	3,8	3,9	3,9

Appendix table 2. Demographic dependency ratio and population in 1970 to 2070 (years 2020 to 2070: projection)

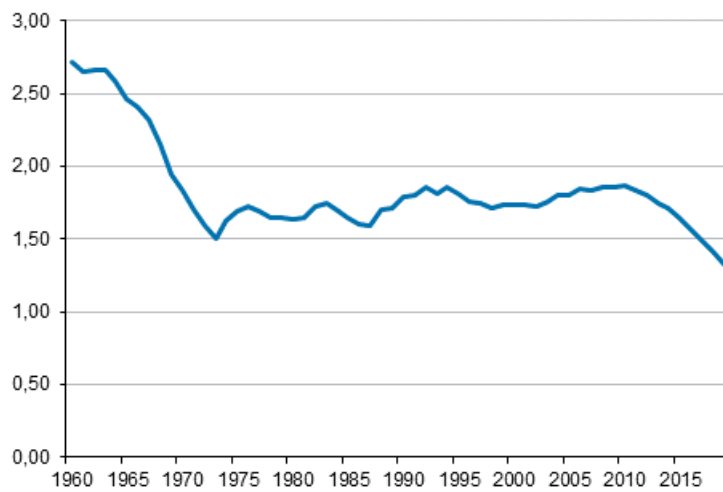
Year	Demographic dependency ratio	Population, total	Aged under 15 and aged 65 and over	Aged 15 to 64
1970	50,7	4 598 336	1 546 038	3 052 298
1980	47,5	4 787 778	1 542 591	3 245 187
1990	48,7	4 998 478	1 637 168	3 361 310
2000	49,4	5 181 115	1 713 531	3 467 584
2010	51,6	5 375 276	1 828 718	3 546 558
2018	60,8	5 517 919	2 087 071	3 430 848
2020	62,0	5 530 922	2 116 090	3 414 832
2030	64,5	5 566 685	2 182 853	3 383 832
2040	66,4	5 525 528	2 205 793	3 319 735
2050	70,1	5 422 296	2 234 655	3 187 641
2060	75,2	5 298 999	2 274 582	3 024 417
2070	81,1	5 180 411	2 320 323	2 860 088

Appendix figures

Appendix figure 1. Demographic dependency ratio 1970–2060

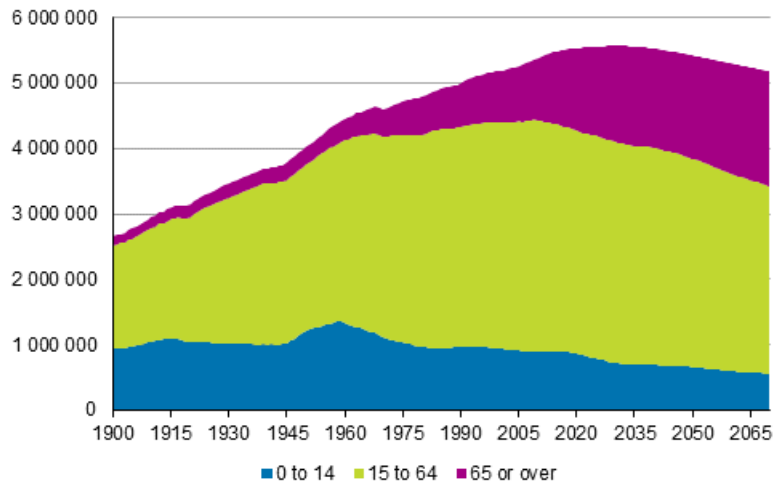


Appendix figure 2. Total fertility rate 1960–2019*

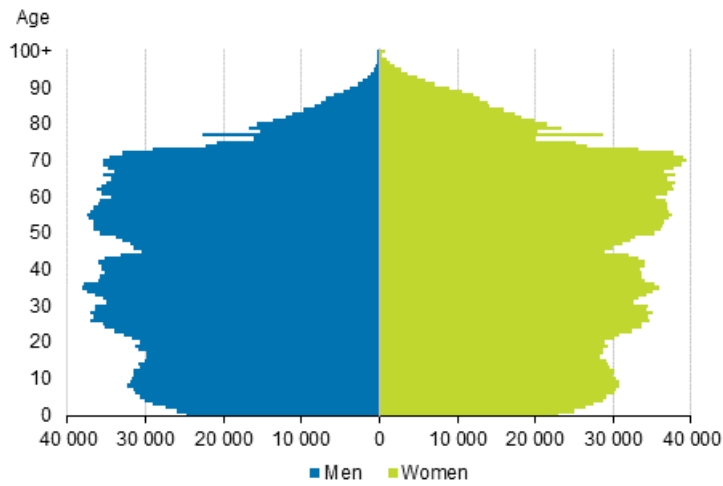


*) 2019 estimate

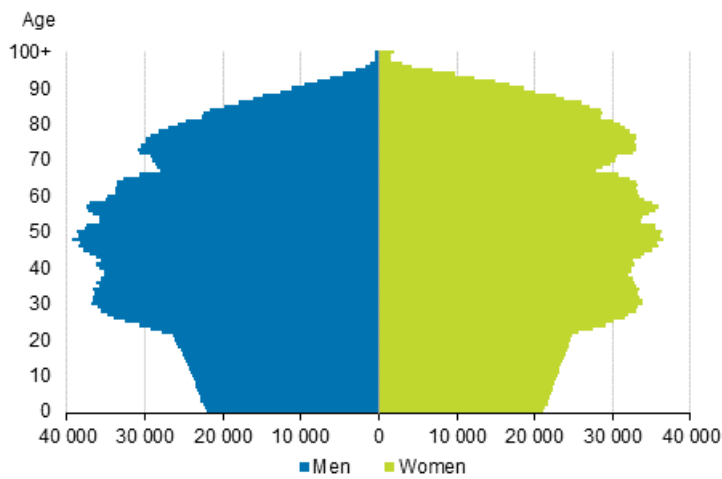
Appendix figure 3. Population by age 1900–2018 and projection 2019–2070



Appendix figure 4. Population by age and gender 2018



Appendix figure 5. Population by age and gender 2040, projection 2019



Quality description: Population projection 2019–2070

1. Relevance of statistical information

The basic population for this population projection has been population by municipality at the end of 2018 by 1-year age group according to gender. The projection was calculated by municipality and the figures for regions and the whole country were derived from municipality data by summing. The projection data can also be printed out using any other regional division as long as it is based on municipalities. In addition to data on population numbers, data are also available on the numbers of births, deaths and migrants according to the projection and the coefficients used in calculating the projection.

There are two calculations of the projection:

- A calculation including migration (calculation 1), where account is taken of the effect of the birth rate, mortality, inter-municipal migration and migration on population development.
- The self-sufficiency calculation (calculation 2) expresses what the future population development would be like without migration. The calculation takes only the impact of the birth rate and mortality on population development into account. The assumptions concerning birth rate and mortality are the same as in calculation 1. The numbers of births are, however, different in these calculations, as migrants assume the fertility of the receiving area in the calculation including migration.

The Central Statistical Office of Finland published the first population projection concerning Finland's future population development in 1934. In 1956 the memorandum of the statistical committee set up in 1953 proposed that population projections should be compiled at regular intervals. The first projections related to the population development of the whole country. Preparation of regional projections started in the 1960s.

In 1973 the so-called population projection group established by the Prime Minister's Office published its report "On arrangement of compilation of population projections" ("Väestöennusteiden laadinnan järjestäminen", Valtioneuvoston kanslian julkaisu 1973:1). In the report population projections were defined as follows: "Population projections are calculations based on the past development of the factors influencing population development, which do not include population development planned by the compiler of the projection or any expressions of intent related to regional policy."

According to the report, population projections "...indicate to decision-makers primarily what the development will lead to if social policy stays unchanged. Decision-makers have to assess the advisability of the development and consider on that basis whether the projections can be used as foundation for decisions on investments and on measurement of activities."

2. Methodological description of survey

The population projection method used is a so-called demographic component model in which the future population number and structure are calculated by means of age-specific birth rate, mortality and migration coefficients. The coefficients are calculated on the basis of demographic statistics for the last few years. To decrease random variation of the coefficients they are calculated for several years and in addition, municipalities are grouped into birth rate, mortality and out-migration areas.

Birth rate

To calculate the number of births, municipalities are grouped into 74 fertility areas on the basis of the total fertility rate in the years 2014 to 2018. Municipalities with a population of 36,000 form their own fertility areas. Municipalities with a smaller population are combined into fertility areas with a population of roughly 30,000 to 70,000. Municipalities with small populations have been paired up with municipalities from anywhere in the country which have the same fertility rate. Previously the combinations were made within regions. When forming fertility areas, account has also been taken of age-specific fertility.

Age-specific fertility rates (women aged 14 to 50) have been calculated for the fertility areas for the years 2014 to 2018. Municipalities belonging to the same fertility area have identical fertility coefficients. In the projection the fertility rates have been kept constant throughout the projection period. For the whole country the average total fertility rate, that is, the average number of children born to each individual woman during her lifetime is 1.35.

Mortality

In order to calculate the number of deaths, 19 mortality areas have been formed. The six municipalities with the largest populations (at least 190,000 people) form their own mortality areas and smaller municipalities have been combined into mortality areas with populations ranging from 170,000 to 400,000. Municipalities have been grouped into mortality areas on the basis of age- and gender-standardised mortality for the years 2012 to 2018. Therefore, the mortality area of a municipality is not determined by its geographical location.

To reduce random variation, the mortality coefficients of the whole country are used in all mortality areas for persons aged 0 to 17 and 90 to 104. Area-specific coefficients are used for persons aged 18 to 89. Age-specific mortality rates have been calculated for the years 2014 to 2018. Coefficients by age and gender group for the annual change in mortality were derived by calculating how much mortality changed when comparing 1987 to 1991 with 2014 to 2018. Mortality was not inflated for any age group, however.

Migration

Municipalities are divided into 77 out-migration categories according to the out-migration propensity of those aged 0 to 6 and 16 to 44 from 2014 to 2018. Municipalities with a population of 36,000 form their own out-migration areas. Municipalities with a smaller population are combined into out-migration areas with populations ranging from 30,000 to 60,000. Municipalities with small populations have been paired up with municipalities from anywhere in the country which have the same out-migration propensity. Previously the combinations were made within regions. Age group-specific out-migration coefficients by gender for the out-migration areas were calculated on the basis of the years 2014 to 2018.

The whole country is divided into 15 migration major regions. Migration major regions are areas with populations of at least 100,000 formed around large regional centres (excl. Uusimaa and Åland). A municipality's major migration region is determined by the regional centre or municipalities adjacent to a regional centre to which the municipality has had the most out-migration during 2014 to 2018. More migration areas have been formed into Southern Finland, because the population and migration numbers in the area require smaller area units.

In the population projection, migration between major migration regions is calculated with migration probabilities. First the total number of out-migrants from the major migration region is calculated by summing the number of out-migrants in the municipalities belonging to the major migration region. Then migration probabilities are used to calculate the proportion of the out-migrants who stay within their own major migration region and the proportion of out-migrants who go to other major migration regions. Age group-specific migration probabilities by gender for major migration regions were calculated on the basis of the years 2014 to 2018.

In-migration proportions have been calculated for municipalities for each age and gender group (a) for the migrants who stay in their own major migration region, (b) migrants from other major migration regions and (c) migrants from abroad into the major migration region. The proportions were calculated from the sum of the in-migrations in the municipality's major migration area. In-migration proportions of the migrants from the municipality's own major migration region were calculated on the basis of the years 2014 to 2018. In-migration proportions of the migrants from other major migration regions and for the migrants from abroad were calculated on the basis of the years 2012 to 2018. All migration coefficients and in-migration proportions have been kept constant throughout the projection period.

In the calculation containing migration, the net immigration for the whole country is assumed to be 15,000 persons per year. Net immigration is obtained by adding the assumed net immigration to the emigration for the whole country. The age distribution of immigration was calculated on the basis of immigration during 2014 to 2018. Immigration is divided into the major migration regions on the basis of the immigration proportion coefficient of each region. The immigration proportion of the major migration regions of the

immigration of the whole country was calculated by age group and gender on the basis of the years 2014 to 2018. Municipalities' immigration was calculated from the sum of immigration to their own major region by using the in-migration proportion coefficient.

3. Correctness and accuracy of data

Municipal projections should be compiled for all municipalities with the same principles. It would be impossible to treat municipalities "individually", and therefore there have always been and will always be cases where e.g. the calculation period of the projection coefficients has somehow been exceptional for a municipality, which causes the projection to differ from the trend development in either direction.

The projection deviations for small municipalities are primarily due to their projection coefficients not corresponding to the actual level of out-migration, in-migration, fertility or mortality. Small municipalities must be combined into larger entities in order to reduce random variation.

In previous population projections the whole country was divided into four mortality areas. The number of mortality areas used now is much higher. The number of mortality areas has been increased so that regional differences in the level can better be taken into account. The population projection by municipality has always had some over-mortality. In order to reduce random variation, mortality coefficients have been calculated for a longer period and mortality coefficients for the whole country have been used for certain age groups (0 to 17 and 90 to 104+).

4. Timeliness and promptness of published data

Statistics Finland has prepared population projections by municipality at intervals of roughly three years. In the intervening years, projection calculations were made concerning the whole country on the basis of various assumptions, e.g. the low, average and high alternative. In recent years alternative calculations have been made mainly only as chargeable assignments, in which case the calculations have been based on the assumptions specified by the customer.

In connection with the 1998 projection a so-called stochastic forecast was calculated for the whole country with the PEP software (Program for Error Propagation) developed at the University of Joensuu. In it the population change components vary like they have varied in the past, and from the produced projection database e.g. the range of some statistical information can be derived with the desired probability. (For further information, see Juha M. Alho: A Stochastic Forecast of the Population of Finland. *Katsauksia* 1998:4).

The 2019 projection extends to the year 2070. It has been published by region up to the year 2040.

5. Accessibility and transparency/clarity of data

Up to 1972, population projections by municipality were published in the "Tilastollisia tiedonantoja" series, then until 1985 in the "Tilastotiedotus VÄ" series and after that in the OSF Population series. Municipalities' projected figures by age group were published as a separate volume of the 1969 projection, while age group data by municipality from later projections were available as photocopies. In the 1990s the data were mainly supplied as Excel tables. Previous projection files by municipality were not retained. Data on the population projections made in 2001, 2004, 2007, 2009, 2012, 2015 and 2018 are available in electronic format.

Data from the latest projection are available free of charge from the Px-Web StatFin service on the Internet at http://pxnet2.stat.fi/PXWeb/pxweb/en/StatFin/StatFin__vrm__vaenn/?tablelist=true

6. Comparability of statistics

Statistics Finland's population projections are long-term projections. Therefore, they do not always give a reliable picture of e.g. the number of births or deaths in the coming years. Since the 1970s the birth rate has fluctuated up and down so that the total fertility rate has varied between 1.41 (2018) and 1.87 (2010).

In population projections fertility has been kept constant at some average or initial level, because it would be impossible to guess the turning points in development. Likewise, mortality has fallen quickly at times and slowly at others. In the projections, the change coefficients for mortality have been calculated for around 20-year periods so that they would include periods of both quick and slower lowering.

When comparing different projections, differences in the projection assumptions should be taken into account. Many municipalities prepare their own population projections, whose assumptions may deviate greatly from those used in Statistics Finland's projections. In addition to Statistics Finland, population projections concerning the whole of Finland are produced by e.g. Eurostat and the UN.

7. Coherence and consistency/uniformity

In Statistics Finland's population projections, the population figures for each year refer to the situation on 31 December. In the projections by Eurostat and many municipalities, the figures refer to the situation on 1 January. In the UN projections, the figures represent the situation in the middle of the year.

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Source: Population and Justice Statistics. Statistics Finland