

# HUMAN FERTILITY DATABASE DOCUMENTATION: LITHUANIA

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## **1 General information**

The earliest reliable historical data on the population of Lithuania can be found in the first population census of the Grand Duchy of Lithuania, which took place in 1790 (Jasas and Truska 1979, Stankuniene 1989). By the time of the census, so-called “handling commissions” had been established. These commissions were the first official institutions responsible for the collection of statistical data in Lithuania (Jasas and Truska 1979). The registration of vital events was very fragmentary at that time, as the parish registration system was never established at the state level.

After the third partition of the Polish-Lithuanian Commonwealth in 1795, Lithuania became a part of the Russian Empire and was divided into three governor’s districts (*gubernias*). After the Order on Statistics was passed in 1863, statistical committees were established at the *gubernia* level in the second half of the 20<sup>th</sup> century (Gozulov 1972). The Statistical Committee of the Russian Empire started publishing data on the population and vital events at the *gubernia* level, including the three Lithuanian governor’s districts. The quality of registration of vital events was relatively poor, as it was usually based only on the church records (Gozulov 1972). Lithuania took part in the first population census of the Russian Empire in 1897. Data on population by age and sex, ethnicity, religion, occupation, and other characteristics were published at the *gubernia* level following the census (Isupov 1994, Gozulov 1972).

Lithuania regained its independence in 1918. Several important territorial changes took place during the inter-war period (1918-1940). First, as a consequence of the military conflict with Poland (1919-1920), a significant part of the territory where the historical capital, Vilnius, is located was lost for the period 1920-1939. It was a significant loss in terms of population: according to the data for 1931, about 18% of the total population resided in that region (Gaucas 1978). Second, the Klaipeda region was regained by Lithuania in 1925, adding 145,000 people to the total national population of 2.03 million (not including the Vilnius region) (Central Statistical Bureau 1926, 1937). However, after Hitler’s ultimatum this region was lost again when Germany took control of it in 1939. Part of the Vilnius region, including the capital city, was returned to Lithuania in 1939 (shortly before the country lost its independence in 1940).

During the inter-war period, there were many attempts to create and maintain a fully functioning registration system of vital events in Lithuania, and to systemise the statistical data according to international standards. The General Department of Statistics was

established in 1919, which was reorganised into the Central Statistical Bureau in 1921. In 1923, a population census was conducted in Lithuania (except in the Vilnius region, which was under the control of Poland; and in the Klaipeda region, where the population enumeration was carried out in 1925). The Polish authorities also conducted population enumerations in the Vilnius region in 1921 and 1931. The 1931 census data on the region of Vilnius and on the city of Vilnius were published in separate volumes in 1936.

The first issue of the Lithuanian Statistical Yearbook was released in 1922, and has been published at least semi-annually since 1928. The 1923 population census data were published in a separate volume in both the Lithuanian and the French languages. The published data on vital events are relatively detailed, and include classifications by age, sex, and other social characteristics (ethnicity, education, religion, urban/rural residence, county, etc.). However, the data on population are not reliable because the population estimates were based on vital events only (migration was not considered at all). Except for the census 1923, which was the only census in Lithuania during the period of its independence (1918-1940), reliable data on population are missing for the period.

Lithuania was incorporated into the Soviet Union in 1940 as the Lithuanian Soviet Socialist Republic, and the Central Statistical Bureau became part of the Central Statistical Office of the USSR. The first data on vital events covering the entire territory of Lithuania became available in 1953. However, it is unclear whether these early data are complete because a guerilla war against the Soviet army lasted until the mid-1950s in some rural areas (Kiaupa et al. 2000). By the end of the 1950s, the Statistical Office of the Lithuanian SSR took several steps to improve the registration system following several orders from central and local authorities (Stukonis 1958). The statistical data on vital events were kept in special, “secret” files labeled: “Report on the Natural Increase and Migration in the Lithuanian SSR”. These files were compiled on an annual basis. Although the Statistical Office of the Lithuanian SSR has published population yearbooks since 1966, the data were available only at the aggregate level, and were restricted to “internal use”. Four population censuses—in 1959, 1970, 1979, and 1989—took place in Lithuania during the period of the Soviet rule (1940-1989). Continuous population data series based on the census data and inter-censal estimates for Lithuania became available from 1959.

After the restoration of independence in 1990, the main body responsible for the population statistics in Lithuania was the Department of Statistics to the Government of the Republic of Lithuania (Statistics Lithuania, <http://www.stat.gov.lt>). Among the first steps taken to improve the comparability of the demographic data was the harmonisation of the statistics according to the international standards, which were often ignored during the Soviet period. For example, the WHO definition of live birth was adopted in 1991. More detailed data on vital events have become available to scientists and the public from publications such as the Demographic Yearbooks of Lithuania, or from other, more specialised statistical abstracts published annually by Statistics Lithuania.

### **1.1 Data collection**

All birth data (live births by the age of the mother, the mother’s year of birth (when available) and birth order (when available) and live births by month), as well as census data on the parity distribution of women from the population censuses of 1979, 1989, 2001, and 2011 were obtained for the HFD either from Statistics Lithuania or were downloaded from the official website of Statistics Lithuania (<http://www.stat.gov.lt/>).

## **1.2 Territorial coverage**

The Lithuanian birth data included in the HFD start in 1958. There were no territorial changes in Lithuania during this period. Numerous territorial changes took place prior to 1945, and they are briefly noted in the introductory section above.

## **2 Birth Count Data**

### **2.1 Coverage and completeness**

During the post-war Soviet period (1945-1989), the registration of births, as well as of other vital events, was very centralised. This high level of centralisation has continued up to today. It can be assumed, therefore, that birth registration has been occurring over the entire territory of Lithuania since the end of the 1950s. The following birth registration procedure has been in force in recent years. First, for each newborn, a birth document is issued by a medical institution. Within three months, this document has to be forwarded to the local Civil Registry Office, where the birth is registered and the birth certificate is issued for the child. At the same time, the child is provided with a personal identification number. Civil registry offices of cities, towns, and districts submit birth records to the Residents' Register Service under the Ministry of the Interior of the Republic of Lithuania. In practice, the central database of the Residents' Register is the main source of data on marriages, divorces, births, deaths, and international and internal migration in Lithuania. Data of the Residents' Register are delivered electronically to Statistics Lithuania (Statistics Lithuania 2010: 7-8). Statistics Lithuania processes and publishes these data in a number of annually issued demographic publications. In recent years, live births by the age of the mother and birth order, live births by month, and the key fertility indicators are published annually in Demographic Yearbooks.

The following types of data on births are available for Lithuania in the HFD:

- Live births by age of the mother, 1958-1977;
- Live births by age of the mother and birth order, 1970-2008;
- Live births by age of the mother, mother's year of birth and birth order, 1993-2020; and
- Live births by month, 1958-2020.

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

### **2.2 Recalculated live birth counts for 2001-2011**

After the 2011 census, Statistics Lithuania not only revised the population age structures and calculated the inter-censal population estimates for 2001-2011 (see also section 3.1) but also recalculated the birth counts for this period (Table 1)<sup>1</sup>. The census disclosed that a lot of women registered as permanent residents of Lithuania and having their births registered in Lithuania were actually residing abroad. The recalculation of birth counts for 2001-2011 involved the exclusion of births that occurred to mothers residing abroad for more than a year. The residential status of mothers was identified using data from the Central Population Register (last address, registered movements) and other registers such as the Social Security Register (reception of social benefits), the Health Insurance Register (use of health care services), etc.

It is noteworthy, however, that emigration statistics substantially improved in Lithuania following the administrative reform implemented in 2009-2010. This reform introduced

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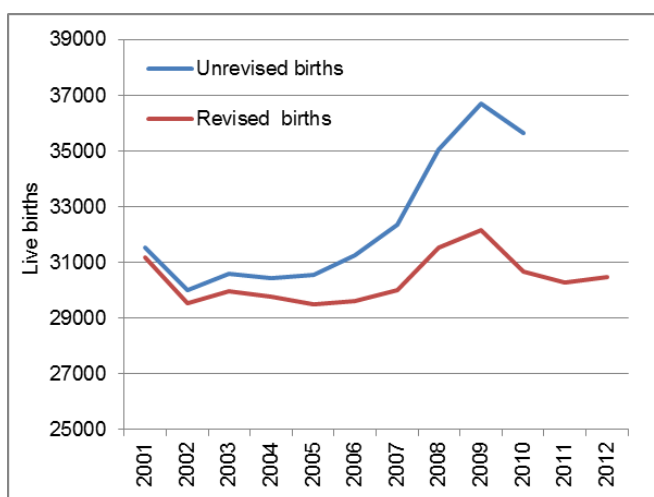
<sup>1</sup> The revised birth counts were published in the HFD data release of March 6, 2014.

additional taxes and fines to persons residing abroad and keeping their permanent residence status in Lithuania (e.g., not declaring emigration). Consequently, substantial improvement in reporting departures to the authorities have been observed.

The current population estimates from the Population Register also improved as the Population Register had also been harmonized with the 2011 census data. Additionally, Statistics Lithuania started doing linkages between Population Register data and data from the other registers in order to identify residence status more precisely (e.g., to identify residence status of a baby born abroad but registered in Lithuania).

**Table 1:** Comparison of unrevived and revised data on births, 2001-2011

Year	Unrevised births	Revised births	Difference
2001	31546	31185	361
2002	30014	29541	473
2003	30598	29977	621
2004	30419	29769	650
2005	30541	29510	1031
2006	31265	29606	1659
2007	32346	30020	2326
2008	35065	31536	3529
2009	36682	32165	4517
2010	35626	30676	4950
2011	--	30268	--



### 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). Because there are no continuous and reliable data series on population or on vital events before 1959, the Human Mortality Database (HMD) provides data on female population exposure for the period since 1959 (Jasilionis and Stankuniene 2010).

#### 3.2 Population count data by age/cohort and parity

Data on the distribution of women by age and on the number of live-born children are available in Lithuania from the population censuses of 1979, 1989, 2001, and 2011. The question about the number of live-born children was included for the first time in the questionnaire of the 1979 census. In the 1989 census, this question was supplemented with a new question about the number of live-born children who remained alive (Statistics Lithuania 2007).

The definition of the number of live-born children used in the censuses of 1979 and 1989 is not available. It is known that this number includes children who died, but not stillbirths. As for the 2001 census, Statistics Lithuania (2004: 5) defines it as including “all children (irrespective of age) born alive to women under enumeration until the moment of the census, regardless of whether all the children are alive and were alive at the moment of the census. The number of children born alive excludes adopted or foster children, the husband’s children from a previous marriage, etc.” At the 2011 census, women were asked how many

children they had born and in which year they had born the first child; the question did not specify whether the children were born alive or not.

In all the censuses (1979, 1989, 2001, and 2011), the question about the number of born children was posed to women aged 15 and over. However, when children born to women younger than 15 years old were found in the 2001 census, information about the number of such women and the birth order of their live-born children was also collected. It is noteworthy that, in the 1979 and 1989 censuses, the question about children was part of the questionnaire given to the 25% sample of households only.

Data on the distribution of women by age and parity from the 1979, 1989, and 2001 censuses were provided for the HFD by Statistics Lithuania. Data from the 1989 census are also available in a separate publication, which was released in 1991 (see Statistics Lithuania 1991). For the 2001 census data, Statistics Lithuania organised the data by subject and published them in 10 publications. One of these publications is named “Fertility”, and includes information about women by age or year of birth and the number of live-born children (see Statistics Lithuania 2004). Data for the 2011 census come from a publication summarizing the results of the census (see Statistics Lithuania 2013).

Appendix 1 provides more detailed information about the data on the distribution of women by age and parity from the four censuses:

Data on the age-parity distribution of women from the 1979 census are used for estimating the initial parity weights  $w_i(x)$  (for one starting year) used for the calculation of period fertility tables. In the HFD vocabulary, it is called the “golden” census approach (for more details, see the Methods Protocol).

## **4 Specific details**

### **4.1 Definitions**

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

During the period 1940-1991, the Soviet definition of live birth was in force in Lithuania. The definition was based on the following criteria: evidence of life (respiration after separation from mother's body), a birth weight of at least 1000 g, a period of gestation of 28 weeks or longer, and a body length of 35 cm or longer. Infants who did not meet the above-mentioned criteria and died within their first week of life were not counted as live births or as infant deaths, but rather as stillbirths. These newborns were registered as live births only if they survived more than seven days. This definition differed from that of the WHO, which led to an underestimation of births and population at age zero; and also resulted in an underestimation of neonatal mortality by about 50%, and an underestimation of infant mortality by about 23% (Anderson and Silver 1997; Anderson and Silver 1986; Blum and Monnier 1989; Velkoff and Miller 1995).

The WHO definition of live birth has been used in Lithuania since 1991. Live birth is defined as any delivered child showing evidence of life (respiration and heartbeat), irrespective of the duration of pregnancy (Statistics Lithuania 2010).

#### ***Definition of a stillbirth***

A stillbirth is defined an infant born without any signs of life who weighed at least 500 g, and who was born after at least 22 weeks of pregnancy (Statistics Lithuania 2010).

#### ***Definition of age***

In the Lithuanian data on births, the age of the mother is always classified by the age in completed years (ACY), which is the age reached at the last birthday.

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

Birth order ranks the child in relation to all of the previous live-born children of the mother. In the case of multiple deliveries, each child is counted separately depending on the sequence of birth.

## **4.2 Data Quality Issues**

### ***Cohort childlessness***

**Cohort childlessness for selected cohorts has extremely low values, and should be used with caution.**

We would like to call attention to the very low levels of childlessness estimated in the HFD for the cohorts born in 1957-1960. The estimated values of childlessness are as follows:

- Cohort 1957: 0.023
- Cohort 1958: 0.026
- Cohort 1959: 0.026
- Cohort 1960: 0.034

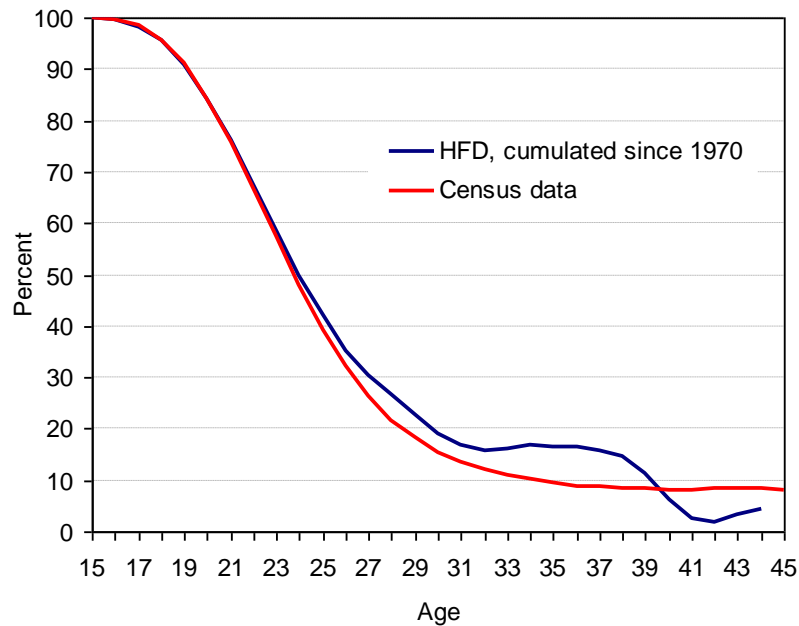
This apparently occurred for several reasons. Studies based on survey data (e.g., Stankuniene and Maslauskaite 2009) suggest that childlessness among women born in the 1950s is indeed lower than among preceding or subsequent birth cohorts. The level of childlessness might be additionally reduced by the modifications we make to data in the HFD (e.g., splitting five-year age groups into one-year age groups<sup>2</sup>). This indicator is also sensitive to the accuracy of population estimates, and cumulates all migration and data quality problems present in a particular cohort line. In the period before 1989, Lithuanian population data have some problems (for more details about Lithuanian population estimates, see Jasilionis and Stankuniene 2010). It is important to keep in mind that HFD cohort data are to be understood as statistical models that may not fully correspond with the fertility behaviour of real birth cohorts.

Figure 4.1 compares the HFD period estimates of childlessness in 2001 generated by cumulating cohort fertility rates since 1970 with the age-specific proportions of childless women based on data from the 2001 census. It offers a good illustration of how estimates of childlessness derived using the HFD methodology diverge from the census-based data.

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<sup>2</sup> Data on births for the period 1958-1977 are available only by five-year age groups.

**Figure 4.1:** Proportion of childless women  $w_0(x)$  in 2001, census data vs. HFD estimates



### ***Sudden jumps in the mean age at birth in the 1980s***

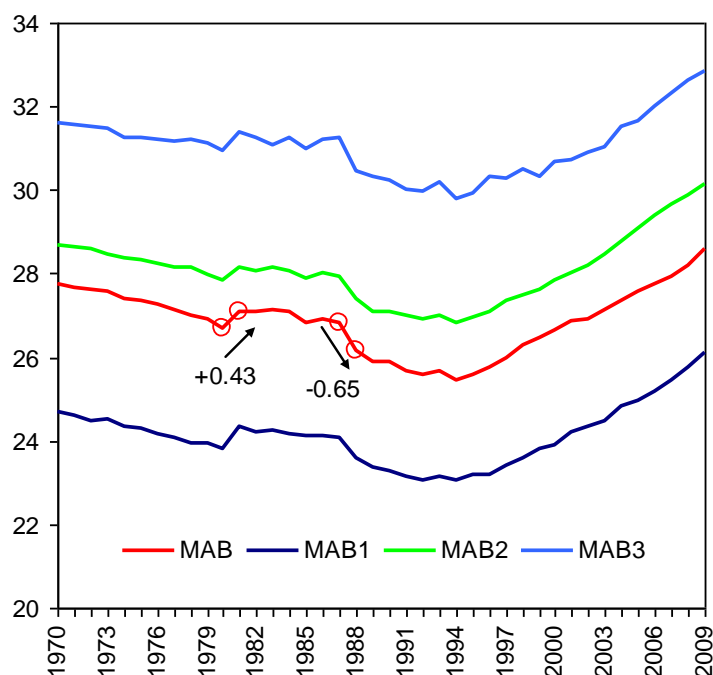
There are two sudden jumps in the mean age at birth (MAB) observed in the 1980s. The first jump appears in 1980-1981: the MAB increased by 0.43, from 26.68 to 27.11, between the two years. The second jump is in 1987-1988: the MAB changed from 26.830 to 26.180; i.e., it decreased by 0.65. A similar pattern of change is found in all birth orders (Figure 4.2). These changes are comparatively large. However, the data have been carefully examined, and no problems could be identified.<sup>3</sup>

We believe that our findings on these trends are accurate, and that the changes in the MAB were brought about by the particular circumstances of the time. In the first instance (1980-1981), the change was caused by a number of factors, including the launch of pronatalist policies (they were introduced in the entire former USSR) and modifications in the educational system.

The second instance (1987-1988) coincides with the growth of the independence movement. The MAB decrease was caused by the dual effects of a greater number of births to younger parents (young people were having children earlier in order to avoid having to serve in the Soviet army) and of a suspension of childbearing at older ages (because of insecurity and uncertainty about the future).

<sup>3</sup> There was a concern that the data format has changed from ACY (age in completed years) to ARDY (age reached during the year/ cohort sorting) between 1980 and 1981 and then back again from ARDY to ACY between 1987 and 1988. No evidence has been found that this could have happened. The ARDY format was never practiced in Lithuania. In addition, births were recorded and data on births were processed in one and the same way (starting from 1982 it was done by a computer program) in the entire former USSR.

**Figure 4.2:** Mean ages at all births and at first, second, and third birth, Lithuania



### 4.3 Revision History

#### Changes with the May 2016 revision:

The data for 2014 have been added. There are no other changes as compared to the data release of November 30, 2015.

#### Changes with the November 2018 revision:

The released data contain some changes as compared to the data update of May 24, 2016. The changes were caused by the drop of the 1958 monthly births (the quality was reassessed as not sufficiently good) from the calculation of the population exposure estimates for this birth cohort. Consequently, changes in the population exposure estimates led to corresponding changes in the birth estimates as well as the age-specific fertility rates for this cohort. Data for 2015-2017 were added.

#### Changes with the November 2020 revision:

Data for 2018-2019 were added.

#### Changes with the March 2022 revision:

Data for 2020 were added.

### Acknowledgements

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## APPENDIX 1

### INPUT DATA USED FOR HFD CALCULATIONS<sup>4</sup>

#### BIRTHS

Period	Type of data	Age range	Birth order	RefCode(s)
1959-1977	Annual number of live births by age of mother (Lexis squares)	≤15, 16,...,48, 49, 50-54, 55+, unknown	–	1
1970-1977	Annual number of live births by age of mother and birth order (Lexis squares)	≤15, 16-19, 20-24, ..., 50-54, 55+, unknown	1, 2,...,10, 11+, unknown	1
1978-1992	Annual number of live births by age of mother and birth order (Lexis squares)	≤15, 16,...,54, 55, unknown <sup>1</sup>	1, 2,...,10, 11+, unknown	1
1993-1998	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	1
1999-2017	Annual number of live births by age of mother, mother's year of birth and birth order (Lexis triangles)	12, 13,...,49, 50/52, unknown	1, 2,...,10, 11+, unknown	1, 5, 9, 11
2018-2019	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,...,10, 11+, unknown	13
1958-2019	Annual number of live births by month	total	total	1, 6, 8, 10, 11

<sup>1</sup> Last age category varies from 49 to 55 depending on presence of births.

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

Period	Type of data	Age range	Year of birth, range	Parity	RefCode(s)	Notes
17.01.1979 <sup>1</sup>	Number of women by age and parity	15, 16,...,54, 55-59, 60-64, 65-69, 70+, unknown	–	0, 1,...,9, 10+, unknown	2	"Golden census"
12.01.1989 <sup>1</sup>	Number of women by age and parity	15, 16,...,54, 55-59, 60-64, 65-69, 70+, unknown	–	0, 1,...,9, 10+, unknown	2	
06.04.2001	Number of women by age and parity	14, 15,...,116, 117, unknown	–	0, 1,...,9, 10+, unknown	3	
01.03.2011	Number of women by age and parity	15, 16,..., 80+, unknown				

<sup>1</sup> The question about the number of children ever born was posed only to a 25% sample of households in the census. The obtained distribution of women by age and parity was applied to the entire female population of Lithuania.

<sup>4</sup> References to data sources are listed in the document LTUref.pdf. They are organized according to RefCodes provided in the tables of Appendix 1.

**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>.