

HUMAN FERTILITY DATABASE DOCUMENTATION: Iceland

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1 General information

This report documents fertility data for Iceland collected for the Human Fertility Database (HFD), including age- and birth order- specific data on births, and data on births by calendar month. The data included in the HFD were collected by the official statistical agency of Iceland (Statistics Iceland), which is responsible for the collection, processing, and dissemination of vital statistics and population data for Iceland.

Statistics Iceland was founded in 1914 (Statistics Iceland 2014a). Statistics Iceland provides information on the resident population in Iceland and on vital events. In 1952 the National Population Register was established in Iceland (Statistics Iceland 2014b). A special census on October 16, 1952, together with the general census of December 1, 1950, served as a basis for the population register (Andreeva 2015). The Register is run by Statistics Iceland as an administrative register and is updated on a daily basis. The Register collects information on marriages, consensual unions, divorces, births, deaths, adoptions, religious affiliation, and changes in residence and in citizenship.

The Icelandic fertility data for the HFD comprise the following official (published and unpublished) tabulations:

- Number of live births by 5-year age groups of the mother for the calendar years 1853 and 1855-2012.
- Number of live births by single years of age of the mother for the calendar years 1963-2012.
- Number of live births by single years of age of the mother, mother's year of birth and by birth order for the calendar years 1990-2023.
- Number of (live) births by month for the calendar years 1853-2023.

Detailed information about the data used in the HFD calculations is provided in Appendix 1 (data not (yet) used in the calculations are available in the Input Data section on the HFD webpage for Iceland).

1.1 Data collection

Similarly to those of other Nordic countries, population statistics for Iceland offer remarkably rich data over an extended period of time. According to Andreeva (2015) the “first modern census in the world” was conducted in Iceland in 1703. During the period 1769–1901, censuses for Iceland were conducted in conjunction with the Danish censuses. Since 1910 Icelandic censuses have been organized and carried out exclusively in Iceland. (A complete list of censuses in Iceland is provided in Andreeva 2015, Appendix 2).

The collection of vital statistics in Iceland began in the seventeenth century. As in the other Nordic countries, parsons (parish priests) collected information on the annual number of births and deaths in their parishes and recorded them in the parish registers (*kirkjubækur*). In 1735 the collection of vital statistics in all parishes became compulsory. Until 1952 the statistics were produced based on the annual birth records from parsons. Since 1953 the population and vital statistics of Iceland come from the National Population Register, which is being daily updated using data on changes in the address registration as well as in the registration of births, marriages, deaths, and other events.

The Icelandic birth data included in the HFD cover the period 1960-2023 (for a detailed description of the data availability and data selection criteria, see section 2 below).

1.2 Territorial coverage

There were no territorial changes in Iceland during the period covered in the HFD.

2 Birth count data

2.1 Coverage and completeness

Data on the distribution of live born children by mothers' age are available from 1853 onwards. However, the birth data for the period 1853-1962 are classified by 5-year age groups of the mother, including a broad age interval ≤ 19 . The standard HFD algorithm, which is used to split birth data by 5-year age groups into data by single years of age does not always perform sufficiently well in cases of such broad open-ended age intervals at young ages. So far only birth counts for the years 1960-1962 have been processed and, based on the positive data checking conclusions, have been included in the HFD. Nevertheless, it is important to note that the data for 1960-1962 are of lower quality (see section 4.2 for more details). Historical fertility data of Iceland for the period prior to 1960, i.e. 1853-1959, are made available in the Human Fertility Collection (HFC)¹.

Data on live births by *single* years of age of the mother are available for the years 1963-2012. Birth counts for the period 1963-1970 come from the ODE collection (Observatoire Démographique Européen), whereas those for 1971-2012 were retrieved from the Demographic Statistics Database of Statistics Iceland (for the HFD calculations only birth data for 1971-1989 are used from this source; see Appendix 1). Data by age of the mother, mother's year of birth, and birth order are available for the period 1990-2023. Table 1 summarizes the age-specific birth count data available for Iceland.

¹ <http://www.fertilitydata.org/cgi-bin/country.php?code=isl>

Table 1 Data on live births, Iceland, 1853-2022

Period	Age range	Age interval	Birth order	Source
1853, 1855-2012	≤19, 20-24, ..., 50+	5-year	-	1
1963-1970	≤15, 16...49, 50+	1-year	-	3
1971-2012	≤14, 15...49, 50+	1-year	-	2
1990-2023 ¹	12, 15, ..., 55	Lexis triangles	1,..., 6+	4, 12

¹ Data on births by birth order were retrieved from the National Population Register; therefore, there are no births of unknown birth order in Iceland. The lowest and the highest age category varies over the years.

Data on births by *calendar month* cover the period 1853-2023. However, the data before 1878 include also stillbirths.

All births to mothers with permanent residence in Iceland are counted, regardless of where the birth takes place.

3 Population count data

3.1 Population count data by age

The annual age structure of the female population in Iceland is taken from the Human Mortality Database (www.mortality.org).

3.2 Revisions in population count data

Statistics Iceland modified the method for estimating the population of Iceland in March 2024 and revised the 2011-2022 intercensal population estimates. Please see the description below.

“Statistics Iceland has developed a new method for population statistics. Until now, population statistics have been based only on registration of legal residence in the national register. The new method is founded on a broader base of register data, tax data and data on students in addition to the national register. The results show that the population of Iceland 1 January 2024 was overestimated by 15,245 people. This overestimation is due to an increase in immigration from EEA countries” (Statistics Series 2024: 9).

4 Specific details

4.1 Definitions

Definition of a live birth

Live births according to Statistics Iceland are all children born with clear signs of life.

Definition of a stillbirth

Before 1992, in the tables of Statistics Iceland stillborn children are those born without signs of life after at least 28 weeks of gestation. Shorter gestation periods were considered miscarriages. Since 1992, however, the limit for miscarriage has been set at 22 weeks gestation and 500 g weight.

Definition of age

The age of the mother is classified by the age in completed years (ACY), which is the age

reached at the last birthday.

Definition of birth order

Birth order is defined by the total number of previously live-born children to a woman. In case of multiple deliveries, each child is assigned a separate birth order.

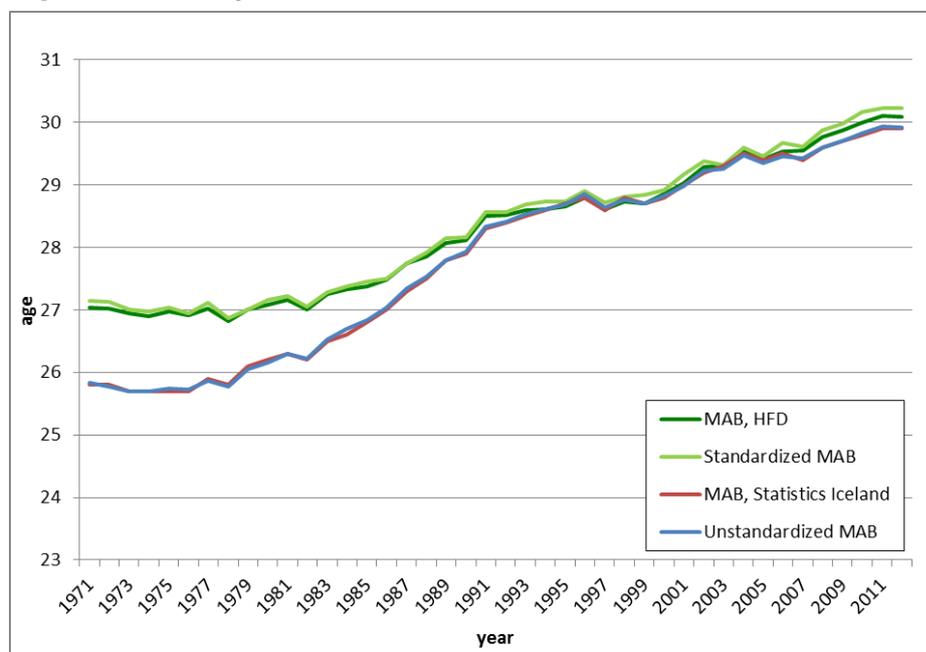
4.2 Data quality issues

Differences between the officially published mean ages at birth and the HFD estimates

The HFD estimates of the mean age at birth for the years 1963-1991 differ from the values officially published by Statistics Iceland for this period. We assume that by Statistics Iceland the mean age at birth is computed without controlling for the age distribution of women of childbearing age. In other words, the official mean age at birth estimates for 1963-1991 are likely to be derived on the basis of age-specific birth counts and thus not by using age-specific fertility rates.

Figure 1 shows the plots of four different types of estimates for the mean age at birth for Iceland, namely 1) HFD mean age at birth estimates (dark green line), 2) mean age at birth estimates based on official age-specific fertility rates published by Statistics Iceland (light green line), 3) mean age at childbearing as officially published by Statistics Iceland (red line), and 4) estimates of unstandardized mean age at birth, calculated using birth count data by age of the mother as published by Statistics Iceland (blue line). The results suggest that differences between the HFD estimates and the officially published values of the mean age at childbearing are caused of using different methodology for deriving the indicator.

Figure 1 Mean age at birth, Iceland, 1971²-2012

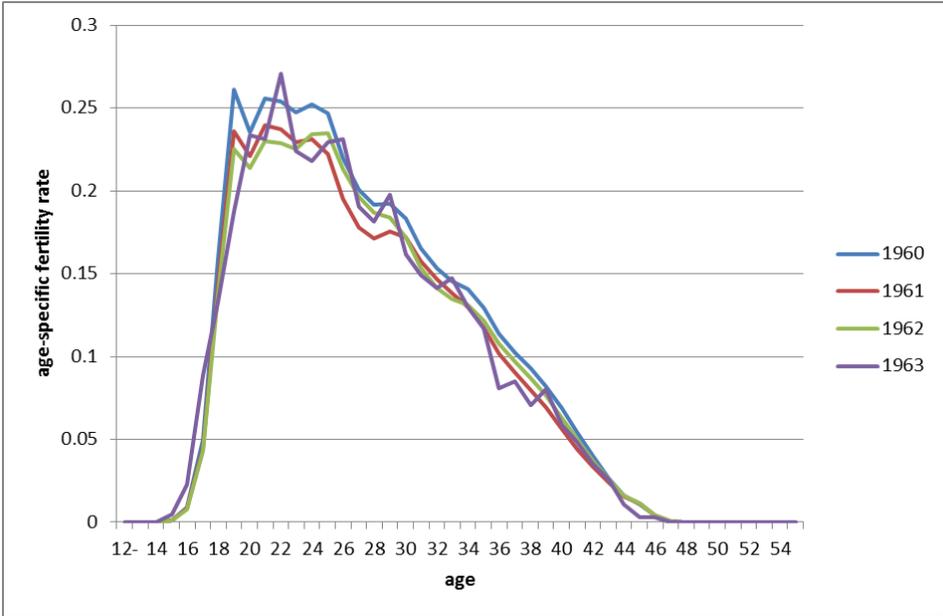


² Note that only plot estimates starting in 1971 are depicted because Statistics Iceland began publishing the number of births by age of mother starting in that year.

As mentioned in section 2.1, for the period 1960-1962 birth data are available by 5-year age groups only, which, using the HFD methodology, are split into single-year age categories. In order to highlight the lower quality of the data for the period 1960-1962, Figure 2 contrasts the

derived age-specific fertility rates for the years 1960-1962 against those calculated for the year 1963. Note that 1963 is the first year for which births are available by single years of age.

Figure 2 Age-specific fertility rates, Iceland, 1960-1963³



³ The age-specific fertility rates for the years 1960-1962 have been derived from birth data by 5-year age groups, the rates for the year 1963 from birth data by single years of age.

4.3 Revision history

Changes with the October 2024 revision:

Data for the year 2022 were added (birth counts for 2023 are available in the Input Data section on the HFD webpage for Iceland).

There are small changes in population exposure estimates for 2010-2021, in birth counts for 2011-2021 and consequently in generated fertility rates for the respective years. The cause for these changes is that Statistics Iceland modified the method for estimating the population of Iceland in March 2024 and updated the time series from 2011 onwards (see section 3.1 for more detail).

Changes with the September 2023 revision:

Data for the year 2021 were added.

Changes with the August 2022 revision:

Data for the years 2019-2020 were added in the HFD. Data on births for 2021 are available in the input data section but were not used in the calculations because the HMD population exposure estimates were not yet ready.

Changes with the April 2020 revision:

Data for the years 2016-2018 were added.

Changes with the November 2018 revision:

Data for the years 2013-2015 were added.

Changes with the June 2016 revision:

Data for the years 1960-1962 and 2011-2012 were added.

References

Andreeva, Mila (2015). About Mortality Data for Iceland: Documentation Report for the Human Mortality Database; last revised by Gabriel Borges on 7 July 2015.
<http://www.mortality.org/hmd/ISL/InputDB/ISLcom.pdf>

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**APPENDIX 1
INPUT DATA USED FOR HFD CALCULATIONS**

BIRTHS

Period	Type of data	Age range	Birth order	RefCode(s)
1960-1962	Annual number of live births by 5-year age-group of mother	≤19,20-25,..., 45-49, 50+	—	1
1963-1970	Annual number of live births by age of mother (Lexis squares)	≤14, 15,...,49, 50+	—	3
1971-1989	Annual number of live births by age of mother (Lexis squares)	≤14, 15,...,49, 50+	—	2
1990-2022	Annual number of live births by age of mother, mother's year of birth, and birth order (Lexis triangles)	12, 13,...,49, 55 ¹	1, 2,...,6+	4, 12
1878-2022	Annual number of live births by month	total	total	5, 13

¹ The lowest and the highest age category varies over the years.

FEMALE POPULATION: Exposure by age and year of birth

The female exposure population by calendar year, age, and year of birth (Lexis triangles) is estimated using data on population size and deaths from the Human Mortality Database, which is available at <http://www.mortality.org> or <http://www.humanmortality.de>.