Neonatal mortality

The number of deaths of children under 28 days of age in a given year, expressed per 1000 live births.

Note: Some of the international variation in infant and neonatal mortality rates may be due to variations among countries in registering practices of premature infants. Most countries have no gestational age or weight limits for mortality registration. However, some countries specify limits based on some combination of gestational age, birth weight or survival.

Sources and Methods

The Eurostat database (dataset Infant mortality rates [demo_minfind] accessed in May 2018) is the main data source for European countries, except for Austria, Turkey and the United Kingdom. Time series are also completed with national data for selected years, see details below.

Australia


Austria

Sources:
2014 onwards: Statistics Austria, Gesundheitsstatistisches Jahrbuch (Todesursachenstatistik).

Minimum threshold of 22 weeks:
Source: Statistics Austria, Gesundheitsstatistisches Jahrbuch (Todesursachenstatistik).
Further information: http://www.statistik.at/web_en/.

Belgium


Minimum threshold of 22 weeks:
Source: Statistics Belgium (former National Statistical Institute).
Methodology: Since 2010, the official numbers for livebirths and deaths are coming from the Population National Register (and not exclusively from vital registration). Livebirths and deaths of residents taking place in foreign countries are therefore included in the statistics.
Canada


Minimum threshold of 22 weeks: Data not available.

Chile

Source: National Committee of Vital Statistics, composed of the National Institute of Statistics (INE), the Ministry of Health (MINSAL, Department of Health Statistics and Information DEIS) and the National Service of Civil Identification Registry (“Servicio de Registro Civil e Identificación”, SRCeI). Methodology: Data correspond to vital registries. Further information: http://www.deis.cl/?page_id=757.

Minimum threshold of 22 weeks:
Source: National Committee of Vital Statistics, composed of the National Institute of Statistics (INE), the Ministry of Health (MINSAL, Department of Health Statistics and Information DEIS) and the National Service of Civil Identification Registry (“Servicio de Registro Civil e Identificación”, SRCeI). Methodology: Data calculated using the gestational age criteria. Further information: Information on Vital Registries available at www.deis.cl.

Czech Republic

Source: Eurostat database. Data extracted on May 30, 2018. Coverage: Until March 2012, live birth was defined as a child expelled or removed out of the mother’s body, who gives sign of life (respiration, heartbeat, umbilicus pulsation, active movement of muscles) and whose birth weight is 500 grams and more or less than 500 grams, and survives for 24 hours after birth. Those surviving less than 24 hours were registered as spontaneous abortions. A fetus with no signs of life and with a birth weight of at least 1000 grams was considered a stillbirth. Since April 2012, live birth is defined as a child expelled or removed out of the mother’s body, who gives sign of life. Definition of live birth does not contain weight limit and gestational age. A fetus with no signs of life and with a birth weight of at least 500 grams is considered a stillbirth.

Break in time series in 1965: Until 1964, live birth was defined as a birth of a fetus that showed signs of life (breathing or a heartbeat), born after 28 weeks of gestation, longer than 35 cm and weighing at least 1000 grams. All fetuses not meeting the criteria of live birth but surviving at least 24 hours were considered live births. Those surviving less than 24 hours were registered as spontaneous abortions. A fetus, or at least 28 weeks gestation, that was not breathing, with a body length of at least 35 cm and with a birth weight of at least 1000 grams was considered a stillbirth. In 1965, the former Czechoslovakia started using the internationally recommended definition of live birth. Such change in definition resulted in a sudden jump in infant mortality rates between 1964 and 1965 in both the Czech Republic and Slovak Republic. Live birth child was defined as a birth of a fetus that showed signs of life (no minimum threshold). A fetus with no signs of life, born at least 28 week gestation and with a birth weight of at least 1000 grams was considered a stillbirth.


Minimum threshold of 22 weeks:
Source: Czech Statistical Office, official national data on births and deaths. Methodology: Data are counted according to a different methodology. Numbers of deaths by birthweight were used in the calculation from 2000 to 2011. Since 2012, the gestational age was used as minimum threshold in the calculation.

Denmark


**Minimum threshold of 22 weeks:**

**Source:** The Medical Birth Register, The Danish Health Authority.

**Methodology:**
- The number of deaths within 28 days of birth in a given birth year out of 1000 live births in that birth year.
- Only live births with a gestational age of at least 22 weeks are included. In cases where gestational age is unknown, a weight criteria of 500g has been used.
- Live births with unknown gestational age and weight have been excluded.

**Estonia**

**Source:** Eurostat database. Data extracted on May 30, 2018.


**Minimum threshold of 22 weeks:**

**Sources:**
- From 2008: National Institute for Health Development, Causes of Death Registry and Medical Birth Registry.

**Finland**

**Source:** Eurostat database. Data extracted on May 30, 2018.


**Minimum threshold of 22 weeks:**

**Source:** THL Medical Birth Register.

**Methodology:** Information on infant and neonatal mortality for the pilot data collection is taken from THL Medical Birth Register (and includes cases without information on gestational age), since the data collected by Statistics Finland do not include information on gestational age for others than deceased infants. The inclusion criteria differ slightly between these two data sources: Statistics Finland includes all births and deaths in Finland for citizens and permanent residents, while THL Medical Birth Register includes all births and deaths in Finland without any restrictions to citizenship or residency.

**France**

**Sources:**
- Until 1995: Institut national de la statistique et des études économiques (Insee).

**Methodology:**

**Breaks in time series:**

2009: In 2008, a new legislative change took place. The decree No. 2008-800 of August 20th 2008 has redefined the notion of a lifeless child. The certificate for a lifeless child is based on a medical birth certificate. The criteria (22 weeks of gestation or a 500-grams weight) are no longer taken into account.

2002: Data for the period 2002 to 2008 refer to neonatal mortality rates based on a minimum threshold of 22 weeks following the viability criteria defined by WHO ([http://www.insee.fr/fr/methodes/default.asp?page=sources/sous-admin-etat-civil.htm](http://www.insee.fr/fr/methodes/default.asp?page=sources/sous-admin-etat-civil.htm)). Until 2001, a minimum threshold of 180 days of gestation age or 28 weeks was necessary for considering a lifeless child.


**Minimum threshold of 22 weeks:**

**Source:** Institut national de la statistique et des études économiques (Insee). Données détaillées des statistiques d’état civil sur les décès en 2016, séries longues, tableau T77 : Décès d’enfants de moins d’un an selon le sexe et la

**Germany**


*Minimum threshold of 22 weeks:*

*Source: Federal Statistical Office,* Statistics on the natural movement of the population, internal table.

*Coverage:*
- Death statistics are produced from a compulsory complete count. They are based on reports from the registrar in whose district the death has taken place. The surveys are conducted decentrally by the statistical offices of the Länder. The offices exchange information so that the deaths can be shown by the Land in which the deceased person lived. Deaths of persons who lived abroad but died in Germany are not included in deaths statistics.
- Births statistics are produced from a compulsory complete count. They are based on reports from the registrar in whose district the birth has taken place. Births of mothers who live abroad but gave birth to their child in Germany are not included in births statistics. Live births include all children whose heart has beat, whose umbilical cord has pulsed or whose natural pulmonary respiration has begun after separation from the womb. The other children are considered as still births or miscarriages and are not included in this figure.

*Deviation from the definition:*
- In Germany data on gestational age are not available.
- From reporting year 2014 onwards, data on birth weight are no longer available.
- From reporting year 2013 onwards, data on deaths of children by birth weight are no longer available.
- Calculation of data on neonatal mortality: total number of deaths of children up to 28 completed days after live birth with a birth weight of respectively 500 grams and more and 1000 grams and more, divided by the total number of live births with a birth weight of respectively 500 grams and more and 1000 grams and more, expressed per 1000 live births.


**Greece**


*Minimum threshold of 22 weeks: Data not available.*

**Hungary**


*Minimum threshold of 22 weeks:*

*Source: Hungarian Central Statistical Office (KSH),* Demographic Yearbook.


**Iceland**


*Minimum threshold of 22 weeks:*

*Source: Statistics Iceland.*

*Coverage:* Two measurements of estimated gestational age are available: the traditional way and by ultrasound scan. Data are collected as follows: ultrasound (89%), and if ultrasound is not known, then estimation of gestational age by the traditional way (5%), and if no information is available about weeks of gestation, then by weight (5%).
Ireland


Minimum threshold of 22 weeks: Data not available.

Israel

Source: Central Bureau of Statistics. Based on birth and death registrations.
Note: The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Minimum threshold of 22 weeks:
Source: Central Bureau of Statistics. Based on death registration and birth registration (including birth weight and gestational age).
Coverage: Coverage rates of gestational age data are approximately 94% on average over the years 2000-2012.
Note: The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Italy


Minimum threshold of 22 weeks:
Data not available. The minimum threshold is not used in Italy for defining live birth in accordance to the WHO definition. Infant and neonatal mortality refer to deaths of all live births independently from the gestational age and/or birth weight. These two variables are collected through infant death forms and used for coding only, since the proportion of unknown cases is about 30%. Nevertheless, where this information is available, the number of cases under the threshold of 22 weeks of gestational age was 12 out of about 1132 in 2014. In substance, the indicators with and without threshold have nearly the same values.

Japan

Methodology: The live births are registered regardless of gestation period, so very premature babies are registered as live births.

Minimum threshold of 22 weeks:
Methodology: Data are submitted with the gestation period threshold, while the live births are registered regardless of the gestation period and very premature babies are registered as live births. The infant mortality rate and neonatal mortality rate by gestation period are only on deaths due to diseases, i.e. they do not include deaths due to external causes.

Korea

Sources:

**Methodology:**
- Information on neonatal deaths was gathered from various existing sources and integrated into one set, after adjusting any overlap among datasets from the various sources (medical insurance data, survey data from medical facilities and vital registration data).
- Total neonatal deaths divided by estimated total live births based on vital registration.


Minimum threshold of 22 weeks:

**Sources:**
- National Statistical Office, Unpublished data

**Methodology:**
- Information on infant/neonatal deaths was gathered from various existing sources and integrated into one set, after adjusting any overlap among datasets from the various sources (medical insurance benefit data, survey data from medical facilities and vital registration data).
- Total infant/neonatal deaths divided by estimated total live births based on vital registration.


**Latvia**

**Source:** Eurostat database. Data extracted on May 30, 2018.


Minimum threshold of 22 weeks:

**Source:** Centre for Disease Prevention and Control.

**Methodology:**
1) Register of Causes of Death (Number of deaths of live-born children under 28 days old and ≥500 grams birthweight).
2) Medical Birth Register (Number of live-born children ≥500 grams birthweight).

**Luxembourg**

**Source:** Eurostat database. Data extracted on May 30, 2018.


Minimum threshold of 22 weeks:

**Data not available.** Registration of gestational age and birth weight by the national deaths registration system by the Directorate of Health is mandatory in Luxembourg but limited to perinatal period (stillbirths and early neonatal deaths) and deaths occurring in Luxembourg. No data is available from age 10 days to 365 days and deaths from residents occurring abroad.
An estimate of 30% of all deaths of resident children <28 days of age occurs in specialised centers abroad. Thus national deaths registration system data usage would underestimate the rate.

**Mexico**


**Methodology:**
- From 2011, information from birth certificates and administrative death records is used, both are corrected for underreporting.
- Due to problems of completeness in infant deaths from vital statistics, the number of neonatal deaths was calculated by multiplying the proportion of deaths observed between 0-28 days (1990-2010) by the number of infant deaths estimated by the National Population Council.


**Minimum threshold of 22 weeks:** Data not available.

**Netherlands**

**Source:** Eurostat database. Data extracted on May 30, 2018.

**Methodology:** Data come from the Causes of death statistics, based on the obligatory registration in the population register. Stillbirths are obligatory registered with a minimum threshold of 24 weeks (and before 1991, 28 weeks); children who die within 7 days after birth are also included.


**Minimum threshold of 22 weeks:**

**Source:** The Netherlands Perinatal Registry (PRN). Data are derived from the linkage of PRN-data and Population Register (PR).

**Methodology:**
- In the Netherlands it is not obligatory to report to the authorities a stillborn child with a gestational period of 22-23 weeks.
- The perinatal registry includes 4 registers (midwives, obstetricians + gynaecologists, GPs and paediatricians/neonatologists) and uses the minimum threshold of 22 weeks.

**New Zealand**

**Source:** Ministry of Health (National Collections).

**Methodology:**
- Birth data from 1991 onwards are based on live births registered in New Zealand by the date of registration. Late birth data are based on live births registered in New Zealand by the date of registration. Late birth registrations are included in the denominator population.
- Death data are based on deaths registered in New Zealand by death registration year.
- The infant mortality figures include late registrations of deaths, after resolving mis-registered infant deaths and still births (i.e. registered as one when it is the other) based on additional information that they receive. These data processes cause delays in provision of final data (for both infant and neonatal mortality statistics).
- Data relate to the year ending in December.


**Minimum threshold of 22 weeks:**

**Source:** Ministry of Health (National Collections).

**Methodology:** Live births and deaths with no reported gestation are excluded from the gestation specific categories but included in the total mortality categories.

**Norway**

**Source:** Eurostat database. Data extracted on May 30, 2018.


**Minimum threshold of 22 weeks:**

Data not available.

**Poland**

**Sources:**

Until 1994: **Statistics Poland,** published annually (Demographic Yearbook of Poland).

**Methodology:**
- Statistics Poland sources of data are administrative registers and the individual documentation “Notification of death”, secondarily used by national statistics.

**Methodology:**
- The CSO sources of data are "Notification of death", secondarily used by national statistics.

In Poland, the criteria for registration of live births are a minimum weight of 500 grams (or a minimum threshold of 22 weeks of gestation).

**Further information:**

Minimum threshold of 22 weeks:
**Source:** **Statistics Poland,** published annually (Demographic Yearbook of Poland).

**Methodology:** Statistics Poland sources of data are administrative registers and the individual documentation “Notification of death”, secondarily used by national statistics.


**Portugal**


Minimum threshold of 22 weeks:
**Source:** **National Statistical Institute,** Health Statistics (several issues).

**Further information:** [http://www.ine.pt](http://www.ine.pt).

**Slovak Republic**


⚠️ **Break in time series in 1965:** Until 1964, live birth was defined as a birth of a fetus that showed signs of life (breathing or a heartbeat), born after 28 weeks of gestation, longer than 35 cm and weighing at least 1000 grams. All fetuses not meeting the criteria of live birth but surviving at least 24 hours were considered live births. Those surviving less than 24 hours were registered as spontaneous abortions. A fetus, of at least 28 weeks gestation, that was not breathing, with a body length of at least 35 cm and with a birth weight of at least 1000 grams was considered a stillbirth. In 1965, the former Czechoslovakia started using the internationally recommended definition of live birth. Such change in definition resulted in a sudden jump in infant mortality rates between 1964 and 1965 in both the Czech Republic and Slovak Republic.


Minimum threshold of 22 weeks:
**Source:** **Statistical Office of the Slovak Republic.**


**Slovenia**


Minimum threshold of 22 weeks:
**Source:** **National Institute of Public Health, Slovenia** (Perinatal information system of the Republic of Slovenia, Notification of death, Medical Certificate of Death and Cause of Death).
Methodology: The minimum threshold of 22 weeks (or 500 g weight) is calculated as: [The number of deaths of children up to 28 completed days after live birth based on a minimum threshold of 22 completed weeks of gestation in a given year] / [expressed per 1000 live births (22 completed weeks of gestation)].

Spain


Methodology:
 Until 1975, "the foetus could only be considered born if it had a human figure and lived for twenty four hours completely separate from the womb" (Art. 30 Civil Code). The statistics on births and deaths carried out until 1975 did not meet the demographic concepts recognised internationally, as these did not include those born alive who died within 24 hours of birth (which in the Civil Code are called "aborted babies" (Art. 745)).
 - Since 1975 the definition of live births follows the WHO definition.


Minimum threshold of 22 weeks:

Methodology:
 - In Spain, only the births that have at least 500 grams at birth are recorded (whether live or dead). Deaths are recorded if the child was born alive (in other case, they are recorded as stillbirth). Data are also available regarding the weeks of gestation or weight at birth only if the death occurs within the first 24 hours of life or it is a stillbirth.
 - Databases of births and deaths have been linked in order to extract the information required.

Sweden


Minimum threshold of 22 weeks:
Source: The Swedish Medical Birth Register.

Methodology:
 - The lowest gestational age in the register is 22 weeks.
 - Data include only observations where information on gestational age is not missing.

Switzerland


Minimum threshold of 22 weeks:
Sources:

Methodology:
 - Gestational age is available only since 2007.
 - Small discrepancies with 2010 data published by Euro-Peristat are possible, due to special inclusion criteria applied for Euro-Peristat data. In Euro-Peristat data:
   - birth and death cases with missing gestational ages were included for the 22 weeks threshold if they had a minimum birthweight of 500 grams;
   - infant deaths following a termination of pregnancy were counted as stillbirths and therefore excluded from live births, neonatal and infant deaths cases;
   - in a few cases, where the birth of a baby was included in the official statistics, but not his/her death or the contrary, the birth inclusion status was applied to both. Here, births and deaths are counted if they are included in the official statistics, irrespective of the inclusion of the other.

Turkey


Minimum threshold of 22 weeks:
Source: Ministry of Health, General Directorate of Public Health.

Methodology:
2007-2016: Rates calculated based on the number of deaths of children under 28 days of age based on a minimum threshold of 22 completed weeks of gestation (or 500 grams birthweight if gestational age is not available). Further information: [https://dosyasb.saglik.gov.tr/Eklenti/13160,sy2016enpdf.pdf?0](https://dosyasb.saglik.gov.tr/Eklenti/13160,sy2016enpdf.pdf?0).

United Kingdom

Sources:
From 2010:
- England and Wales: Vital Statistics Tables, ONS.
- Scotland: ISD Maternity, Annual Reports.
- Northern Ireland: Northern Ireland Statistics and Research Agency, Annual Reports.
From 2003-2009: UK Health Statistics, ONS.

Break in time series: 1 October 1992: In the UK, the definition of a stillbirth was amended to cover 24 weeks gestation or more (but voluntary notification at 22 and 23 weeks is possible). Before 1992, it was 28 weeks.

Further information:

Minimum threshold of 22 weeks:
Sources:
England and Wales: ONS (Health Analysis & Life Events).
Scotland: ISD Maternity, data available only from 2006 onwards.
No data available for Northern Ireland.

United States

Sources:

Minimum threshold of 22 weeks:
Methodology: Estimates exclude events with unknown (non-stated) gestational age.

NON-OECD ECONOMIES

Brazil

Source: The World Bank, World Development Indicators online (accessed on 16 June 2017).
http://databank.worldbank.org/data/
Estimates Developed by the UN Inter-agency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA Population Division) at www.childmortality.org. Projected data are from the United Nations Population Division's World Population Prospects; and may in some cases not be consistent with data before the current year.

China

Source: The World Bank, World Development Indicators online (accessed on 16 June 2017).
http://databank.worldbank.org/data/
Estimates Developed by the UN Inter-agency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA Population Division) at www.childmortality.org. Projected data are from the United Nations Population Division’s World Population Prospects; and may in some cases not be consistent with data before the current year.

Colombia

Source: The World Bank, World Development Indicators online (accessed on 16 June 2017).
http://databank.worldbank.org/data/
Estimates Developed by the UN Inter-agency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA Population Division) at www.childmortality.org. Projected data are from the United Nations Population Division's World Population Prospects; and may in some cases not be consistent with data before the current year.

Costa Rica

Source: The World Bank, World Development Indicators online (accessed on 16 June 2017).
http://databank.worldbank.org/data/
Estimates Developed by the UN Inter-agency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA Population Division) at www.childmortality.org. Projected data are from the United Nations Population Division's World Population Prospects; and may in some cases not be consistent with data before the current year.

India

Source: The World Bank, World Development Indicators online (accessed on 16 June 2017).
http://databank.worldbank.org/data/
Estimates Developed by the UN Inter-agency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA Population Division) at www.childmortality.org. Projected data are from the United Nations Population Division's World Population Prospects; and may in some cases not be consistent with data before the current year.

Indonesia

Source: The World Bank, World Development Indicators online (accessed on 16 June 2017).
http://databank.worldbank.org/data/
Estimates Developed by the UN Inter-agency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA Population Division) at www.childmortality.org. Projected data are from the United Nations Population Division's World Population Prospects; and may in some cases not be consistent with data before the current year.
Lithuania


Russian Federation

Note: This document, as well as any data and any map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

South Africa

Source: The World Bank, World Development Indicators online (accessed on 16 June 2017).
Estimates Developed by the UN Inter-agency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA Population Division) at www.childmortality.org. Projected data are from the United Nations Population Division's World Population Prospects; and may in some cases not be consistent with data before the current year.

http://www.oecd.org/health/health-data.htm