

HUMAN FERTILITY DATABASE DOCUMENTATION: REPUBLIC OF KOREA

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1 General information

This report documents South Korean fertility data collected for the Human Fertility Database (HFD) project. The assembled data include births by age and birth order and births by calendar month, as well as the distribution of women by age and parity. These data were extracted from birth and death registration statistics and population censuses produced and disseminated by Statistics Korea (formerly, Korea National Statistical Office). Statistics Korea (also referred as KOSTAT: <http://kostat.go.kr/>) is the central government organisation for statistics. It also runs the Korean Statistical Information Service (KOSIS: <http://kosis.kr>), which is a national online statistical database.

The HFD contains the following fertility data for South Korea:

- Number of live births by age of the mother, 1981-2018.
- Number of live births by age of the mother and birth order, 1981-2018.
- Number of live births by month, 2001-2018.
- Distribution of women by age and number of live-born children from the population census of 2000.

The data, which are used in the HFD calculations, are specified in Appendix 1.

1.1 Territorial coverage

Korea is a peninsula jutting southward from the East Asian continent into the western rim of the Pacific Ocean. After liberation from Japanese colonial rule in 1945, Korea was divided into two parts along the 38th parallel north. A new border, a demilitarised zone marking the boundary between South and North Korea, was established after the end of the Korean War (1950-1953).

The data collected for the HFD pertains to the territory of the Republic of Korea, which is commonly known as “South Korea”, and refers to the southern part of the Korean peninsula and its adjacent islands. There were no changes in the country’s territory during the period

covered by the HFD.

The Republic of Korea covers an area of 99,461 km², accounting for approximately 45 per cent of the entire peninsula. The population of South Korea is about 50 million. As of 2017, the country ranks 27th in the world in terms of population, and accounts for 0.7 per cent of the global population of 7.6 billion. In terms of population density, the Republic of Korea ranks third, after Bangladesh and Taiwan, among countries and territories with a population of over 10 million (Statistics Times, 2019).

1.2 Data collection and availability

Throughout the entire period of the Chosun Dynasty (1392-1910), the population and the number of households in Korea were counted fairly regularly through a registry system designed for the purposes of taxation, labour mobilisation, and military conscription. Series of data on the total population and the number of households are available for every third year for a 150-year period between 1639 and 1789. Despite their poor coverage, the data for 1678-1789 have a high degree of consistency in terms of quality (Kwon et al., 1975).

The first census of the Korean population was conducted in 1925 under Japanese colonial rule. The aims of the population censuses conducted under this regime were the efficient and effective exploitation of the Korean labour force and economy, as well as the identification of candidates for conscription during World War II. Five population censuses were carried out during the Japanese colonial period of 1910-1945. The household registration system (戶籍), which required all residents to report the details of the composition of and any demographic changes in their household to a local administrative office, was also maintained during this period. In 1949, one year after the government of the Republic of Korea was established, the sixth census was conducted with the aim of collecting the population statistics required for the formulation of various policies and development plans. However, the 1949 census data were lost during the Korean War, and only the preliminary report from this census, which indicates the total size of the population, is available. The next census was conducted in 1955 with the goal of obtaining information on the human and material resources needed to reconstruct the nation after the Korean War.

The first modern census in terms of planning, data processing, and evaluation carried out in Korea was the 1960 population census (Kim, M., 2004). This census was conducted in accordance with the UN World Census Program. The distinctive features of the 1960 census were that it was conducted on a *de jure* basis, and that a post-enumeration survey was carried out after the census. The 1960 population census was conducted with questionnaires, and was the first population census that was combined with the housing census. Between 1960 and 2010, 10 more censuses were conducted every fifth year ending in “0” or “5”; with an exception of the population census of 1966. A brief summary of the history and the major features of these population censuses are provided in Appendix 2 (see Table A1).

Since 2015, censuses have been carried out annually using a register-based method (Andreeva et al., 2018).

During the period when South Korea was under Japanese colonial rule (1910-1945), vital statistics on births, deaths, marriage, and divorce were collected through a newly established administrative system. Thus, the year 1910 marks the start of modern vital registration in

South Korea. Under the Population Survey Act and the Vital Survey Ordinance, which were approved by the newly established government in 1949, every vital event had to be reported on the vital survey report form, separately from the civil registration form. In 1970, vital registration and civil registration were unified in a single registration form, which is still in use. The vital registration system and the quality of vital statistics were improved by the development of various social systems, including the health insurance system, which greatly reduced the problems of delays and omissions in registration. The conversion of vital registration into a web-based reporting system in 2004 also played an important role in efforts to improve the vital registration system.

The *Annual Report on Vital Statistics* has been published since 1980, and all vital data for South Korea since 1970 are currently available in these publications. For vital statistics for the period 1970-1996, births and deaths registered with a delay of up to 10 years after their occurrence were added to the total numbers of births and deaths for the year in which they occurred. However, the reporting of vital events in the year of occurrence has improved considerably in South Korea, with the registration rate for births increasing from 56.2 per cent in 1975 to 99.7 per cent in 2000, and the registration rate for deaths increasing from 72.3 per cent in 1975 to 99.5 per cent in 2000 (Kim, M., 2004). Thus, since 1997, it has been possible to confirm the total numbers of births and deaths per year by accumulating the numbers of births and deaths registered in the corresponding year of occurrence and up to the end of April of the following year.

All vital statistics for South Korea pertain to the population of Korean nationality. This means that births are included in the official vital statistics of South Korea only if at least one of the resident parents is a Korean national, or was born abroad but naturalised. Births to resident parents who are both foreigners are excluded.

Currently, birth and death statistics are compiled on a monthly basis by Statistics Korea, and are published in the forms of a monthly report and an annual report on vital statistics. The standard annual period of the statistics collected by the continuous registration system is from 1 January to 31 December. Data on vital events, as well as on the rates, are available online from the Korean Statistical Information System (KOSIS).

2 Demographic transition of the Korean population

The Korean population had high levels of fertility and mortality until the beginning of the 20th century. But in the decades that followed, these trends changed markedly, with Korea completing the full pattern of the demographic transition within a period of 70-80 years. Based on changes in the country's fertility, mortality, migration, and population growth levels, along with major political and socio-economic factors, the Korean demographic transition can be divided into five stages: the traditional stage (to 1910), the early transitional stage (1910-1945), the chaotic stage (1945-1960), the late transitional stage (1960-1985), and the post-transitional stage (1985 to present). The major features of each stage of the transition are summarised in Table 1.

Table 1 Demographic transition and related factors in South Korea

Stage	Period	Population growth	Fertility	Mortality	International migration	Political and socio-economic factors
The traditional stage	Before 1910	Very low and stable increase	High	High with fluctuations	Negligible	Typical agrarian society/ mortality fluctuated due to famine, epidemics, and war
The early transitional stage	1910-1945	Rapid increase	High	Mortality transition	Massive emigration of farmers to Manchuria and Japan	Japanese colonial rule/ introduction of medical facilities and medicine
The chaotic stage	1945-1960	Rapid increase except for 1949-1955	High	Medium to high mortality from 1949-1955	Massive influx from Manchuria and Japan/ refugees from North Korea during the War	Liberation, partition of the country, the Korean War, social turmoil, economic hardship
The late transitional stage	1960-1985	Continued decline in growth rate	Fertility transition	Continued decline	Slight increase in emigration after 1970	Modernisation, economic development, urbanisation, family planning programs
The post-transitional stage	1985-present	Further decline in growth rate with negative growth potential	Continuing fertility decline to below-replacement level	Further substantial decline	Maintained low level	Social development, globalisation, expansion of education, changes in lifestyle, rising gender equality, medical insurance

Source: Kim, D. (2004: 14); Kim (2005, 2009).

3 Birth count data

3.1 Annual birth counts by age of mother and birth order

Data on live birth counts are produced and published by Statistics Korea based on the aggregation of birth registrations from the local administrative offices. Birth registration is legally required in South Korea, and each birth must be reported to the local administrative office within a month (30 days) of its occurrence (Andreeva et al., 2018).

The timeliness of birth reporting has improved considerably in recent decades. The share of all births with delayed registration was just 0.9 per cent in 2005 (Lee et al., 2016), and had further declined to 0.3 per cent by 2015 (Kim and Kim, 2017; cited in Andreeva et al., 2018). Both births and deaths with delayed registration are added to the Korean Vital Statistics for the year in which they occurred once every 10 years (Kim and Kim, 2017; cited in Andreeva et al., 2018).

Data on live births by single year of age of the mother and biological birth order have been available since 1981. The upper limit of the reproductive age span was set at 49. Births to mothers outside of the reproductive age span of 15-49 were grouped into two broad age

categories: ≤ 14 and ≥ 50 . The number of births to mothers of unknown age or with an unknown birth order are also provided for the entire period.

It is important to emphasise that until the late 1990s, the birth count data for South Korea suffered from the problem of under-registration, which was mainly related to the under-reporting of neonatal and infant deaths (Park, 2001; Yang et al., 2010). It has been estimated that due to the under-registration of infant deaths, the live birth totals were undercounted by 0.8 per cent in the 1980s, and by 0.7 per cent in the 1990s. To increase the accuracy of estimates of foetal and infant deaths, Statistics Korea has also been using information collected from crematoriums and hospitals since 1999. This practice has significantly improved the quality of the data on both live births and foetal and infant deaths. However, as infant mortality has been substantially reduced¹, the number of births reported each year by these additional data sources has been also decreasing, and has been at less than 0.1 per cent of total live births since the second half of the 2000s (Statistics Korea, 2013).

3.2 Monthly birth count data

The totals of live births by calendar month are available for South Korea for the period since 2000. Monthly birth counts are collected by year and month of registration, and are not adjusted for omissions or delayed registration. The official birth statistics for the calendar year are usually released by Statistics Korea in August of the following year.

4 Population Count Data

4.1 Population count data by age

The female and male exposure populations are estimated using annual female and male age structures and data on deaths from the Human Mortality Database (HMD). The HMD uses end-of-the-year resident registration population counts that cover the population of Korean nationality. For more details on the population and death count data collected by the HMD, please see Andreeva et al., 2016.

4.2 Population count data by age and parity

Data on the distribution of women by age and number of children ever born (born alive) have been collected since the 1960 census, with the exception of the 1995 census. The question about the number of children ever born was asked of ever-married women; i.e., women who are currently married, widowed, or divorced. Data on the number of children ever born were collected from complete census data in the 1960 and 1985 censuses, and from sampling surveys in the other censuses.

¹ Infant mortality has declined sharply in South Korea in recent decades (Statistics Korea, 2011). In 2015, South Korea was among the 10 OECD countries with the lowest infant mortality rates (Lee et al., 2016).

Table 2 Distribution of women by age and parity from population censuses

Period	Type of data	Age range	Year of birth, range	Parity
1960	Women by age and parity	13, 14, ..., 48, 49, 50-54, 55-59, ..., 75-79, 80+, unknown	-	0, 1, 2, 3, 4, ..., 16+, unknown
1966	Women by age and parity	15-19, 20-24, ..., 75-79, 80+, unknown	-	0, 1, 2, 3, 4, ..., 11+, unknown
1970	Women by age and parity	15, 16, ..., 48, 49, 50-54, 55-59, ..., 70-74, 75+	-	0, 1, 2, 3, 4, ..., 9+, unknown
1975	Women by age and parity	15, 16, ..., 48, 49, 50-54, 55-59, ..., 70-74, 75+	-	0, 1, 2, 3, 4, ..., 10+, unknown
1980, 1985, 1990	Women by age and parity	15, 16, ..., 53, 54, 55-59, 60-64, ..., 70-74, 75+, unknown	-	0, 1, 2, 3, 4, ..., 10+, unknown
2000	Women by age and parity	15, 16, ..., 58, 59, 60-64, 65-69, 70-74, 75+, unknown	-	0, 1, 2, 3, 4, ..., 10+, unknown
2005, 2010, 2015	Women by age and parity	15-19, 20-24, ..., 70-74, 75+	-	0, 1, 2, 3, 4, ..., 10+, unknown

Source: Statistics Korea (2012b); Census Reports (various years).

At present, the HFD includes data on the distribution of women by age and parity from the 2000 population census only. The estimates are based on a 10 per cent sample, and pertain to the distribution as of 1 November 2000. As in all South Korean population censuses, only ever-married women were asked the question about the number of children ever born. In the HFD calculations, never-married women are included in the category of childless women. Given that the share of births that are non-marital is still very small (less than two per cent) in South Korea (Statistics Korea, 2019), the error produced by the assumption that all never-married women are childless is negligible (Yoo, 2015).

5 Specific details

5.1 Definitions

Definition of live birth

Following the conventional definition created by the WHO in 1950, live birth refers to the complete expulsion or extraction from its mother of the product of conception, irrespective of the duration of the pregnancy; which, after such separation, breathes or shows any sign of life, such as a heartbeat, pulsation of the umbilical cord, or definite movement of voluntary muscles for however brief a time, and regardless of whether the umbilical cord has been cut or the placenta is attached (WHO, 1993: 129).

Definition of age

The birthday of the mother, reported either by the solar or the lunar calendar², is converted to the age at birth of a child in completed years (ACY); i.e., the age reached at the last birthday. The birth registration form requires parents to report the child's actual date of birth, regardless of the birthday used in the household registration system.

Definition of birth order

Birth order ranks a child in relation to all of the previous live-born children of the mother.

5.2 Data quality issues

Undercounting of births before 2000. Due to the problem of the underestimation of live birth counts, which is discussed more extensively in section 3.1, the HFD birth data series do not begin until 2000 (see Appendix 1). Data on births for the years before 2000 are available in the input data file accessible on the HFD country page for South Korea. More data, including various research estimates, for the previous years (age-specific fertility rates as well as summary fertility indicators) can be also found in the Human Fertility Collection (HFC), which is available at www.fertilitydata.org. However, the data for the years before 2000 should be used with caution.

Numerator-denominator bias. Births are included in the birth statistics in South Korea only if at least one of the resident parents is of Korean nationality (see section 1.2). The exposure population used for the HFD calculations also covers only Korean nationals (see section 4.1). This means that in cases in which the father is a Korean national but the mother is a foreigner, the mother is not included in the exposure population. However, the share of births to a Korean father and a foreign mother is not large, constituting slightly more than 3% in the 2000-2017 period (see Table A2 in Appendix 2). Thus, the impact of the female population undercount is negligible.

5.3 Revision History

Changes with the January 2019 revision:

The release contains some changes as compared to the dataset published as of November 2019. The changes have to do with data revisions implemented by Statistics Korea, including adding vital events with delayed registration. Regarding birth counts, more notable changes appear in births for the years 2000-2007, although some changes were made also in the 2008-2015 birth data. Since data on death counts, which we take from the HMD, were also

² According to the traditional Korean age counting system, people are born at the age of one, and on the New Year's or Lunar New Year's Day, one year is added to each person's age. Since age is incremented at the beginning of the lunar or solar year rather than on the anniversary of a birthday, a person may be considered one or two years older in this Asian system of reckoning than in the international age system. China and Japan have a similar age counting tradition.

revised, the changes reflect on the produced population exposure estimates as well.

In addition, the data series were updated through 2018.

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APPENDIX 1

INPUT DATA USED FOR HFD CALCULATIONS

BIRTHS

Period	Type of data	Age range	Birth order	RefCode(s)
2000-2018	Annual number of live births by age of mother and birth order (Lexis squares)	≤14, 15,..., 49, 50+, unknown	1, 2,..., 7, 8+, unknown	1, 3, 7
2001-2018	Annual number of live births by month	total	total	2, 4, 8

FEMALE POPULATION: Distribution by age and parity

Period	Type of data	Age range	Year of birth, range	Parity	RefCode(s)	Notes
01.11.2000*	Number of women by birth cohort and parity	15, 16, ..., 59, 60-64, 65-69, 70-74, 75+, unknown	–	0, 1,...,7, 8+, unknown	5	“Golden census”

* In the HFD calculations, never-married women are included in the category of childless women (see section 4.2).

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>.

APPENDIX 2

Table A1 History of the population census in South Korea

Census date	Title of census	Major features
Oct. 1, 1925	Simplified population census	The first population census
Oct. 1, 1930	Population census	Economic activities of the occupation, etc., included for the first time
Oct. 1, 1935	Population census	Usual place of residence included
Oct. 1, 1940	Population census	Military service, designated skills, and job 3 years ago included for the first time
May 1, 1944	Population survey	Conducted for the purposes of resource mobilisation according to the Japanese Wartime Mobilisation Act
May 1, 1949	Population census	The first census after the establishment of the South Korean government; migration included for the first time
Sept. 1, 1955	Simplified population census	Occupancy and type of household (farm or non-farm) included for the first time
Dec. 1, 1960	Population and housing census	The first housing census, adopted the labour force approach, and tabulation of 20% of the questionnaires for economic activity and fertility items
Oct. 1, 1966	Population census	Joint administration of a 10% sampling survey for economic activities and fertility items; housing items excluded
Oct. 1, 1970	Population and housing census	Joint administration of a 10% sampling survey for economic activities, fertility, migration, and some housing items
Oct. 1, 1975	Population and housing census	Joint administration of a 5% sampling survey for economic activities, fertility, migration and some housing items
Nov. 1, 1980	Population and housing census	Joint administration of a 15% sampling survey for economic activities, fertility, and migration items
Nov. 1, 1985	Population and housing census	No sampling survey; surname, family origin, and religion included
Nov. 1, 1990	Population and housing census	Joint administration of a 10% sampling survey for economic activities, fertility, and migration items; OMR system of data input
Nov. 1, 1995	Population and housing census	Joint administration of a 10% sampling survey for economic activities, commuting, and migration items; raster map
Nov. 1, 2000	Population and housing census	Joint administration of a 10% sampling survey for economic activities, fertility, migration, commuting, and information society related items; digital map and decentralised data processing
Nov. 1, 2005	Population and housing census	Joint administration of a 10% sampling survey for economic activities, fertility, migration, commuting, and elderly related items; internet survey (0.9%) for the first time
Nov. 1, 2010	Population and housing census	Joint administration of a 10% sampling survey for economic activities, fertility, migration, commuting, and multi-cultural related items; internet survey expanded to 47% of respondents

Source: Kim, M. (2004: 37); Statistics Korea (2012b); Census Reports (various years).

Table A2 Annual live births by nationality of the father and the mother

Husband	Wife	2010	2011	2012	2013	2014	2015	2016	2017
Korean	Korean	443,971	444,476	456,665	410,483	409,823	414,600	382,694	335,713
	Naturalised	2,062	2,507	2,485	2,288	2,395	2,340	2,177	2,067
	Foreign	15,369	16,086	16,498	14,900	14,198	12,866	12,456	11,720
Naturalised	Korean	79	112	104	98	128	109	110	103
	Naturalised	73	113	128	126	151	153	142	108
	Foreign	276	334	371	433	517	517	562	546
Foreign	Korean	2,236	2,528	2,911	2,973	3,151	2,999	3,039	2,852
	Naturalised	217	334	411	472	634	745	945	1,044
	Foreign	0	0	0	0	0	0	0	0
Unknown	Unknown	5,888	4,775	4,977	4,682	4,438	4,091	4,118	3,618
Total		470,171	471,265	484,550	436,455	435,435	438,420	406,243	357,771

Source: Statistics Korea.