Australian Government

Australian Institute of Health and Welfare

Stillbirths and neonatal deaths in Australia

2015 and 2016

in brief

AIHW

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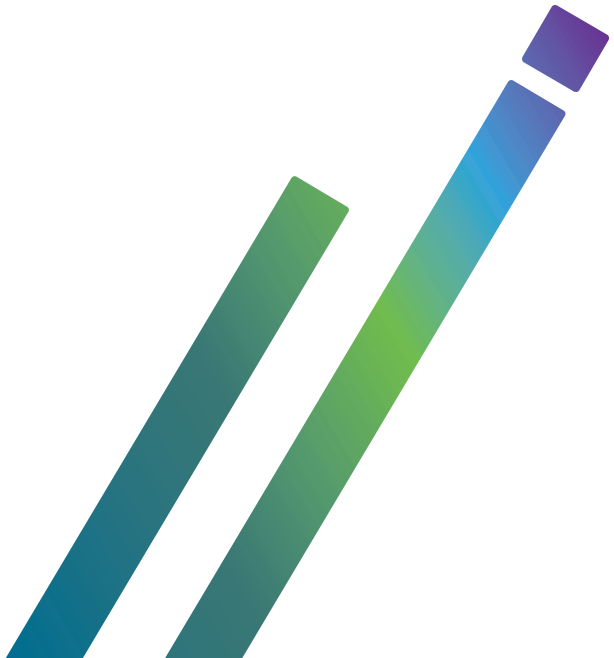

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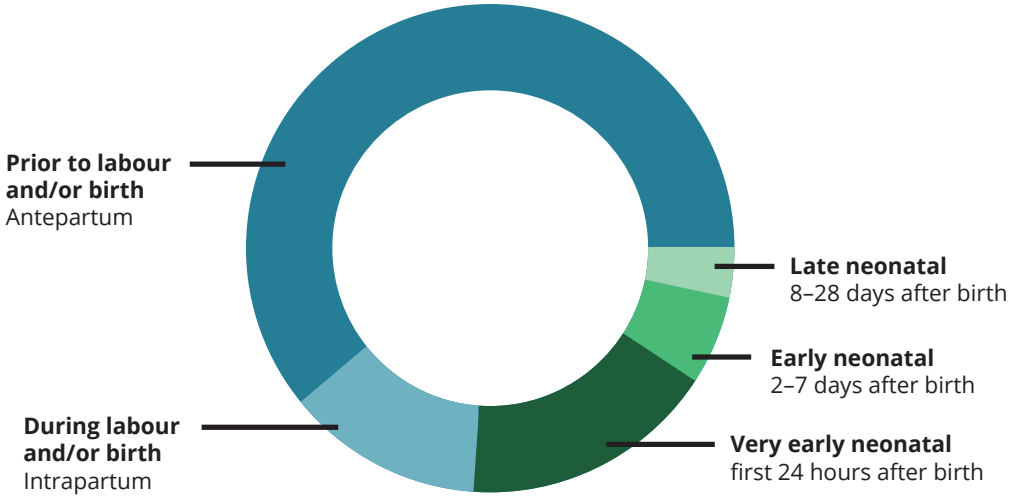
Contents

Stillbirths and neonatal deaths at a glance

Of the **5,702 perinatal deaths** in 2015 and 2016:

75% or **4,263** were **stillbirths**

25% or **1,439** were **neonatal deaths**



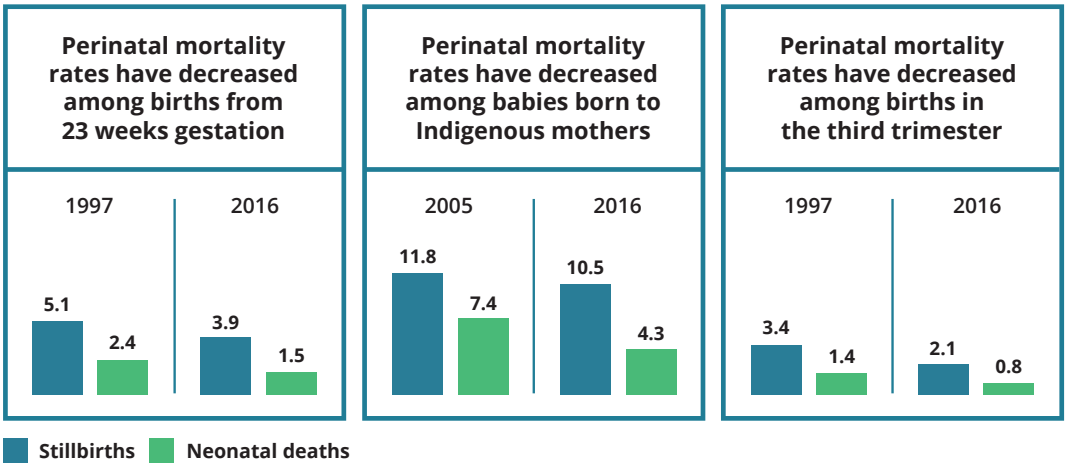
3 in 4 stillbirths (3,333) occured prior to labour and/or birth

2 in 3 neonatal deaths (931) occured during the **first 24 hours after birth**

60% of perinatal deaths occurred at 20–26 completed weeks gestation.

Perinatal deaths are those occurring prior to or during labour and/or birth (stillbirth) or up to 28 days after birth (neonatal death) where babies are of 20 or more completed weeks gestation or with a birthweight of at least 400 grams.

Although perinatal mortality rates have remained constant since 1997, there have been improvements among some groups:



Congenital anomaly
was the most common cause of perinatal death
29% of stillbirths and **31% of neonatal deaths**

20% of stillbirths
occurred prior to labour with no known reason (unexplained antepartum death)

29% of neonatal deaths
occurred due to spontaneous preterm birth

Autopsies were performed for: **4 out of 10 stillbirths and 3 out of 10 neonatal deaths.**

For more information on definitions, visit page 34 in this report.

1 Overview

In Australia, for 2015 and 2016, there were 5,702 perinatal deaths (that is, stillbirths and neonatal deaths combined). Three-quarters (4,263) were stillbirths and the remaining 1,439 died within 28 days of birth—neonatal deaths.

In Australia in 2015 and 2016:

- there were 623,701 babies born to 614,515 women
- the overall perinatal mortality rate for these years was 9.1 per 1,000 births
- the rate of stillbirth was 6.8 per 1,000 births and the rate of neonatal death was 2.3 per 1,000 live births.

Stillbirths, neonatal deaths and perinatal deaths, 2015 and 2016

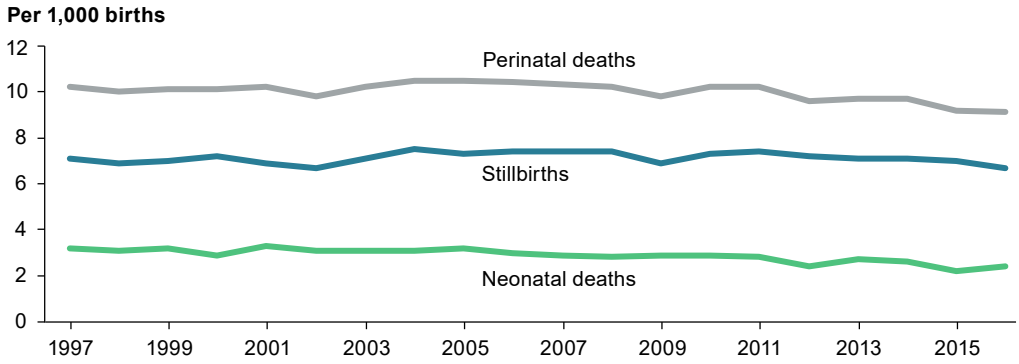
			Stillbirths		Neonatal deaths		Perinatal deaths	
Year	Total births	Live births	Number	Rate	Number	Rate	Number	Rate
2015	308,887	306,725	2,148	7.0	688	2.2	2,836	9.2
2016	314,814	312,683	2,115	6.7	751	2.4	2,866	9.1
Total	**623,701**	**619,408**	**4,263**	**6.8**	**1,439**	**2.3**	**5,702**	**9.1**

Notes

1. The rate is the number of deaths per 1,000 births.
2. The sum of the number of stillbirths plus the number of live births may not always be equal to the total number of births as they are sourced from different data collections.

Since 1997, the perinatal mortality rate has remained relatively constant. In 2004 and 2005, the highest rates were reported at 10.5 perinatal deaths per 1,000 births for each of those years and in 2016 the lowest rate of 9.1 perinatal deaths per 1,000 births was reported. From 1997 to 2016, the overall stillbirth rate has not changed notably (from 7.1 to 6.7 stillbirths per 1,000 births) while there has been a slow reduction in the rate of neonatal deaths (from 3.2 to 2.4 neonatal deaths per 1,000 live births).

Rate of perinatal deaths in Australia, 1997–2016



Note: 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.

Perinatal deaths by select demographics of the mother, 2015 and 2016

	Perinatal deaths		Stillbirths	Neonatal deaths
	Number	Deaths per 1,000 births	Deaths per 1,000 births	Deaths per 1,000 live births
Total	**5,702**	**9.1**	**6.8**	**2.3**
State of birth				
New South Wales	1,522	7.8	5.8	2.0
Victoria	1,728	10.8	8.3	2.5
Queensland	1,152	9.2	6.5	2.8
Western Australia	577	8.1	6.5	1.7
South Australia	363	9.0	7.2	1.9
Tasmania	118	10.2	6.6	3.6
Australian Capital Territory	136	10.4	7.4	3.0
Northern Territory	106	13.2	9.1	4.2
Indigenous status of the mother				
Indigenous	362	13.4	9.4	4.0
Non-Indigenous	5,225	8.8	6.6	2.2
Not stated	115	..		
Remoteness of mother's usual residence				
Major cities	3,888	8.6	6.5	2.1
Inner regional	961	9.5	6.9	2.6
Outer regional	517	10.0	7.5	2.6
Remote	89	9.8	7.5	2.3
Very remote	116	19.8	13.6	6.3
Not stated/unable to be assigned	131	..		
Disadvantage quintile of mother's area of usual residence				
Quintile 1 (Most disadvantaged)	1,308	10.4	7.6	2.8
Quintile 2	1,210	9.9	7.2	2.7
Quintile 3	1,170	9.3	7.1	2.2
Quintile 4	1,031	8.0	5.9	2.1
Quintile 5 (Least disadvantaged)	848	7.3	5.7	1.6
Not stated/unable to be assigned	135	..		
Mother's country of birth				
Australia (includes external territories)	3,709	9.0	6.7	2.4
Born overseas	1,873	8.9	6.8	2.2
Not stated	120	..		

Notes

1. The perinatal mortality rate for Victoria includes terminations due to maternal psychosocial indications.
2. In 2015 and 2016, 14% 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.
3. 'Not stated/unable to be assigned' includes non-Australian residents and those whose geographic area of usual residence was 'Not stated'.
4. Disadvantage proportions are calculated after excluding records where mother's area of usual residence was 'Not stated'.
5. Further disaggregation of mother's country of birth can be found on page 3 and in the supplementary data tables.

Higher for Indigenous mothers

Babies born to Indigenous women accounted for 4.3% of all births and 6.3% of all perinatal deaths. The rate of perinatal death for babies born to Indigenous women was 13.4 deaths per 1,000 births. A section focusing on Indigenous women and their babies can be found on page 29.

Higher for those living in remote and very remote areas

The majority of babies born in 2015 and 2016 were to mothers who lived in major cities (72.4%) and inner regional areas (16.1%), while 2.4% were born to mothers living in remote and very remote areas.

The rate of perinatal death increased with remoteness, and was notably higher for babies born to those living in very remote areas. The incidence of perinatal death in remote and very remote areas should be treated with caution due to the relatively small numbers of women living in these areas.

Socioeconomic disadvantage more common

Women living in the most disadvantaged areas of Australia (quintiles 1 and 2) were 25% more likely to have a perinatal death than women living in the least disadvantaged areas (quintiles 4 and 5). The difference was most marked in relation to neonatal death.

Similar rates for mothers born overseas

There was little overall difference in the perinatal mortality rates of babies of women who were born in Australia compared to babies of women born overseas.

The highest rates of perinatal death was amongst babies of mothers born in:

- Melanesia (including Papua New Guinea) (17.0 perinatal deaths per 1,000 births)
- North Africa (15.7 perinatal deaths per 1,000 births)
- Central and West Africa (15.5 perinatal deaths per 1,000 births).

Further disaggregation of mother's country of birth can be found in the supplementary data tables. It is important to note that country of birth is not always an indication of ethnicity.

An international perspective

For purposes of international comparison, the World Health Organization (WHO) recommends that all countries report perinatal mortality data using the WHO international definitions of stillbirth and neonatal death (WHO 2006).

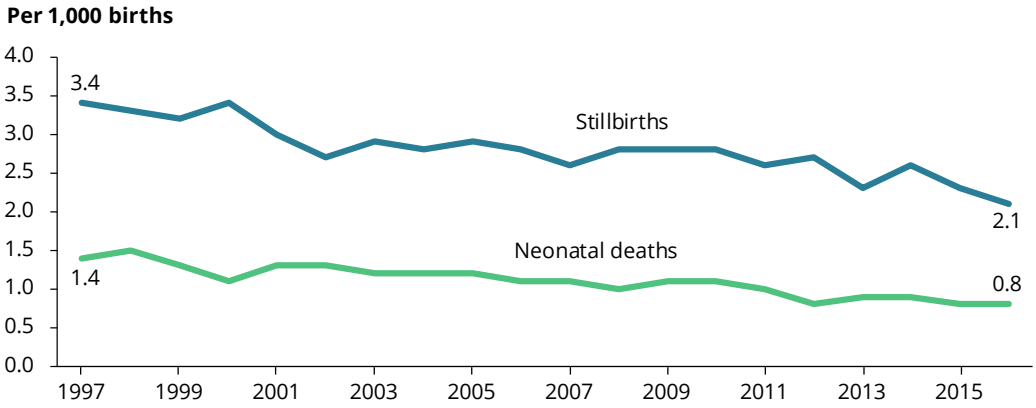
World Health Organization international definitions

For purposes of international comparison, stillbirths and neonatal deaths are defined as third trimester perinatal deaths (≥28 weeks gestational age or ≥1,000 grams birthweight) (WHO 2015).

This differs from the standard definitions used for stillbirths and neonatal deaths in Australia of ≥20 weeks gestational age or ≥400 grams birthweight.

Using the WHO definitions, which account only for perinatal deaths occurring from the third trimester onwards, the rate of stillbirths in Australia has decreased from 3.4 stillbirths per 1,000 births in 1997 to 2.1 stillbirths per 1,000 births in 2016. The rate of neonatal deaths has also declined, from 1.4 neonatal deaths per 1,000 live births in 1997 to 0.8 neonatal deaths per 1,000 live births in 2016.

Rate of stillbirths and neonatal deaths in Australia, WHO definitions, 1997–2016



Note: Data from the Northern Territory between 2000 and 2002 and from Victoria in 2009 are not available so have been excluded from both the numerator and denominator.

The estimated worldwide stillbirth rate in 2015 was 18 stillbirths per 1,000 births, varying from 3 stillbirths per 1,000 births in combined high-income countries to 29 stillbirths per 1,000 births in sub-Saharan Africa (Blencowe et al. 2016). The estimated worldwide neonatal mortality rate in 2015 was 19 neonatal deaths per 1,000 live births, varying from 3 neonatal deaths per 1,000 births in combined high-income countries, to 28 neonatal deaths per 1,000 live births in southern Asia and 29 per 1,000 live births in sub-Saharan Africa (UNICEF 2015).

2 Gestational age, birthweight and plurality

Gestational age

In 2015 and 2016, the majority (82.5%) of babies were born from 38 to 41 completed weeks of gestation. The largest proportion of perinatal deaths (48.5%) occurred from 20 to 23 weeks gestation.

Perinatal deaths by gestational age, 2015 and 2016

			Stillbirths		Neonatal deaths		Perinatal deaths	
Completed weeks	Total births	Live births	Number	Rate	Number	Rate	Number	Rate
20–22	2,289	535	1,735	758.0	519	970.1	2,254	984.7
23–26	2,364	1,491	857	362.5	379	254.2	1,236	522.8
27–31	5,438	4,929	502	92.3	106	21.5	608	111.8
32–35	22,720	22,339	375	16.5	113	5.1	488	21.5
36+	590,570	589,801	737	1.2	298	0.5	1,035	1.8
Not stated	320	313	57	..	24	..	81	..
Total			**4,263**	**6.8**	**1,439**	**2.3**	**5,702**	**9.1**

Notes

1. The rate is the number of deaths per 1,000 births.
2. The sum of the number of stillbirths plus the number of live births may not always be equal to the total number of births as they are sourced from different data collections.

Birthweight

Stillbirth and neonatal mortality rates both declined dramatically with increasing birthweight. Two-thirds (64.5%) of perinatal deaths occurred in babies weighing less than 1,000 grams, and 81.0% of perinatal deaths occurred in those classified as low birthweight (less than 2,500 grams).

Perinatal deaths by birthweight, 2015 and 2016

			Stillbirths		Neonatal deaths		Perinatal deaths	
Birthweight (grams)	Total births	Live births	Number	Rate	Number	Rate	Number	Rate
Less than 2,500	43,781	40,282	3,456	78.9	1,162	28.8	4,618	105.5
2,500 to 4,499	571,357	570,706	628	1.1	246	0.4	874	1.5
4,500 and over	8,244	8,228	15	1.8	5	0.6	20	2.4
Not stated	319	192	164	..	26	..	190	..
Total			**4,263**	**6.8**	**1,439**	**2.3**	**5,702**	**9.1**

Notes

1. The rate is the number of deaths per 1,000 births.
2. The sum of the number of stillbirths plus the number of live births may not always be equal to the total number of births as they are sourced from different data collections.

Birthweight for gestational age

Birthweight and gestational age are interrelated and birthweight is best expressed in relation to gestational age to take this into account.

When looking at birthweight for gestational age, babies are often referred to in the following categories:

Small for gestational age: Babies with a birthweight less than the 10th percentile for their gestational age.

Large for gestational age: Babies with a birthweight more than the 90th percentile for their gestational age.

Appropriate for gestational age: Babies with a birthweight between the 10th and 90th percentiles for their gestational age.

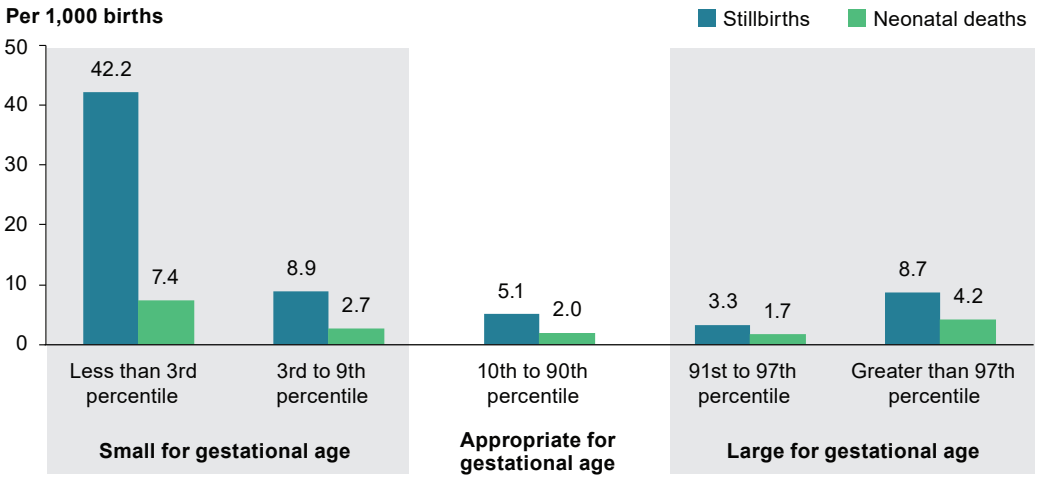
The most recently published birthweight percentiles were developed for Australia using information about live born singleton babies born between 2004 and 2013 (Johnson et al. 2016). To view this information, see the supplementary data tables.

Perinatal death was most common in babies who were small for their gestational age (21.9 deaths per 1,000 births), especially for those babies whose birthweight was less than the 3rd percentile for their gestational age (49.3 deaths per 1,000 births).

Babies considered to be an appropriate birthweight for their gestational age had a perinatal mortality rate of 7.1 deaths per 1,000 births.

The lowest rates of perinatal death occurred in those babies whose birthweight was in the 91st to 97th percentile for their gestational age (5.1 deaths per 1,000 births). However, for babies weighing greater than the 97th percentile the mortality rate was markedly higher (12.8 deaths per 1,000 births).

Perinatal deaths by birthweight percentiles, 2015 and 2016



Note: Excludes records where birthweight and/or gestational age is not stated.

Risk of perinatal death by gestational age

The gestational age-specific risk of perinatal death is the likelihood of a perinatal death occurring within a specified gestation interval. This is calculated by dividing the number of perinatal deaths occurring within the gestational interval (numerator) by the total number of unborn babies at the start of the interval (denominator). The perinatal mortality risk is expressed as the proportion per 1,000 babies remaining in utero.

The risk of a baby dying in the perinatal period was greatest after 41 completed weeks of gestation and before 24 weeks gestation. Some caution is required with interpretation of these figures as the number of babies remaining in utero after 41 completed weeks was small.

Perinatal deaths by risk of death per 1,000 fetuses remaining in utero, by gestational age, 2015 and 2016

		Stillbirths		Neonatal deaths		Perinatal deaths	
Gestational age	Babies remaining in utero at start of interval	Number	Risk	Number	Risk	Number	Risk
20–21 weeks	623,381	1,188	1.9	307	0.5	1,495	2.4
22–23 weeks	621,864	894	1.4	379	0.6	1,273	2.0
24–25 weeks	620,496	358	0.6	171	0.3	529	0.9
26–27 weeks	619,377	281	0.5	68	0.1	349	0.6
28–29 weeks	617,979	194	0.3	48	0.1	242	0.4
30–31 weeks	616,203	178	0.3	31	0.1	209	0.3
32–33 weeks	613,290	182	0.3	60	0.1	242	0.4
34–35 weeks	607,192	193	0.3	53	0.1	246	0.4
36–37 weeks	590,570	284	0.5	91	0.2	375	0.6
38–39 weeks	517,342	274	0.5	126	0.2	400	0.8
40–41 weeks	211,785	172	0.8	78	0.4	250	1.2
42 or more	2,998	7	2.3	3	1.0	10	3.3
Not stated	320	58		24		82	
Total	**623,701**	**4,263**		**1,439**		**5,702**	

Note: Risk calculation excludes births where gestational age is not stated.

Plurality

Plurality refers to the number of babies resulting from a pregnancy.

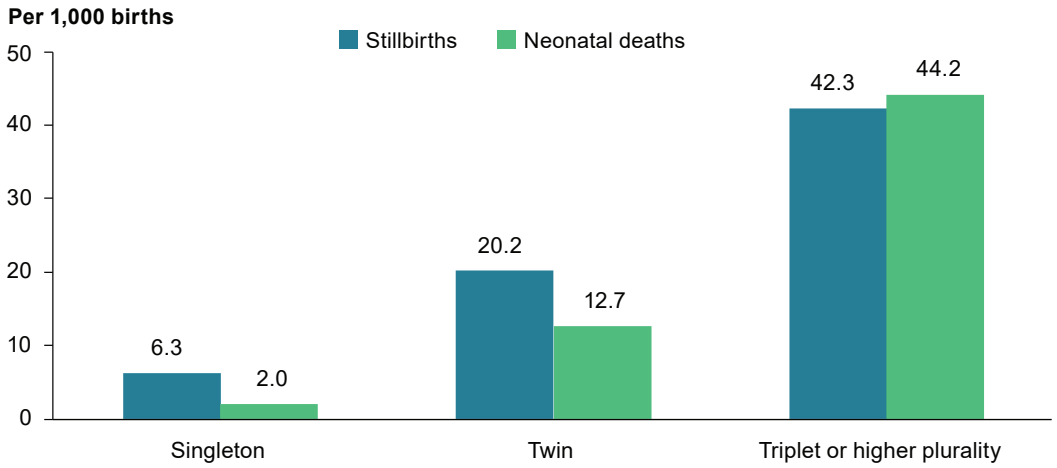
In 2015 and 2016, 97.1% of all births were singleton births (where only one baby was born) and 2.9% were multiple births (twins, triplets and higher pluralities such as quadruplets).

The perinatal mortality rate for singleton births was 8.3 deaths per 1,000 births, with 3,832 (76.5%) of those being stillbirths.

The perinatal mortality rate for twins (32.6 deaths per 1,000 births) was almost 4 times that of singletons, and for higher multiples (triplets or higher pluralities) was 10 times that of singletons (84.6 deaths per 1,000 births).

As plurality increased, neonatal deaths became more prominent relative to stillbirths. This increased incidence of neonatal death primarily relates to a greater risk of pre-term birth associated with twins and higher pluralities.

Perinatal deaths by plurality, 2015 and 2016



Find out more in our web report:
Gestational age, birthweight and plurality.

3 Maternal characteristics

This section presents data on maternal and medical characteristics that have been commonly associated with stillbirth or neonatal death. While these characteristics are more commonly found in women with pregnancies that result in stillbirth and neonatal death, it is understood that they are often unavoidable and it is not implied that these characteristics are the cause of perinatal deaths.

Maternal age	Perinatal mortality rates were highest among babies born to younger and older women and lowest for babies born to women aged 25–34.
Smoking during pregnancy	Perinatal death was more common among babies born to women who smoked during pregnancy, although perinatal mortality rates for babies born to women who reported smoking only within the first 20 weeks were lower than for those women who smoked throughout. It should be noted that methods used for data collection of a woman's smoking status can vary across jurisdictions.
Parity *number of previous pregnancies resulting in live or stillbirths—excluding the current pregnancy.*	Babies born to women with a parity of 4 or more had the highest rate of perinatal death (16.8 deaths per 1,000 births), while babies born to mothers with a parity of 1 or 2 had the lowest rate of perinatal death (7.5 deaths per 1,000 births).
Previous stillbirth	Women who have had a previous stillbirth were more than 3 times as likely to experience another stillbirth when compared with women who had had at least 1 previous pregnancy and no previous stillbirth. Data on previous stillbirth were not available from New South Wales, Western Australia or South Australia so these states have been excluded from the analysis.
Diabetes	Perinatal death was almost twice as likely among babies born to women with pre-existing diabetes compared with babies born to women with no diabetes.
Body mass index (BMI)	Babies born to women classed as obese (BMI of 30 or more) had higher perinatal mortality rates than those born to women with a BMI below 30. Data on BMI was not available from New South Wales in 2015 and has been excluded from the analysis.

Perinatal deaths by select maternal characteristics, 2015 and 2016

	Perinatal deaths		Stillbirths	Neonatal deaths
	Number	Deaths per 1,000 births	Deaths per 1,000 births	Deaths per 1,000 live births
Total	**5,702**	**9.1**	**6.8**	**2.3**
Mother's age				
Under 20	283	18.0	13.6	4.5
20–24	810	10.6	7.7	2.9
25–29	1,389	8.2	6.0	2.2
30–34	1,774	8.0	6.0	2.0
35–39	1,044	9.1	7.0	2.2
40 or over	331	12.3	9.7	2.6
Not stated	71	..		
Smoking status				
Smoked only in the first 20 weeks	142	10.3	6.6	3.7
Smoked throughout pregnancy	645	13.3	9.4	4.0
Did not report smoking	4,429	8.0	6.0	2.1
Not stated	486	..		
Parity (number of previous pregnancies)				
0	2,641	9.9	7.4	2.5
1	1,603	7.4	5.4	2.0
2	680	7.9	6.0	1.9
3	338	11.2	8.4	2.8
4 or more	354	16.8	12.4	4.5
Not stated	86	..		
Previous stillbirth				
Had a previous stillbirth	103	25.8	20.3	5.6
No previous stillbirth	1,528	8.7	6.2	2.5
No previous births	1,542	11.4	8.5	2.9
Not stated	67	..		
Mother's diabetes status				
Pre-existing diabetes	84	16.8	12.8	4.1
Gestational diabetes	211	4.2	2.9	1.3
None	3,342	8.9	6.5	2.4
Not stated	337	..		
Body mass index of mother				
Less than 18.5	178	8.7	6.2	2.5
18.5–24.9	2,014	7.8	6.1	1.8
25.0–29.9	1,074	8.2	6.1	2.1
30 or more	992	9.9	6.9	3.0
Not stated	672	..		

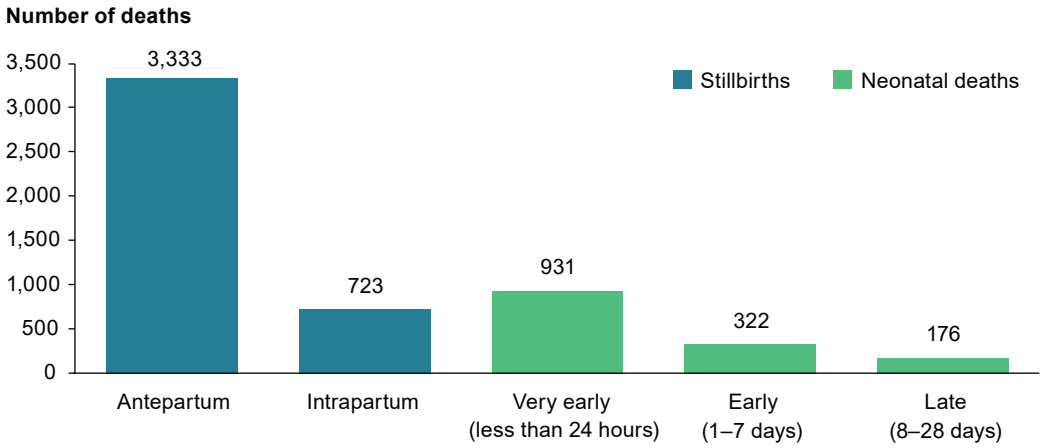
Notes

1. Methods used for data collection of smoking status can vary across jurisdictions.
2. Body mass index of mother excludes NSW for 2015 as data were not available. Body mass index of mother is usually collected at the first antenatal visit; the stage of pregnancy at which this occurs can vary across women and pregnancies.
3. Previous stillbirth in multiparous women excludes NSW, WA and SA for 2015 and 2016 as data were not available.
4. Mother's diabetes status excludes Victoria in 2015 and 2016 as data were not available.
5. Tests to diagnose gestational diabetes are usually performed between 24 and 28 weeks gestation (or earlier for those considered high risk). Therefore perinatal deaths that occur prior to the gestational age where testing for gestational diabetes usually occurs may be under represented in this category.

4 Timing of perinatal deaths

Antepartum stillbirth (fetal death prior to the onset of labour) was the most frequent type of perinatal death (60.8%). A further 13.2% of perinatal deaths were the result of intrapartum stillbirth (fetal death during labour and birth). Two-thirds (64.7%) of neonatal deaths occurred within the first 24 hours following birth (17.0% of perinatal deaths).

Perinatal deaths by timing of death, 2015 and 2016



Note: Excludes records where timing of stillbirth or neonatal death is not stated.

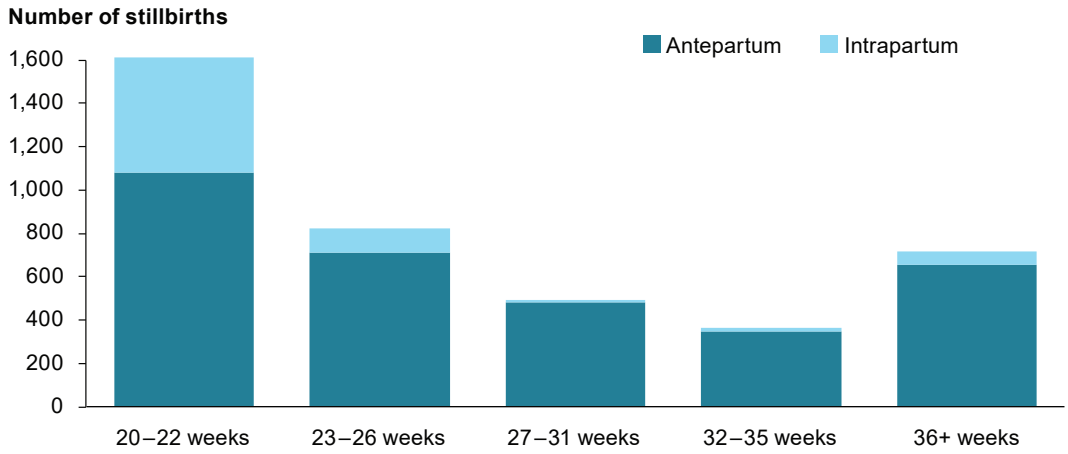
Intrapartum stillbirths and very early neonatal deaths

Intrapartum stillbirth (fetal death occurring during labour and birth) and neonatal death within the first 24 hours after birth are often considered together as, in many cases, the process leading to the death is a perceived continuum that may lead to death before or after the birth occurs. The most common causes for these deaths were congenital anomaly (37.5%) and spontaneous preterm birth (26.7%).

Timing of stillbirths

Where the timing of fetal death was stated (4,056 deaths), 17.8% of stillbirths occurred during labour and birth (intrapartum). The highest numbers of intrapartum stillbirths occurred prior to 27 weeks gestation and increasing in frequency close to term (36+ weeks). The majority of stillbirths (82.2%) in 2015 and 2016 were antepartum (occurring prior to the onset of labour).

Stillbirths by timing of death and gestation, 2015 and 2016



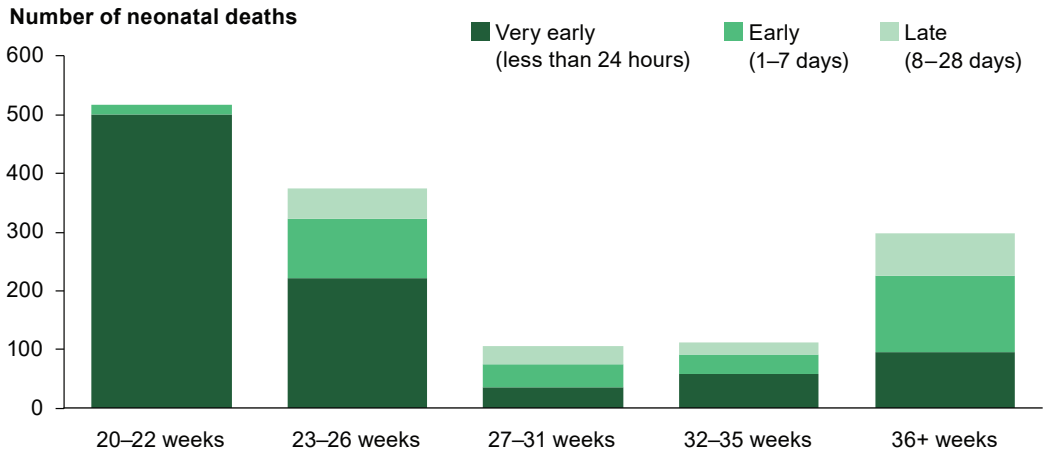
Note: Excludes records where timing of stillbirth is not stated.

Timing of neonatal deaths

For neonatal deaths, where the age of the baby at death was stated (1,429 deaths), almost two-thirds of neonatal deaths (65.2%) occurred within 24 hours of birth and a total of 87.7% occurred within the first 7 days of life.

The majority of neonatal deaths (69.7%) occurred in babies born before 32 weeks gestation. Over a third of neonatal deaths occurred in babies born prior to 22 weeks gestation, with 96.5% of these babies dying within the first 24 hours after birth.

Neonatal deaths by timing of death and gestation, 2015 and 2016



Note: Excludes records where timing of neonatal death is not stated.

5 Causes of perinatal deaths

Causes of perinatal deaths were classified according to the Perinatal Society of Australia and New Zealand (PSANZ) Perinatal Mortality Classification System, version 2.2 (Flenady et al. 2009), 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 a Neonatal Death Classification (PSANZ-NDC).

The PSANZ-PDC system classifies all perinatal deaths (stillbirths and neonatal deaths) by the single most important factor leading to the chain of events which resulted in the death.

The PSANZ-NDC is an additional classification system, applied only to neonatal deaths, to identify the single most important factor in the neonatal period—the time between birth and 28 days—which caused the death.

Number of perinatal deaths by cause (PSANZ-PDC), 2015 and 2016

		Stillbirths	Neonatal deaths	Perinatal deaths
Cause of death				
Congenital anomaly	Structural, functional or chromosomal abnormality	1,253	449	1,702
Unexplained antepartum death	Fetal death prior to labour where no cause is identified	836	..	836
Spontaneous preterm	Spontaneous onset of preterm labour or rupture of membranes	251	415	666
Specific perinatal conditions	Specific conditions in appropriately grown babies without congenital anomalies	395	98	493
Perinatal infection	Primary infection and also secondary infections in term infants	313	153	466
Antepartum haemorrhage	Bleeding after 20 weeks gestation from placental origin	270	120	390
Maternal conditions	Medical/surgical disorders of the mother or complications or treatment	353	18	371
Fetal Growth Restriction	Fetal growth restriction without evidence of maternal or fetal cause	263	16	279
Hypertension	Pre-existing and pregnancy related hypertensive disorder	128	36	164
Hypoxic peripartum death	Acute or chronic hypoxia of normally formed babies	44	61	105
No obstetric antecedent	SIDS, postnatally acquired infection, accident or trauma	..	39	39
Not stated	PSANZ-PDC not stated	157	34	191
Total		4,263	1,439	5,702

Notes

1. For detailed definitions of PSANZ-PDC categories refer to the Technical notes.
2. 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.

The most commonly classified causes for all perinatal deaths in 2015 and 2016 were:

- congenital anomaly (29.8%)
- unexplained antepartum death (14.7%)
- spontaneous preterm birth (11.7%).

At gestations below 26 weeks, maternal conditions, including medical or surgical conditions or injury, were a more commonly classified cause of death and unexplained antepartum death was a less commonly classified cause.

Causes of stillbirths

In 2015 and 2016, the main classified causes of stillbirth were:

- congenital anomaly (29.4%)
- unexplained antepartum death (19.6%)
- specific perinatal condition (9.3%).

Congenital anomaly was the main cause of stillbirth for singleton babies (29.4%), while specific perinatal conditions were the main cause of death for multiples (37.2%).

Congenital anomaly was also the leading cause of stillbirth for babies who were considered small for their gestational age (25.2%) as well as those considered large for their gestational age (44.6%).

For stillbirths, maternal conditions were a more prominent cause of death at gestations below 26 weeks and unexplained antepartum death was a less prominent cause.

Stillbirths by cause (PSANZ-PDC), plurality and birthweight percentiles, 2015 and 2016

	Stillbirths		Plurality		Birthweight percentiles	
Cause of death	Number	%	Singleton	Multiple	< 10th percentile	> 90th percentile
Congenital anomaly	1,253	29.4%	31.1%	13.5%	25.2%	44.6%
Unexplained antepartum death	836	19.6%	20.1%	14.0%	20.2%	12.8%
Specific perinatal conditions	395	9.3%	6.4%	37.2%	8.8%	13.1%
Maternal conditions	353	8.3%	8.9%	2.4%	1.9%	8.7%
Perinatal infection	313	7.3%	7.6%	5.3%	5.9%	4.8%
Antepartum haemorrhage	270	6.3%	6.7%	3.2%	3.8%	5.9%
Fetal Growth Restriction	263	6.2%	6.2%	5.0%	17.9%	0.7%
Spontaneous preterm	251	5.9%	5.4%	11.9%	3.8%	5.2%
Hypertension	128	3.0%	2.9%	3.4%	7.3%	0.3%
Hypoxic peripartum death	44	1.0%	1.1%	0.8%	0.6%	0.7%
No obstetric antecedent	..	..	..	..	..	..
Not stated	157	3.7%	3.8%	3.4%	4.7%	3.1%
Number of stillbirths	**4,263**		**3,832**	**379**	**1,117**	**289**

Interpretation of the incidence of congenital abnormality as the leading classified cause of stillbirths is complicated by the fact that a proportion of these stillbirths were due to terminations of pregnancy, including some in relation to non-lethal abnormalities.

The number of terminations of pregnancy cannot be determined because they are not consistently reported in the National Perinatal Mortality Data Collection due to variations in jurisdictional legislation and reporting practices.

Causes of neonatal deaths

In 2015 and 2016, the main classified causes of neonatal death were:

- congenital anomaly (31.2%)
- spontaneous preterm birth (28.8%)
- perinatal infection (10.6%).

Congenital anomaly was the main classified cause of neonatal death for singleton babies (35.3%), while spontaneous pre-term birth was the main cause of death for multiples (54.2%).

Congenital anomaly was the leading cause of neonatal death for babies who were considered small for their gestational age (47.5%) and those considered large for their gestational age (31.3%). Spontaneous pre-term birth was the main cause of neonatal deaths for babies considered an appropriate birthweight for their gestational age (32.8%).

Neonatal deaths by cause (PSANZ-PDC), plurality and birthweight percentiles, 2015 and 2016

	Neonatal deaths		Plurality		Birthweight percentiles	
Cause of death	Number	%	Singleton	Multiple	< 10th percentile	> 90th percentile
Congenital anomaly	449	31.2%	35.3%	10.4%	47.5%	31.3%
Spontaneous preterm	415	28.8%	23.8%	54.2%	16.3%	23.6%
Perinatal infection	153	10.6%	11.2%	6.7%	4.6%	9.0%
Antepartum haemorrhage	120	8.3%	8.8%	6.3%	5.0%	13.2%
Specific perinatal conditions	98	6.8%	5.3%	15.0%	4.2%	9.7%
Hypoxic peripartum death	61	4.2%	4.7%	2.5%	5.0%	3.5%
No obstetric antecedent	39	2.7%	3.2%	0.4%	2.1%	4.2%
Hypertension	36	2.5%	3.1%	0.0%	8.3%	0.0%
Maternal conditions	18	1.3%	1.4%	0.8%	0.4%	0.7%
Fetal Growth Restriction	16	1.1%	0.7%	2.5%	4.6%	0.7%
Unexplained antepartum death	..	..	..	..	..	..
Not stated	34	2.4%	2.6%	1.3%	2.1%	4.2%
Number of neonatal deaths	1,439		1,179	240	240	144

In 2015 and 2016, the most frequent PSANZ-NDC causes of neonatal deaths (the most significant condition present in the baby in the neonatal period leading to the death) were:

- extreme prematurity (36.9%)
- congenital anomaly (29.7%)
- neurological conditions (13.1%).

Neonatal deaths by cause (PSANZ-NDC), 2015 and 2016

		Neonatal deaths	
Cause of death		Number	%
Extreme prematurity	Too immature for resuscitation or death after unsuccessful resuscitation	531	36.9%
Congenital anomaly	Structural, functional or chromosomal abnormality	428	29.7%
Neurological	Includes deaths from asphyxial brain damage or intracranial haemorrhage	188	13.1%
Infection	Congenital or acquired infection by organism such as sepsis or pneumonia	82	5.7%
Cardio-respiratory disorders	Such as respiratory distress syndrome or meconium aspiration syndrome	67	4.7%
Other	Includes SIDS, multisystem failure, trauma and treatment complications	51	3.5%
Gastrointestinal	Gastrointestinal conditions including necrotizing enterocolitis	33	2.3%
Not stated	PSANZ-NDC not stated	59	4.1%
Total		**1,439**	**100%**

Note: For detailed definitions of PSANZ-PDC categories refer to the Technical notes.

Find out more:

To view data on **causes of stillbirths and neonatal deaths by plurailty, gestation, timing and maternal characteristics**, see the web report.

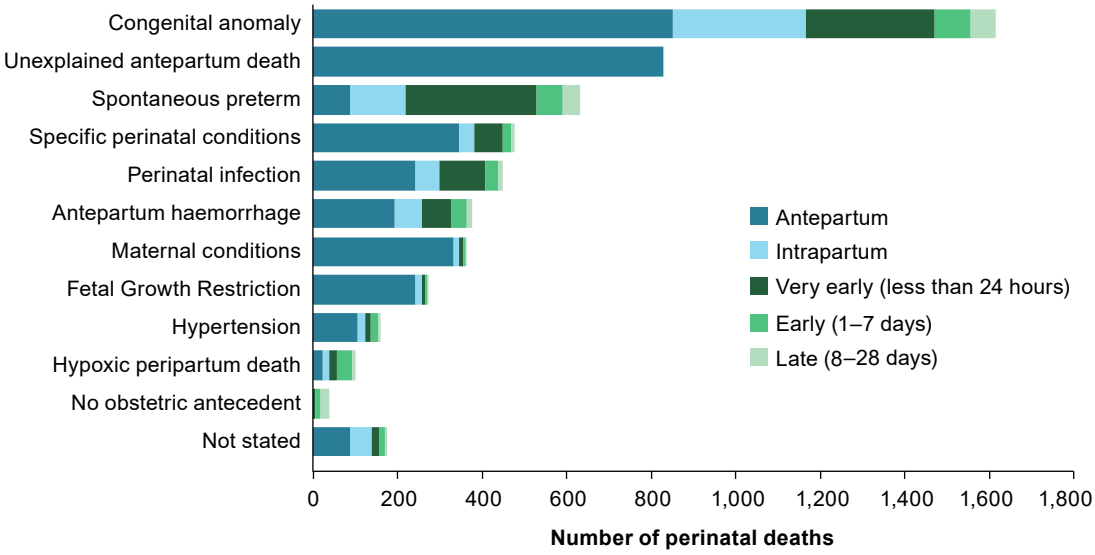
Timing and causes of perinatal deaths

The most commonly classified causes of antepartum stillbirths were congenital anomaly (25.5%), unexplained antepartum death (24.8%), specific perinatal conditions (10.4%) and maternal conditions (10.0%).

Congenital anomaly (43.7%) and spontaneous pre-term birth (18.4%) were the most common causes allocated to intrapartum stillbirths.

Congenital anomaly (31.2%) and spontaneous pre-term birth (28.8%) were the most common causes of neonatal death; perinatal infection (10.6%) and antepartum haemorrhage (8.3%) were also common.

Perinatal deaths by cause (PSANZ-PDC) and timing of death, 2015 and 2016



Note: Excludes records where timing of stillbirth or neonatal death is not stated.

6 Investigation following perinatal death

Autopsy

The purpose of an autopsy is to accurately identify the cause(s) of death. An accurate identification of the cause of death assists with identifying disorders that have implications for counselling and monitoring in future pregnancies (Flenady et al. 2018). Autopsy results contribute to clinical audit and assist with identification of factors contributing to the death. Perinatal autopsy examinations require written consent from parent(s) following informed discussion.

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.

Full autopsy: examination of all body cavities and dissection of all organs.

Limited autopsy: examination of one or more body cavities (such as the chest and/or abdomen) and dissection of one or more organs, but not the whole body.

External examination only: external examination of the body and growth parameters and any other relevant investigations such as radiological survey, genetic testing, placental histology, virology and microbiology.

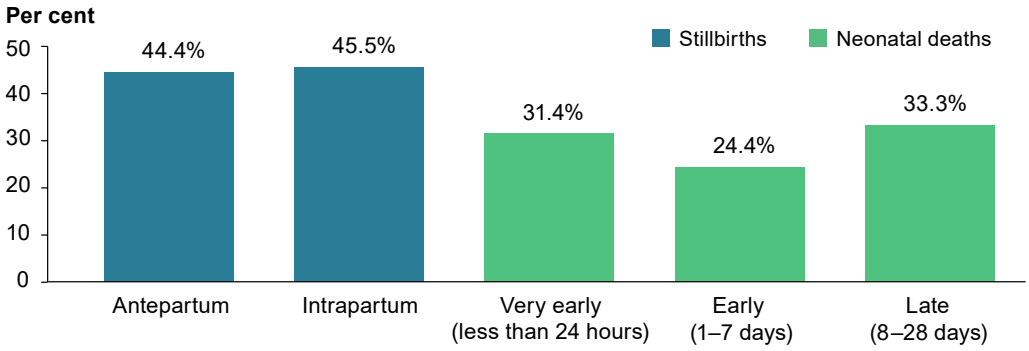
Some jurisdictions are only able to report if an autopsy was performed, but are unable to report the type, these have been included as **Autopsy performed but type unknown**.

In 2015 and 2016, there were 2,246 perinatal deaths where an autopsy was performed (41.1% of all perinatal deaths). Autopsies were reported to have been performed for 44.8% of stillbirths and 30.1% of neonatal deaths.

Number of perinatal deaths by autopsy type, 2015 and 2016

Autopsy type	Stillbirths	Neonatal deaths	Perinatal deaths
Full autopsy	679	144	823
Limited autopsy	43	42	85
External examination only	126	45	171
Autopsy performed but type unknown	982	185	1,167
No autopsy performed	2,251	965	3,216
Not stated	182	58	240
Total	**4,263**	**1,439**	**5,702**

Proportion of perinatal deaths where autopsy was performed by timing of death, 2015 and 2016



Notes

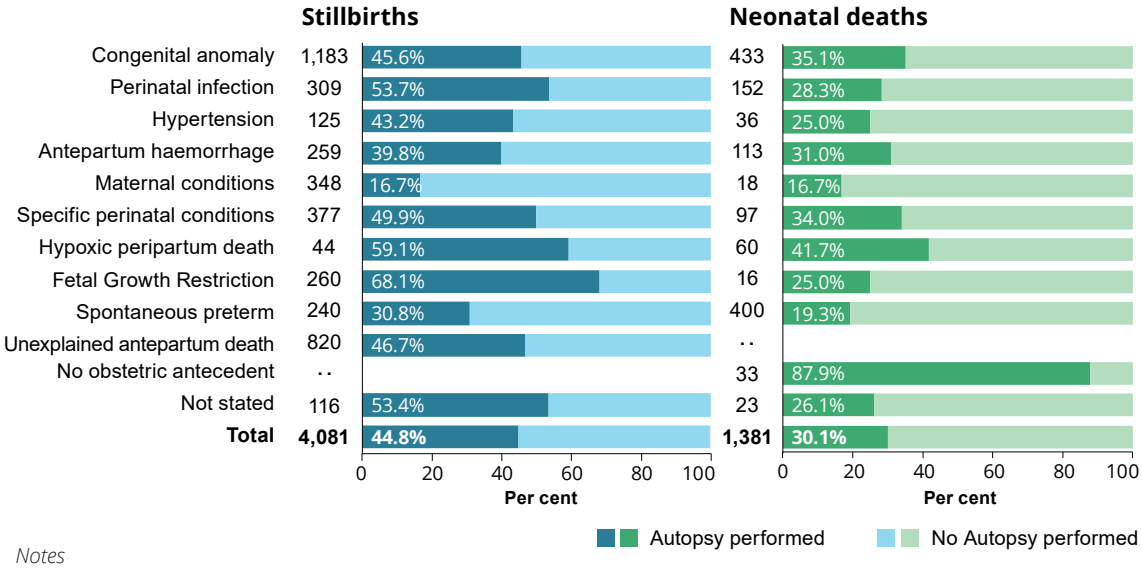
1. Autopsy performed includes full and limited autopsies, external examinations and records where an autopsy was performed but type is unknown.
2. Excludes records where autopsy status was 'Not stated'.

Where autopsy status was known, autopsy was most commonly performed for intrapartum stillbirths and least commonly for early neonatal deaths.

The incidence of autopsy varied depending on the allocated cause of death category, with 68.1% of stillbirths due to antepartum haemorrhage undergoing an autopsy compared with 33.8% of deaths where the cause was classified as fetal growth restriction.

For neonatal deaths, 87.9% of deaths where there was no obstetric antecedent as the classified cause of death underwent an autopsy, while 16.7% of deaths due to specific perinatal condition underwent an autopsy.

Proportion of perinatal deaths where autopsy was performed by cause of death (PSANZ-PDC), 2015 and 2016



Notes

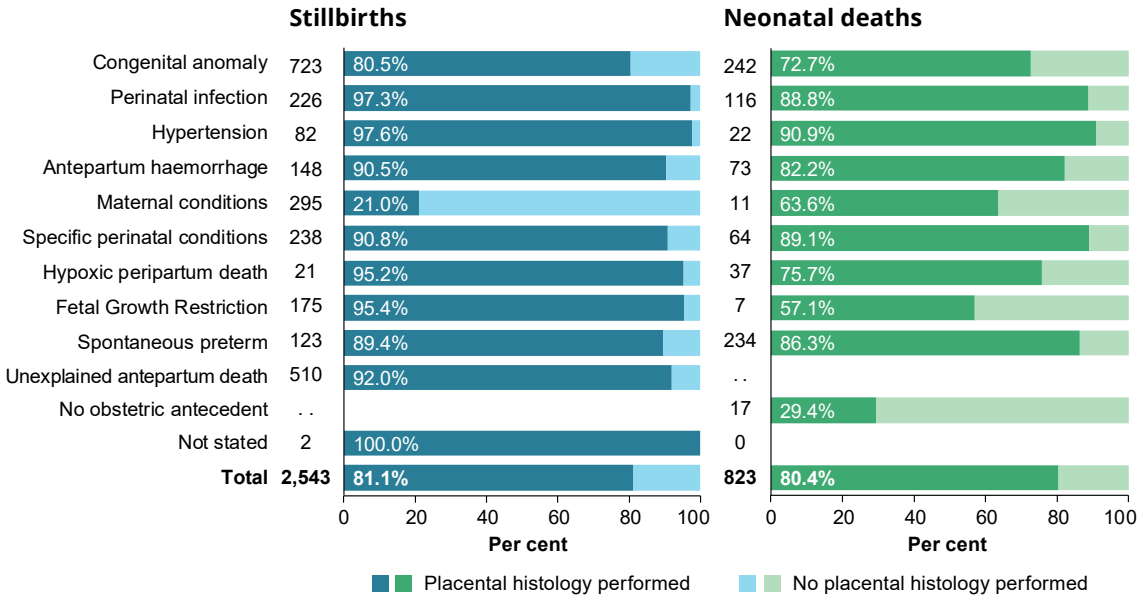
1. Autopsy performed includes full and limited autopsies, external examinations and records where an autopsy was performed but type is unknown.
2. Excludes records where autopsy status was 'Not stated'.

Placental examination

The placenta is integral to a baby's growth and survival prior to birth. Microscopic examination of the placenta, membranes and cord by a pathologist (histological examination) should be considered after all births (Flenady et al. 2018). Histological examination of the placenta is of particular importance when the baby's weight is not consistent with its gestation at birth, when birth is significantly preterm or the baby is ill at birth, or a stillbirth has occurred. Consent is not required for placental examination.

In 2015 and 2016, there were 3,366 perinatal deaths where placental histology status was stated. Of these, 2,724 placental histological examinations were performed. Data on placental histological examinations are not available for Queensland, Western Australia or South Australia. After excluding those states, this equates to placental examination being performed in 80.9% of all perinatal deaths (81.1% of stillbirths and 80.4% of neonatal deaths) where placental investigation status was known.

Proportion of perinatal deaths where placental examination was performed by cause of death (PSANZ-PDC), 2015 and 2016



Note: Excludes Qld, WA and SA, as data were not available, and records where placental examination was 'Not stated'.

Contributing factors

State and territory perinatal mortality committees examine circumstances associated with perinatal deaths to identify possible contributing factors, so that systemic factors affecting the perinatal mortality rate may be identified. Review of a perinatal death may identify more than one contributing factor.

Contributing factors are grouped into three main categories:

- **Professional practice** (such as failure to recognise clinical deterioration and inadequate clinical monitoring in at-risk situations).
- **Lack of, or delay in, access to appropriate care** (including access to appropriate expertise, services and treatment).
- **Family and social situation** (such as substance abuse, family violence and language barriers).

In 2015 and 2016, Victoria, Tasmania and the Northern Territory supplied the findings of 339 perinatal deaths (232 stillbirths and 107 neonatal deaths) reviewed for contributing factors to the National Perinatal Mortality Data Collection. Contributing factors were identified in relation to 176 of these perinatal deaths, with factors found to have *significantly* contributed to the outcome in 82 (24.2%) of the 339 perinatal deaths that were reviewed. No contributing factor was identified for 163 (48.1%) of the cases reviewed.

Of the 214 contributory factors identified, most frequent were those relating to the mother, her family and the social situation (56.1%), and related to professional practice (32.2%). On average, more than one contributory factor was found for each case reviewed. For neonatal deaths, there was a greater proportion of factors identified related to professional practice (50.0%).

Contributing factor review for perinatal deaths, 2015 and 2016

	Stillbirths	Neonatal deaths	Perinatal deaths
Deaths reviewed for contributoring factor(s)			
Number of deaths reviewed	232	107	339
Deaths with contributing factor(s) identified	131	45	176
Deaths with no contributing factor(s) identified	101	62	163
Deaths where contributing factor assessment not undertaken	1,244	369	1,613
Records excluded as not supplied to data collection	2,787	963	3,750
Total	**4,263**	**1,439**	**5,702**
Contributory factors identified (more than one can be identified per case)			
Contributory factor(s) related to the mother/her family/social situation	101	19	120
Contributory factor(s) related to professional care	43	26	69
Contributory factor(s) related to access to care	18	5	23
Other contributory factor(s) identified	0	2	2
Total number of contributory factor(s) identified	**162**	**52**	**214**

Notes

1. More than one contributing care factor can be identified in relation to a perinatal death.
2. Excludes NSW, Qld, WA, SA and ACT as data were not available.

7 Focus groups

- **Near-term singleton babies with no known major congenital anomaly**
- **Aboriginal and/or Torres Strait Islander women and their babies**

Near-term singleton perinatal deaths without congenital anomaly

This section examines perinatal deaths that occurred in singleton pregnancies, where the baby did not have a major congenital anomaly causing death and where the pregnancy ended at or after 36 weeks gestation. For the purposes of this report, such babies are called 'near-term normally-formed singleton babies'.

In 2015 and 2016, near-term normally-formed singleton babies accounted for a large proportion (93.0%) of all babies born, and a small proportion (13.5%) of perinatal deaths with a low rate of perinatal death (1.3 perinatal deaths per 1,000 births).

When considering potential avoidability in relation to perinatal death, review of perinatal death in this group of babies is likely to be most effective when examining policy and practice in maternity and neonatal care (Draper et al. 2015, 2017; Royal College of Obstetricians and Gynaecologists 2017).

A **near-term normally-formed singleton** baby is one that meets all 3 of the following criteria:

- ☑ Born at or after 36 weeks gestation
- ☑ Classified cause of death not due to a congenital anomaly
- ☑ Plurality must be that of a single fetus

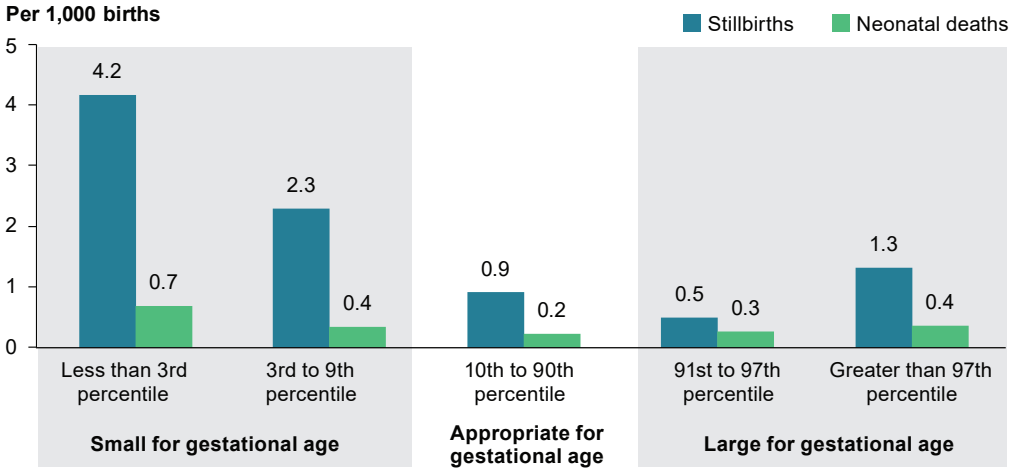
In 2015 and 2016, perinatal deaths of near-term normally-formed singleton babies:

- accounted for 770 perinatal deaths, 623 (80.9%) of which were stillbirths and 147 (19.1%) were neonatal deaths
- were most common at 36 weeks gestation (6.2 perinatal deaths per 1,000 births) and babies with a birthweight less than the 10th percentile (3.2 perinatal deaths per 1,000 births)
- were more likely among babies born to women who reported smoking during pregnancy compared with women who did not smoke (2.42 and 1.21 deaths per 1,000 births, respectively)
- were more likely to occur in babies born to women who had pre-existing diabetes (4.25 deaths per 1,000 births)
- decreased as the number of antenatal visits increased. The lowest rates were seen among babies born to women who accessed 6 or more antenatal visits (1.16 per 1,000 births).

Birthweight for gestational age

The rate of perinatal death was highest for near-term normally-formed single babies whose birthweight was classified as being small for their gestational age. The rate of both stillbirth and neonatal death was particularly high for those babies whose birthweight was classified as being less than the 3rd percentile for their gestational age.

Perinatal deaths for near-term normally-formed singleton babies by percentiles, 2015 and 2016

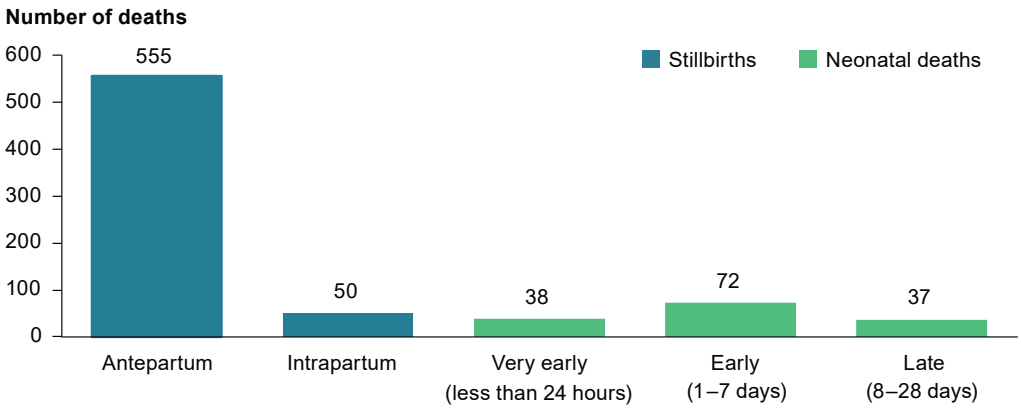


Note: Excludes records where birthweight and/or gestational age is not stated.

Timing of perinatal deaths

Antepartum stillbirth (death prior to the onset of labour) was the most common type of perinatal death (73.8%) for near-term normally-formed single babies.

Perinatal deaths for near-term normally-formed singleton babies by timing of death, 2015 and 2016



Note: Excludes records where timing of stillbirth or neonatal death is not stated.

Causes

The most commonly classified causes of perinatal death for near-term normally-formed singleton babies were unexplained antepartum death (36.6%) and perinatal infection (13.5%).

These causes were similar for stillbirths (45.3% and 13.5%, respectively). For neonatal deaths, the most common causes were hypoxic peripartum death (31.3%) and no obstetric antecedent (25.9%).

Perinatal deaths for near-term normally-formed singleton babies by cause (PSANZ-PDC), 2015 and 2016

	Stillbirths		Neonatal deaths		Perinatal deaths	
Cause of death	**Number**	**%**	**Number**	**%**	**Number**	**%**
Unexplained antepartum death	282	45.3%	..	..	282	36.6%
Perinatal infection	84	13.5%	20	13.6%	104	13.5%
Hypoxic peripartum death	31	5.0%	46	31.3%	77	10.0%
Specific perinatal conditions	65	10.4%	10	6.8%	75	9.7%
Antepartum haemorrhage	49	7.9%	20	13.6%	69	9.0%
Fetal Growth Restriction	50	8.0%	3	2.0%	53	6.9%
Maternal conditions	37	5.9%	3	2.0%	40	5.2%
No obstetric antecedent	..	..	38	25.9%	38	4.9%
Hypertension	9	1.4%	4	2.7%	13	1.7%
Not stated	16	2.6%	3	2.0%	19	2.5%
Total	**623**		**147**		**770**	

Notes

1. For detailed definitions of PSANZ-PDC categories refer to the Technical notes.
2. 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.

Causes of perinatal deaths among near-term normally-formed singleton babies varied by birthweight percentile with the majority (69.1%) of babies who died having birthweights appropriate for their gestational age.

Babies considered small for their gestational age (weighing less than the 10th percentile) accounted for 177 or 23.0% of perinatal deaths among near-term normally formed singleton babies. These deaths were most commonly due to:

- unexplained antepartum death (47 perinatal deaths)
- fetal growth restriction (46 perinatal deaths).

Babies considered large for their gestational age (weighing greater than the 90th percentile) most commonly died as a result of:

- unexplained antepartum death (14 perinatal deaths)
- maternal conditions (13 perinatal deaths); these can include conditions such as diabetes.

Perinatal deaths for near-term normally-formed singleton babies by cause (PSANZ-PDC) and birthweight percentiles, 2015 and 2016

	Stillbirths			Neonatal deaths		
Cause of death	< 10th percentile	10th–90th percentile	> 90th percentile	< 10th percentile	10th–90th percentile	> 90th percentile
Unexplained antepartum death	30.7%	51.6%	34.1%	..	..	..
Perinatal infection	17.0%	12.1%	14.6%	8.3%	14.4%	18.8%
Hypoxic peripartum death	3.9%	5.4%	2.4%	41.7%	29.8%	25.0%
Specific perinatal conditions	7.8%	11.7%	7.3%	0.0%	6.7%	12.5%
Antepartum haemorrhage	3.9%	9.6%	4.9%	16.7%	14.4%	6.3%
Fetal Growth Restriction	28.1%	1.6%	0.0%	12.5%	0.0%	0.0%
Maternal conditions	2.6%	4.7%	31.7%	0.0%	1.9%	0.0%
No obstetric antecedent	..	..	..	20.8%	26.0%	37.5%
Hypertension	2.6%	1.2%	0.0%	0.0%	3.8%	0.0%
Not stated	3.3%	2.1%	4.9%	0.0%	2.9%	0.0%
Total	**153**	**428**	**41**	**24**	**104**	**16**

Note: 4 births have been excluded, as birthweight was not available.

For neonatal deaths, the predominant conditions present in the baby in the neonatal period leading to the death (identified by the PSANZ-NDC system) for near-term normally-formed singleton babies across all birthweights were neurological (54.4%).

Perinatal deaths for near-term normally-formed singleton babies by cause (PSANZ-NDC), 2015 and 2016

	Neonatal deaths	
Cause of death	Number	%
Neurological	80	54.4%
Other	33	22.4%
Infection	23	15.6%
Cardio-respiratory disorders	7	4.8%
Gastrointestinal	1	0.7%
Not Stated	3	2.0%
Total	**147**	

Note: For detailed definitions of PSANZ-NDC categories refer to the Technical notes.

Find out more in our web report:
Near-term singleton perinatal deaths without congenital anomaly.

Investigation

Stillbirths classified as 'unexplained antepartum death' and neonatal deaths classified as having 'no obstetric antecedent' are deaths where the underlying causes are largely unknown. These, and perinatal deaths classified as 'hypoxic peripartum death', accounted for 51.5% of deaths in term normally-formed singleton babies. Investigations such as autopsy and placental histology examination are of particular importance in seeking the underlying causes of death in these babies.

Autopsy

Autopsy was performed more frequently in this group (57.7%) than for perinatal deaths occurring across all babies (41.1%). For near-term normally-formed singleton babies, the proportion of autopsy was similar across stillbirths (344 or 57.3% of stillbirths) and neonatal deaths (81 or 59.1% of neonatal deaths).

Perinatal deaths by autopsy status, 2015 and 2016

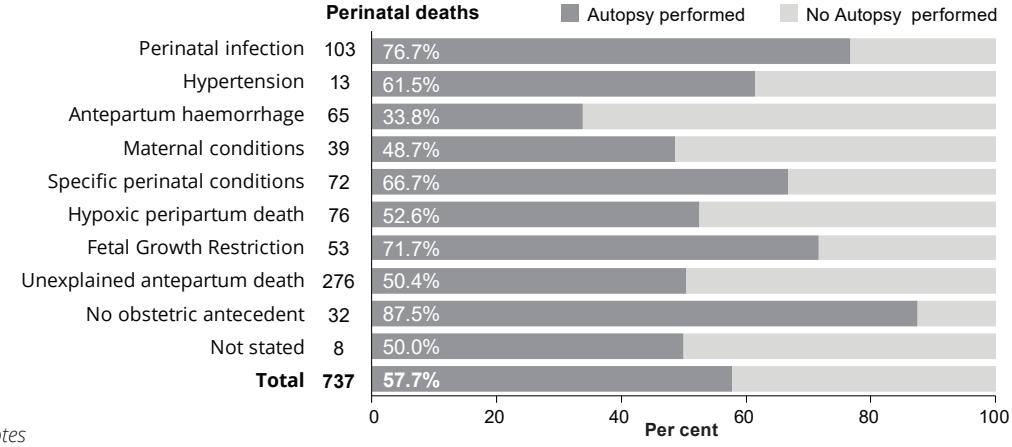
	Stillbirth		Neonatal death		Perinatal death	
Autopsy status	**Number**	**%**	**Number**	**%**	**Number**	**%**
Autopsy performed	344	57.3%	81	59.1%	425	57.7%
No autopsy performed	256	42.7%	56	40.9%	312	42.3%
Not stated	23		10		33	
Total	**623**		**147**		**770**	

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

Autopsy investigation was conducted more frequently in relation to neonatal deaths, with the highest proportion being performed in very early (less than 24 hours) neonatal deaths (75.0%).

The incidence of autopsy varied depending on the cause of death, with 87.5% of deaths due to hypoxic peripartum death undergoing an autopsy compared with 33.8% of deaths due to fetal growth restriction.

Proportion of perinatal deaths were an autopsy was performed by cause of death (PSANZ-PDC), 2015 and 2016



Notes

1. Autopsy performed includes full and limited autopsies, external examinations and records where an autopsy was performed but type is unknown.
2. Excludes records where autopsy status was 'Not stated'.

Placental examination

In 2015 and 2016, there were 394 placental histological examinations performed for near-term normally-formed singleton baby perinatal deaths. Data on placental histology examinations are not available for Queensland, Western Australia or South Australia. Across jurisdictions reporting these data, 9 out of 10 perinatal deaths had placental histological examination performed.

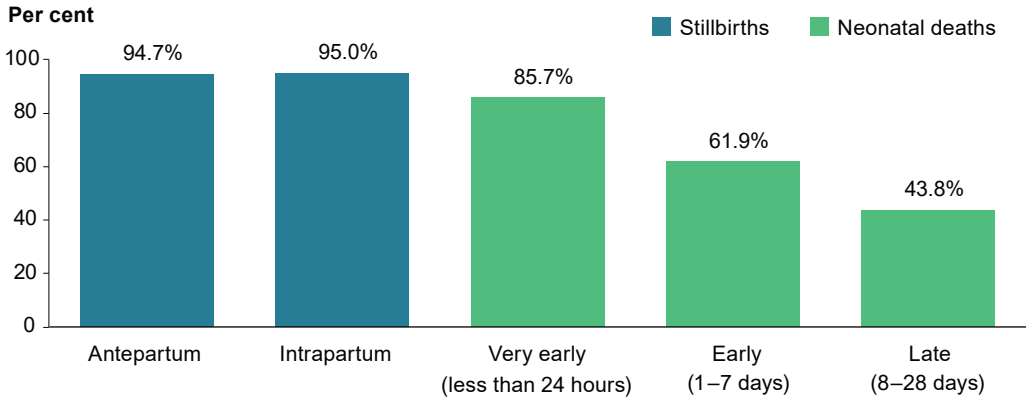
Perinatal deaths by placental examination, 2015 and 2016

	Stillbirth		Neonatal death		Perinatal death	
Placental examination	**Number**	**%**	**Number**	**%**	**Number**	**%**
Placental histology performed	343	94.8%	51	64.6%	394	89.3%
None	19	5.2%	28	35.4%	47	10.7%
Not stated	11		7		18	
Total	**373**		**86**		**459**	

Note: Placental histology performed excludes Qld, WA and SA as data were not available.

Where placental examination status was known, placental histological examination was most commonly performed for stillbirths, both antepartum and intrapartum, and least commonly for late neonatal deaths.

Proportion of perinatal deaths of near-term normally-formed singleton babies where placental histology was performed by timing of death, 2015 and 2016



Notes

1. Placental histology performed excludes Qld, WA and SA as data were not available
2. Excludes records where status was 'Not stated'.

Indigenous women and their babies

A woman's Indigenous status is self-identified during maternity and newborn care. The data presented in this chapter are reported by maternal Indigenous status—that is, babies born to mothers who identify as Aboriginal and/or Torres Strait Islander.

In 2015 and 2016, babies born to Indigenous women accounted for 4.3% of all births and 6.3% of all perinatal deaths (6.0% of stillbirths and 7.4% of neonatal deaths).

Perinatal deaths for babies of Indigenous women, 2015 and 2016

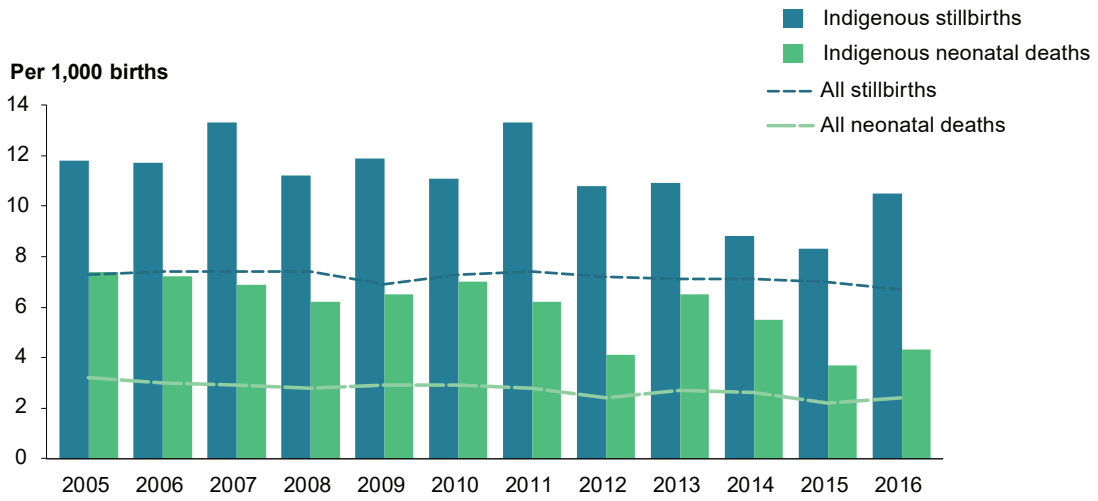
			Stillbirths		Neonatal deaths		Perinatal deaths	
Year	Total births	Live births	Number	Rate	Number	Rate	Number	Rate
2015	13,204	13,090	110	8.3	49	3.7	159	12.0
2016	13,794	13,647	145	10.5	58	4.3	203	14.7
Total	**26,998**	**26,737**	**255**	**9.4**	**107**	**4**	**362**	**13.4**

Notes

1. The rate is the number of deaths per 1,000 births.
2. The sum of the number of stillbirths plus the number of live births may not always be equal to the total number of births as they are sourced from different data collections.

The rate of perinatal death for babies born to Indigenous women decreased from 19.1 deaths per 1,000 births in 2005 to 14.7 deaths per 1,000 births in 2016. The rate of neonatal death for babies born to Indigenous women decreased from 7.4 to 4.3 deaths per 1,000 live births. The rate of stillbirth for babies born to Indigenous women has shown a smaller decrease, from 11.8 stillbirths per 1,000 births in 2005 to 10.5 stillbirths per 1,000 births in 2016.

Rate of perinatal deaths for babies of Indigenous women, 2015 and 2016



Note: Data from Victoria are not available for 2009 so have been excluded.

In 2015 and 2016:

- the perinatal mortality rate was higher for babies born to Torres Strait Islander women compared with babies born to Aboriginal women and babies born to women who identify as both Aboriginal and Torres Strait Islander
- stillbirth and neonatal mortality rates in babies born to Indigenous women increased with increasing remoteness
- the perinatal mortality rate was higher among babies born to Indigenous women who reported smoking during pregnancy compared with babies born to Indigenous women who did not smoke
- perinatal death was more than twice as common among babies born to Indigenous women who had pre-existing diabetes than to those born to Indigenous women who had no diabetes.

Perinatal deaths of babies of Indigenous women by select characteristics, 2015 and 2016

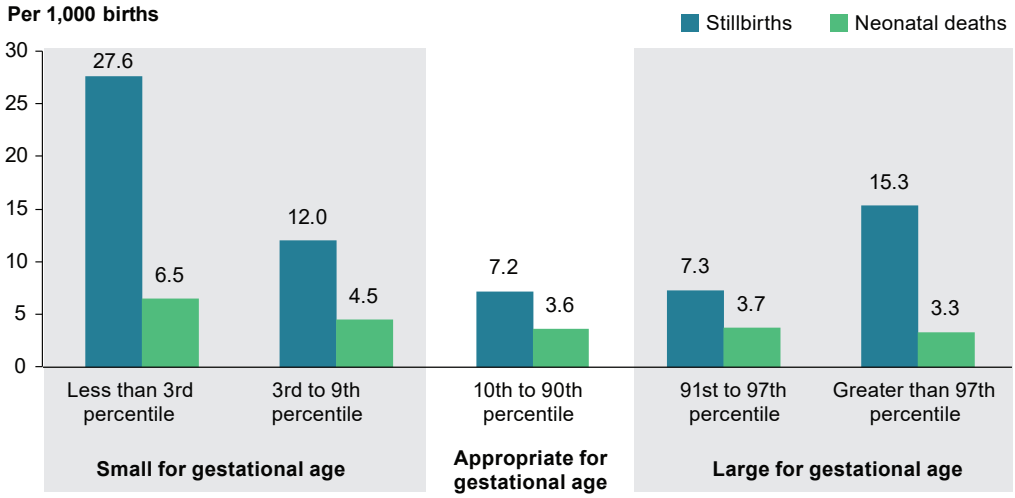
	Perinatal deaths		Stillbirths	Neonatal deaths
	Number	Deaths per 1,000 births	Deaths per 1,000 births	Deaths per 1,000 live births
Total	**362**	**13.4**	**9.4**	**4.0**
Indigenous status of the mother				
Aboriginal	325	13.4	9.3	4.1
Aboriginal and Torres Strait Islander	17	12.1	9.3	2.9
Torres Strait Islander	20	15.9	12.0	4.0
Remoteness of mother's usual residence				
Major cities	85	9.5	7.1	2.4
Inner regional	57	9.5	6.7	2.8
Outer regional	87	14.2	10.4	3.9
Remote and very remote	131	22.9	14.9	8.1
Not stated	2	..		
Smoking status				
Smoked during pregnancy	173	14.5	10.3	4.3
Did not report smoking	176	12.0	8.5	3.5
Not stated	13	..		
Mother's diabetes status				
Pre-existing diabetes	17	30.2	21.3	9.1
Gestational diabetes	13	4.8	2.9	1.8
None	297	14.8	10.6	4.2
Not stated	19	..		
Mother's age				
Under 20	59	15.2	11.3	3.9
20–24	119	13.7	8.4	5.3
25–29	80	10.9	7.2	3.7
30–34	68	14.9	12.2	2.7
35–39	28	14.1	11.0	3.0
40 or over	8	16.7	14.6	2.1

Note: Mother's diabetes status excludes Victoria in 2015 and 2016.

Birthweight for gestational age

The rate of perinatal death in babies born to Indigenous women was highest for those babies who were small for their gestational age (less than 10th percentile). Babies who were small or large for gestational age and born to Indigenous women had a higher rate of stillbirth than babies whose birthweights were appropriate for gestational age. The rate of stillbirth was particularly high for those babies whose birthweight was classified as being less than the 3rd percentile for their gestational age.

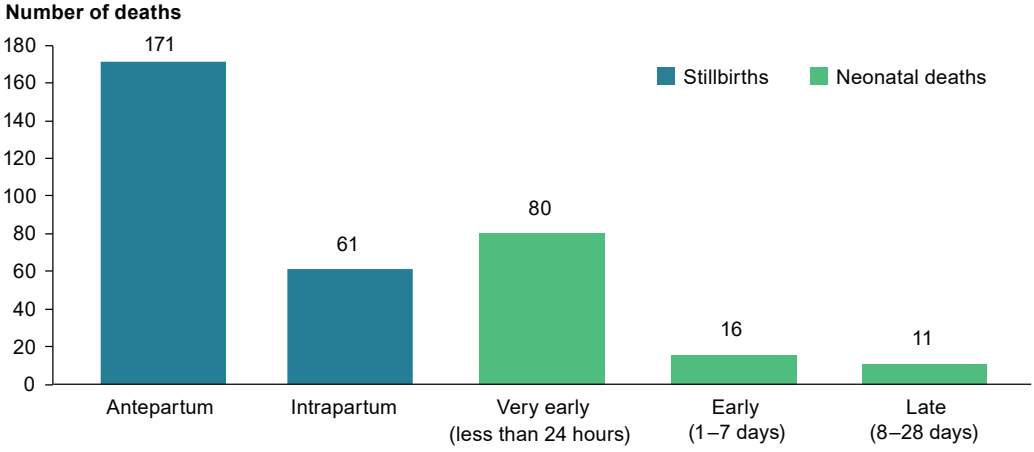
Perinatal deaths of babies of Indigenous women by percentiles, 2015 and 2016



Timing of perinatal deaths

In babies born to Indigenous women, antepartum stillbirths (those occurring prior to the onset of labour) were the most common type of perinatal death (50.4%).

Perinatal deaths of babies of Indigenous women by timing of death, 2015 and 2016



Note: Excludes records where timing of stillbirth or neonatal death is not stated.

Causes

The most common causes of perinatal deaths among babies born to Indigenous women were congenital anomaly, spontaneous preterm and unexplained antepartum death.

Unexplained antepartum death, congenital anomaly, and spontaneous pre-term were the main causes of stillbirth. Spontaneous pre-term, congenital anomaly and specific perinatal condition were the main causes of neonatal death.

Perinatal deaths of babies of Indigenous women by cause (PSANZ-PDC), 2015 and 2016

	Stillbirths		Neonatal deaths		Perinatal deaths	
Cause of death	Number	%	Number	%	Number	%
Congenital anomaly	53	20.8%	18	16.8%	71	19.6%
Spontaneous preterm	31	12.2%	40	37.4%	71	19.6%
Unexplained antepartum death	56	22.0%	..	..	56	15.5%
Perinatal infection	20	7.8%	8	7.5%	28	7.7%
Antepartum haemorrhage	20	7.8%	7	6.5%	27	7.5%
Specific perinatal conditions	14	5.5%	10	9.3%	24	6.6%
Maternal conditions	14	5.5%	3	2.8%	17	4.7%
Fetal Growth Restriction	15	5.9%	2	1.9%	17	4.7%
Hypertension	12	4.7%	3	2.8%	15	4.1%
Hypoxic peripartum death	3	1.2%	5	4.7%	8	2.2%
No obstetric antecedent	..	..	3	2.8%	3	0.8%
Not stated	17	6.7%	8	7.5%	25	6.9%
Total	**255**		**107**		**362**	

Notes

1. For detailed definitions of PSANZ-PDC categories refer to the Technical notes.
2. 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.

For neonatal deaths, a second classification (PSANZ-NDC) is applied to identify the most significant condition present in the baby in the neonatal period leading to the death. Among babies born to Indigenous women, the most common causes were extreme prematurity, followed by congenital anomaly.

Neonatal deaths of babies of Indigenous women by cause (PSANZ-NDC), 2015 and 2016

	Neonatal deaths	
Cause of death	Number	%
Extreme prematurity	60	56.1%
Congenital anomaly	15	14.0%
Neurological	8	7.5%
Cardio-respiratory disorders	6	5.6%
Infection	5	4.7%
Other	3	2.8%
Not stated	10	9.3%
Total	**107**	

Note: For detailed definitions of PSANZ-NDC categories refer to the Technical notes.

Investigation

In 2015 and 2016, for babies born to Indigenous women, an autopsy was reported to have been performed in 136 or 39.4% of cases. This was lower than the incidence of autopsy across all babies who died in the same period (41.1%).

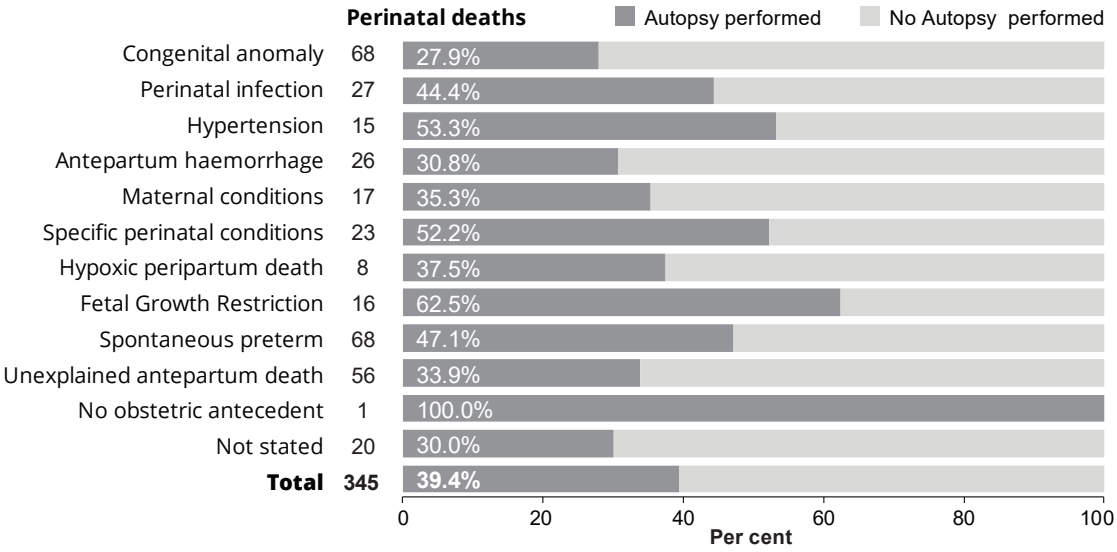
Perinatal deaths of babies of Indigenous women by autopsy status, 2015 and 2016

	Stillbirth		Neonatal death		Perinatal death	
Autopsy status	**Number**	**%**	**Number**	**%**	**Number**	**%**
Autopsy performed	95	38.6%	41	41.4%	136	39.4%
No autopsy performed	151	61.4%	58	58.6%	209	60.6%
Not stated	9	..	8	..	17	..
Total	**255**		**107**		**362**	

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

An autopsy was most commonly performed for perinatal deaths of babies born to Indigenous women where the cause of death was no obstetric antecedent, fetal growth restriction or hypertension.

Perinatal deaths of babies of Indigenous women by autopsy status and cause (PSANZ-PDC), 2015 and 2016



Note: Excludes 17 records where autopsy status was 'Not stated'.

Placental histological examinations were performed for 91.9% of perinatal deaths among babies born to Indigenous women, which was a higher incidence than that seen across all perinatal deaths (75.5%).

Acknowledgments

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The authors would like to acknowledge the families and loved ones whose losses are documented in this report and express their sincere condolences to them.

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Notes

Data source

The National Perinatal Mortality Data Collection (NPMDC) is a data collection established within the AIHW that contains information regarding the deaths of babies in hospitals and in the community, and includes all neonatal deaths and stillbirths of babies of at least 20 weeks gestation or at least 400 grams birthweight, during pregnancy, birth or within 28 days of birth.

The NPMDC builds on the National Perinatal Data Collection (NPDC), also managed by the AIHW, which contains data on all babies born in hospitals and in the community within the scope of that collection. Common identifier fields in the NPDC and NPMDC allow demographic information regarding perinatal death records in the NPMDC to be retrieved from the NPDC.

State and territory health authorities supply data to the AIHW under individual data agreements. The NPDC data are obtained from the birth hospitals and may not include information about deaths that occur among babies who died after transfer to a different hospital or after discharge home.

Definitions used in reporting

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:

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 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.

Live birth: the birth of a baby who show 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 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.

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. As such, 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.

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 used in this report.

ABS data are sourced from state and territory registrars of Births, Deaths and Marriages. 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. NPMDC and NPDC data contained in this report are sourced from midwives, and other staff, who collect information from mothers and perinatal administrative and clinical record systems.

The ABS codes the cause of deaths using the ICD classification system, while the NPMDC uses the PSANZ classification system.

Find out more:

For more information on the **methods, definitions and data used** within this report, please see the Technical notes in the web report.

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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, 6 babies are stillborn and 2 die within 28 days of birth (neonatal death).

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