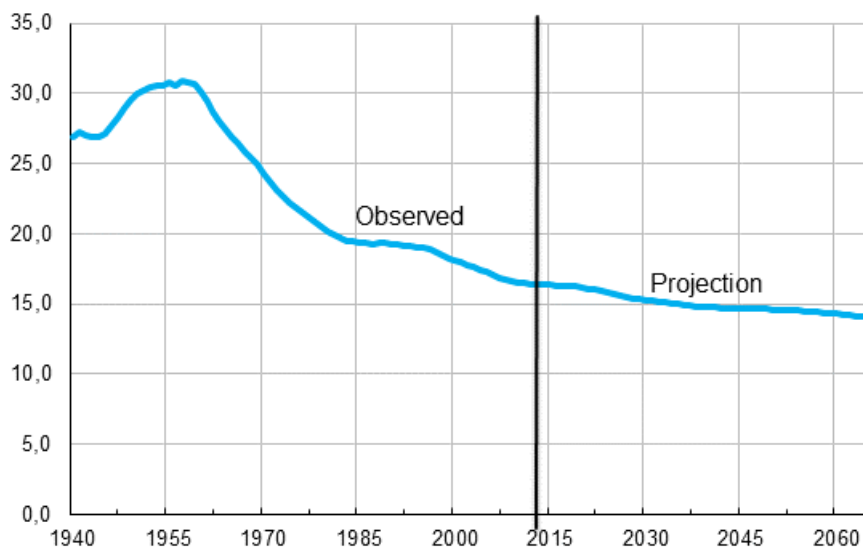


Population projection 2015–2065

Share of young people in the population is in danger of diminishing further

According to Statistics Finland's latest population projection, there would be 882,000 persons aged under 15 in Finland in 2030. The number of persons aged under 15 has last been this low in 1894. At the beginning of the 1980s, one in five Finns were aged under 15. According to the projection, the share of persons aged under 15 in the population would decrease to 14 per cent by 2060. The main reason for the declining share of young people is an insufficient birth rate.

The share of persons aged under 15 in the population in 1940 to 2065, per cent



The worst is over in the decrease of the population of working age

The number of the population of working age (aged 15 to 64) was highest in 2009, when there were 3.55 million such persons in Finland. During 2010 to 2014, the number of working-age people has fallen by 69,000 persons.

According to the population projection of 2015, the number of working-age people would decrease from the current 3.48 million to 3.41 million, or by 75,000 persons, by 2030. After this, the number of working-age people would recover slightly, and by 2045 they would number 3.46 million. Then, the

number of working-age people would again start declining and, according to the projection, they would number 3.40 million in 2060.

The proportion of people of working age in the population will diminish from the present 64 to 59 per cent by 2030 and to 57 per cent by 2060.

The so-called self-sufficiency forecast describes a situation where there would be no immigration and emigration at all and only the birth rate and mortality would influence the age structure. According to the self-sufficiency forecast, the number of people of working age would go down by the year 2030 by 300,000 persons and by the year 2050 by 550,000 persons.

Demographic dependency ratio weakens

The proportion of persons aged 65 or over in the population is estimated to rise from the present 19.9 to 26 per cent by 2030 and to 29 per cent by 2060. The demographic dependency ratio, that is, the number of children and pensioners per one hundred persons of working age, will go up in the near future.

At the end of 2014, the demographic dependency ratio was 57.1. According to the projection, the limit of 60 dependents would be reached in 2017 and that of 70 dependents by 2032. In 2060, the demographic dependency ratio would be 76.

Assumptions of the 2015 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 1.70.

The forecast also assumes that in 2015, Finland's migration gain from abroad will be 14,000 persons and in 2016 to 2065 it will be 17,000 persons per year. Mortality is assumed to continue declining similarly to what has been detected when comparing the mortality for 1987 to 1991 and 2010 to 2014. More detailed information about the assumptions and the forecasting method can be found in the quality description.

Statistics Finland's projection is a trend calculation

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.

The calculations mainly indicate the outcome from the present development under the assumption that it continues unchanged. Thus, they should not be interpreted as descriptions of the inevitable. The task of a population projection is to provide tools with which decision-makers can assess whether measures need to be taken to influence the development.

The projection has been made for the whole country up to 2065 and regionally up to 2040.

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Appendix table 1. Population by age 1900–2060 (years 2020 to 2060: projection)

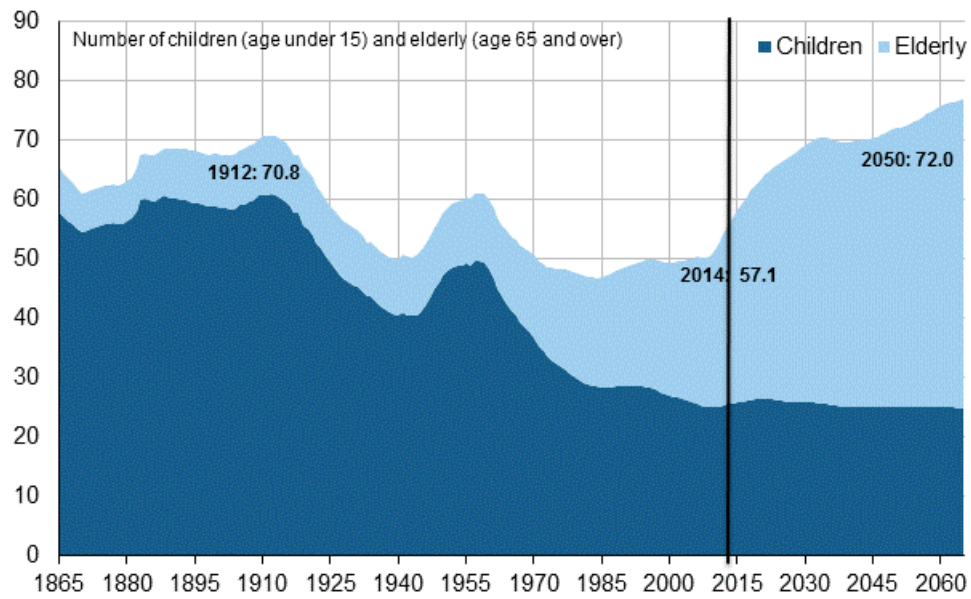
Year	Age groups, total	Age group 0 to 14	Age group 15 to 64	Age group 65-	0–14, %	15–64, %	65-, %
1900	2 655 900	930 900	1 583 300	141 700	35,1	59,6	5,3
1910	2 943 400	1 049 400	1 724 500	169 500	35,7	58,6	5,8
1920	3 147 600	1 051 000	1 908 300	188 300	33,4	60,6	6,0
1930	3 462 700	1 018 300	2 227 200	217 200	29,4	64,3	6,3
1940	3 695 617	995 599	2 464 107	235 911	26,9	66,7	6,4
1950	4 029 803	1 208 799	2 554 354	266 650	30,0	63,4	6,6
1960	4 446 222	1 340 187	2 778 234	327 801	30,1	62,5	7,4
1970	4 598 336	1 118 550	3 052 298	427 488	24,3	66,4	9,3
1980	4 787 778	965 209	3 245 187	577 382	20,2	67,8	12,1
1990	4 998 478	964 203	3 361 310	672 965	19,3	67,2	13,5
2000	5 181 115	936 333	3 467 584	777 198	18,1	66,9	15,0
2010	5 375 276	887 677	3 546 558	941 041	16,5	66,0	17,5
2020	5 595 213	905 177	3 425 880	1 264 156	16,2	61,2	22,6
2030	5 769 032	881 745	3 408 861	1 478 426	15,3	59,1	25,6
2040	5 861 491	865 950	3 453 582	1 541 959	14,8	58,9	26,3
2050	5 914 143	864 163	3 438 029	1 611 951	14,6	58,1	27,3
2060	5 978 836	853 476	3 401 416	1 723 944	14,3	56,9	28,8

Appendix table 2. 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							
	1995	1998	2001	2004	2007	2009	2012	2015
Population at the end of 2030	5 095 169	5 249 755	5 290 563	5 442 841	5 683 182	5 850 097	5 847 678	5 769 032
Dependency ratio	67,4	70,1	70,9	71,8	73,3	73,0	71,2	69,2
Number of persons aged 65 and over	1 219 963	1 348 502	1 389 126	1 420 395	1 494 360	1 525 155	1 495 624	1 478 426
Proportion of persons aged 65 and over (per cent)	23,9	25,7	26,3	26,1	26,3	26,1	25,6	25,6
Number of persons aged 85 and over	125 602	152 754	169 022	178 503	220 505	242 156	226 001	219 209
Proportion of persons aged 85 and over (per cent)	2,5	2,9	3,2	3,3	3,9	4,1	3,9	3,8

Appendix figures

Appendix figure 1. Demographic dependency ratio 1865–2065



Quality description: Population projection 2015–2065

1. Relevance of statistical information

The basic population for this population projection has been population by municipality at the end of 2014 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 79 fertility areas on the basis of the total fertility rate in the years 2010 to 2014. Municipalities with a population of 35,000 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 2010 to 2014. 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 1.70.

Mortality

In order to calculate the number of deaths, 20 mortality areas have been formed. The five municipalities with the largest populations (at least 175,000 people) form their own mortality areas and smaller municipalities have been combined into mortality areas with populations ranging from 150,000 to 400,000. Municipalities have been grouped into mortality areas on the basis of age- and gender-standardised mortality for the years 2008 to 2014. 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 2010 to 2014. 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 2010 to 2014. Mortality was not inflated for any age group, however.

Migration

Municipalities are divided into 84 out-migration categories according to the out-migration propensity of those aged 0 to 6 and 16 to 44 from 2010 to 2014. Municipalities with a population of 35,000 form their own out-migration areas. Municipalities with a smaller population are combined into out-migration areas with populations ranging from 20,000 to 40,000. 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 2010 to 2014.

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 2010 to 2014. 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 2010 to 2014.

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 and from other major migration regions were calculated on the basis of the years 2010 to 2014 and for the migrants from abroad on the basis of the years 2010 to 2014. 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 14,000 persons in 2015 and in 2016 to 2065 it will be 17,000 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 2010 to 2014. 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 2010 to 2014. 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 2015 projection by municipality extends to the year 2065. 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 and 2012 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 1.50 (1973) 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