

# HUMAN FERTILITY DATABASE DOCUMENTATION: SWITZERLAND

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## **1 General information**

This report documents Swiss data collected for the Human Fertility Database project, namely age- and birth order-specific data on births, data on total births by calendar month and year, and data on the parity-specific exposure population (women by age and/or birth cohort and the number of live-born children). The Human Fertility Database (HFD) for Switzerland is based on the official data on birth counts published in vital statistics publications and on individual birth records, which were kindly provided by the Swiss Federal Statistical Office (SFSO).

Data on live births by age of the mother (for all birth orders combined) have been available since 1932. Prior to 1998, only the birth order within the current marriage, and not the biological (true) order of a woman's children, was recorded<sup>1</sup>. The biological birth order has been recorded since 1998. Prior to 2005, however, these records contain many births with unknown birth order.

Monthly data on live births have been available since 1871.

Population data since 1876 have been processed and documented in the Human Mortality Database (HMD, [www.mortality.org](http://www.mortality.org)).

Data for female population by parity are available from the 2000 population census.

### **1.1 Territorial coverage**

There have been no territorial changes in Switzerland during the period covered by these data. Switzerland is currently divided into 26 cantons (federal states of the Swiss confederation).

The statistics record live births to persons of Swiss nationality and foreigners with official residence permit for minimum of 12 months. Births in Switzerland to women domiciled abroad are not included. Since 1987, births outside of Switzerland to women of Swiss nationality domiciled in Switzerland have been included in the statistics. Births outside of Switzerland to women of foreign nationality domiciled in the cities of Zurich and Berne, and in the canton of Basle-City, are also included in the vital statistics (Calot et al. 1998: 223).

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<sup>1</sup> Birth order specific data for 1969-2008 were estimated by Marion Burkimsher and will be available in the Human Fertility Collection (HFC). For documentation, including the discussion of minor differences between HFD and HFC data for 1998-2008, see Burkimsher (2011).

Starting in 2001 the residence status of the mother has been registered and births to women belonging to the non-permanent population (e.g., asylum-seekers) were from then on excluded from the official statistics. Starting from 2010 onwards the births to asylum seekers resident for over 1 year will be included again.

Thus, the Swiss data represent the resident population (de jure), rather than the de facto population. However, births to residents may be under-represented, especially before 1987, due to incomplete coverage of those residents who gave birth outside of Switzerland (Glei 2008).

## **1.2 Data collection and availability**

The Swiss Federal Statistical Office was founded in 1860 (Calot et al. 1998: 5). The first modern census was that of 1860; since then, decennial censuses have been taken, with the exception of those conducted in 1888 and 1941 (Glei 2008). In 1870, vital statistics were standardised at the national level.

## **2 Birth count data**

Birth count data included in the Human Fertility Database cover the period from 1932 onwards. Data for 1944–1968 and 1979–1985 originate from the publication *Two Centuries of Swiss Demographic History* (Calot et al. 1998). Data for 1969–1978 and from 1988 onwards were provided in electronic format by the Swiss Federal Statistical Office. Tabulations of data by both biological birth order and marital birth order for 1998 onwards have also been provided in electronic format by the Swiss Federal Statistical Office. Data for 1932-1943 and 1986-1987 were provided by the Observatoire Démographique Européen (ODE).

Totals of live births by year and month of birth for the present-day territory are available for the period since 1871.

## **3 Population count data**

The annual age structure of women is available in the Human Mortality Database ([www.mortality.org](http://www.mortality.org)).

The distribution of women by the number of live-born children is available from the 2000 census (5 December). All respondents were requested to report the number of children they have ever had<sup>2</sup>. The data are tabulated by age in completed years and the number of live-born children, up to birth order 20 (the highest recorded case is of parity 19), and unknown.

In the census of 2000, individuals and their families with residence permits A (seasonal workers), L (temporary work permits of < 1 year), F (provisional entry) and N (asylum seekers) are included, but they are not considered as permanent residents, and therefore are not included in the resident population, which is covered in the HMD and HFD databases. The population covered by census data and by vital registration thus slightly differs.

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<sup>2</sup> Census question: Are you the father or mother of one or more children? If yes: How many children (including adult or deceased children); birth year of the first four children and (if more than 4) of the youngest child.

## 4 Specific details

### 4.1 Definitions of live birth

A live birth is defined as follows: “Any child which, having been totally extruded (head, trunk, limbs) from its mother’s body, draws breath or manifests heartbeats is born alive within the meaning of article 46 of the Swiss Civil Code” (Calot et al. 1998: 223).

### 4.2 Age

For 1932-1943, live births are tabulated by age of the mother in completed years (ACY, Lexis squares). Since 1944, the data are available by the age in completed years and the mother’s birth cohort, i.e. by Lexis triangles. However, for 1998-2004 we use the birth order-specific data, which are classified by age reached during the year (Ardy, Lexis vertical parallelograms; ARDY = year of birth minus birth cohort of mother).

### 4.3 Birth order

The live birth order is defined by the total number of live-born children a woman has previously delivered, without counting stillbirths. For 1998 onwards these data are available both by the biological birth order and by the birth order within the current marriage. The latter information is used for redistribution of births with unknown biological birth order in 1998-2004 (see Appendix 2).

### 4.4 Unknown cases

Among birth counts, there are no cases with unknown age tabulated.

In 1998-2004, the biological birth order was unknown for a significant proportion of births. The proportion of unknowns is higher for non-marital births than marital. Table 1 gives the proportion of unknown cases by marital status. Because of particularity of the data, we use a country-specific method for redistributing unknown cases (see Appendix 2).

In 2005, there were only three cases of unknown birth order, and no unknown cases were recorded in 2006 and later.

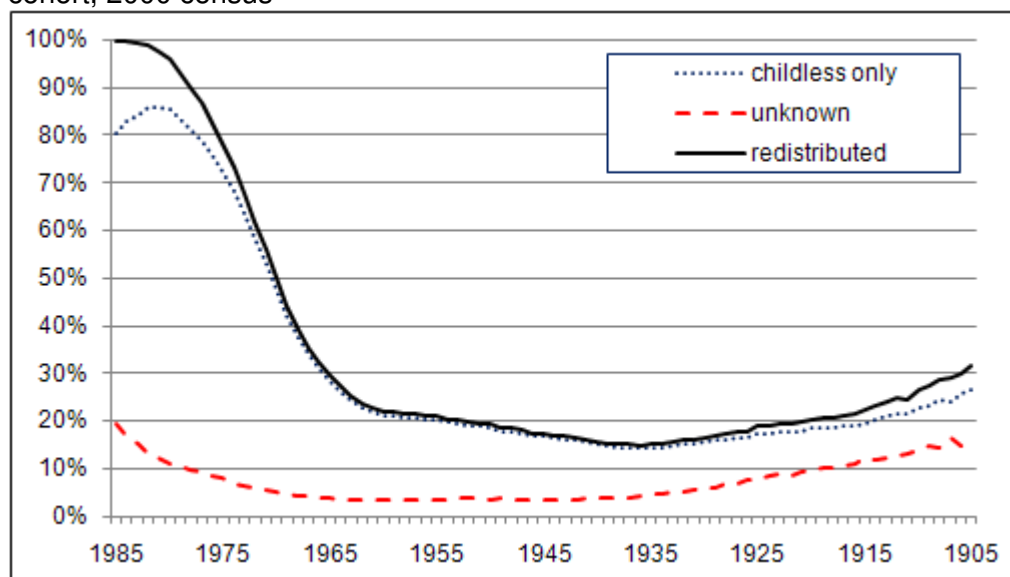
**Table 1** Proportion of births with unknown birth order, by marital status

Year	Marital	Non-marital	TOTAL	TOTAL N
1998	17%	14%	17%	13342
1999	18%	22%	18%	14153
2000	10%	14%	11%	8516
2001	7%	10%	7%	5031
2002	5%	8%	5%	3866
2003	5%	10%	6%	4137
2004	3%	7%	3%	2347
2005	0%	0%	0%	3
2006	0%	0%	0%	0
2007	0%	0%	0%	0
2008	0%	0%	0%	0

In the census data of 2000, women of unknown parity were 5.9% of the total. The number of women with an unknown number of children varies with age, and is especially high among the very young (up until 20) and very old women (from around age 80). Because this figure correlates with the number of childless women at young ages, we suspect that most of the young women of unknown parity were in fact childless (see the following chart). However, we

simply redistribute the unknown cases following the known proportions, and do not try and assign a higher proportion of unknowns to the childless category.

**Figure 1:** Proportion of women with no children and with unknown number of children, by cohort, 2000 census



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## References

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## Data sources

1. Gérard Calot, Alain Confesson, Jean-Paul Sardon, Erminio Barazini, Stéphane Cotter, and Philippe Wanner. (1998). *Two Centuries of Swiss Demographic History: Graphic Album of the 1860-2050 period*. Neuchâtel: Swiss Federal Statistical Office.
2. Swiss Federal Statistical Office
3. Observatoire Démographique Européen (ODE)

## APPENDIX 1

### DESCRIPTION OF DATA USED FOR LEXIS DATABASE

#### BIRTHS

Period	Type of data	Age range	Birth order	RefCode
1932-1943	Annual number of live births by age of mother (Lexis squares)	-16, 17, ..., 44, 45+	–	3
1944-1968	Annual number of live births by age of mother and mother's year of birth (Lexis triangles)	12, 13, ..., 55	–	1
1969-1978	Annual number of live births by age of mother and mother's year of birth (Lexis triangles)	12, 13, ..., 55	–	2
1979-1985	Annual number of live births by age of mother and mother's year of birth (Lexis triangles)	12, 13, ..., 55	–	1
1986-1987	Annual number of live births by age of mother and mother's year of birth (Lexis triangles)	12, 13, ..., 48, 49+	–	3
1988-1997	Annual number of live births by age of mother and mother's year of birth (Lexis triangles)	12, 13, ..., 61	–	2
1998-2004	Annual number of live births by mother's year of birth (Lexis vertical parallelograms)	-14, 15, 47, 48+	1, 2, 3, 4, 5 <sup>1</sup>	2
2005-2009	Annual number of live births by age of mother, mother's year of birth and birth order (Lexis triangles)	12, 13, ..., 49, 50+	1, 2, 3, 4, 5+, unknown <sup>2</sup>	2
1871-2009	Annual number of live births by month	–	–	2

<sup>1</sup> Births with unknown birth order have been redistributed using the method described in Appendix 2.

<sup>2</sup> Births with unknown birth order were recorded only in 2005.

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

Period	Type of data	Age range	Year of birth, range	Parity	RefCode(s)	Notes
05.12.2000	Number of women by age and parity	-10, 11, ..., 110	–	0, 1, ..., 20, unknown	3	'Golden census' unknown parity to be distributed proportionally

#### 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

### REDISTRIBUTION OF BIRTHS WITH UNKNOWN BIRTH ORDER 1998-2004

According to the HFD Methods Protocol, births with unknown birth order are to be distributed proportionally across the known birth order categories within the corresponding age group. The Swiss data make a special case because the proportion of births with unknown birth order is unusually large for the period 1998-2004. However, there is the additional information of marital birth order that helps to redistribute these births more accurately.

The birth data are tabulated by:

1. Calendar year  $t$ .
2. Age reached during the year  $y$ .
3. Marital status of the mother (married  $M$  or non-married  $NM$ ).
4. Birth order within the current marriage  $j$  (1-5+; it is always known, but for married women only).
5. Biological birth order  $i$  (1-5+ or unknown).

The approach we use to redistribute births with unknown biological birth order is expressed in formulae [1], [2], and [3].

For non-marital births, redistribution is done as follows:

$$B_i^{*NM}(y,t) = B_i^{NM}(y,t) + B_{UNK}^{NM}(y,t) \cdot \left( \frac{B_i^{NM}(y,t)}{B_{TOT}^{NM}(y,t) - B_{UNK}^{NM}(y,t)} \right) \quad [1]$$

For marital births, we distribute births with unknown biological birth order  $i$  within each category of birth order within current marriage  $j$ :

$$B_i^{*Mj}(y,t) = B_i^{Mj}(y,t) + B_{UNK}^{Mj}(y,t) \cdot \left( \frac{B_i^{Mj}(y,t)}{B_{TOT}^{Mj}(y,t) - B_{UNK}^{Mj}(y,t)} \right) \quad [2]$$

Finally, the total number of births by age of the mother and biological birth order is estimated by adding non-marital births and the sum of marital births for each corresponding category of age and biological birth order:

$$B_i^*(y,t) = B_i^{*NM}(y,t) + \sum_{i=1}^{5+} B_i^{*Mj}(y,t) \quad [3]$$