



Stillbirths and neonatal deaths in Australia

Web report | Last updated: 14 Dec 2020 | Topic: [Mothers & babies](#)

About

In 2018, in Australia, 2,789 babies died in the perinatal period. Three-quarters (2,115) were stillbirths and the remaining 674 were neonatal deaths. This web report provides information related to these deaths, including causes, maternal characteristics, timing and investigations.

Cat. no: PER 107

Findings from this report:

- [There were 9.2 perinatal deaths for every 1,000 births in 2018](#)
 - [Nearly 2 in 5 perinatal deaths \(38%\) occurred before 22 completed weeks' gestation](#)
 - [Every day in Australia, 6 babies are stillborn and 2 die within 28 days of birth \(neonatal death\)](#)
 - [More than 30% of deaths were caused by a congenital anomaly](#)
-

Overview of perinatal deaths

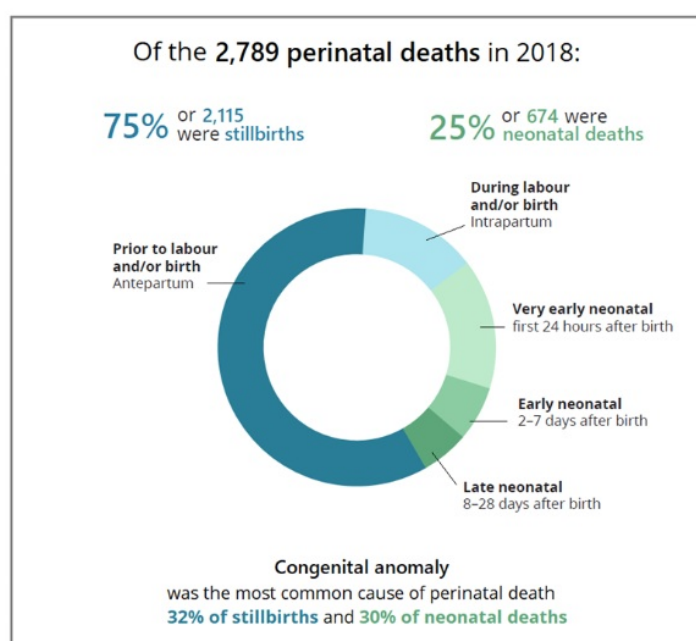
Australia is one of the safest places in the world for a baby to be born, yet death occurring within the perinatal period is not uncommon. Every day in Australia, 6 babies are stillborn and 2 die within 28 days of birth (neonatal death).

In 2018, there were:

- 303,029 babies born to 298,630 women
- 2,789 perinatal deaths (0.9% of babies born). Of these deaths, just over 75% were stillbirths (2,115) and just under 25% (674) were neonatal deaths
- 9.2 perinatal deaths per 1,000 births (7.0 stillbirths per 1,000 births and 2.2 neonatal deaths per 1,000 live births).

Although perinatal mortality rates have remained relatively unchanged since 1999, 2 categories decreased over the period:

- neonatal deaths of babies born at 23 weeks gestation or more
- deaths occurring in the third trimester of pregnancy.



International comparison using the WHO definition

The data visualisation below displays perinatal mortality rates in Australia using two different definitions - the Australian and the World Health Organization (WHO) definitions.

For the purposes of international comparison, stillbirths are defined as those occurring in the third trimester- born at 28 weeks' gestation or more, and/or weighing 1,000 grams or more (WHO 2015). This differs from the standard definitions used for stillbirths in Australia- born at 20 weeks' gestation or more, and/or weighing 400 grams or more.

Neonatal deaths are all registered deaths occurring within 28 days of birth. In Australia, registered deaths are those born at 20 weeks' gestation or more, and/or weighing 400 grams or more.

The WHO definition of stillbirth results in reporting of babies who are larger and more mature than the definition applied in Australia. This means Australian perinatal mortality rates reported using the WHO definition are lower than those reported using the Australian definition.

Using the WHO definitions (stillbirths from the third trimester and all neonatal deaths):

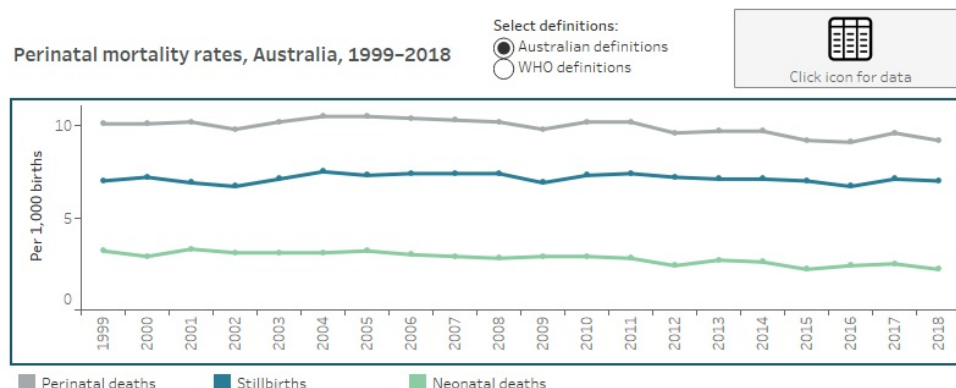
- The rate of stillbirths in Australia has decreased from 3.6 per 1,000 births in 1999 to 2.4 per 1,000 births in 2018.
- The rate of neonatal deaths in Australia is the same using both Australian and WHO definitions, and has decreased from 3.2 per 1,000 live births in 1999 to 2.2 per 1,000 live births in 2018.

Chart title: Perinatal mortality rates, Australia, 1999-2018:

The stacked continuous line graph shows that perinatal mortality rates in Australia, using the Australian definitions, have decreased from 10.1 perinatal deaths per 1,000 total births in 1999 to 9.2 perinatal deaths per 1,000 total births in 2018. The rate of stillbirths in Australia has held steady, with 7.0 per 1,000 births in both 1999 and 2018, while the rate of neonatal deaths in Australia has decreased from 3.2 per 1,000 live births in 1999 to 2.2 per 1,000 live births in 2018.

The graph also allows you to use the WHO definitions of perinatal death. When these definitions are used, the graph shows that perinatal mortality rates have decreased from 6.7 perinatal deaths per 1,000 total births in 1999 to 4.6 perinatal deaths per 1,000 total births in 2018. The rate of stillbirths has decreased from 3.6 to 2.4 per 1,000 births over the same period, while the rate of neonatal deaths has decreased from 3.2 to 2.2 per 1,000 live births in 2018.

The underlying data for this data visualization are also available in the Excel spreadsheet located on the Data page.



Notes:

1. Total births comprise live births and stillbirths collected by the National Perinatal Data Collection. The sum of stillbirths and live births may not add up to total births.
2. The rate is the number of deaths per 1,000 births. Stillbirth and perinatal mortality rates were calculated using total births (live births and stillbirths). Neonatal mortality rates were calculated using live births.
3. Data from the Northern Territory for 2000 to 2002 and from Victoria in 2009 are not available so have been excluded from both the numerator and denominator.
4. Data from New South Wales for 2017 and 2018 are preliminary data only, as submitted to the National Perinatal Data Collection.

Source: AIHW analysis of the NPMDC and NPDC.

www.aihw.gov.au

Perinatal death data reported by the Australian Bureau of Statistics (ABS) are not directly comparable with the National Perinatal Mortality Data Collection (NPMDC) and National Perinatal Data Collection (NPDC) data.

ABS data are sourced from state and territory registrars of Births, Deaths and Marriages. NPMDC and NPDC data are sourced from midwives and other staff, who collect information from mothers and perinatal administrative and clinical record systems. For more information on the NPMDC and NPDC and definitions used for reporting perinatal deaths please refer to the [Technical Notes-Definitions used in reporting](#).

References

- WHO 2015. [Global reference list of 100 core health indicators, 2015](#).

Overview of perinatal deaths

Key demographics

This section presents data on maternal and medical characteristics, as supplied to the National Perinatal Data Collection (NPDC), which have been commonly associated with stillbirth or neonatal death.

While these characteristics are more commonly found in women with pregnancies resulting in stillbirth and neonatal death, they are characteristics that are numerically associated with perinatal death and it is not implied that they are the cause of perinatal deaths.

In 2018, there were:

- 9.2 perinatal deaths per 1,000 births (2,789 deaths)
- 7.0 stillbirths per 1,000 births (2,115 deaths)
- 2.2 neonatal deaths per 1,000 live births (674 deaths).

Perinatal mortality rates were higher among babies born to:

- women who were aged under 20, 20-24 and 40 and over
- Aboriginal and Torres Strait Islander women
- women who lived in *Very remote* areas
- women living in the most disadvantaged areas of Australia (quintiles 1 and 2).

Chart title: Perinatal mortality rates, by maternal characteristics, 2018

The horizontal bar charts in this data visualisation display the rate of stillbirths and neonatal deaths by different maternal demographic characteristics. The first view shows the difference in rates by state or territory of birth. The rate of stillbirths ranged between 6.0 deaths per 1,000 births in Queensland to 11.9 deaths per 1,000 births in the Northern Territory. The neonatal death rates ranged from 1.7 per 1,000 live births in Western Australian to 5.1 per 1,000 live births in the Northern Territory.

The difference in rates by remoteness shows that rates of stillbirth and neonatal death increase with increasing remoteness. The rate of stillbirths increased from 8.5 deaths per 1,000 births in Major cities to 14.8 deaths per 1,000 births in Very remote areas. The rate of neonatal death increased from 2.9 per 1,000 live births in Major cities to 6.7 per 1,000 live births in Very remote areas.

The difference in rates by mother's country of birth shows that rates of stillbirth and neonatal death are similar for mothers born in Australia or born overseas. The rate of stillbirths was 6.7 deaths per 1,000 births for mothers born in Australia and 7.3 deaths per 1,000 births for mothers born overseas. The rate of neonatal death was 2.1 deaths per 1,000 live births for mothers born in Australia and 2.4 deaths per 1,000 live births for mothers born overseas.

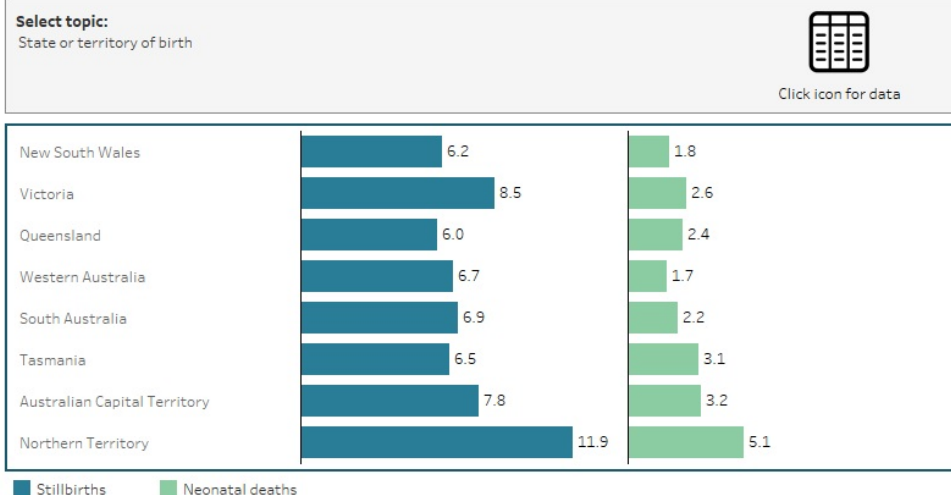
The difference in rates by mother's Indigenous shows that rates of stillbirth and neonatal death are higher for Aboriginal and Torres Strait Islander mothers. The rate of stillbirths was 11.5 deaths per 1,000 births for Indigenous mothers and 6.7 deaths per 1,000 births for non-Indigenous mothers. The rate of neonatal death was 4.8 deaths per 1,000 live births for Indigenous mothers and 2.1 deaths per 1,000 live births for non-Indigenous mothers.

The difference in rates by socioeconomic status shows that rates of stillbirth and neonatal death increase with increasing disadvantage. The rate of stillbirths increased from 7.5 deaths per 1,000 births in the least disadvantaged areas of Australia to 11.3 deaths per 1,000 births in the most disadvantaged areas. The rate of neonatal death increased from 1.8 per 1,000 live births in the least disadvantaged areas of Australia to 4.3 per 1,000 live births in the most disadvantaged areas.

The difference in rates by maternal age group shows that rates of stillbirth and neonatal death are highest for the youngest and oldest mothers. The rate of stillbirths was highest for mothers under 20, 16.2 per 1,000 births, followed by mothers aged 40 or over, 9.2 stillbirths per 1,000 births. The rate of neonatal death was highest for mothers under 20, 3.7 per 1,000 live births, followed by mothers aged 20-24 and mothers aged 40 or over, 2.7 per 1,000 live births.

The underlying data for this data visualization are also available in the Excel spreadsheet located on the Data page.

Perinatal mortality rates, by state or territory of birth, 2018



Notes:

1. The rate is the number of deaths per 1,000 births. Stillbirth and perinatal mortality rates were calculated using total births (live births and stillbirths). Neonatal mortality rates were calculated using live births.
2. Data from New South Wales for 2018 are preliminary data only, as submitted to the National Perinatal Data Collection.
3. The perinatal mortality rate for Victoria includes terminations due to maternal psychosocial indications. The stillbirth rate for Victoria differs from that reported in the Victorian Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM) annual report due to differences in scope for inclusion. See the notes section for more information.
4. In 2018, 14.5% of women who gave birth in the ACT were non-ACT residents (proportion calculated after excluding records where state/territory of usual residence was 'Not stated'). These women are often transferred to the ACT requiring access to maternity services for high-risk pregnancies.

Source: AIHW analysis of the NPMDC and NPDC.

www.aihw.gov.au

For 2017 and 2018, NSW perinatal mortality data were not available at the time of production for this report. Where possible in this report, preliminary perinatal deaths data for NSW for 2017 and 2018 supplied to the National Perinatal Data Collection have been used.

Country of birth

There was little overall difference in perinatal mortality rates for babies of women born in Australia compared to babies of women born overseas. The highest rates of perinatal death were among babies of mothers whose country of birth was in:

- Melanesia (including Papua New Guinea)
- Central and West Africa
- Southern Europe.

Detailed country of birth data can be found in the [supplementary data tables](#).

Overview of perinatal deaths

Birthweight and gestational age are interrelated and birthweight is generally expressed in relation to gestational age using population percentiles (refer to the [Technical notes—Methods](#) for more information on percentiles).

Gestational age and birthweight

A baby may be small due to being pre-term (born early), or due to being small for gestational age (either due to genetic factors, or because it is the subject of a growth restriction within the uterus). Poor fetal growth is associated with increased risk of perinatal death and with fetal distress during labour, and these babies are more likely to develop long-term health conditions later in life.

Adjusting birthweight for gestational age allows for differences in a baby's growth status and maturity to be taken into account when examining their health outcomes at birth.

Babies are defined as being small for gestational age if their birthweight is below the 10th percentile for their gestational age and sex, as determined by national percentiles. Babies are defined as large for gestational age if their birthweight is above the 90th percentile for their gestational age and sex.

In 2018:

- Nearly 2 in 5 perinatal deaths (38.4%) occurred before 22 completed weeks gestation
- Rates of perinatal death decreased rapidly from 28 weeks gestation and were lowest among babies born at term (37-41 weeks).

The highest rates of perinatal death were among:

- Babies born at less than 22 weeks' gestation
- Babies born in the second trimester (less than 28 weeks' gestation)
- Babies born with a birthweight less than 2,500 grams
- Babies who were small for gestational age (birthweight below the 10th percentile for their age and sex)
- Multiple births.

Perinatal mortality rates, by baby characteristics, 2018

The bar charts in this data visualisation show the rates of both stillbirth and neonatal death by different baby characteristics. The first view shows the difference in rates by the baby's birthweight for gestational age percentile. Rates of perinatal death were highest in babies born small for gestational age, or those with a birthweight below the 10th percentile for their gestational age and sex. The highest rates were in babies whose birthweight for gestational age was below the 3rd percentile for their gestational age and sex. The stillbirth rate for this category was 45.2 deaths per 1,000 total births, and the neonatal death rate was 8.7 deaths per 1,000 live births.

The difference in rates by birthweight groups shows that rates of stillbirth and neonatal death are highest for low birthweight babies, weighing less than 2500g. The rate of stillbirths for low birthweight babies was 82.5 per 1,000 births, compared to 0.9 for normal weight babies weighing between 2,500 and 4,499 grams. The rate of neonatal death for low birthweight babies was 25.8 per 1,000 live births, compared to 0.4 for normal weight babies weighing between 2,500 and 4,499 grams.

The difference in rates by gestational age group shows that rates of stillbirth and neonatal death decrease as a babies gestational age increases. The rate of stillbirths decreased from 790.0 deaths per 1,000 births at 20-22 weeks' gestation to 1.1 deaths per 1,000 births at 36 weeks' or more gestation. The rate of neonatal death decreased from 991.0 per 1,000 live births at 20-22 weeks' gestation to 0.5 per 1,000 live births at 36 weeks' or more gestation.

The difference in rates by trimester of pregnancy shows that rates of stillbirth and neonatal death are higher in the second trimester, or before 28 weeks' gestation. The rate of stillbirths was 535.6 deaths per 1,000 births in the second trimester and 2.2 per 1,000 births in the third trimester. The rate of neonatal deaths was 348.3 deaths per 1,000 live births in the second trimester and 0.8 per 1,000 live births in the third trimester.

The difference in rates by plurality shows that rates of stillbirth and neonatal death increase as the number of babies in a pregnancy increases. The rate of stillbirths decreased from 57.3 deaths per 1,000 births for pregnancies with three or more babies to 6.6 deaths per 1,000 births for pregnancies with a single baby. The rate of neonatal deaths decreased from 49.7 deaths per 1,000 live births for pregnancies with three or more babies to 2.0 deaths per 1,000 live births for pregnancies with a single baby.

The underlying data for this data visualization are also available in the Excel spreadsheet located on the [Data](#) page.

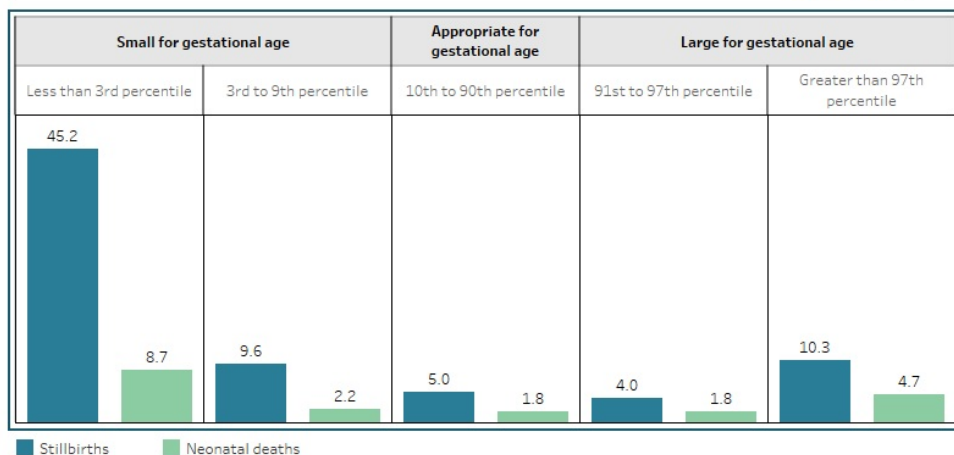
Perinatal mortality rates, by birthweight for gestational age, 2018

Select topic:

Birthweight for gestational age



Click icon for data



Notes:

1. The rate is the number of deaths per 1,000 births. Stillbirth and perinatal mortality rates were calculated using total births (live births and stillbirths). Neonatal mortality rates were calculated using live births.
2. Data from New South Wales for 2018 are preliminary data only, as submitted to the National Perinatal Data Collection.

Source: AIHW analysis of the NPMDC and NPDC.

www.aihw.gov.au

Gestational age trend

While perinatal mortality rates have been holding relatively steady for babies born before 28 weeks' gestation, they have been gradually decreasing among babies born after 28 weeks' gestation.

Stillbirths occurring after 28 weeks of gestation, or in the third trimester of pregnancy, are known as late gestation stillbirths. Evidence indicates that these stillbirths are the most likely to be preventable (Flenady et al. 2016). The rate of late gestation stillbirths in Australia has decreased from 3.5 per 1,000 births in 1999 to 2.2 per 1,000 births in 2018.

Neonatal deaths in both the second and third trimesters of pregnancy have decreased over this period, with deaths in the third trimester decreasing from 1.3 per 1,000 births to 0.8 per 1,000 births in 2018.

Chart title: Perinatal mortality rates, by trimester of pregnancy and gestational age groups, 1999-2018

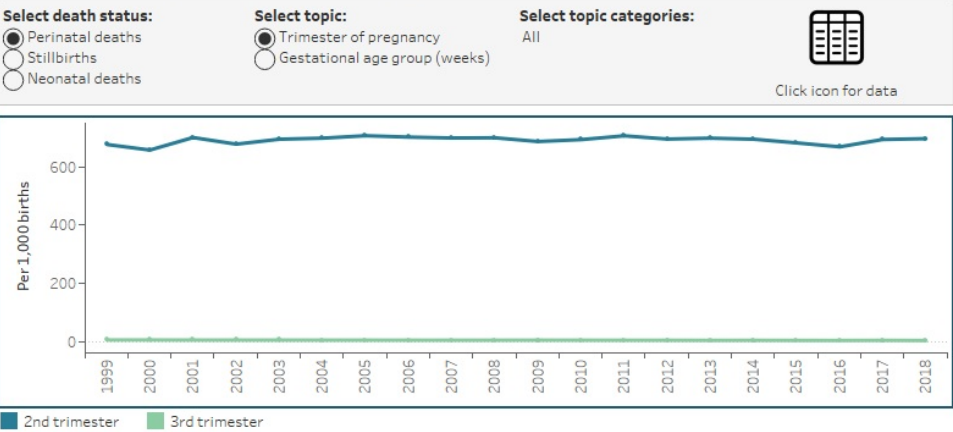
The stacked continuous line graphs in this data visualisation show the changes in perinatal deaths rates by two different measures of gestational age, trimester of pregnancy and clinical gestational age groups.

The continuous line graph for trimester of pregnancy shows that the perinatal mortality rate has held steady for babies born in the second trimester of pregnancy, or from 20-27 weeks in this data collection, from 676.6 deaths per 1,000 births in 1999 to 696.6 deaths per 1,000 births in 2018. The second trimester category also includes babies born at less than 20 weeks weighing 400g or more. Mortality rates for babies born in the third trimester, or from 28 weeks' gestation, has decreased from 4.8 deaths per 1,000 births in 1999 to 3.0 deaths per 1,000 births in 2018.

The continuous line graph for gestational age group shows that the perinatal mortality rate have held relatively steady for babies born at 20-22 weeks gestation, from 990.5 deaths per 1,000 births in 1999 to 995.4 deaths per 1,000 births in 2018, for babies born at 23-26 weeks, from 572.7 to 581.2 deaths per 1,000 births over the same period, and for babies born at 27-31 weeks, from 132.0 to 123.2 deaths per 1,000 births. Mortality rates have decreased for babies born at 32-35 weeks, from 33.6 to 22.3 deaths per 1,000 births, and for babies born at 36 or more weeks, from 2.9 to 1.5 deaths per 1,000 births.

The underlying data for this data visualization are also available in the Excel spreadsheet located on the Data page.

Perinatal mortality rates, by trimester of pregnancy, 1999–2018



Notes:

1. The rate is the number of deaths per 1,000 births. Stillbirth and perinatal mortality rates were calculated using total births (live births and stillbirths). Neonatal mortality rates were calculated using live births.
2. Total births comprise live births and stillbirths collected by the National Perinatal Data Collection. The sum of stillbirths and live births may not add up to total births.
3. Data from the Northern Territory for 2000 to 2002 and from Victoria in 2009 are not available so have been excluded from both the numerator and denominator.
4. Data from New South Wales for 2017 and 2018 are preliminary data only, as submitted to the National Perinatal Data Collection.
5. While the 2nd trimester is defined clinically as 14-27 weeks of gestation, the scope of the National Perinatal Mortality Data Collection is limited to perinatal deaths occurring from 20 weeks of gestation. 2nd trimester also includes births prior to 20 weeks that are 400 grams or more birthweight.

Source: AIHW analysis of the NPMDC and NPDC.
www.aihw.gov.au

References

- V Flenady et al., for The Lancet Ending Preventable Stillbirths study group and The Lancet Stillbirths In High-Income Countries Investigator Group 2016. Ending preventable stillbirths 4. Stillbirths: Recall to action in high-income countries.

Overview of perinatal deaths

Timing of perinatal deaths

In 2018, where the timing of perinatal deaths was stated:

- Nearly three in five (59.5%) perinatal deaths and the majority (81.4%) of stillbirths occurred before the onset of labour (antepartum death)
- Nearly three in five (56.4%) neonatal deaths occurred within the first 24 hours following birth and were more common with decreasing gestational age
- Early neonatal deaths (1-7 days) and late neonatal deaths (8-28 days) were more common among babies born from 36 weeks gestation.

Definitions of timing of perinatal death can be found in the [Technical notes—Definitions used in reporting](#).

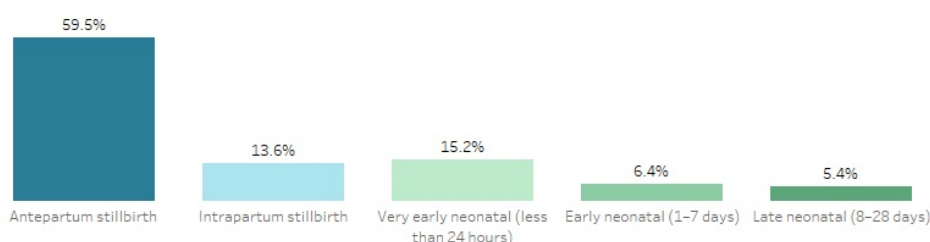
Intrapartum stillbirths (those occurring during labour and birth) and neonatal deaths within the first 24 hours after birth are often considered together as, in many cases, the process leading to the death is a continuum that may lead to death before or after the birth occurs.

Chart title: Timing of perinatal deaths, 2018

The vertical bar chart at the top of this data visualisation shows the timing of perinatal deaths. The majority, 59.5%, were antepartum stillbirths. This was followed by deaths in the very early neonatal period (less than 24 hours), and intrapartum stillbirths, 15.2% and 13.6% respectively. Early and late neonatal deaths accounted for 6.4% and 5.4% of deaths respectively.

The stacked horizontal bar chart at the bottom of this data visualisation shows the timing of perinatal deaths by gestational age group. Antepartum stillbirth was the most common time of death for all gestational age groups, with more than half of antepartum stillbirths being babies born at less than 27 weeks' gestation. Most intrapartum stillbirths and very early neonatal deaths were for babies born at 20-22 weeks' gestation, while most early and late neonatal deaths were babies born at 36 weeks' gestation or more.

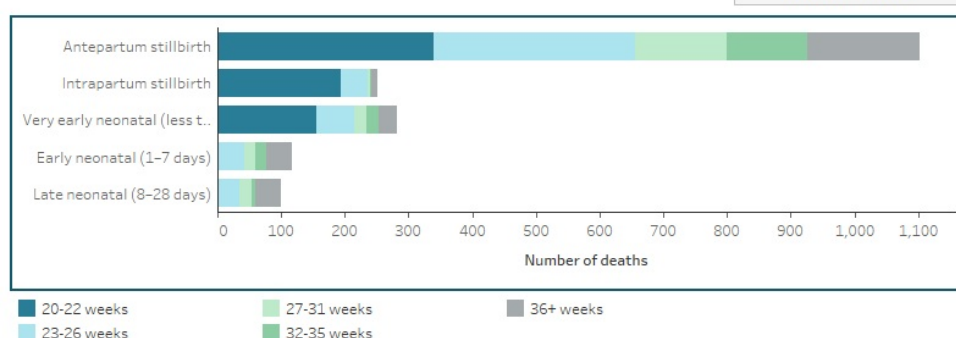
Timing of perinatal deaths, 2018



Timing of perinatal deaths, by gestational age group, 2018



Click icon for data



Notes:

- Data from New South Wales for 2018 are preliminary data only, as submitted to the National Perinatal Data Collection.
- Excludes records where timing of stillbirth or neonatal death is not stated.
- 20-22 weeks includes births prior to 20 weeks that are 400 grams or more birthweight.

Source: AIHW analysis of the NPMDC and NPDC.

www.aihw.gov.au

Causes of perinatal deaths

Causes of perinatal deaths are classified according to the Perinatal Society of Australia and New Zealand (PSANZ) Perinatal Mortality Classification System, version 2.2, as part of each state or territory's perinatal mortality review process.

The PSANZ Perinatal Mortality Classification System incorporates a Perinatal Death Classification (PSANZ-PDC) and an additional Neonatal Death Classification (PSANZ-NDC).

The PSANZ-PDC system classifies all perinatal deaths (stillbirths and neonatal deaths) by the single most important factor which led to the chain of events which resulted in the death (refer to [Technical notes—Definitions used in reporting](#) for cause of death classifications).

In 2018:

The most commonly classified causes for all **perinatal deaths** were:

- Congenital anomaly (31.4%)
- Spontaneous preterm birth (14.6%)
- Unexplained antepartum death (12.5%).

The most commonly classified causes of **stillbirths** were:

- Congenital anomaly (31.7%)
- Unexplained antepartum death (16.6%)
- Maternal conditions (13.3%).

The most commonly classified causes of **neonatal deaths** were:

- Spontaneous preterm birth (32.7%)
- Congenital anomaly (30.3%)
- Specific perinatal conditions (6.2%).

Chart title: PSANZ PDC causes of perinatal deaths, by various characteristics, 2018

The horizontal bar charts in this data visualisation show the different PSANZ Perinatal Death Classification causes of death by a range of different maternal and baby characteristics. In the total view, it shows that congenital anomaly was the most commonly classified cause of perinatal death, followed by spontaneous preterm birth and unexplained antepartum death.

The difference in causes by gestational age group shows that congenital anomaly remained the most commonly classified cause of death for all gestational age groups, from 23.5% of deaths for babies born at 36 weeks or more to 35.4% of deaths for babies born at 20-22 weeks. This was followed by spontaneous preterm birth for babies born at 20-22 and 23-26 weeks (22.3% and 19.6% respectively), and by unexplained antepartum death for babies born at 27-31 weeks, 32-35 weeks and 36 weeks or more (16.7%, 21.3% and 22.8% respectively).

The difference in causes by timing of death shows that congenital anomaly remained the most commonly classified cause of death for antepartum stillbirths (26.6%), intrapartum stillbirths (44.0%), as well as early neonatal deaths (28% of deaths). This was followed by spontaneous preterm birth for intrapartum stillbirth and early neonatal death (23.8% and 24.6% respectively), and by unexplained antepartum death for antepartum stillbirths (22.8%). The most common cause of death for very early and late neonatal deaths was spontaneous preterm birth (39.0% and 25.0%, respectively), followed by congenital anomaly (35.5% and 19.0%, respectively).

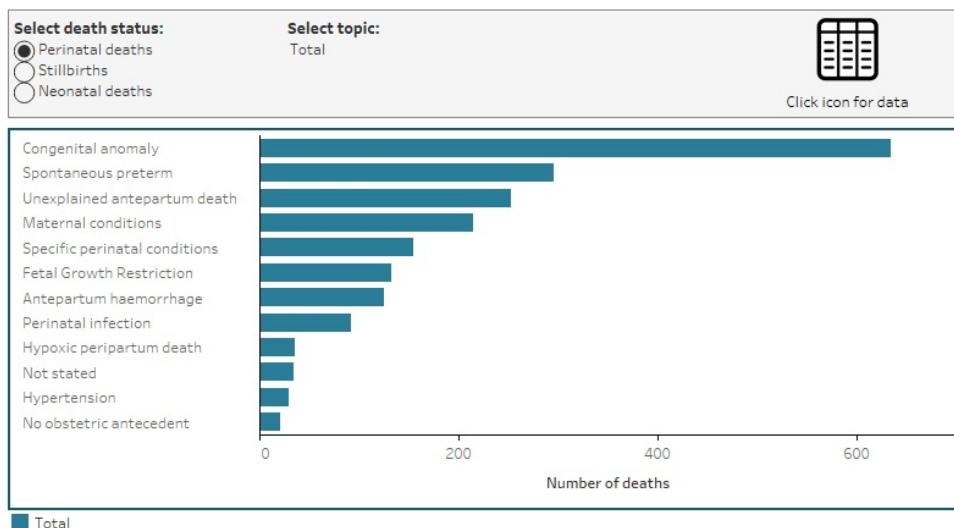
The difference in causes by maternal age group shows that congenital anomaly was the most commonly classified cause of death for all age groups except mothers aged under 20, from 22.8% of deaths for mothers aged 20-24 to 36.2% of deaths for mothers aged 35-39. This was followed by maternal conditions for mothers aged 20-24 (19.0%), by spontaneous preterm birth for mothers aged 25-39, 30-34 and 35-39 (16.9%, 13.6% and 13.9% respectively), and by unexplained antepartum death for mothers aged 40 or over (12.0%). For mother aged under 20, the most common cause of death was maternal conditions (35.2%), followed by congenital anomaly (16.5%).

The difference in causes by plurality shows that congenital anomaly was the most commonly classified cause of death for all single pregnancies, 32.8%, followed by spontaneous preterm birth and unexplained antepartum death (13.4% and 12.7% respectively). The most commonly classified cause of death for multiple pregnancies, or multiple pregnancies, was spontaneous preterm birth, accounting for 27.2% of deaths, followed by specific perinatal conditions and congenital anomaly (26.6% and 16.3% respectively).

The difference in causes by birthweight percentile shows that congenital anomaly remained the most commonly classified cause of death for all groups. It accounted for 33.1% of deaths for babies born small for gestational age, 30.3% of deaths for babies born appropriate for gestational age, and 45.2% of babies born large for gestational age. This was followed by Fetal Growth Restriction for babies born small for gestational age (22.4%), by spontaneous preterm birth for babies born appropriate for gestational age (19.0%), and by specific perinatal conditions for babies born large for gestational age (13.9%).

The underlying data for this data visualization are also available in the Excel spreadsheet located on the Data page.

PSANZ-PDC cause of perinatal deaths, by total for death status, 2018



Notes:

1. The category of unexplained antepartum death includes deaths of normally-formed fetuses prior to the onset of labour where no identified predisposing factors are considered likely to have caused the death and deaths where insufficient information was available to allow more specific classification of the cause of death.
2. Data from New South Wales for 2018 were not available at the time of production of this report so have been excluded from both the numerator and denominator.

Source: AIHW analysis of the NPMDC and NPDC.

www.aihw.gov.au

In 2018, **congenital anomaly** was the most commonly classified cause of perinatal death, and this remained true across almost all deaths, regardless of maternal or gestational age, plurality, baby's birthweight percentile or the timing of death. The only exceptions to this were for:

- **Late gestation stillbirths.** Unexplained antepartum death was the most commonly classified cause of death for stillbirths occurring at 32-35 and 36+ weeks' gestation (27.9% and 35.9%, respectively).
- **Early gestation neonatal deaths.** Spontaneous preterm birth was the most commonly classified cause for neonatal deaths occurring at 20-22 and 23-26 weeks' gestation (47.8% and 55.9%, respectively).
- **Babies born to mothers aged under 20.** Maternal conditions were the most commonly classified cause of perinatal death for babies born to mothers aged under 20 (35.2%). Maternal conditions refers to deaths where a medical condition (e.g. diabetes) or a surgical condition (e.g. appendicitis) or an injury in the mother (including complications or treatment of that condition) is the cause.
- **Multiple births.** Spontaneous preterm birth was the most commonly classified cause for multiples (27.2%), followed by specific perinatal conditions, such as cord entanglement (26.6%).
- **Very early (less than 24 hours) and late neonatal deaths (8-28 days).** The most commonly classified cause of very early and late neonatal deaths was spontaneous preterm birth (39.0% and 25.0% respectively).
- **Neonatal deaths in babies considered appropriate for gestational age (AGA).** Spontaneous preterm birth was the main classified cause of neonatal deaths for babies considered appropriate birthweight for their gestational age (39.3%)

Causes of neonatal deaths

The PSANZ-NDC is an additional classification system applied only to neonatal deaths to identify the single most significant condition present in the neonatal period that caused the baby's death.

In 2018, the most commonly classified conditions causing neonatal deaths were:

- Congenital anomaly (30.3%)
- Extreme prematurity (28.5%)
- Neurological conditions (13.2%).

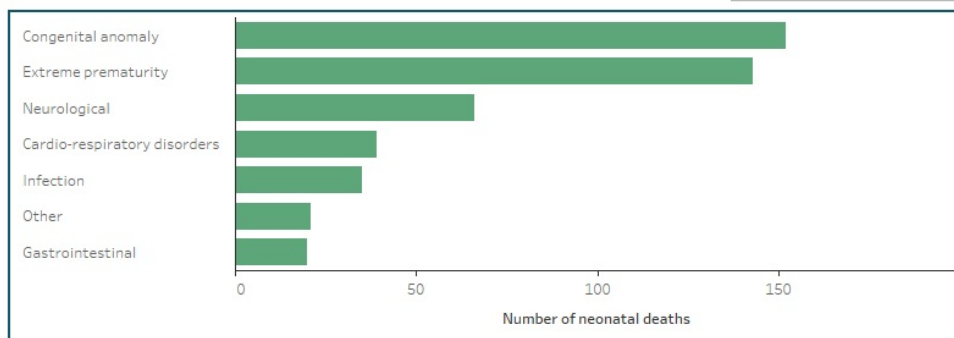
Chart title: PSANZ NDC cause of neonatal deaths, 2018

The horizontal bar chart in this data visualisation shows that congenital anomaly was the most commonly classified condition causing neonatal death, followed by extreme prematurity and neurological conditions. Together, they accounted for 72% of all neonatal causes of death. The remaining deaths were caused by cardio-respiratory disorders (7.8%), infection (7.0%), other conditions (4.2%) and gastrointestinal conditions (4.0%).

PSANZ-NDC cause of neonatal deaths, 2018



Click icon for data



1. Data from New South Wales for 2018 were not available at the time of production of this report so have been excluded from both the numerator and denominator.

Source: AIHW analysis of the NPMDC and NPDC.

www.aihw.gov.au

Investigation following perinatal death

Autopsy

The National Perinatal Mortality Data Collection collects data on whether or not an autopsy was performed and, where applicable, the type of autopsy performed (a full autopsy, limited autopsy or external examination).

For the purposes of this report, deaths where any of these autopsy types have been performed will collectively be treated as deaths where an 'autopsy' has been performed.

The purpose of an autopsy is to accurately identify the cause(s) of death. Autopsy results contribute to clinical audit and assist with identification of factors contributing to the death. Perinatal autopsy examinations require written consent from the parent(s) following informed discussion.

In 2018, there were 2,789 perinatal deaths, 1,956 of which (1,475 stillbirths and 481 neonatal deaths) had a stated autopsy status. Of deaths where autopsy status was stated, there were:

- 886 (45.3%) perinatal deaths that had an autopsy performed
- 694 (47.1%) stillbirths and 192 (39.9%) neonatal deaths that had an autopsy performed.

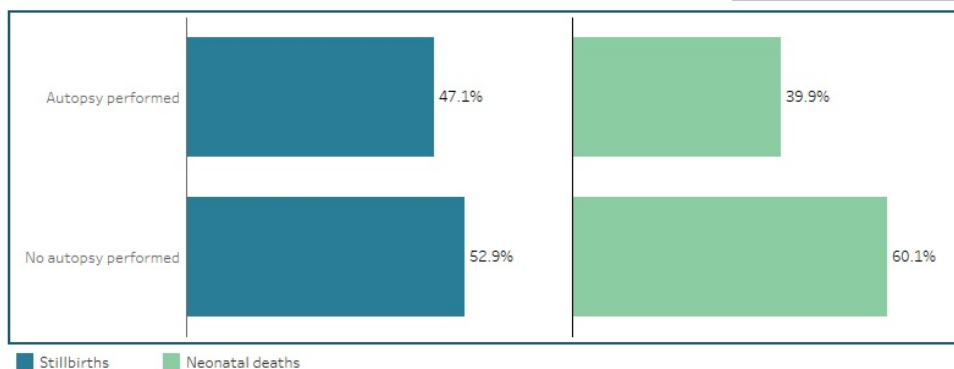
Chart title: Autopsy of perinatal deaths, 2018

The horizontal bar charts show that more than half of all perinatal deaths reported not having an autopsy performed. A higher proportion of stillbirths reported having an autopsy performed than neonatal deaths, 47.1% vs 39.9% respectively.

Autopsy of perinatal deaths, 2018



Click icon for data



1. Autopsy performed includes full and limited autopsies, external examinations and records where an autopsy was performed but type is unknown.

2. Data from New South Wales for 2018 were not available at the time of production of this report so have been excluded from both the numerator and denominator.

3. Proportions exclude 'Not stated' values from the denominator.

Source: AIHW analysis of the NPMDC and NPDC.

www.aihw.gov.au



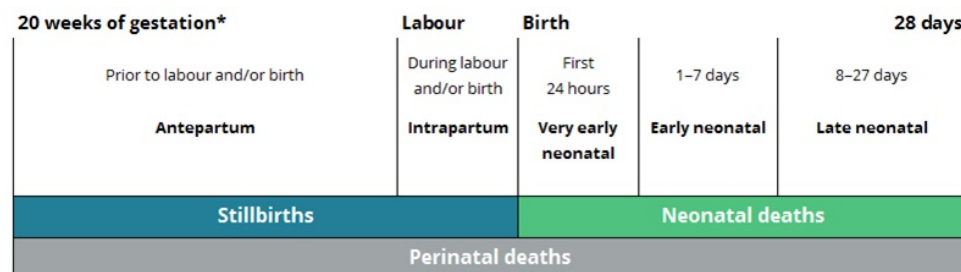
Technical notes



Technical notes

Various definitions are used for reporting and registering perinatal deaths in Australia. The National Perinatal Mortality Data Collection (NPMDC) collects data and reports using the following definitions:

Figure 1: Definitions of perinatal death



*At least 20 week of gestation and/or 400 grams birthweight.

Chart: aihw.gov.au

Stillbirth: a fetal death prior to birth of a baby of 20 or more completed weeks of gestation or of 400 grams or more birthweight.

Neonatal death: the death of a live born baby of 20 or more completed weeks of gestation or of 400 grams or more birthweight within 28 days of birth.

Perinatal death: stillbirth or neonatal death of a baby of 20 or more completed weeks of gestation or of 400 grams or more birthweight.

Antepartum stillbirth: fetal death occurring prior to labour and/or birth.

Intrapartum stillbirth: fetal death occurring during labour and/or birth.

Very early neonatal death: death of a live born baby within the first 24 hours after birth.

Early neonatal death: death of a live born within 1-7 days after birth.

Late neonatal death: death of a live born within 8-28 days after birth.

Live birth: the birth of a baby who shows signs of life such as voluntary muscle movement, pulsating of the umbilical cord or presence of a heartbeat at birth, regardless of whether the placenta is still attached or the umbilical cord has been cut.

Terminations of pregnancy performed at 20 or more weeks of gestation may be included and recorded either as stillbirths or, in the unlikely event of showing evidence of life, as live births. There are variations in legislation regarding termination of pregnancy between states and territories, and recording of terminations is likely to be incomplete.

World Health Organization (WHO) definitions

To allow for international comparisons, the WHO recommendation regarding perinatal mortality indicators, taken from the [Global reference list of 100 core health indicators, 2015](#) has been used. The indicators define stillbirths as all fetal deaths of a baby born at 28 weeks' gestation or more, and/or weighing 1,000 grams or more. The indicators define neonatal deaths as all registered deaths in the first 28 days of life. In Australia, registered deaths are those born at 20 weeks' gestation or more, and/or weighing 400 grams or more.

Cause of death classification

The Perinatal Society of Australia and New Zealand (PSANZ) Perinatal Mortality Classification System is used in Australia and New Zealand to classify the causes of stillbirths and neonatal deaths. It includes the PSANZ Perinatal Death Classification (PSANZ-PDC) and PSANZ Neonatal Death Classification (PSANZ-NDC). The PSANZ-PDC system classifies all perinatal deaths by the single most important factor seen as the antecedent cause of death. In addition, for neonatal deaths, the PSANZ-NDC system is used to identify conditions occurring in the neonatal period which resulted in the death.

The PSANZ Perinatal Death Classification is an integral part of the PSANZ Perinatal Mortality Guidelines, developed for optimal standards in investigating, classifying and auditing of perinatal deaths.

The National Perinatal Mortality Data Collection (NPMDC) collects data on causes of death that have been classified according to the [PSANZ Perinatal Mortality Classification System, version 2.2](#). The classification is recorded as part of each state and territory's perinatal mortality review process following completion of investigations and at the end of a multi-disciplinary review of the perinatal death.

The other classification system used in Australia to classify perinatal deaths is the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10). This classification system is based on the registered cause/s of death on the Medical Certificate of Cause of Perinatal Death, assigned by the treating medical practitioner shortly after death without access to any subsequent

investigations.

The National Maternal and Perinatal Mortality Clinical Expert Group (NMPMCEG) (formerly the National Maternal and Perinatal Mortality Advisory Group (NMPMAG)) has concluded that the PSANZ-PDC and PSANZ-NDC classifications are the most appropriate for national reviews. The ICD classification of cause of death has not been included in this report.

PSANZ-PDC primary classification groups:

These are the 11 high-level groups used in reporting:

Congenital anomaly: deaths in which a congenital anomaly in the baby (whether structural, functional or chromosomal) is considered to have been of major importance in the cause of the death.

Perinatal infection: primary infections occurring in term and preterm neonatal and fetal deaths and secondary infections in term infants (such as Group B Streptococcus and Cytomegalovirus).

Hypertension: deaths where a hypertensive disorder in the baby's mother, such as pre-eclampsia or pre-existing high blood pressure, is considered to have led to the death.

Antepartum haemorrhage: all perinatal deaths where the primary factor leading to the death was bleeding from the placental bed in the woman's uterus.

Maternal conditions: deaths where a medical condition (e.g. diabetes) or a surgical condition (e.g. appendicitis) or an injury in the mother (including complications or treatment of that condition) is the cause.

Specific perinatal conditions: deaths of normally formed, appropriately grown babies, in which a specific perinatal condition, such as cord entanglement or a blood group incompatibility, was the main underlying cause.

Hypoxic peripartum deaths: deaths from acute or chronic inadequate oxygen supply from the placenta of normally formed babies, typically of >24 weeks gestation or >600 grams birthweight.

Fetal Growth Restriction: deaths of babies that were significantly low birthweight for their gestational age or where repeated antenatal ultrasound measurements had shown poor or absent growth before death.

Spontaneous preterm: deaths of normally formed, appropriately grown preterm babies following spontaneous onset of preterm labour or spontaneous rupture of membranes, irrespective of whether labour was subsequently induced and mode of delivery.

Unexplained antepartum death: deaths of normally formed fetuses prior to the onset of labour where no predisposing factors are considered likely to have caused the death.

No obstetric antecedent: includes Sudden Infant Death Syndrome (SIDS), postnatally acquired infection (such as Newborn Intensive Care Unit-acquired septicaemia from an intravenous line), accidental asphyxiation and other accidents, poisoning or violence.

PSANZ-NDC primary classification groups:

The PSANZ-NDC classification system is applied only to neonatal deaths and classifies them by the most significant condition present in the baby, in the neonatal period, leading to the death.

Congenital anomaly: deaths in which a congenital anomaly in the baby (whether structural, functional or chromosomal) is considered to have been of major importance in the cause of the death.

Extreme prematurity: neonatal death in infants deemed too immature for resuscitation or continued life support beyond the delivery room (typically infants of gestational age ≤ 24 weeks or birthweight ≤ 600 grams).

Cardio-respiratory disorders: neonatal deaths in which a cardio-respiratory condition (such as respiratory distress syndrome or meconium aspiration syndrome) is considered to have been the major contributor to the death.

Infection: neonatal deaths in which infection is considered to have been the major contributor (such as early onset Group B Streptococcus sepsis, pneumonia).

Neurological: neonatal deaths in which asphyxial brain damage (hypoxic ischaemic encephalopathy) or intracranial haemorrhage was considered to have been the major contributor.

Gastrointestinal: primarily includes neonatal deaths related to necrotizing enterocolitis (a medical condition where a portion of the bowel dies).

Other: includes Sudden Infant Death Syndrome (SIDS), multisystem failure, trauma and treatment complications.

Technical notes

National Perinatal Data Collection

The National Perinatal Data Collection (NPDC) is a national population-based cross-sectional collection of data on pregnancy and childbirth. The data are based on births reported to the perinatal data collection in each state and territory in Australia. Midwives and other birth attendants, using information obtained from mothers and from hospital or other records, complete notification forms for each birth. A standard de-identified extract is provided to the Australian Institute of Health and Welfare (AIHW) on an annual basis to form the NPDC.

Detailed information on completeness, accuracy and other aspects of data quality for the National Perinatal Data Collection (NPDC) is in the [data quality statement](#).

National Perinatal Mortality Data Collection

Scope

The National Perinatal Mortality Data Collection (NPMDC) is a population-based cross-sectional collection of data regarding the deaths of babies in hospitals and in the community, and includes all neonatal deaths and stillbirths of a baby at least 20 weeks gestation or at least 400 grams birthweight, during pregnancy, birth or within 28 days of birth.

The NPMDC commenced with the 2013 birth cohort and builds on information collected in the NPDC. Common identifier fields in the NPDC and NPMDC allow demographic information regarding perinatal death records in the NPMDC to be retrieved from the NPDC for reporting.

There are 33 voluntary data items collected in the NPMDC which are supplied by state and territory health authorities using a standard de-identified extract to the Australian Institute of Health and Welfare (AIHW) on an annual basis. Data specifications supplied to jurisdictions for collection are included in the supplementary tables.

Detailed information on completeness, accuracy and other aspects of data quality for the NPMDC is in the [data quality statement](#).

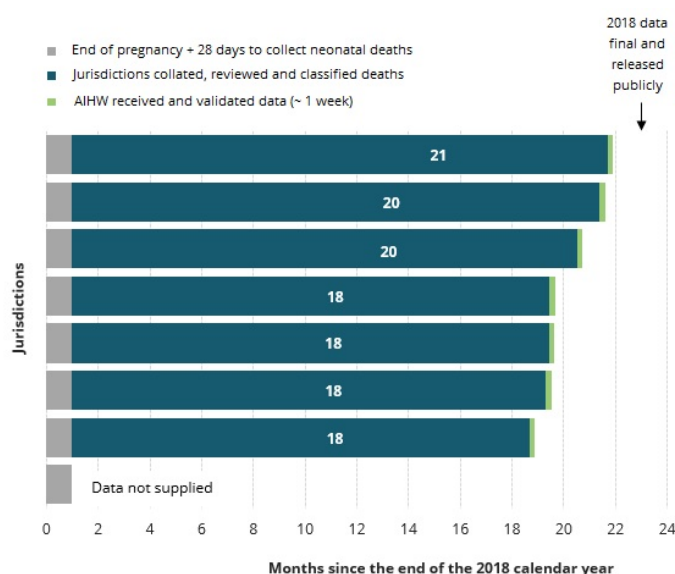
Data timeliness

The NPMDC data cannot be finalised for a calendar year until all Jurisdictional Mortality Review Committee reports that apply to that period are complete. Jurisdictions coordinate and facilitate data collection procedures from service providers and the updating of records.

NPMDC data for 2018 was requested from states and territories on 26 June 2020 for submission to the AIHW by 14 August 2020. Data were received from 4 jurisdictions by this date. Data suppliers in some jurisdictions have given feedback that a request for data 17 months after the end of the collection period is unachievable as some data (particularly pertaining to PSANZ classification codes and contributory factors) are still waiting to be compiled at this stage.

Timelines for reporting perinatal deaths 2018 data are outlined in Figure 1. The NPMDC data for 2018 was finalised and reported 23 months after the end of the collection period.

Figure 2: Months since the end of the 2018 calendar period and public reporting of National Perinatal Mortality Data Collection, by jurisdiction



Source: National Perinatal Mortality Data Collection



Technical notes

Some topics in this report may exclude data for selected states and territories for reasons including:

- Data are not currently collected by a state and territory, or are not collected in a format that is comparable with the specifications for the National Perinatal Data Collection (NPDC) or National Perinatal Mortality Data Collection (NPMDC).
- Data are not currently supplied by a state and territory for the NPDC or NPMDC. Data items that are not part of the Perinatal NMDS are not mandatory for provision to the NPDC, and there are currently no Perinatal NMDS items in the NPMDC.

The exclusions for reported data items in the NPDC are summarised in Table 1. These exclusions apply to both the numerator and denominator for rate calculations, and the data presented are not representative of the jurisdictions excluded.

Table 1: Summary of state and territory exclusions in the National Perinatal Data Collection (NPDC) for 2018

| Data item | Exclusion |
|---|-------------------------------------|
| Cause of perinatal death ^(a) | New South Wales (data not provided) |

Note: (a) This data item is not currently part of the Perinatal NMDS and is not mandated for provision to the NPDC.

Data quality for the National Perinatal Mortality Data Collection

Detailed information on completeness for all data items in the NPMDC is available, at the national level, in the interactive data visualisation below for 2013 to 2018.

Definitions for the terms used to quantify completeness:

Supplied - Stated: supplied an appropriate value for a proportion of records for the data item during specified collection year/s

Not supplied/stated: proportion of values supplied as not stated or missing, where a jurisdiction has either supplied appropriate values for a portion of records or did not supply any value for all records for the data item during the specified collection year/s.

This figure shows the data quality, or percentage of records with an accepted value supplied, for each data item in the National Perinatal Mortality Data Collection, from 2013 to 2018. Detailed information on completeness, accuracy and other aspects of data quality can be found in the data quality statement, linked to from the Data sources page.

Visualisation not available for printing

Preliminary data

Preliminary data on perinatal deaths is available through the National Perinatal Data Collection and reported in the [Australia's mothers and babies](#) publication series.

The AIHW has established a separate, enduring National Perinatal Mortality Data Collection to obtain complete information on these deaths which contains annual perinatal deaths data from 2013. For 2017 and 2018, NSW perinatal mortality data were not available at the time of production for this report. Where possible in this report, preliminary perinatal deaths data for NSW for 2017 and 2018 supplied to the National Perinatal Data Collection have been used.

Data on stillbirths and neonatal deaths are provided to the NPDC by jurisdictions as a subset of the larger cohort of all babies born in the same collection period. These preliminary data on stillbirths and neonatal deaths are made available to the public approximately 18 months after the end of the collection period.

Because these data are supplied to the AIHW often prior to completion of all Jurisdictional Mortality Review Committee reports, the data is not as comprehensive as that supplied to the NPMDC, particularly pertaining to PSANZ classification regarding the cause of death and contributory factors.

These preliminary data may also not include neonatal deaths for babies transferred to another hospital, re-admitted to hospital after discharge or who died at home after discharge.

Data provided to the NPMDC may vary from the preliminary data reported by the NPDC due to a variety of factors. Such factors include the inclusion of babies transferred to another hospital, re-admitted to hospital after discharge or who died at home after discharge; or cases where not enough detail was able to be provided by the jurisdiction to enable linkage of a particular death in the NPMDC back to the corresponding record in the NPDC

Quality of data for reporting Indigenous status

Indigenous status is a measure of whether a person identifies as being of Aboriginal and/or Torres Strait Islander origin. Unless otherwise stated, data for babies are based on the Indigenous status of the mother. However, the outcomes of babies of Indigenous women remain a key data resource for assessing provision of antenatal care in pregnancy and other interventions before or during pregnancy.

Comparing NPMDC data with Victorian Consultative Council on Obstetric and Paediatric Mortality and Morbidity data

The stillbirth data for Victoria reported to the National Perinatal Mortality Data Collection differs to that reported by the Victorian Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM). For 2018, the CCOPMM annual report shows 473 stillbirths and an adjusted stillbirth rate of 6.0 per 1,000 births (CCOPMM 2019. [Victoria's mothers, babies and children 2018](#). Melbourne: Victorian Government). The difference is due to the following exclusions applied to the stillbirths reported by CCOPMM:

- Stillbirths proven to have occurred at less than 20 weeks' gestation (for example, where a fetal death in utero diagnosed by ultrasound at 19 weeks' gestation), but where birth occurs at 20 weeks' gestation or more
- Stillbirths where a fetal death in utero is diagnosed at 20 weeks' gestation or more, but where the birthweight is less than 150 grams.

Comparing NPMDC data with ABS registrations of death data

Perinatal death data reported by the Australian Bureau of Statistics (ABS) are not directly comparable with the NPMDC and NPDC data contained in this report. Variation in the number of perinatal deaths reported by the ABS and NPMDC can be seen in Table 2.

While the definitions of stillbirth (fetal death in ABS reporting) and neonatal death are the same, ABS data are sourced from state and territory registrars of Births, Deaths and Marriages. Data from the NPMDC and NPDC contained in this report are sourced from midwives, and other staff, who collect information from mothers and perinatal administrative and clinical record systems.

It is the responsibility of the parents to register a birth with Births, Deaths and Marriages, however some perinatal deaths may not be recorded when notifications are not registered by the parents. A delay in registrations is often seen, particularly for stillbirths, with the original date of death often being many years prior to the date of registration. This means the accuracy of the number of perinatal deaths reported by the ABS for a particular year often improves over time.

Table 2: Number of perinatal deaths reported by Australian Bureau of Statistics and the National Perinatal Mortality Data Collection, Australia, 2013-2018

| Year | NPMDC Stillbirths | ABS Stillbirths | NPMDC Neonatal deaths | ABS Neonatal deaths |
|------|-------------------|-----------------|-----------------------|---------------------|
| 2013 | 2,194 | 1,781 | 822 | 763 |
| 2014 | 2,225 | 1,698 | 798 | 714 |
| 2015 | 2,148 | 1,718 | 688 | 707 |
| 2016 | 2,115 | 1,724 | 751 | 700 |
| 2017 | 2,173 | 1,760 | 751 | 744 |
| 2018 | 2,115 | 1,682 | 674 | 737 |

Note: ABS stillbirths and neonatal deaths are reported by the year in which the death occurred (ABS 2018, Customised report).

For more information on perinatal deaths data collected by the ABS, [visit the perinatal deaths page at the Australian Bureau of Statistics](#).

Technical notes

Mortality rates

Calculation of stillbirth rate

The stillbirth rate is calculated as the proportion of births in a specified population which are stillbirths. This proportion is expressed in relation to all births.

Stillbirth rate = Number of stillbirths x 1,000 / Total number of births

Calculation of neonatal mortality rate

The neonatal mortality rate is calculated as the proportion of births in a specified population which are live born and subsequently die within 28 days of birth (neonatal deaths). This proportion is expressed in relation to all live births.

Neonatal mortality rate = Number of neonatal deaths x 1,000 / Number of live births

Calculation of perinatal mortality rate

The perinatal mortality rate is calculated as the proportion of births in a specified population which are stillbirths or neonatal deaths (perinatal deaths). This proportion is expressed in relation to all births.

Perinatal mortality rate = Number of perinatal deaths x 1,000 / Total number of births

Calculation of Australian national birthweight percentiles by gestational age

Birthweight percentiles were calculated from data on all liveborn singleton babies born in Australia between 2004 and 2013 with a gestational age of 20-44 weeks.

Records with indeterminate sex were excluded from analysis. Records with missing or not stated data for sex, birthweight or gestational age were also excluded. Birthweight outliers were calculated and excluded using a method based on Tukey's box and whisker plots.

Gestational age is reported in completed weeks of gestation, calculated from the first day of the last menstrual period (LMP) or estimated by prenatal and/or postnatal assessment if the LMP date was missing. Birthweight is reported to the nearest 5 grams.

Data used to assign percentile is supplied in the [supplementary tables](#).

Geography

Geographic data are based on the usual residence of the mother. In 2018, the usual residence of the mother is based on Statistical Area Level 2 (SA2) of the Australian Bureau of Statistics Australian Statistical Geography Standard Edition 2016 for all states and territories.

Remoteness

This report uses the Australian Statistical Geography Standard Remoteness Structure, which groups geographic areas into six classes of Remoteness Area based on their relative access to services using the Accessibility/Remoteness Index of Australia.

The six classes are: *Major cities*, *Inner regional*, *Outer regional*, *Remote*, *Very remote* and *Migratory*: See the [Australian Statistical Geography Standard \(ASGS\): Volume 5—Remoteness Structure, July 2016](#) for more information of remoteness.

Socioeconomic status

The Socio-Economic Indexes for Areas (SEIFA) are measures of socioeconomic status (SES) that summarise a range of socioeconomic variables associated with disadvantage. Socioeconomic disadvantage is typically associated with low income, high unemployment and low levels of education.

The SEIFA index used in this report is the 2016 SEIFA Index of Relative Socioeconomic Disadvantage (IRSD) developed by the Australian Bureau of Statistics for use at Statistical Area Level 2.

Since the IRSD summarises only variables that indicate disadvantage, a low score indicates that an area has many low-income families, many people with little training and many people working in unskilled occupations; hence, this area may be considered disadvantaged relative to other areas. A high score implies that the area has few families with low incomes and few people with little or no training and working in unskilled occupations. These areas with high index scores may be considered less disadvantaged relative to other areas. It is important to understand that a high score reflects a relative lack of disadvantage rather than advantage and that the IRSD relates to the average disadvantage of all people living in a geographic area. It cannot be presumed to apply to all individuals living within the area.

Population-based Australian cut-offs for SEIFA quintiles have been used in this report. This method ranks the SEIFA scores for a particular geography (for example, Statistical Area Level 2) from lowest to highest, and the geographical areas are divided into 5 groups, such that approximately 20% of the population are in each group.

See the [Census of Population and Housing: Socio-Economic Indexes for Areas \(SEIFA\), Australia, 2016](#) for further information on SEIFA.

Confidentiality

To maintain privacy and confidentiality of individuals, cells in the supplementary data tables are suppressed if there is a risk of disclosure of an attribute of an individual that was not already known. A cell in a table is considered identifiable if, as well as being able to identify the entity, other details are also revealed. It is AIHW policy that these cells need to be confidentialised, unless the attribute that would be disclosed is deemed to be non-sensitive in the context of the data being published.

© Australian Institute of Health and Welfare 2023



Notes

Data quality statement

National Perinatal Data Collection (NPDC)

National Perinatal Mortality Data Collection (NPMDC)

© Australian Institute of Health and Welfare 2023





Data



Report editions

Newer releases

- Stillbirths and neonatal deaths |
Web article | 29 Nov 2022
 - Stillbirths and neonatal deaths in Australia 2017-2018 |
Publication | 10 Jun 2021
-

This release

Stillbirths and neonatal deaths in Australia | 14 Dec 2020

Previous releases

- Stillbirths and neonatal deaths in Australia 2015 and 2016 |
Web report | 04 Jul 2019
 - Perinatal deaths in Australia 2013-2014 |
Publication | 29 May 2018
 - Perinatal deaths in Australia 1993-2012 |
Publication | 12 Oct 2016
-

Related material

Resources

Related topics

- [Life expectancy & deaths](#)
-