HUMAN FERTILITY DATABASE DOCUMENTATION: NORWAY

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Last revision: 20 April 2023

1 General information

This report provides an overview of the Norwegian data collected for the Human Fertility Database, including of the age- and birth order-specific data on births; the monthly data on births; and the data on the distribution of women by age, birth cohort, and number of live-born children. All of the data were obtained from Statistics Norway.

The Norwegian data for the Human Fertility Database include information on:[1]

- Live births by the mother's age group for the years 1936–1966;
- Live births by the mother's age in completed years, birth cohort, and birth order for the years 1967–2022;
- Live births by month for the years 1931–2022; and
- The population of women by age, birth cohort, and parity on 1 January for the years 1985–2015.

All of the input data used for generating the HFD output data and indicators are specified in Appendix 1.

The birth data for the period 1936–1966 were drawn from official publications of Statistics Norway. The figures for the period 1967 onwards were obtained from the Central Population Register (CPR)[2]. The CPR was based at Statistics Norway up to 1991. From 1991 onwards, the CPR has been based at the Directorate of Taxes.

Until now only data from 1967 onwards have been used for calculations of HFD output. The data for 1936–1966 were excluded because concerns about the quality of those data were raised. For most of this time period, no births were reported in the 14 and younger age group, but it is not clear whether births in the 15-19 age group had instead been assigned to the open age group of 19 and younger. Problems were also found in the HFD methodology, such as the splitting of the data of these broad and unevenly distributed age groups into

[1] HFD data users might be interested to know that Statistics Norway has published its collection of historical population data on its website. These data are not of sufficient detail and quality to be included in the HFD. The series of historical fertility data includes total numbers of births and crude birth rates for the period starting in 1735 (see http://www.ssb.no/histstat/tabeller/3-13.html).

[2] When it was first established in 1964, the CPR was named Det Sentrale Personregisteret [The Central Person Register] (DSP). From 1995 onwards, the official register has been named Det Sentrale Folkeregister [Central Population Register] (DSF). The abbreviation CPR refers to the official register both before and after the name change, as the name change did not alter the content of the register in any way that is relevant for the data delivered to the HFD (Statistics Norway 2012a).

single-year age categories. Thus, data for 1936–1966 are currently published only in the input file `NORbirths.txt`, but will be added to the mainstream output data when these methodological problems have been resolved.

In 1769, the first Norwegian census covering both men and women was conducted. The first fully nominal census was taken in 1801. From the next census in 1815 to the 1875 census, censuses were conducted every 10 years. From 1890 to 1990, censuses were taken in years ending with zero (with the exception of the 1940 census, which was postponed to 1946) (Soltvedt 2004). The first Norwegian publication containing official statistics on population was published by the Ministry of Finance, Trade, and Customs in the 1830s. The government's production of official statistics increased throughout the period 1860–1880, and in 1876 Statistics Norway was established under the name *Det statistiske Centralbureau*. The *Official Statistics of Norway* (NOS) series, which was published from 1861 onwards, presented the official statistics in a more standardised format. The first annual *Statistical Yearbook* was published in 1879. In the final years of the 19th century, statistical production in Norway was becoming increasingly centralised. However, this trend towards centralisation was followed by a trend towards decentralisation in the period 1900–1920, and then by a new wave of centralisation from 1920 onwards (Bore 2012). The current name of the national statistical agency is *Statistisk sentralbyrå* (SSB, *English name:* Statistics Norway).

In 1964, the Central Population Register (CPR) was established on the basis of the 1960 census, and since then censuses have been increasingly register-based. The 1960 census was thus the last fully conventional census (Soltvedt 2004). The 2011 census was completely register-based (Bore 2012). Currently, the Statistics Act of 1989 regulates the production of official statistics in Norway (Bore 2012).

1.1 Data collection

Register information is based on the Central Population Register, as described by Statistics Norway (2012b):

> *The population register receives notifications of births, deaths, marriages, divorces, migrations etc. from different sources for the municipalities covered by the register.*
> *The register was built up from 1964 to 1966 on the basis of the 1960 census, at the same time as the 11-digit national identity number was introduced as identification.*
> *The Office of the National Registrar, which administrates the register, was transferred in 1991 from Statistics Norway to the Directorate of Taxes.*
> *Updating of the Central Population Register is done in part by the local population registries, which are connected to the DSF[3] via terminals, and in part by the Directorate of Taxes. The basis of the statistics on changes in the population is electronic copies to Statistics Norway of all such register updates. The reports are also used to update a separate Statistics Norway population database kept for statistical purposes which forms the basis for the statistics on the composition of the population.*

1.2 Territorial coverage

The Kingdom of Norway consists of the mainland, the archipelago of Svalbard, and the island of Jan Mayen. Jan Mayen has no registered residents. Women who live in Svalbard generally give birth at hospitals located on the mainland. As a Norwegian who resides in

[3] DSF is the abbreviation for the Norwegian name of the register (Det Sentrale Folkeregister), while the English name is Central Population Register, which is abbreviated as CPR.

Svalbard will also have an official place of residence on the Norwegian mainland, any birth that takes place in Svalbard will be registered at the mother's place of residence on the mainland. The Antarctic islands of Bouvetøya, Peter I Øy, and Dronning Maud Land (Queen Maud Land) on the Antarctic continent are dependent territories. These territories are not part of the Kingdom of Norway, and have no registered residents (Statistics Norway 2012b). The populated area of Norway has remained unchanged since 1931.[4]

In 2018, 5.3 million people were living in Norway (Eurostat). On 1 January 2011, 12.2% of the Norwegian population had been born to immigrant parents, either abroad or in Norway; 34% of these immigrants were of Norwegian nationality. The largest groups of foreign-born residents came from Poland, Sweden, Germany, and Iraq (Statistics Norway 2012c).

2 Birth Count Data

2.1 Coverage and Completeness

The population consists of individuals who are considered residents of Norway. The main rules for determining an individual's residency status are as follows (Statistics Norway 2012b):

> *Persons from countries outside the Nordic countries are regarded as residents of Norway when they have lived here or intend to live here at least 6 months, even though the stay is temporary. The same six-month rule applies to migration from Norway to a country outside the Nordic countries.*
> *The aforementioned six-month rule does not always apply to migration between Norway and another Nordic country. In Denmark, for example, a person is registered as a resident if the person intends to stay in the country at least 3 months. The same limit is used for out-migration. In Sweden and Finland the limit is one year. For persons who come/move to Norway from another Nordic country, the six-month rule is still valid, as residence is decided by the country of immigration's rules, cf. the Nordic agreement on inter-Nordic migration dated 8 May 1989. This agreement replaced a similar agreement from 5 December 1968.*
> *People living in Svalbard, on Jan Mayen or in Norwegian dependencies who on departure were registered in the population register of a Norwegian municipality shall still be counted as residents of that municipality. The same rules apply to people on the Norwegian continental shelf. (…)*
> *From March 1987 to January 1994 asylum seekers were usually counted as immigrants and hence also as residents even though the processing of their application for residence had not been completed. Before and after this period, only asylum seekers with residence permits have been registered.*

2.2 Age- and order-specific birth counts

The data on births by five-year age groups of the mother for the period 1936–1966 come from the series of official statistical publications called *Vital Statistics*.[5]

Order-specific birth counts for the years 1967–2022 are provided by the age and the birth cohort of the mother. These data are based on register information obtained from different sources. The births of migrants who have lived or intend to live in the country for at least six months are included. Live births occurring in Norway to women who are not residents of

[4] "Riksgrensen". *Store norske leksikon*. From http://snl.no/riksgrensen (accessed on 19 March 2012)

[5] The series of *Vital Statistics* is available online at http://www.ssb.no/histstat/publikasjoner/histemne-02.html#P655_19975

Norway are not registered in the population register. If the mother is later granted residency, the child is then registered as an immigrant. The starting point for creating the dataset on age- and order-specific birth counts was the yearly recording of live births in the Central Population Register (CPR). This procedure helps to ensure that children born to female Norwegian residents living abroad are included if they are registered. However, the reporting of births occurring abroad is voluntary.

In the official statistics before 1985, birth order referred to the order of births to a woman in her current marriage; thus, the biological order of each birth must be obtained from other sources. For information on birth order, the so-called *Women File* is used. The Women File was originally created by Helge Brunborg and Øystein Kravdal (for details, see Brunborg and Kravdal 1988), and is currently administered by the Division for Population Statistics, Statistics Norway. The Women File is also used for register-based Norwegian fertility research. The present version of the Women File contains all women who have been assigned a personal identification number (PIN). The personal identification number was introduced in 1964 on the basis of the 1960 census. For the oldest cohorts, the information on the number of children ever born to a woman is based on the information in the 1970 census on the number of children who were living in her home at that time. Women born before 1935 have been excluded, as they may have had children who left home before 1970; thus, their true parity numbers are unknown. The Women File therefore includes all females born from 1935 onwards who have ever been residents of Norway in the period starting in November 1960. For the years immediately after the PIN system was first implemented, the data quality is questionable. As the data based on PIN codes are considered to be of good quality from 1967 onwards, the time series provided to the HFD starts in this year. Before it was linked with official birth records, the Women File was checked for duplicates and changes in personal identification numbers[6].

The data in the HFD differ from the official birth statistics produced by Statistics Norway because a total of 760 duplicates have been removed for the years 1967–2010 (by way of a link file with personal identification numbers). These duplicates are mainly related to problems that occurred during the start-up phase of the CPR: after 1971, the deviations are minor (a maximum of nine births in 1987).

The data on the biological parity of women were taken from the Women File for the years 1967–1998. Before 1987, the parity of a woman in the official births statistics referred to the number of children born to her within her current marriage. There are thus marked differences between the parity distribution in the HFD data for Norway and in the official birth statistics for this period. For the years 1987–1998, information on the biological birth order is also available in the official statistics; nevertheless information from the Women File is considered to be of better quality. In cases in which the two sources differ, the information on birth order from the Women File is used. The differences are expected to be minor. For the years 1967–1998, a total of 1741 births in the official birth records could not be found in the Women File. The order of these births is reported as unknown. For the years 1999–2022, the official statistics on the annual number of live births by birth order are of high quality. Information on the parity of each woman is thus taken from the official statistics for this period. (Note that the HFD birth counts are not identical to the official birth statistics for this period, as 29 out of the 760 duplicates discussed above have been removed from the dataset for the period 1999–2010.)

[6] In the rare event that such a change takes place, it is typically due to a correction of a mistake made when the PIN was given (i.e., a person was given two PIN numbers, and one of them was subsequently deleted); or, as a PIN number contains information on biological sex, to a change of sex.

2.3 Monthly data on live births

Monthly data on live births for the period 1967–2022 come from the Central Population Register. They were constructed by extracting information on the month of birth using information on the personal identification number.

For the years 1931–1966, monthly data on live births were obtained from the annual birth statistics published by Statistics Norway in the series of *Vital Statistics*.[7]

Live births by month for 2011–2022 were downloaded from the Statbank of Statistics Norway https://statbank.ssb.no.

The sum of births by month in 1970 is 64,549, while the sum of births by the age of the mother is 64,559. The sum of births by month in 1996 is 60,926, while the sum of births by the age of the mother is 60,924. The source of these differences is unknown.

3 Population Count Data

3.1 Population count data by age

The annual age structure of women is taken from the Human Mortality Database (HMD, www.mortality.org).

3.2 Population count data by age/cohort and parity

The distribution of women by age and parity was constructed on the basis of the Women File. The register covers the entire population, but for the purposes of the HFD only data on women aged 15+ were selected. The data are complete and highly reliable, and refer to 31 December of the given year. Parity is defined as the number of live-born children a woman has given birth to, including adoptions. This implies that the distribution of women by age and parity also refers to cases of adoption. Women with no registered births are defined as childless. The earliest cohort whose fertility is described in the Women File is the 1935 cohort, who reached the age of 40 in 1975. However, the first cohort for whom the coverage of data on the biological parity distribution of women at fertile ages is sufficient for computing the HFD period fertility tables (i.e., up to age 49) is the 1985 cohort.

For confidentiality reasons, the number in a given birth cohort and parity category is truncated if it is lower than four. These figures are substituted in the input file by a dot ".", which denotes a missing value.

In the HFD, data are available up to 1 January 2015. Currently HFD does not have a possibility to update the time series of these data.

4 Specific details

4.1 Definitions of live birth

A foetus that shows signs of life at birth is counted as live born in Norway (NOS 1994, (http://www.ssb.no/mikrodata/datasamling/fdtrygd_10041/variabler/main/kodelister/). Births are reported to the Medical Birth Registry and to the Central Population Register. The

[7] The series of *Vital Statistics* is available online at http://www.ssb.no/histstat/publikasjoner/histemne-02.html#P655_19975

Medical Birth Registry uses the WHO definition of live birth.[8] The definition of live birth in reports to the Central Population Register is consistent with the definition in reports to the Medical Birth Registry.[9] Originally, a birth could be reported to the MBR as a live birth only after at least 16 full weeks of gestation. In 2001, a birth could be considered a live birth after at least 12 full weeks of gestation. The definition of live birth has recently been limited to live births that occurred after at least 22 full weeks of gestation. If information on the duration of the pregnancy is not available, only a child with a birth weight above 500 grams who fulfils the WHO definition is classified as a live birth. If neither the birth weight nor the duration of the pregnancy are known, the child is counted as live born if he or she fits the WHO definition and is longer than 25 cm.[10]

4.2 Age of mother

The age of the mother is defined as her age at the time of birth in completed years. For the period 1967 onwards, the data on births are provided both by the mother's age and the child's year of birth (Lexis triangles).

4.3 Birth order

Birth order refers to the biological birth order. Additionally, as the data are based on administrative registers, the definition of birth is juridical and includes adoptions. In the Women File, a child who is given up for adoption is no longer linked to his/her biological mother, but to his/her adoptive mother. Thus, a woman who gives up her first child for adoption is registered as childless (until she has another child).

4.4 Unknown cases

Births that appear in the official statistics without the mother's age, and for which the mother's age or parity could not be recovered from the Women File, were registered as cases for which the age of the mother was unknown. Births for which the mother's parity was not found in the Women File were registered as being of unknown parity. In 1967–1998 the maximum number of births for which both the age of the mother and the birth order were unknown was 112 (i.e., 0.2% in 1991).

In 1999–2012 there were no cases in which the birth order is unknown, and the number of cases in which the age of mother was unknown was negligible (40 in 2009 was maximum).

In the 2013–2019 data there were no cases in which the age of the mother is unknown, and the number of cases in which the birth order of a live birth was unknown was around 200 (0.2–0.4%).

4.5 Data Quality Issues

It is noteworthy that the order-specific data provided for the HFD differ from the order-specific data obtainable on the website of Statistics Norway (StatBank). There are two reasons for this discrepancy. First, the latter group of birth data are based on birth certificates, and refer to birth order within marriage for the years before 1985. Second, for the period 1978–1985 the StatBank order-specific data include still births.

Svein Holm, who provided the birth counts from the CPR, made the following comments on the quality of the data (in personal correspondence):

[8] Kari Klungsøyr, Chief Physician, Medical Birth Registry of Norway, personal correspondence.

[9] Gunn Gabrielsen, chief midwife at the Department of Gynaecology and Obstetrics, Haukeland University Hospital, Norway, personal correspondence on 19 March 2012.

[10] Kari Klungsøyr, Chief Physician, Medical Birth Registry of Norway, personal correspondence.

Most of the children[11] born from 1953 onwards and a significant number of those born in earlier years were registered in the CPR with their mother's ID number. Children born before 1964 were assigned their parents' personal identification numbers in connection with the census of 1970. However, the history of births is not correct for all women. The reasons for these errors include:

- *The mother died or emigrated before 1970;*
- *The child had been assigned a personal identification number but died or emigrated before 1970; or*
- *The child had never been assigned an ID, in most cases because the child died or emigrated before 1 November 1960 or had never been a resident of Norway. This is particularly likely to have been the case for immigrants who left older children abroad.*

The data sources may include errors in the reporting of births that occurred before 1970, and in the fertility histories of immigrant women. Children who were born abroad to immigrant women were not registered if the child did not move to Norway. Additionally, adopted children were registered with their juridical (not biological) mother. However, the number of the errors in birth histories stemming from these sources is expected to be negligible.

4.6 Revision history

Changes with the March 2016 revision:

The release includes new data for 2010–2014. There are no other changes as compared to the previous HFD data release on 21 February 2013.

Changes with the January 2020 revision:

The release includes new data for 2015–2018.

Changes with the June 2021 revision:

The release includes new data for 2019–2020.

Changes with the April 2023 revision:

The release includes new data for 2021–2022.

Acknowledgements

I am thankful to Svein Holm, Trude Lappegård, Halvard Skiri, Helge Brunborg, Lars Østby, John Erik Sjørbotten, Tove Irene Slaastad, Kirsten Enger Dybendal, Marit Rønsen, and Aleksander Hagen (all at Statistics Norway); and to Gunn Gabrielsen (Haukeland University Hospital) and Kari Klungsøyr (Medical Birth Registry) for helping me access and document the data provided in various ways. I would also like to thank Kryštof Zeman, Aiva Jasilioniene, and Karolin Kubisch for their helpful comments and guidance on data collection and documentation, and to Miriam Hils for language editing of this document.

[11] At least 98%; personal communication, Halvard Skiri.

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APPENDIX 1

INPUT DATA USED FOR HFD CALCULATIONS

BIRTHS

Period	Type of data	Age range	Birth order	RefCode(s)
1967–2022	Annual number of live births by age of mother, mother's year of birth, and birth order (Lexis triangles)	12, 13,…,49, 50+, unknown	1, 2, 3, 4, 5+, unknown	2, 3, 4, 10, 13, 15
1931–2022	Annual number of live births by month	total	total	1, 8, 9, 12, 14

FEMALE POPULATION: Distribution by age and parity

Period	Type of data	Age range	Year of birth, range	Parity	RefCode(s)	Notes
1.1.1985 – 1.1.2015[1]	Number of women by age and parity	15, 16,…, 48, 49 [2]	–	0, 1,…,6, 7+, unknown	5, 6, 7	Data for 1985 are used as 'Golden census'[3]

Notes:

[1] Original data are dated as of 31.12.1984 to 31.12.2014, but we denote them in the input file `NORparity.txt` as of 1.1.1985–1.1.2015. Currently, we do not have a possibility to update the time series of these data beyond 1.1.2015.

[2] The earliest cohort whose fertility is described in the Women File is the 1935 cohort. As these women were aged 40 in 1975, data on the 1975 parity is available for the age range 15–40 only. The first date for which complete information on the biological parity distribution of all women aged 15–49 is available is 1.1.1985.

FEMALE POPULATION: Distribution by age and parity

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.