

HUMAN FERTILITY DATABASE DOCUMENTATION: UKRAINE

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1 General information

A range of factors influenced demographic developments in Ukraine in the 20th century and the beginning of the 21st century. The events that had the greatest impact on fertility and population size were World Wars I and II (1914-1918 and 1939-1945, respectively), the mass repressions in the 1930s, the famines in 1932-1933 and 1947, the introduction of a series of population policies aimed at increasing fertility in the 1980s, and the dissolution of the Soviet Union in 1991.

Between three and four million Ukrainians died in World War I, and another 4.6 million died in the famines and mass repressions in 1929-1939. The total population losses in Ukraine in the three decades of the 20th century marked by wars, famines, and repressions (1929-1959) have been estimated at around 13.8 million (Pyrozhevskiy et al., 2011).

Following a gradual decline in the 1950s, fertility rates in Ukraine were among the lowest in Europe in the mid-1960s. The country's fertility levels subsequently stabilized, with the TFR remaining slightly below two from the mid-1960s through the 1970s (around 1.95). A modest fertility increase was observed in the mid- to late 1980s, with the TFR rising to 2.13 in 1986 and remaining above two until 1989. This positive trend was largely the result of a family policy package introduced in the Soviet Union in 1981-83¹.

In 1991 the Soviet Union collapsed and Ukraine became an independent state. During the 1990s, Ukraine experienced political and economic crises that were accompanied by huge migration waves and a substantial drop in fertility. The TFR plunged, reaching its lowest value of 1.09 in 2000. During the 12 years between the two censuses the total population of Ukraine decreased, from 51.7 million in 1989 to 48.5 million in 2001.

The first decade of the 21st century saw an increase in the total number of births in Ukraine. This upturn in fertility was attributed to a wide range of developments, including a trend toward the realization of births that had been postponed to a better time, the adaptation of

¹ These family policies were based on new principles, and provided new forms of family support, such as paid childcare leave with flat-rate compensation for the mother until the first birthday of the child, an additional unpaid childcare leave until the child was 18 months old, and a lump-sum grant for each live birth that increased incrementally for second- and third-order births. Additional benefits were given to mothers with large numbers of children (i.e., three or more).

young people to the market economy, an increase in state child benefits, and the presence of a relatively large group of women of the most reproductive ages (20-29) who were born during the increase in fertility in the 1980s.

The Ukrainian data assembled for the Human Fertility Database project consist of published and unpublished official tabulations based on individual birth records and the official results of population censuses collected by the State Statistics Committee of Ukraine. These data include the following:

- Number of live births by age of the mother, 1945-2013
- Number of live births by age of the mother and birth order, 1945-2013
- Number of live births by calendar month, 1968-2013
- Distribution of women by age and number of live-born children from the 1979, 1989, and 2001 censuses.

Detailed information about the data used in the HFD calculations is provided in Appendix 1.

1.1 Data collection

The State Statistics Committee of Ukraine (Державний комітет статистики України, www.ukrstat.gov.ua) is the governmental agency responsible for the collection and dissemination of population data in Ukraine, including vital statistics registration and annual population count data. The agency is also in charge of organizing and conducting the censuses, and of publishing census data.

The first population census on the territory of Ukraine² (as a part of the Russian Empire) was conducted in 1897, and this census became the first official data source for scientific analyses and publications (State Statistics Committee of Ukraine, 2004a). The total population was estimated at 23.4 million.

The Central Bureau of Statistics of Ukraine was established in 1920. In December 1922 the Ukrainian Soviet Socialist Republic became one of the founding republics of the USSR (Ukrainian SSR). Eight population censuses took place before the collapse of the Soviet Union: in 1920, 1926, 1937³, 1939, 1959, 1970, 1979, and 1989. In addition, the urban population was counted (registered) in 1923 and in 1931. In August 1987 the Central Bureau of Statistics of the Ukrainian SSR was renamed the State Statistics Committee of the Ukrainian SSR, and since 1991 it has been known as the State Statistics Committee of Ukraine.

The All-Ukrainian Population Census of 2001 was the first census conducted in Ukraine since the republic gained its independence in 1991. The census registered 48.457 million people. About 78% of the total population (37.5 million) were of Ukrainian nationality, 17.3% (8.3 million) were of Russian nationality, and 16 other ethnic groups (nationalities)—such as Byelorussians, Moldovans, Crimean Tatars, Bulgarians, Hungarians, and Romanians—each consisted of between 30,000 to 300,000 individuals (State Statistics Committee of Ukraine, 2004b). All of the people who were permanently or temporarily residing in the territory of Ukraine (Ukrainians, foreign citizens, and stateless persons) were included in the 2001 All-Ukrainian Census.

² In 1897, part of Western Ukraine belonged to the Austro-Hungarian Empire and therefore was not included in that census.

³ Results from the “repressed” 1937 census were kept secret and did not become publicly available until 1989 (Pyrozkhov et al., 2011)

Birth registration in Ukraine is compiled by the public civil registration authorities (Державний орган реєстрації актів цивільного стану) on the basis of medical birth certificates issued at the place of residence of one of the parents. Under article 144 of the Family Code, parents are required register a child's birth with the civil registration authorities no later than one month after the child has been born.

The State Statistics Committee receives primary administrative data on vital statistics and the migration of the population on a monthly basis. Since 1993, the basic demographic indicators for the whole country and for each of the regions have been published in July of the subsequent year. Since 2003 the State Statistics Committee, in collaboration with the Institute of Demography and Social Studies at the National Academy of Sciences, has published annual analytical reports on population developments in Ukraine. Some of these tabulations are for scientific purposes only and are not published: e.g., tabulations of the distribution of live births by the father's and the mother's citizenship (form H-4); of the distribution of live births by the father's and the mother's age by five-year age groups (form H-2); of live births by five-year age groups of the mother and her marital status (form H-1); and of live births by the age of the mother (single-year age groups) and birth orders one through 10+, as well as by urban/rural areas (form H-6). These tables are available upon request.

1.2 Territorial coverage

The borders of Ukraine changed many times during the first half of the 20th century. Before World War II the territory of Western Ukraine was subject to several secret protocols between Germany and the USSR, and its governance was transferred from Poland to the Ukrainian SSR.

The borders changed again after World War II. In a treaty signed by Czechoslovakia and the Soviet Union on June 29, 1945, Transcarpatian Ukraine was officially ceded to the Ukrainian SSR. In March 1945, Bircha, Lisko, and most of Peremyshl Raion (including the city of Peremyshl) were transferred to Poland. On May 15, 1948, Medyka Raion was transferred to Poland as well. In December 1951, Nyzhnyo-Ustryky Raion was also ceded to Poland (as part of the Polish-Soviet territorial exchange). In February 1954, the Presidium of the Supreme Soviet of the USSR issued a decree on the transfer of the Crimean region from the Russian Soviet Federal Republic to Soviet Ukraine.

In 1959 the Central Bureau of Statistics recalculated all of the demographic data so that they covered the entire territory of Ukraine at that time. The changes in the territory of Ukraine before 1959 are not relevant for the HFD, as the birth count data used for purposes of the HFD pertain to the period since 1959.

After the collapse of the Soviet Union in 1991 Ukraine became an independent state. Its borders remained identical to those of the Ukrainian Soviet Republic. Present-day Ukraine is subdivided into 24 provinces (oblasts) and the autonomous republic (avtonomna respublika) of Crimea. The cities of Kiev and Sevastopol have special legal status. The 24 provinces and Crimea are subdivided into 490 districts (raions).

Registrations of births in Ukraine cover the full territory of Ukraine in its modern borders.

2 Birth Count Data

2.1 Coverage and Completeness

The birth count data assembled for the HFD project cover the period 1945–2013 (for details, see Table 1 below). The data for the whole period are available in the Input Data file.

However, due to the low quality of population statistics for the earlier years, only data from the year 1959 are used in producing the HFD output files.

Data for the period 1945–1967 were collected at the Central State Archives of Supreme Bodies of Power and Government of Ukraine (<http://www.archives.gov.ua>). For the period 1945–1954, data on births are available by single years of age of the mother and birth order, whereas for the period 1955-1977 birth count data were collected and archived by five-year age groups of the mother and birth order.

Table 1 Description of data on live births, Ukraine 1945-2013

Period	Age range	Age interval	Birth order
1945-1954	-15 – 55+, UNK	1-year	1-11+, UNK
1955-1977	-15 – 55+, UNK	5-year	1-11+, UNK
1978-1994	-15 – 55+, UNK	1-year	1-11+, UNK
1995-1998	-15 – 55+	1-year	1-8+
1999-2009	-15 – 55+, UNK	1-year	1-10+, UNK
2010-2013	12 – 55+, UNK	1-year	1-10+, UNK

Detailed birth data for the period 1978–1994 come from unpublished tables of the State Statistics Committee of Ukraine. Since 1999, birth counts by age of the mother and birth order have been officially published in the demographic yearbooks “Населення України” (Population of Ukraine).

Due to changes in the civil registration legislation in the period 1995-1998, data by biological birth order were not collected and were therefore excluded from the official statistical tabulations. In 1999 the Department of Demography and Labour Force⁴ at the Institute for Economics and Forecasting (Ukrainian Academy of Sciences) recalculated and published official estimates of births by age of the mother and biological birth order for the period 1995-1998 (Javorsky, 1999). The birth estimates by birth order for the period 1995-1998 were obtained through the extrapolation of the actual distribution of age-specific fertility rates by birth order in the period 1990-1994. We generated another set of estimates through the interpolation of the actual age-specific fertility rates by birth order in the periods 1993-1994 and 1999-2000. About 0.09%-0.17% of the total number of births were relocated between the birth orders, which means that around 400-700 births were redistributed from birth order one to a higher birth order. As the changes in the estimated birth order-specific fertility indicators were negligible, we decided to use the officially published estimates.

The data on births in the HFD include all of the births to permanent residents of Ukraine, regardless of their citizenship.

Since the mid-1990s⁵ the State Statistics Committee of Ukraine has published data according to the year of registration instead of the year of occurrence. The data for a given year include all of the demographic events that were registered during that year. The data are produced monthly, and include, for example, all of the births that were registered in that month, regardless of the date when the event occurred. All of the events that occurred in the previous year can be registered during the current year. If an event occurred earlier than the previous year, then it is registered separately and is not included in the statistics. In the HFD we assume for such cases that the year of occurrence is the same as the year of registration.

⁴ The Department of Demography and Labor Force at the Institute for Economics and Forecasting was turned into the Institute of Demography and Social Studies at the National Academy of Sciences of Ukraine in 2002.

⁵ This information is not available in any official publication. We received confirmation from the State Statistics Committee that the birth statistics currently include births according to year of registration, but we were not able to get information about the year when this rule was introduced. The trends in the monthly data indicate that it probably happened in 1995.

3 Population Count Data

3.1 Population count data by age

The data on population size are taken from the Human Mortality Database (HMD). Because there are no reliable data series on population before 1959, the HMD provides data on female population exposure from 1959 onward (Pirozhkov et al., 2011). However, for the computation of parity-specific fertility tables we use population estimates and birth data from 1970 onward. We chose this later date because the Ukrainian population estimates before the 1970s are not sufficiently reliable (Pyrozhkov et al., 2011) for the computation of parity-specific fertility tables.

After the collapse of the USSR in 1991, Ukraine, like most countries in the former Eastern Bloc, experienced huge waves of migration (predominantly emigration), which led to a substantial discrepancy between the annual population estimates and the 2001 census results (Pyrozhkov et al., 2011). Population estimates for this period are produced using special methods, which are described in detail in the HMD background and documentation file (Pyrozhkov et al., 2011).

3.2 Population count data by age and parity

Data on the distribution of women by age and the number of live-born children are available from the 1979, 1989, and 2001 population censuses in Ukraine. The question about the number of live-born children was asked of women aged 15 and over, regardless of their marital status. In the 1979 and 1989 censuses this question was part of a special questionnaire given to a random 25% sample of all Ukrainian households.

Tabulations from the 1979 and 1989 censuses received from the State Statistics Committee of Ukraine were aggregated by five-year age groups. Thus, it was not possible to use these data for the HFD estimates. More detailed data on the age-parity distribution of women from these two censuses were retrieved from the Central Economic Archive in Moscow. However, the distribution of women from the 1989 census at ages 35 to 70 was grouped by five-year age groups. The data are therefore provided in the “Input data” section on the HFD website, but were not used in the HFD calculations.

Data from the 1979 and the 2001 population censuses, which are used for the calculations in the HFD, cover women by single ages 15-54 and parities 0-10+, as well as the categories of unknown age and unknown parity.

4 Specific details

4.1 Definitions

Definition of a live birth

The definition of live birth has changed over time in Ukraine. According to the Soviet definition of a *live birth* (see Andreev, 2012), which was in force until February 1996, a live birth is a fetus that exits the maternal body at a gestational age of at least 28 weeks (i.e., fetal growth ≥ 35 cm, weighing ≥ 1000 g) and that shows signs of life (a heartbeat or breathing). Any fetus delivered at a gestational age of at least 28 weeks that shows no signs of life is considered a *stillbirth*. Such a restrictive definition led to an underestimation of births and of the population at age zero, an underestimation of neonatal mortality by about 50%, and an underestimation of infant mortality by about 25% (Anderson and Silver, 1986, Blum and Monnier, 1989, Velkoff and Miller, 1995).

The WHO definition of live birth has been used in Ukraine since March 1996, and the definitions of *stillbirth* and *perinatal period* were further refined in 2006.

- 03.1996 – 03.2006 (*Instructions №31 from 19.02.1996 for defining live birth, stillbirth and perinatal period, Ministry of Health, Ukraine*)

A *live birth* is defined as a fetus of any gestational age that exits the maternal body and shows signs of life such as breathing, voluntary movement, a heartbeat, or pulsation of the umbilical cord; however briefly, and regardless of whether the umbilical cord or placenta are intact.

Stillbirth is defined as a birth at any gestational age in which the child shows no subsequent signs of life, such as breathing, voluntary movement, a heartbeat, or pulsation of the umbilical cord.

The *perinatal period* starts at 28 weeks of gestation (or 259 days, the time at which fetal weight corresponds to 1,000 g), includes the stages of labor and the first seven full days of life of the newborn, or 158 hours after birth.

- 04.2006 – present (*Instructions № 179 from 29.03.2006 for defining live birth, stillbirth and perinatal period, Ministry of Health, Ukraine*)

A *live birth* is defined as a fetus of any gestational age that exits the maternal body and shows signs of life such as breathing, voluntary movement, a heartbeat, or pulsation of the umbilical cord.

Stillbirth is defined as a birth in which the child has a gestational age of at least 22 weeks or a weight of at least 500 g and shows no subsequent signs of life, such as breathing, voluntary movement, a heartbeat, or pulsation of the umbilical cord.

The *perinatal period* starts at 22 weeks of gestation (or 154 days, the time at which fetal weight corresponds to 500 g), includes the stages of labor and the first seven full days of life of the newborn, or 168 hours after birth.

Definition of age

The age of the mother was recorded as the age in completed years (ACY) during the entire period of 1945–2013. In Ukraine ages 15 to 49 are considered the reproductive (childbearing) ages. However, birth records are also provided for women younger than age 15 years and older than age 49.

Definition of birth order

In Ukrainian vital statistics, “birth order” refers to the biological (true) birth order of the child in relation to the mother, irrespective of the mother’s marital status.

4.2 Data Quality Issues

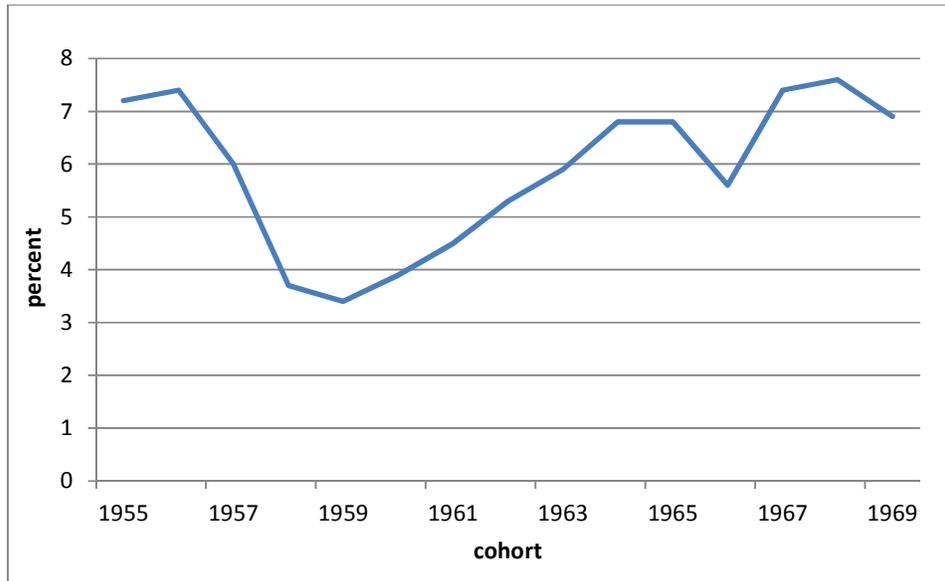
Warning: Due to quality problems of population estimates, data prior to 1970 should be used with extra caution.

For the computation of parity-specific fertility tables we use population estimates and birth data since 1970. We chose this later date because the Ukrainian population estimates before the 1970s are not sufficiently reliable (Pyrozkhov et al., 2011) for the computation of parity-specific fertility tables.

Cohort childlessness

Special attention must be paid to the very low levels of childlessness estimated in the HFD for the cohorts born in 1958-1961, which approach the threshold for primary infertility (see Figure 1).

Figure 1 Cohort childlessness at age 40, Ukraine, cohorts 1955-1969



The very low values of estimated childlessness are as follows: cohort 1958: 3.5%; cohort 1959: 3.2%; cohort 1960: 3.7%; and cohort 1961: 4.3%.

Similar levels of cohort childlessness in the cohorts of women born in the late 1950s and early 1960s are also observed in the HFD data for Russia, Estonia, and Lithuania (see www.humanfertility.org). It appears that several factors have contributed to the estimation of such low values in many of the former Soviet republics. Previous research has suggested that what seem to be unrealistically low levels of childlessness estimated for the 1958-1962 cohorts are attributable to a combination of real fertility behavior and limited data quality for the period before 1989 (e.g., Jasilioniene et al., 2011 for Lithuania).

In a study based on the Ukrainian Longitudinal Monitoring Survey, Perelli-Harris (2008) found that childlessness among women born in 1960-1964 is only 4%; a result that is in line with the HFD estimates. In addition, Pyrozhev et al. (2011) reported that the Ukrainian population data prior to 1990, and especially the data for the period 1959-1970, have the same problems as the data from other ex-Soviet republics. Data issues such as age-heaping and inconsistent fluctuations in the age distribution of female population counts repeatedly affect fertility estimates for particular cohorts. As a result, a series of relatively minor data distortions may accumulate when the cohort summary indicators are computed. Thus, data users should be aware that the HFD cohort fertility indicators are statistical estimates that are dependent on the data limitations, and that may not fully correspond to the fertility behavior of real cohorts.

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**APPENDIX 1
DESCRIPTION OF DATA USED FOR LEXIS DATABASE**

BIRTHS

Period	Type of data	Age range	Birth order	RefCode(s)
1959-1977	Annual number of live births by age of the mother and birth order (Lexis squares)	≤15,16-19, 20-24, ..., 50-54, 55+, unknown	1, 2, ..., 10, 11+, unknown	2,3
1978-1994	Annual number of live births by age of the mother and birth order (Lexis squares)	≤15, 16,...,54, 55+, unknown	1, 2, ..., 10, 11+, unknown	4
1995-1998	Annual number of live births by age of the mother and birth order (Lexis squares)	≤15, 16, ..., 54, 55+, unknown	1, 2, ..., 7, 8+	5
1999-2009	Annual number of live births by age of the mother and birth order (Lexis squares)	≤15,16...54, 55+, unknown	1, 2, ..., 9, 10+, unknown	6
2010-2013	Annual number of live births by age of the mother and birth order (Lexis squares)	12,13,...54, 55+, unknown	1, 2, ..., 9, 10+, unknown	12
1968-2009	Annual number of live births by month	total	total	7
2010-2013	Annual number of live births by month	total	total	13

FEMALE POPULATION: Distribution by age and parity

Period	Type of data	Age range	Year of birth, range	Parity	RefCode(s)	Notes
17.01.1979 ¹	Number of women by age and parity	15,16... 54, 55-59, 60-64, 65-69, 70+, unknown	–	0, 1, ..., 9, 10+, unknown	8	Used as “Golden Census”
05.12.2001	Number of women by age and parity	15,16... 54, 55-59, 60-64, 65-69, 70+, unknown	–	0, 1, ..., 9, 10+, unknown	11	-

¹ The question about the number of children ever born was asked of a random 25% sample of households in the census. The distribution of women by age and parity obtained was applied to the entire female population of Ukraine.

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 (HMD), available at <http://www.mortality.org> or <http://www.humanmortality.org>