

# HUMAN FERTILITY DATABASE DOCUMENTATION: SWEDEN

## Authors:

### **Lotta Persson**

Statistics Sweden, Stockholm

**E-mail:** lotta.persson@scb.se

### **Gunnar Andersson**

Stockholm University

**Email:** gunnar.andersson@sociology.su.se

### **Edward J. Nash**

Formerly Max Planck Institute for Demographic Research

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Revised by Aiva Jasilioniene

Max Planck Institute for Demographic Research

**E-mail:** Jasilioniene@demogr.mpg.de

## **1 General information**

This report documents the Swedish data collected for the Human Fertility Database, namely age- and birth order-specific data on births in Sweden, data on births by calendar month, and data on number of women by age and parity (at the end of each year).

The data for Sweden to the Human Fertility Database contain information on:

- Number of births (including still-births) by five-year age groups of mother, 1775-1860;
- Number of (live) births by single years of age for single calendar years 1891–1969;
- Number of live births by age of the mother, mother's year of birth, and birth order for single calendar years 1970–2018;
- Number of women by age (one-year age groups) and parity for single calendar years 1969–2018 (end of the year);
- Monthly data on births for single calendar years 1851–2018.

All data that are used in the HFD calculations, i.e. to produce the output estimates and indicators, are summarized in the tables of Appendix 1.

### **1.1 Territorial coverage**

There have been some territorial changes in Sweden over the years. Until 1809, Finland was part of Sweden, and between 1814 and 1905 Sweden and Norway were in a union. Since 1905, the Swedish borders have not changed. The historical data provided to the Human Fertility Database that pertain to periods before 1905 apply to the same territorial definition of Sweden as is relevant today.

## **1.2 Data collection and availability**

As early as 1749 Sweden started collecting statistical information about the annual number of births, deaths and the country's population by age and sex. This information was collected by *Tabellverket* (the Office of Tables), and was later transformed into Statistics Sweden. In 1860, the collection of data was reorganized; demographic data for subsequent years are very accurate.

During the period 1751–1775, censuses were conducted every third year, and during 1775–1860, every fifth year. Between 1860 and 1930 the censuses were conducted every 10 years, and thereafter every fifth year (with the exception of 1955). The last census in Sweden was conducted in 1990; thereafter Swedish statisticians have relied entirely on population registers to measure population change.

When the national civil registration system was computerized in 1968, Statistics Sweden received a copy of the civil registers and established its own register covering the total population. This register was named the Total Population Register (TPR) and it contains most of the data found in the civil registration. The register is updated daily, using data on changes in the registered population transferred electronically from the central civil register.

## **2 Birth count data**

### **2.1 Coverage and completeness**

#### ***(Live) births by age of mother***

Birth count data available for Sweden in the HFD date back to 1775. It is the longest time series of data that can be found in the HFD. Data for 1775-1890 are provided only in the input file, however. Due to several reasons, including that for many years there are no data that would enable to separate live births from still births, and that the current HFD methodology is not sufficiently refined to split historical birth data available by aggregated age groups into finer age categories satisfactory, data before 1891 are not used in the HFD output calculation.

For the period 1891–1969, data on births by calendar year and age of the mother are available for single-age categories. Age ranges are between 11 and 55 years.

Up to 1954, all deliveries, ***including still-births***, are included in the data. Multiple deliveries are calculated as a single delivery. However, for the years 1861-1954, counts of live births by month are available. Based on these data, estimates of live births by age for the years 1891-1954 were generated. For the description of the method, see Appendix 2. From 1955 onwards, recorded births refer to all live-born children only.

Data up to 1950 are derived from the publication *Swedish Population History* (Statistics Sweden, 1976). Data after 1950 are derived from official publications on annual vital statistics and demographic change.

#### ***Live births by age of mother and birth order***

In the late 1960s, the Swedish population-register systems were computerized. This made it possible to more readily produce further statistics on childbearing based on the longitudinal information available in the registers. From 1970 onwards we can therefore provide data on births and risk populations of women by parity, age in single-year age groups (12–55/60 years), birth cohort and calendar year. This allows for the specification of cohort as well as period fertility measures, and the coverage of data for all triangles of the Lexis diagram for

these years. The data have from 1970 to 2011 been processed from the Historic Population Register (HPR) that has been generated from the Total Population Register (TPR). Both registers are described in the *Section 3 Swedish Population Registers*.

Births refer to live-born children.

In practice, it is possible to produce statistics on various other dimensions of fertility as well. Statistics Sweden publishes information on some of these dimensions in their annual series *Befolkningsförändringar*, which contains tabulations of annual vital statistics and population change in Sweden. Data on births by civil status of the woman, geographical residence, and migration status are covered. In general, the demand for birth statistics by civil status of parents has decreased since the 1970s. Today this social category is less important than it once was. In contrast, demographic statistics by migration status and country of origin have gained in importance and coverage.

### ***Live births by month***

Monthly data on live births are available starting from the year 1851. The data from 1970 to 2011 have been processed from the Historic Population Register (HPR) that has been generated from the Total Population Register (TPR). Data for the years before 1970 and after 2011 are derived from official publications on annual vital statistics and demographic change.

## **3 Population count data**

### ***3.1 Population count data by age***

The annual age structure of female population is taken from the Human Mortality Database (HMD).

### ***3.2 Population count data by age and parity***

Data on the distribution of women by age and the number of live-born children is available from the Swedish Population Register for the period 1969-2018. Data refer to the end of each year.

## **4 Specific details**

### **4.1 Swedish Population Register**

#### ***The Total Population Register (TPR)***

When the national civil registration system was computerized in 1968, Statistics Sweden received a copy of the civil registers and established its own register covering the total population. This register was named the Total Population Register (TPR), and it contains most of the data found in the civil registration. The register is updated daily, using data on changes in the registered population transferred electronically from the central civil register.

In recent years, some new registers have been created on the basis of TPR data. The most important are the Multi-Generation Register and the Historic Population Register, which are mainly used for medical and demographic research and analysis.

## ***The Historic Population Register (HPR)***

There has been a need to facilitate the use of historical data and to make longitudinal studies easier. Therefore, a Historic Population Register (HPR) has been created by integrating the annual stock and flow registers and organizing data into an easily accessible database. All individuals who have been entered in the national civil population register of Sweden at any time since 1969 can be studied by means of the HPR. When it comes to registered births, the HPR differs slightly from the TPR in that late announced births are added to the HPR.

### ***4.2 Definitions***

#### ***Definition of a live birth***

A live birth refers to a newborn child who after delivery was breathing or showed other signs of life, such as heartbeat, pulsations in the umbilical cord, or clear spontaneous movements of the skeletal musculature.

#### ***Definition of birth order***

Birth order is a tabulated variable and refers to the total number of live births that a woman has previously given birth to. In case of multiple deliveries, each child is assigned a separate birth order.

## **5 Revision history**

### **Changes with the January 2018 revision:**

Data on births by month were added for the period 1851-1890. This affected slightly the population exposure estimates derived for the cohorts born in these years.

### **Changes with the February 2016 revision:**

Since the previous update, Sweden published a new series of annual population estimates by sex and single year of age for all the years from 1860 through 2014. The new series differs from the previous one for all the years from 1861 to 1991, except for census years (1945 excluded), when the population counts are similar by sex and age. In addition, we were able to obtain monthly live births for the period 1891-1910, which allowed us to refine our estimates on live births by age of the mother for these years. These changes have some minor effects on fertility measures, which are particularly concentrated in the period 1891-1910 (upward) and the 1950s (downward).

## **Acknowledgements**

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## Data sources

1. Official annual reports on vital statistics and demographic change: *Befolkning (BiSOS A)*, 1891-1910
2. Statistics Sweden (1976). *Swedish Population History*. Urval No 8.
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11. Live births by age of the mother, mother's year of birth, and birth order, live births by month, distribution of women by age and parity, 2016. Tabulations produced using individual-level vital and population statistics data. Unpublished data, received by email from Johan Tollebrant (Statistics Sweden) on 06.10.2017.
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13. Live births by age of the mother, mother's year of birth, and birth order, live births by month, distribution of women by age and parity, 2017-2018. Tabulations produced using individual-level vital and population statistics data. Unpublished data, received by email from Johan Tollebrant (Statistics Sweden) on 15.03.2019.

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

**BIRTHS**

<b>Period</b>	<b>Type of data</b>	<b>Age scale</b>	<b>Birth order</b>	<b>RefCode(s)</b>
1891-1969 <sup>1</sup>	Annual number of live births by age of mother (Lexis squares)	11, 12,..., 54, 55, unknown	Total	2, 3, 4, 5
1970-2018 <sup>2</sup>	Annual number of live births by age of mother, mother's year of birth and birth order (Lexis triangles)	11/12, 13,..., 59, 60	1,2,... 13/18 <sup>3</sup>	6, 7, 8, 9, 10, 11, 13
1851-2018	Annual number of live births by month	Total	Total	1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13

<sup>1</sup> For the years 1891–1954, birth counts by age were originally available for all births with multiple deliveries counted as one birth (including still-births). Estimates of live births were generated using the method described in Appendix 2.

<sup>2</sup> Total numbers of births by age of the mother in the period of 1970-2018 were computed on the basis of order-specific birth data, which are assumed to cover all births that occurred in the given years.

<sup>3</sup> Maximum value is the maximum birth order for which a birth was recorded in Sweden in a given year.

**FEMALE POPULATION: Distribution by age and parity**

<b>Period</b>	<b>Type of data</b>	<b>Age scale</b>	<b>Year of birth, range</b>	<b>Parity</b>	<b>RefCode(s)</b>	<b>Notes</b>
31.12.1969-31.12.2018	Women by age and parity	10, 11,..., 54, 55	-	0, 1,..., 14/19 <sup>4</sup>	6, 7, 8, 9, 10, 11, 13	The first year is used as the 'Golden' census

<sup>4</sup> Maximum value is the maximum parity recorded in Sweden among women aged 10-55 in a given year.

**FEMALE POPULATION: Exposure by age and year of birth**

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>.

## APPENDIX 2 ADJUSTMENT OF ALL BIRTHS BY AGE TO LIVE BIRTHS

For the years 1861-1954, we derive data on live births by age from information on all births, including still births, by age. We benefit from the fact that for the whole period 1861-1954 counts of live births by month are available. This information will be used to estimate the total number of live births by age in a year.

In order to estimate the number of live births by age  $B^*(x,t)$  for a specific year, we calculate the ratio  $r(t)$  of live births to all births for the year using equation 1 and then multiply the counts of births by age  $B^A(x,t)$  by this ratio to produce the estimate (equation 2).

Note that this correction may result in a non-integer estimate of the number of live births by age.

$$r(t) = \frac{B(t)}{B^A(t)} \tag{1}$$

$$B^*(x,t) = r(t) \cdot B^A(x,t) \tag{2}$$