The Consultative Council on Obstetric and Paediatric Mortality and Morbidity

# Victoria's mothers, babies and children 2014 and 2015

VICTORIA State Government | Health and Human Services

To receive this publication in an accessible format phone 9096 0380, using the National Relay Service 13 36 77 if required, or email clinical.councils@dhhs.vic.gov.au

Authorised and published by the Victorian Government, 1 Treasury Place, Melbourne.



Where the term 'Aboriginal' is used it refers to both Aboriginal and Torres Strait Islander people. Indigenous is retained when it is part of the title of a report, program or quotation.

ISBN 978-0-7311-7185-9

Available at https://www2.health.vic.gov.au/hospitals-and-health-services/quality-safety-service/consultative-councils/council-obstetric-paediatric-mortality/

(1703016)

# Message from the Chair

Despite the burgeoning rise in Victoria's population and consequent increases in the number of births, the outcomes for mothers and babies continues to improve. The perinatal mortality rate in 2014 and 2015 was amongst the lowest yet for the state, and amongst the lowest in the developed world. This is a tribute to the quality of care provided to mothers and children by Victoria's health care providers.

These outcomes were achieved despite the increasing age of mothers, the effect of rising obesity rates and prevalence of various chronic diseases, all of which have an impact on the course of the pregnancy and the developing baby.

Another major contributor to maternal, perinatal and child and adolescent outcomes is vulnerability: the increased risk that comes from factors that include socioeconomic deprivation, social isolation and suboptimal education opportunities. Recognition of these factors, alongside activating appropriate responses that can maximise positive interaction with the health services and minimise clinical risk, are key to addressing them and reducing their impact.

Other challenges remain, and a number of these are highlighted in this report. Two of the major functions of CCOPMM are to analyse all the data that are collected about each birth and review each death for mothers, babies, children and adolescents, to determine if there were contributing factors that played a part in the outcomes. Many of these factors are not modifiable, but the lessons learned, if appropriately applied, can form a major tool in further reducing — and preventing — some of these deaths that have such an impact on all those affected by them.

A number of planned initiatives have been introduced in 2016, which will have a major impact on improving the investigations of perinatal deaths and their reporting and analysis. The Victorian Perinatal Autopsy Service is now functioning, ensuring that all services in Victoria can access the highest quality autopsy service. The web-based Australian Perinatal Mortality Audit Tool (APMAT), developed in partnership with the Mater Research Institute in Queensland, will commence operation in 2017. APMAT will facilitate the reporting of key data items, and assist services in the classification of the deaths and reporting of potential contributing factors. Regional perinatal mortality and morbidity committees are now in operation, ensuring that all deaths and serious complications are comprehensively reviewed throughout the state, again an essential instrument for the improvement of maternity and neonatal services.

This report is the product of dedicated effort by members of the Clinical Council Unit under the leadership of Ms Vickie Veitch, which supports CCOPMM, members of the specialist sub-committees that review the deaths and the members of the council that oversees CCOPMM's activities.

The recommendations and good practice points in the report have been generated from the specialist sub-committees following their case reviews, and I commend them to health services — both managerial and clinicians — and to the consumers of Victoria's maternity and paediatric health care.

Jeremy JN Oats
Chair, CCOPMM

# Contents

# Figures

## Tables

# 1. Executive summary

Victoria continues to be a very safe place for mothers to give birth and for children to grow, with women, children and families experiencing world-class maternal, perinatal and paediatric services. The quality of maternal and paediatric care delivered in Victoria is due in part to the Victorian Government's commitment to assuring families of the safety and quality of the Victorian health care system and the passionate clinicians that provide that care.

In order to have safe, quality care, it is essential that well-established and efficient monitoring and reporting systems are in place. The need for CCOPMM and its clinical case review, classification and reporting functions could not be greater. The mortality review functions undertaken by CCOPMM, provides essential information to allow health services and the department to continually improve their care and achieve the goal of 'zero avoidable harm'.

*Victoria's Mothers, Babies and Children 2014 and 2015* presents key finding and recommendations arising from the review of births and deaths by CCOPMM. This report continues with the format presented in *Victoria's Mothers, Babies and Children 2012 and 2013*, with a selection of high-level priority areas and recommendations focusing on system-level issues. In addition, it has continued with individual sections, focusing on births and perinatal, child and adolescent and maternal mortality.

The report provides valuable evidence, information and data which are used to inform policy and service delivery, while also contributing to clinical practice improvements within the Victorian health system. Additionally, the report highlights the clinical risks which exist within our maternity and paediatric sectors, reminding us that safe care can be safer for Victorian mothers and children.

While Victoria works to implement the recommendations of Targeting Zero, the review of hospital safety and quality assurance in Victoria (2016), it is important to acknowledge that the events at Djerriwarrh occurred during the reporting period of this report. While we never wish for an event like this to recur, the identification of preventable deaths and associated contributing factors can drive further improvements to safety and quality through targeted initiatives and sharing of the lessons learnt.

The Victorian health system is experiencing the most significant overhaul of Victoria's health system in decades. Health services will need to be supported through this transition, and CCOPMM will play an important role in ensuring the community is well informed of the emerging risks to the health and wellbeing of Victoria's mothers and children.

## 1.1 Priority areas

Through their review of births and deaths for 2014 and 2015, the CCOPMM has highlighted a number of key priority areas that significantly impact the health and wellbeing of Victorian women and children. These areas require attention from not only the Victorian health sector, but also from the community more broadly.

### Clinical deterioration

Even when children and adolescents are receiving clinical care, avoidable deaths can still occur. Incorrect diagnosis, or failure to recognise clinical deterioration in children, are huge challenges for the health sector. The CCOPMM has reviewed multiple deaths where health practitioners have made presumptive diagnosis of a common medical problem, even though the clinical features were atypical. Clinicians need to be reminded that the diagnosis should be reconsidered when clinical deterioration occurs.

### Intentional self-harm (including suicide)

Intentional self-harm (including suicide) is a major cause of death in adolescents aged 15–17 years. This impacts adolescents as young as thirteen, so it is essential that there is greater awareness and action on youth mental health across the community. Much more work is required to prevent intentional self-harm (including suicide) in young people. A major challenge facing the health sector is the impulsive way in which adolescents intentionally self-harm and the lack of any planning.

### Asthma and anaphylaxis

Deaths of children and adolescents from asthma and anaphylaxis continue to occur in Victoria. While there has been improvement in the rate of deaths attributed to asthma and anaphylaxis, the major issue for the health sector is that these deaths are largely preventable. Most asthma and anaphylaxis deaths tend to include multiple factors, with delayed recognition, suboptimal clinical management and/or first-line response by carers being major issues. Patients, their families and health services all play an important role in reducing these rates.

### Avoidable perinatal mortality

Regular perinatal mortality and morbidity review is an essential tool to improving the quality and safety within health services. Although Victoria's overall maternal and perinatal mortality rates are low, there remains a cohort of deaths that are potentially avoidable. Health services need to ensure that through their mortality and morbidity reviews they are identifying contributing factors and modifying their practice accordingly.

## 1.2 Key findings

A selection of key findings from the data received by the CCOPMM in 2014 and 2015 is provided below. These data provide insight into the needs of Victorian women, babies, children and adolescents, and should be used to inform clinical practice, health policy and service planning.

### Births in Victoria

The number of babies born in Victoria continues to increase slowly, following a significant increase between 2011 and 2012.

Nearly one-third of the women who gave birth in 2015 were born in a country where English is not the first language.

Too many women are continuing to give birth via caesarean section, with one-third of women giving birth this way in 2015.

### Maternal mortality

Maternal deaths continue to be rare in Victoria, with a total of 19 deaths occurring between 2014–15.

A major challenge for health services is the impact of pre-existing health conditions, such as diabetes, obesity and cardiovascular disease.

Complex psychosocial circumstances continue to be a key factor in maternal mortality, including drug and alcohol abuse, mental health conditions and family violence.

### Perinatal mortality

Victoria's perinatal mortality rate is at its lowest rate (9.0 per 1000 births) in 15 years, which is comparable with the most recent national rate of 9.6 per 1000 births (2014).

Mortality rates of Aboriginal and Torres Strait Islander babies have also declined from 23.6 per 1000 births in 2008–10 to 13.6 per 1000 births in 2013–15.

While there have been improvements of perinatal outcomes in Victoria, there are some key challenges for the sector. The rate of contributing factors identified through the review of mortality cases has increased from 5 per cent in 2012–13 to 8 per cent in 2014–15. In addition, perinatal mortality rates remain high for a number of vulnerable groups in the community, including:

- Aboriginal women
- women born in Sub-Saharan Africa, Oceania, southern and eastern Europe and southern and central Asia
- multiple pregnancies
- women who give birth to babies preterm or with fetal growth restriction.

### Child and adolescent mortality

Child and adolescent deaths continue to decline in Victoria; however, a significant number of young deaths continue to be avoidable.

Congenital anomaly was the leading cause of death for 28 days to four years and the 10–14 years age group in 2015. Malignancy (cancer) was the leading cause of death in the 5–9 year age group in 2015. Sadly, suicide and motor vehicle accidents continue to be leading causes of death in 15–17 year olds.

While all child and adolescent deaths are an area of concern for the CCOPMM, certain causes of death have been highlighted in this report:

- deaths associated with incorrect diagnosis and clinical deterioration
- youth suicide, which continues to be a major challenge for the sector and the community
- deaths from anaphylaxis and asthma, with a significant number continuing to be potentially avoidable
- sudden and unexplained death in infancy as the result of unsafe sleep environments and practices
- unintentional deaths at work sites, including farms, factories or rural properties
- deaths from motor vehicle accidents, as either a passenger or pedestrian.

## 1.3 Recommendations

The following recommendations have been developed through analysis of the case reviews undertaken by the CCOPMM. The aim of the recommendations is to influence system-level change for the purpose of improving health outcomes for Victorian mothers, babies, children and adolescents.

### Clinical deterioration

Even when children or adolescents have recently seen a medical practitioner or have been admitted to hospital, avoidable deaths can and still occur.

#### Recommendation 1

That all health services providing paediatric services implement a comprehensive and integrated organisational-wide approach to detect and respond to any paediatric deterioration. That approach requires multiple processes and practices, including:

- thresholds for admission (such as repeated presentations for same illness)
- specific skills for paediatric Medical Emergency Team (MET) attendance
- assessing parental concerns about a child's condition/change in condition openly
- use of specific paediatric observation charts, such as the Victorian Children's Tool for Observation and Response (ViCTOR)
- embedding the value of review/reassessment by a second, independent clinician at critical points in the care pathway, including when:
  - questions remain about a diagnosis
  - the signs and symptoms are atypical
  - normal clinical resolution is not occurring with adequate treatment
  - at the request of parents, caregivers or staff caring for the child.
- escalation procedures (including links with tertiary paediatric centres and PIPER)
- informing parents and carers about the expected clinical course their child's illness and the symptoms or signs to look for which should prompt medical review. In addition, parents or carers should be encouraged to re-present their child to a medical practitioner if they have concerns about the progress of their child's illness following discharge from a health service
- ongoing paediatric education and skills training.

## Intentional self-harm (including suicide)

Too many young lives are being lost to suicide, which is a major cause of death in the 15–17 year age group in Victoria. There is a need for greater awareness and action on youth mental health across the community. Self-harm in young people is also a significant issue.

### Recommendation 2

That the Department of Health and Human Services continues to focus on implementing evidence-based interventions to prevent youth suicide, and specifically:

- Consider making at least one of the place-based trial sites (as part of the *Suicide Prevention Framework 2016–2025* year one actions) target youth intentional self-harm (including suicide).
- Include intentional self-harm (including suicide) prevention as part of the role of the Victorian Child and Youth Area Partnerships.
- Note the importance of accurate recording of the number and rate of intentional self-harm deaths, in order to monitor preventative efforts and guide resource allocation.

## Asthma and anaphylaxis

Tragically, deaths of children and adolescents continue to occur in Victoria from asthma and food-related anaphylaxis. The underlying features of the events leading to these deaths are often multifactorial, but are largely preventable. Delayed recognition and suboptimal management are key features of avoidable deaths in these categories.

### Recommendation 3

The CCOPMM endorses the recommendation of the coroner, that the Department of Health and Human Services formulates a mandatory reporting scheme, regarding children with anaphylaxis presenting to hospitals and emergency departments.

## Avoidable perinatal mortality

Perinatal mortality and morbidity review is a confirmed basis of good maternity care, and Victorian health services are required to undertake this activity according to the Perinatal Society of Australia and New Zealand (PSANZ) guidelines. Contributing factors are revealed in about eight per cent of all stillbirth and neonatal death cases, and over half the cases have multiple contributing factors relating to clinical or system management. Expert review of these cases reveals that in about 41.1 per cent of cases with contributing factors, (approximately 3.3% of all perinatal mortality), the contributing factors were likely to have influenced the outcome (meaning the death was probably avoidable).

### Recommendation 4

Health services must ensure that all clinicians working in their organisation who provide intrapartum care or utilise CTG monitoring receive regular training, and that their competency is maintained while they provide this care.

Health services must ensure that practitioners that they contract to provide ultrasound services meet the training and accreditation that comply with the standards set out by RANZCOG (RANZCOG C-Obs 57):

> That all practitioners involved in provision of mid-trimester fetal morphology ultrasound screening must undergo appropriate specific training in this critical and specialised area of practice. They should participate in ongoing professional development, clinical audit and multidisciplinary review of outcomes specific to their performance of mid-trimester fetal morphology ultrasound screening.

When reviewing perinatal mortality and morbidity cases, maternity services should identify potential contributing factors and modify their practices accordingly.

All clinicians (including paramedics) who may be involved in neonatal resuscitation should receive regular neonatal resuscitation training, and have their clinical competencies in neonatal resuscitation monitored by their health service or organisation.

Implementation of a Neonatal Resuscitation Program (e.g. the Paediatric Infant Perinatal Emergency Retrieval's [PIPER's] neoResus program) based on Australian and New Zealand Council on Resuscitation (ANZCOR) guidelines should become mandatory in Victoria.

# 2. About this report

The review and reporting functions of the Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM) provides a vital service to the Victorian Government in monitoring the safety and quality of the Victorian health care system. This report provides an overview of the mortality and birth data received by the CCOPMM for the 2014 and 2015 calendar years. It is anticipated that the information provided in this report will be used to inform service monitoring, quality improvement initiatives, health policy and clinical practice guidelines. In addition, the report contains data to support important maternal and child health research.

The report provides:

- key findings and recommendations arising from the CCOPMM's review of births and deaths in Victoria in 2014 and 2015
- detailed mortality and morbidity statistics
- summary information on the main causes of death, contributing factors and trends
- de-identified clinical case studies to highlight recommendations and areas of particular concern
- 'good practice points' arising from the review of cases during the reporting period
- key messages for consumers that arise from cases reviewed by the CCOPMM.

Unlike previous reports, which contained multiple sections, this report will only have one section, with a smaller number of tables, charts and figures included in the appendices. This reduction in size is due to a commitment from both the department and the CCOPMM to make VPDC, VCAR and mortality data available online. The early sections of the report highlight the priority areas identified by the CCOPMM, key findings and the recommendations generated by council. Following this are dedicated sections to births, maternal mortality, perinatal mortality and child and adolescent mortality, with each section including key themes identified by CCOPMM through the review process and analysis of data.

The report has continued to provide high-level recommendations for health outcome improvement, with four recommendations aimed at influencing system-level change. The remaining guidance from council has been converted into 'Good practice points' for clinicians or 'Messages for consumers', with a further information section also included.

As with the previous report, it is hoped that his new format will help facilitate increased transfer of information, while ensuring that the key findings, lessons and recommendations are easily accessible to both consumer and expert audiences.

The definitions and 'methods of analysis' should be used to fully interpret the key findings. The statistical flowcharts (Appendix 3) outline the scope of the data collections, and the case inclusions and exclusions used for reporting. Data from outside of 2014 and 2015 is included where it is available and where it provides contextual information. In the mortality sections (Sections 5, 6 and 7), data may refer to deaths that occurred over a period of three or more years (for example the triennium 2013–15), to address low numbers of deaths.

The CCOPMM values your feedback, which should be directed to: ccopmm@dhhs.vic.gov.au. Please share this report.

# 3. Priority areas

Based on the cases presented to the CCOPMM and the data sources available to the department, a number of key priorities for the Victorian health system have been identified. These priority areas reflect factors and circumstances that impact significantly on women and children, in terms of:

- the proportion of the population affected
- the severity of the impact
- the sustained disparities or slow improvement in outcomes.

## 3.1 Clinical deterioration

**Even when children or adolescents have recently seen a medical practitioner or have been admitted to hospital, avoidable deaths can and still occur.**

Child deaths have occurred where health practitioners have not reconsidered the diagnosis and treatment, when they have hospital observations that the illness is not following the expected pattern, the clinical features were atypical or when parents have represented with ongoing concerns on one or more occasions.

In some cases, parents have taken children to multiple practitioners during the same illness to have their continued concerns addressed. However, it is unlikely that parents will try more than three occasions, even in the event of serious clinical deterioration.

### SNAPSHOT

Deaths occur in situations where:

- The **wrong diagnosis** was made initially, and the diagnosis was not reconsidered when clinical deterioration occurred (or the trajectory of illness did not follow the usual pattern for that diagnosis). This includes situations where subsequent clinicians have maintained the initial clinical diagnosis, despite clear evidence of deterioration or atypical features suggesting alternative diagnoses.
- The diagnosis or concern is properly identified, but there is a failure to follow the expected clinical course despite adequate treatment for a given diagnosis or **escalate** the patient's deteriorating condition.
- A new, more serious diagnosis develops (for example, a bacterial sepsis following a recent viral infection); however, the child's caregivers were not given important information on **symptoms or signs that should trigger re-presentation** for medical care.
- Health practitioners have **failed to appropriately respond to parental concerns** regarding their child's condition or multiple presentations.
- Treating clinicians have **failed to transfer relevant information** to the receiving doctor (or other providers, such as a general practitioner or maternal and child health services) responsible for ongoing care following transfer or post discharge review and re-evaluation.
- Parents or guardians have taken children to **multiple practitioners during the same illness** to have their continued concerns addressed. However, it is unlikely that parents will seek advice on more than three occasions, even in the event of serious clinical deterioration.

### Case study 1

A 13 month old child presented to their local general practitioner with stridor (sign of an obstructed or constricted airway). A diagnosis of croup was made, and the family advised to present to hospital if signs of deterioration occurred. The symptoms did not improve, and the family presented to hospital, where a diagnosis of croup was made and admission organised. Adrenaline was given, but the symptoms did not resolve as expected. The child failed to respond to the usual clinical course for croup, with repeated episodes of cyanosis and respiratory distress, without coryza or other signs of upper respiratory tract infection. The child collapsed on the ward and died, despite resuscitation efforts. The actual diagnosis was a foreign body in the airway.

### Case study 1 key messages

**Stridor that is not acute viral croup.** If a child has acute stridor without coryza or signs of an upper respiratory infection, or has any episode of cyanosis, or where the stridor fails to resolve by 3–5 days, or if the child is toxic, the diagnosis is unlikely to be viral croup and should be urgently investigated. A chest X-ray should be done for any child who has atypical clinical features. An episode of cyanosis in any child with stridor is an emergency.

### Case study 2

A nine month old infant was admitted to hospital with a diagnosis of bronchiolitis. Despite maximal treatment the infant remained distressed, tachycardic and tachypnoeic. The family requested review on multiple occasions due to the infant's condition. The family was repeatedly reassured by many different clinicians that the diagnosis was bronchiolitis and that the infant should not be disturbed, because handling caused a deterioration in clinical state. The infant collapsed on the ward and died. A chest X-ray performed showed cardiomegaly and a diagnosis of cardiomyopathy was made.

### Case study 2 key messages

Whenever questions remain about a diagnosis, or the signs are atypical, the family expresses ongoing concerns or the normal clinical pathway of resolution is not occurring, there is a need for reassessment or second opinion. Retaking a good history and doing a thorough clinical examination remain the basis for making an accurate diagnosis. Looking carefully at the trend or any significant change in the vital signs charts may suggest a deterioration. The clinical story is important. Reassessment will usually also involve further investigation, seeking a second opinion or referral.

### Recommendation 1

That all health services providing paediatric services implement a comprehensive and integrated organisational-wide approach to detect and respond to any paediatric deterioration. That approach requires multiple processes and practices including:

- thresholds for admission (such as repeated presentations for same illness)
- specific skills for paediatric Medical Emergency Team (MET) attendance.
- assessing parental concerns about a child's condition/change in condition openly
- use of specific paediatric observation charts, such as the Victorian Children's Tool for Observation and Response (ViCTOR)
- embedding the value of review/reassessment by a second, independent clinician at critical points in the care pathway, including when:
  - questions remain about a diagnosis
  - the signs and symptoms are atypical
  - normal clinical resolution is not occurring with adequate treatment
  - at the request of parents, caregivers or staff caring for the child.
- escalation procedures (including links with tertiary paediatric centres and PIPER)
- informing parents and carers about the expected clinical course their child's illness and the symptoms or signs to look for which should prompt medical review. In addition, parents or carers should be encouraged to re-present their child to a medical practitioner if they have concerns about the progress of their child's illness following discharge from a health service
- ongoing paediatric education and skills training.

## Good practice points

- Whenever there are questions about a child's diagnosis, the child's signs are atypical, or the normal clinical pathway of resolution despite adequate treatment is not occurring, the child should be re-assessed, have further investigation, a second opinion or referral to a specialist in paediatric care.
- Parental concerns about their child's health status should be considered at all times, because parents know their children best. When parents report concerns about a child's wellbeing or change in status (in particular in the context of severe chronic disease or developmental disability) their concerns should be taken seriously and addressed without delay.
- A number of studies have shown higher rates of serious pathology in children who have repeated medical attendances during a single acute illness. Multiple representations should serve as a trigger for careful re-evaluation of the clinical picture. Any child who presents on multiple occasions in the same illness should be seen by a senior doctor experienced in childhood illnesses.
- Some emergency departments operate a policy that children presenting for the third time (or more), even if at different facilities, must be reviewed by a senior doctor or admitted for observation — a 'three strikes and you're in' policy. Thresholds for action might be different in the primary care setting, but serious illness should be considered in any child who attends several times during a single acute illness.
- The importance of comprehensive, timely and accurate communication at the points of transfer of care is critical in paediatric care. This includes between teams within a hospital, or between hospital clinical staff and an outside practitioner such as a GP or MCH nurses.
- The use of 'track and trigger' paediatric early warning charts such as ViCTOR have been demonstrated to be an effective tool to assist in **recognising and responding** to clinical deterioration in children.

## Further information

The Victorian Children's Tool for Observation and Response (ViCTOR) is a standardised monitoring chart for children of all ages, to assist Victorian health services to develop more robust mechanisms to detect and respond to a child's deterioration. All information, including valuable education resources, can be found on the ViCTOR website: <https://www.victor.org.au/>.

*Children and Infants — Recognition of a Sick Baby or Child in the Emergency Department* (NSW Heath, 2011): <http://www0.health.nsw.gov.au/policies/pd/2011/pdf/PD2011_038.pdf>.

PIPER provides high quality education, patient information and clinical practice guidelines: <http://www.rch.org.au/piper/guidelines/>.

The Victorian *Neonatal eHandbook* was developed for medical and nursing personnel working in special care nurseries throughout Victoria and provides guidelines regarding assessment and management for more than 90 newborn conditions. <https://www2.health.vic.gov.au/hospitals-and-health-services/patient-care/perinatal-reproductive/neonatal-ehandbook>.

Royal Children's Hospital *Clinical Practice Guidelines*: <http://www.rch.org.au/clinicaguide/>

Raising children network: <http://raisingchildren.net.au/>.

## 3.2 Intentional self-harm (including suicide)

**Too many young lives are being lost to intentional self-harm (including suicide), which is a major cause of death in the 15–17 year age group in Victoria. There is a need for greater awareness and action on youth mental health across the community. Non-suicidal self-harm in young people is also a significant issue.**

Intentional self-harm (including suicide) is occurring in children as young as 13 years.

While awareness of mental illness and depression in young people has grown significantly over the past decade, it is still not always identified. Even when detected, young people may not receive all the help they need to recover and stay well. Managing mental illness and depression can be particularly hard for young people who have other health issues such as alcohol and drug problems, a disability or a chronic illness. These groups are also at higher risk of suicide, along with those who experience bullying, family stress or have had close contact with someone who has died as a result of self-harm.

Adolescents may self-harm in an impulsive way with little apparent planning, which poses a further challenge for prevention.

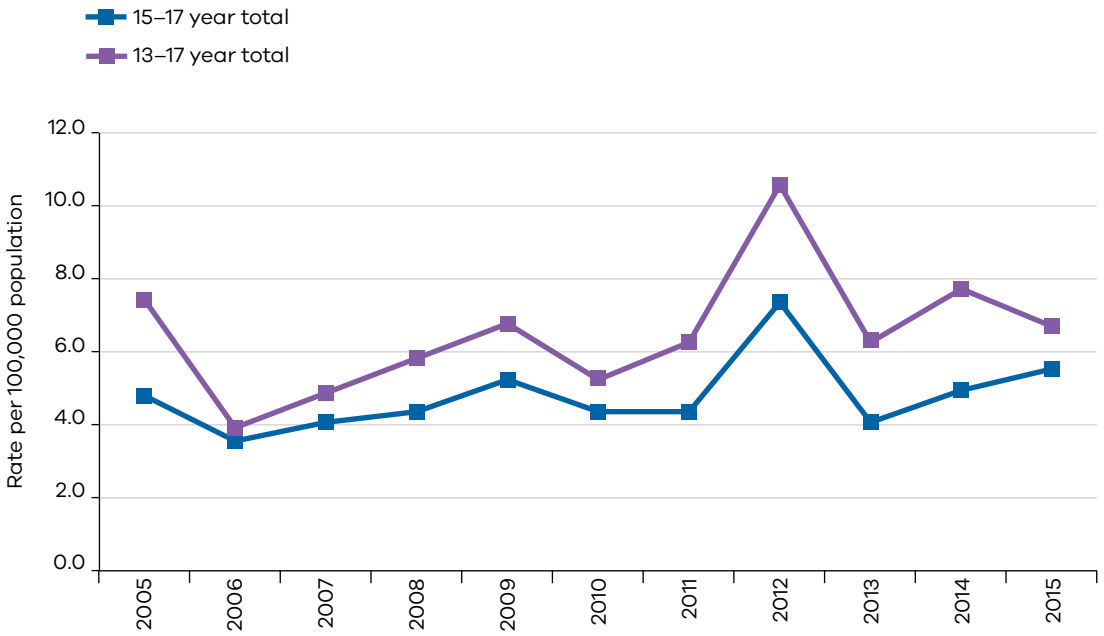
Much more is required to prevent intentional self-harm (including suicide) in adolescents, including programs to support emotional health and health seeking behaviour, self-esteem and wellbeing, delivered through local community organisations as well as through health care and education services.

The Victorian Government's 10-year mental health plan and the associated *Suicide Prevention Framework 2016–2025* (2016) commits to halving the suicide rate over the next ten years, and provides an important importunity to focus efforts.

### SNAPSHOT

- There were 36 deaths in 2014 and 2015 from intentional self-harm in the 13–17 year age group, including 30 deaths in the 15–17 year age group.
- Intentional self-harm was the most common cause of death in the 15–17 year age group in 2014, and the second most common in 2015.
- Males accounted for 67 per cent of the deaths from intentional self-harm in 2014–15.

**Figure 1. Rate of intentional self-harm (including suicide) by age group, Victoria, 2005–15**




### Recommendation 2

That the Department of Health and Human Services continues to focus on implementing evidence-based interventions to prevent youth suicide, and specifically:

- considers making at least one of the place-based trial sites (as part of the Suicide Prevention Framework 2016–2025 year one actions) target youth intentional self-harm and suicide
- includes suicide prevention as part of the role of the Victorian Child and Youth Area Partnerships
- notes the importance of accurate recording of the number and rate of intentional self-harm deaths, in order to monitor preventative efforts and guide resource allocation.

## Good practice points

- Screening for emotional health and wellbeing should be part of routine preventative healthcare. Changes in behaviour outside the person's normal range of behaviour may be a warning sign of intentional self-harm (including suicide) risk. Such changes may include: loss of interest in previously pleasurable activities, disengagement from friends, school and social activities, problem behaviour, substance misuse, significant distress over a relationship breakdown, lack of care about dress and appearance.
- At-risk adolescents need regular engagement with and support from skilled health care professionals. Their families also need support. Where a health professional believes they do not have the capacity to support at-risk adolescents, referral and liaison with specialised adolescent mental health services must be undertaken.
- At-risk adolescents who fail to attend or disengage from services should be actively followed up, because disengagement may be a sign of increased risk of intentional self-harm. Verbal communication or threats of suicide, and/or previous attempted intentional self-harm are serious and require urgent specialist mental health assessment. Friends and family may be aware of threats or communication about self-harm and should act on their concerns. Many cases of lowered mood/depression can be managed by a GP or paediatrician, providing they have adequately assessed the risk of intentional self-harm as being low. However, health

professionals not confident or competent to assess this risk, or support at-risk adolescents should refer to specialised adolescent mental health services.

- An unexpected improvement in mood can also occur just prior to intentional self-harm. When low mood is continuing despite appropriate intervention, and then there is an unexpected mood improvement that is sudden in onset, it is possible that the young person has made a decision to end their life. Mental health reassessment should be sought at this point.
- Many young people can be supported to share their distress with people (for example, parents) to help keep them safe. Occasionally, at times of very high risk, professionals are required to break a young person's desire for confidentiality (around them not wanting to let others know the extent of their distress) in order to keep them safe.
- Additional good practice points were published in the *Victoria's Mothers, Babies and Children Report 2012 and 2013*.

## Further information

*Victoria's Mothers, Babies and Children Report 2012 and 2013*: <https://www2.health.vic.gov.au/hospitals-and-health-services/quality-safety-service/consultative-councils/council-obstetric-paediatric-mortality/mothers-babies-children-report-2012-13>.

Department of Health and Human Services: *Suicide Prevention Framework 2016–2025* (2016): <https://www2.health.vic.gov.au/about/publications/policiesandguidelines/victorian-suicide-prevention-framework-2016-2025>.

The National Youth Mental Health Foundation's *headspace* provides general health advice, mental health and counselling services, education, employment, alcohol and other drug services for adolescents and young people aged 12–25 years. It also provides resources for health services and professionals who work with young people, which may assist in the management of self-harm: <http://www.headspace.org.au/>.

The National Health and Medical Research Council clinical practice guideline, *Depression in adolescents and young adults* (2011): <https://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/ext0007_cp_guideline_depression_adolescents_young_beyondblue.pdf>.

The Royal Australasian College of Physicians' *Routine adolescent psychosocial health assessment — position statement* (2008) is written for all primary, secondary and tertiary care physicians and paediatricians who consult with adolescent patients: <https://www.racp.edu.au/docs/default-source/advocacy-library/routine-adolescent-psychosocial-health-assessment.pdf>.

Support is available for those who may be distressed by phoning:

- Kids Helpline 1800 551 800 <https://kidshelpline.com.au>
- Lifeline 13 11 14 <https://www.lifeline.org.au>
- beyondblue 1300 22 4636 <http://www.beyondblue.org.au/>.

## 3.3 Asthma and anaphylaxis

**Tragically, deaths of children and adolescents continue to occur in Victoria from asthma and food-related anaphylaxis. The underlying features of the events leading to these deaths are often multifactorial, but are largely preventable. Delayed recognition and suboptimal management are key features of avoidable deaths in these categories.**

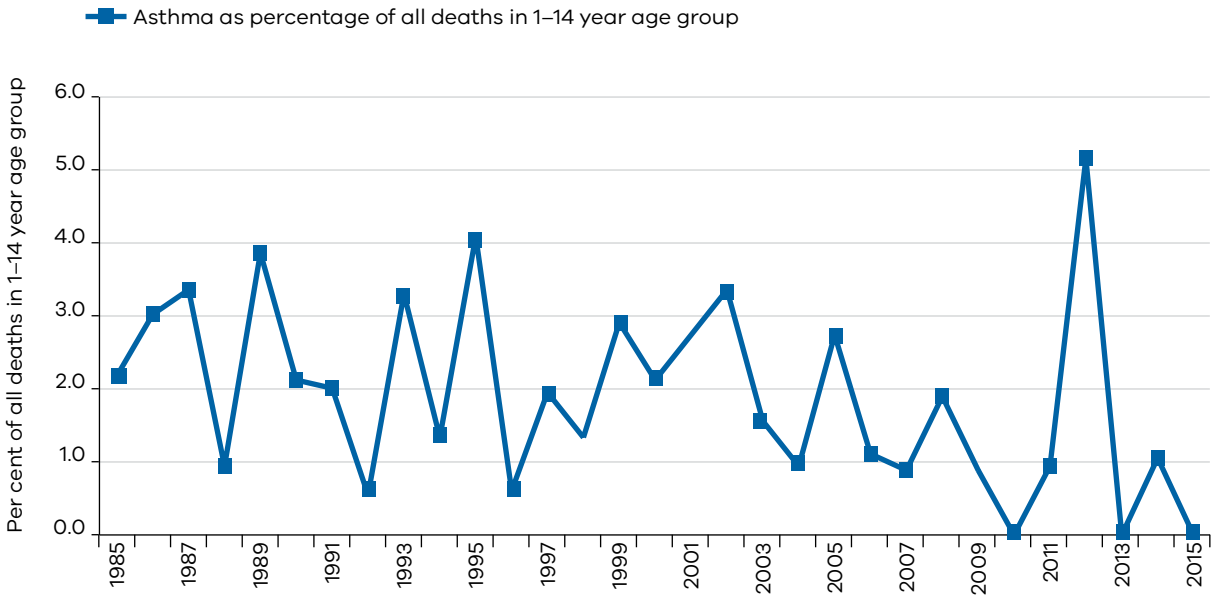
In the cases of deaths from asthma, suboptimal management, including emergency management by carers or people unfamiliar with the child's emergency asthma management, poor adherence to treatment and missed opportunities for prevention are recurring issues.

Deaths from food-related anaphylaxis over the last 10 years (2006–15) occurred following exposure to food that was not prepared in the home or when the ingredients had not been assessed prior to consumption, in circumstances where there were failures to recognise or treat the allergic reaction, and delayed or ineffective treatment with adrenaline.

### SNAPSHOT

- There were two deaths during 2014 to 2015 from asthma.
- There were two deaths during 2014 to 2015 related to anaphylaxis to known food allergens.
- Across the ten-year period 2006 to 2015 there have been 17 deaths from asthma and seven deaths from food-related anaphylaxis.
- Recurring themes for the death cases related to asthma were:
  - suboptimal management, including emergency management by carers
  - poor adherence to medical treatment plans and prevention strategies
  - care provided by people unfamiliar with the emergency asthma management of the child.
- Deaths from food-related anaphylaxis over the last 10 years (2006–15) occurred in the following circumstances:
  - food consumed that was not prepared in the home, where the ingredients were not assessed prior to consumption
  - failure to recognise the symptoms of anaphylaxis, leading to delays in emergency management
  - co-existent asthma, especially if poorly controlled or mistakenly treating and managing the event purely as asthma
  - failure to carry an adrenaline auto-injector when away from home
  - failure to administer adrenaline via auto-injector for fear of having the wrong diagnosis, or when the child was resisting its administration
  - failure to administer repeated doses or adrenaline, or failure to commence an adrenaline infusion (if available)
  - exercise shortly after allergen exposure.

**Figure 2. Asthma as a percentage of all deaths in 1–14 year age group, 1985–2015**




### Recommendation 3

The CCOPMM endorses the recommendation of the coroner, that the Department of Health and Human Services formulates a mandatory reporting scheme, regarding children with anaphylaxis presenting to hospitals and emergency departments.

## Good practice points

The good practice points from 2012 and 2013 have been reviewed in light of the 2014 and 2015 deaths and remain relevant. They are repeated here, with updated information.

- Children and adolescent asthma plans should be reviewed regularly and encompass asthma control, medication review, education and understanding of emergency care.
- Clinicians are required to create asthma plans that can be easily followed by adolescents, and in the case of children, their families and carers.
- Children with anaphylaxis need to have regular review with their medical practitioner to:
  - have ongoing education and reinforcement of the avoidance of triggers, and the recognition and emergency management of anaphylaxis
  - receive prescriptions to ensure their adrenaline auto injectors are up to date
  - ensure the correct dose for weight is prescribed
  - review symptoms so that the management plan can be changed if needed
  - ensure competence in recognition and emergency management of anaphylaxis is maintained.
- The early administration of adrenaline is essential in the management of anaphylaxis.
- Children with severe anaphylaxis will need repeated doses of adrenaline. After the second dose if there is **no resolution of symptoms within five minutes**, a continuous intravenous infusion of adrenaline should be commenced if practitioners have the skills and equipment available.
- Children who have suffered anaphylaxis should be admitted for observation to an emergency department or short-stay unit, for four to six hours.
- Children at risk of anaphylaxis should not exercise in the hours after possible exposure to a food allergen.

- Children with asthma and anaphylaxis are at particular risk, and should ensure their asthma control is optimal.
- Health workers and parents need to appreciate the dangers of asthma and anaphylaxis together. The treatment is adrenaline. Affected children and parents should be encouraged to carry an adrenaline auto injector, and use it immediately symptoms of anaphylaxis occur, or if symptoms of asthma do not respond to initial therapy.

## Messages for consumers

- Adolescents with growing autonomy and independence need to be able to manage their asthma and be aware of symptoms suggesting deterioration. They need assistance from their parents, carers and health professionals to ensure they have a full understanding of regular and emergency care of their asthma.
- Carers of children with asthma who also have a history of anaphylaxis need to be able to manage both their asthma and their anaphylaxis confidently.
- Children with anaphylaxis need to have regular review with their medical practitioner, and together with their families and regular carers, need to have ongoing education and reinforcement of the avoidance of triggers, and the recognition and emergency management of anaphylaxis.
- Families and carers should have the skills and confidence to administer the auto-injector at the first sign of anaphylaxis, even when there is resistance from the child.
- A past history of food allergy is not a contraindication to exercise. However, children who have had an acute (non-anaphylactic) allergic reaction to food should be advised to minimise exertion in the 2–4 hours after the allergic reaction to minimise the risk of anaphylaxis.
- In the event a carer is unable to determine whether a child is suffering from asthma or anaphylaxis, an adrenaline auto-injector should be administered in the first instance, followed by any medication listed within the emergency management plan.
- Health workers and parents need to appreciate the dangers of asthma and anaphylaxis together. The treatment is adrenaline. Affected children and parents should be encouraged to carry an adrenaline auto injector, and use it immediately symptoms of anaphylaxis occur, or if symptoms of asthma do not respond to initial therapy.

## Further information

The *Australian Asthma Handbook* (version 1.2, 2016) by the National Asthma Council Australia provides new national asthma guidelines to assist all health professionals: <http://www.asthmahandbook.org.au/>.

All Victorian schools, with students enrolled who have been diagnosed as being at risk of anaphylaxis, are required to develop and implement an anaphylaxis management policy that meets the legislative and policy requirements of Ministerial Order No. 706: *Anaphylaxis Management in Schools*: <http://www.education.vic.gov.au/school/principals/health/Pages/anaphylaxisschools.aspx>.

The Australian Society of Clinical Immunology and Allergy website has a range of information and training for health professionals and patients: <http://www.allergy.org.au/>.

## 3.4 Avoidable perinatal mortality

**Perinatal mortality and morbidity review is a confirmed basis of good maternity care, and Victorian health services are required to undertake this activity according to the Perinatal Society of Australia and New Zealand (PSANZ) guidelines. Contributing factors are revealed in about eight per cent of all stillbirth and neonatal death cases, and over half the cases have multiple contributing factors relating to clinical or system management.**

Expert review of these cases reveals that in about 41.1 per cent of cases with contributing factors (approximately 3.3% of all perinatal mortality), the contributing factors were likely to have influenced the outcome (meaning the death was probably avoidable). The recurrent themes in care deficiencies over the period are:

- inadequate intrapartum care, including inadequate fetal monitoring
- factors relating to the woman's pregnancy, family and social situation
- inadequate antenatal care.

During 2012–15, inadequate fetal monitoring comprised 10 per cent of perinatal deaths where contributing factors were identified. Avoidable perinatal deaths occur when clinicians either do not recognise an antenatal or intrapartum abnormal cardiotocographic (CTG) tracing, or fail to escalate their concerns to a more senior colleague.

For stillbirths, the following contributing factors remain issues for health services/providers to address:

- family neglect, lack of understanding or noncompliance with medical advice
- inadequate care of the diabetic mother
- delayed caesarean section.

Areas where there has been considerable improvement for stillbirth are:

- 12 per cent improvement in 'inadequate antenatal monitoring'
- four per cent improvement in 'inadequate intrapartum management of medical conditions'.

For neonatal deaths, the following contributing factors remain issues for health services/providers to address:

- failure to expedite delivery
- inadequate intrapartum monitoring.

## SNAPSHOT

- Victoria had 2074 perinatal deaths of babies with a birthweight of 500 g or more between 2012 and 2015.
- Each perinatal death is reviewed by the CCOPMM's expert assessors and cases that have factors that may have contributed to the outcome are reviewed by the Stillbirth and Neonatal Mortality and Morbidity Sub-committees.
- Where factors are identified, the likelihood that they may have contributed to the outcome is graded as unlikely/insignificant, might/possible or likely/significant. Of the 255 cases (12% of all the perinatal deaths) reviewed by the sub-committees, 168 were assessed as having one or more contributing factors (8% of all perinatal deaths). A total of 323 contributing factors were identified.
- Forty-four per cent of the 168 cases were identified as having only one contributing factor. The remaining 56 per cent of cases were identified as having multiple factors.
- The most common contributing factors for perinatal deaths between 2012 and 2015 were:
  - **inadequate intrapartum care (25%)** – includes inadequate intrapartum fetal monitoring, failure to expedite delivery
  - **factors relating to the woman's pregnancy, family and social situation (20%) –** includes substance abuse, maternal smoking, non-reporting of decreased fetal movements, non-recognition or lack of understanding that pregnancy was high risk because of, for example, maternal medical conditions, morbid obesity
  - **inadequate antenatal care (20%) –** failure to, or delay in, referral for specialist care, suboptimal management of maternal medical disorders such as hypertension, diabetes.
- Specific issues that occurred more frequently were:
  - family neglect, lack of understanding or noncompliance with medical advice inadequate monitoring of the baby during labour
  - failure to hasten the birth of the baby
  - misinterpretation of, or undue reliance on, clinical tests.
- Between 2012 and 2015, 109 stillbirth cases were identified as having contributing factors:
  - inadequate antenatal care (27%)
  - inadequate antenatal monitoring (14%)
  - factors relating to the woman's pregnancy, family and social situation (27%).
- Specific issues that occurred more frequently were:
  - family neglect or ignorance
  - insufficient antenatal care
  - inadequate care of diabetic mother
  - inadequate management of the growth restricted fetus
  - misinterpretation of, or undue reliance on clinical tests.
- Between 2012 and 2015, 59 cases of neonatal death were identified as having contributing factors. The most common contributing factors in neonatal cases were:
  - inadequate intrapartum care and management of specific conditions (43%)
  - delays in recognition or treatment of the infant (16%).
- Specific issues that occurred more frequently were:
  - failure to expedite delivery
  - inadequate intrapartum monitoring
  - caesarean section too late
  - delay or lack of consultation
  - insufficient antenatal care
  - misinterpretation of, or undue reliance on clinical tests
  - family neglect, lack of understanding or noncompliance with medical advice.

**Figure 3. Per cent of all contributing factors in stillbirths 2012–15**

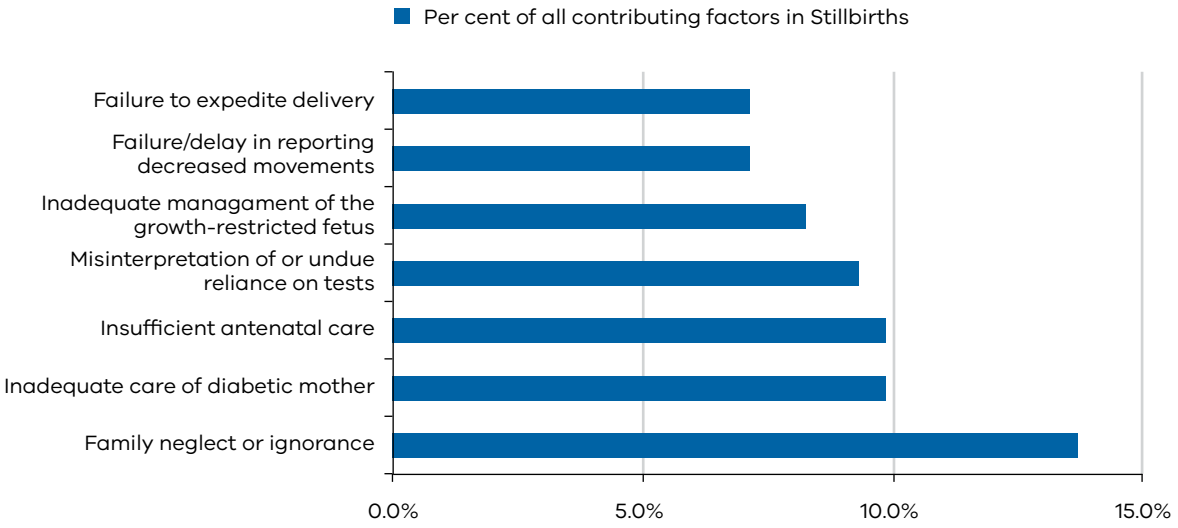
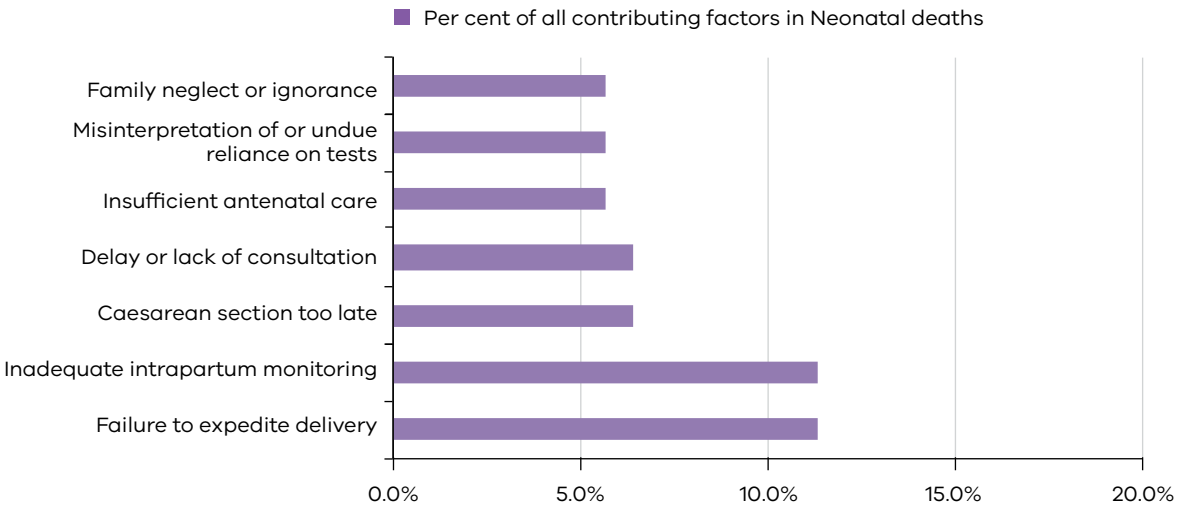



**Figure 4. Per cent of all contributing factors in neonatal deaths 2012–15**




### Case study 3

A 29 year old first-time mother started spontaneous labour at 40 weeks after an uncomplicated pregnancy. She reported that her membranes had ruptured one hour previously, and that for the past 24 hours the baby had not been moving as much. Upon admission, it was noted that the amniotic fluid was moderately stained by meconium (this can indicate that the baby is physiologically distressed). An external CTG tracing was commenced that showed a baseline heart rate of 165 beats per minute, reduced short-term variability and no decelerations. This pattern was not recognised as being abnormal by the maternity care team. She continued to have moderate uterine contractions every three minutes. Three hours after admission, concern was raised about the CTG tracing, which now showed a baseline of 170 beats per minute, reduced variability and deep late (Type 2) decelerations. The obstetrician was called, vaginal examination revealed that the cervix was 6 cm dilated and the baby was born by emergency caesarean section 25 minutes later. The male infant had a normal birthweight of 3250 grams, but was pulseless and made no respiratory efforts. Despite active resuscitation, including intubation CPR and adrenaline, the baby could not be revived.

### Case study 3 key messages

Reduced fetal movement and meconium stained liquor require careful fetal evaluation. Maintaining core competencies in CTG monitoring (to recognise non-reassuring CTG patterns) and emergency maternity management is a key requirement for all maternity clinicians involved in intrapartum care.

### Recommendation 4

Health services must ensure that all clinicians working within their organisation who provide intrapartum care or utilise CTG monitoring receive regular training and their competency is maintained while they provide this care.

Health services must ensure that practitioners that they contract to provide ultrasound services meet the training and accreditation that comply with the standards set out by RANZCOG (RANZCOG C-Obs 57): 'That all practitioners involved in provision of mid-trimester fetal morphology ultrasound screening must undergo appropriate specific training in this critical and specialised area of practice. They should participate in ongoing professional development, clinical audit and multidisciplinary review of outcomes specific to their performance of mid-trimester fetal morphology ultrasound screening.'

When reviewing perinatal mortality and morbidity cases, maternity services should identify potential contributing factors and modify their practices accordingly.

All clinicians (including paramedics) who may be involved in neonatal resuscitation should receive regular neonatal resuscitation training, and have their clinical competencies in neonatal resuscitation monitored by their health service or organisation.

Implementation of a Neonatal Resuscitation Program (e.g. the Paediatric Infant Perinatal Emergency Retrieval's [PIPER's] neoResus program) based on Australian and New Zealand Council on Resuscitation (ANZCOR) guidelines should become mandatory in Victoria.

## Good practice points

- Pregnant women attending emergency department should be assessed by a member of the obstetric team in addition to usual care by the emergency clinicians.
- Suspected cases of FGR must be referred for assessment and management by senior consultant staff.
- Clinicians are reminded of the association between low PAPP-A measured as a component of the first trimester screen for chromosome anomalies and subsequent risk of FGR.
- Even in the presence of a normal clinical assessment (including a CTG and ultrasound), where maternal concerns about DFM at term remain, delivery may be the most appropriate management.

## Further Information

*PSANZ Clinical Practice Guideline for Perinatal Mortality*: <https://www.psanz.com.au/guidelines/>.

Royal Australian and New Zealand College of Obstetricians and Gynaecologists' Fetal Surveillance Education Program: <www.fsep.edu.au>.

Australian and New Zealand Council on Resuscitation (ANZCOR) Neonatal Guidelines <https://resus.org.au/guidelines/>

# 4. Births in Victoria

Information about births in Victoria informs health care policy and service planning, while drawing attention to areas of clinical risk.

In addition to information about birthing rates, maternal characteristics, such as age, country of birth, marital status, place of residence (rural versus metropolitan areas) and socioeconomic status, provide insight into the needs of mothers and their babies.

Information about risks such as maternal obesity and smoking, as well as the types of birthing intervention and outcomes, is helpful in identifying clinical and organisational priorities. This type of health information is often referred to as co-morbidities and morbidity.

This section highlights some of the key health or morbidity data receiving from the Victorian Perinatal Data Collection (VPDC) in 2014 and 2015 with incorporations of data from mortality case reviews.

## 4.1 Overview

**Giving birth in Victoria continues to be a safe pursuit for both mothers and children. However, disparities in health outcomes exist between different groups of women and these need to be highlighted, and in some cases, addressed.**

The number of births in Victoria continues to increase by around one per cent per year.

Obesity is a continuing concern, affecting 18.7 per cent of pregnant women in 2015, compared with 17.6 per cent in 2012 and 2013.

While caesarean births have not increased, the overall rate in 2015 remains high at 33.4 per cent, and the rate of women experiencing induction of labour has continued to rise (28.8% in 2015 compared with 26.2% in 2013).

## SNAPSHOT

- Victoria's overall birth numbers continue to increase slowly, with a total of 78,791 babies born in 2014 and 78,961 in 2015. Of women giving birth in 2015, 73.4 per cent were public patients in public hospitals; 1.9 per cent were private patients in public hospitals; 24.4 per cent were private patients in private hospitals; and 0.3 per cent had a planned home birth under the care of a private midwife.
- The median age of mothers overall has remained at 31 years for the last decade; while the median age of first-time mothers increased from 29 to 30 years in 2015.
- Of all women who gave birth in 2015, 30.6 per cent were born in a country where English is not the first language, with the most common being India (4888 women), then China (2645), Vietnam (1599), Sri Lanka (1028), Philippines (918), Pakistan (704), Malaysia (696), Sudan (608), Afghanistan (594) and Iraq (538).
- Young mothers, and those who live in rural areas, are more likely to live in socioeconomically deprived areas.
- Of women who gave birth in 2015, 44.3 per cent were overweight (25.5%) or obese (18.7%). Obesity is a risk factor for a number of poor perinatal outcomes. Reporting of maternal height and weight improved greatly in 2015.
- The number of women giving birth who have had one or more previous caesarean sections has continued to increase. In 2015, 23.6 per cent of all women who had previously given birth had had one caesarean, while 6.7 per cent had had two or more previous caesareans (Figure 5).
- The number of women who had an induced labour has continued to increase, as has the number who had a planned caesarean before the onset of labour. Conversely, 50.2 per cent of women had a spontaneous onset of labour, around one-third of whom later had labour augmented (Figure 6). In 2015, women were more likely to have a pre-labour caesarean in the private sector, and slightly more likely to have labour induced in the public sector (Figure 7).
- One-third (33.4%) of women gave birth by CS in 2015, while the proportion of unassisted vaginal births has continued to fall (51.5%). Women admitted as private patients were much more likely to give birth by caesarean section (42.9%) compared with of women admitted as public patients (30.0%), and experience an instrumental vaginal birth (19.1% compared with 13.6%).
- Babies who were born early (before 37 weeks gestation), comprised 8.4 per cent of all births — an increase of 0.2 per cent from 2013; while the proportion born late (at 42 or more weeks) fell to 0.5 per cent (Figure 9).
- Fewer babies were born with a very low birthweight (less than 1500 g) in 2015 (1.2%) compared with 2010 (1.4%). However, the proportion of low birthweight babies overall (less than 2500 g) has changed little in those five years (6.7% in 2015). Fewer babies weighing 4500 g or more were born in 2015 (1.5%) compared with 2010 (1.9%).
- In 2015, 1.8 per cent of babies had an Apgar score below 7 at five minutes, which has remained consistent since 2012.
- The vast majority of women who gave birth in 2015 initiated breastfeeding (94.5%). Of those babies born at 37 or more weeks, whose mother initiated breastfeeding, 77.7 per cent were exclusively breastfeeding at the time of discharge from hospital, with 79.2 per cent born in public hospitals and 72.8 per cent born in private hospitals.

**Figure 5. Number of women giving birth who had previously given birth by caesarean section, 2012–15**

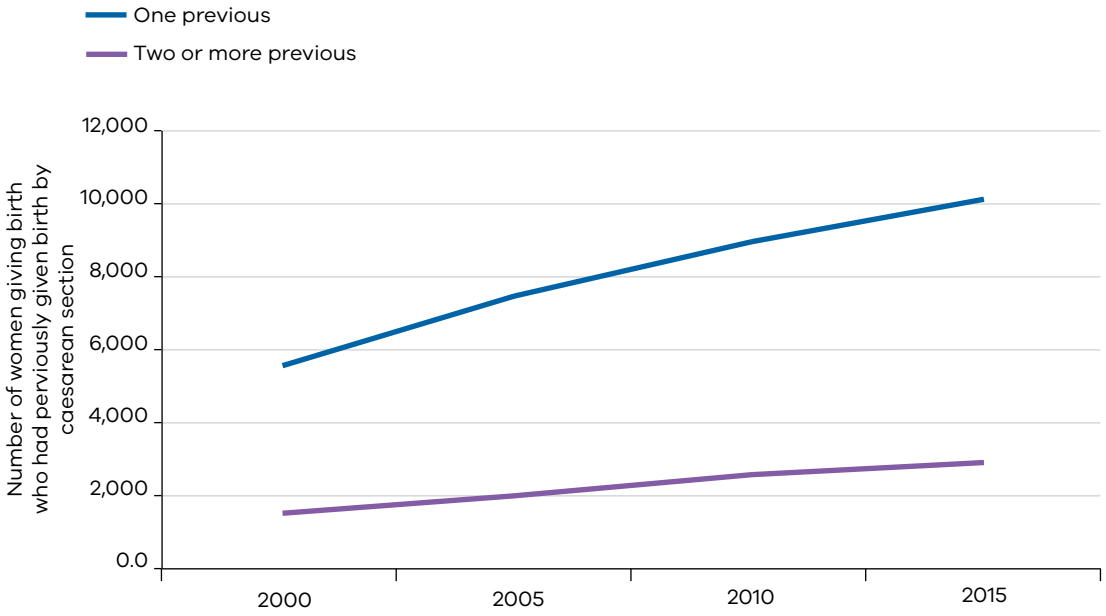



**Figure 6. Onset of labour, confinements, 2012–15**

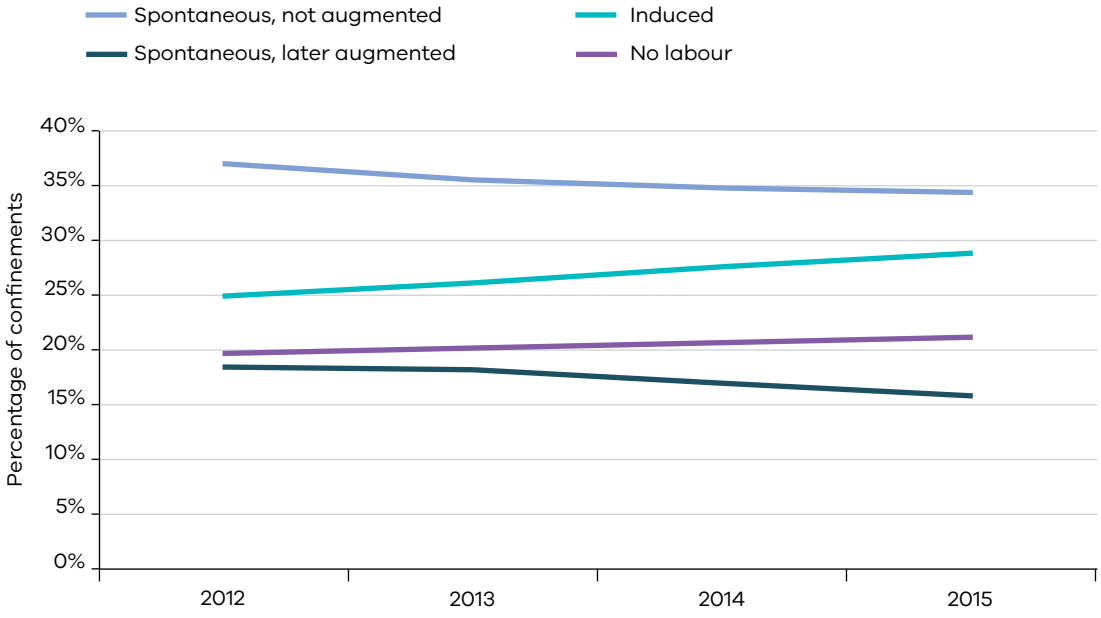


**Figure 7. Onset of labour by admission status, confinements in 2015**

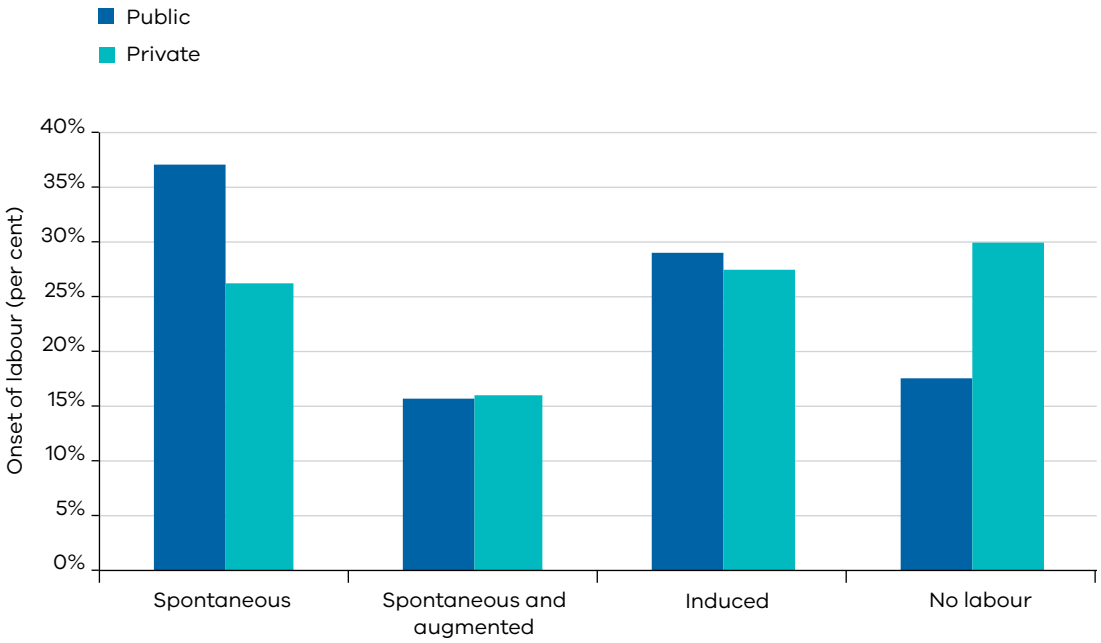



**Figure 8. Trend in method of birth, all confinements 1985–2015**

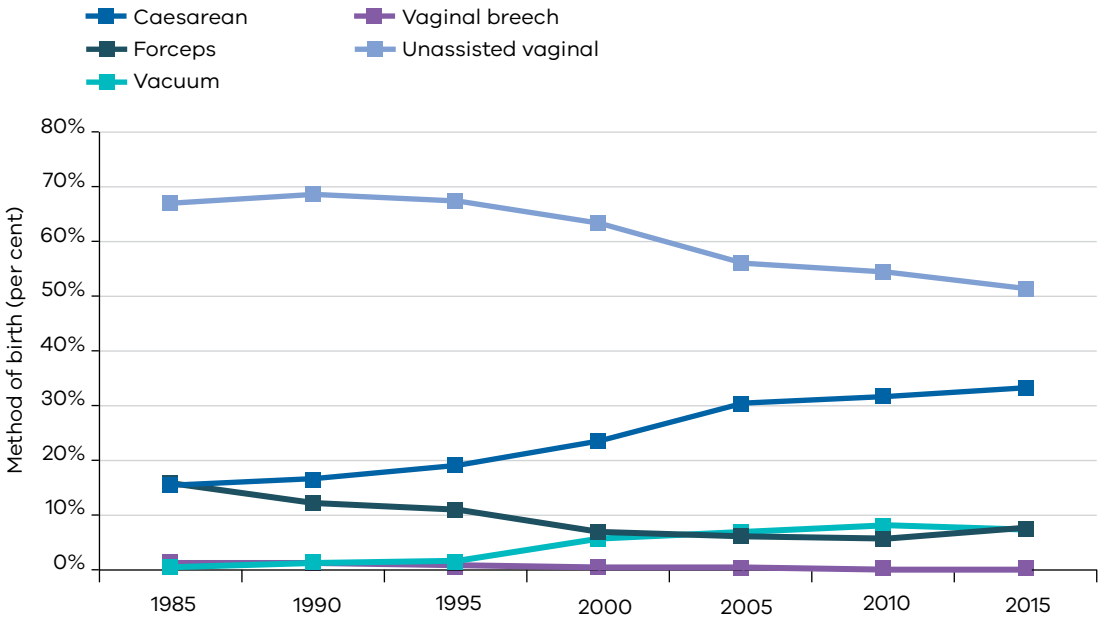


**Figure 9. Preterm and post-term birth, 1985–2015 (percentage of adjusted births)**

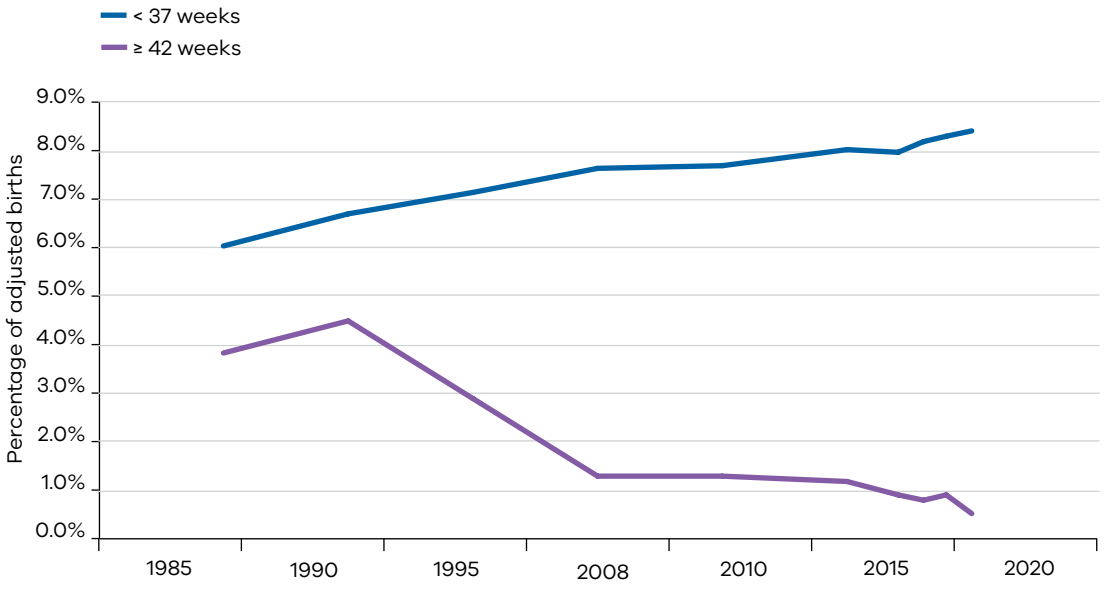
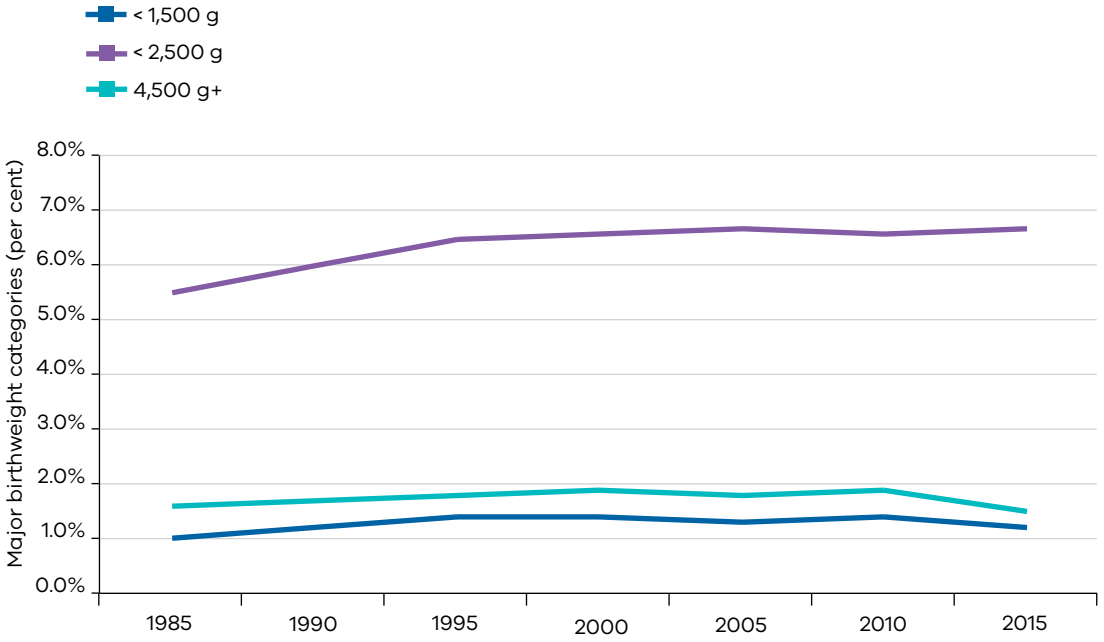



**Figure 10. Trend in major birthweight categories, 1985–2015 (percentage of adjusted births)**




## Good practice points

- Complete, accurate and timely reporting of perinatal data enables better surveillance of the trends for emerging risk factors. Heath providers should ensure that data on each woman's weight and height are accurately reported to allow the risks associated with obesity to be monitored.

## Messages for consumers

- In 2015, one-third of women gave birth by caesarean section. This increases the risk of complicating future pregnancies. If you have previously given birth by caesarean section, you should discuss your birthing options early in pregnancy with your maternity care provider.

## 4.2 Homebirth

**The options for birthing at home in Victoria were expanded in 2009 with the provision of public home birthing services at two metropolitan maternity services, in addition to the services provided by privately practising midwives. The number of women who intend to birth at home at the beginning of their pregnancy in 2014 and 2015 remains small, around one in 200 women (or 0.53% of all births). The proportion of women who actually birth at home is 0.42 per cent of all birthing women.**

### SNAPSHOT

**Private homebirth**

- During 2014 and 2015, 242 and 250 women respectively birthed at home under the care of a private midwife1 (as planned at the beginning of their pregnancy).
- For women who planned a private home birth, 35 (11.9%) and 37 (11.9%) required transfer to hospital during labour in 2014 and 2015 respectively.
- Of the women who birthed at home privately in 2014 and 2015 combined, 53 of the 492 (10.8%) had a postpartum haemorrhage. Of the 112 women who originally planned a homebirth but transferred to hospital care, 30 (26.8 per cent) had a postpartum haemorrhage. This compares with 23.6 per cent of all women giving birth in Victoria in 2014 and 2015 combined. Two women who gave birth at home privately had a severe postpartum haemorrhage (greater than 1500 mL blood loss) and one of these required a blood transfusion. Both had been given prophylactic oxytocics in the third stage of labour.
- Of the 250 babies born at home in 2015 under private midwife care, four (1.6%) had a low Apgar score at five minutes, along with another two babies (3.2%) who were transferred to hospital care This compares with 1.5 per cent of all births in Victoria in 2015.

**Public homebirth**

- Of the 207 women planning a homebirth within a public hospital, 82 (2014) and 74 (2015) women actually birthed at home.
- Of these women, 16 (14.3%) and eight (8.4%) required transfer to hospital during labour in 2014 and 2015 respectively.
- Of the 156 women who birthed at home under a public hospital model in 2014 and 2015, 11 (7.1%) had a postpartum haemorrhage, along with 12 of the 51 (23.5%) who originally planned a public homebirth, but transferred to hospital care. This compares with 23.6 per cent of all women giving birth in Victoria in 2014 and 2015 combined. No woman in the public homebirth programs had a severe postpartum haemorrhage at home (greater than 1500 mL blood loss).
- Only one baby (0.6%) born at home under a public hospital model had a low Apgar score at five minutes, along with another three babies (5.9%) who were transferred to hospital care. This compares with 1.5 per cent of all births in Victoria in 2015.

1 The few cases where women planned to give birth in hospital, but changed their plan during labour to give birth under the care of a private midwife are excluded.

**Figure 11. Planned homebirth — place of birth outcome, Victoria 2012–15 (number)**

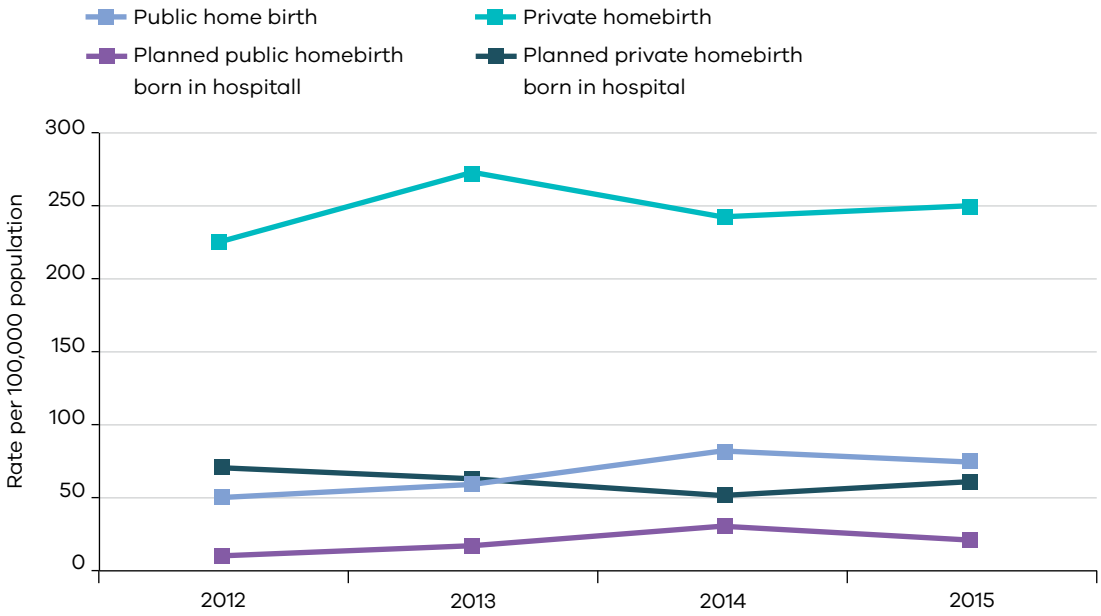



**Figure 12. Planned homebirth — public homebirth model — place of birth outcome, 2012–15 (number)**

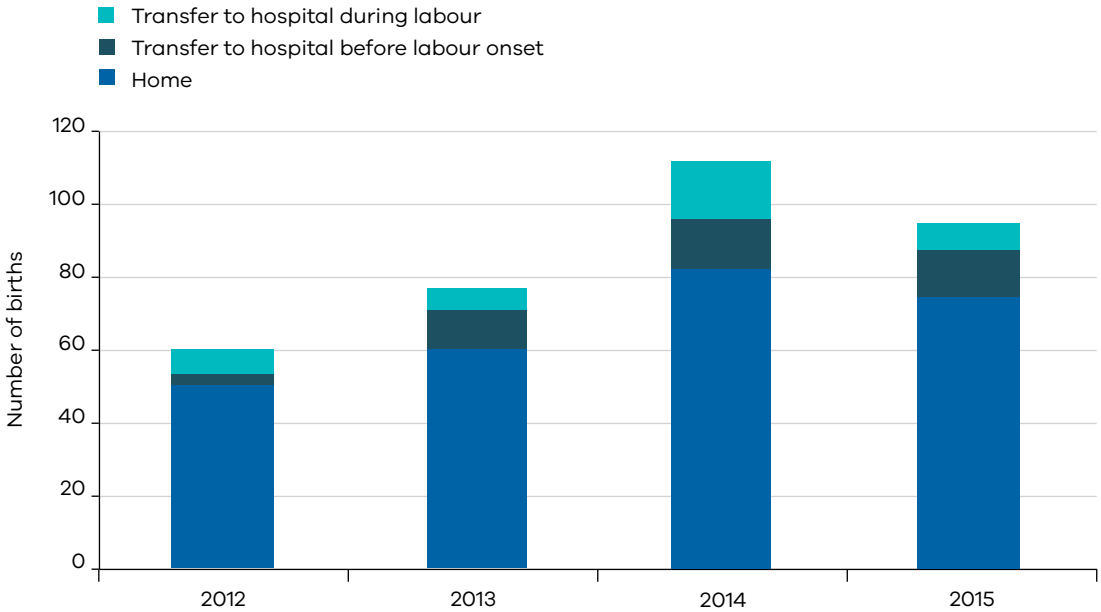


**Figure 13. Planned homebirth with a private midwife — place of birth outcome, 2012–15 (number)**

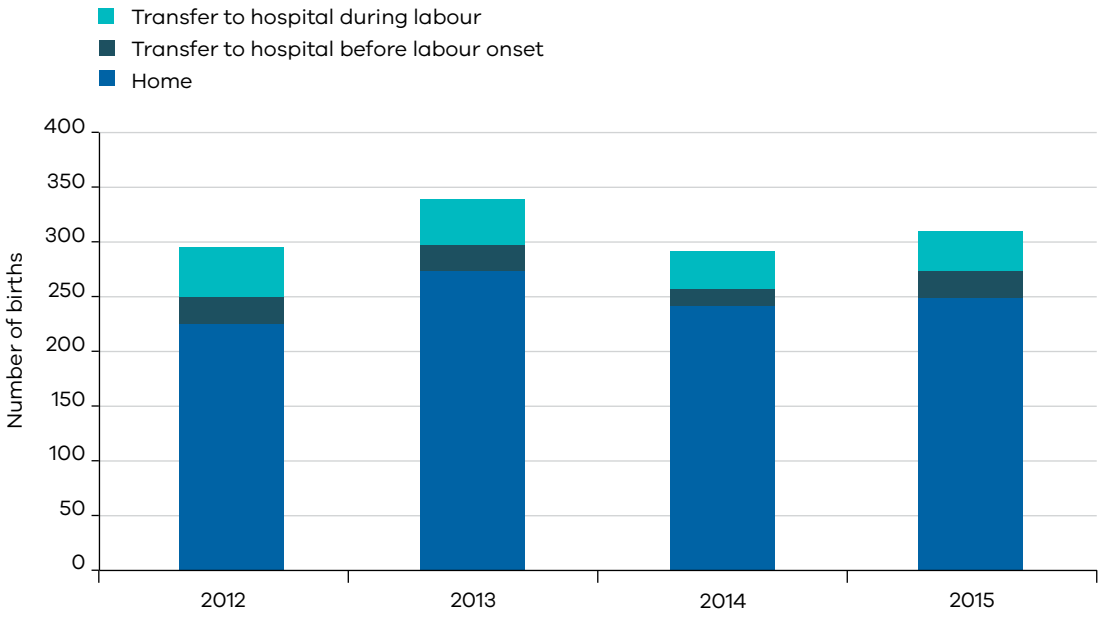
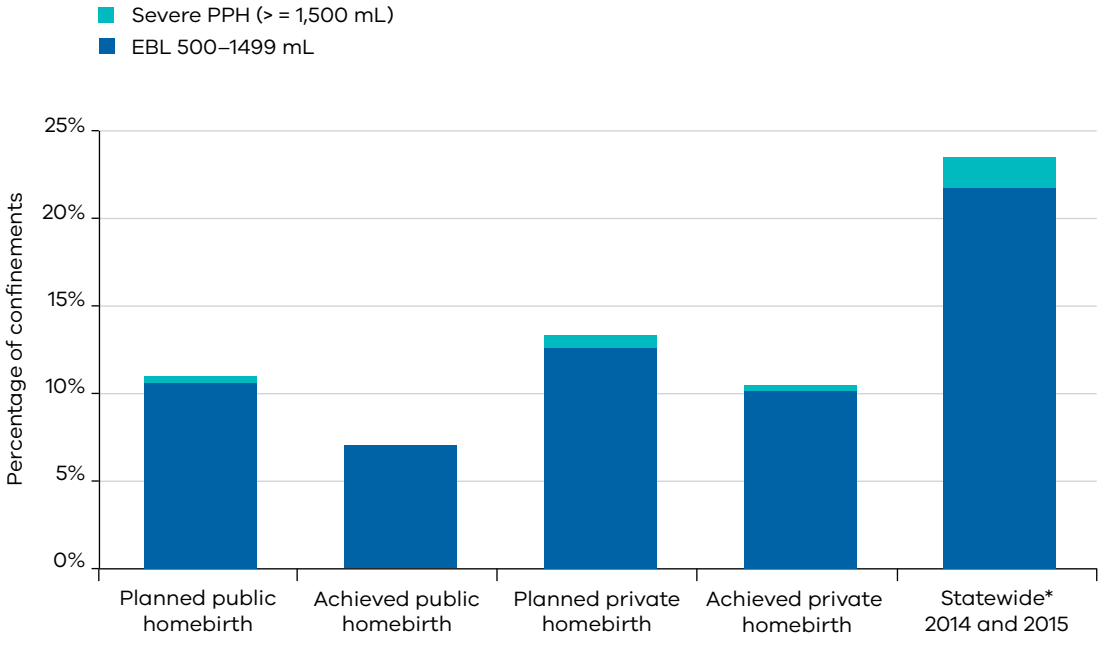



**Figure 14. Postpartum haemorrhage for planned and actual home births and for all women who gave birth in Victoria, 2014 and 2015 (percentage of confinements)**

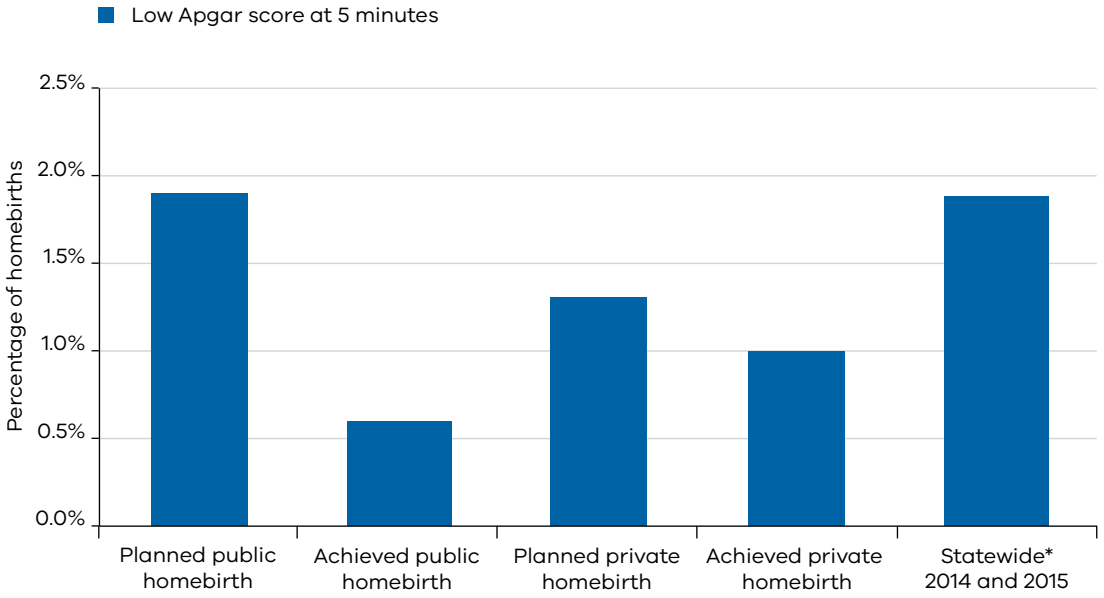



*Statewide = all confinements at home or in hospital in 2014 or 2015.

EBL = estimated blood loss.

NB: 'actual' home births are a subset of 'planned' home births; that is, those women who planned a homebirth and actually birthed at home as planned.

**Figure 15. Low Apgar scores for planned and actual home births and for all live births in Victoria, 2014 and 2015 (percentage of live births)**




* Statewide = all live births at home or in hospital in 2014 or 2015.

NB: 'actual' home births are a subset of 'planned' home births.

## Good practice points

- Health services and private homebirth practitioners must provide women with evidence-based information on the safety and potential risks of having their baby at home and the triggers for referral to a hospital or obstetrician. This discussion, including the advice given and the woman's responses, should be documented.
- Private practitioners who are supporting a woman with risk factors (or example, breech presentation) are required to refer the woman to specialist care for documented discussion of associated risks and safety options.
- Public health services and private practitioners must document discussions with women who decline recommended tests in pregnancy, as outlined in the Australian College of Midwives National Midwifery Guidelines for Consultation and Referral. Appendix B: Record of understanding of the National Midwifery Guidelines for Consultation and Referral can be used to document these discussions.

## Messages for consumers

- Home birth is currently available as an option to women who do not require complex care at Sunshine and Casey hospitals. Care is provided by midwives employed at the hospitals at no cost to the woman. Health services may offer home birth programs where they have the capacity, capability and demand to provide a safe, high-quality and sustainable program, and where robust feasibility and planning processes have been undertaken. This service is being considered for implementation in a number of other Victorian maternity services in 2017.
- Home birth under the care of a private midwife is also available.
- A small number of women planning a home birth will need to be transferred to hospital during labour. During pregnancy, your midwife will discuss the details of this emergency transfer plan in case it is needed.
- Most women who plan a home birth but do not actually give birth at home change their plan during pregnancy. This may be related to a complication that develops, or a change in wishes or circumstances.

## Further information

Victorian public health services establishing a home birth program should refer to the Department of Health and Human Services document *Implementing a public home birth program: guidance for Victorian public health services* (2015): <https://www2.health.vic.gov.au/about/publications/policiesandguidelines/implementing-public-home-birth-program>.

The Nursing and Midwifery Board of Australia's revised *Registration standard: Safety and quality guidelines for privately practising midwives* (SQG): <http://www.nursingmidwiferyboard.gov.au/News/2016-02-01-revised-midwifery-standards.aspx>.

The Better Health Channel provides further information on homebirth in Victoria: <https://www.betterhealth.vic.gov.au/health/servicesandsupport/homebirth>.

## 4.3 Post-partum morbidity

**Nearly one-quarter of all women giving birth in Victoria in 2014 and 2015 experience a primary postpartum haemorrhage,[2] with increasing rates of severe haemorrhage since 2012–13.**

Postpartum haemorrhage (PPH) continues to be a significant cause of maternal morbidity in Victoria. The incidence of PPH may be underestimated, because not all blood loss in the first 24 hours is taken into account when data on blood loss is recorded and submitted to the Victorian Perinatal Data Collection (VPDC) following the birth.

Severe perineal trauma is another significant adverse event which increases the likelihood of haemorrhage. The known impact of these adverse events on women is that these complications delay maternal recovery in the postnatal period and can reduce the likelihood of being able to successfully breastfeed.

Prophylactic oxytocics are given to reduce the risk of postpartum haemorrhage, but do not protect against blood sustained from perineal trauma. Victoria has the highest episiotomy rates in Australia, but lower rates of severe perineal trauma (third- and fourth-degree tears) which carry the risk of long term faecal incontinence. Further research is required to better understand the driving influencers for variation in practice for episiotomies and rates of perineal trauma among differing cohorts.

### SNAPSHOT

- About 24 per cent of women giving birth in 2014 or 2015 experienced a postpartum haemorrhage (≥ 500 mL blood loss).
- The rate of women experiencing severe PPH (≥ 1500 mL blood loss) is 1.9 per cent (2014) and 1.8 per cent (2015). This is an increase from 1.4 per cent in 2012–13.
- Women having a first birth were more likely to experience a PPH or severe PPH than women having a subsequent birth (Figures 16 and 17).
- Of all women giving birth in 2014 and 2015, 1.7 per cent required a blood transfusion.
- In 2015, women who gave birth by caesarean section were more likely to have a PPH (37.1%) than those who gave birth vaginally (13.6% for unassisted vaginal birth and 27.4% for instrumental vaginal birth). The principal difference was that blood loss between 500 and 1000 mL was three times greater in women who gave birth by caesarean section, and two times greater for an instrumental vaginal birth compared with an unassisted vaginal birth. Those who had an assisted vaginal birth were also more likely to have a severe PPH (3.1%) than those having an unassisted vaginal birth (1.6%) or a caesarean section (1.6%) in 2015 (Figure 18).
- Of women who gave birth in 2014 and 2015, 98.4 per cent were given prophylactic oxytocics. This rate is consistent with previous years.
- Of women who gave birth vaginally in 2015, 3.1 per cent sustained a severe (third- or fourth-degree) perineal laceration. This was more common for first births, and in women admitted as public patients (Figure 19).
- Of women who gave birth vaginally in 2015, 26.6 per cent had an episiotomy. This rate is consistent with previous years. Women having their first baby and those admitted as private patients were more likely than others to have an episiotomy (Figure 20).

2 According to the World Health Organization definition of ≥ 500 mL in the first 24 hours following birth.

**Figure 16. Postpartum haemorrhage for women having first births, 2012–15 (percentage)**

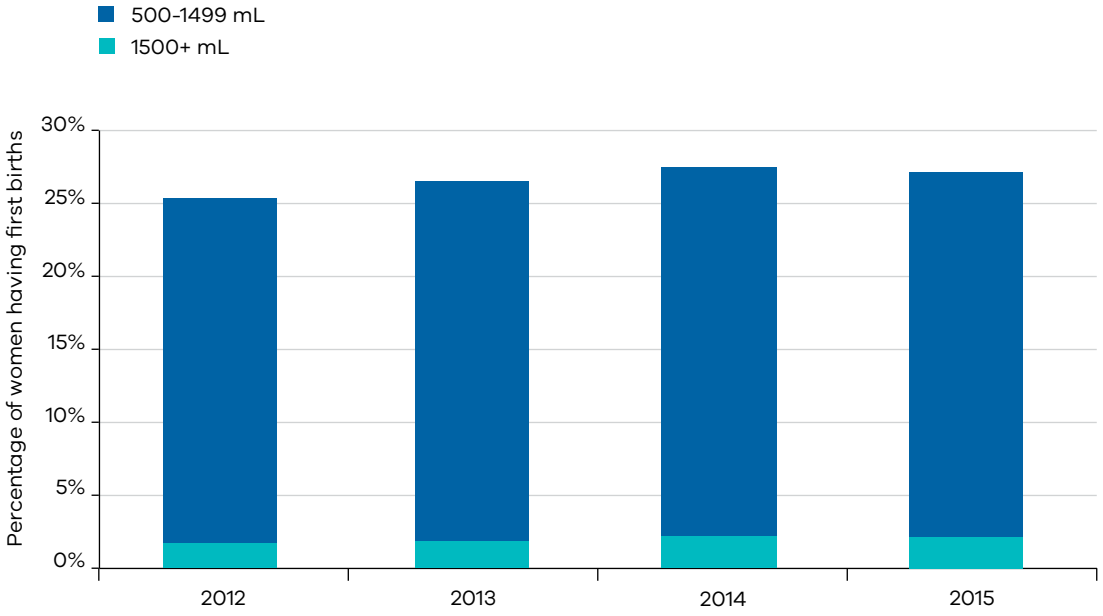



**Figure 17. Postpartum haemorrhage for women having subsequent births, 2012–15 (percentage)**

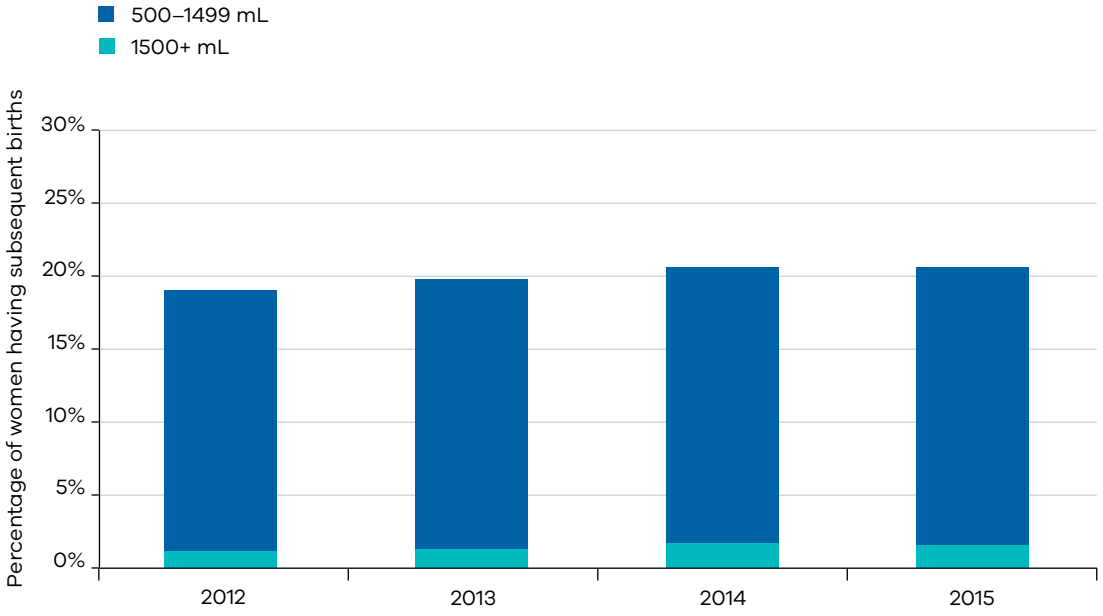


**Figure 18. Postpartum haemorrhage by method of birth, all women giving birth in 2014 and 2015**

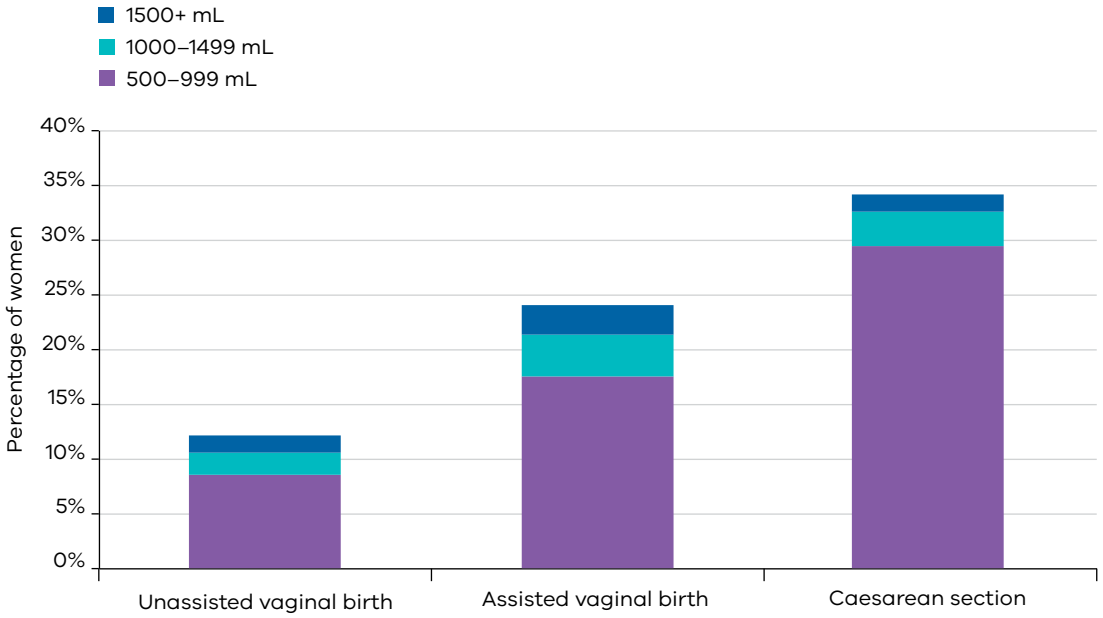



**Figure 19. Severe (third- or fourth-degree) perineal lacerations for women who gave birth vaginally by parity and admission status, 2012–15**

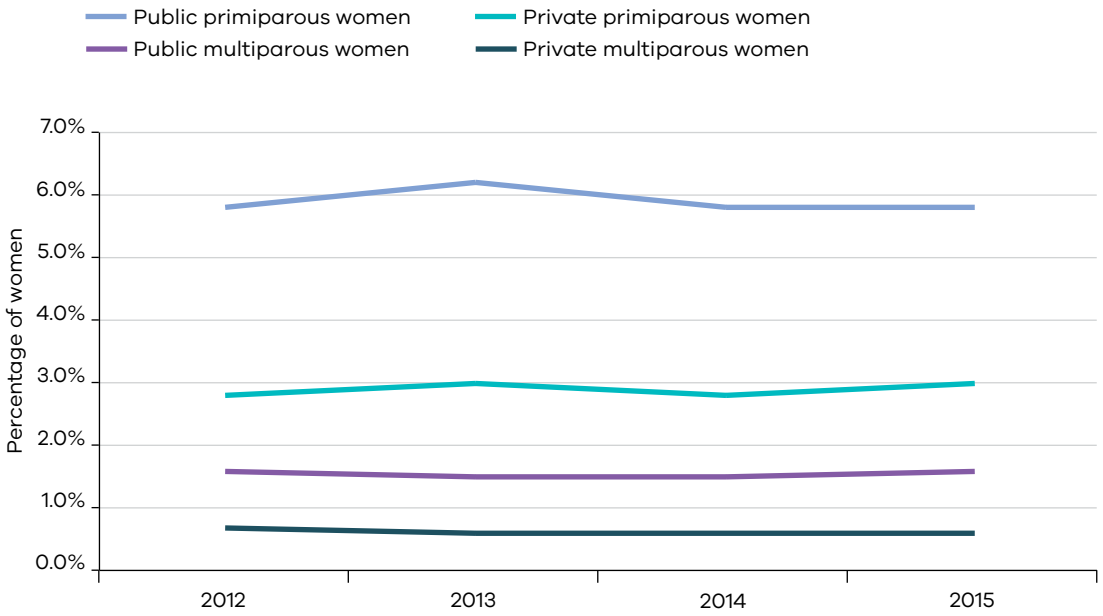
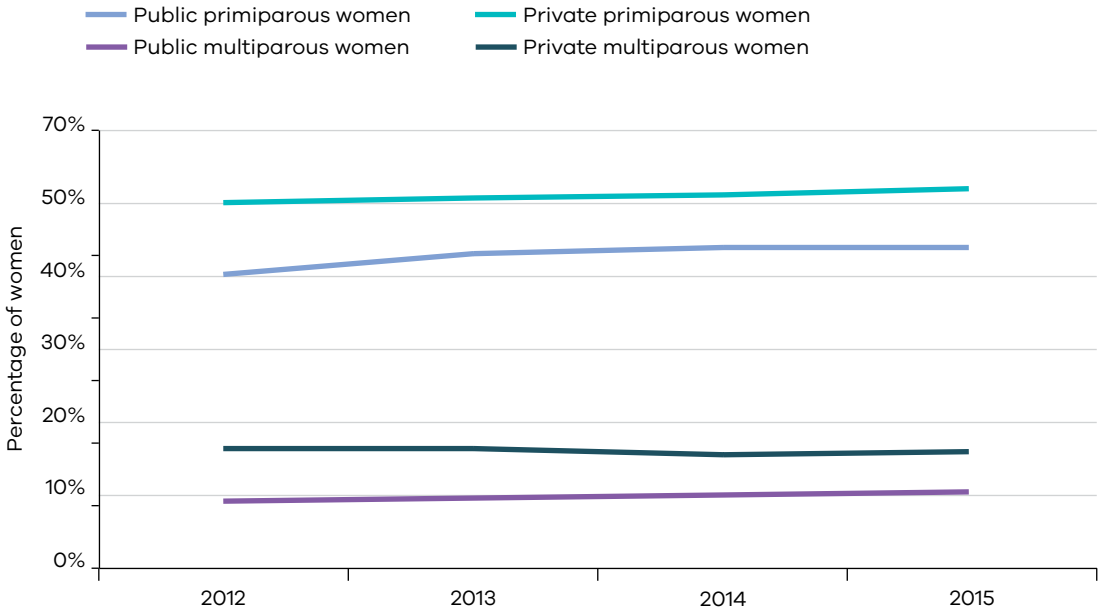


**Figure 20. Episiotomy for women giving birth vaginally by parity and admission status, 2012–15 (percentage)**




## Good practice points

- Health services should ensure there are evidence-based policies and procedures in place to manage the protection of the perineum during childbirth, including judicial use of episiotomies to prevent severe perineal trauma.
- Health services should actively monitor clinician competencies in the practice of episiotomy.
- Health services and health care providers should ensure clinicians are competent in the identification of third- and fourth-degree perineal lacerations, and follow appropriate evidence-based guidelines for the immediate and longer-term management.
- Maternity services should ensure that the total blood loss in the first 24 hours following birth is reported to the VPDC so that the burden of PPH can be accurately ascertained.

## Messages for consumers

- Nearly one-quarter of women giving birth experience a postpartum haemorrhage. Preventative medication and prompt recognition and management of excessive blood loss usually prevents serious harm.
- Episiotomy may be required to prevent major perineal damage during birth. Your caregiver should discuss the indications for episiotomy with you.

## Further Information

Royal College of Obstetricians and Gynaecologists *Third- and Fourth-degree Perineal Tears, Management (Green-top Guideline No. 29)*: <https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg29/>.

## 4.4 Aboriginal mothers and babies

**Health outcomes for Aboriginal mothers and babies are significantly poorer than for non-Aboriginal mothers and babies. However, the rates of maternal smoking, teenage pregnancy and perinatal mortality are showing an improving trend over the recent period in Victoria.**

The factors influencing the improved rates for certain health outcomes for Aboriginal mothers and babies in Victoria is unclear. However, increasing numbers of women and babies are being identified (or identifying as) Aboriginal in the Victorian Perinatal Data Collection, and there may be characteristics of these families that are associated with improved outcomes; such as higher socioeconomic status. Other factors that may be influencing these outcomes may be related to data quality, or the rates may reflect a true improvement in outcomes. Further analysis is required to confirm this trend with some degree of certainty.

The council is cautiously optimistic about this emerging trend in Victoria and will continue to closely monitor these outcomes and associated factors.

### SNAPSHOT

- In 2014, 1020 Aboriginal women gave birth in Victoria (1.3% of all women giving birth). This number slightly increased in 2015, with 1156 Aboriginal women giving birth in Victoria (1.5% of all women giving birth).
- In 2014, 1564 babies were born to Aboriginal women or were identified as Aboriginal. This represented 2.0 per cent of all births in Victoria. This number increased in 2015, with 1708 babies born to Aboriginal women or identified as Aboriginal. This represented 2.2 per cent of all babies and an increase of 0.2 per cent.
- In 2014 and 2015, 9.4 per cent of Aboriginal women giving birth were younger than 20 years, compared to 1.7 per cent of non-Aboriginal women (Figure 21). The proportion of teenage mothers has reduced by four per cent in 2014 and 2015, as compared to 2012 and 2013 (13.4 per cent).
- In 2014 and 2015, 39.9 per cent of Aboriginal women smoked at any time during pregnancy, including 30.1 per cent who continued to smoke in the second half of pregnancy (Figure 22). This compares with 9.4 per cent of non-Aboriginal women smoking at any stage, and 5.4 per cent who continued to smoke in the second half of pregnancy. The proportion of women who smoked at any time during pregnancy reduced by almost four per cent compared to 2013 (43.7%).
- Aboriginal women were less likely to require medical intervention for labour and childbirth (59.0% had an unassisted vaginal delivery in 2014 and 2015, compared to 51.4% of non-Aboriginal women).
- In 2014 and 2015, Aboriginal babies were 41 per cent more likely to be born pre-term (less than 37 weeks gestation) as compared to non-Aboriginal babies (RR 1.41 95% CI 1.28–1.57) Of Aboriginal babies, 11.2% were born pre-term, as compared to 8.0% of non-Aboriginal babies.
- In 2014 and 2015, Aboriginal babies were 60 per cent more likely to be born with a low birthweight (below 2500 g) than non-Aboriginal babies (RR 1.60 95% CI 1.45–1.78). Of Aboriginal babies, 10.2 per cent were born with a low birthweight (below 2500 g), as compared to 6.4 per cent of non-Aboriginal babies (Figure 23).

**Figure 21. Maternal age for Aboriginal and non-Aboriginal women who gave birth in Victoria, 2014 and 2015**

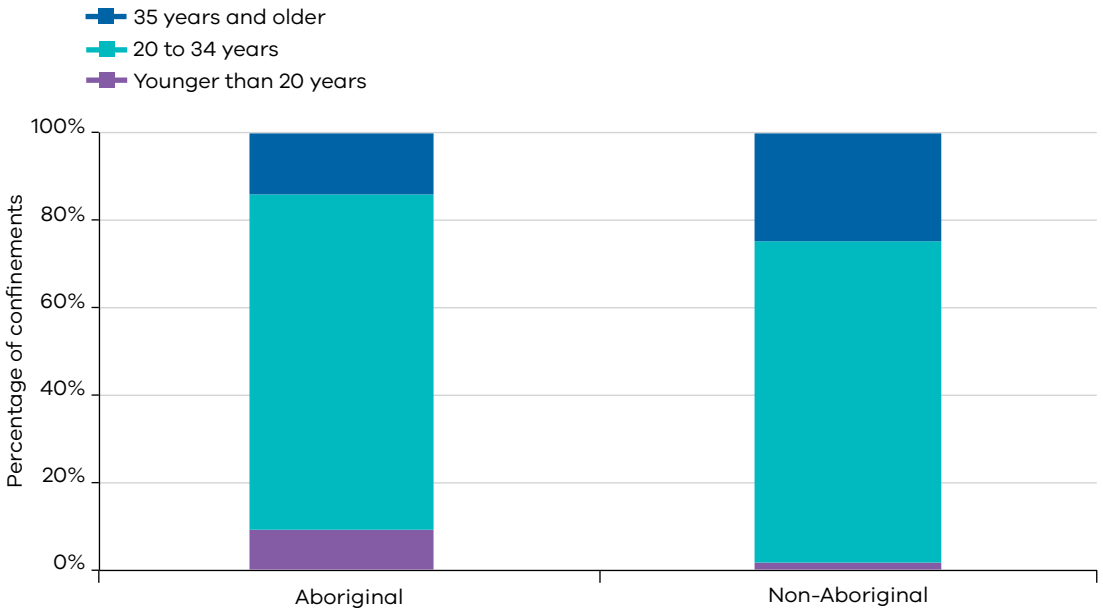



**Figure 22. Smoking in pregnancy for Aboriginal and non-Aboriginal women who gave birth in Victoria, 2014 and 2015**

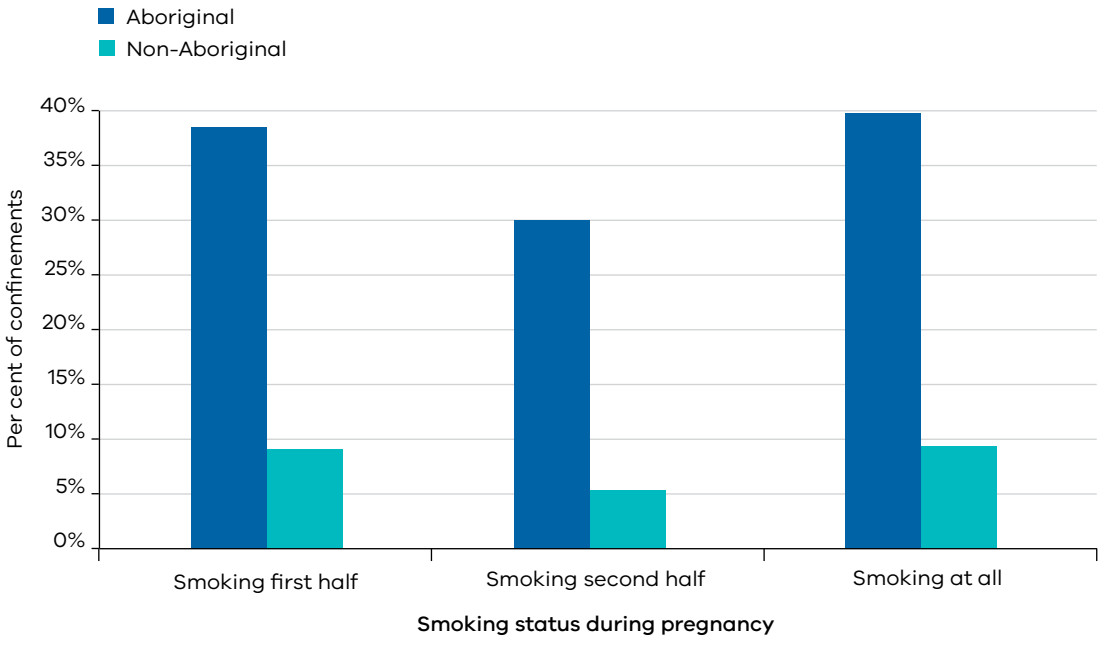
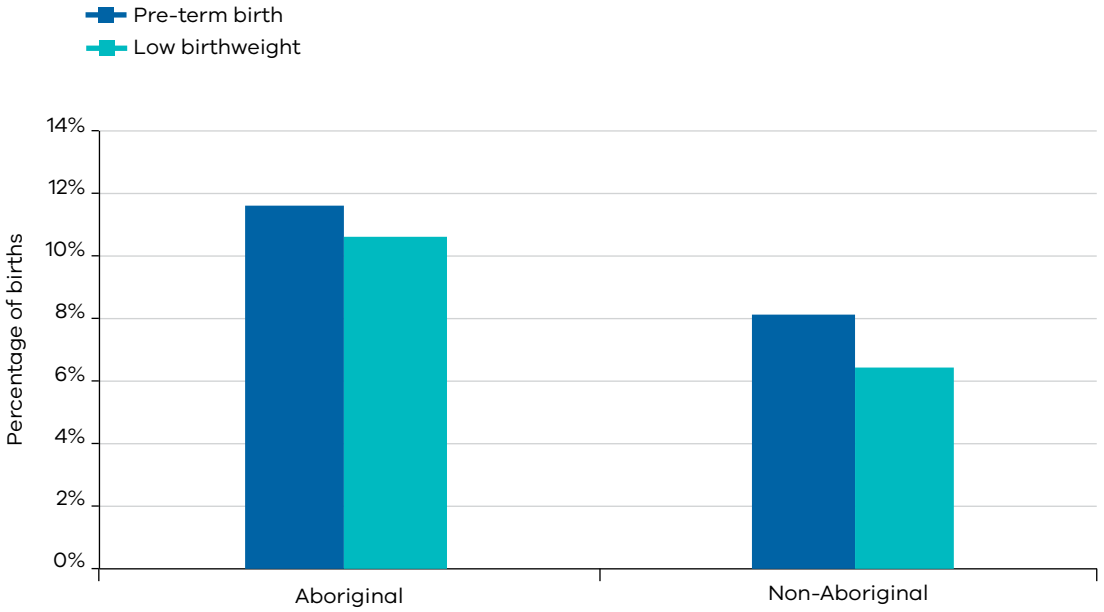


**Figure 23. Preterm birth (before 37 weeks gestation) and low birthweight (less than 2,500 g) for Aboriginal and non-Aboriginal babies born in Victoria, 2014 and 2015**




## Good practice points

Health service providers should carefully ascertain the mother's and the baby's Aboriginality to enable accurate monitoring of health outcomes and ensure the validity of the assessment of comparative perinatal outcomes.

## Messages for consumers

- Stopping cigarette smoking, especially in pregnancy, is one key action that women can take that will improve the outcomes of pregnancy. Women and their partners who smoke are urged to access help from the QUIT program.
- Engagement with maternity health service before becoming pregnant:
  - will optimise the health of women and their babies
  - identify and manage maternal and fetal risk factors, particularly early in pregnancy
  - reduce perinatal morbidity and mortality, including incidence of preterm birth and low birthweight.

## Further information

Victorian Aboriginal Community Controlled Health Organisation: <http://www.vaccho.org.au/>.

Koori Maternity Services: <https://www.betterhealth.vic.gov.au/health/serviceprofiles/Koori-Maternity-Services>.

# 5. Maternal deaths

Maternal deaths during pregnancy or following childbirth are rare in Australia. There are, however, important lessons that can be shared from the review of maternal deaths to ensure Victorian rates continue to remain low.

## 5.1 Overview

**Although maternal deaths are relatively rare in Victoria, detailed review of each death is essential to identify potential contributing factors so that the lessons learned can be used to further increase the safety of giving birth in Victoria.**

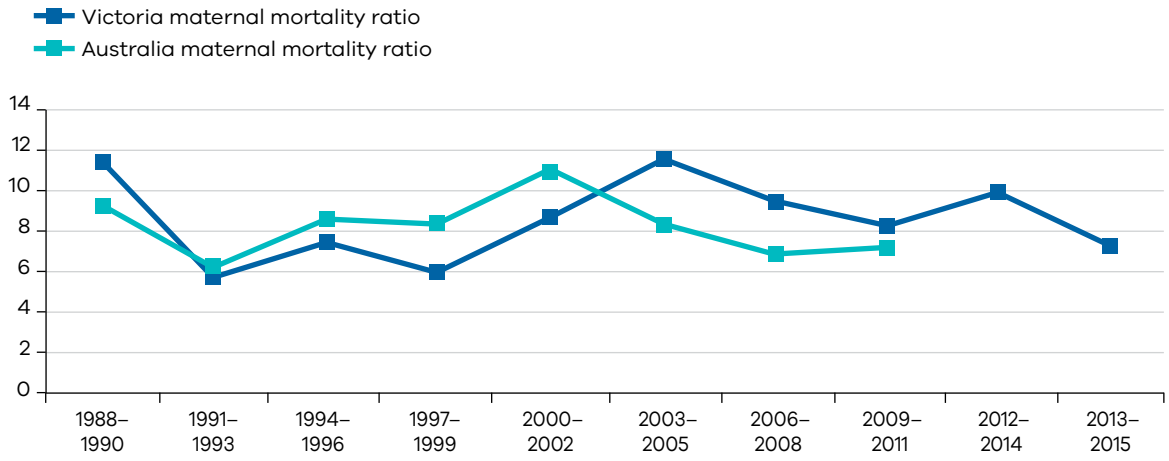
The increasing prevalence of women entering pregnancy with chronic conditions that carry significantly greater risk of adverse outcomes (such as obesity, diabetes or cardiovascular diseases) poses major challenges to health care providers. Many of the maternal deaths, and especially many of the late deaths that occur in the first year after the birth, continue to occur in the context of complex psychosocial circumstances, including drug and alcohol abuse, mental health problems and family violence.

Maternal deaths are classified as: 'direct' (relating to the pregnancy or birth); 'indirect' (pre-existing medical condition or newly diagnosed condition); and 'incidental' (unrelated to the pregnancy or birth); and 'late' (those occurring more than 42 days from the end of the pregnancy).

## SNAPSHOT

- In 2014 and 2015 there were a total of 19 maternal deaths: three direct, seven indirect and nine incidental. All the incidentals were late deaths.
- Because the number of deaths in any one year is small, this report has combined the deaths over the five-year period 2011 to 2015 inclusive.
- The Maternal Mortality Ratio (MMR) from 2011 to 2015 was 8.9 per 100,000 women who gave birth.
- The latest available Australian data is for the five-year period 2008 to 2012, when the MMR was 7.1 per 100,000 women giving birth. Comparison with other jurisdictions should be cautious, because the numbers are small and therefore subject to volatility.
- For the years 2011–15, the commonest causes of the early deaths (that is, during or within 42 days of the end of the pregnancy) were related to pre-existing cardiovascular disease or non-obstetric haemorrhage, including intracerebral haemorrhage. These accounted for 16 of the 22 indirect deaths (73%).
- Of the 13 direct deaths, obstetric haemorrhage and thromboembolism were the most common causes of death (three each), followed by amniotic fluid embolism (two) and complications related to anaesthesia (two).
- In a number of cases, it was not possible to determine if deaths related to drug overdoses were accidental or intentional, and consequently, the number of deaths due to suicide may be underestimated. In the five-year interval there were three deaths from suicide and three further possible deaths from suicide.
- In two cases, domestic violence was identified as being a principal cause, but again, this is likely to be an underestimation due to inadequate ascertainment of domestic violence.
- In three deaths, despite comprehensive investigations, including autopsy, it was not possible to definitively determine the cause of the death, and these remain 'undetermined or unascertained'.
- A recent report from the United States found that the risk of death from suicide is actually decreased during pregnancy, and in the year following the end of the pregnancy, while deaths from homicide are increased. Due to the small numbers of deaths under review, it is not possible to determine if this is the situation in Victoria.

**Figure 24: Mortality ratios by triennia, Victoria and Australia, 1988–2015**




a. The year 2013 is included twice, that is, rolling triennia were used for the two most recent triennia so that the 2014 and 2015 data could be represented.

b. At the time of publication the Australian data for 2012 onwards were not available.

### Case study 4

A previously well 25 year old woman midway through her first pregnancy who collapsed suddenly at home and was unable to be resuscitated despite prompt attendance by Ambulance Victoria. Due to the family's religious beliefs, an autopsy was not performed. It later transpired that there was a strong family history of sudden deaths at young ages, which raises the distinct possibility of an inherited cardiac conduction abnormality.

### Case study 4 key messages

At the first visit, a detailed family history should be taken, seeking specifically details about the causes of deaths in the immediate family. If such a history is revealed, referral to a cardiologist for evaluation is indicated.

Wherever possible, the family should be counselled on the importance of a full autopsy so that conditions that have implications for surviving family members can be identified.

### Case study 5

A 33 year old primigravid woman (a woman with a first pregnancy) was seen in the emergency department at 36 weeks gestation, complaining of severe central chest pain. Investigations (ECG and troponin) for myocardial infarction (heart attack) were negative and a V/Q scan to detect a pulmonary embolus was also normal. A chest X-Ray was not ordered due to a perception that it may cause harm to the fetus. The pain gradually settled following administration of Panadeine Forte. Labour was induced one week later following the development of pre-eclampsia, and she subsequently had a normal vaginal birth of a healthy infant. Two days postpartum she again complained of severe chest pain and collapsed and was unable to be resuscitated. An autopsy revealed a haemopericardium (severe bleeding around the heart) that caused cardiac tamponade (stopping the heart's ability to contract) due to an aortic dissection (rupture of the wall of the great vessel).

### Case study 5 key messages

Pregnancy at any gestation is not a contraindication to performing radiological examinations when a pregnant woman presents with severe chest or abdominal pain.

**Table 1. Causes of maternal deaths, Victoria 2011–15**

| | Cause of death | Maternal deaths included in mortality ratio | Late[a] maternal deaths |
|---|---|---|---|
| Direct | | N=12 | N=1 |
| (due to a complication of the pregnancy) | Obstetric haemorrhage | 3 | |
| | Thromboembolism | 2 | 1 |
| | Anaesthetic related death | 2 | |
| | Amniotic fluid embolus | 2 | |
| | Early pregnancy death – ectopic pregnancy | 1 | |
| | Sepsis[b] | 1 | |
| | Post partum sepsis – Streptococcus Group A | 1 | |
| Indirect | | N=22 | N=5 |
| (related to a pre-existing or newly diagnosed condition exacerbated by pregnancy) | Cardiac disease | 8 | |
| | Non-obstetric haemorrhage (includes intracerebral bleeding) | 8 | |
| | Psychosocial[c] | 1 | 2 |
| | Sepsis – acute pyelonephritis | 1 | |
| | Complications of heart transplant for the treatment of peripartum cardiomyopathy | | 1 |
| | Carcinoma of the cervix | | 1 |
| | Bronchopneumonia with associated substance abuse and domestic violence | | 1 |
| | Mixed drug toxicity | 1 | |
| | Undetermined | 3 | |
| Incidental | | N=0 | N=11 |
| (where the pregnancy is unlikely to have contributed significantly to the death) | Bronchopneumonia | | 1 |
| | Metastatic melanoma | | 1 |
| | Subarachnoid haemorrhage secondary to endocarditis | | 1 |
| | Prolonged QT syndrome | | 1 |
| | Pulmonary embolus | | 1 |
| | Complications post tubal ligation | | 1 |
| | Injuries (assault) | | 2 |
| | Traumatic head injury (unintentional) | | 1 |
| | Combined drug toxicity | | 2 |
| Total | | 34 | 17 |

a. All late (direct, indirect and incidental) maternal deaths occurring after 42 days but within one year of the birth are excluded from the calculation of the maternal mortality ratio.

b. This death did not occur in Victoria.

c Psychosocial causes include deaths in which a psychiatric condition contributed to the cause of death, and encompass wider issues such as family violence and substance misuse. In 2012 the National Maternal Mortality Advisory Committee advised that maternal deaths from suicide where the onset of mental health disorder is first recognised in pregnancy should be classified as 'direct' deaths, all other maternal suicides and psychosocial deaths should be classified as 'indirect'. Previously, many psychosocial deaths unrelated to the pregnancy were classified as 'incidental' deaths. Psychosocial can include deaths as the result of suicide or homicide

## Contributing factors in maternal deaths

Review of maternal death cases occurring in the five-year period 2011 to 2015 revealed a range of contributing factors, including family violence, difficulty accessing care and suboptimal standards of practice. One or more contributing factors were identified in 15 of the 51 (29%) maternal deaths.

It is important to note that the contributing factors identified may not have directly caused the death, nor had an influence on the outcome, although this assessment is made on each case.

Especially where these factors were related to suboptimal clinical care, feedback to health services was given so that they can be addressed and reduce subsequent morbidity and mortality.

**Table 2. Assessment of contributing factors in maternal deaths, Victoria 2011–15**

| Contributing factor | Number |
|---|---|
| **Factors relating to access to care** | **3** |
| Delay in transfer | 1 |
| Delay in access to specialist assistance | 1 |
| Lack of access to specialist care and services | 1 |
| **Factors relating to professional practice** | **23** |
| Anaesthetic issues | 3 |
| Delay in diagnosis and transfer | 4 |
| Failure to review diagnosis in light of diagnostic evidence | 1 |
| Failure to maintain an adequate airway and ventilation | 1 |
| Over reliance on test result despite clinical evidence of placenta accreta | 1 |
| Inadequate communication/communication breakdown | 1 |
| Inadequate management of obstetric haemorrhage (monitoring, diagnosis, resuscitation) | 3 |
| Inadequate investigation and management of sepsis | 1 |
| Suboptimal resuscitation | 3 |
| Suboptimal diabetes management | 1 |
| Inappropriate discharge | 1 |
| Poor organisational management | 1 |
| Poor crisis management | 1 |
| Poor documentation | 1 |
| **Factors relating to the pregnant woman, her family and social situation** | **8** |
| Declining or not following medical advice | 1 |
| Delay in seeking medical advice | 1 |
| Family violence | 3 |
| Substance misuse | 3 |
| **Total** | **33** |

NB: some cases have multiple contributing factors.

The presence or absence of contributing factors is systematically assessed and coded by the expert Maternal Mortality and Morbidity Sub-committee of the CCOPMM in their review of all maternal deaths that occur in the state of Victoria.

The factors are grouped into three main categories:

- factors related to professional practice
- factors related to access to care, including access to appropriate expertise, services
- factors related to the woman, her family and social situation.

If a contributing factor is identified the relevance of that factor to the outcome is further characterised as:

- **R** — failure to recognise the problem
- **A** — failure to act appropriately
- **C** — communication failure
- **S** — failure to supervise
- **H** — inadequate human resources.

The relevance of the suboptimal factor(s) to the outcome are determined as:

- **I** — unlikely to have contributed to outcome (insignificant)
- **P** — might have contributed to outcome (possible)
- **S** — likely to have contributed to outcome (significant)
- **U** — insufficient information available (undetermined).

Contributing factors were identified in 15 of the maternal deaths (29%). For the direct and indirect deaths contributing factors were identified in 38 per cent of cases.

### Sub-optimal clinical practice

- Factors related to clinical practice accounted for two-thirds of all the contributing factors identified.
- Suboptimal professional factors were identified in 13 maternal deaths. The most common factors were:
  - inadequate resuscitation and postoperative care
  - delays in diagnosis and transfer to appropriate level of care
  - over-reliance or misinterpretation of significance of test results on tests.

### Factors related to the woman, her family and social situation

- Contributing factors were identified in four maternal deaths.
  - The most common factors were family violence, substance misuse and declining or not following medical advice

### Access to care

- Delays in transfer for specialist critical care were identified in two deaths.

### Good practice points

- At the first visit, a detailed family history should be taken, seeking specific details about the causes of deaths in the immediate family. If a history of cardiac disease or sudden otherwise unexplained deaths is revealed, referral to a cardiologist for evaluation should be considered.
- ECGs recorded during pregnancy should be reported by clinicians with appropriate expertise.
- If sepsis is suspected, treatment with appropriate antibiotics should be started as soon as possible.
- Rarity of blood group should not influence the decision of whether or not to cross-match blood before an operative procedure, where it is anticipated that active resuscitation may be required.
- Clinicians are reminded about the value of autopsy in identifying the exact cause of death and underlying factors, even where the cause of death may seem apparent.
- Clinicians should not delay necessary radiological imaging, including chest X-ray, because of pregnancy. This risk to the fetus is minimal after the first trimester. This is particularly important when a life-threatening condition, such as aortic or splenic artery aneurysm, is suspected.
- Resuscitation training should be multidisciplinary and include clear identification of the clinical leader.

- A convulsion in pregnancy even when there is a past history of epilepsy should be first treated as an eclamptic seizure, especially if there is any hypertension and/or proteinuria.
- Pregnant women presenting to emergency departments wherever possible should be seen by an obstetrically trained medical practitioner.
- All pregnant women should be tested for proteinuria at their first booking and at each subsequent visit for those with risk factors for, or clinical indications of, pre-eclampsia; in particular, raised blood pressure.

# 6. Perinatal deaths

Perinatal mortality includes fetal deaths (stillbirths) and deaths of live-born babies within the first 28 days after births (neonatal deaths). The information in this section refers to the 'adjusted' perinatal mortality rate, where terminations of pregnancy for psychosocial reasons are excluded. This adjustment provides a better measure for avoidable mortality and for comparison nationally and with other jurisdictions. Statistics for unadjusted perinatal mortality can be found in the appendices of this report.

## 6.1 Overview

**Victoria's perinatal mortality rate (9.0 per 1000 births) is the lowest in 15 years, and comparable with the most recent overall Australian rate of 9.6 per 1000 births reported for 2014.**

**Victoria's perinatal mortality rates for Aboriginal and Torres Strait Island babies continued to decline from 23.6 per 1000 births in 2008–10 to 13.6 per 1000 births in 2013–15. However, the gap between Aboriginal and non-Aboriginal populations remains wide (almost one and a half times).**

Although these rates are at historic lows, the challenge still remains to reduce these deaths further by identifying and potentially modifying risk factors associated with increased stillbirths and neonatal deaths. These include the hypertensive disorders, fetal growth restriction (FGR), diabetes and reduced fetal movements — an important warning sign of imminent fetal death.

Rates remain higher for babies of:

- Aboriginal women
- women born in Sub-Saharan Africa, Oceania, Southern and eastern Europe and southern and central Asia
- multiple pregnancies
- born preterm or with FGR.

Social factors, including socioeconomic disadvantage, nutrition, smoking and substance abuse and maternal education, are all associated with increased risks of perinatal loss.

A recurrent concern identified by the Stillbirth, Neonatal Mortality and Morbidity and Child and Adolescent Sub-committees of CCOPPM is the quality of ultrasound examinations and reports.

Antenatal diagnosis of some major congenital abnormalities, especially cardiac anomalies, requires skilled ultrasonic assessment. If these anomalies are not identified, the opportunity for counselling of the parents and preparation for appropriate management is missed.

Similarly, the accurate ultrasound measurement and reporting of the growth parameters of the developing fetus requires assessment by skilled practitioners, so that the responsible maternity service practitioners can react appropriately when the baby's growth is below or above the normal range.

Perinatal mortality includes fetal deaths (stillbirths) born after 20 weeks' gestation and deaths of live-born babies (irrespective of gestational age) within the first 28 days of life. To enable comparison and benchmarking against other jurisdictions, termination for psychosocial reasons are excluded from the analyses in this section — 'adjusted' perinatal mortality.

## SNAPSHOT

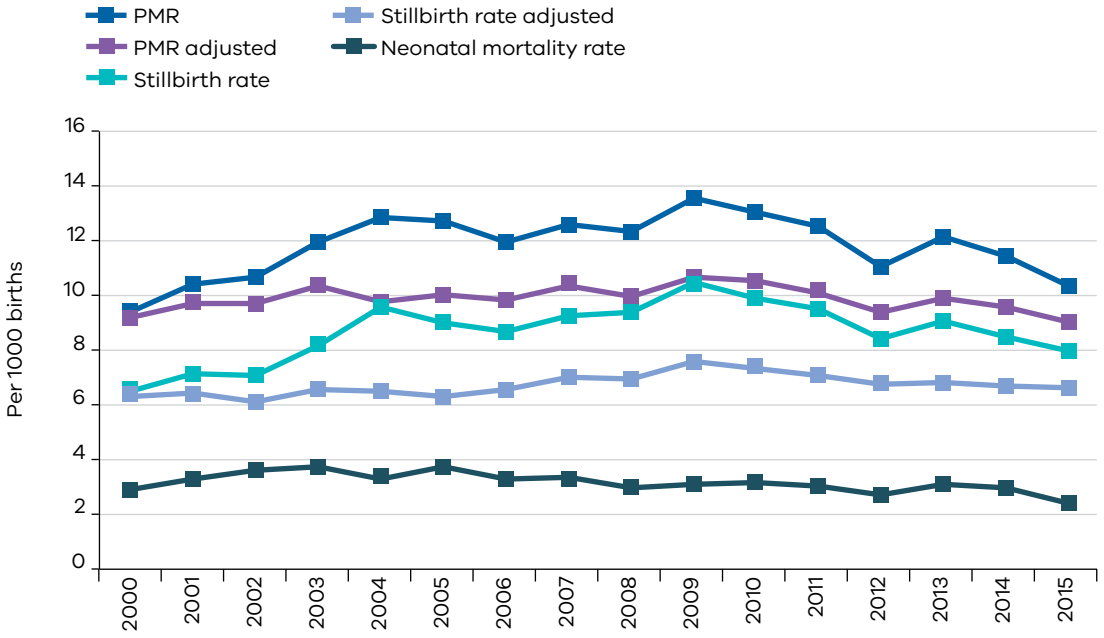
- Victoria's perinatal mortality rates are 9.6 per 1000 births (2014) and 9.0 per 1000 births (2015). These are the lowest reported for Victoria in 15 years.
- The adjusted stillbirth rate for babies born after 20 weeks' gestation was 6.7 per 1000 births in 2014 and 6.6 per 1000 births in 2015.
- The adjusted neonatal death rate (up to 28 days of age) was 2.9 per 1000 in 2014 and 2.4 per 1000 per total births in 2015.
- The total adjusted perinatal mortality rates were 9.6 per 1000 in 2014 and 9.0 per 1000 total births in 2015.
- The perinatal mortality rate for twin pregnancies for the combined years 2014 and 2015 was 35.9 per 1000 for twin pregnancies, and 133.3 per 1000 for triplets, compared with 8.4 per 1000 for singletons.
- The perinatal mortality rates continued to be higher for women from south and central Asia, southern and central Europe, Oceania and Sub-Saharan Africa, compared with women born in Australia.
- The fall in the perinatal mortality rates for women of Aboriginal and Torres Strait Island status continued in 2014 and 2015 (down from 23.6 per 1000 births in 2008–10 to 13.6 per 1000 in 2013–15), but still remains higher than for women of non-Aboriginal and Torres Strait Island status (9.4 per 1000 births). The risk of perinatal mortality in babies of Aboriginal women was 1.4 times greater than for babies of non-Aboriginal women.
- The reduction in the Aboriginal and Torres Strait Islander perinatal mortality rate is mainly due to the decline in stillbirths, because the neonatal mortality rate has remained relatively unchanged. The number of Aboriginal and Torres Strait Islander perinatal deaths involved are small and associated with a high degree of volatility, therefore further analysis is required to confirm these results, and these should be interpreted with caution.
- The leading cause of stillbirth was congenital anomalies. Unexplained fetal deaths, where a definitive cause could not be established, remained the second-most common classification in 2015. Preterm birth, fetal growth restriction (FGR) and specific fetal conditions, including twin-to-twin transfusion syndrome, feto-maternal haemorrhage, cord accidents and birth trauma, also remain amongst the next most common causes.
- For newborns up to the age of 28 days, congenital anomalies and spontaneous preterm birth were the two most common causes.
- The council is undertaking further research in the quality of obstetric ultrasound provided in Victoria, which aims to inform strategies to improve the identification and management of selected major congenital abnormalities and suboptimal fetal growth during pregnancy.

**Table 3. Perinatal deaths and crude and adjusted mortality rates in Victoria 2001–15**

| | 2001 | 2005 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|
| **Number** | | | | | | | | | |
| Live births[a] | 61,705 | 66,041 | 72,474 | 73,755 | 73,389 | 77,712 | 77,609 | 78,438 | 78,637 |
| Stillbirths | 444 | 599 | 767 | 738 | 705 | 659 | 712 | 672 | 633 |
| Neonatal deaths | 204 | 247 | 226 | 235 | 223 | 210 | 241 | 231 | 189 |
| Perinatal deaths | 648 | 846 | 993 | 973 | 928 | 869 | 953 | 903 | 822 |
| Stillbirth | 7.1 | 9.0 | 10.5 | 9.9 | 9.5 | 8.4 | 9.1 | 8.5 | 8.0 |
| Neonatal | 3.3 | 3.7 | 3.1 | 3.2 | 3.0 | 2.7 | 3.1 | 2.9 | 2.4 |
| Perinatal | 10.4 | 12.7 | 13.6 | 13.1 | 12.5 | 11.1 | 12.2 | 11.4 | 10.4 |
| **Number (adjusted for terminations of pregnancy for maternal psychosocial indications)** | | | | | | | | | |
| Live births | 61,705 | 66,039 | 72,474 | 73,755 | 73,389 | 77,712 | 77,609 | 78,437 | 78,637 |
| Stillbirths | 399 | 421 | 553 | 547 | 522 | 527 | 533 | 526 | 526 |
| Neonatal deaths | 204 | 245 | 226 | 235 | 223 | 210 | 241 | 230 | 189 |
| Perinatal deaths | 603 | 666 | 779 | 782 | 745 | 737 | 774 | 756 | 715 |
| **Rate per 1000 births[b,c] (adjusted for terminations of pregnancy for maternal psychosocial indications** | | | | | | | | | |
| Stillbirth | 6.4 | 6.3 | 7.6 | 7.4 | 7.1 | 6.7 | 6.8 | 6.7 | 6.6 |
| Neonatal | 3.3 | 3.7 | 3.1 | 3.2 | 3.0 | 2.7 | 3.1 | 2.9 | 2.4 |
| Perinatal | 9.7 | 10.0 | 10.7 | 10.5 | 10.1 | 9.4 | 9.9 | 9.6 | 9.0 |

a, b. Stillbirth and perinatal death rates were calculated using total births (live births and stillbirths) as the denominator.
c. Neonatal death rates were calculated using live births as the denominator.

**Figure 25. Perinatal mortality rates in Victoria 2000 to 2015 (crude and adjusted)**



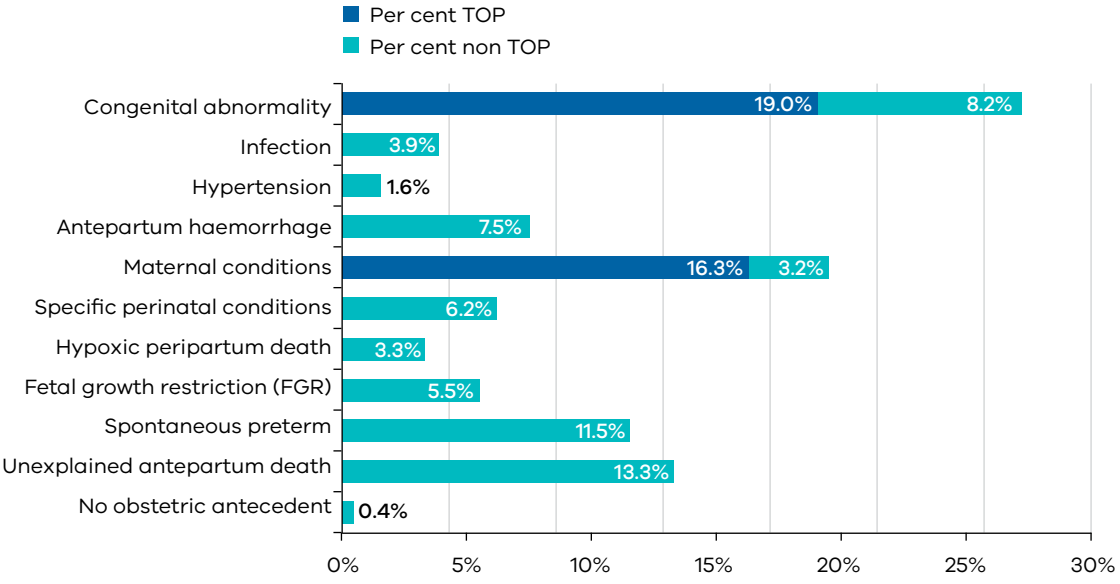

PMR = perinatal mortality rate.

**Table 4. Perinatal mortality rate (PMR) adjusted, by maternal place of birth, Victoria 2015**

| | Live births | Stillbirths | Neonatal deaths | Perinatal deaths | Per cent of all perinatal deaths | PMR by maternal place of birth |
|---|---|---|---|---|---|---|
| North-east Asia | 3712 | 8 | 9 | 17 | 2.4 | 4.6 |
| Americas | 1110 | 4 | 2 | 6 | 0.8 | 5.4 |
| North-west Europe | 2290 | 11 | 6 | 17 | 2.4 | 7.4 |
| North Africa and the Middle East | 2762 | 13 | 8 | 21 | 2.9 | 7.6 |
| South-east Asia | 5064 | 27 | 15 | 42 | 5.9 | 8.2 |
| Australia | 50002 | 339 | 110 | 449 | 62.8 | 8.9 |
| Southern and Eastern Europe | 1437 | 11 | 4 | 15 | 2.1 | 10.4 |
| Southern and Central Asia | 7838 | 68 | 19 | 87 | 12.2 | 11.0 |
| Oceania and Antarctica (excl. Australia) | 2202 | 20 | 6 | 26 | 3.6 | 11.7 |
| Sub-Saharan Africa | 1686 | 18 | 7 | 25 | 3.5 | 14.7 |
| *Missing* | *534* | *7* | *3* | *10* | *1.4* | *18.5* |
| **Total** | **78,637** | **526** | **189** | **715** | **100.0** | **9.0** |

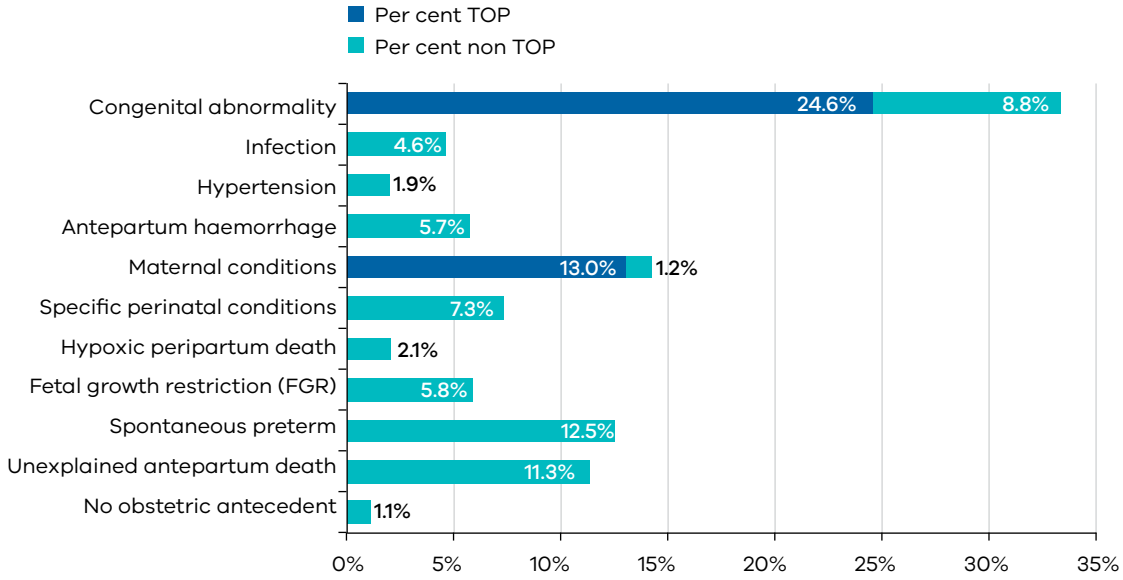
This table is ranked by PMR.

**Figure 26. a (i) and (ii) Causes of perinatal deaths (per cent) PSANZ PDC, Victoria 2014**




TOP – termination of pregnancy.

**Figure 27. a (i) and (ii) Causes of perinatal deaths (percentage) PSANZ PDC, Victoria 2015**




TOP – termination of pregnancy.

**Figure 28. Perinatal mortality rate (adjusted) by Aboriginal status, Victoria 2001–15**

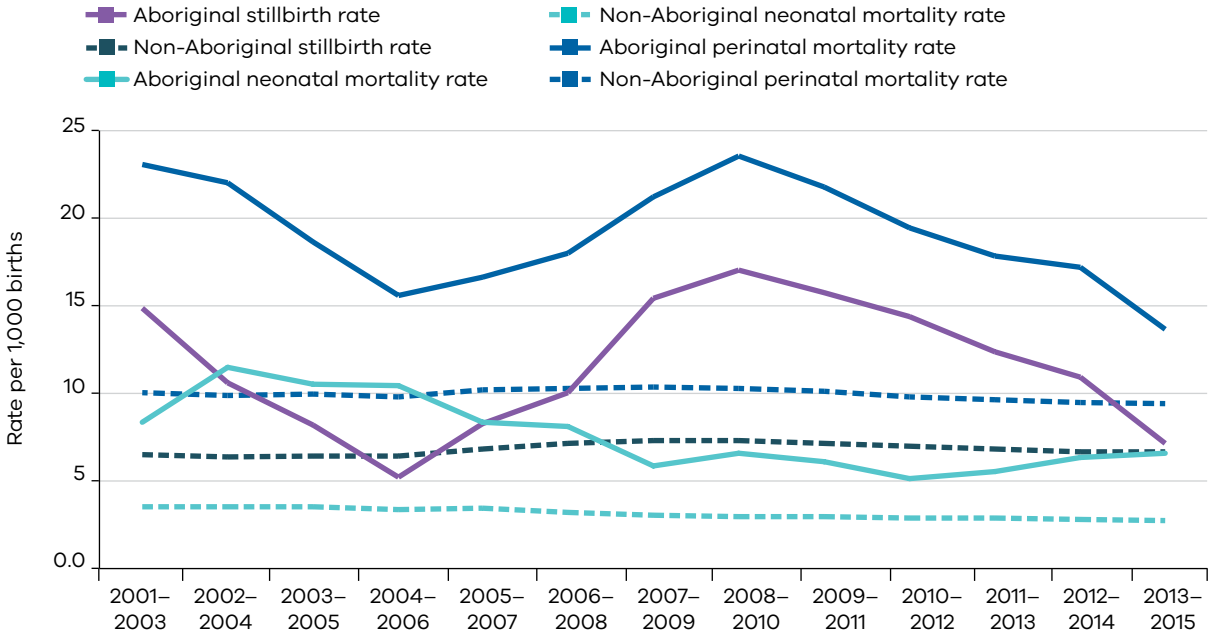


**Table 5. PMR-adjusted in Victoria 2012–15 (birthweight ≥ 500 g)**

| | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|
| Total births (birthweight ≥ 500 g) | 78,000 | 77,906 | 78,729 | 78,867 |
| Live births | 77,618 | 77,505 | 78,338 | 78,515 |
| Stillbirths | 382 | 401 | 391 | 352 |
| Neonatal deaths | 121 | 156 | 142 | 129 |
| Perinatal deaths | 503 | 557 | 533 | 481 |
| **Rate per 1000 births** | | | | |
| Stillbirths | 4.9 | 5.1 | 5.0 | 4.5 |
| Neonatal | 1.6 | 2.0 | 1.8 | 1.6 |
| Perinatal | 6.4 | 7.1 | 6.8 | 6.1 |

## Good practice points

**Decreased fetal movements:**

- The PSANZ-SANDA Clinical Practice Guideline is expected management when caring for women who report decreased fetal movements.

**Hypertensive disorders:**

- testing for proteinuria is essential in women with high blood pressure

**Diabetes and pregnancy:**

- women with pre-existing diabetes require specialist care
- clinicians are reminded that women at high risk for diabetes should be screened before pregnancy or as early as possible in pregnancy. Risk factors include:
  i. previous GDM
  ii. previous impaired fasting glucose (IFG) and/or impaired glucose tolerance (IGT)
  iii. women aged 40 or more years
  iv. first-degree relative with diabetes or history of GDM
  v. BMI of ≥ 35
  vi. previous macrosomic infant (birthweight 4500 g or ≥ 95th centile)
  vii. polycystic ovarian syndrome (PCOS)
  viii. corticosteroid and antipsychotic medication.

**Premature rupture of membranes:**

Pregnant women should receive advice on the implications and reporting of premature rupture of membranes.

**Urgent caesarean section:**

- Where possible, the O&G consultant should personally speak with the anaesthetist regarding the degree of urgency and critical details. If this is not possible, the HMO be directed to communicate these details. Hospitals should have a system in place to indicate the urgency of a caesarean.

**Adult resuscitation and monitoring:**

- Clinicians are reminded of the importance of sufficient intravenous fluid replacement prior to delivery for placental abruption.
- Consideration should be given to the monitoring of maternal pulse to distinguish between maternal and fetal heart rates and oxygen saturation using an oximeter during as an alert for concealed haemorrhage from uterine rupture during VBACs.

**Neonatal resuscitation:**

- Neonatal services should ensure they have procedures in place for securing endotracheal tubes and umbilical venous catheters when inserted during medical procedures.
- Maternal services should have a systematic program for neonatal resuscitation training and ensure that they follow the Neonatal Resuscitation Guidelines.
- Collection of blood from the femoral artery is not recommended in neonates as it can cause thrombosis of the vessel and DIC in the presence of hypoxia.
- Advanced skills training is required to reinforce how to confirm the correct placement of the endotracheal tube.
- PIPER should be contacted early in the resuscitation process when the baby is not responding.
- NICU directors should develop collaborative guidelines for the referral for ECMO.

**Unwell neonate:**

- Appropriate antibiotic therapy should be considered early in the treatment of the unwell neonate.
- When babies weighing less than 2.5 kg are being discharged, timely review by a senior paediatrician must be arranged.
- Newborns who are failing to feed adequately require close observation before and after discharge from the maternity service.
- The attention of parents should be drawn the signs of an unwell baby page in the M&CHN book. This should occur both during child birth education classes and before discharge from the maternity service.
- Maternity services are encouraged to develop and use a template for recording advice given by telephone.
- Maternity services should consider the following points when reviewing an 'unexpected' neonatal death:
  - How well lit was the room? Could staff actually observe the colour/breathing of the baby?
  - If mother was encouraged to breast feed soon after the birth, what support/instruction was she given?
  - What position was the baby found in?
  - Did the parents notice any unusual sounds?

## 6.2 Neonatal resuscitation

**The absence of clinicians skilled in neonatal resuscitation and non-adherence to current, authoritative clinical practice guidelines has contributed to avoidable neonatal mortality and morbidity in Victorian hospitals.**

The *Australian and New Zealand Council on Resuscitation (ANZCOR) Neonatal Resuscitation Guidelines* cover the first response; that is, the initial assessment of the newborn infant, determination if the neonate does need assistance, and if so, guidance on assisting with positive pressure ventilation and external chest compression. The second component is advanced resuscitation, which covers endotracheal intubation, cardiac output support, provision of vascular access and provision of volume expanders.

### SNAPSHOT

- Inadequate neonatal resuscitation remains a contributing factor in neonatal deaths.
- Avoidable factors include incorrect placement of the endotracheal tube or not ensuring that the tube is adequately secured.
- Clinicians attending for neonatal resuscitation have not been familiar with the latest ANZCOR guidelines for neonatal resuscitation.

### Case study 6

A 30 year old woman in her third pregnancy presented in labour at 40 weeks' gestation after an uncomplicated pregnancy. Twelve hours after admission the fetal heart was noted to be 80 bpm and there were prolonged late decelerations on the CTG. Because the cervix was 7 cm dilated, she was taken immediately to the operating theatre and the baby was born 20 minutes later. His birthweight was 2780 g (< third centile) and he had an Apgar of 1. Due to the lack of experience in neonatal resuscitation, on the third attempt he was intubated with some difficulty and CPR was commenced. He failed to respond to resuscitative attempts and these efforts were ceased after 23 minutes. A postmortem CT scan showed that the endotracheal tube was misplaced in the mid thoracic oesophagus; that is, it was not in the correct position in the trachea.

### Case study 6 key messages

This case highlights the importance that any clinician (including paramedics) who may be involved in neonatal resuscitation must receive neonatal resuscitation training and have their clinical competencies in neonatal resuscitation monitored by their health service or organisation.

The ANZCOR neonatal resuscitation guidelines must be followed.

The correct placement of the endotracheal tube should be confirmed by attaching an end tidal $CO_2$ detector to the outside of the endotracheal tube.

## Good practice points

### Neonatal services

- Neonatal services should ensure they have procedures in place for securing endotracheal tubes and umbilical venous catheters when inserted during medical procedures:
  - Maternity services should have a systematic program for neonatal resuscitation training, monitoring ongoing competencies and ensure that they follow the ANZCOR neonatal resuscitation guidelines.
  - PIPER should be contacted early in the resuscitation process when the baby is not responding.
  - Neonatal intensive care unit (NICU) directors should develop collaborative guidelines for the referral for ECMO.
  - A self-inflating bag should be available at every birth in the event of resuscitation equipment failure.

### Health care practitioners

- Advanced skills training is required to reinforce how to confirm the correct placement of the endotracheal tube.
- Umbilical vein cannulation (UVC) is the first option for intravenous (IV) access in a compromised baby requiring resuscitation with IV therapy.
- Following insertion of the UVC, its correct position should be confirmed with a lateral and an antero-posterior X-ray.
- Collection of blood from the femoral artery is not recommended in neonates, because this can cause thrombosis of the vessel and disseminated intravascular coagulation in the presence of hypoxia.
- Adrenaline should be administered via the endotracheal tube (ETT) if venous access is not immediately available.
- If unable to intubate the baby, ventilation with bag and mask should be continued until further clinical support arrives. Pressure may need to be actively increased if using a T-piece, and clinicians should document the pressures being used. This is important in deciding when to intubate, because increasing pressures are a guide to changing management.
- The correct placement of the endotracheal tube should be confirmed by attaching an end tidal CO2 detector to the outside of the endotracheal tube.

## Further information

Australian and New Zealand Council on Resuscitation (ANZCOR) Neonatal Guidelines <https://resus.org.au/guidelines/>

The PIPER – Paediatric Infant Perinatal Emergency Retrieval Guidelines page: <http://www.rch.org.au/piper/guidelines/>.

## 6.3 Reduced fetal movements

**Even in low-risk pregnancies a reduction in the mother's perception of fetal movements is associated with an increased risk of fetal growth restriction, preterm birth and antepartum fetal death.**

Despite the emphasis that has been placed on the need for clinicians to advise women to report a reduction in fetal movements as a matter of urgency, delays in reporting and inadequate management once the women present remains a frequent concern.

### SNAPSHOT

- Reduced fetal movements continue to be a recurrent factor associated with perinatal deaths reviewed by the CCOPMM.
- Failure or delay in reporting reduced fetal movements comprised the second-most common contributing factor of those relating to the pregnant woman and her family.
- Clinicians continue to be falsely reassured by a reactive CTG tracing in women who reported persisting reduced fetal movements, especially in term pregnancies.

### Case study 7

A 28 year old primigravida (first-time mother) after an uncomplicated antenatal course phoned her maternity service at 40+2 weeks, reporting that she was having irregular contractions. She was not asked about the baby's movements. She rang back 10 hours later to report that the contractions were continuing and mentioned that she was uncertain about the baby's movements. She was told to take two paracetamol tablets and encouraged to stay at home. The following day she presented for her regular 41-week assessment, and when assessed, reported that she had not felt any fetal movements for the past six hours. No fetal heart could be detected and a 'fetal death in utero' was confirmed by ultrasound examination. Labour was subsequently induced and she progressed to a normal vaginal birth of a 3000 g stillborn female infant. Autopsy was declined. The placental weight, as was the infant's birthweight, was below the tenth centile for gestational age and histology show evidence of ante-mortem hypoxia. All other investigations were within normal limits.

### Case study 8

A 30 year old multiparous woman with poorly controlled Type 2 diabetes presented at 37+4 days stating that she had not felt fetal movements for 'a number of days'. Fetal death in utero was confirmed, labour was induced and a stillborn infant birthweight 3020 g was born. Autopsy found a brain: liver ratio of 5.2, indicative of fetal growth restriction.

### Case study 8 key messages

Women should be given explicit instruction about reporting any reduction in their perception of reduced fetal movements.

Maternity staff should specifically ask about fetal movements at each encounter.

In high-risk pregnancies, for example, those complicated by diabetes, hypertensive disorders, fetal growth restriction, maternity care givers should pay even greater attention to reduced fetal movements.

Further investigations including ultrasound growth, amniotic fluid measurement and Doppler blood flow measurements should be performed as a matter of urgency.

## Good practice points

- Even in the presence of a normal clinical assessment (including a CTG and ultrasound) where maternal concerns about reduced fetal movements at term remain, delivery may be the most appropriate management.
- If the CTG trace is normal, clinicians should base the management of reduced fetal movements on a full clinical history and findings, particularly the presence of abnormal fetal growth restriction, diabetes, hypertensive disorders.
- Pregnant women should be informed that the healthy fetus does not reduce the frequency of its movements towards the end of pregnancy, and that they should contact their health care provider directly to report a reduction in movements and not to wait until the next day.
- Maternity service providers should adopt the PSANZ-SANDA Clinical Practice Guideline for the Management of Women who Report Decreased Fetal Movements.

## Messages for consumers

- The healthy baby's movements (kicking) does not decrease towards the end of pregnancy.
- Always let your health care provider know if you think that the baby is moving less than usual, as soon as you are aware of this.
- If you report that the baby is moving less, your health care provider should assess you and your baby's wellbeing as a matter of urgency.

## Further information

PSANZ-SANDA *Clinical Practice Guideline for the Management of Women who report Deceased Fetal Movements*: <https://sanda.psanz.com.au/assets/Uploads/FINAL-DFM-guideline-Ed1V1-1-16Sept2010.pdf>.

## 6.4 Obesity

**Obesity continues to be a significant contributing factor for adverse pregnancy outcomes for both mother and baby, including perinatal mortality.**

Approximately four out of every ten mothers (43%) were overweight (BMI 25–29.9) or obese (BMI above 30) between 2014 and 2015. Obesity increases the risk of stillbirth and neonatal death. It hampers the assessment of fetal growth, and therefore the identification of both the very large or growth restricted baby during pregnancy.

For the mother, obesity increases the risk of developing diabetes, hypertensive disorders, thrombo-embolism, requiring delivery by caesarean section, infections, postpartum haemorrhage, anaesthetic complications and maternal death.

In addition, women with extreme obesity (BMI above 40) may require specialised equipment, such as larger operating tables, birthing suite beds, lifting equipment, and consequently may require transfer to units that provide this equipment and specialist staff.

### SNAPSHOT

In 2014 and 2015:

- One in five women (18.3%) who gave birth in Victoria was obese (BMI over 30). This is comparable to the national average of 20.0 per cent (2014).
- Obese women were 30.0 per cent (RR 1.30, 95% CI 1.09–1.53) more likely to have stillbirth or neonatal death, as compared to women having a normal BMI. A BMI of 40 or more (obese class III) increased the risk of stillbirth or neonatal death by almost two times (RR 1.98, 95% CI 1.47–2.68) (Figure 29).
- The risk of caesarean section in overweight women (BMI 25 to 29.9) was 23.7 per cent higher (RR 1.23, 95% CI 1.21–1.25), which increased to 49.2 per cent (RR 1.49, 95% CI 1.46–1.51) in obese women, and to 76.5 per cent (RR 1.76, 95% CI 1.71–1.82) in women with obesity class III, compared to women having a normal BMI (Figure 30).
- Babies of pregnant women who were obese were less likely to be exclusively breastfed on discharge from hospital than women of healthy weight (Figure 31).

**Figure 29. Perinatal mortality rate (PMR) by maternal BMI category, Victoria 2014 and 2015**

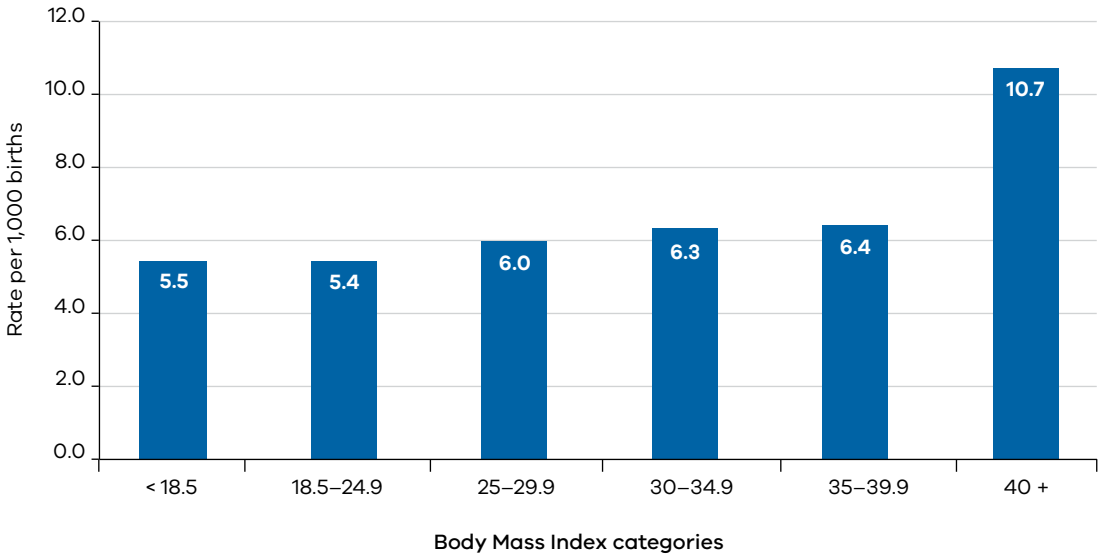



**Figure 30. Caesarean section rates by maternal BMI category, Victoria 2014 and 2015**

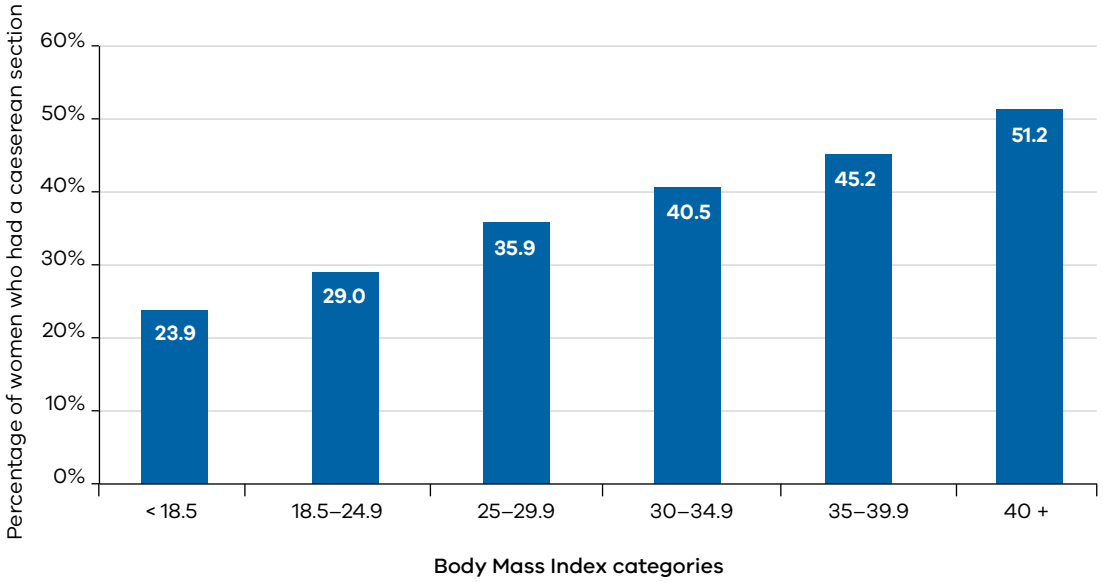
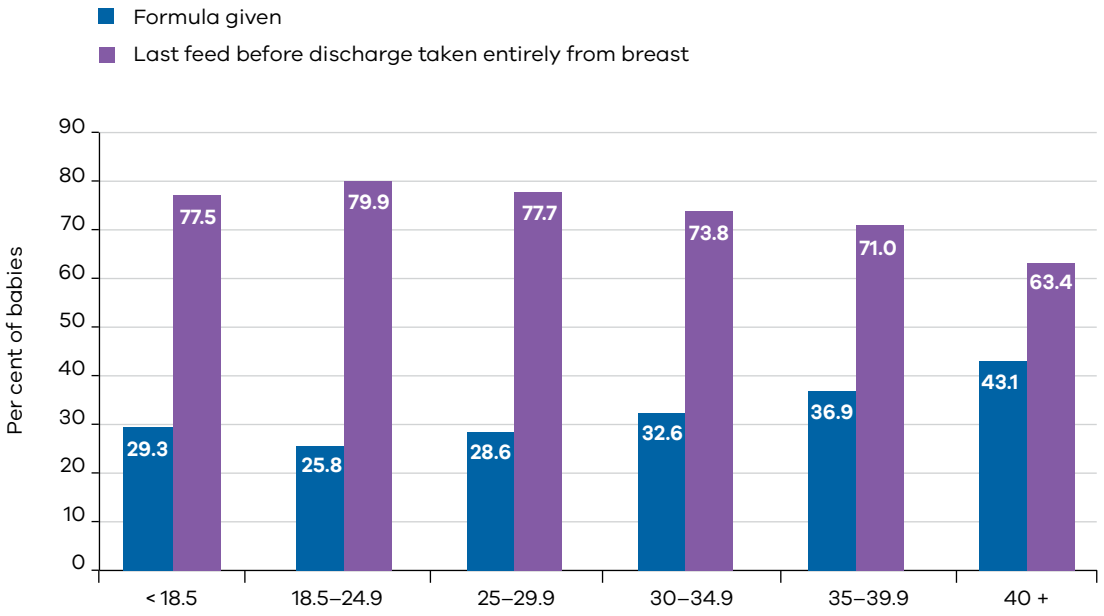


**Figure 31. Breastfeeding status and use of infant formula in hospital (for term breastfed babies) by maternal BMI category, Victoria 2014 and 2015**




## Case study 9

A 22 year old primigravida (first-time mother) with a BMI of 39 (obese) was seen for her first visit at a rural maternity service that catered for low-risk women who gave birth after 37 weeks' gestation (Capability Level 2). She was advised that she needed to give birth at the regional service that cared for women with complex problems (Capability Level 5). After assessment at the regional centre, her antenatal care was shared with her local maternity service. An early glucose tolerance test was normal, but when repeated at 26 weeks was diagnostic of gestational diabetes, and she required insulin therapy to achieve normal blood sugar levels. An ultrasound scan at 34 weeks found that the baby's estimated birthweight was on the 95th centile, and her care was transferred to the regional centre. At 36 weeks she reported reduced fetal movements and a CTG showed a non-reassuring trace. There were difficulties siting a spinal needle because of her obesity and she required a general anaesthetic for her caesarean section. The male baby weighed 3750 g (> 95th centile). Post birth she developed a wound infection that required prolonged hospitalisation and a DVT in her right leg, despite prophylactic anticoagulation. She was unable to establish breast feeding.

## Case study 9 key messages

Women with morbid obesity are at risk of developing perinatal complications and require close monitoring and transfer to an appropriate level service.

## Good practice points

- According to the agreed capability level of the health service, there should be clear booking criteria relating to BMI and document processes for the referral and safe transfer of care to a maternity service with the adequate facilities and capability.
- Health services should ensure that maternal height and weight are reported accurately to the Victorian Perinatal Data Collection (VPDC).
- Women with a high BMI should be carefully reviewed for additional risk factors at the initial antenatal and follow-up visits. This assessment should be discussed with women and well documented. An appropriate plan for care should be developed and documented including the options when approaching a threshold for safe care at the service.
- An ultrasound assessment of fetal growth should be performed in the third trimester to detect abnormal fetal growth.
- In women with a high BMI, a fetal scalp electrode (FSE) should be applied when external CTG monitoring cannot be reliably obtained or interpreted. This is particularly important in the second stage of labour.

## Messages for consumers

- Women who are overweight are encouraged to consult their family doctor before planning a pregnancy so that weight reduction strategies can be put in place before they become pregnant.
- Depending on the capability level of the local maternity service, it may be necessary for the woman to be primarily managed at a larger regional or metropolitan centre during pregnancy and/or childbirth.

## Further information

Better Health Channel, *Weight, fertility and pregnancy health*: <https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/weight-fertility-and-pregnancy-health>.

Royal Australian and New Zealand College of Obstetricians and Gynaecologists *Management of Obesity in Pregnancy*: <https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women's%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/C-Obs_49_Management-of-Obesity-in-Pregnancy-Review-Sep-2013.pdf?ext=.pdf>.

# 7. Child and adolescent mortality

Child and adolescent mortality refers to any death of a child from the age of 28 days up until the age of 17 years and 364 days.

## 7.1 Overview

**Child and adolescent mortality rates continue to stay low in Victoria. However, a number of young people continue to die from preventable causes, and this section highlights opportunities for Victoria to reduce these rates even further.**

The main causes of death in babies and children up to 14 years are congenital anomalies and malignancies. However, for Victorian adolescents (15–17 years) the main causes of death are motor vehicle accidents and suicide.

### SNAPSHOT

- Overall, mortality rates continue to decline with slight year-on-year variation. In 2015, there were slightly more deaths (n = 155) than in 2014 (n = 133) for children and adolescents aged between one and 17 years.
- In 2015, Victoria's infant and under-five year mortality rates per 1000 live births were similar to national rates (3.0 compared to 3.0; 3.4 compared to 3.8 respectively). However, Australia's rates were ranked 16th and 18th respectively in 2015 for the 34 OECD countries.
- The main causes of death in post-neonatal infants (28 to 364 days of age) in 2015 were:
  - congenital anomaly (40%)
  - sudden infant death syndrome (18%)
  - prematurity (18%).
- Victoria's infant mortality rate was 3.3 per 1000 live births (2014) and 3.0 per 1000 live births (2015).
- The main causes of death in children aged 1–4 years in 2015 were:
  - congenital anomaly (35%)
  - malignancy (13%)
  - intentionally inflicted injury (13%).
- The main causes of death in children aged 5–9 years in 2015 were:
  - malignancy (50%)
  - motor vehicle accident (19%)
  - congenital anomaly (19%).
- The main causes of death in children aged 10–14 years in 2015 were:
  - congenital anomaly (34%)
  - malignancy (29%)
  - suicide (14%).

- The main causes of death in adolescents aged 15–17 years in 2015 were:
  - motor vehicle accidents (29%)
  - suicide (25%)
  - other acquired disease (13%).
- Social factors are important health determinants.
- In Victoria, more children from disadvantaged backgrounds died than children from less disadvantaged backgrounds. Children from disadvantaged backgrounds are more vulnerable.
- Vulnerability in health arises from multiple areas. These include:
  - mothers not fully accessing antenatal care leading to poorer perinatal outcomes
  - children whose mothers' pregnancies are complicated by alcohol or drug abuse, maternal smoking, mental illness or family violence
  - families not fully accessing postnatal care with failure to monitor growth, health and development of their infant
  - lack or delay in immunisation
  - children living in households affected by:
    - drug and alcohol abuse
    - physical, sexual and emotional abuse
    - domestic violence
    - neglect
    - lack of secure housing
    - poverty and economic deprivation
    - poor parental education.
  - children whose parents or caregivers are unable to detect the signs of serious illness in their infants and children, leading to delay in seeking medical care
  - children living in households exposed to hazards, such as:
    - unsafe sleeping
    - inappropriate restraint in cars and other vehicles
    - children left unattended in cars or playing in driveways
    - inadequate adult supervision and safety mechanisms around swimming pools, spas and baths
    - inadequate adult supervision on roadways
    - access to small objects that can be ingested with fatal consequences
    - access to matches or other fire-lighting equipment.

**Figure 32. Victoria's infant mortality and under-five mortality rates**

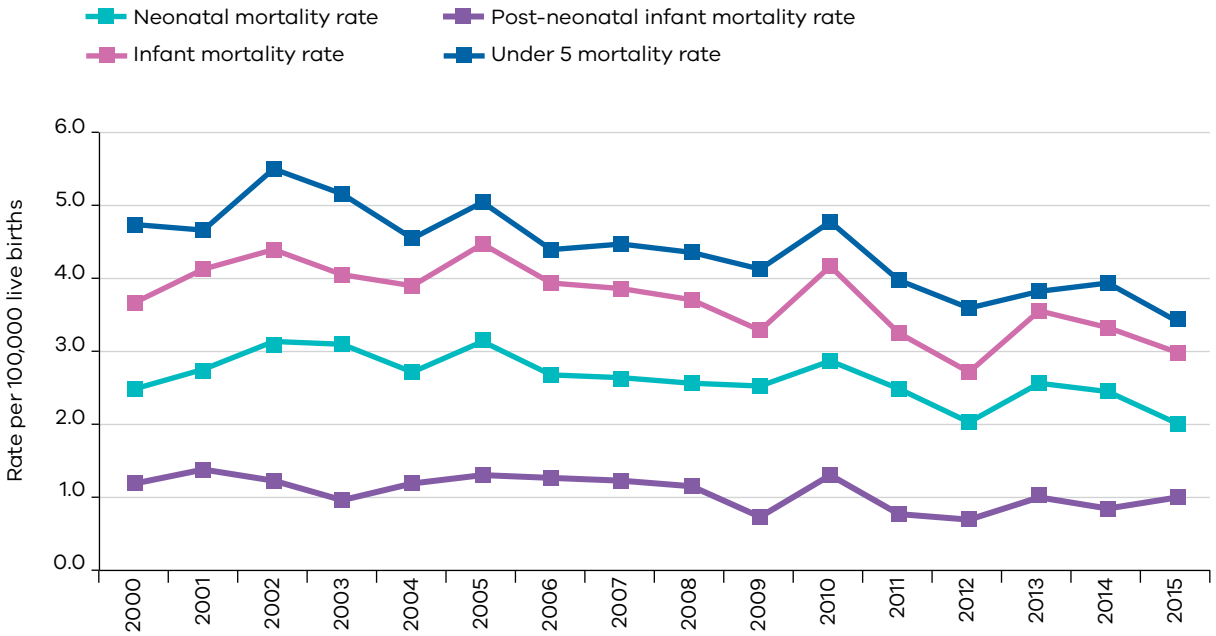



**Figure 33. Rates of death by age group, (excluding 28–364 days) Victoria 1985–2015**

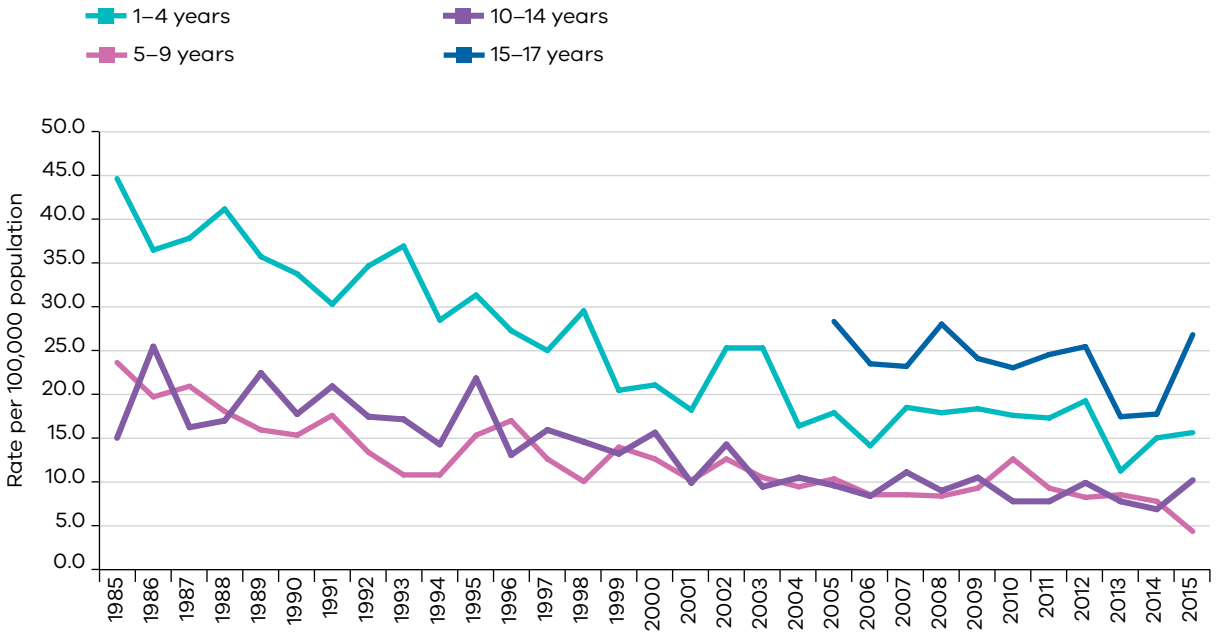


**Table 6. Percentage of deaths aged 28 days to 17 years by IRSD score, Victoria, 2014–15**

| | IRSD Quintile | % |
|---|---|---|
| Most disadvantaged | 1 | 26.4 |
| | 2 | 21.9 |
| | 3 | 22.6 |
| | 4 | 15.2 |
| Least disadvantaged | 5 | 13.8 |

IRSD: Index of Relative Social Disadvantage, from SEIFA 2011 Victorian decile.
This data is based on 420 deaths (missing = 2) of Victorian residents aged 28 days to 17 years, occurring in Victoria in 2014–15.

### Case study 10

A two month old infant was found deceased at 10.30 am on the mattress he shared with his mother. The diagnosis was sudden infant death syndrome, Type II. His mother's pregnancy had been characterised by poor antenatal care attendance, smoking and other drug use, mental health issues and family violence. He had been born prematurely at 35 weeks' gestation with a low birthweight. His family had been supported in hospital by the hospital staff, Department of Health and Human Services and by extended family members. Safe sleeping education had been given in hospital. After discharge from hospital his mother left her home due to family violence, and was staying with her extended family in a cramped home with exposure to cigarette smoke. The mother was sleeping on a mattress on the floor, and sharing this mattress with her infant. She had not attended routine appointments at the maternal and child health nurse and the infant had not been immunised. The infant's weight gain was poor, and he was reported to have a chesty cough, but had not sought medical care for this.

## Good practice points

### 1. Vulnerable children

- Vulnerable children and their families need intensive and ongoing intervention to limit the health consequences of their vulnerability. Midwives, medical practitioners and maternal and child health nurses are key to the early identification and referral of those at risk. Services should be oriented to identify and support vulnerable children and their families.

### 2. Infections

- Group A Strep and staphylococcal infections (including community-acquired MRSA) are increasingly common in the community, and particularly so amongst high-risk populations including Aboriginal, Torres Strait Islander, Pacific Islander and Indian children. Consideration of addition of the routine use of antibiotics covering MRSA should be given when these children present with signs of serious bacterial infection.
- Group A strep and staphylococcal infections (including community-acquired MRSA) also occur in many children with no clear vulnerability. Children with likely serious bacterial infection or toxin mediated disease from gram-positive organisms should be treated promptly with fluids, antibiotics and referred. The signs are nonspecific, but include fever, erythematous rash, limb pain or limitation of movement, poor feeding, abdominal pain, lethargy, throat infection, empyema and oliguria. It is the persistence of these signs, the presence of multiple signs, or their extreme nature (for example a temperature of 40 °C in a child who refuses to walk) that signals possible serious bacterial infection, rather

than a common viral syndrome. The triad of diarrhoea, a sunburn-like rash and postural hypotension is often not appreciated as a sign of serious infection.

- A full assessment of the severity of illness is indicated, a blood culture and full blood examination should be done, and if the child has several signs of serious infection, initial antibiotics should include a third-generation cephalosporin, flucloxacillin and clindamycin. In such children giving anti-pyretics (ibuprofen or paracetamol) can mask signs of bacterial sepsis, delay presentation and make the infection worse.
- Serious bacterial infection often occurs after an initial viral syndrome (often in association with similar viral illness in siblings). Failure to recover quickly, especially where more serious features as listed appear, should trigger alerts.
- One of the features common to the deaths reviewed by the CCOPMM was that the parents or caregivers had not represented following initial 'reassurance' by their GPs, even though it was most likely evident that things were not going according to plan. If a child presents with features consistent with a viral infection, the child's carers should be given information about reasonable expectations of the course of that illness over the next few hours and subsequent days, and a clear message to return if things do not proceed as expected. Symptoms or signs to look out for that would indicate a change should also be described. Children should be reviewed early if the clinical course is not progressing as expected. Parents and medical practitioners should be encouraged to present again if this occurs.
- In an era of reduced incidence of invasive bacterial disease as result of widespread public health initiatives including immunisations, it is important for clinicians to be aware that serious illnesses, including invasive bacterial infections and rare complications of viral illnesses including myocarditis, still occur. It is vital that clinicians look out for features that could suggest a child may be experiencing one of these less-common conditions, even if most of the child's symptoms could be fitted into the pattern of a simple viral infection. Where a child is not improving or has some behaviours suggesting they are more unwell, it is important that care is escalated.

### 3. Epilepsy

- The Consultative Council continues to review many deaths in children with epilepsy. Some of these deaths are SUDEP (sudden unexplained death in epilepsy), some are drownings. or other unintentional injury. While some deaths are not predictable or preventable, children with epilepsy should never be left unattended in the bath or shower. Although the causes of sudden death in epilepsy are uncertain, improved seizure control has been shown in randomised trials to reduce the risk of SUDEP. Children and adolescents with refractory or difficult to control epilepsy should have an individualised care plan, be followed by a paediatrician with expertise in epilepsy, and should regular review of the adequacy of seizure control.
- Non adherence to anti-epileptic medication (AED) has been shown in adults to have a more than threefold increase in mortality. Abrupt AED withdrawal and frequent AED dose changes may be possible risk factors in SUDEP, together with missed doses , and drinking alcohol, and poor sleep.
- Children with uncontrolled epilepsy or frequent seizures are at the highest risk of SUDEP. In addition early onset of epilepsy and developmental disabilities may be other risk factors.
- Clinicians should make parents and caregivers aware of the risks of noncompliance and other potential risk factors for SUDEP.
- Children and adolescents with epilepsy should have regular review with their medical practitioner for dose adequacy, because as children gain weight, their dose will need to be increased. This could explain poor seizure control with good compliance.

**4. Cancer and children**

- Because childhood cancer is uncommon, and the symptoms often nonspecific, the diagnosis can be delayed and this can have consequences for treatment success. Persistent limb pain (not fitting the pattern of benign nocturnal limb pain) or limb swelling in a child requires an explanation and investigation.

**5. Incorrect diagnosis**

- In any child with unremitting fever, alternative diagnoses should be sought, including serious bacterial infection and Kawasaki disease.
  - Kawasaki disease is an acute, febrile vasculitis of childhood that can affect medium-sized arteries, particularly the coronary arteries.
  - The recognition of Kawasaki disease can be difficult, especially in infants, where it may present with incomplete or unusual features.
  - An echocardiogram does not rule out Kawasaki disease, because coronary aneurysms often develop later.
  - If a simple viral infection is unlikely, and an infant has unremitting fever, Kawasaki disease should be considered as a differential, and prompt referral and intravenous immunoglobulin given.
  - The risk of giving immunoglobulin is low when compared with the risk of Kawasaki disease complications.
- Any child with fever, seizures and poor conscious state should be considered to have raised intracranial pressure (ICP) until proven otherwise. A CT scan is a poor test for intracranial hypertension, and an MRI should be done urgently if possible. The febrile child who is not recovering to normal conscious state after a seizure should be examined for signs of raised ICP (including the use of fundoscopy), managed as if they have raised ICP, and treated for bacterial meningitis and Herpes Simplex Virus encephalitis. In the presence of fever, seizures and impaired conscious state, clinicians should consider the potential for raised intracranial pressure.

**6. Fat embolism syndrome in Duchenne muscular dystrophy**

- Fat embolism has been recognised in patients with Duchenne muscular dystrophy following minor trauma, falls or bone fractures. Fat embolism syndrome needs to be considered in patients with Duchenne muscular dystrophy following minor trauma even without fractures. Early recognition of fat embolism syndrome and aggressive resuscitation are important to improve survival.
- Falls from wheelchairs can be minimised by always using appropriate restraints while in a wheelchair.

**7. Risk assessment for surgical procedures in children with severe disabilities**

- Children with severe underlying disability should be carefully assessed prior to surgery to ensure that the risks of surgery do not outweigh the possible benefits. A multidisciplinary approach with a coordinating paediatrician working with surgeons is needed to assist families in making the difficult decisions related to surgery. Prior to surgery there should be appropriate planning of post-operative care, taking into account all possible risks, including the need for intensive care and prolonged post-operative respiratory support for children with compromised respiratory function.

## 7.2 SUDI/SIDS

**While there have been major reductions in sudden infant deaths in the last two decades, many unexpected infant deaths still occur, often in marginalised or disadvantaged families. Despite growing information for parents on the safest sleeping environments, infants continue to die in situations associated with unsafe sleep practices.**

Co-sleeping is associated with an increased risk of death, and is not recommended. Although not all sudden and unexpected deaths in infancy (SUDI) can be eliminated, the promotion of safe sleeping for every sleep is the best way to minimise the risk. A key to further reducing preventable deaths in this category is to ensure parents and carers understand the safest sleeping environments and practices for infants, and **have a safe sleep plan for every sleep**.

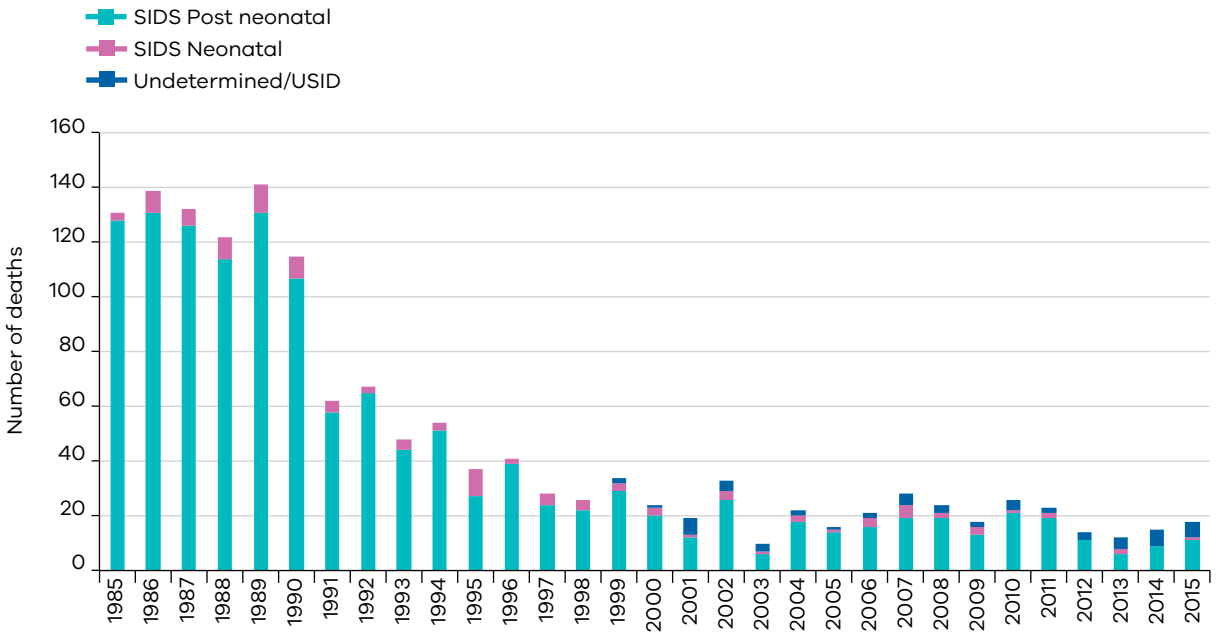
The infants most at risk are premature or small for gestational age and those younger than three months of age. The risk is also highest where the co-sleeper is affected by sedating drugs, alcohol or is a smoker, or where the sleep surface is unsafe.

Vulnerable children are at higher risk of SUDI.

### SNAPSHOT

- There were 33 unexplained SUDI deaths in 2014–15.
- The majority of unexplained SUDI deaths occurred in circumstances where the SIDS and Kids Safe Sleeping message was not fully followed.
- Co-sleeping was a feature in almost half (48.5%) of the 33 unexplained SUDI deaths.

**Figure 34. Sudden unexpected death in infants, Victoria 1985–2015**



## Good practice points

- All health workers involved with infants and mothers should know the risk factors for SUDI, which include:
- prone or side positioning to sleep
- sleeping baby on a soft surface, for example, soft mattress, pillow and waterbed
- sleeping baby on a sofa (with or without a parent)
- loose, soft and fluffy bedding, including pillows, doonas, soft toys, cot bumpers or sheepskin (also known as lambswool) anywhere in baby's sleep environment
- sleeping baby with face or head covered
- exposing babies to tobacco smoke before birth or after
- sleeping baby in an unsafe cot or in an unsafe environment
- sharing a sleep surface with a baby can increase the risk of SUDI.
- All parents and care givers should be made aware of the Ritchie Centre recommendations for safe infant sleeping 2013.
- Vulnerable children are at higher risk of SUDI. There should be appropriate supports for parents that will be greater than providing information. These could include:
  - ongoing education for parents and caregivers
  - increased home visits to assess sleeping environments
  - assistance with the purchase of safe cots and bedding
  - support for mothers at risk of homelessness.

## Messages for consumers

Based on the case review of infant deaths and consideration of the wider literature, the CCOPMM provides the following recommendations on safe sleeping for parents. These are a modified version of the SIDS and Kids Safe Sleeping Message:

- All babies should sleep on their back from birth, not on their front or side.
- Always sleep baby in a safe cot that meets the Australian Standard AS2172:2013, with a firm mattress that is the right size for the cot, and is not tilted or elevated. The mattress should be covered with only a tightly-fitted sheet and, if required, a thin tightly-fitted mattress protector under the fitted sheet. A baby should never be put down to sleep on a sofa, bean bag, sheepskin or pillow.
- In the first 6–12 months, babies are to sleep in their own cot, in the same room as an adult caregiver. It is much safer for babies to sleep in their own cot than to sleep next to another person.
- A lightweight sleeping bag of correct size, that has a fitted neck, armholes/sleeves and no hood, is the appropriate sleeping garment for newborn babies.
- Keep baby away from tobacco smoke before birth and after. The risk is increased even if a caregiver goes outside to smoke.
- Keep adults who are under the influence of alcohol or drugs or sedating medication away from babies.
- Breastfeed your baby if you can.
- A dummy can be offered to a baby as a sleep aid, for the first 6–12 months only. Dummies must not be forced, have a neck cord, covered in anything sweet or offered during awake time.
- When travelling with a baby, it is essential that a portable cot (that meets Australian Standard 2195:2015 folding cot) is used in addition to the recommendations above.

## Further information

Red Nose, *safe sleeping*: <http://www.sidsandkids.org/safe-sleeping/>.

Raising children network: <http://raisingchildren.net.au/>.

Victorian State Government, *The Ritchie Centre recommendations for safe infant sleeping 2013*: <https://www2.health.vic.gov.au/about/publications/policiesandguidelines/ritchie-centre-recommendations-safe-infant-sleeping>.

## 7.3 Children in the workplace

**Child and adolescent deaths from unintentional injury have declined steadily over the last 20 years in Victoria. However, a number of deaths continue to be associated with inadequate supervision, especially at work sites and involving machinery, water or other hazards.**

Disturbing facts show that 30 per cent of farm incidents happen to farm visitors, and also that children account for approximately one in five deaths on farms.

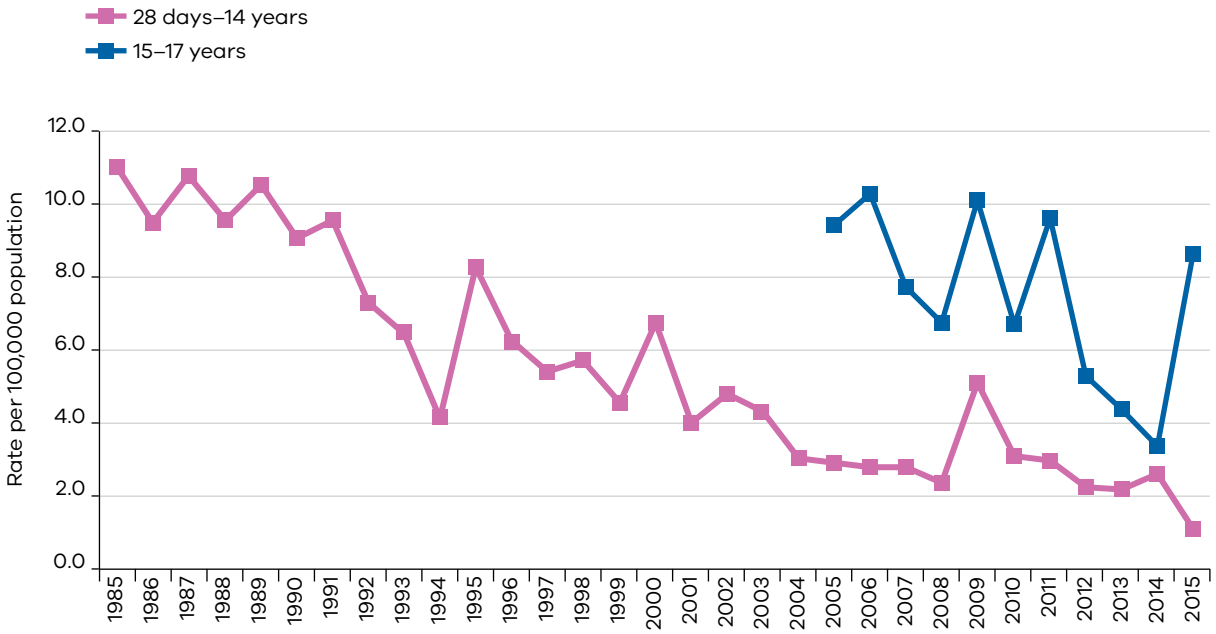
Unintentional paediatric deaths at work sites, including factories, farms or rural properties, are tragically not uncommon, and are usually attributed to inappropriate or unsupervised use of motorised vehicles (quad bikes, motorcycles and other motorised vehicles used in workplaces, such as fork lifts or tractors). They also occur from a lack of supervision broadly, including around water (for example, dams).

Where the worksite is also the child's home, further precautions need to be taken in order to separate the worksite from the child's play areas.

### SNAPSHOT

- There were 35 deaths in 2014 and 30 deaths in 2015 from unintentional injuries of all types.
- Causes of death from unintentional injury in 2014 and 2015 include those from motor vehicle (including driveway) accidents (42 deaths), drowning (nine deaths), asphyxia (three deaths) fire (three deaths), and other unintentional injury deaths (seven deaths).
- The number of deaths and injuries to children and adolescents that occur on worksites, farms or rural properties is disproportionately high.
- Deaths occurred where children were present with parents who were working, assisting with work or recreational activities, and where the child's safety was not properly assessed or considered.
- Deaths were also related to a lack of supervision and/or inappropriate activities (according to their maturity, strength, coordination and according to workplace regulation) by the child/adolescent.

**Figure 35. Unintentional death rates by age group, Victoria 1985–2015**




## Messages for consumers

- Children should not be present at worksites where machinery or motorised vehicles are operating as participants or as visitors without active supervision by an adult who is not concurrently working. Adequate supervision is not possible when an adult is both concentrating on their job in addition to supervising young children, whose impulsivity and lack of recognition of risk is well documented.
- Where the worksite is also the home, parents and caregivers need to make adequate provision for safe play areas, and not encourage play in the worksite area.
- No adolescent should be in control of machinery or a motorised vehicle in a workplace for which they do not have the appropriate licensing, training or supervision by senior staff.
- Children and adolescents should not engage in activities beyond their strength, coordination or maturity.
- Children under the age of fourteen should not ride quad bikes or motorcycles of any size. Children aged 14–16 should be restricted to riding quad bikes or motorcycles no larger in engine capacity than 90 cc. All children using motorcycles and quad bikes should ensure they use protective gear and helmets, undertake adequate training and are under constant supervision of adults.

## Further information

Safe Work Australia: <http://www.safeworkaustralia.gov.au/sites/swa/whs-information/agriculture/quad-watch/pages/quad-watch>.

Farmsafe: <http://www.farmsafe.org.au/>.

## 7.4 Death from motor vehicle accidents

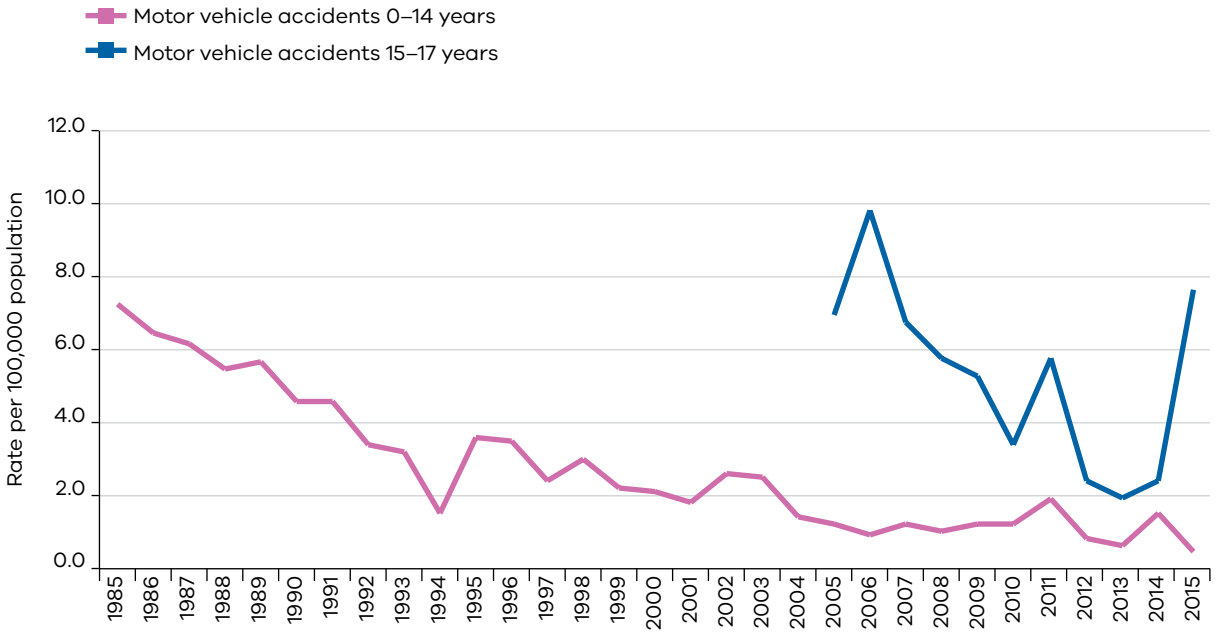
**Deaths from motor vehicle accidents have continued to decrease across the state. However, deaths continue to occur in children under the age of 18, with the adolescent group (15–17) most at risk.**

Being either a passenger in a motor vehicle or a pedestrian is the most common factor for deaths related to motor vehicle accidents.

### SNAPSHOT

- In 2014–15, 21 adolescents aged 15–17 years died in motor vehicle accidents.
- Motor vehicle accidents were the most common cause of death in the 15–17 year age group in 2015 (16 deaths).
- Many adolescents take risks by driving or being a passenger in a vehicle for which the driver:
  - is not licensed
  - is under the effects of alcohol and/or drugs
  - is carrying multiple passengers beyond the seating capacity of the vehicle, meaning some passengers are unrestrained
  - is carrying passengers who choose not to use a seatbelt
  - is participating in high-risk activities
  - is driving a powerful vehicle beyond their capability to control or are legally permitted to drive
  - is distracted by their environment, such as, mobile phones, passengers, loud music etc.
- In 2014–15, 10 children and adolescents died as pedestrians.

**Figure 36. Deaths from motor vehicle accidents by age group 1985–2015**



## Messages for consumers

- Adolescents should not be driving vehicles for which they are not licensed.
- Adolescents are at risk of death from driving with other adolescents or young adults who are:
  - inexperienced
  - affected by alcohol and/or drugs
  - unlicensed
  - driving vehicles which are very powerful
  - distracted by their environment, such as, mobile phones, passengers, loud music etc.
- Adolescents should be encouraged to identify when their safety is at risk and have strategies to avoid these situations.

## Further information

Pedestrian deaths can be minimised by following road safety messages:

Transport Accident Commission: <https://www.tac.vic.gov.au/road-safety>.

Vicroads *Safety & Road Rules*: <https://www.vicroads.vic.gov.au/safety-and-road-rules>.

Department of Infrastructure and Regional Development, *Road Safety Statistics*: <https://bitre.gov.au/statistics/safety/>.

# 8. Council functions and audit methods

## 8.1 About the Consultative Council on Obstetric and Paediatric Mortality and Morbidity

The CCOPMM was established in 1962 under the *Health Act 1958* and now functions under the *Public Health and Wellbeing Act 2008* (the Act).

The CCOPMM is an advisory body to the Minister for Health on maternal, perinatal and paediatric mortality and morbidity, with members being appointed by the Minister of Health. Four substantive sub-committees also report to the CCOPMM:

- Maternal Mortality and Morbidity Sub-committee
- Stillbirth Sub-committee
- Neonatal Mortality and Morbidity Sub-committee
- Child and Adolescent Mortality and Morbidity Sub-committee.

The CCOPMM works closely with the Department of Health and Human Services and Safer Care Victoria in its role to advise on strategies to reduce avoidable mortality and morbidity. The Clinical Councils Unit, within the Safety and Quality Support branch of Safer Care Victoria, manages and supports the work programs of the CCOPMM and two other consultative councils.

### Functions of the CCOPMM

Under the Act, the functions of the CCOPMM are to:

a. Conduct study, research and analysis into the incidence and causes in Victoria of maternal deaths, stillbirths and the deaths of children;
b. Conduct study, research and analysis into the incidence and causes of obstetric and paediatric morbidity;
c. Conduct a perinatal data collection unit for the purpose of –
    i. Collecting, studying, researching and interpreting information on and in relation to births in Victoria;
    ii. Identifying and monitoring trends in respect of perinatal health including birth defects and disabilities;
    iii. Providing information to the Secretary on the requirements for and the planning of neonatal care units;
    iv. Providing information for research into the epidemiology of perinatal health including birth defects and disabilities
    v. Establishing and maintaining a register of birth defects and disabilities;
d. Provide to health service providers –
    i. Information on obstetrics and paediatrics;
    ii. Strategies to improve obstetric and paediatric care;
e. Consider, investigate and report on any other matters in respect of obstetric and paediatric mortality and morbidity referred to CCOPMM by the Minister or the Secretary;
f. Liaise with any other Consultative Council (whether or not prescribed) on any matter relevant to the functions of CCOPMM;
g. Publish an annual report on the research and activities of CCOPMM;
h. Perform any other prescribed function;
i. Collection information for the purpose of performing its functions as outlined in the Act.

## Members of the CCOPMM 2014 and 2015

### Consultative Council on Obstetric and Paediatric Mortality and Morbidity

- Professor Jeremy Oats (Chair)
- Professor Richard Doherty
- Professor Peter McDougall
- Professor Terry Nolan
- Professor Michael Permezel
- Dr Jennifer Anderson
- Dr Virginia Billson
- Dr Mary Anne Biro
- Ms Anne Catchlove
- Professor Paul Monagle
- Mr Nicolas Thomas
- Professor Euan Wallace
- Ms Lisa Dunlop (2015)
- Dr David Fuller (2015)
- Dr Mark Lubliner (2015)
- Dr Alexis Shub (2015)
- Ms Nicola Reinders (2015)
- Dr Mary Belfrage (2015)
- Professor John McNeil (2015)
- Ms Karen Sawyer (2015)
- Professor Susan McDonald (2015)

### Maternal Mortality and Morbidity Sub-committee

- Professor Jeremy Oats (Chair)
- Dr Malcolm Barnett
- Dr Fiona Cullinane
- Dr Andrew Ross
- Dr Virginia Billson
- Dr Dennis Handrinos
- Dr Matthew Lynch
- Professor Susan McDonald (2015)
- Professor Michael Permezel
- Dr Wendy Pollock
- Associate Professor Scott Simmons (2015)
- Associate Professor Mark Umstad
- Dr Craig Walker
- Professor Euan Wallace

### Stillbirth Sub-committee

- Professor Euan Wallace (Chair)
- Dr Virginia Bilson
- Dr Lisa Begg
- Dr Mary Anne Biro
- Dr Fiona Cullinane
- Ms Patrice Hickey
- Professor Michael Permezel
- Associate Professor Glyn Teale
- Dr Christine Tippett
- Dr David Simon
- Professor Jeremy Oats

- Dr Jodie Benson
- Associate Professor Mark Umstad
- Dr Lisa Hui (2015)
- Professor Susan McDonald (2015)
- Dr David Simon
- Dr Bernadette White (2015)
- Ms Colleen White (2015)

**Neonatal Mortality and Morbidity Sub-committee**

- Professor Peter McDougall (Chair)
- Dr Virginia Billson
- Dr Fiona Cullinane
- Dr Michael Stewart
- Professor Jeremy Oats
- Dr Mark Tarrant
- Professor Susan Walker
- Dr Carl Kuschel
- Jim Holberton
- Dr Elizabeth Carse
- Dr Simon Fraser
- Dr Sarah Parsons
- Dr Michael Stewart
- Ms Avril McLean
- Dr Sophie Treleaven (2015)
- Ms Jane Bailey (2015)
- Dr Charles Barfield (2015)
- Dr Rosemarie Boland (2015)
- Dr Paul Howat (2015)
- Dr Alexis Shub (2015)

**Infant, Child and Adolescent Mortality and Morbidity Sub-committee**

- Professor Terry Nolan (Chair 2014 and 2015)
- Professor Paul Monagle (Chair 2015)
- Professor Richard Doherty
- Professor Terry Duke
- Dr Jenny Proimos
- Professor Jeremy Oats
- Dr Rosemary Lester
- Dr Cathie Rose
- Professor Susan Sawyer
- Professor Frank Shann
- Professor Mike South
- Dr Peter Wearne
- Dr Hubert van Doorn
- Associate Professor Duncan MacGregor
- Dr Mick Creati (2015)
- Dr Karen Dunn (2015)
- Dr David Fuller (2015)
- Dr Annie Moulden (2015)
- Dr Rob Roseby (2015)
- Dr Greg Rowles (2015)
- Dr Sophie Treleaven (2015)
- Professor Katrina Williams (2015)

## 8.2 Collecting and reviewing information on births and deaths

### Review of deaths

The CCOPMM's primary role is to review all maternal, perinatal and paediatric deaths in Victoria, determine factors that may have contributed to these deaths and provide advice and recommendations on effective strategies to address preventable harm and improve clinical outcomes. All perinatal deaths, from 20 weeks gestation (or 400 g birthweight if gestation is not known) and all children deaths under the age of 18 that occur in Victoria are reviewed.

Information is sought from multiple sources, including the VPDC, hospital case records, individual doctors and midwives, pathology services, the state coroner and the Paediatric Infant Perinatal Emergency Retrieval service. The CCOPMM considers the clinical features of each case and classifies each death according to the Perinatal Society of Australia and New Zealand's *Perinatal Mortality Classification System* for perinatal deaths and the *International Statistical Classification of Diseases and Health Related Problems, 10th revision, Australian Modification* (6th edition) for all post-neonatal infant, child and adolescent deaths.

In many cases, the CCOPMM has multiple sources of information available regarding children (including health, welfare and education records), and may not limit the cause of death classification to the cause of death recorded in postmortem reports or death certificates alone. In some cases, new information may become available at a later time that leads to change in the classification assigned to a particular death or group of deaths.

Complex or contentious mortality cases are referred to the specialist sub-committees of the CCOPMM for review. The CCOPMM assess preventability and makes recommendations for improving clinical practice and systems based on the findings from each review and the best available evidence. Avoidable factors cannot always be identified from the information available during case review; therefore, the actual number of cases that may have preventable factors could be higher.

### Review of births

It is a requirement of the Act that births that occur in Victoria are reported to the CCOPMM within a prescribed time period. The CCOPMM has statutory responsibility for the VPDC and the Victorian Congenital Anomalies Register (VCAR). The data collections are managed by the Department and Safer Care Victoria on behalf of the CCOPMM.

The collections enable the analysis of information in relation to the health of mothers, babies and children in order to contribute to improvements in their health. Information is collected on obstetric conditions, procedures and outcomes, and neonatal morbidity and congenital anomalies relating to every birth in Victoria of at least 20 weeks gestation, or if gestation is unknown, at least 400 g birthweight.

**Victorian Perinatal Data Collection (VPDC)**

The VPDC was established in 1982 under the *Health Act 1958* and consists of sociodemographic characteristics and clinical outcome data on all births occurring in Victoria. Data are collected from public and private hospitals, birth centres and homebirth practitioners from their clinical and patient administrative system, via secure data exchange.

Further information on the VPDC can be found at: https://www2.health.vic.gov.au/hospitals-and-health-services/quality-safety-service/consultative-councils/council-obstetric-paediatric-mortality/perinatal-data-collection

**Victorian Congenital Anomalies Register (VCAR)**

As per the *Public Health and Wellbeing Act 2008*, the CCOPMM has a legislative responsibility to maintain a register of congenital anomalies and disabilities. The data collected in this register provide the necessary information for surveillance, research and planning of clinical improvement initiatives. The VCAR includes suspected or confirmed congenital anomalies. Data are obtained from multiple sources, including the VPDC, hospital records, perinatal death certificates, autopsy reports, cytogenetics reports, clinicians and other person in the community, such as parents. Any person has the ability to notify VCAR via the CCOPMM website.

Further information about VCAR can be found at: https://www2.health.vic.gov.au/hospitals-and-health-services/quality-safety-service/consultative-councils/council-obstetric-paediatric-mortality/congenital-anomalies-register

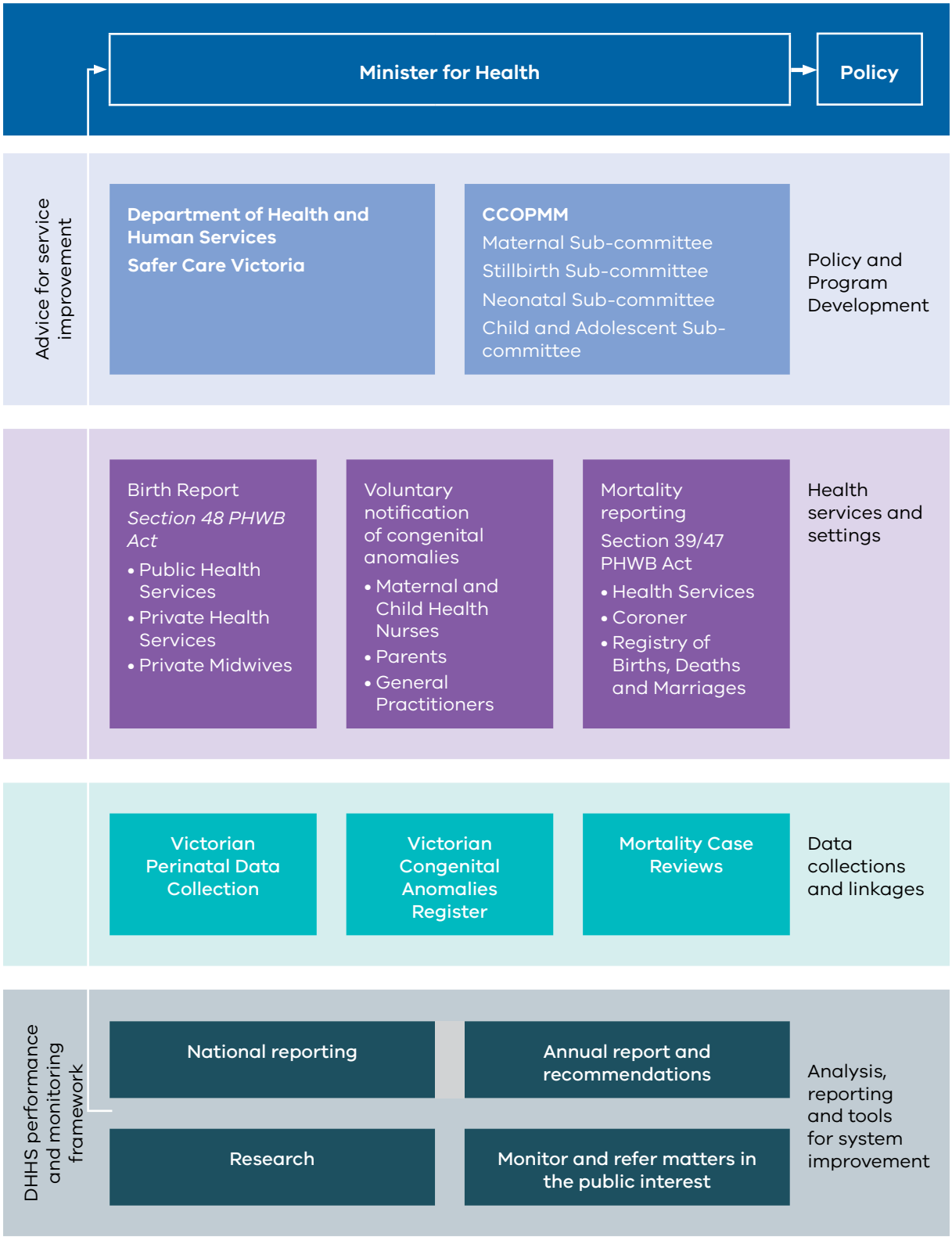
## Reporting and analysis

The VPDC contributes to the National Perinatal Data Collection (NPDC) managed by the University of New South Wales National Perinatal Epidemiology and Statistical Unit (NPESU). The NPESU produces the annual report *Australia's Mothers and Babies* on behalf of the Australian Institute of Welfare (AIHW), using the NPDC and other data. The VPDC contains additional items to enable more detailed analysis on the health of mothers and babies in Victoria.

The CCOPMM supports research that is strategic and targeted at priority requiring further evidence to inform clinical outcome improvements. Regulation 10 of the Public Health and Wellbeing Regulations 2009 sets out the circumstances in which the CCOPMM is authorised to release data for research purposes. All research requests involving CCOPMM-held data must be submitted to Council for approval. Research proposals must conform the National Health and Medical Research Council's *National Statement on Ethical Conduct in Human Research* (2007) and a properly constituted Victorian Human Research Ethics Committee must give approval prior to the CCOPMM's consideration of the request.

In the public interest, the CCOPMM is also authorised to provide information to authorities and interested parties specified under Section 41 of the Act.

**Figure 37. CCOPMM relationships, accountabilities and role**




Further information regarding data and research requests can be found at: https://www2.health.vic.gov.au/hospitals-and-health-services/quality-safety-service/consultative-councils/council-obstetric-paediatric-mortality/access-to-ccopmm-data

# 9. References


Australian Health Minister's Advisory Council 21012 and 2014, *Clinical Practice Guidelines: Antenatal Care – Module I and II*. Australian Government Department of Health, Canberra: <http://www.health.gov.au/antenatal

Ciccarone RM, Kim M, Tice AD, Nakata M, Effler P, et al. 2010, *Hawaii Med J*. Jun; 69(6): 142–144. Prevention of Community-Associated Methicillin-Resistant Staphylococcus aureus Infection Among Asian/Pacific Islanders: A Qualitative Assessment: <https://www.ncbi.nlm.nih.gov/pubmed/20535687>.

Faught E, Duh MS, Weiner JR, Guérin A, Cunnington MC. 2008 Nonadherence to antiepileptic drugs and increased mortality: findings from the RANSOM Study, Nov 11;71(20):1572-8. doi: 10.1212/01.wnl.0000319693.10338.b9. Epub 2008 Jun 18: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3118015/>.

*Guidelines for Diagnostic Imaging During Pregnancy and Lactation*. ACOG Committee Opinion No. 656 2016.

Hennessy MJ, Tight MG, Binnie CD et al. 2001 Sudden withdrawal of carbamazepine increases cardiac sympathetic activity in sleep. *Neurology* 57, 1650–1654.

McAdam LC1, Rastogi A, Macleod K, Douglas Biggar W 2012 Fat Embolism Syndrome following minor trauma in Duchenne muscular dystrophy *Neuromuscul Disord*. 22(12):1035-9. doi: 10.1016/j.nmd.2012.07.010. Epub 2012 Aug 21.

Nillsson, L Farahmand BY, Persson P-G et al. 1999 Risk factors for sudden unexpected death in epilepsy L: a case control study. *Lancet* 353, 888–893.

Nilsson L, Diwan V, Farahmand BY et al. 2001 Antiepileptic drug therapy and its management in sudden unexpected death in epilepsy: a case –control study *Epilpesia* 42 667–73.

Queensland Government fact sheet: Methicillin resistant Staphylococcus aureus (MRSA) in the community. Information for clinicians: <https://www.health.qld.gov.au/chrisp/resources/nmMRSA_clinical.pdf>.

Red Nose, *What are the Risk Factors for Sudden Unexpected Death in Infancy (SUDI)?*: <https://rednose.com.au/article/what-are-the-risk-factors-for-sudden-unexpected-death-in-infancy-sudi>.

Tomson T, Walczak T, Sillanpaa M, Sander JW 2005 Sudden unexpected death in epilepsy: a review of incidence and risk factors. *Epilepsia* 46 Suppl 11: 54–61.

Tong SY, Bishop EJ, Lilliebridge RA, Cheng AC, Spasova-Penkova Z, Holt DC, Giffard PM, McDonald MI, Currie BJ, Boutlis CS (2009) Community-Associated Strains of Methicillin-Resistant *Staphylococcus aureus* and Methicillin-Susceptible *S. aureus* in Indigenous Northern Australia: Epidemiology and Outcomes, *J Infect Dis*. 199 (10): 1461–1470. doi: 10.1086/598218: <https://www.ncbi.nlm.nih.gov/pubmed/19392622>.

Turnidge JD (2009) High Burden of Staphylococcal Disease in Indigenous Communities *J Infect Dis*. 199 (10): 1416–1418. doi: 10.1086/598219: <https://academic.oup.com/jid/article/199/10/1416/876156/High-Burden-of-Staphylococcal-Disease-in>.

# 10. Appendices

## Appendix 1: Definitions

### Child death

Child death refers to the death of a child occurring after and including the 1st birthday and up to, but not including, the 18th birthday (1–17 years).

### Confinements

Confinements refer to the number of women who gave birth to one or more live births and/or stillbirths (regardless of plurality) with a pregnancy of 20 weeks gestation or more.

### Congenital anomaly, formerly birth anomaly

A congenital anomaly is any anomaly of prenatal origin, arising from conception or occurring before the end of pregnancy. This includes structural, functional, genetic, chromosomal and biochemical anomalies.

### Crude birth rate

The crude birth rate is measured by the number of live births (see definition below) per 1000 estimated female resident population aged 15–44 years for a given calendar year.

### Estimated resident population

The estimated resident population (ERP) is an Australian Bureau of Statistics (ABS) measure of the population based on the concept of residence and refers to all people, regardless of nationality or citizenship, who usually live in Australia, with the exception of foreign diplomatic personnel and their families.

### Infant death

Infant death refers to the death of a live-born infant occurring within one year of birth. Infant death can be divided into neonatal death referring to the death of a live-born infant less than 28 days after birth, of at least 20 weeks gestation or, if gestation is unknown, weighing at least 400 g, and post-neonatal infant death, referring to the death of an infant between 28 days and 364 days.

### Late maternal death

Late maternal death refers to the death of a woman after 42 days, but within a year of the birth or termination of the pregnancy. The death may be due to direct, indirect or incidental causes; however, indirect and incidental late maternal deaths are not included in the maternal mortality ratio.

### Live birth

A live birth is the birth of a child who, after delivery, breathes or shows any evidence of life such as a heartbeat.

## Maternal death

### For classification of cause of death

For classification purposes, maternal death refers to the death of a woman while pregnant or within 42 days of the end of the pregnancy, irrespective of the cause of death. This definition allows for classification of maternal deaths based on direct, indirect or incidental causes, as follows:

- direct — the death is considered to be due to a complication of the pregnancy (for example, haemorrhage from placenta praevia)
- indirect — the death is considered to be due to a pre-existing or newly diagnosed condition aggravated by the physiological or pathological changes of pregnancy (for example, deterioration in pre-existing heart disease or diabetes). Deaths consequent on psychiatric disease are usually categorised as indirect, except for puerperal psychosis, which is classified as direct
- incidental — the death is considered unrelated to pregnancy (for example, passenger in motor vehicle accident).
- late maternal death — when the death occurs after 42 days, but within a year of the birth or termination of pregnancy.

### For calculating the maternal mortality ratio

The World Health Organization (WHO) defines maternal death as 'the death of a woman during pregnancy, childbirth or in the 42 days of the puerperium, irrespective of the duration and site of the pregnancy, from any cause related to, or aggravated by, the pregnancy or its management'. This WHO definition allows for identification of maternal deaths as either direct or indirect only. It includes deaths from abortion and ectopic pregnancy, however excludes incidental deaths from causes unrelated to pregnancy, such as deaths from injury or malignancy. The WHO definition is used by the CCOPMM to calculate the maternal mortality ratio.

## Perinatal death

Perinatal deaths refer to stillbirths and live births with only brief survival and are grouped on the assumption that similar factors are associated with these losses. The CCOPMM defines perinatal death to include stillbirth and neonatal deaths within 28 days of birth of infants of gestation ≥ 20 weeks or if gestation is unknown of birthweight ≥ 400 g.

For national statistics, the CCOPMM also reports on perinatal deaths of infants with a birthweight of ≥ 500 g, or, if the birthweight is unknown, infants of ≥ 22 weeks gestation. This definition has certain advantages because it excludes from the calculation those mostly pre-viable live births of < 500 g and also the majority of cases where the pregnancy was terminated for fetal or maternal indications.

For international comparison and as recommended by WHO, only fetuses and infants of at least 1000 g birthweight, or where birthweight is unavailable, the corresponding gestational age (28 weeks) or body length (35 cm crown–heel) are included in the perinatal mortality ratio.

### Post-neonatal infant, child and adolescent deaths

These deaths are classified under the following categories:

- determined at birth
- SUDI, including SIDS
- unintentional injury
- acquired disease
- intentional injury
- undetermined.

## Standardised mortality ratio

This is a risk ratio where the observed mortality pattern in a group is compared with what would have been expected if the variable–specific mortality rates had been the same as the specified reference population. Indirect standardisation adjusts for differences in the distribution of the variable of interest (for example, age) between the study and reference population.

## Stillbirth

A stillbirth is defined as the birth of an infant of at least 20 weeks gestation or, if gestation is unknown, weighing at least 400 g, who shows no signs of life at birth.

## Sudden unexpected deaths in infancy (SUDI)[3]

This group of deaths includes all infants (under one year of age) who die suddenly and unexpectedly after they are placed for sleeping. SUDI can be classified into explained SUDI and unexplained SUDI and can include deaths related to:

- unexplained:
  - SIDS is the sudden unexpected death of an infant < one year of age, with onset of the fatal episode apparently occurring during sleep
  - unclassified sudden infant death (USID), with or without autopsy
  - undetermined
- explained:
  - suffocation while sleeping (including asphyxiation by bedclothes and overlaying)
  - infection, metabolic disorders, congenital anomalies, genetic conditions
  - other, for example non-accidental injury.

Some international definitions of SUDI include unexpected events such as unintentional injury (for example, motor vehicle accidents). The CCOPMM does not include unintentional injuries in its SUDI definitions, but details of unintentional injury in infants are listed elsewhere in the report. SUDI deaths where a cause of death is identified (usually at autopsy) are included in the 'explained' category and are also included within other appropriate categories (for example, congenital anomalies or genetic conditions, infection) elsewhere in the report. Unexplained SUDI deaths are classified according to the Krous definition.

### Category IA SIDS

Category IA includes deaths that meet the requirements of the general definitions and also all of the following requirements.

*Clinical*

- > 21 days and < 9 months of age
- Normal clinical history including term pregnancy (gestational age ≥ 37 weeks)
- Normal growth and development
- No similar deaths among siblings, close genetic relatives (uncles, aunts or first degree cousins) or other infants in the custody the same caregiver

*Circumstances of death*

- Investigation of the various scenes where incidents leading to death might have occurred and determination that they do not provide an explanation for the death
- Found in a safe sleeping environment, with no evidence of accidental death

3 Krous HF, Beckwith JB, Byard RW, Rognum TO, Bajanowski T, Corey T, Cutz E, Hanzlick R, Keens TG, Mitchell EA. Sudden Infant Death Syndrome and Unclassified Sudden Infant Deaths: A definitional and Diagnostic Approach" Pediatrics 2004;114(1):234-238.

*Autopsy*

- Absence of potentially fatal pathologic findings. Minor respiratory system inflammatory infiltrates are acceptable; intrathoracic petechial haemorrhage is a supportive but not obligatory or diagnostic finding
- No evidence of unexplained trauma, abuse, neglect or unintentional injury
- No evidence of substantial thymic stress effect (thymic weight of < 15 g and/or moderate/severe cortical lymphocyte depletion). Occasional 'starry sky' macrophages or minor cortical depletion is acceptable
- Negative results of toxicologic, microbiologic, radiologic, vitreous chemistry and metabolic screening studies

**Category IB SIDS**

Category IB includes infant deaths that meet the requirements of the general definition and also meet all of the criteria for category IA except that investigation of the various scenes where incidents leading to death might have occurred was not performed or ≥ 1 of the following analyses were not performed: toxicologic, microbiologic, radiologic, vitreous, chemistry or metabolic screening studies.

**Category II SIDS**

Category II includes infants that meet category I except for ≥ 1 of the following.

*Clinical*

- Age range outside that of category IA or IB (that is 0–21 days or 270 days [9 months] through to first birthday)
- Similar deaths among siblings, close relatives or infants in the custody of the same caregiver that are not recognised suspect for infanticide or recognised genetic disorders
- Neonatal or perinatal conditions (for example those resulting from preterm birth) that have resolved by the time of death

*Circumstances of death*

- Mechanical asphyxia or suffocation caused by overlaying not determined with certainty

*Autopsy*

- Abnormal growth or development not thought to have contributed to death
- Marked inflammatory changes or abnormalities not sufficient to be unequivocal causes of death

**Unclassified sudden infant death**

Includes deaths that do not meet the criteria for category I or II SIDS, but for which alternative diagnoses of natural or unnatural conditions are equivocal, including cases where autopsies were not preformed.

**Post-resuscitation cases**

Infants found in extremis who are not resuscitated and later die ('temporarily interrupted SIDS') may be included in the aforementioned categories, depending on the fulfilment of relevant criteria.

## Acronyms

| | |
|---|---|
| APMAT | Perinatal Mortality Audit Tool |
| BMI | body–mass index |
| CCOPMM | Consultative Council on Obstetric and Paediatric Mortality and Morbidity |
| CTG | Cardiotocography |
| FGR | fetal growth restriction |
| FSE | fetal scalp electrode |
| MCH | Maternal and Child Health |
| MMR | Maternal Mortality Ratio |
| PIPER | Paediatric Infant Perinatal Emergency Retrieval. |
| PPH | Postpartum Haemorrhage |
| PSANZ | Perinatal Society of Australia and New Zealand |
| SUDEP | sudden unexplained death in epilepsy |
| UVC | umbilical vein cannulation |
| VPDC | Victorian Perinatal Data Collection |
| VCAR | Victorian Congenital Anomalies Register |
| ViCTOR | Victorian Children's Tool for Observation and Response |

# Appendix 2: Measures of obstetric and paediatric mortality and morbidity

## Maternal mortality ratio (MMR)

The MMR is defined as follows:

$$\text{Maternal mortality ratio} = \frac{\text{number of direct and indirect maternal deaths} \times 100{,}000}{\text{total number of confinements}}$$

The MMR excludes late maternal deaths.

Confinements is the number of pregnancies of 20 weeks gestation or more resulting in live birth or stillbirth (regardless of plurality).

Maternal deaths in early pregnancy from direct or indirect causes are included in the numerator for the MMR even though the denominator does not include pregnancies that end before 20 weeks gestation because the available data on the number of these pregnancies are unreliable.

## Perinatal mortality rate (PMR)

The PMR is calculated as stillbirths and neonatal deaths per 1000 total births (stillbirths and live births). For CCOPMM statistics, the rate refers to all births of at least 20 weeks gestation or, if gestation is unknown, of birthweight of at least 400 g. However, for purposes of continuity, PMR of infants of ≥ 500 g or, where the birthweight is unknown, of at least 22 weeks gestation, is also presented ($PMR_{500}$). For international comparisons, the rate refers to all births of at least 1000 g birthweight or, when the birthweight is unknown, of at least 28 weeks gestation and neonatal deaths occurring within seven days of birth (recommended by WHO).

$$\text{Perinatal mortality rate} = \frac{(\text{number of stillbirths} + \text{neonatal deaths}) \times 1000}{\text{total (stillbirths} + \text{live births)}}$$

## Neonatal mortality rate (NMR)

The NMR is calculated per 1000 live births of at least 20 weeks gestation or, if gestation is unknown, of birthweight at least 400 g.

$$\text{Neonatal mortality rate} = \frac{\text{number of neonatal deaths} \times 1000}{\text{total live births}}$$

**Stillbirth rate**

$$\text{Stillbirth rate} = \frac{\text{number of stillbirths} \times 1000}{\text{total (stillbirths} + \text{live births)}}$$

## Infant mortality rate (IMR)

The IMR is calculated as the number of infant deaths divided by the number of total (Victorian-born) live births for the index year (reported as the rate per 1000 live births). The live births are limited to those infants ≥ 20 weeks gestation or, if the gestation is unknown, of birthweight ≥ 400 g.

Deaths during the neonatal period of infants born as the result of termination of pregnancy for congenital anomaly or other reasons, such as maternal conditions, are excluded from the IMR calculation.

$$\textit{Infant mortality rate} = \frac{\textit{(number of infant deaths) x 1000}}{\textit{total live births}}$$

# Appendix 3: Births and deaths flowcharts 2014 and 2015

## List of figures



**Figure 1: Births and deaths flow chart, Victoria 2014**

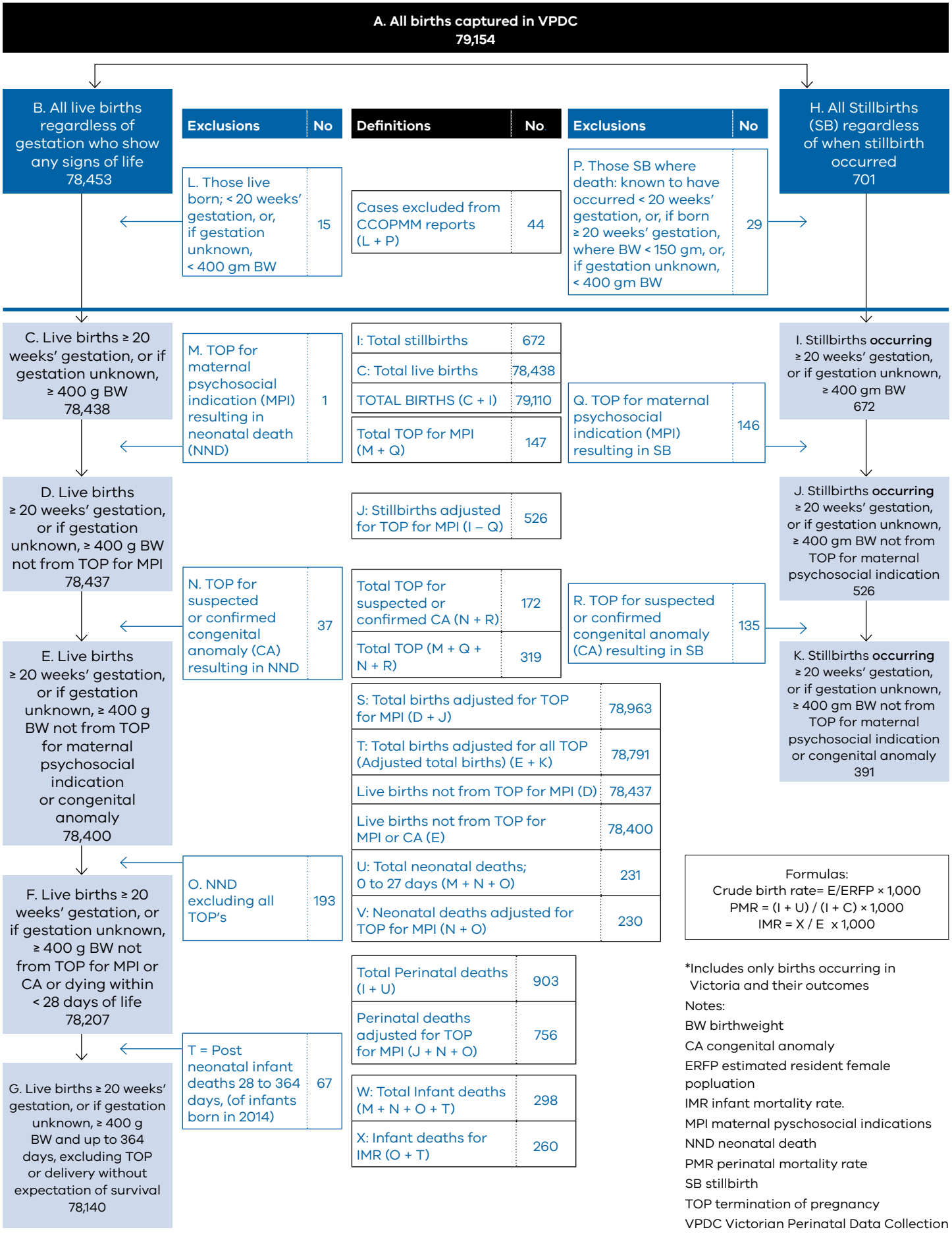
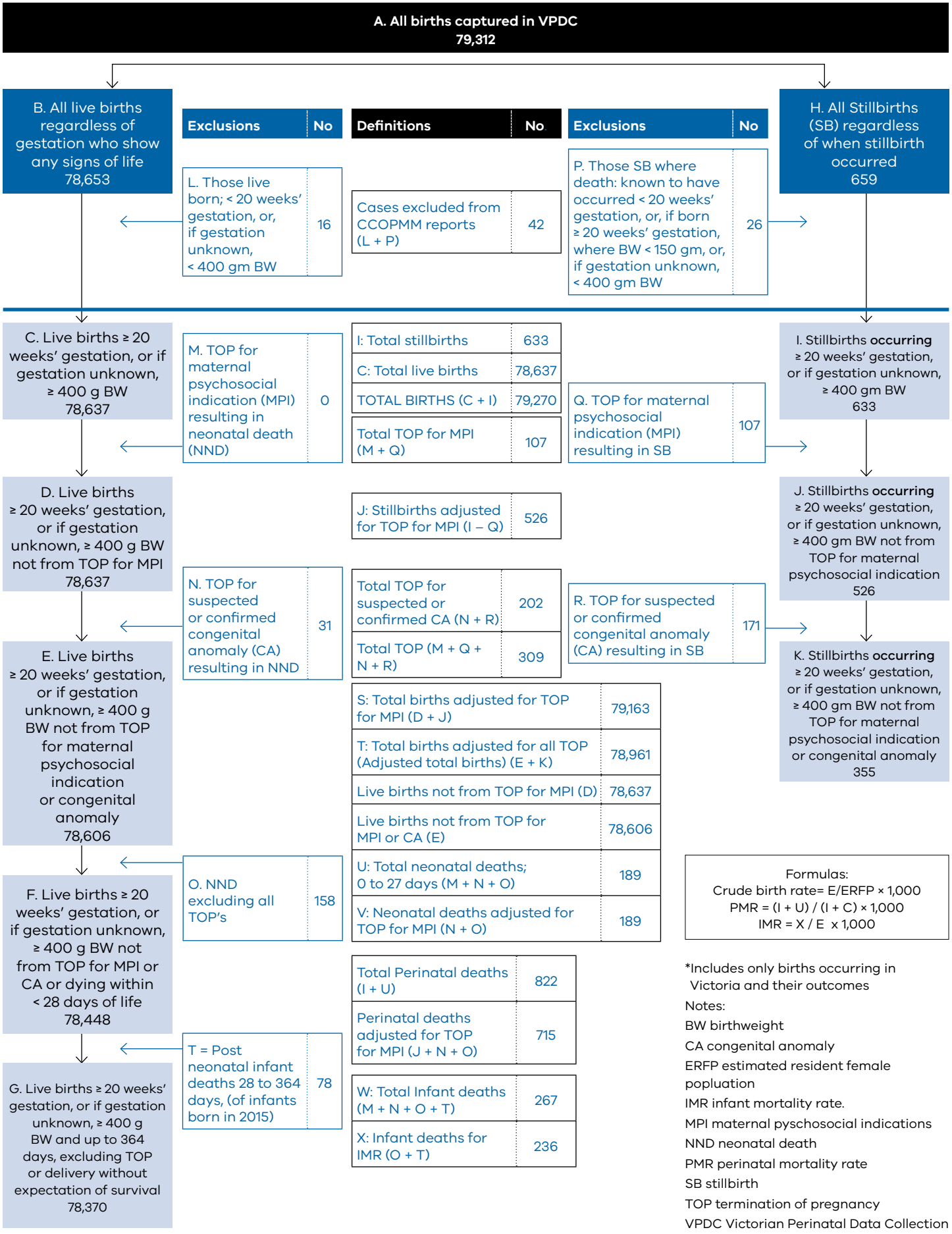


**Figure 2: Births and deaths flow chart, Victoria 2015**



# Appendix 4: Births in Victoria 2014 and 2015

## Contents



## List of tables

## List of figures

**Table 1: Total births in Victoria, 2014 and 2015**

| | 2014 | 2015 |
|---|---|---|
| **Births** | | |
| Total births (C + I)[a] | 79,110 | 79,270 |
| Total stillbirths (I) | 672 | 633 |
| Total live births (C) | 78,438 | 78,637 |
| Terminations of pregnancy – TOP[b] (M + Q + N + R) | 319 | 309 |
| **Adjusted[c] births** | | |
| Adjusted total births (E + K) | 78,791 | 78,961 |
| Adjusted live births (E) | 78,400 | 78,606 |
| Adjusted stillbirths (K) | 391 | 355 |
| **Confinements** | | |
| Total confinements | 77,930 | 78,147 |
| **Adjusted[c] confinements** | **77,577** | **77,752** |
| **Crude birth rate[d]** | 63.4 | 62.4 |
| **Births excluded from CCOPMM report[e] (L + P)** | 44 | 42 |

a. Information in parentheses refers to the numbers in the Births and Deaths Flow Chart.

b. Terminations of pregnancy at 20 or more weeks' gestation for congenital anomalies or maternal psychosocial indications

c. Adjusted figures exclude terminations of pregnancy for congenital anomalies or maternal psychosocial indications. Tables in Appendix 4 exclude 7 cases in 2014 and 54 cases in 2015 where the birthweight was incorrectly reported as < 150 grams. This results in 78,784 adjusted total births in 2014 and 78,907 adjusted total births in 2015 used as the denominator for tables in Appendix 4. In addition, cases with missing data are excluded from some tables.

d. Estimated female resident population (ERFP) – 3235.0 – Population by Age and Sex, Regions of Australia, 2014 and 3235.0 – Population by Age and Sex, Regions of Australia, 2015

e. Cases excluded from the report were known to have died before 20 weeks' gestation.

**Table 2: Crude birth rate, Victoria 2014 and 2015**

| | 2014 | 2015 |
|---|---|---|
| Adjusted live births | 78,400 | 78,606 |
| Estimated female resident population (EFRP) aged 15–44 years | 1,236,981 | 1,259,172 |
| Crude birth rate per 1,000 EFRP (aged 15-44 years)[a] | 63.4 | 62.4 |

a. The EFRP (aged 15- 44 years) was obtained from ABS Catalogue 3235.0 – Population by Age and Sex, Regions of Australia 2014 and Catalogue 3235.0 – Population by Age and Sex, Regions of Australia 2015, (http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3235.02014 and http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3235.02015

**Table 3: Trends in births, confinements and live births per 1,000 ERFP[a] aged 15–44 years, Victoria 1985 to 2015**

| | 1985 | 1990 | 1995 | 2000 | 2005 | 2010 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|
| Adjusted total births | 61,189 | 66,878 | 64,717 | 62,555 | 66,340 | 74,127 | 78,041 | 77,963 | 78,791 | 78,961 |
| Adjusted live births | 60,784 | 66,374 | 63,247 | 62,148 | 65,993 | 73,731 | 77,659 | 77,566 | 78,400 | 78,606 |
| Adjusted confinements | 60,468 | 66,004 | 62,734 | 61,562 | 65,115 | 72,914 | 76,825 | 76,744 | 77,577 | 77,752 |
| EFRP[a] | 974,347 | 1,044,969 | 1,033,818 | 1,053,114 | 1,082,355 | 1,170,211 | 1,200,168 | 1,219,535 | 1,236,981 | 1,259,172 |
| Live births per 1,000 EFRP | 62.4 | 63.5 | 61.2 | 59.0 | 61.0 | 63.0 | 64.7 | 63.6 | 63.4 | 62.4 |

a. The EFRP (aged 15- 44 years) for the years 2014 and 2015 were obtained from ABS Catalogue 3235.0 – Population by Age and Sex, Regions of Australia 2014 and Catalogue 3235.0 – Population by Age and Sex, Regions of Australia 2015, (http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3235.02014 and http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3235.02015
EFRP for years prior to 2014 were obtained from ABS data. Births to women younger than 15 years are included in the 15–19 year age group and women aged 45 or older are included in the 40–44 year age group.

## Maternal characteristics

**Table 4: Maternal age group, confinements 2014 and 2015**

| | 2014 | | 2015 | |
|---|---|---|---|---|
| Maternal age group | n | % | n | % |
| Younger than 20 years | 1,544 | 2.0 | 1,261 | 1.6 |
| 20–24 years | 8,081 | 10.4 | 7,825 | 10.1 |
| 25–29 years | 20,672 | 26.6 | 20,186 | 26.0 |
| 30–34 years | 28,354 | 36.5 | 29,000 | 37.3 |
| 35–39 years | 15,232 | 19.6 | 15,800 | 20.3 |
| 40–44 | 3,444 | 4.4 | 3,399 | 4.4 |
| 45+ years | 228 | 0.3 | 257 | 0.3 |
| Unknown | 22 | 0.0 | 24 | 0.0 |
| Total | 77,577 | 100.0 | 77,752 | 100.0 |

**Table 5: Trends in maternal age group, % of confinements 1985 to 2015**

| Maternal age group | 1985 | 1990 | 1995 | 2000 | 2005 | 2010 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|
| Younger than 20 years | 4.4 | 4.3 | 3.5 | 3.3 | 2.7 | 2.4 | 2.3 | 2.2 | 2.0 | 1.6 |
| 20–24 years | 23.1 | 18.3 | 15.7 | 12.4 | 11.3 | 11.2 | 10.9 | 10.8 | 10.4 | 10.1 |
| 25–29 years | 40.2 | 37.6 | 33.6 | 30.7 | 25.4 | 26.4 | 26.8 | 26.3 | 26.6 | 26.0 |
| 30–34 years | 24.4 | 29.0 | 32.7 | 34.6 | 37.0 | 33.9 | 34.8 | 35.5 | 36.5 | 37.3 |
| 35–39 years | 6.9 | 9.3 | 12.5 | 16.2 | 19.9 | 21.3 | 20.4 | 20.2 | 19.6 | 20.3 |
| 40+ years | 0.9 | 1.3 | 2.1 | 2.9 | 3.7 | 4.7 | 4.7 | 4.9 | 4.7 | 4.7 |
| Median age – overall (years) | 27.0 | 28.0 | 29.0 | 30.0 | 31.0 | 31.0 | 31.0 | 31.0 | 30.8 | 31.0 |
| Median age – primiparae (years) | 25.0 | 26.0 | 27.0 | 28.0 | 29.0 | 29.0 | 29.0 | 29.0 | 29.0 | 30.0 |
| Mean age – overall (years) | 27.5 | 28.2 | 29.1 | 29.9 | 30.6 | 31.3 | 31.2 | 31.3 | 30.8 | 31.0 |
| Mean age – primiparae (years) | 25.4 | 26.2 | 27.2 | 28.2 | 29.1 | 29.6 | 29.7 | 29.8 | 29.4 | 29.6 |

**Figure 1: Trends in maternal age group, confinements 1985 to 2015 (%)**

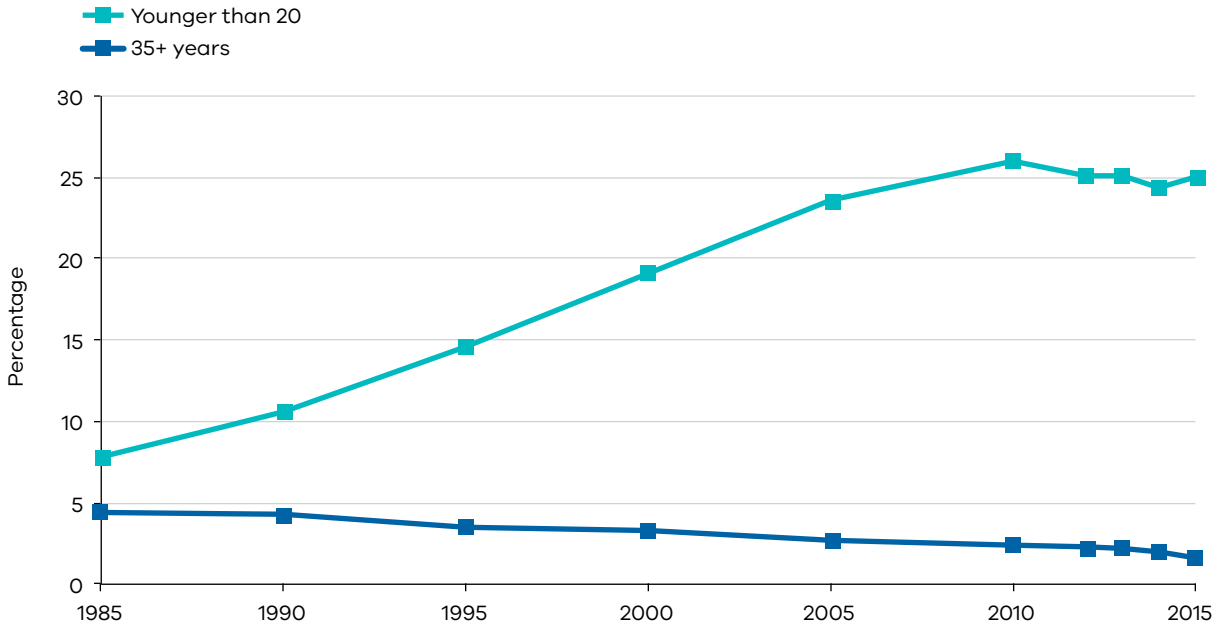


**Table 6: Trends in confinements, Department of Health regions, 1990 to 2015**

| Department of Health regions | 1990 | | 2000 | | 2010 | | 2014 | | 2015 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % |
| Barwon-South West | 4,780 | 7.2 | 4,001 | 6.5 | 4,353 | 6.0 | 4469 | 5.8 | 4563 | 5.9 |
| Grampians | N/A | N/A | 2,838 | 4.6 | 2,630 | 3.6 | 2723 | 3.5 | 2797 | 3.6 |
| Loddon Mallee | 3,897 | 5.9 | 3,484 | 5.7 | 3,757 | 5.2 | 3821 | 4.9 | 3606 | 4.6 |
| Hume | N/A | N/A | 3,116 | 5.1 | 3,196 | 4.4 | 3286 | 4.2 | 3281 | 4.2 |
| Gippsland | 3,582 | 5.4 | 2,683 | 4.4 | 2,980 | 4.1 | 3042 | 3.9 | 3069 | 3.9 |
| **Total rural** | **18,388** | **27.9** | **16,122** | **26.2** | **16,916** | **23.3** | **17,341** | **22.3** | **17,316** | **22.2** |
| Western Metropolitan | 12,767 | 19.3 | 8,643 | 14.0 | N/A | N/A | N/A | N/A | N/A | N/A |
| Northern Metropolitan | N/A | N/A | 10,219 | 16.6 | 25,204 | 34.6 | 28617 | 36.9 | 28723 | 36.9 |
| Eastern Metropolitan | 19,197 | 29.1 | 11,334 | 18.4 | 11,403 | 15.6 | 11601 | 15.0 | 11232 | 14.4 |
| Southern Metropolitan | 15,146 | 22.9 | 13,989 | 22.7 | 17,813 | 24.4 | 18610 | 24.0 | 18900 | 24.3 |
| **Total metropolitan** | **47,110** | **71.4** | **44,185** | **71.8** | **54,420** | **74.6** | **58,828** | **75.9** | **58,855** | **75.6** |
| Other (non-Victorian) | 506 | 0.8 | 1,262 | 2.0 | 1,564 | 2.1 | 1409 | 1.8 | 1581 | 2 |
| **Total confinements** | **66,003** | **100** | **61,569** | **100** | **72,900** | **100** | **77578** | **100** | **77,752** | **100** |

N/A – not applicable. This regional boundary was combined with another regional boundary, for example in 2009 Northern Metropolitan and Western Metropolitan regions were called Northern and Western Metropolitan region.

**Table 7: Trends in marital status, confinements 1990 to 2015 (%)**

| Marital status | 1990 | 2000 | 2010 | 2014 | 2015 |
|---|---|---|---|---|---|
| Married | 83.4 | 75.3 | 69.7 | 69.8 | 69.6 |
| De facto | 6.2 | 11.8 | 15.8 | 17.5 | 17.9 |
| Single | 9.2 | 11.7 | 11.0 | 11.0 | 10.9 |
| Separated/divorced/widowed | 1.1 | 1.1 | 0.8 | 0.7 | 0.6 |

**Table 8: Maternal place of birth, confinements 2014 and 2015**

| Place of birth[a] | 2014 | | 2015 | |
|---|---|---|---|---|
| | n | % | n | % |
| Australia | 49,698 | 64.1 | 49,395 | 63.5 |
| Southern and Central Asia | 7,271 | 9.4 | 7,800 | 10.0 |
| South-East Asia | 4,841 | 6.2 | 5,017 | 6.5 |
| North-West Europe | 2,226 | 2.9 | 2,249 | 2.9 |
| North Africa and Middle East | 2,621 | 3.4 | 2,717 | 3.5 |
| Oceania and Antarctica | 2,165 | 2.8 | 2,187 | 2.8 |
| North-East Asia | 4,070 | 5.2 | 3,681 | 4.7 |
| Southern and Eastern Europe | 1,510 | 1.9 | 1,415 | 1.8 |
| Sub-Saharan Africa | 1,594 | 2.1 | 1,673 | 2.2 |
| Americas | 1,025 | 1.3 | 1,100 | 1.4 |
| Unknown | 556 | 0.7 | 518 | 0.7 |
| **Total** | **77,577** | **100.0** | **77,752** | **100.0** |

a. Standard Australian Classification of Countries (SACC) 2011, <http://www.abs.gov.au/ausstats/abs@.nsf/mf/1269.

**Table 9: Ten most common countries of birth, for women born in non-English speaking countries, confinements in 1990, 2000, 2010 and 2014 and 2015**

| 1990 | | 2000 | | 2010 | | 2014 | | 2015 | |
|---|---|---|---|---|---|---|---|---|---|
| Country of birth | Number of confinements | Country of birth | Number of confinements | Country of birth | Number of confinements | Country of birth | Number of confinements | Country of birth | Number of confinements |
| Vietnam | 1,068 | Vietnam | 1,905 | India | 3,508 | India | 4,546 | India | 4,888 |
| Former Yugoslavia | 971 | China | 883 | China | 1,573 | China | 3,079 | China | 2,645 |
| Lebanon | 721 | Former Yugoslavia | 579 | Vietnam | 1,452 | Vietnam | 1,557 | Vietnam | 1,599 |
| Italy | 712 | Philippines | 567 | Sri Lanka | 776 | Sri Lanka | 1,024 | Sri Lanka | 1,028 |
| Philippines | 609 | Lebanon | 548 | Philippines | 727 | Philippines | 842 | Philippines | 918 |
| Turkey | 584 | India | 519 | Malaysia | 522 | Malaysia | 688 | Pakistan | 704 |
| Malaysia | 502 | Sri Lanka | 457 | Sudan | 493 | Pakistan | 643 | Malaysia | 696 |
| Greece | 489 | Other Africa | 411 | Iraq | 441 | Sudan | 550 | Sudan | 608 |
| India | 385 | Turkey | 403 | Indonesia | 427 | Iraq | 545 | Afghanistan | 594 |
| Sri Lanka | 346 | Malaysia | 322 | Lebanon | 417 | Afghanistan | 544 | Iraq | 538 |

**Table 10: Maternal BMI, confinements 2014 and 2015**

| BMI | 2014 | | 2015 | |
|---|---|---|---|---|
| | n | % | n | % |
| < 18.5 | 2,370 | 3.1 | 2,388 | 3.1 |
| 18.5 to < 25 | 36,710 | 47.3 | 39,482 | 50.8 |
| 25 to < 30 | 18,656 | 24.0 | 19,847 | 25.5 |
| 30 to < 35 | 8,425 | 10.9 | 8,650 | 11.1 |
| 35 to < 40 | 3,388 | 4.4 | 3,589 | 4.6 |
| 40 to < 50 | 1,834 | 2.4 | 2,060 | 2.6 |
| 50 to < 60 | 196 | 0.3 | 229 | 0.3 |
| ≥ 60 | 26 | 0.0 | 35 | 0.0 |
| Unknown | 5,972 | 7.7 | 1,472 | 1.9 |
| **Total** | **77,577** | **100.0** | **77,752** | **100.0** |

**Table 11: Proportion of women reporting any smoking during first 20 weeks of pregnancy, Victoria 2014 and 2015**

| Reported smoking | 2014 | | 2015 | |
|---|---|---|---|---|
| | n | % | n | % |
| No smoking < 20 weeks of pregnancy | 68,896 | 88.8 | 69,495 | 89.4 |
| Quit smoking < 20 weeks of pregnancy | 1,631 | 2.1 | 1,576 | 2.0 |
| Continued smoking < 20 weeks of pregnancy | 5,973 | 7.7 | 5,588 | 7.2 |
| Not stated | 1,077 | 1.4 | 1,093 | 1.4 |
| **Total** | **77,577** | **100.0** | **77,752** | **100.0** |

**Table 12: IRSD quintile* and maternal age, confinements 2014 and 2015 (%)**

| Quintile | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|
| Maternal age group | % | % | % | % | % | % |
| 2014 | | | | | | |
| < 20 years | 42.2 | 24.4 | 16.4 | 10.2 | 6.8 | 100 |
| 20–24 years | 36.7 | 25.3 | 17.1 | 13.1 | 7.8 | 100 |
| 25–29 years | 23.5 | 22.9 | 20.8 | 18.1 | 14.7 | 100 |
| 30–34 years | 15.7 | 18.4 | 20.9 | 22.2 | 22.7 | 100 |
| 35–39 years | 13.6 | 16.7 | 19.5 | 22.5 | 27.7 | 100 |
| 40 + years | 14.8 | 16.8 | 18.3 | 22.4 | 27.8 | 100 |
| 2015 | | | | | | |
| < 20 years | 43.0 | 25.7 | 15.2 | 11.0 | 5.1 | 100 |
| 20–24 years | 36.3 | 25.2 | 18.1 | 12.5 | 8.0 | 100 |
| 25–29 years | 24.1 | 23.1 | 20.6 | 17.6 | 14.5 | 100 |
| 30–34 years | 16.0 | 18.7 | 20.8 | 22.0 | 22.5 | 100 |
| 35–39 years | 13.6 | 16.6 | 19.5 | 23.0 | 27.3 | 100 |
| 40 + years | 14.5 | 15.1 | 18.3 | 23.0 | 29.2 | 100 |

*Index of Relative Social Disadvantage. Quintile 1 is most disadvantaged.

**Table 13: IRSD quintile* and place of residence, confinements 2014 and 2015 (%)**

| Quintile | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|
| Place of residence | % | % | % | % | % | % |
| 2014 | | | | | | |
| Metropolitan | 17.6 | 17.3 | 19.9 | 21.8 | 23.4 | 100 |
| Rural | 26.7 | 27.6 | 20.2 | 15.0 | 10.4 | 100 |
| 2015 | | | | | | |
| Metropolitan | 15.9 | 17.7 | 20.1 | 22.6 | 23.7 | 100 |
| Rural | 24.1 | 22.2 | 19.9 | 17.4 | 16.3 | 100 |

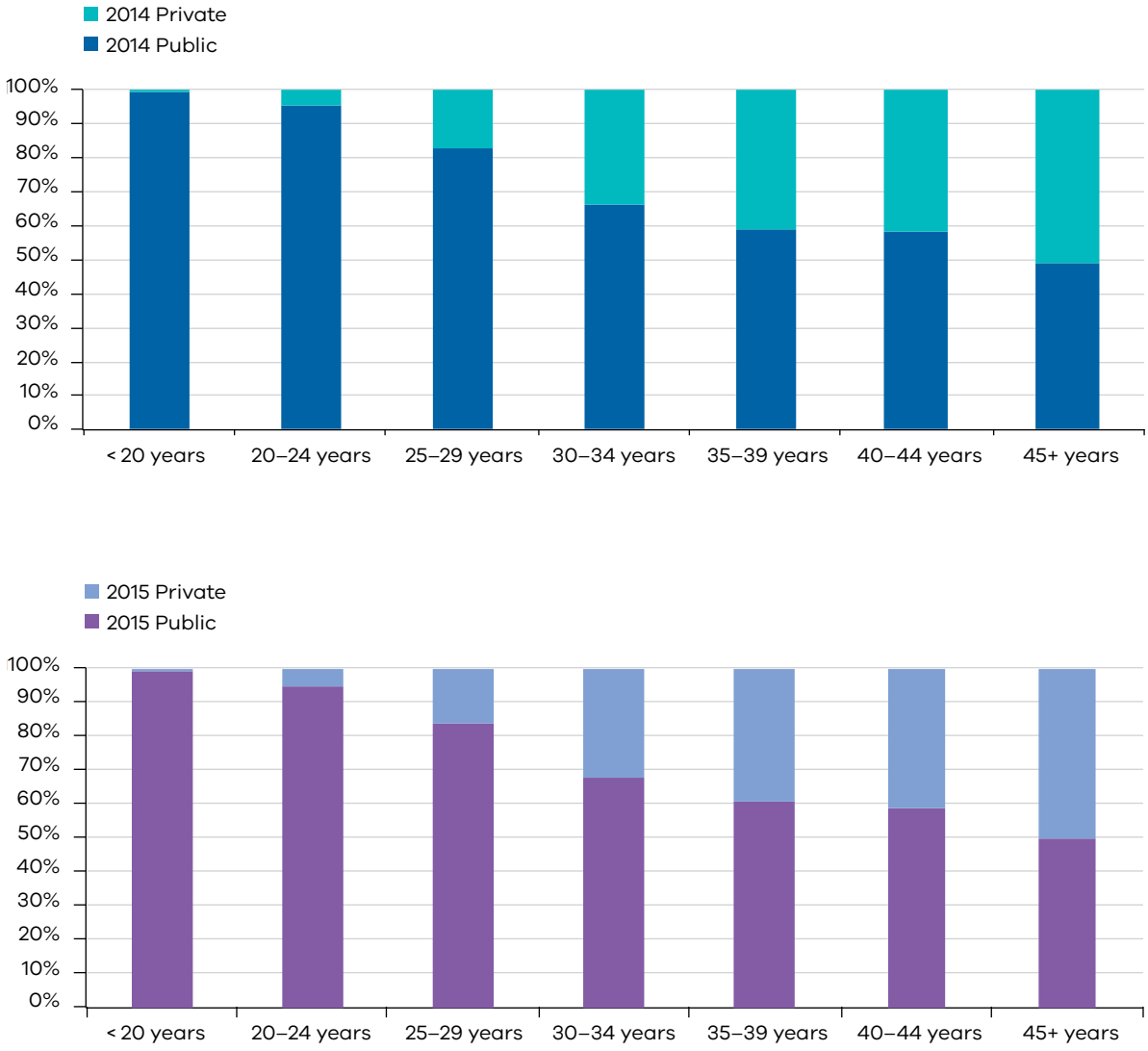
*Index of Relative Social Disadvantage. Quintile 1 is most disadvantaged.

## Organisational Factors

**Table 14: Admission status, confinements 2014 and 2015**

| Admission status | 2014 | | 2015 | |
|---|---|---|---|---|
| | n | % | n | % |
| Public | 56,177 | 72.4 | 57,037 | 73.4 |
| Private in public hospital | 1513 | 2.0 | 1488 | 1.9 |
| Private in private hospital | 19,621 | 25.3 | 18,947 | 24.4 |
| Private – planned home birth | 249 | 0.3 | 254 | 0.3 |
| Unknown | 1,525 | 2.0 | 1,506 | 1.9 |
| Total | 77,577 | 100.0 | 77,752 | 100.0 |

**Figure 2: Public or private admission by maternal age group, confinements 2014 and 2015 (%)**




Excludes cases with unknown admission status and / or unknown maternal age.

**Table 15: Trends in admission status, confinements 2000 to 2015 (%)**

| Admission status | 2000 | 2005 | 2010 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| Public | 69.6 | 63.5 | 68.7 | 70.2 | 70.6 | 72.4 | 73.4 |
| Private | 30.4 | 36.5 | 31.3 | 29.7 | 29.3 | 27.6 | 26.6 |

**Table 16: Actual place of birth, confinements 2014 and 2015**

| Place of birth | 2014 | | 2015 | |
|---|---|---|---|---|
| | n | % | n | % |
| Hospital | 76,829 | 99 | 76,977 | 99 |
| Birth centre | 3 | 0 | 3 | 0 |
| Planned home births – private midwife | 242 | 0.3 | 250 | 0.3 |
| Planned home births – public hospital program | 82 | 0.1 | 74 | 0.1 |
| Unplanned out-of-hospital births | 402 | 0.5 | 419 | 0.5 |
| Inadequately described | 19 | 0 | 29 | 0 |
| Total | 77,577 | 100 | 77,752 | 100 |

**Table 17: Age of women planning public or private home confinements, 2014 and 2015**

| Maternal age group | 2014 | | | | 2015 | | | |
|---|---|---|---|---|---|---|---|---|
| | Public | | Private | | Public | | Private | |
| | n | % | n | % | n | % | n | % |
| Younger than 20 years | 1 | 0.9 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20–24 years | 7 | 6.3 | 15 | 5.1 | 2 | 2.1 | 15 | 4.8 |
| 25–29 years | 28 | 25 | 70 | 23.9 | 20 | 21.1 | 56 | 18 |
| 30–34 years | 44 | 39.3 | 111 | 37.9 | 33 | 34.7 | 120 | 38.6 |
| 35–39 years | 23 | 20.5 | 75 | 25.6 | 38 | 40 | 85 | 27.3 |
| 40 + years | 9 | 8 | 15 | 5.1 | 2 | 2.1 | 25 | 8 |
| Unknown | 0 | 0 | 7 | 2.4 | 0 | 0 | 10 | 3.2 |
| Total | 112 | 100 | 293 | 100 | 95 | 100 | 311 | 100 |

**Table 18: Place of birth for planned home confinements, 2014 and 2015**

| Place of birth | 2014 | | | | | | 2015 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Home | | Hospital | | Total | | Home | | Hospital | | Total | |
| | n | % | n | % | n | % | n | % | n | % | n | % |
| Planned pubic homebirth | 82 | 73.2 | 30 | 26.8 | 112 | 100 | 74 | 77.9 | 21 | 22.1 | 95 | 100 |
| Planned private homebirth | 242 | 82.6 | 51 | 17.4 | 293 | 100 | 250 | 80.4 | 61 | 19.6 | 311 | 100 |

**Table 19: Time of change in plan for women who planned public or private home confinements and gave birth in hospital, 2014 and 2015**

| | 2014 | | | | 2015 | | | |
|---|---|---|---|---|---|---|---|---|
| | Public | | Private | | Public | | Private | |
| Time of change | n | % | n | % | n | % | n | % |
| Before onset of labour | 14 | 46.7 | 16 | 31.4 | 13 | 61.9 | 24 | 39.3 |
| During labour | 16 | 53.3 | 35 | 68.6 | 8 | 38.1 | 37 | 60.7 |
| Total | 30 | 100 | 51 | 100 | 21 | 100 | 61 | 100 |

**Table 20: Trend in number of women achieving planned home confinements, 1985 to 2015**

| | 1985 | 1990 | 1995 | 2000 | 2005 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Public (n) | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 45 | 58 | 50 | 60 | 82 | 74 |
| % of all confinements | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Private (n) | 144 | 181 | 110 | 114 | 182 | 248 | 298 | 300 | 262 | 266 | 226 | 271 | 242 | 250 |
| % of all confinements | 0.2 | 0.3 | 0.2 | 0.2 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.3 | 0.4 | 0.3 | 0.3 |

**Table 21: Trends in parity, confinements, 1990 to 2015**

| | 1990 | 2000 | 2010 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| Parity | % | % | % | % | % | % | % |
| None | 40.8 | 41.7 | 43.7 | 44.5 | 45 | 45.1 | 43.8 |
| One | 33.3 | 34.6 | 34.5 | 34.8 | 34.5 | 34.7 | 36.0 |
| Two | 17 | 15.7 | 14.2 | 13.7 | 13.3 | 13.1 | 13.2 |
| Three | 5.9 | 5.2 | 4.7 | 4.3 | 4.4 | 4.2 | 4.2 |
| Four | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.6 | 1.5 |
| Five or more | 1.1 | 1.2 | 1.3 | 1.3 | 1.3 | 1.3 | 1.2 |

**Table 22: Number of previous caesarean sections, of women who had one or more prior births, 2000 to 2015**

| Number of previous caesarean sections | 2000 | | 2005 | | 2010 | | 2012 | | 2013 | | 2014 | | 2015 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % | n | % | n | % |
| None | 28,806 | 80.3 | 27,653 | 74.4 | 29,419 | 72.0 | 30,302 | 71.1 | 29739 | 70.5 | 29071 | 69.6 | 29959 | 69.7 |
| One | 5,572 | 15.5 | 7,488 | 20.2 | 8,996 | 22.0 | 9,662 | 22.7 | 9777 | 23.2 | 9967 | 23.9 | 10165 | 23.6 |
| Two | 1,241 | 3.5 | 1,678 | 4.5 | 2,104 | 5.1 | 2,143 | 5.0 | 2184 | 5.2 | 2178 | 5.2 | 2341 | 5.4 |
| Three | 231 | 0.6 | 276 | 0.7 | 414 | 1.0 | 387 | 0.9 | 425 | 1.0 | 435 | 1.0 | 439 | 1.0 |
| Four | 32 | 0.1 | 47 | 0.1 | 60 | 0.1 | 78 | 0.2 | 59 | 0.1 | 80 | 0.2 | 83 | 0.2 |
| Five or more | 9 | 0.0 | 10 | 0.0 | 8 | 0.0 | 29 | 0.1 | 19 | 0.0 | 29 | 0.1 | 14 | 0.0 |
| Total | 35,891 | 100 | 37,152 | 99.9 | 41,001 | 100 | 42,601 | 100 | 42,203 | 100.0 | 41,760 | 100.0 | 43,001 | 100.0 |

**Table 23: Trends in gestation, confinements 1990 to 2015 (%)**

| Gestation | 1990 n = 66,004 | 1995 n = 62,734 | 2000 n = 61,562 | 2005 n = 65,115 | 2010 n = 72,864 | 2012 n = 76,825 | 2013 n = 76,744 | 2014 n = 77,577 | 2015 n = 77,752 |
|---|---|---|---|---|---|---|---|---|---|
| 20–27 weeks | 0.6 | 0.7 | 0.7 | 0.6 | 0.6 | 0.5 | 0.6 | 0.6 | 0.5 |
| 28–31 weeks | 0.6 | 0.7 | 0.7 | 0.6 | 0.7 | 0.6 | 0.6 | 0.7 | 0.7 |
| 32–36 weeks | 5 | 5.1 | 5.5 | 5.5 | 5.8 | 6.0 | 6.0 | 6.2 | 6.4 |
| 37–41 weeks | 88.1 | 89.9 | 91.8 | 91.9 | 91.6 | 92.0 | 92.0 | 91.6 | 92.0 |
| 42 + weeks | 4.5 | 3 | 1.3 | 1.3 | 1.2 | 0.9 | 0.8 | 0.7 | 0.5 |
| Not reported | 1.1 | 0.7 | 0 | 0 | 0.1 | 0.0 | 0.0 | 0.2 | 0.0 |

**Table 24: Onset of labour, confinements 2014 and 2015**

| Onset of labour | 2014 | | 2015 | |
|---|---|---|---|---|
| | n | % | n | % |
| Spontaneous (not augmented) | 26960 | 34.8 | 26731 | 34.4 |
| Spontaneous and augmented | 13217 | 17.0 | 12256 | 15.8 |
| Induced | 21331 | 27.5 | 22377 | 28.8 |
| No labour | 16,039 | 20.7 | 16,372 | 21.1 |
| Total | 77,547 | 100.0 | 77,736 | 100.0 |

Excludes cases with missing data.

**Figure 3: Trends in onset of labour, confinements 1990 to 2015 (%)**

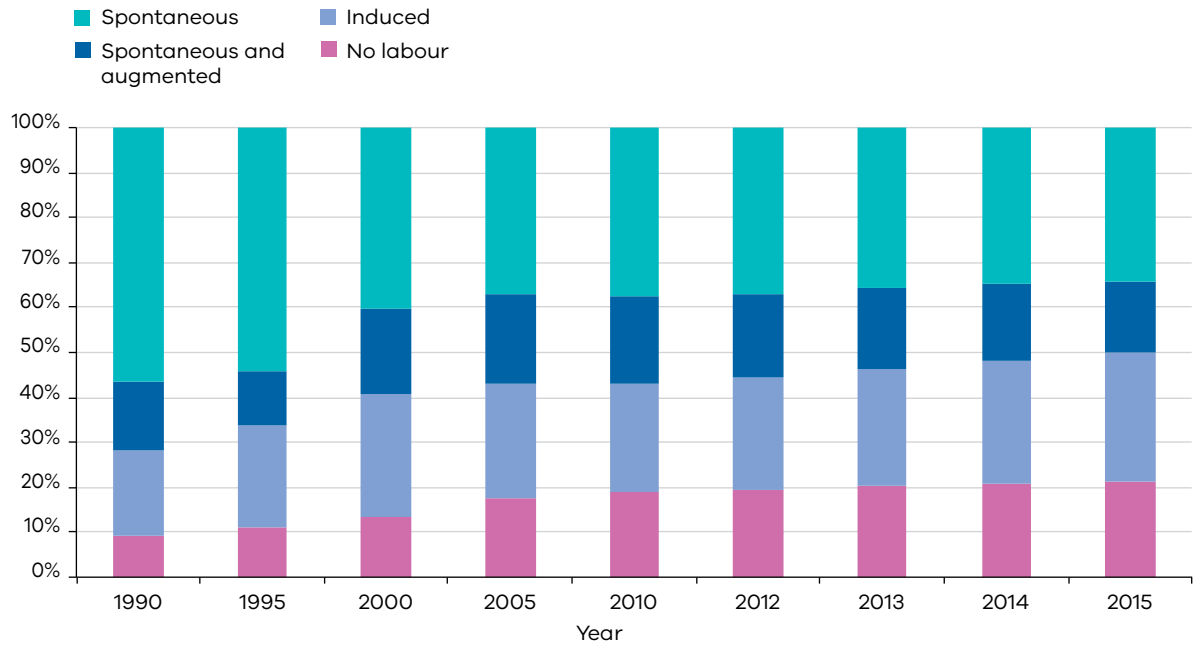
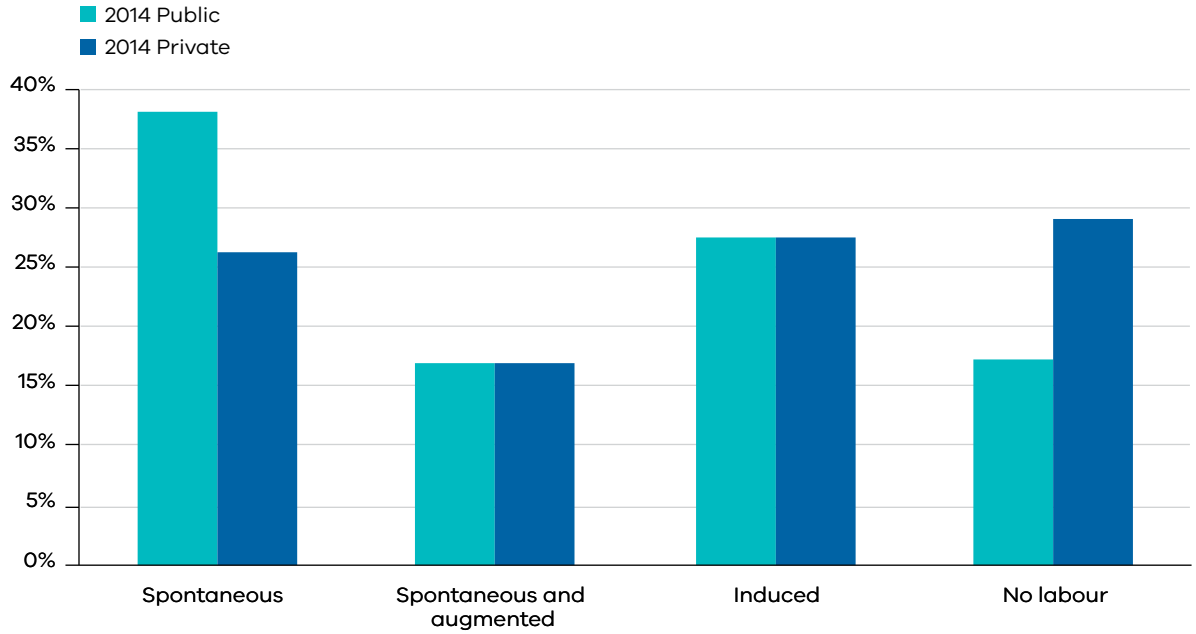


**Figure 4: Onset of labour by admission status, confinements 2014 and 2015 (%)**



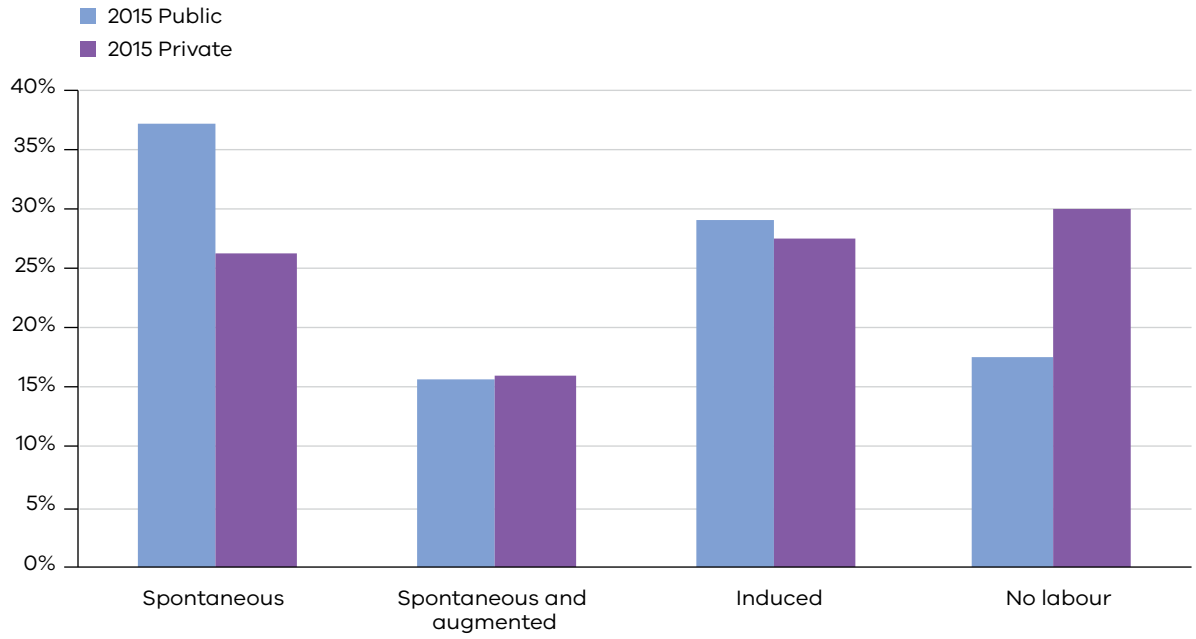



**Table 25: Fetal monitoring in labour (of women who experienced labour), 2014 and 2015**

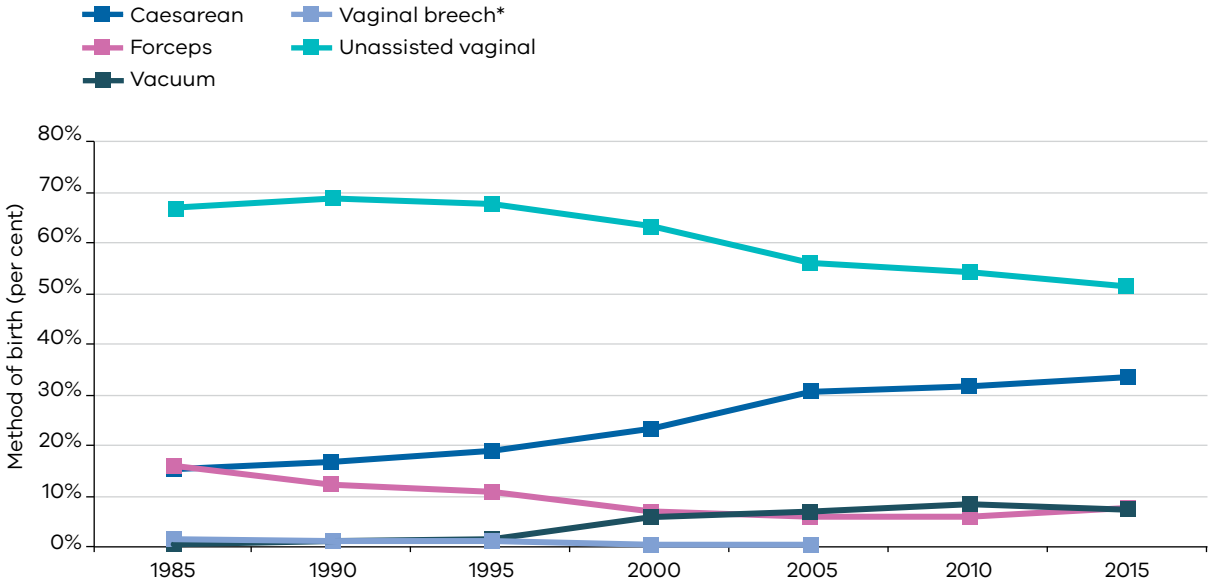
| Type of monitoring | 2014 | | 2015 | |
|---|---|---|---|---|
| | n | % | n | % |
| None | 1,132 | 1.8 | 1,464 | 2.4 |
| Intermittent auscultation | 8,230 | 13.4 | 7,786 | 12.6 |
| Admission CTG/Intermittent CTG | 10,555 | 17.2 | 9,980 | 16.2 |
| Continuous external CTG | 32,109 | 52.2 | 31,998 | 51.8 |
| Internal CTG (scalp electrode) | 9,094 | 14.8 | 10,071 | 16.3 |
| Fetal blood sampling | 316 | 0.5 | 351 | 0.6 |
| Other/not adequately described | 72 | 0.1 | 96 | 0.2 |
| **Total** | **61,508** | **100.0** | **61,746** | **100.0** |

Note: Fetal monitoring in labour is reported in a hierarchical manner e.g. a woman who had intermittent auscultation followed by continuous external CTG monitoring is reported as 'continuous external CTG monitoring'.

**Table 26: Method of birth, confinements, 2014 and 2015**

| Method of birth | 2014 | | 2015 | |
|---|---|---|---|---|
| | n | % | n | % |
| Unassisted vaginal | 39847 | 51.4 | 40059 | 51.5 |
| Vacuum | 5659 | 7.3 | 5569 | 7.2 |
| Forceps | 6049 | 7.8 | 6132 | 7.9 |
| Total caesarean | 26,012 | 33.5 | 25,989 | 33.4 |
| – *planned* | 13,454 | 17.3 | 13,547 | 17.4 |
| – *unplanned* | 12,558 | 16.2 | 12,442 | 16.0 |
| Unknown | 10 | 0.0 | 3 | 0.0 |
| **Total** | **77,577** | **100.0** | **77,752** | **100.0** |

**Figure 5: Trends in method of birth, all confinements, 1985 to 2015 (%)**




*Vaginal breech now included in unassisted vaginal or forceps.

### Table 27: Method of birth by onset of labour, confinements, 2014 and 2015

| Method of birth by onset of labour, confinements 2014 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Method of birth | Unassisted vaginal | | Vacuum | | Forceps | | Caesarean | | Unknown | | Total | |
| | n | % | n | % | n | % | n | % | n | % | n | % |
| Spontaneous (not augmented) | 20,594 | 76.4 | 1746 | 6.5 | 1397 | 5.2 | 3223 | 12.0 | 0 | 0.0 | 26,960 | 100 |
| Augmented | 7124 | 53.9 | 1753 | 13.3 | 2084 | 15.8 | 2254 | 17.1 | 2 | 0.0 | 13,217 | 100 |
| Induced | 12,109 | 56.8 | 2156 | 10.1 | 2566 | 12.0 | 4500 | 21.1 | 1 | 0.0 | 21,332 | 100 |
| No labour[a] | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 16029 | 0.0 | 11 | 0.0 | 16,040 | 100 |
| **Total** | **39,827** | **51.4** | **5,655** | **7.3** | **6,047** | **7.8** | **26,006** | **33.5** | **14** | **0.0** | **77,549** | **100** |

a. No labour includes those experiencing failed induction. Excludes cases with missing data on onset of labour.

| Method of birth by onset of labour, confinements 2015 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Method of birth | Unassisted vaginal | | Vacuum | | Forceps | | Caesarean | | Unknown | | Total | |
| | n | % | n | % | n | % | n | % | n | % | n | % |
| Spontaneous (not augmented) | 20,495 | 76.7 | 1742 | 6.5 | 1426 | 5.3 | 3066 | 11.5 | 2 | 0.0 | 26,731 | 100 |
| Augmented | 6557 | 53.5 | 1593 | 13.0 | 2018 | 16.5 | 2088 | 17.0 | 0 | 0.0 | 12,256 | 100 |
| Induced | 12,994 | 58.1 | 2231 | 10.0 | 2687 | 12.0 | 4464 | 19.9 | 1 | 0.0 | 22,377 | 100 |
| No labour[a] | 0 | 0.0 | 0 | 0.0 | 0 | 0.7 | 16368 | 0.6 | 4 | 0.0 | 16,372 | 100 |
| **Total** | **40,046** | **51.5** | **5,566** | **7.2** | **6,131** | **7.9** | **25,986** | **33.4** | **7** | **0.0** | **77,736** | **100** |

a. No labour includes those experiencing failed induction. Excludes cases with missing data on onset of labour.

### Table 28: Method of birth by admission status, confinements 2014 and 2015

| Method of birth by admission status, confinements 2014 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Admission status | | Unassisted vaginal | Vacuum | Forceps | Caesarean | Unknown | Total |
| Public patient | n | 31,739 | 3320 | 4232 | 16,890 | 4 | 56,185 |
| | % | 56.5 | 5.9 | 7.5 | 30.1 | 0.0 | 100 |
| Private patient | n | 8105 | 2338 | 1817 | 9119 | 4 | 21,383 |
| | % | 37.9 | 10.9 | 8.5 | 42.6 | 0.9 | 100 |
| **Total** | **n** | **39,844** | **5658** | **6049** | **26,009** | **8** | **77,568** |
| | **%** | **51.4** | **7.3** | **7.8** | **33.5** | **0.0** | **100** |

| Method of birth by admission status, confinements 2015 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Admission status | | Unassisted vaginal | Vacuum | Forceps | Caesarean | Unknown | Total |
| Public patient | n | 32,194 | 3325 | 4426 | 17,099 | 1 | 57,045 |
| | % | 56.4 | 5.8 | 7.8 | 30.0 | 0.0 | 100 |
| Private patient | n | 7855 | 2244 | 1705 | 8884 | 1 | 20,689 |
| | % | 38.0 | 10.8 | 8.2 | 42.9 | 0.0 | 100 |
| **Total** | **n** | **40,049** | **5569** | **6131** | **25,983** | **2** | **77,734** |
| | **%** | **51.7** | **7.7** | **7.3** | **33.3** | **0.0** | **100** |

*NB excludes a small number of cases with unknown admission status.

**Figure 6: Methods of birth by admission status, confinements 2014 and 2015 (%)**

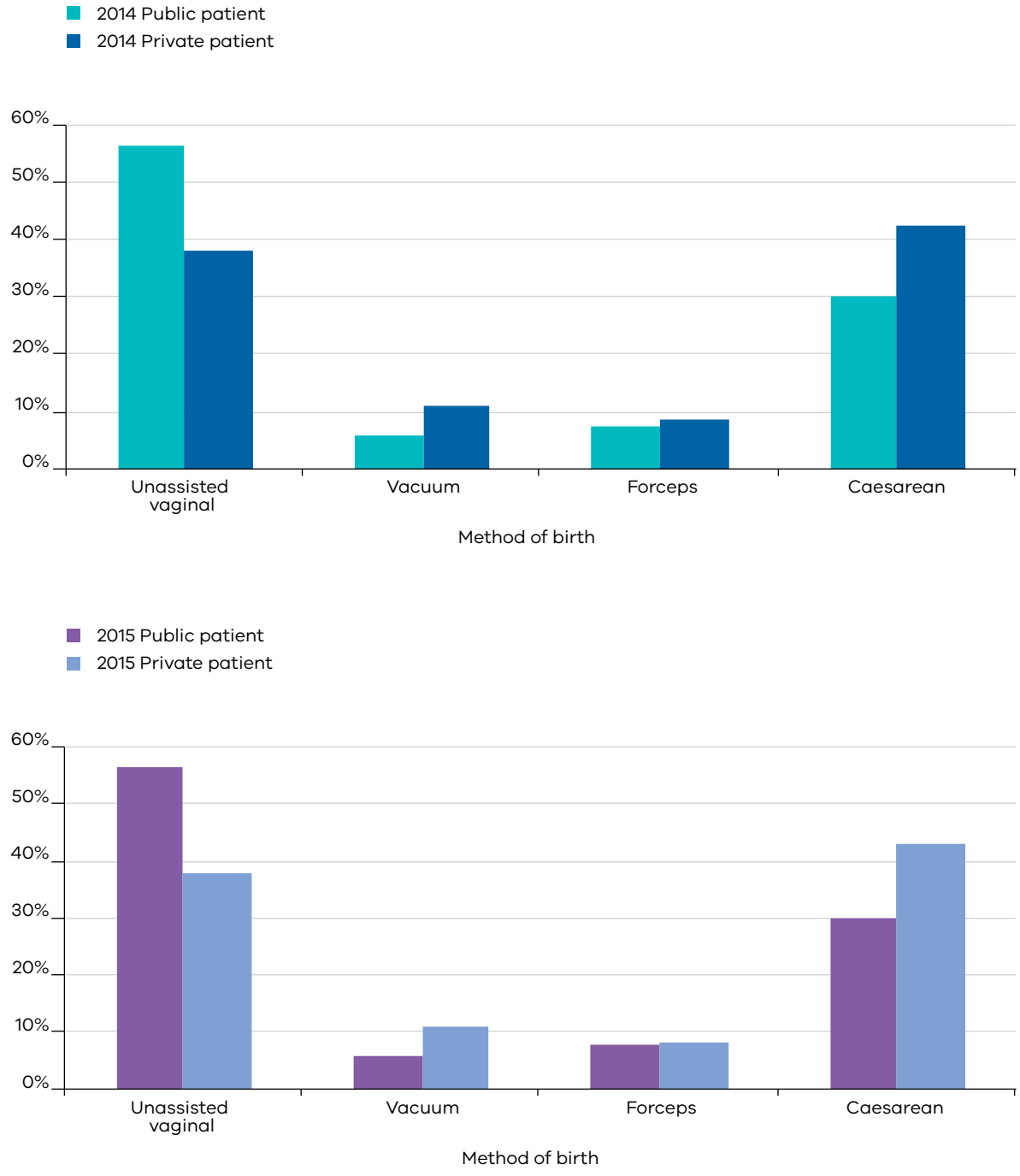


**Table 29: Method of birth by presentation, confinements 2014 and 2015**

| 2014 | | Unassisted | Vacuum | Forceps | Caesarean | Unknown | Total |
|---|---|---|---|---|---|---|---|
| Vertex | n | 39,083 | 5,602 | 5,990 | 22,748 | 1 | 73,424 |
| | % | 53.2 | 7.6 | 8.2 | 31 | 0 | 100 |
| Breech | n | 257 | 0 | 13 | 2836 | 1 | 3,107 |
| | % | 8.3 | 0 | 0.4 | 91.3 | 0 | 100 |
| Other | n | 451 | 49 | 45 | 353 | 2 | 900 |
| | % | 50.1 | 5.4 | 5 | 39.2 | 0.2 | 100 |
| Not reported | n | 57 | 8 | 1 | 75 | 5 | 146 |
| | % | 39 | 5.5 | 0.7 | 51.4 | 3.4 | 100 |
| Total | n | 39,848 | 5,659 | 6,049 | 26,012 | 9 | 77,577 |

| 2015 | | Unassisted | Vacuum | Forceps | Caesarean | Unknown | Total |
|---|---|---|---|---|---|---|---|
| Vertex | n | 39,268 | 5523 | 6081 | 22,743 | 1 | 73,616 |
| | % | 53.3 | 7.5 | 8.3 | 30.9 | 0 | 100 |
| Breech | n | 258 | 2 | 13 | 2863 | 0 | 3136 |
| | % | 8.2 | 0.1 | 0.4 | 91.3 | 0 | 100 |
| Other | n | 499 | 42 | 37 | 305 | 0 | 883 |
| | % | 56.5 | 4.8 | 4.2 | 34.5 | 0 | 100 |
| Not reported | n | 34 | 2 | 1 | 78 | 2 | 117 |
| | % | 29.1 | 1.7 | 0.9 | 66.7 | 1.7 | 100 |
| Total | n | 40,059 | 5569 | 6132 | 25,989 | 3 | 77,752 |

Note: 'Other' includes all presentations other than vertex or breech, for example face, brow, compound, shoulder, etc. 'Unassisted vaginal' means without instruments.

**Table 30: Epidural analgesia for women who experienced labour, confinements 2014 and 2015**

| | 2014 | | 2015 | |
|---|---|---|---|---|
| Used epidural analgesia | n | % | n | % |
| First births | 13,254 | 44.0 | 13,116 | 44.9 |
| Subsequent births | 5,956 | 19.0 | 6,187 | 19.3 |
| Total | 19,210 | 31.2 | 19,303 | 31.5 |

**Table 31: Type of anaesthesia for operative vaginal birth, confinements 2014 and 2015**

| | 2014 | | 2015 | |
|---|---|---|---|---|
| Type of anaesthesia | n | % | n | % |
| None | 1083 | 9.3 | 1067 | 9.1 |
| Local anaesthetic/ Pudendal block | 2988 | 25.5 | 3204 | 27.4 |
| Regional only | 7302 | 62.4 | 7298 | 62.4 |
| General anaesthetic + epidural | 0 | 0 | 2 | 0.0 |
| General anaesthetic only | 13 | 0.1 | 10 | 10.0 |
| Other | 322 | 2.8 | 120 | 100.0 |
| Total | 11,708 | 100 | 11,701 | 100 |

**Table 32: Type of anaesthesia for caesarean birth, confinements 2014 and 2015**

| Type of anaesthesia | 2014 | | 2015 | |
|---|---|---|---|---|
| | n | % | n | % |
| Not known | 46 | 0.1 | 12 | 0.1 |
| Regional only | 24,533 | 94.3 | 24,620 | 94.7 |
| General anaesthetic only | 1169 | 4.5 | 1111 | 4.3 |
| General anaesthetic and regional | 264 | 1.0 | 246 | 0.9 |
| Total | 26,012 | 100 | 25,989 | 100 |

**Table 33: 3rd and 4th degree lacerations following vaginal birth by admission type and parity, confinements 2014 and 2015**

| 3rd and 4th degree lacerations | | | 2014 | 2015 |
|---|---|---|---|---|
| Public admission | Primiparous women | n | 990 | 980 |
| | | % | 5.8 | 5.8 |
| | Multiparous women | n | 324 | 369 |
| | | % | 1.5 | 1.6 |
| Private admission | Primiparous women | n | 190 | 133 |
| | | % | 3.2 | 3 |
| | Multiparous women | n | 70 | 32 |
| | | % | 1.1 | 0.6 |

This table excludes a small number of cases with missing data on parity and/or admission status.

**Table 34: Episiotomy for vaginal birth by admission type and parity, confinements 2014 and 2015**

| Episiotomy | | | 2014 | 2015 |
|---|---|---|---|---|
| Public admission | Primiparous women | n | 7571 | 7458 |
| | | % | 44.2 | 44.1 |
| | Multiparous women | n | 2222 | 2434 |
| | | % | 10.0 | 10.6 |
| Private admission | Primiparous women | n | 3043 | 2902 |
| | | % | 51.6 | 52.3 |
| | Multiparous women | n | 985 | 994 |
| | | % | 15.5 | 15.9 |

This table excludes a small number of cases with missing data on parity and/or admission status.

**Table 35: Estimated blood loss and blood transfusion by parity, confinements 2014 and 2015**

| 2014 | < 500 mL | | 500–1,499 mL | | 1,500 mL or more | | Not reported | |
|---|---|---|---|---|---|---|---|---|
| **Parity** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Primiparae | 24,996 | 71.4 | 8,892 | 25.4 | 765 | 2.2 | 364 | 1 |
| *transfused** | 71 | 0.3 | 319 | 3.6 | 369 | 48.2 | *0* | 0 |
| Multiparae | 33,384 | 78.5 | 8,035 | 18.9 | 692 | 1.6 | 443 | 1 |
| *transfused** | 66 | 0.2 | 176 | 2.2 | 307 | 44.4 | 2 | 0.4 |
| All women | 58,381 | 75.3 | 16,929 | 21.8 | 1,457 | 1.9 | 810 | 1 |
| *transfused** | 137 | 0.2 | 495 | 2.9 | 676 | 46.4 | 2 | 0.2 |

| 2015 | < 500 mL | | 500–1,499 mL | | 1,500 mL or more | | Not reported | |
|---|---|---|---|---|---|---|---|---|
| **Parity** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Primiparae | 24,419 | 71.7 | 8,592 | 25.2 | 704 | 2.1 | 356 | 1 |
| *transfused** | 101 | 0.4 | 293 | 3.4 | 303 | 43 | 3 | 0.8 |
| Multiparae | 34,283 | 78.5 | 8,280 | 19 | 711 | 1.6 | 404 | 0.9 |
| *transfused** | 98 | 0.3 | 180 | 2.2 | 306 | 43 | 3 | 0.7 |
| All women | 58,704 | 75.5 | 16,872 | 21.7 | 1,415 | 1.8 | 761 | 1 |
| *transfused** | 199 | 0.3 | 473 | 2.8 | 609 | 43 | 6 | 0.8 |

* % transfused within each blood loss category.

**Table 36: Women given prophylactic oxytocics in the third stage of labour, 2014 and 2015**

| | 2014 | | 2015 | |
|---|---|---|---|---|
| **Prophylactic oxytocic** | **n** | **%** | **n** | **%** |
| Prophylactic oxytocic given | 76,287 | 98.3 | 76,579 | 98.5 |
| Prophylactic oxytocic not given | 1181 | 1.5 | 1096 | 1.4 |
| Not reported | 109 | 0.1 | 77 | 0.1 |

**Table 37: Initiation of breastfeeding (women with a live birth), 2014 and 2015**

| | 2014 | | 2015 | |
|---|---|---|---|---|
| **Initiation of breastfeeding** | **n** | **%** | **n** | **%** |
| Attempted to breastfeed or express breastmilk | 72,993 | 94.5 | 73,145 | 94.5 |
| Did not attempt to breastfeed or express | 4111 | 5.3 | 4077 | 5.3 |
| Unknown | 112 | 0.1 | 200 | 0.3 |

**Table 38: Term, live-born babies whose mothers initiated breastfeeding given formula in hospital, 2014 and 2015**

| 2014 | Overall | | Public hospitals | | Private hospitals | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| Infant formula given | 19,181 | 28.2 | 12,371 | 24.6 | 6808 | 38.8 |
| Infant formula not given | 47,977 | 70.5 | 37,139 | 73.9 | 10,602 | 60.5 |
| Unknown | 854 | 1.3 | 723 | 1.4 | 123 | 0.7 |

| 2015 | Overall | | Public hospitals | | Private hospitals | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| Infant formula given | 19,248 | 28.2 | 12,704 | 24.9 | 6542 | 38.5 |
| Infant formula not given | 48,206 | 70.6 | 37,588 | 73.7 | 10,368 | 61.1 |
| Unknown | 743 | 1.1 | 669 | 1.3 | 72 | 0.4 |

These tables exclude babies not fed in the birth hospital, and those born at home under private midwife care:

**Table 39: Term, live-born babies whose mothers initiated breastfeeding having their last feed before discharge entirely and directly from the breast, 2014 and 2015**

| Breastfeeding status 2014 | Overall | | Public hospitals | | Private hospitals | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| Exclusively breast fed | 53,182 | 78.1 | 40,102 | 79.7 | 12,848 | 73.3 |
| Not exclusively breast fed | 14,502 | 21.3 | 9,884 | 19.7 | 4,610 | 26.3 |
| Unknown | 373 | 0.5 | 300 | 0.6 | 67 | 0.4 |

| Breastfeeding status 2015 | Overall | | Public hospitals | | Private hospitals | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| Exclusively breast fed | 53,022 | 77.7 | 40,425 | 79.2 | 12,351 | 72.8 |
| Not exclusively breast fed | 14,854 | 21.8 | 10,267 | 20.1 | 4,582 | 27.0 |
| Unknown | 369 | 100 | 324 | 0.6 | 42 | 0.2 |

These tables exclude babies not fed in the birth hospital, and those born at home under private midwife care.

**Table 40: Trends in preterm and post-term births, 1985 to 2015 (%)**

| Gestation | 1985 | 1990 | 1995 | 2000 | 2005 | 2010 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|
| < 37 weeks | 6 | 6.7 | 7.1 | 7.6 | 7.7 | 8.0 | 7.9 | 8.2 | 8.3 | 8.4 |
| ≥ 42 weeks | 3.8 | 4.5 | 2.9 | 1.3 | 1.3 | 1.2 | 0.9 | 0.8 | 0.9 | 0.5 |

**Figure 7: Trends in preterm and post-term births, 1985 to 2015 (%)**

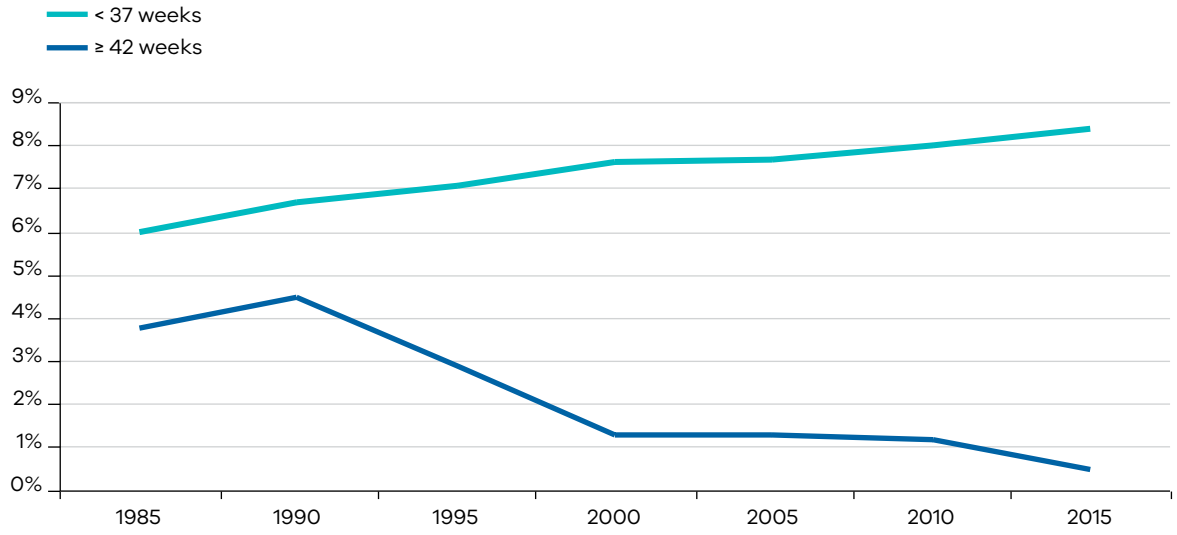



**Table 41: Neonatal capability level of maternity service for birth at various gestations (completed weeks) 2014 and 2015**

| 2014 Neonatal capability level of maternity service | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Gestation** | | **Level 1** | **Level 2** | **Level 3** | **Level 4** | **Level 5** | **Level 6** | **Not stated** | **Total** |
| 20–27 | n | 1 | 81 | 38 | 58 | 42 | 281 | 0 | **501** |
| | % | 0.2 | 16.2 | 7.6 | 11.6 | 8.4 | 56.1 | 0.0 | **100.0** |
| 28–31 | n | 0 | 121 | 10 | 30 | 38 | 451 | 0 | **650** |
| | % | 0.0 | 18.6 | 1.5 | 4.6 | 5.8 | 69.4 | 0.0 | **100.0** |
| 32–36 | n | 0 | 1449 | 586 | 1152 | 727 | 1489 | 0 | **5403** |
| | % | 0.0 | 26.8 | 10.8 | 21.3 | 13.5 | 27.6 | 0.0 | **100.0** |
| 37–41 | n | 43 | 21,930 | 8990 | 15,590 | 10,111 | 14,822 | 16 | **71,502** |
| | % | 0.1 | 30.7 | 12.6 | 21.8 | 14.1 | 20.7 | 0.0 | **100.0** |
| 42 + | n | 1 | 263 | 68 | 125 | 96 | 173 | 0 | **726** |
| | % | 0.1 | 36.2 | 9.4 | 17.2 | 13.2 | 23.8 | 0.0 | **100.0** |
| Total | n | 45 | 23,844 | 9,692 | 16,955 | 11,014 | 17,216 | 16 | **78,782** |
| | % | **0.1** | **30.3** | **12.3** | **21.5** | **14.0** | **21.9** | **0.0** | **100.0** |

| 2015 Neonatal capability level of maternity service | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Gestation** | | **Level 1** | **Level 2** | **Level 3** | **Level 4** | **Level 5** | **Level 6** | **Not stated** | **Total** |
| 20–27 | n | 0 | 83 | 35 | 62 | 34 | 235 | 0 | **449** |
| | % | 0.0 | 18.5 | 7.8 | 13.8 | 7.6 | 52.3 | 0.0 | **100.0** |
| 28–31 | n | 0 | 90 | 14 | 40 | 26 | 432 | 0 | **602** |
| | % | 0.0 | 15.0 | 2.3 | 6.6 | 4.3 | 71.8 | 0.0 | **100.0** |
| 32–36 | n | 0 | 1476 | 571 | 1160 | 800 | 1544 | 0 | **5551** |
| | % | 0.0 | 26.6 | 10.3 | 20.9 | 14.4 | 27.8 | 0.0 | **100.0** |
| 37–41 | n | 27 | 21,325 | 9307 | 16,305 | 10,069 | 14,888 | 1 | **71,922** |
| | % | 0.0 | 29.7 | 12.9 | 22.7 | 14.0 | 20.7 | 0.0 | **100.0** |
| 42 + | n | 0 | 83 | 56 | 62 | 51 | 131 | 0 | **383** |
| | % | 0.0 | 21.7 | 14.6 | 16.2 | 13.3 | 34.2 | 0.0 | **100.0** |
| Total | n | 27 | 23,057 | 9,983 | 17,629 | 10,980 | 17,230 | 1 | **78,907** |
| | % | 0.0 | 29.3 | 12.7 | 22.4 | 13.9 | 21.9 | 0.0 | **100.2** |

**Table 42: Birthweight categories, births 2014 and 2015**

| Grams | 2014 | | 2015 | |
|---|---|---|---|---|
| | n | % | n | % |
| < 500 g | 202 | 0.3 | 173 | 0.2 |
| 500–999 g | 352 | 0.4 | 321 | 0.4 |
| 1,000–1,499 g | 508 | 0.6 | 459 | 0.6 |
| 1,500–1,999 g | 1093 | 1.4 | 1015 | 1.3 |
| 2,000–2,499 g | 3203 | 4.1 | 3324 | 4.2 |
| 2,500–2,999 g | 12441 | 15.8 | 12,735 | 16.1 |
| 3,000–3,499 g | 28,977 | 36.8 | 28,847 | 36.6 |
| 3,500–3,999 g | 23,279 | 29.5 | 23,701 | 30 |
| 4,000–4,499 g | 7406 | 9.4 | 7161 | 9.1 |
| 4,500 + | 1250 | 1.6 | 1171 | 1.5 |
| Not known | 73 | 0.1 | 0 | 0 |
| **Total** | **78784** | **100** | **78907** | **100** |

**Figure 8: Trends in preterm and post-term births, 1985 to 2015 (%)**

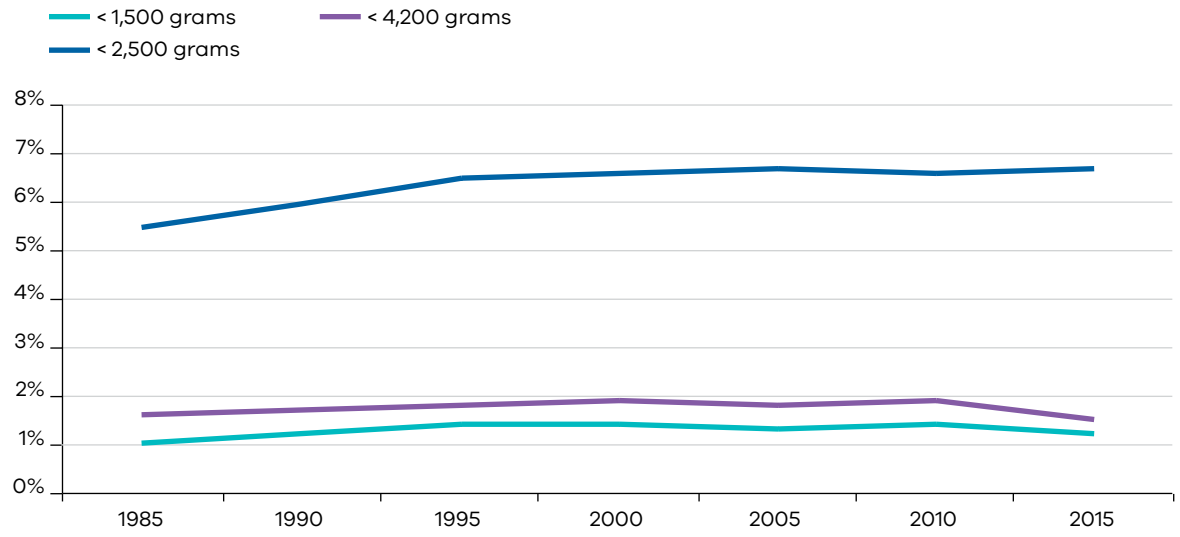



**Table 43: Apgar score at five minutes, 2014 and 2015 (live births only)**

| Apgar | 2014 | | 2015 | |
|---|---|---|---|---|
| | n | % | n | % |
| < 4 | 250 | 0.3 | 247 | 0.3 |
| 4 to 6 | 1258 | 1.6 | 1191 | 1.5 |
| 7 to 10 | 76,726 | 97.9 | 76,992 | 98 |
| Unknown | 166 | 0.2 | 124 | 0.2 |
| **Total** | **78,400** | **100** | **78,554** | **100** |

### Table 44: Method of resuscitation used, 2014 and 2015 (live births only)

| Type of resuscitation | 2014 | | 2015 | |
|---|---|---|---|---|
| | n | % | n | % |
| None | 60,023 | 76.6 | 60,300 | 76.8 |
| Suction and or oxygen | 3679 | 4.7 | 3079 | 3.9 |
| Intermittent positive pressure respiration bag and mask with air | 1209 | 1.5 | 1137 | 1.4 |
| Intermittent positive pressure respiration bag and mask with oxygen | 785 | 1 | 736 | 0.9 |
| Continuous positive airway pressure with air | 2952 | 3.8 | 3272 | 4.2 |
| Continuous positive airway pressure with oxygen | 2951 | 3.8 | 3024 | 3.8 |
| Endotracheal intubation and IPPR with air | 111 | 0.1 | 93 | 0.1 |
| Endotracheal intubation and IPPR with oxygen | 397 | 0.5 | 293 | 0.4 |
| External cardiac massage and ventilation | 250 | 0.3 | 204 | 0.3 |
| Other | 5992 | 7.6 | 5952 | 7.6 |
| **Total** | **78,349** | **100.0** | **78,090** | **100.0** |

Excludes cases with resuscitation method not known (51 in 2014, 464 in 2015)

### Table 45: Multiple births, 2014 and 2015

| Plurality | 2014 | | 2015 | |
|---|---|---|---|---|
| | n | % of all births | n | % of all births |
| Twins | 2349 | 3.0 | 2226 | 2.8 |
| Triplets | 57 | 0.1 | 63 | 0.1 |
| Quadruplets | 0 | 0 | 0 | 0 |
| Quintuplets | 0 | 0 | 0 | 0 |
| Not stated | 0 | 0 | 0 | 0 |
| **Total** | **2406** | **3.1** | **2289** | **2.9** |

### Table 46: Trends in multiple births, 1990 to 2015

| Year | Twins | % of all births | Triplets | % of all births | Quads or higher order | % of all births |
|---|---|---|---|---|---|---|
| 1990 | 1649 | 2.5 | 69 | 0.1 | 4 | 0 |
| 1995 | 1850 | 2.9 | 87 | 0.1 | 0 | 0 |
| 2000 | 1903 | 3.0 | 63 | 0.1 | 0 | 0 |
| 2005 | 2388 | 3.6 | 48 | 0.1 | 0 | 0 |
| 2010 | 2339 | 3.2 | 56 | 0.1 | 6 | 0 |
| 2014 | 2349 | 3.0 | 57 | 0.1 | 0 | 0 |
| 2015 | 2226 | 2.8 | 63 | 0.1 | 0 | 0 |

**Table 47: Multiple birth by maternal age group, confinements 2014 and 2015 (% of mothers in each age group)**

| 2014 | | | | |
|---|---|---|---|---|
| Maternal age | Sets of twins | % of all confinements in this age group | Sets of triplets | % of all confinements in this age group |
| Younger than 20 years | 9 | 0.6 | 1 | 0.06 |
| 20–24 years | 76 | 0.9 | 0 | 0.00 |
| 25–29 years | 276 | 1.3 | 1 | 0.00 |
| 30–34 years | 434 | 1.5 | 10 | 0.04 |
| 35–39 years | 282 | 1.9 | 4 | 0.03 |
| 40–44 years | 86 | 2.5 | 1 | 0.03 |
| 45 years or older | 17 | 7.5 | 2 | 0.88 |

| 2015 | | | | |
|---|---|---|---|---|
| Maternal age | Sets of twins | % of all confinements in this age group | Sets of triplets | % of all confinements in this age group |
| Younger than 20 years | 11 | 0.9 | 0 | 0.00 |
| 20–24 years | 85 | 1.1 | 2 | 0.03 |
| 25–29 years | 245 | 1.2 | 7 | 0.03 |
| 30–34 years | 419 | 1.4 | 6 | 0.02 |
| 35–39 years | 276 | 1.7 | 5 | 0.03 |
| 40–44 years | 56 | 1.6 | 1 | 0.03 |
| 45 years or older | 22 | 8.6 | 0 | 0.00 |

**Table 48: Gestation by plurality, confinements 2014 and 2015**

| 2014 | | | | | | |
|---|---|---|---|---|---|---|
| Gestation at birth (completed weeks) | Singletons | % | Sets of twins | % | Sets of triplets | % |
| 20–27 | 376 | 0.5 | 60 | 5.1 | 4 | 21.1 |
| 28–31 | 421 | 0.6 | 103 | 8.7 | 6 | 31.6 |
| 32–36 | 4,243 | 5.6 | 572 | 48.4 | 9 | 47.4 |
| 37–41 | 70,619 | 92.5 | 445 | 37.7 | 0 | 0.0 |
| 42 + | 719 | 0.9 | 1 | 0.1 | 0 | 0.0 |
| **Total** | **76,378** | **100.0** | **1,181** | **100.0** | **19** | **100.0** |

| 2015 | | | | | | |
|---|---|---|---|---|---|---|
| Gestation at birth (completed weeks) | Singletons | % | Sets of twins | % | Sets of triplets | % |
| 20–27 | 350 | 0.5 | 45 | 4.0 | 3 | 14.3 |
| 28–31 | 439 | 0.6 | 71 | 6.4 | 7 | 33.3 |
| 32–36 | 4,376 | 5.7 | 571 | 51.3 | 11 | 52.4 |
| 37–41 | 71,072 | 92.8 | 427 | 38.3 | 0 | 0.0 |
| 42 + | 380 | 0.5 | 0 | 0.0 | 0 | 0.0 |
| **Total** | **76,617** | **100.0** | **1,114** | **100.0** | **21** | **100.0** |

**Table 49: Method of birth for singleton and multiple births, confinements 2014 and 2015***

| 2014 | Singleton pregnancy (n = 76,377) | Twin pregnancy (n = 1,181) | Triplet pregnancy (n = 19) |
|---|---|---|---|
| **Method of birth** | **%** | **%** | **%** |
| Unassisted vaginal birth | 51.9 | 19.1 | 21.1 |
| Vacuum | 7.4 | 3.0 | 0.0 |
| Forceps | 7.8 | 7.5 | 0.0 |
| Caesarean section – total | 32.9 | 70.2 | 78.9 |
| *planned* | 16.9 | 42.0 | 36.8 |
| *unplanned* | 16.0 | 28.2 | 42.1 |
| Not reported | 0.0 | 0.2 | 0.0 |

| 2015 | Singleton pregnancy (n = 76,617 ) | Twin pregnancy (n = 1114) | Triplet pregnancy (n = 21) |
|---|---|---|---|
| **Method of birth** | **%** | **%** | **%** |
| Unassisted vaginal birth | 52.0 | 20.6 | 4.8 |
| Vacuum | 7.2 | 2.9 | 0.0 |
| Forceps | 7.9 | 5.7 | 4.8 |
| Caesarean section – total | 32.9 | 70.8 | 90.5 |
| *planned* | 17.1 | 41.7 | 52.4 |
| *unplanned* | 15.8 | 29.1 | 38.1 |
| Not reported | 0.0 | 0.0 | 0.0 |

*Method of birth for first born of a multiple birth.

**Table 50: Trends in births and confinements to Aboriginal women, 1985 to 2015**

| | Births | | Confinements | |
|---|---|---|---|---|
| **Year** | **n** | **% of all births** | **n** | **% of all confinements** |
| 1985 | 323 | 0.5 | 321 | 0.5 |
| 1990 | 436 | 0.7 | 429 | 0.6 |
| 1995 | 423 | 0.7 | 417 | 0.7 |
| 2000 | 380 | 0.6 | 376 | 0.6 |
| 2001 | 419 | 0.7 | 414 | 0.7 |
| 2002 | 421 | 0.7 | 416 | 0.7 |
| 2003 | 372 | 0.6 | 364 | 0.6 |
| 2004 | 435 | 0.7 | 431 | 0.7 |
| 2005 | 534 | 0.8 | 525 | 0.8 |
| 2006 | 568 | 0.8 | 561 | 0.8 |
| 2007 | 698 | 1.0 | 688 | 1.0 |
| 2008 | 727 | 1.0 | 720 | 1.0 |
| 2009 | 835 | 1.2 | 825 | 1.2 |
| 2010 | 874 | 1.2 | 868 | 1.2 |
| 2011 | 932 | 1.3 | 912 | 1.3 |
| 2012 | 965 | 1.2 | 955 | 1.2 |
| 2013 | 1014 | 1.3 | 1000 | 1.3 |
| 2014 | 1037 | 1.3 | 1020 | 1.3 |
| 2015 | 1171 | 1.5 | 1156 | 1.5 |

**Table 51: Maternal age by Aboriginal status, confinements 2014 and 2015**

| 2014 | Aboriginal | | Non-Aboriginal | | Unknown | |
|---|---|---|---|---|---|---|
| Maternal age | n | % | n | % | n | % |
| Younger than 20 years | 116 | 11.4 | 1,415 | 1.9 | 12 | 3.7 |
| 20–34 years | 757 | 74.2 | 56,131 | 73.6 | 218 | 66.9 |
| 35 years or older | 145 | 14.2 | 18,668 | 24.5 | 93 | 28.5 |
| Not stated | 2 | 0.2 | 17 | 0.0 | 3 | 0.9 |
| **Total** | **1,020** | **100.0** | **76,231** | **100.0** | **326** | **100.0** |

| 2015 | Aboriginal | | Non-Aboriginal | | Unknown | |
|---|---|---|---|---|---|---|
| Maternal age | n | % | n | % | n | % |
| Younger than 20 years | 89 | 7.7 | 1,166 | 1.5 | 6 | 2.5 |
| 20–34 years | 909 | 78.6 | 55,945 | 73.3 | 157 | 64.6 |
| 35 years or older | 158 | 13.7 | 19,225 | 25.2 | 73 | 30.0 |
| Not stated | 0 | 0.0 | 17 | 0.0 | 7 | 2.9 |
| **Total** | **1,156** | **100.0** | **76,353** | **100.0** | **243** | **100.0** |

**Table 52: Birthweight by maternal Aboriginal status, births 2014 and 2015**

| | Mother Aboriginal | | Mother non-Aboriginal | | Unknown | |
|---|---|---|---|---|---|---|
| 2014 | n | % | n | % | n | % |
| < 1,500 grams | 20 | 1.9 | 1031 | 1.3 | 11 | 3.3 |
| 1,500–2,499 grams | 106 | 10.2 | 4166 | 5.4 | 24 | 7.1 |
| 2,500–4,499 grams | 900 | 86.8 | 70,914 | 91.6 | 288 | 85.7 |
| 4,500+ grams | 11 | 1.1 | 1230 | 1.6 | 9 | 2.7 |
| Unknown | 0 | 0 | 69 | 0.1 | 4 | 1.2 |
| **Total** | **1037** | **100** | **77,410** | **100** | **336** | **100** |

| | Mother Aboriginal | | Mother non-Aboriginal | | Unknown | |
|---|---|---|---|---|---|---|
| 2015 | n | % | n | % | n | % |
| < 1,500 grams | 22 | 1.9 | 920 | 1.2 | 11 | 4.4 |
| 1,500–2,499 grams | 112 | 9.6 | 4198 | 5.4 | 29 | 11.5 |
| 2,500–4,499 grams | 1017 | 86.9 | 71,215 | 91.9 | 212 | 84.1 |
| 4,500+ grams | 20 | 1.7 | 1151 | 1.5 | 0 | 0 |
| Unknown | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **1171** | **100** | **77,484** | **100** | **252** | **100** |

**Table 53: Birthweight by maternal and baby Aboriginal status, births 2014 and 1015**

| 2014 | Mother and/or baby Aboriginal | | Neither mother nor baby Aboriginal | | Unknown | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| < 1,500 grams | 21 | 1.4 | 854 | 1.1 | 187 | 23.3 |
| 1,500–2,499 grams | 141 | 9.1 | 4064 | 5.3 | 91 | 11.34 |
| 2,500–4,499 grams | 1369 | 88.0 | 70,230 | 91.9 | 503 | 62.7 |
| 4,500+ grams | 23 | 1.5 | 1213 | 1.6 | 14 | 1.8 |
| Unknown | 1 | 0.1 | 65 | 0.1 | 7 | 0.9 |
| **Total** | **1555** | **100** | **76,426** | **100** | **802** | **100** |

| 2015 | Mother and/or baby Aboriginal | | Neither mother nor baby Aboriginal | | Unknown | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| < 1,500 grams | 25 | 1.5 | 748 | 0.9 | 180 | 22.0 |
| 1,500–2,499 grams | 146 | 8.6 | 4086 | 5.4 | 107 | 13.1 |
| 2,500–4,499 grams | 1499 | 88.2 | 70,420 | 92.2 | 525 | 64.2 |
| 4,500+ grams | 30 | 1.8 | 1135 | 1.5 | 6 | 0.7 |
| Unknown | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **1700** | **100** | **76,389** | **100** | **818** | **100** |

**Table 54: Proportion of women smoked at all during pregnancy by Aboriginal status, Victoria 2014 and 2015**

| 2014 | Aboriginal | | Non Aboriginal | | Not stated/ Inadequately described | | Total | |
|---|---|---|---|---|---|---|---|---|
| Reported smoking | n | % | n | % | n | % | n | % |
| No smoking during pregnancy | 567 | 55.6 | 65,198 | 85.5 | 256 | 78.5 | 66,021 | 85.1 |
| Continued smoking during pregnancy | 412 | 40.4 | 7,390 | 9.7 | 45 | 13.8 | 7,847 | 10.1 |
| Not known | 41 | 4.0 | 3,643 | 4.8 | 25 | 7.7 | 3,709 | 4.8 |
| **Total** | **1,020** | **100.0** | **76,231** | **100.0** | **326** | **100.0** | **77,577** | **100.0** |

| 2015 | Aboriginal | | Non Aboriginal | | Not stated/ Inadequately described | | Total | |
|---|---|---|---|---|---|---|---|---|
| Reported smoking | n | % | n | % | n | % | n | % |
| No smoking during pregnancy | 661 | 57.2 | 65,905 | 86.3 | 193 | 79.4 | 66,759 | 85.9 |
| Continued smoking during pregnancy | 457 | 39.5 | 6,910 | 9.1 | 28 | 11.5 | 7,395 | 9.5 |
| Not known | 38 | 3.3 | 3,538 | 4.6 | 22 | 9.1 | 3,598 | 4.6 |
| **Total** | **1,156** | **100.0** | **76,353** | **100.0** | **243** | **100.0** | **77,752** | **100.0** |

**Table 55: Maternal Body Mass Index by Aboriginal status, confinements 2014 and 2015**

| 2014 | Aboriginal | | Non Aboriginal | | Not stated/ inadequately described | | Total | |
|---|---|---|---|---|---|---|---|---|
| BMI | n | % | n | % | n | % | n | % |
| < 18.5 | 40 | 3.9 | 2,317 | 3.0 | 13 | 4.0 | 2,370 | 3.1 |
| 18.5 to < 25 | 345 | 33.8 | 36,251 | 47.6 | 114 | 35.0 | 36,710 | 47.3 |
| 25 to < 30 | 235 | 23.0 | 18,344 | 24.1 | 78 | 23.9 | 18,657 | 24.0 |
| 30 to < 35 | 163 | 16.0 | 8,227 | 10.8 | 35 | 10.7 | 8,425 | 10.9 |
| 35 to < 40 | 70 | 6.9 | 3,306 | 4.3 | 12 | 3.7 | 3,388 | 4.4 |
| 40 to < 50 | 53 | 5.2 | 1,769 | 2.3 | 12 | 3.7 | 1,834 | 2.4 |
| 50 to < 60 | 4 | 0.4 | 190 | 0.2 | 2 | 0.6 | 196 | 0.3 |
| ≥ 60 | 0 | 0.0 | 24 | 0.0 | 2 | 0.6 | 26 | 0.0 |
| Unknown | 110 | 10.8 | 5,803 | 7.6 | 58 | 17.8 | 5,971 | 7.7 |
| Total | 1,020 | 100.0 | 76,231 | 100 | 326 | 100.0 | 77,577 | 100 |

| 2015 | Aboriginal | | Non Aboriginal | | Not stated/ inadequately described | | Total | |
|---|---|---|---|---|---|---|---|---|
| BMI | n | % | n | % | n | % | n | % |
| < 18.5 | 38 | 3.3 | 2,347 | 3.1 | 3 | 1.2 | 2,388 | 3.1 |
| 18.5 to < 25 | 462 | 40.0 | 38,916 | 51.0 | 104 | 42.8 | 39,482 | 50.8 |
| 25 to < 30 | 270 | 23.4 | 19,530 | 25.6 | 47 | 19.3 | 19,847 | 25.5 |
| 30 to < 35 | 167 | 14.4 | 8,448 | 11.1 | 35 | 14.4 | 8,650 | 11.1 |
| 35 to < 40 | 103 | 8.9 | 3,475 | 4.6 | 11 | 4.5 | 3,589 | 4.6 |
| 40 to < 50 | 65 | 5.6 | 1,987 | 2.6 | 8 | 3.3 | 2,060 | 2.6 |
| 50 to < 60 | 11 | 1.0 | 217 | 0.3 | 1 | 0.4 | 229 | 0.3 |
| ≥ 60 | 1 | 0.1 | 33 | 0.0 | 1 | 0.4 | 35 | 0.0 |
| Unknown | 39 | 3.4 | 0 | 1.8 | 33 | 13.6 | 1,472 | 1.9 |
| Total | 1,156 | 100 | 74,953 | 100 | 243 | 100 | 77,752 | 100 |

**Table 56: Birthweight by maternal Aboriginal status, births 2014 and 2015**

| 2014 | Mother Aboriginal | | Mother non-Aboriginal | | Unknown | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| < 1,500 grams | 20 | 1.9 | 1,031 | 1.3 | 11 | 3.3 |
| 1,500–2,499 grams | 106 | 10.2 | 4,166 | 5.4 | 24 | 7.1 |
| 2,500–4,499 grams | 900 | 86.8 | 70,914 | 91.6 | 288 | 85.7 |
| 4,500+ grams | 11 | 1.1 | 1,230 | 1.6 | 9 | 2.7 |
| Unknown | 0 | 0.0 | 69 | 0.1 | 4 | 1.2 |
| Total | 1,037 | 100.0 | 77,410 | 100.0 | 336 | 100.0 |

| 2015 | Mother Aboriginal | | Mother non-Aboriginal | | Unknown | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| < 1,500 grams | 22 | 1.9 | 920 | 1.2 | 11 | 4.4 |
| 1,500–2,499 grams | 112 | 9.6 | 4,198 | 5.4 | 29 | 11.5 |
| 2,500–4,499 grams | 1,017 | 86.8 | 71,215 | 91.9 | 212 | 84.1 |
| 4,500+ grams | 20 | 1.7 | 1,151 | 1.5 | 0 | 0.0 |
| Unknown | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Total | 1,171 | 100.0 | 77,484 | 100.0 | 252 | 100.0 |

**Table 57: Birthweight by maternal and baby Aboriginal status, births 2014 and 2015**

| 2014 | Mother and/or baby Aboriginal | | Neither mother nor baby Aboriginal | | Unknown | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| < 1,500 grams | 21 | 1.4 | 854 | 1.1 | 187 | 23.3 |
| 1,500–2,499 grams | 141 | 9.1 | 4064 | 5.3 | 91 | 11.3 |
| 2,500–4,499 grams | 1369 | 88.0 | 70,230 | 91.9 | 503 | 62.7 |
| 4,500+ grams | 23 | 1.5 | 1213 | 1.6 | 14 | 1.7 |
| Unknown | 1 | 0.1 | 65 | 0.1 | 7 | 0.9 |
| **Total** | **1555** | **100.0** | **76,426** | **100.0** | **802** | **100.0** |

| 2015 | Mother and/or baby Aboriginal | | Neither mother nor baby Aboriginal | | Unknown | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| < 1,500 grams | 25 | 1.5 | 748 | 1.0 | 180 | 22.0 |
| 1,500–2,499 grams | 146 | 8.6 | 4086 | 5.3 | 107 | 13.1 |
| 2,500–4,499 grams | 1499 | 88.2 | 70,420 | 92.2 | 525 | 64.2 |
| 4,500+ grams | 30 | 1.8 | 1135 | 1.5 | 6 | 0.7 |
| Unknown | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| **Total** | **1700** | **100.0** | **76,389** | **100.0** | **818** | **100.0** |

**Table 58: Gestation by maternal Aboriginal status, births 2014 and 2015**

| 2014 | Mother Aboriginal | | Mother non-Aboriginal | | Unknown | |
|---|---|---|---|---|---|---|
| Gestation | n | % | n | % | n | % |
| 20–27 weeks | 7 | 0.7 | 496 | 0.6 | 5 | 1.5 |
| 28–31 weeks | 15 | 1.4 | 629 | 0.8 | 5 | 1.5 |
| 32–36 weeks | 117 | 11.3 | 5,260 | 6.8 | 24 | 7.1 |
| 37–41 weeks | 890 | 85.8 | 70,322 | 90.8 | 292 | 86.9 |
| 42 weeks + | 8 | 0.8 | 703 | 0.9 | 10 | 3.0 |
| **Total** | **1,037** | **100.0** | **77,410** | **100.0** | **336** | **100.0** |

| 2015 | Mother Aboriginal | | Mother non-Aboriginal | | Unknown | |
|---|---|---|---|---|---|---|
| Gestation | n | % | n | % | n | % |
| 20–27 weeks | 14 | 1.2 | 429 | 0.6 | 6 | 2.4 |
| 28–31 weeks | 9 | 0.8 | 585 | 0.8 | 8 | 3.2 |
| 32–36 weeks | 130 | 11.1 | 5,388 | 7.0 | 33 | 13.1 |
| 37–41 weeks | 1,014 | 86.6 | 70,707 | 91.3 | 204 | 81.0 |
| 42 weeks + | 4 | 0.3 | 375 | 0.5 | 1 | 0.4 |
| **Total** | **1,171** | **100.0** | **77,484** | **100.0** | **252** | **100.0** |

**Table 59: Gestation by maternal and/or baby Aboriginal status, births 2014 and 2015**

| 2014 | Mother and/or baby Aboriginal | | Neither mother nor baby Aboriginal | | Unknown | |
|---|---|---|---|---|---|---|
| Gestation | n | % | n | % | n | % |
| 20–27 weeks | 8 | 0.5 | 361 | 0.5 | 139 | 17.3 |
| 28–31 weeks | 14 | 0.9 | 585 | 0.8 | 50 | 6.2 |
| 32–36 weeks | 162 | 10.4 | 5,124 | 6.7 | 115 | 14.3 |
| 37–41 weeks | 1,360 | 87.5 | 69,660 | 91.1 | 484 | 60.3 |
| 42 weeks + | 11 | 0.7 | 696 | 0.9 | 14 | 1.7 |
| **Total** | **1,555** | **100.0** | **76,426** | **100.0** | **802** | **100.0** |

| 2015 | Mother and/or baby Aboriginal | | Neither mother nor baby Aboriginal | | Unknown | |
|---|---|---|---|---|---|---|
| Gestation | n | % | n | % | n | % |
| 20–27 weeks | 15 | 0.9 | 299 | 0.4 | 135 | 16.5 |
| 28–31 weeks | 11 | 0.6 | 544 | 0.7 | 47 | 5.7 |
| 32–36 weeks | 156 | 9.2 | 5,265 | 6.9 | 130 | 15.9 |
| 37–41 weeks | 1,513 | 89.0 | 69,907 | 91.5 | 505 | 61.7 |
| 42 weeks + | 5 | 0.3 | 374 | 0.5 | 1 | 0.1 |
| **Total** | **1,700** | **100.0** | **76,389** | **100.0** | **818** | **100.0** |

# Appendix 5: Maternal deaths in Victoria 2014 and 2015

## List of tables



## List of figures

**Table 1: Maternal mortality ratios in Victoria 1988-2015 (per 100,000 confinements)**

| Year | Direct deaths | Indirect deaths | Confinements[a] | Maternal mortality ratio[b] |
|---|---|---|---|---|
| 1988 | 3 | 5 | 62,854 | 12.7 |
| 1989 | 2 | 3 | 63,419 | 7.9 |
| 1990 | 6 | 3 | 66,004 | 13.6 |
| 1991 | 1 | 3 | 64,338 | 6.2 |
| 1992 | 2 | 2 | 65,404 | 6.1 |
| 1993 | 3 | 0 | 63,795 | 4.7 |
| 1994 | 2 | 3 | 63,983 | 7.8 |
| 1995 | 4 | 3 | 62,734 | 11.2 |
| 1996 | 2 | 0 | 62,028 | 3.2 |
| 1997 | 2 | 2 | 61,312 | 6.5 |
| 1998 | 2 | 1 | 61,071 | 4.9 |
| 1999 | 2 | 2 | 61,588 | 6.5 |
| 2000 | 2 | 2 | 61,571 | 6.5 |
| 2001 | 1 | 4 | 61,108 | 8.2 |
| 2002 | 5 | 2 | 62,023 | 11.3 |
| 2003 | 0 | 3 | 62,403 | 4.8 |
| 2004 | 4 | 8 | 62,543 | 19.2 |
| 2005 | 3 | 4 | 65,429 | 10.7 |
| 2006 | 1 | 6 | 68,547 | 10.2 |
| 2007 | 1 | 9 | 71,190 | 14.0 |
| 2008 | 2 | 1 | 71,323 | 4.2 |
| 2009 | 1 | 4 | 71,986 | 6.9 |
| 2010 | 3 | 3 | 73,302 | 8.2 |
| 2011 | 3 | 4 | 72,951 | 9.6 |
| 2012 | 4 | 6 | 77,183 | 13.0 |
| 2013 | 2 | 5 | 77,130 | 9.1 |
| 2014 | 2 | 4 | 77,930 | 7.7 |
| 2015[c] | 1 | 3 | 78,147 | 5.1 |

a. Includes confinements related to termination of pregnancy.

b. Per 100,000 confinements. Ratio calculated using direct and indirect deaths.

c. The single direct death is included in 2015, however the death did not occur in Victoria. A Victorian resident, who had her obstetric care in Victoria, died from sepsis related to preterm rupture of membranes. She died at a health service interstate. Excluding her death from the Victorian Maternal Mortality ratio decreases the Maternal Mortality ratio to 3.8.

Note that this table refers only to direct and indirect deaths occurring within 42 days of the birth. Excluded from this table are all late maternal deaths (indirect or direct deaths occurring 42–364 days after birth) and incidental maternal deaths.

**Table 2: Maternal mortality ratios by triennia, Victoria and Australia 1988–2015**

| Triennium | Direct deaths | Indirect deaths | Confinements | Victoria Maternal mortality ratio[a] | Australia Maternal mortality ratio[a,b] |
|---|---|---|---|---|---|
| 1988–1990 | 11 | 11 | 192,277 | 11.4 | 9.3 |
| 1991–1993 | 6 | 5 | 193,537 | 5.7 | 6.2 |
| 1994–1996 | 8 | 6 | 188,745 | 7.4 | 8.6 |
| 1997–1999 | 6 | 5 | 183,971 | 6.0 | 8.4 |
| 2000–2002 | 8 | 8 | 184,702 | 8.7 | 11.1 |
| 2003–2005 | 7 | 15 | 190,375 | 11.6 | 8.4 |
| 2006–2008 | 4 | 16 | 211,060 | 9.5 | 6.9 |
| 2009–2011 | 7 | 11 | 218,239 | 8.2 | 7.2 |
| 2012–2014 | 8 | 15 | 232,243 | 9.9 | N/A |
| 2013–2015[C] | 5 | 12 | 233,207 | 7.3 | N/A |

a. Per 100,000 confinements. Ratio calculated using direct and indirect deaths occurring within 42 days of the birth.
b. Source of Australian mortality ratios: Australian Institute of Health and Welfare 2015, Maternal deaths in Australia 2008–2012, AIHW, Canberra.
c. Note that the year 2013 and 2014 are included twice in this table, that is, a rolling triennia was used for the most recent two triennia so that the 2014 and 2015 data could be represented.
N/A – not available

**Figure 1: Mortality ratios by triennia, Victoria and Australia, 1988–2015**

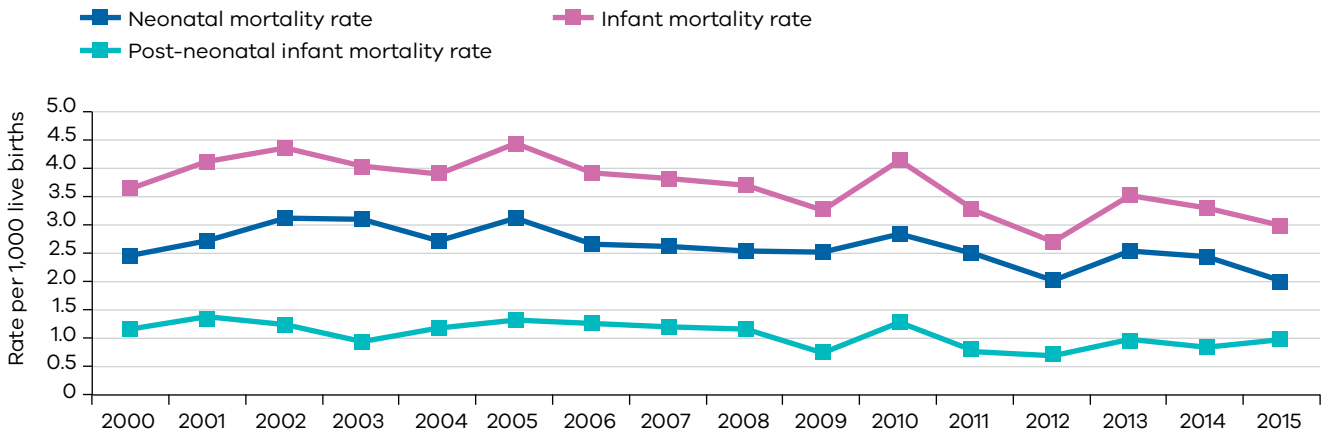



**Table 3: Five year periods for National comparison**

| Five year period | Direct deaths | Indirect deaths | Confinements | Victoria Maternal mortality ratio[a] | Australia Maternal mortality ratio[a] |
|---|---|---|---|---|---|
| 2006–2010[b] | 8 | 23 | 356,348 | 8.7 | 6.8 |
| 2008–2012[c] | 14 | 18 | 366,745 | 8.7 | 7.1 |
| 2010–2014 | 14 | 22 | 378,496 | 9.5 | N/A |
| 2011–2015[d] | 12 | 22 | 383,341 | 8.9 | N/A |

a. Per 100,000 confinements. Ratio calculated using direct and indirect deaths occurring within 42 days of the birth.
b. Source of Australian maternal mortality ratios: Australian Institute of Health and Welfare 2014, Maternal deaths in Australia 2006–2010, AIHW, Canberra.
c. Source of Australian maternal mortality ratios: Australian Institute of Health and Welfare 2015, Maternal deaths in Australia 2008–2012, AIHW, Canberra.
d. The Victorian maternal mortality ratio for the period 2011–2015 is added to include data covering 2015.
N/A – not available

**Table 4: Causes of maternal deaths, Victoria 2014**

| | Total |
|---|---|
| **Direct maternal deaths** | **2** |
| Amniotic fluid embolism | 1 |
| Anaesthetic – related death | 1 |
| **Indirect maternal deaths** | **4** |
| Intracranial haemorrhage | 1 |
| Intraventricular haemorrhage | 1 |
| Aortic aneurysm dissection | 1 |
| Undetermined | 1 |
| **Incidental maternal deaths** | **0** |
| **Late maternal death (direct or indirect)** | **0** |
| **Late maternal death (incidental)** | **4** |
| Subarachnoid haemorrhage secondary to endocarditis | 1 |
| Metastatic melanoma | 1 |
| Traumatic head injury (unintentional) | 1 |
| Traumatic head injury (assault) | 1 |
| **Total** | **10** |

**Table 5: Causes of maternal deaths, Victoria 2015**

| | Total |
|---|---|
| **Direct maternal deaths** | **1** |
| Sepsis[a] | 1 |
| **Indirect maternal deaths** | **3** |
| Dilated cardiomyopathy | 1 |
| Combined drug toxicity | 1 |
| Unascertained | 1 |
| **Incidental maternal deaths** | **0** |
| **Late maternal death (direct or indirect)** | **0** |
| **Late maternal death (incidental)** | **5** |
| Prolonged QT syndrome | 1 |
| Pulmonary embolus | 1 |
| Combined drug toxicity | 2 |
| Multiple injuries (assault) | 1 |
| **Total** | **9** |

a. This death did not occur in Victoria.

**Table 6: Causes of maternal deaths, Victoria 2011-2015**

| | Cause of death | Maternal deaths included in mortality ratio | Late[a] maternal deaths |
|---|---|---|---|
| Direct | | N = 12 | N = 1 |
| (due to a complication of the pregnancy) | Obstetric haemorrhage | 3 | |
| | Thromboembolism | 2 | 1 |
| | Anaesthetic related death | 2 | |
| | Amniotic fluid embolus | 2 | |
| | Early pregnancy death – ectopic pregnancy | 1 | |
| | Sepsis[b] | 1 | |
| | Post partum sepsis – *Streptococcus* Group A | 1 | |
| Indirect | | N = 22 | N = 5 |
| (related to a pre-existing or newly diagnosed condition exacerbated by pregnancy) | Cardiac disease | 8 | |
| | Non-obstetric haemorrhage (includes intracerebral bleeding) | 8 | |
| | Psychosocial[c] | 1 | 2 |
| | Sepsis – acute pyelonephritis | 1 | |
| | Complications of heart transplant for the treatment of peripartum cardiomyopathy | | 1 |
| | Carcinoma of the cervix | | 1 |
| | Bronchopneumonia with associated psychosocial problems | | 1 |
| | Mixed drug toxicity | 1 | |
| | Undetermined | 3 | |
| Incidental | | N = 0 | N = 11 |
| (where the pregnancy is unlikely to have contributed significantly to the death) | Bronchopneumonia | | 1 |
| | Metastatic melanoma | | 1 |
| | Subarachnoid haemorrhage secondary to endocarditis | | 1 |
| | Prolonged QT syndrome | | 1 |
| | Pulmonary embolus | | 1 |
| | Complications post tubal ligation | | 1 |
| | Injuries (assault) | | 2 |
| | Traumatic head injury (unintentional) | | 1 |
| | Combined drug toxicity | | 2 |
| Total | | 34 | 17 |

a Late maternal deaths occur after 42 days but within 1 year of the birth and are not included in the maternal mortality ratio.

b. This death did not occur in Victoria.

c. Psychosocial causes include deaths in which a psychiatric and/or social condition contributed to the cause of death and encompass wider issues such as family violence and substance misuse. In 2012 the National Maternal Mortality Advisory Committee advised that maternal deaths from suicide where the onset of mental health disorder is first recognised in pregnancy should be classified as "direct" deaths, all other maternal suicides and psychosocial deaths should be classified as "indirect". Previously many psychosocial deaths unrelated to the pregnancy were classified as "incidental" deaths.

Psychosocial causes can include intentional self-harm and homicide.

**Table 7: Assessment of contributing factors in maternal deaths, Victoria 2011–2015**

| Contributing factor | Number |
|---|---|
| **Factors relating to access to care** | **3** |
| Delay in transfer | 1 |
| Delay in access to specialist assistance | 1 |
| Lack of access to specialist care and services | 1 |
| **Factors relating to professional practice** | **23** |
| Anaesthetic issues | 3 |
| Delay in diagnosis and transfer | 4 |
| Failure to review diagnosis in light of diagnostic evidence | 1 |
| Failure to maintain an adequate airway and ventilation | 1 |
| Over-reliance on test result despite clinical evidence of placenta accreta | 1 |
| Inadequate communication/communication breakdown | 1 |
| Inadequate management of obstetric haemorrhage (monitoring, diagnosis, resuscitation) | 3 |
| Inadequate investigation and management of sepsis | 1 |
| Suboptimal resuscitation | 3 |
| Suboptimal diabetes management | 1 |
| Inappropriate discharge | 1 |
| Poor organisational management | 1 |
| Poor crisis management | 1 |
| Poor documentation | 1 |
| **Factors relating to the pregnant woman, her family and social situation** | **8** |
| Declining or not following medical advice | 1 |
| Delay in seeking medical advice | 1 |
| Family violence | 3 |
| Substance misuse | 3 |
| **Total** | **33** |

Contributing factors were identified in 15 of all 51 maternal deaths (29%). Multiple contributing factors were present in some cases.

Removing the 11 incidental deaths increases the proportion in whom contributing factors were found to 48% (15/40).

# Appendix 6: Perinatal deaths in Victoria 2014 and 2015

## List of tables

# List of figures

**Table 1: Perinatal mortality rates in Victoria 2014**

| Specified birthweight/ gestation | Total births | Live births | Stillbirths | | Neonatal deaths | | Perinatal deaths | |
|---|---|---|---|---|---|---|---|---|
| | | | Number | Rate | Number | Rate | Number | Rate |
| $PMR_{Crude}$ ≥ 20 weeks or ≥ 400 g | 79,110 | 78,438 | 672 | 8.5 | 231 | 2.9 | 903 | 11.4 |
| $PMR_{Adjusted}$ ≥ 20 weeks or ≥ 400 g excluding TOP for MPI[a] | 78,963 | 78,437 | 526 | 6.7 | 230 | 2.9 | 756 | 9.6 |
| $PMR_{500}$ ≥ 500 g or ≥ 22 weeks | 78,729 | 78,338 | 391 | 5.0 | 142 | 1.8 | 533 | 6.8 |
| $PMR_{1,000}$ ≥ 1,000 g or ≥ 28 weeks[b] | 78,220 | 78,007 | 213 | 2.7 | 51 | 0.7 | 264 | 3.4 |

**Table 2: Perinatal mortality rates in Victoria 2015**

| Specified birthweight/ gestation | Total births | Live births | Stillbirths | | Neonatal deaths | | Perinatal deaths | |
|---|---|---|---|---|---|---|---|---|
| | | | Number | Rate | Number | Rate | Number | Rate |
| $PMR_{Crude}$ ≥ 20 weeks or ≥ 400 g | 79,270 | 78,637 | 633 | 8.0 | 189 | 2.4 | 822 | 10.4 |
| $PMR_{Adjusted}$ ≥ 20 weeks or ≥ 400 g excluding TOP for MPI[a] | 79,163 | 78,637 | 526 | 6.6 | 189 | 2.4 | 715 | 9.0 |
| $PMR_{500}$ ≥ 500 g or ≥ 22 weeks | 78,867 | 78,515 | 352 | 4.5 | 129 | 1.6 | 481 | 6.1 |
| $PMR_{1,000}$ ≥ 1,000 g or ≥ 28 weeks[b] | 78,430 | 78,255 | 175 | 2.2 | 52 | 0.7 | 227 | 2.9 |

Notes:

Stillbirth and perinatal death rates were calculated using total births (live births and stillbirths) as the denominator. Neonatal death rates were calculated using live births as the denominator. MPI – Maternal psychosocial indications TOP – Termination of pregnancy

a. Births, deaths and rates are adjusted for TOP for MPI.

b. This category is for international comparison, and only includes early neonatal deaths (0–6 days) not all neonatal deaths (0–27 days).

**Table 3: Perinatal deaths and crude and adjusted mortality rates in Victoria 2001–2015**

| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Number** | | | | | | | | | | | | | | | |
| Live births | 61,705 | 62,688 | 63,028 | 63,082 | 66,041 | 69,229 | 71,780 | 71,843 | 72,474 | 73,755 | 73,389 | 77,712 | 77,609 | 78438 | 78637 |
| Stillbirths | 444 | 445 | 521 | 610 | 599 | 607 | 672 | 682 | 767 | 738 | 705 | 659 | 712 | 672 | 633 |
| Neonatal deaths | 204 | 227 | 237 | 207 | 247 | 227 | 241 | 215 | 226 | 235 | 223 | 210 | 241 | 231 | 189 |
| Perinatal deaths | 648 | 672 | 758 | 817 | 846 | 834 | 913 | 897 | 993 | 973 | 928 | 869 | 953 | 903 | 822 |
| **$PMR_{Crude}$ [a,b]** | | | | | | | | | | | | | | | |
| Stillbirth | 7.1 | 7.0 | 8.2 | 9.6 | 9.0 | 8.7 | 9.3 | 9.4 | 10.5 | 9.9 | 9.5 | 8.4 | 9.1 | 8.5 | 8.0 |
| Neonatal | 3.3 | 3.6 | 3.8 | 3.3 | 3.7 | 3.3 | 3.4 | 3.0 | 3.1 | 3.2 | 3.0 | 2.7 | 3.1 | 2.9 | 2.4 |
| Perinatal | 10.4 | 10.6 | 11.9 | 12.8 | 12.7 | 11.9 | 12.6 | 12.4 | 13.6 | 13.1 | 12.5 | 11.1 | 12.2 | 11.4 | 10.4 |
| **Number (adjusted)** | | | | | | | | | | | | | | | |
| Live births | 61,705 | 62,688 | 63,028 | 63,082 | 66,039 | 69,229 | 71,780 | 71,843 | 72,474 | 73,755 | 73,389 | 77,712 | 77,609 | 78437 | 78637 |
| Stillbirths | 399 | 385 | 418 | 413 | 421 | 457 | 508 | 504 | 553 | 547 | 522 | 527 | 533 | 526 | 526 |
| Neonatal deaths | 204 | 227 | 237 | 207 | 245 | 227 | 241 | 215 | 226 | 235 | 223 | 210 | 241 | 230 | 189 |
| Perinatal deaths | 603 | 612 | 655 | 620 | 666 | 684 | 749 | 719 | 779 | 782 | 745 | 737 | 774 | 756 | 715 |
| **PMRAdjusted [a,b]** | | | | | | | | | | | | | | | |
| Stillbirth | 6.4 | 6.1 | 6.6 | 6.5 | 6.3 | 6.6 | 7.0 | 7.0 | 7.6 | 7.4 | 7.1 | 6.7 | 6.8 | 6.7 | 6.6 |
| Neonatal | 3.3 | 3.6 | 3.8 | 3.3 | 3.7 | 3.3 | 3.4 | 3.0 | 3.1 | 3.2 | 3.0 | 2.7 | 3.1 | 2.9 | 2.4 |
| Perinatal | 9.7 | 9.7 | 10.3 | 9.8 | 10.0 | 9.8 | 10.4 | 9.9 | 10.7 | 10.5 | 10.1 | 9.4 | 9.9 | 9.6 | 9.0 |

Note: this table contains amended figures since previous reports.
a. Stillbirth and perinatal death rates were calculated using total births (live births and stillbirths) as the denominator.
b. Neonatal death rates were calculated using live births as the denominator.

**Figure 1: Perinatal mortality rates in Victoria 2000–2015 (crude and adjusted)**

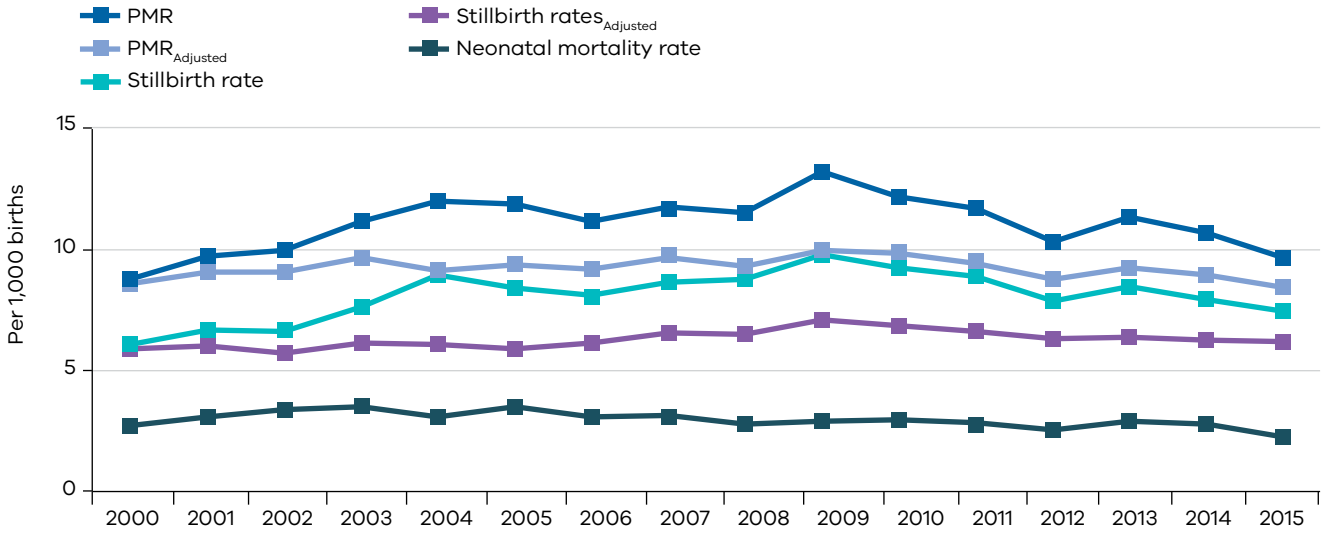


**Table 4: Different definitions of perinatal mortality**

| Perinatal death definitions | | | | | | PMR, Victoria | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Criteria 1 | Condition | Criteria 2 | Inclusions | Impact on PMR compared with CCOPMM results | PMR 2014 | $PMR_{Adjusted}$ 2014 | PMR 2015 | $PMR_{Adjusted}$ 2015 |
| CCOPMM (Victoria) | ≥ 20 weeks' gestation[a] | or, where gestation is unknown | birthweight of ≥ 400 g | Includes deaths of *babies born in Victoria*, even if mother not usually resident in Victoria | Results in more deaths included in the PMR than ABS | 11.4 | 9.6 | 10.4 | 9.0 |
| ABS | Birthweight of ≥ 400 g | or, where birthweight is unknown | ≥ 20 weeks' gestation | Includes deaths of babies born only to mothers *usually resident in the jurisdiction (Victoria)* | Results in fewer deaths included in the PMR and therefore lower PMR than CCOPMM | 10.3 | 9.5 | 9.7 | 8.8 |
| NPDC 1[b] | Birthweight of ≥ 400 g | or | ≥ 20 weeks' gestation | Includes deaths of *babies occurring in Victoria* even if mother not usually resident in the jurisdiction, or infant not born in Victoria | Results in more deaths included in the PMR than CCOPMM | 12.0 | 11.5 | 10.9 | 10.3 |
| NPDC 2[b] | Birthweight of ≥ 400 g | or | ≥ 20 weeks' gestation | Adjusted to include only *mothers usually resident in the jurisdiction (Victoria)* | Results in fewer deaths included in the PMR and therefore lower PMR than NPDC1 | 11.7 | 11.4 | 10.8 | 10.2 |

a. Where a perinatal death is diagnosed unexpectedly ≥ 20 weeks' gestation (with no prior ultrasound or clinical evidence of definite heartbeat at or beyond 20 w), a minimum birthweight of 150 gm applies.

b. Calculated according to National Perinatal Data Collection (NPDC) definitions using data from the VPDC.

**Table 5: $PMR_{Crude}$ by maternal state or territory of usual residence, ABS 2008–2014**

| Usual residence of mother | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|
| New South Wales | 7.8 | 7.9 | 7.6 | 8.0 | 7.5 | **8.1** | 8.2 |
| **Victoria** | **7.9** | **8.9** | **8.0** | **8.1** | **7.7** | **8.2** | **10.7** |
| Queensland | 9.9 | 10.4 | 10.5 | 9.1 | 10.0 | 9.1 | 10.0 |
| South Australia | 6.5 | 6.2 | 6.1 | 6.0 | 5.9 | 6.1 | 8.8 |
| Western Australia | 8.1 | 8.8 | 8.0 | 9.7 | 8.4 | 7.5 | 8.8 |
| Tasmania | 9.1 | 10.6 | 10.9 | 10.1 | 10.1 | 9.5 | 13.7 |
| Northern Territory | 7.8 | 14.8 | 12.5 | 12.8 | 9.4 | 14.4 | 13.8 |
| Australian Capital Territory | 6.4 | 7.0 | 16.7 | 7.2 | 10.0 | 7.0 | 11.3 |
| **Australia** | **8.2** | **8.8** | **8.6** | **8.4** | **8.2** | **8.2** | **9.5** |

References: ABS Cat No 3303.0 Causes of death, Australia, 2013, released 31 March 2015 ( http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3303.02013?OpenDocument), accessed October 27, 2015

Data prior to 2014

1: Table 13.1 Fetal, neonatal and perinatal deaths, Australia, 2004–2013.

2: Table 13.4 Perinatal deaths by state or territory of usual residence of mother, 2004–2013

2014 data

AIHW 2016. Australia's mothers and babies 2014—in brief. Perinatal statistics series no. 32. Cat. no. PER 87. Canberra: AIHW. Table 4.2 from Additional material, accessed December 9 2016 from http://www.aihw.gov.au/publication-detail/?id=60129557656&tab=2

Note:

The published PMR in this table differ from that previously published for CCOPMM Annual Reports, due to the ongoing revisions at ABS and CCOPMM.

**Table 6: $PMR_{Crude}$ by state or territory of death, AIHW 2008–2014**

| State or territory reporting the death | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|
| New South Wales | 8.7 | 8.6 | 8.2 | 8.5 | 8.1 | 8.0 | 7.7 |
| **Victoria** | **12.7** | **13.8** | **13.3** | **12.9** | **11.5** | **12.5** | **11.7** |
| Queensland | 9.6 | 11.0 | 10.4 | 9.7 | 10.1 | 9.5 | 9.7 |
| South Australia | 9.2 | 10.0 | 9.1 | 10.3 | 8.9 | 9.0 | 8.9 |
| Western Australia | 10.1 | 9.3 | 8.1 | 9.5 | 8.4 | 7.8 | 8.5 |
| Tasmania | 10.8 | 10.7 | 10.1 | 8.2 | 10.8 | 9.8 | 12.2 |
| Northern Territory | 14.0 | 14.0 | 15.3 | 11.2 | 9.2 | 18.2 | 12.8 |
| Australian Capital Territory | 11.2 | 15.1 | 12.9 | 13.0 | 11.2 | 9.1 | 12.6 |
| **Australia** | **10.2** | **9.8** | **9.3** | **9.9** | **9.6** | **9.7** | **9.6** |

References:

Hilder L, Zhichao Z, Parker M, Jahan S, Chambers GM 2014. Australia's mothers and babies 2012. Perinatal statistics series no. 30. Cat. no. PER 69. Canberra: AIHW.

AIHW 2015. Australia's mothers and babies 2013— supplementary tables. Perinatal statistics series no. 31. Cat. no. PER 72. Canberra: AIHW.

2014 data AIHW 2016. Australia's mothers and babies 2014—in brief. Perinatal statistics series no. 32. Cat. no. PER 87. Canberra: AIHW. Table 4.1 from Additional material, accessed December 9 2016 from http://www.aihw.gov.au/publication-detail/?id=60129557656&tab=2

**Table 7: $PMR_{500}$ in Victoria 2005–2015 (birthweight ≥ 500 g)**

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Number** | | | | | | | | | | | |
| Total births ( birthweight ≥ 500 g) | 66,226 | 69,421 | 71,981 | 72,100 | 72,706 | 74,000 | 73,628 | 78,000 | 77,906 | 78,729 | 78,867 |
| Live births | 65,948 | 69,155 | 71,677 | 71,774 | 72,360 | 73,641 | 73,273 | 77,618 | 77,505 | 78,338 | 78,515 |
| Stillbirths | 278 | 266 | 304 | 326 | 346 | 359 | 355 | 382 | 401 | 391 | 352 |
| Neonatal deaths | 159 | 157 | 148 | 149 | 143 | 152 | 143 | 121 | 156 | 142 | 129 |
| Perinatal deaths | 437 | 423 | 452 | 475 | 489 | 511 | 498 | 503 | 557 | 533 | 481 |
| **Rate per 1,000 births[a,b]** | | | | | | | | | | | |
| Stillbirths | 4.2 | 3.8 | 4.2 | 4.5 | 4.8 | 4.9 | 4.8 | 4.9 | 5.1 | 5.0 | 4.5 |
| Neonatal | 2.4 | 2.3 | 2.1 | 2.1 | 2.0 | 2.1 | 2.0 | 1.6 | 2.0 | 1.8 | 1.6 |
| Perinatal | 6.6 | 6.1 | 6.3 | 6.6 | 6.7 | 6.9 | 6.8 | 6.4 | 7.1 | 6.8 | 6.1 |

a. Stillbirth and perinatal death rates were calculated using total births (live births and stillbirths) as the denominator.
b. Neonatal deaths rates were calculated using live births as the denominator.
Note: This table includes updated figures since previous reports.

**Figure 2: $PMR_{500}$ in Victoria 2000–2015**

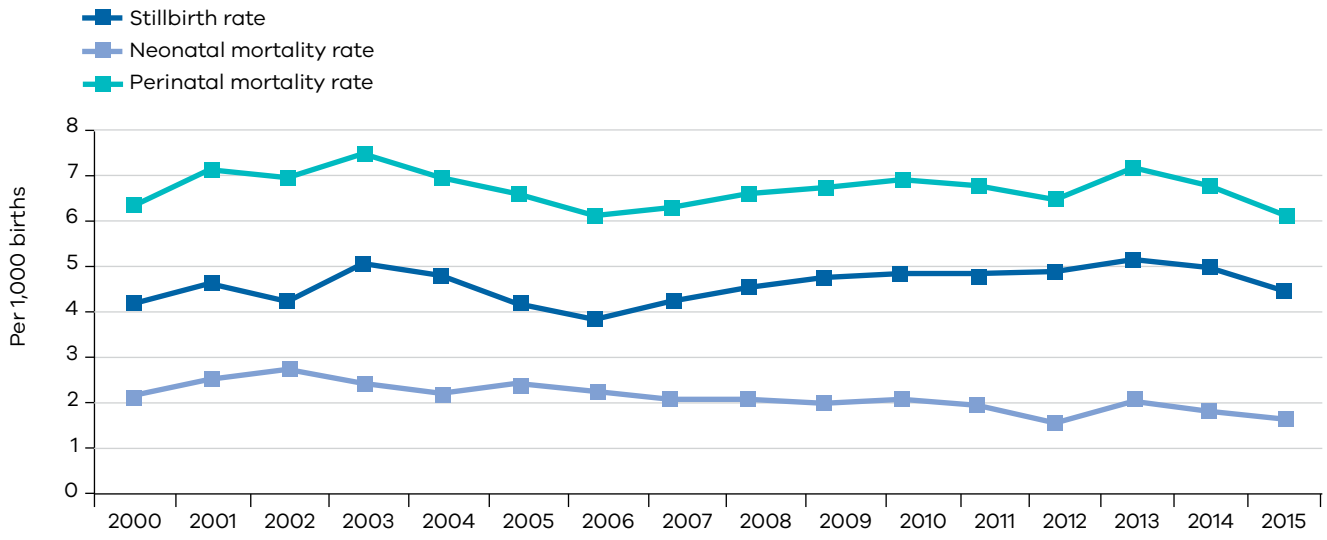



**Table 8: $PMR_{500}$ in Victoria 2000–2015**

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stillbirth rate | 4.2 | 4.6 | 4.2 | 5.0 | 4.8 | 4.2 | 3.8 | 4.2 | 4.5 | 4.8 | 4.9 | 4.8 | 4.9 | 5.1 | 5.0 | 4.5 |
| Neonatal mortality rate | 2.2 | 2.5 | 2.7 | 2.4 | 2.2 | 2.4 | 2.3 | 2.1 | 2.1 | 2.0 | 2.1 | 2.0 | 1.6 | 2.0 | 1.8 | 1.6 |
| Perinatal mortality rate | 6.4 | 7.1 | 6.9 | 7.5 | 7.0 | 6.6 | 6.1 | 6.3 | 6.6 | 6.7 | 6.9 | 6.8 | 6.4 | 7.1 | 6.8 | 6.1 |

**Table 9: $PMR_{1,000}$ for international comparison, Victoria 2000–2015**

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stillbirth rate[a] | 2.9 | 3.1 | 2.4 | 3 | 2.6 | 2.8 | 2.5 | 2.6 | 3 | 2.8 | 3.2 | 2.8 | 2.8 | 2.7 | 2.7 | 2.2 |
| Early neonatal mortality rate[b] | 0.9 | 1 | 0.8 | 0.9 | 0.8 | 0.8 | 0.8 | 0.8 | 0.7 | 1.1 | 0.9 | 0.8 | 0.6 | 0.6 | 0.7 | 0.7 |
| Perinatal mortality rate[a] | 3.8 | 4.1 | 3.2 | 3.9 | 3.3 | 3.6 | 3.3 | 3.4 | 4 | 3.9 | 4.0 | 3.6 | 3.4 | 3.3 | 3.4 | 2.9 |

a. Stillbirth and perinatal death rates were calculated using all births (live births and stillbirths) as the denominator.

b. Neonatal death rates were calculated using live births as the denominator. This category is for international comparison, and only includes early neonatal deaths (0–6 days) not all neonatal deaths (0–27 days). It includes all perinatal deaths, including terminations of pregnancy.

**Figure 3: Trends in $PMR_{1,000}$ for international comparison, Victoria 1975 to 2015**

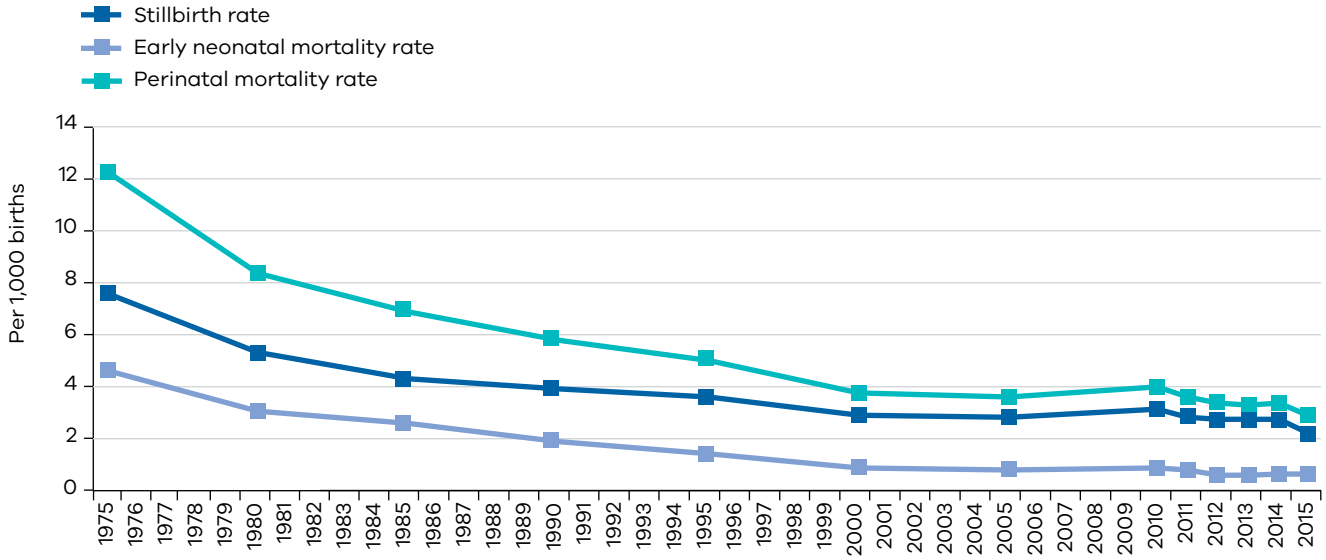



**Table 10: Trends in $PMR_{1,000}$ for international comparison, Victoria, 1975 to 2015**

| | 1975 | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stillbirth rate | 7.6 | 5.3 | 4.3 | 3.9 | 3.6 | 2.9 | 2.8 | 3.2 | 2.8 | 2.8 | 2.7 | 2.7 | 2.2 |
| Early neonatal mortality rate | 4.6 | 3.1 | 2.6 | 1.9 | 1.4 | 0.9 | 0.8 | 0.9 | 0.8 | 0.6 | 0.6 | 0.7 | 0.7 |
| Perinatal mortality rate | 12.3 | 8.4 | 6.9 | 5.8 | 5.0 | 3.8 | 3.6 | 4.0 | 3.6 | 3.4 | 3.3 | 3.4 | 2.9 |

### Table 11a: Gestational age and $PMR_{Adjusted}$, Victoria 2014

| Gestational age | Total births[a] | | Stillbirths | | | | Live births[b] | | Neonatal deaths | | | Perinatal deaths | | | Live births surviving beyond neonatal period at each gestation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | rate[c] | risk[d] | n | % | n | % | rate[e] | n | % | rate[f] | n | % |
| 20–21 weeks | 177 | 0.2 | 119 | 22.6 | 672.3 | 1.5 | 58 | 0.1 | 58 | 25.2 | 1,000.0 | 177 | 23.4 | 1,000.0 | 0 | 0.0 |
| 22–23 weeks | 162 | 0.2 | 95 | 18.1 | 586.4 | 1.2 | 67 | 0.1 | 59 | 25.7 | 880.6 | 154 | 20.4 | 950.6 | 8 | 11.9 |
| 24–25 weeks | 163 | 0.2 | 53 | 10.1 | 325.2 | 0.7 | 110 | 0.1 | 24 | 10.4 | 218.2 | 77 | 10.2 | 472.4 | 86 | 78.2 |
| 26–27 weeks | 163 | 0.2 | 32 | 6.1 | 196.3 | 0.4 | 131 | 0.2 | 9 | 3.9 | 68.7 | 41 | 5.4 | 251.5 | 122 | 93.1 |
| 28–31 weeks | 662 | 0.8 | 60 | 11.4 | 90.6 | 0.8 | 602 | 0.8 | 20 | 8.7 | 33.2 | 80 | 10.6 | 120.8 | 582 | 96.7 |
| 32–36 weeks | 5,407 | 6.8 | 83 | 15.8 | 15.4 | 1.1 | 5,324 | 6.8 | 16 | 7.0 | 3.0 | 99 | 13.1 | 18.3 | 5,308 | 99.7 |
| 37–41 weeks | 71,509 | 90.6 | 83 | 15.8 | 1.2 | 1.1 | 71,426 | 91.1 | 44 | 19.1 | 0.6 | 127 | 16.8 | 1.8 | 71,382 | 99.9 |
| > 41 weeks | 576 | 0.7 | 1 | 0.2 | 1.7 | 1.4 | 575 | 0.7 | 0 | 0.0 | 0.0 | 1 | 0.1 | 1.7 | 575 | 100.0 |
| Not known | 144 | 0.2 | 0 | 0.0 | 0.0 | 0.0 | 144 | 0.2 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 144 | 100.0 |
| Total | 78,963 | 100.0 | 526 | 100.0 | 6.7 | N/A | 78,437 | 100.0 | 230 | 100.0 | 2.9 | 756 | 100.0 | 9.6 | 78,207 | 99.7 |

a. Total births includes live births and stillbirths, (live birth data obtained from VPDC).
b. Live births includes those babies who later died during the neonatal period (babies born alive who died within 28 days of birth).
c. Stillbirth rate is calculated using total births as the denominator and is expressed as deaths per 1,000 total births at that gestation.
d. Stillbirth risk is calculated using total births (still in utero at that gestation) as the denominator, and is expressed as deaths per 1,000 total births at or beyond that gestation.
e. Neonatal death rate is calculated using live births as the denominator, and is expressed as deaths per 1,000 live births at that gestation
f. Perinatal death rate is calculated using total births as the denominator, and is expressed as deaths per 1,000 total births at that gestation.

N/A – not applicable

### Table 11b: Gestational age and $PMR_{Adjusted}$, Victoria 2015

| Gestational age | Total births[a] | | Stillbirths | | | | Live births[b] | | Neonatal deaths | | | Perinatal deaths | | | Live births surviving beyond neonatal period at each gestation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | rate[c] | risk[d] | n | % | n | % | rate[e] | n | % | rate[f] | n | % |
| 20–21 weeks | 171 | 0.2 | 129 | 24.5 | 754.4 | 1.6 | 42 | 0.1 | 42 | 22.2 | 1,000.0 | 171 | 23.9 | 1,000.0 | 0 | 0.0 |
| 22–23 weeks | 174 | 0.2 | 120 | 22.8 | 689.7 | 1.5 | 54 | 0.1 | 48 | 25.4 | 888.9 | 168 | 23.5 | 965.5 | 6 | 11.1 |
| 24–25 weeks | 122 | 0.2 | 40 | 7.6 | 327.9 | 0.5 | 82 | 0.1 | 16 | 8.5 | 195.1 | 56 | 7.8 | 459.0 | 66 | 80.5 |
| 26–27 weeks | 172 | 0.2 | 43 | 8.2 | 250.0 | 0.5 | 129 | 0.2 | 7 | 3.7 | 54.3 | 50 | 7.0 | 290.7 | 122 | 94.6 |
| 28–31 weeks | 610 | 0.8 | 51 | 9.7 | 83.6 | 0.6 | 559 | 0.7 | 13 | 6.9 | 23.3 | 64 | 9.0 | 104.9 | 546 | 97.7 |
| 32–36 weeks | 5,557 | 7.0 | 65 | 12.4 | 11.7 | 0.8 | 5,492 | 7.0 | 25 | 13.2 | 4.6 | 90 | 12.6 | 16.2 | 5,467 | 99.5 |
| 37–41 weeks | 71,976 | 90.9 | 78 | 14.8 | 1.1 | 1.1 | 71,898 | 91.4 | 38 | 20.1 | 0.5 | 116 | 16.2 | 1.6 | 71,860 | 99.9 |
| >41 weeks | 373 | 0.5 | 0 | 0.0 | 0.0 | 0.0 | 373 | 0.5 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 373 | 100.0 |
| Not known | 8 | 0.0 | 0 | 0.0 | 0.0 | 0.0 | 8 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 8 | 100.0 |
| Total | 79,163 | 100.0 | 526 | 100.0 | 6.6 | N/A | 78,637 | 100.0 | 189 | 100.0 | 2.4 | 715 | 100.0 | 9.0 | 78,448 | 99.8 |

a. Total births includes live births and stillbirths, (live birth data obtained from VPDC).
b. Live births includes those babies who later died during the neonatal period (babies born alive who died within 28 days of birth).
c. Stillbirth rate is calculated using total births as the denominator and is expressed as deaths per 1,000 total births at that gestation.
d. Stillbirth risk is calculated using total births (still in utero at that gestation) as the denominator, and is expressed as deaths per 1,000 total births at or beyond that gestation.
e. Neonatal death rate is calculated using live births as the denominator, and is expressed as deaths per 1,000 live births at that gestation
f. Perinatal death rate is calculated using total births as the denominator, and is expressed as deaths per 1,000 total births at that gestation.

N/A – not applicable

### Table 12a: Birthweight and $PMR_{Adjusted}$, Victoria 2014

| | Total births[a] | | Stillbirths | | | Live births[b] | | Neonatal deaths | | | Perinatal deaths | | | Live births surviving beyond neonatal period at each weight category | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | rate[c] | n | % | n | % | rate[d] | n | % | rate[e] | n | % |
| <500 g | 292 | 0.4 | 193 | 36.7 | 661.0 | 99 | 0.1 | 88 | 38.3 | 888.9 | 281 | 37.2 | 962.3 | 11 | 11.1 |
| 500–999 g | 418 | 0.5 | 119 | 22.6 | 284.7 | 299 | 0.4 | 60 | 26.1 | 200.7 | 179 | 23.7 | 428.2 | 239 | 79.9 |
| 1,000–1,499 g | 524 | 0.7 | 49 | 9.3 | 93.5 | 475 | 0.6 | 16 | 7.0 | 33.7 | 65 | 8.6 | 124.0 | 459 | 96.6 |
| 1,500–1,999 g | 1,098 | 1.4 | 28 | 5.3 | 25.5 | 1,070 | 1.4 | 8 | 3.5 | 7.5 | 36 | 4.8 | 32.8 | 1,062 | 99.3 |
| 2,000–2,499 g | 3,205 | 4.1 | 33 | 6.3 | 10.3 | 3,172 | 4.0 | 13 | 5.7 | 4.1 | 46 | 6.1 | 14.4 | 3,159 | 99.6 |
| 2,500–2,999 g | 12,441 | 15.8 | 33 | 6.3 | 2.7 | 12,408 | 15.8 | 13 | 5.7 | 1.0 | 46 | 6.1 | 3.7 | 12,395 | 99.9 |
| 3,000–3,499 g | 28,977 | 36.7 | 45 | 8.6 | 1.6 | 28,932 | 36.9 | 18 | 7.8 | 0.6 | 63 | 8.3 | 2.2 | 28,914 | 99.9 |
| 3,500–3,999 g | 23,279 | 29.5 | 16 | 3.0 | 0.7 | 23,263 | 29.7 | 7 | 3.0 | 0.3 | 23 | 3.0 | 1.0 | 23,256 | 100.0 |
| >4,000 g | 8,656 | 11.0 | 7 | 1.3 | 0.8 | 8,649 | 11.0 | 6 | 2.6 | 0.7 | 13 | 1.7 | 1.5 | 8,643 | 99.9 |
| Not known | 73 | 0.1 | 3 | 0.6 | 41.1 | 70 | 0.1 | 1 | 0.4 | 0.1 | 4 | 0.5 | 54.8 | 69 | 98.6 |
| Total | 78,963 | 100.0 | 526 | 100.0 | 6.7 | 78,437 | 100.0 | 230 | 100.0 | 2.9 | 756 | 100.0 | 9.6 | 78,207 | 99.7 |

a. Total births includes live births and stillbirths, (live birth data obtained from VPDC).
b. Live births includes those babies who later died during the neonatal period (babies born alive who died within 28 days of birth).
c. Stillbirth rate is calculated using total births as the denominator and is expressed as deaths per 1,000 total births of that birthweight category.
d. Neonatal death rate is calculated using live births as the denominator, and is expressed as deaths per 1,000 total births of that birthweight category.
e. Perinatal death rate is calculated using total births as the denominator, and is expressed as deaths per 1,000 total births of that birthweight category.

### Table 12b: Birthweight and $PMR_{Adjusted}$, Victoria 2015

| | Total births[a] | | Stillbirths | | | Live births[b] | | Neonatal deaths | | | Perinatal deaths | | | Live births surviving beyond neonatal period at each weight category | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | rate[c] | n | % | n | % | rate[d] | n | % | rate[e] | n | % |
| <500 g | 324 | 0.4 | 202 | 38.4 | 623.5 | 122 | 0.2 | 60 | 31.7 | 491.8 | 262 | 36.6 | 808.6 | 62 | 50.8 |
| 500–999 g | 409 | 0.5 | 149 | 28.3 | 364.3 | 260 | 0.3 | 54 | 28.6 | 207.7 | 203 | 28.4 | 496.3 | 206 | 79.2 |
| 1,000–1,499 g | 471 | 0.6 | 36 | 6.8 | 76.4 | 435 | 0.6 | 9 | 4.8 | 20.7 | 45 | 6.3 | 95.5 | 426 | 97.9 |
| 1,500–1,999 g | 1,017 | 1.3 | 23 | 4.4 | 22.6 | 994 | 1.3 | 11 | 5.8 | 11.1 | 34 | 4.8 | 33.4 | 983 | 98.9 |
| 2,000–2,499 g | 3,324 | 4.2 | 31 | 5.9 | 9.3 | 3,293 | 4.2 | 17 | 9.0 | 5.2 | 48 | 6.7 | 14.4 | 3,276 | 99.5 |
| 2,500–2,999 g | 12,738 | 16.1 | 38 | 7.2 | 3.0 | 12,700 | 16.2 | 13 | 6.9 | 1.0 | 51 | 7.1 | 4.0 | 12,687 | 99.9 |
| 3,000–3,499 g | 28,847 | 36.4 | 24 | 4.6 | 0.8 | 28,823 | 36.7 | 11 | 5.8 | 0.4 | 35 | 4.9 | 1.2 | 28,812 | 100.0 |
| 3,500–3,999 g | 23,701 | 29.9 | 17 | 3.2 | 0.7 | 23,684 | 30.2 | 10 | 4.3 | 0.4 | 27 | 3.8 | 1.1 | 23,674 | 100.0 |
| > 4,000 g | 8,332 | 10.5 | 6 | 1.1 | 0.7 | 8,326 | 10.6 | 4 | 2.1 | 0.5 | 10 | 1.4 | 1.2 | 8,322 | 100.0 |
| Total | 79,163 | 100.0 | 526 | 100.0 | 6.6 | 78,637 | 100.0 | 189 | 100.0 | 2.4 | 715 | 100.0 | 9.0 | 78,448 | 99.8 |

a. Total births includes live births and stillbirths, (live birth data obtained from VPDC).
b. Live births includes those babies who later died during the neonatal period (babies born alive who died within 28 days of birth).
c. Stillbirth rate is calculated using total births as the denominator and is expressed as deaths per 1,000 total births of that birthweight category.
d. Neonatal death rate is calculated using live births as the denominator, and is expressed as deaths per 1,000 total births of that birthweight category.
e. Perinatal death rate is calculated using total births as the denominator, and is expressed as deaths per 1,000 total births of that birthweight category.

### Table 13a: $PMR_{Adjusted}$ in singleton and multiple births, Victoria 2014

| | Total births[a] | | Stillbirths | | | Live births[b] | | Neonatal deaths | | | Perinatal deaths | | | Live births surviving beyond neonatal period at each plurality category | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | rate[c] | n | % | n | % | rate[d] | n | % | rate[e] | n | % |
| Singleton births | 76,542 | 96.9 | 470 | 89.4 | 6.1 | 76,072 | 97.0 | 176 | 76.5 | 2.3 | 646 | 85.4 | 8.4 | 75,896 | 99.8 |
| Twin births | 2,364 | 3.0 | 54 | 10.3 | 22.8 | 2,310 | 2.9 | 45 | 19.6 | 19.5 | 99 | 13.1 | 41.9 | 2,265 | 98.1 |
| Triplet births | 57 | 0.1 | 2 | 0.4 | 35.1 | 55 | 0.1 | 9 | 3.9 | 163.6 | 11 | 1.5 | 193.0 | 46 | 83.6 |
| Quadruplets | 0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 |
| *(Multiples beyond twin)* | *57* | *0.1* | *2* | *0.4* | *35.1* | *55* | *0.1* | *9* | *3.9* | *163.6* | *11* | *1.5* | *193.0* | *46* | *83.6* |
| *(All multiple births)* | *2,421* | *3.1* | *56* | *10.6* | *23.1* | *2,365* | *3.0* | *54* | *23.5* | *22.8* | *110* | *14.6* | *45.4* | *2,311* | *97.7* |
| Unknown | 0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 |
| Total births | 78,963 | 100.0 | 526 | 100.0 | 6.7 | 78,437 | 100.0 | 230 | 100.0 | 2.9 | 756 | 100.0 | 9.6 | 78,207 | 99.7 |

a. Total births includes live births and stillbirths, (live birth data obtained from VPDC).
b. Live births includes those babies who later died during the neonatal period (babies born alive who died within 28 days of birth).
c. Stillbirth rate is calculated using total births as the denominator, and expressed as deaths per 1,000 total births of that plurality
d. Neonatal mortality rate is calculated using live births as the denominator, and is expressed as deaths per 1,000 live births of that plurality.
e. Perinatal death rate is calculated using total births as the denominator, and is expressed as deaths per 1,000 total births of that plurality.

### Table 13b: $PMR_{Adjusted}$ in singleton and multiple births, Victoria 2015

| | Total births[a] | | Stillbirths | | | Live births[b] | | Neonatal deaths | | | Perinatal deaths | | | Live births surviving beyond neonatal period at each plurality category | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | rate[c] | n | % | n | % | rate[d] | n | % | rate[e] | n | % |
| Singleton births | 76,870 | 97.1 | 482 | 91.6 | 6.3 | 76,388 | 97.1 | 162 | 85.7 | 2.1 | 644 | 90.1 | 8.4 | 76,226 | 99.8 |
| Twin births | 2,230 | 2.8 | 40 | 7.6 | 17.9 | 2,190 | 2.8 | 26 | 13.8 | 11.9 | 66 | 9.2 | 29.6 | 2,164 | 98.8 |
| Triplet births | 63 | 0.1 | 4 | 0.8 | 63.5 | 59 | 0.1 | 1 | 0.5 | 16.9 | 5 | 0.7 | 79.4 | 58 | 98.3 |
| Quadruplets | 0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 |
| *(Multiples beyond twin)* | *63* | *0.1* | *4* | *0.8* | *63.5* | *59* | *0.1* | *1* | *0.5* | *16.9* | *5* | *0.7* | *79.4* | *58* | *98.3* |
| *(All multiple births)* | *2,293* | *2.9* | *44* | *8.4* | *19.2* | *2,249* | *2.9* | *27* | *14.3* | *12.0* | *71* | *9.9* | *31.0* | *2,222* | *98.8* |
| Unknown | 0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 |
| Total births | 79,163 | 100.0 | 526 | 100.0 | 6.6 | 78,637 | 100.0 | 189 | 100.0 | 2.4 | 715 | 100.0 | 9.0 | 78,448 | 99.8 |

a. Total births includes live births and stillbirths, (live birth data obtained from VPDC).
b. Live births includes those babies who later died during the neonatal period (babies born alive who died within 28 days of birth).
c. Stillbirth rate is calculated using total births as the denominator, and expressed as deaths per 1,000 total births of that plurality
d. Neonatal mortality rate is calculated using live births as the denominator, and is expressed as deaths per 1,000 live births of that plurality.
e. Perinatal death rate is calculated using total births as the denominator, and is expressed as deaths per 1,000 total births of that plurality.

**Table 14: Stillbirth, neonatal death and $PMR_{Adjusted}$ by plurality, Victoria 2007 to 2015**

| | Singletons | | Twins | | Other multiple births | | Total | |
|---|---|---|---|---|---|---|---|---|
| Year | n | Rate | n | Rate | n | Rate | n | Rate |
| Stillbirths | | | | | | | | |
| 2007 | 462 | 6.6 | 44 | 18.0 | 2 | 40.8 | 508 | 7.0 |
| 2008 | 454 | 6.5 | 48 | 20.1 | 2 | 47.6 | 504 | 7.0 |
| 2009 | 496 | 7.0 | 57 | 23.8 | 0 | NA | 553 | 7.6 |
| 2010 | 499 | 7.0 | 45 | 19.6 | 3 | 55.6 | 547 | 7.4 |
| 2011 | 471 | 6.6 | 46 | 19.6 | 5 | 172.4 | 522 | 7.1 |
| 2012 | 479 | 6.3 | 45 | 18.9 | 3 | 73.2 | 527 | 6.7 |
| 2013 | 490 | 6.5 | 38 | 16.0 | 5 | 89.3 | 533 | 6.8 |
| 2014 | 470 | 6.1 | 54 | 22.8 | 2 | 35.1 | 526 | 6.7 |
| 2015 | 482 | 6.3 | 40 | 17.9 | 4 | 63.5 | 526 | 6.6 |
| Neonatal deaths | | | | | | | | |
| 2007 | 196 | 2.8 | 43 | 17.6 | 2 | 42.6 | 241 | 3.4 |
| 2008 | 173 | 2.5 | 42 | 18.0 | 0 | NA | 215 | 3.0 |
| 2009 | 185 | 2.6 | 41 | 17.0 | 0 | NA | 226 | 3.1 |
| 2010 | 194 | 2.7 | 36 | 16.0 | 5 | 686.3 | 235 | 3.2 |
| 2011 | 184 | 2.6 | 39 | 17.6 | 0 | NA | 223 | 3.1 |
| 2012 | 180 | 2.4 | 29 | 12.4 | 1 | 26.3 | 210 | 2.7 |
| 2013 | 193 | 2.6 | 45 | 19.3 | 3 | 58.8 | 241 | 3.1 |
| 2014 | 176 | 2.3 | 45 | 19.5 | 9 | 163.6 | 230 | 2.9 |
| 2015 | 162 | 2.1 | 26 | 11.9 | 1 | 16.9 | 189 | 2.4 |
| Perinatal deaths | | | | | | | | |
| 2007 | 658 | 9.4 | 87 | 35.0 | 4 | 81.6 | 749 | 10.4 |
| 2008 | 627 | 9.0 | 90 | 37.8 | 2 | 47.6 | 719 | 9.9 |
| 2009 | 681 | 9.7 | 98 | 40.9 | 0 | NA | 779 | 10.7 |
| 2010 | 693 | 9.7 | 81 | 35.2 | 8 | 740.7 | 782 | 10.6 |
| 2011 | 655 | 9.2 | 85 | 37.6 | 5 | 172.4 | 745 | 10.2 |
| 2012 | 659 | 8.7 | 74 | 31.1 | 4 | 97.6 | 737 | 9.4 |
| 2013 | 683 | 9.0 | 83 | 35.0 | 8 | 142.9 | 774 | 9.9 |
| 2014 | 646 | 8.4 | 99 | 41.9 | 11 | 193.0 | 756 | 9.6 |
| 2015 | 644 | 8.4 | 66 | 29.6 | 5 | 79.4 | 715 | 9.0 |

Source of adjusted total births denominator data: VPDC

Stillbirth and perinatal mortality rates were calculated using total births (live births and stillbirths) as the denominator. Neonatal mortality rates were calculated using live births as the denominator.

**Table 15a: Perinatal mortality (adjusted) by maternal place of birth, Victoria 2014**

| | Live births | Stillbirths | Neonatal deaths | Perinatal deaths | % of all Perinatal deaths | PMR by maternal place of birth |
|---|---|---|---|---|---|---|
| Southern And Eastern Europe | 1523 | 7 | 3 | 10 | 1.3 | 6.5 |
| Americas | 1039 | 4 | 1 | 5 | 0.7 | 4.8 |
| North-East Asia | 4106 | 21 | 10 | 31 | 4.1 | 7.5 |
| South-East Asia | 4877 | 28 | 13 | 41 | 5.4 | 8.4 |
| Australia | 50329 | 324 | 151 | 475 | 62.8 | 9.4 |
| Southern and Central Asia | 7319 | 61 | 19 | 80 | 10.6 | 10.8 |
| North Africa and the Middle East | 2637 | 24 | 7 | 31 | 4.1 | 11.6 |
| North-West Europe | 2253 | 20 | 8 | 28 | 3.7 | 12.3 |
| Sub-Saharan Africa | 1616 | 15 | 7 | 22 | 2.9 | 13.5 |
| Oceania and Antarctica (Excl Australia) | 2183 | 17 | 8 | 25 | 3.3 | 11.4 |
| Missing | *555* | *5* | *3* | *8* | *1.1* | *14.3* |
| Total | 78,437 | 526 | 230 | 756 | 100.0 | 9.6 |

**Table 15b: Perinatal mortality (adjusted) by maternal place of birth, Victoria 2015**

| | Live births | Stillbirths | Neonatal deaths | Perinatal deaths | % of all Perinatal deaths | PMR by maternal place of birth |
|---|---|---|---|---|---|---|
| North-East Asia | 3712 | 8 | 9 | 17 | 2.4 | 4.6 |
| Americas | 1110 | 4 | 2 | 6 | 0.8 | 5.4 |
| North-West Europe | 2290 | 11 | 6 | 17 | 2.4 | 7.4 |
| North Africa and the Middle East | 2762 | 13 | 8 | 21 | 2.9 | 7.6 |
| South-East Asia | 5064 | 27 | 15 | 42 | 5.9 | 8.2 |
| Australia | 50002 | 339 | 110 | 449 | 62.8 | 8.9 |
| Southern and Eastern Europe | 1437 | 11 | 4 | 15 | 2.1 | 10.4 |
| Southern and Central Asia | 7838 | 68 | 19 | 87 | 12.2 | 11.0 |
| Oceania and Antarctica (Excl Australia) | 2202 | 20 | 6 | 26 | 3.6 | 11.7 |
| Sub-Saharan Africa | 1686 | 18 | 7 | 25 | 3.5 | 14.7 |
| Missing | 534 | 7 | 3 | 10 | 1.4 | 18.5 |
| **Total** | **78,637** | **526** | **189** | **715** | **100.0** | **9.0** |

**Table 16: Aboriginal and non-Aboriginal perinatal morality (adjusted), by triennia, Victoria 2001–2015**

| | Total births | | | Live births | | | Stillbirths | | Neonatal deaths (NND) | | Stillbirth rate[a] | | | Neonatal mortality rate[b] | | | Perinatal mortality rate[a] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All births | Non ATSI | ATSI | All live births | Non ATSI | ATSI | Non ATSI | ATSI | Non ATSI | ATSI | Non ATSI | ATSI | RR(CI) | Non ATSI | ATSI | RR(CI) | Non ATSI | ATSI | RR(CI) |
| 2001–2003 | 188,625 | 187,413 | 1,212 | 187,390 | 186,196 | 1,194 | 1,217 | 18 | 658 | 10 | 6.5 | 14.9 | 2.3 (1.4–3.6) | 3.5 | 8.4 | 2.4 (1.3–4.1) | 10.0 | 23.1 | 2.3 (1.5–3.3) |
| 2002–2004 | 189,996 | 188,768 | 1,228 | 188,780 | 187,565 | 1,215 | 1,203 | 13 | 657 | 14 | 6.4 | 10.6 | 1.7 (0.95–2.9) | 3.5 | 11.5 | 3.3 (1.9–5.6) | 9.9 | 22.0 | 2.2 (1.5–3.2) |
| 2003–2005 | 193,381 | 192,039 | 1,342 | 192,138 | 190,807 | 1,331 | 1,232 | 11 | 676 | 14 | 6.4 | 8.2 | 1.3 (0.7–2.3) | 3.5 | 10.5 | 3.2 (1.9–5.4) | 9.9 | 18.6 | 1.9 (1.3–2.7) |
| 2004–2006 | 199,615 | 198,076 | 1,539 | 198,328 | 196,797 | 1,531 | 1,279 | 8 | 665 | 16 | 6.5 | 5.2 | 0.8 (0.4–1.6) | 3.4 | 10.5 | 3.1 (1.9–5.1) | 9.8 | 15.6 | 1.6 (1.1–2.4) |
| 2005–2007 | 208,448 | 206,643 | 1,805 | 207,024 | 205,234 | 1,790 | 1,409 | 15 | 701 | 15 | 6.8 | 8.3 | 1.2 (0.7–2.0) | 3.4 | 8.4 | 2.4 (1.5–4.1) | 10.2 | 16.6 | 1.6 (1.1–2.3) |
| 2006–2008 | 214,322 | 212,324 | 1,998 | 212,784 | 210,806 | 1,978 | 1,518 | 20 | 668 | 16 | 7.1 | 10.0 | 1.4 (0.9–2.2) | 3.2 | 8.1 | 2.5 (1.5–4.2) | 10.3 | 18.0 | 1.7 (1.3–2.4) |
| 2007–2009 | 216,598 | 214,332 | 2,266 | 214,994 | 212,763 | 2,231 | 1,569 | 35 | 656 | 13 | 7.3 | 15.4 | 2.1 (1.5–2.9) | 3.1 | 5.8 | 1.9 (1.1–3.3) | 10.4 | 21.2 | 2.0 (1.5–2.7) |
| 2008–2010 | 218,514 | 216,054 | 2,460 | 216,898 | 214,480 | 2,418 | 1,574 | 42 | 642 | 16 | 7.3 | 17.1 | 2.3 (1.7–3.1) | 3.0 | 6.6 | 2.2 (1.3–3.6) | 10.3 | 23.6 | 2.3 (1.8–3.0) |
| 2009–2011 | 219,762 | 217,095 | 2,667 | 218,161 | 215,536 | 2,625 | 1559 | 42 | 647 | 16 | 7.2 | 15.7 | 2.2 (1.6–2.9) | 3.0 | 6.1 | 2.0 (1.2–3.3) | 10.2 | 21.7 | 2.1 (1.6–2.8) |
| 2010–2012 | 225,185 | 222,403 | 2,782 | 223,599 | 220,857 | 2,742 | 1546 | 40 | 642 | 14 | 7.0 | 14.4 | 2.1 (1.5–2.8) | 2.9 | 5.1 | 1.7 (1.0–2.9) | 9.8 | 19.4 | 2.0 (1.5–2.6) |
| 2011–2013 | 228,955 | 226,038 | 2,917 | 227,380 | 224,499 | 2,881 | 1539 | 36 | 648 | 16 | 6.8 | 12.3 | 1.8 (1.3– 2.5) | 2.9 | 5.6 | 1.9 (1.2– 3.1) | 9.7 | 17.8 | 1.8 (1.4– 2.4) |
| 2012–2014 | 234,000 | 230,977 | 3,023 | 232,421 | 229,431 | 2,990 | 1546 | 33 | 652 | 19 | 6.7 | 10.9 | 1.6 (1.2–2.3) | 2.8 | 6.4 | 2.2 (1.4–3.5) | 9.5 | 17.2 | 1.8 (1.4–2.4) |
| 2013–2015 | 235,174 | 231,944 | 3,230 | 233,598 | 230,391 | 3,207 | 1553 | 23 | 631 | 21 | 6.7 | 7.1 | 1.1 (0.7–1.6) | 2.7 | 6.5 | 2.4 (1.4–3.5) | 9.4 | 13.6 | 1.4 (1.1–1.9) |

Notes:

Source of total birth and live birth denominator data: VPDC.

ATSI: Infants born to women who identified themselves as Aboriginal or of Torres Strait Islander descent

Births in which Aboriginality was unknown are excluded from this table

Rolling triennia are used in this table

a. Stillbirth and perinatal mortality rates are calculated using adjusted total births as the denominator, and expressed as deaths per 1,000 adjusted total births.

b. Neonatal death rate is calculated using live births as the denominator, and is expressed as deaths per 1,000 live births.

**Figure 4: $PMR_{Adjusted}$ by Aboriginal status, by triennia, Victoria 2001–2015**

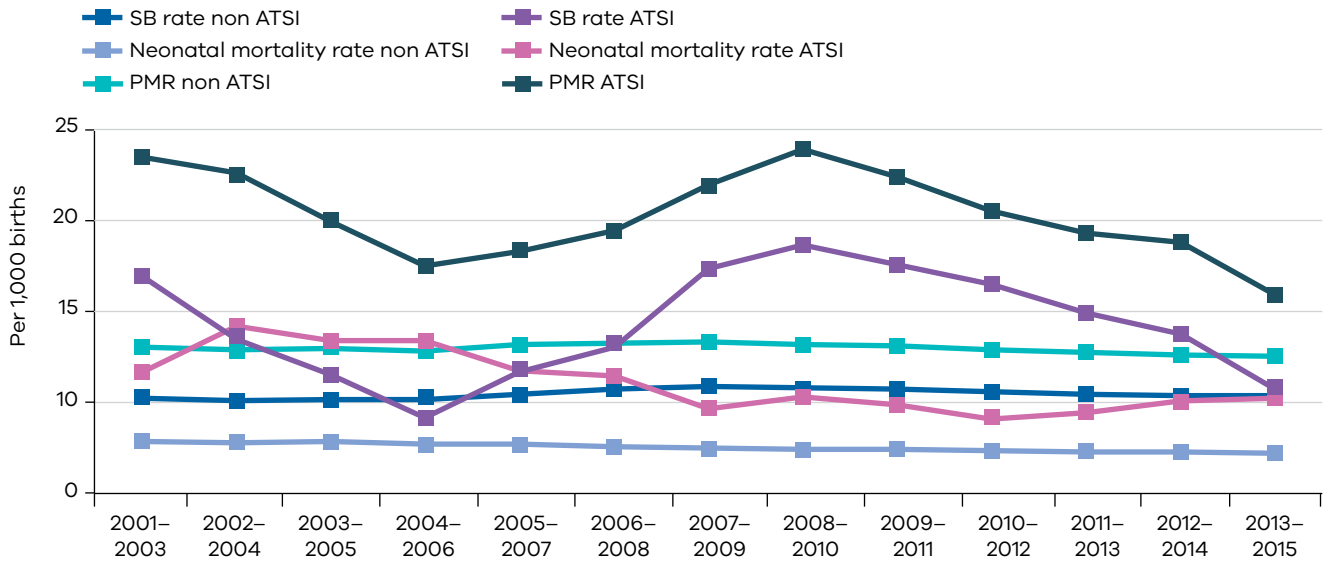



**Table 17: $PMR_{Adjusted}$ by Aboriginal status, by triennia, Victoria 2001–2015**

| | SB rate non ATSI | Neonatal mortality rate non ATSI | PMR non ATSI | SB rate ATSI | Neonatal mortality rate ATSI | PMR ATSI |
|---|---|---|---|---|---|---|
| 2001–2003 | 6.5 | 3.5 | 10.0 | 14.9 | 8.4 | 23.1 |
| 2002–2004 | 6.4 | 3.5 | 9.9 | 10.6 | 11.5 | 22.0 |
| 2003–2005 | 6.4 | 3.5 | 9.9 | 8.2 | 10.5 | 18.6 |
| 2004–2006 | 6.5 | 3.4 | 9.8 | 5.2 | 10.5 | 15.6 |
| 2005–2007 | 6.8 | 3.4 | 10.2 | 8.3 | 8.4 | 16.6 |
| 2006–2008 | 7.1 | 3.2 | 10.3 | 10.0 | 8.1 | 18.0 |
| 2007–2009 | 7.3 | 3.1 | 10.4 | 15.4 | 5.8 | 21.2 |
| 2008–2010 | 7.3 | 3.0 | 10.3 | 17.1 | 6.6 | 23.6 |
| 2009–2011 | 7.2 | 3.0 | 10.2 | 15.7 | 6.1 | 21.7 |
| 2010–2012 | 7.0 | 2.9 | 9.8 | 14.4 | 5.1 | 19.4 |
| 2011–2013 | 6.8 | 2.9 | 9.7 | 12.3 | 5.6 | 17.8 |
| 2012–2014 | 6.7 | 2.8 | 9.5 | 10.9 | 6.4 | 17.2 |
| 2013–2015 | 6.7 | 2.7 | 9.4 | 7.1 | 6.5 | 13.6 |

**Table 18a: Perinatal deaths by PSANZ PDC major categories and type, Victoria 2014**

| | Stillbirths | | | Stillbirth (adjusted) | | | Neonatal deaths | | | Total perinatal deaths | | | Total perinatal deaths (adjusted) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cause of death PSANZ PDC | n | % | Rate[c] | n | % | Rate[e] | n | % | Rate[c] | n | % | Rate[c] | n | % | Rate[e] |
| 1. Congenital abnormality[a] | 170 | 25.3 | 2.1 | 170 | 32.3 | 2.2 | 76 | 32.9 | 1.0 | 246 | 27.2 | 3.1 | 246 | 32.5 | 3.1 |
| 2. Infection | 22 | 3.3 | 0.3 | 22 | 4.2 | 0.3 | 13 | 5.6 | 0.2 | 35 | 3.9 | 0.4 | 35 | 4.6 | 0.4 |
| 3. Hypertension | 12 | 1.8 | 0.2 | 12 | 2.3 | 0.2 | 2 | 0.9 | 0.0 | 14 | 1.6 | 0.2 | 14 | 1.9 | 0.2 |
| 4. Antepartum haemorrhage | 47 | 7.0 | 0.6 | 47 | 8.9 | 0.6 | 21 | 9.1 | 0.3 | 68 | 7.5 | 0.9 | 68 | 9.0 | 0.9 |
| 5. Maternal conditions[b] | 169 | 25.1 | 2.1 | 23 | 4.4 | 0.3 | 7 | 3.0 | 0.1 | 176 | 19.5 | 2.2 | 29 | 3.8 | 0.4 |
| 6. Specific perinatal conditions[d] | 33 | 4.9 | 0.4 | 33 | 6.3 | 0.4 | 23 | 10.0 | 0.3 | 56 | 6.2 | 0.7 | 56 | 7.4 | 0.7 |
| 7. Hypoxic peripartum death | 13 | 1.9 | 0.2 | 13 | 2.5 | 0.2 | 17 | 7.4 | 0.2 | 30 | 3.3 | 0.4 | 30 | 4.0 | 0.4 |
| 8. Fetal growth restriction (FGR) | 46 | 6.8 | 0.6 | 46 | 8.7 | 0.6 | 4 | 1.7 | 0.1 | 50 | 5.5 | 0.6 | 50 | 6.6 | 0.6 |
| 9. Spontaneous preterm | 40 | 6.0 | 0.5 | 40 | 7.6 | 0.5 | 64 | 27.7 | 0.8 | 104 | 11.5 | 1.3 | 104 | 13.8 | 1.3 |
| 10. Unexplained antepartum death | 120 | 17.9 | 1.5 | 120 | 22.8 | 1.5 | 0 | 0.0 | 0.0 | 120 | 13.3 | 1.5 | 120 | 15.9 | 1.5 |
| 11. No obstetric antecedent | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 4 | 1.7 | 0.1 | 4 | 0.4 | 0.1 | 4 | 0.5 | 0.1 |
| Total | 672 | 100 | 8.5 | 526 | 100.0 | 6.7 | 231 | 100.0 | 2.9 | 903 | 100.0 | 11.4 | 756 | 100.0 | 9.6 |

a. Maternal conditions includes terminations of pregnancy ≥20 weeks for psychosocial indications.

b. Stillbirth and perinatal death rates were calculated using total births (live births and stillbirths) as the denominator. Neonatal death rates were calculated using live births as the denominator.

c. Specific perinatal conditions includes termination for suspected but not confirmed congenital abnormalities.

d. Adjusted stillbirth and adjusted perinatal rates are calculated using live births and adjusted stillbirths and neonatal deaths (not including terminations of pregnancy for maternal psychosocial indications) as the denominator.

**Table 18b: Perinatal deaths by PSANZ PDC major categories and type, Victoria 2015**

| Cause of death PSANZ PDC | Stillbirths | | | Stillbirth (adjusted) | | | Neonatal deaths | | | Total perinatal deaths | | | Total perinatal deaths (adjusted) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | Rate[b] | n | % | Rate[d] | n | % | Rate[b] | n | % | Rate[b] | n | % | Rate[d] |
| 1. Congenital abnormality[a] | 208 | 32.9 | 2.6 | 208 | 39.5 | 2.6 | 66 | 34.9 | 0.8 | 274 | 33.3 | 3.5 | 274 | 38.3 | 3.5 |
| 2. Infection | 26 | 4.1 | 0.3 | 26 | 4.9 | 0.3 | 12 | 6.3 | 0.2 | 38 | 4.6 | 0.5 | 38 | 5.3 | 0.5 |
| 3. Hypertension | 14 | 2.2 | 0.2 | 14 | 2.7 | 0.2 | 2 | 1.1 | 0.0 | 16 | 1.9 | 0.2 | 16 | 2.2 | 0.2 |
| 4. Antepartum haemorrhage | 25 | 3.9 | 0.3 | 25 | 4.8 | 0.3 | 22 | 11.6 | 0.3 | 47 | 5.7 | 0.6 | 47 | 6.6 | 0.6 |
| 5. Maternal conditions[c] | 116 | 18.3 | 1.5 | 9 | 1.7 | 0.1 | 1 | 0.5 | 0.0 | 117 | 14.2 | 1.5 | 10 | 1.4 | 0.1 |
| 6. Specific perinatal conditions[d] | 43 | 6.8 | 0.5 | 43 | 8.2 | 0.5 | 17 | 9.0 | 0.2 | 60 | 7.3 | 0.8 | 60 | 8.4 | 0.8 |
| 7. Hypoxic peripartum death | 6 | 0.9 | 0.1 | 6 | 1.1 | 0.1 | 11 | 5.8 | 0.1 | 17 | 2.1 | 0.2 | 17 | 2.4 | 0.2 |
| 8. Fetal growth restriction (FGR) | 48 | 7.6 | 0.6 | 48 | 9.1 | 0.6 | 0 | 0.0 | 0.0 | 48 | 5.8 | 0.6 | 48 | 6.7 | 0.6 |
| 9. Spontaneous preterm | 54 | 8.5 | 0.7 | 54 | 10.3 | 0.7 | 49 | 25.9 | 0.6 | 103 | 12.5 | 1.3 | 103 | 14.4 | 1.3 |
| 10. Unexplained antepartum death | 93 | 14.7 | 1.2 | 93 | 17.7 | 1.2 | 0 | 0.0 | 0.0 | 93 | 11.3 | 1.2 | 93 | 13.0 | 1.2 |
| 11. No obstetric antecedent | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 9 | 4.8 | 0.1 | 9 | 1.1 | 0.1 | 9 | 1.3 | 0.1 |
| Total | 633 | 100.0 | 8.0 | 526 | 100.0 | 6.7 | 189 | 100.0 | 2.4 | 822 | 100.0 | 10.4 | 715 | 100.0 | 9.0 |

a. Maternal conditions includes terminations of pregnancy ≥20 weeks for psychosocial indications.

b. Stillbirth and perinatal death rates were calculated using total births (live births and stillbirths) as the denominator. Neonatal death rates were calculated using live births as the denominator.

c. Specific perinatal conditions includes termination for suspected but not confirmed congenital abnormalities.

d. Adjusted stillbirth and adjusted perinatal rates are calculated using live births and adjusted stillbirths and neonatal deaths (not including terminations of pregnancy for maternal psychosocial. indications) as the denominator.

**Figure 5a: Causes of perinatal death (%), PSANZ PDC, Victoria 2014**

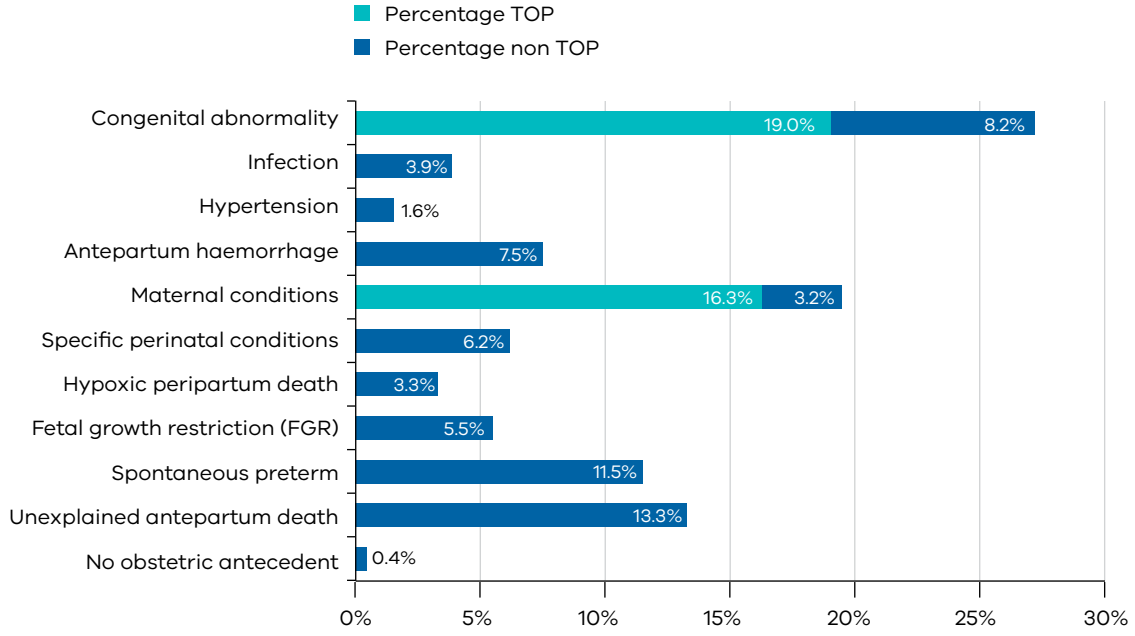



**Figure 5b: Causes of perinatal death (%), PSANZ PDC, Victoria 2015**

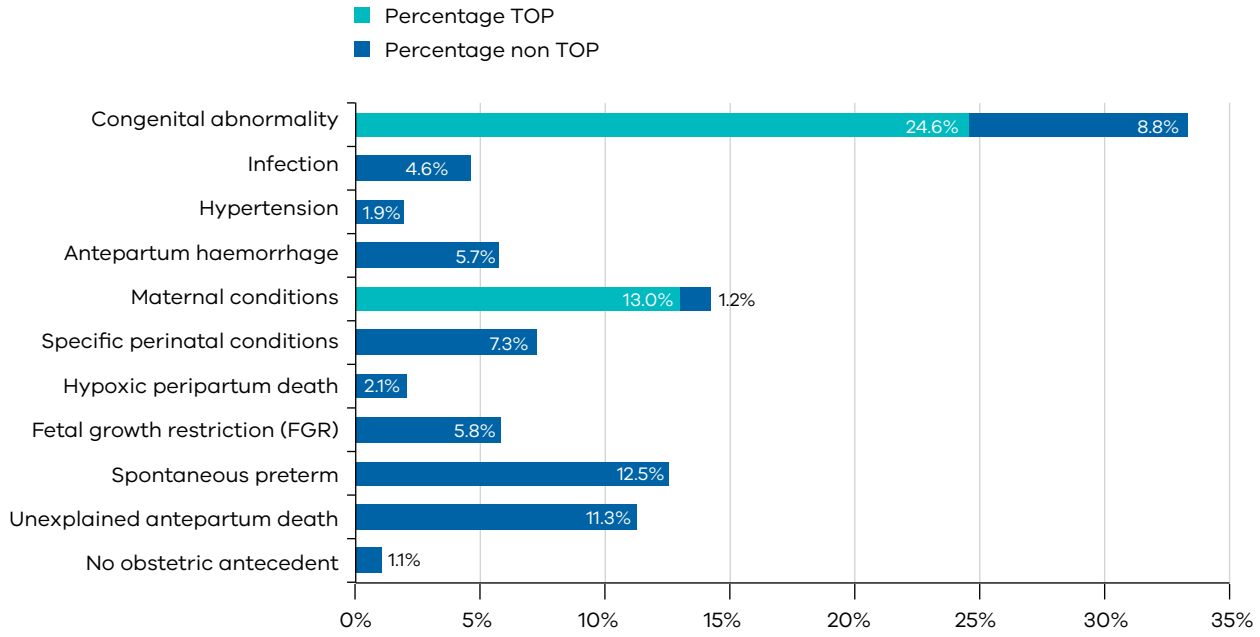


**Figure 6a: Causes of stillbirth (%), PSANZ PDC, Victoria 2014**

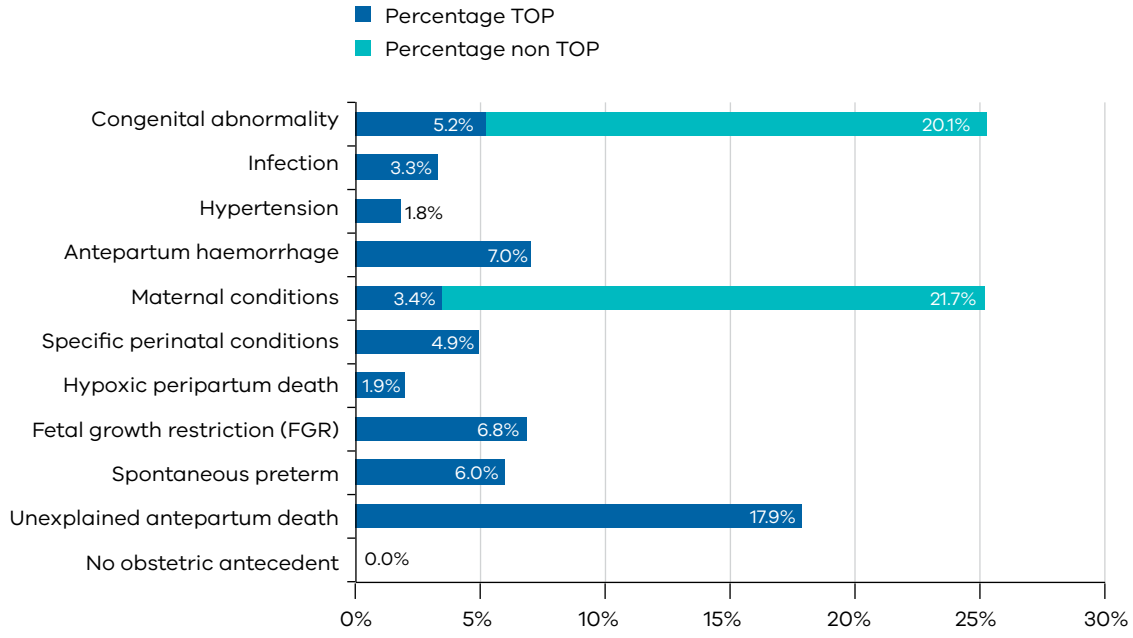



**Figure 6b: Causes of stillbirth (%), PSANZ PDC, Victoria 2015**

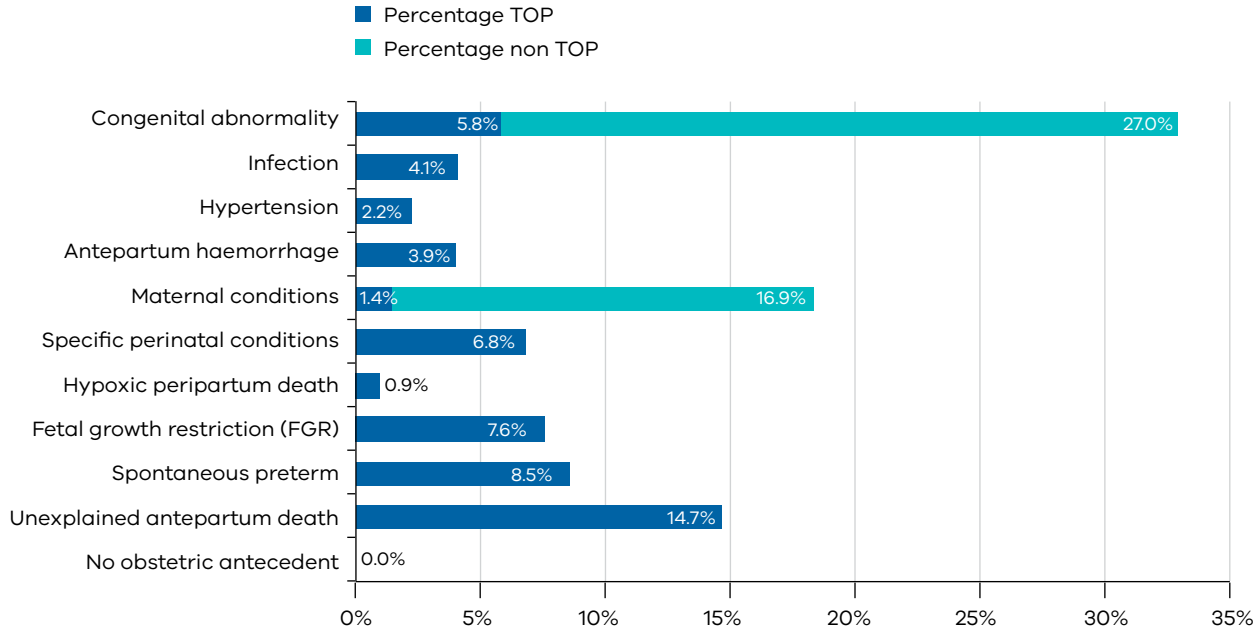


**Figure 7a: Causes of neonatal death (%), PSANZ PDC, Victoria 2014**

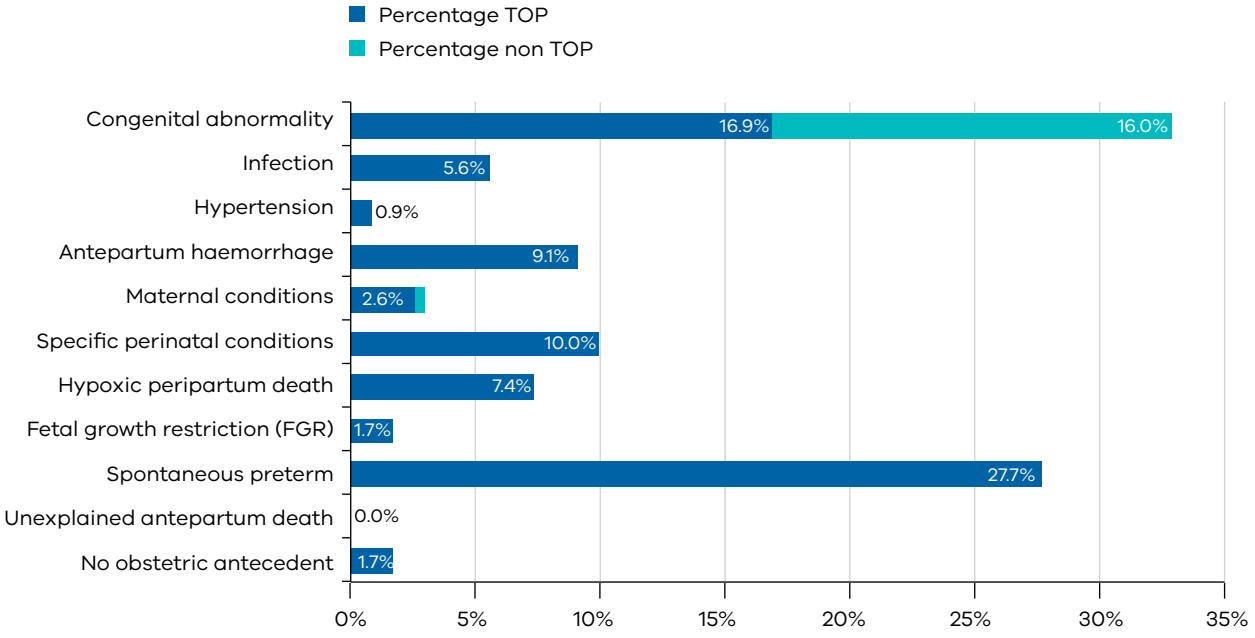



**Figure 7b: Causes of neonatal death (%), PSANZ PDC, Victoria 2015**

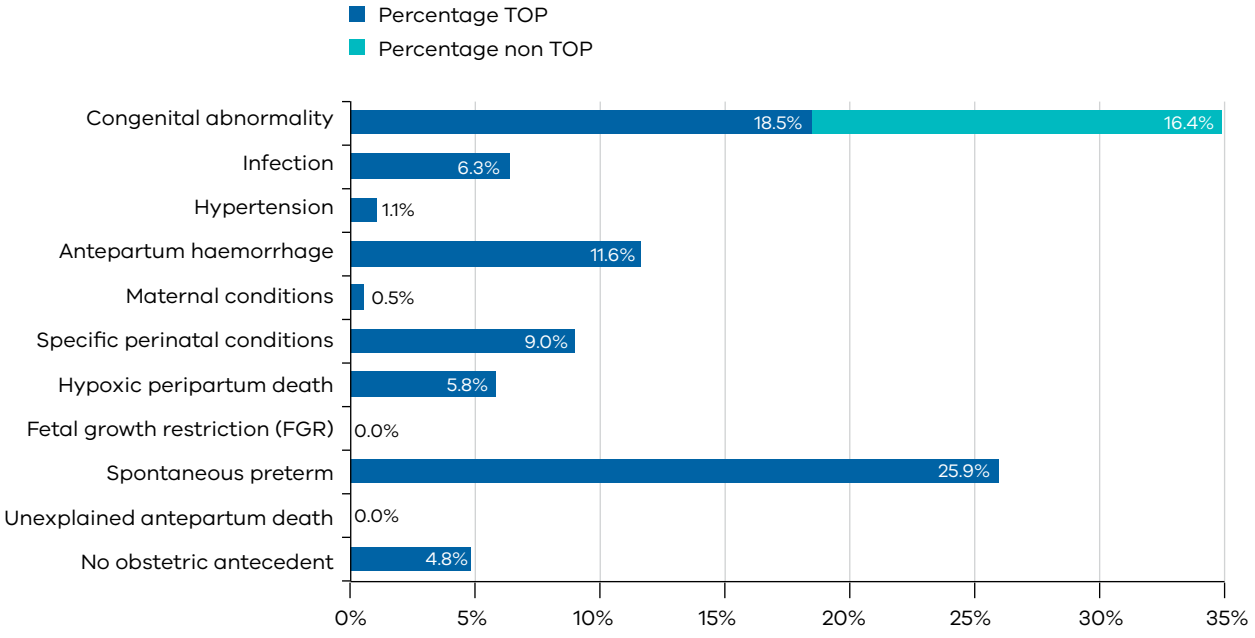


**Table 19a: Perinatal deaths by PSANZ PDC expanded categories and type, Victoria 2014**

| | Stillbirths (Fetal death) | | Neonatal death | | Total | |
|---|---|---|---|---|---|---|
| **PSANZ PDC** | **n** | **%** | **n** | **%** | **n** | **%** |
| **1. Congenital Abnormality** | **170** | **25.3** | **76** | **32.9** | **246** | **27.2** |
| 1.1 Central nervous system abnormalities | 3 | 0.4 | 7 | 3.0 | 10 | 1.1 |
| TOP Central nervous system abnormalities | 43 | 6.4 | 8 | 3.5 | 51 | 5.6 |
| 1.2 Cardiovascular system | 5 | 0.7 | 11 | 4.8 | 16 | 1.8 |
| TOP Cardiovascular system | 11 | 1.6 | 13 | 5.6 | 24 | 2.7 |
| 1.3 Urinary Tract | 0 | 0.0 | 2 | 0.9 | 2 | 0.2 |
| TOP Urinary Tract | 8 | 1.2 | 3 | 1.3 | 11 | 1.2 |
| 1.4 Gastrointestinal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| TOP Gastrointestinal | 4 | 0.6 | 0 | 0.0 | 4 | 0.4 |
| 1.5 Chromosomal | 17 | 2.5 | 7 | 3.0 | 24 | 2.7 |
| TOP Chromosomal | 39 | 5.8 | 7 | 3.0 | 46 | 5.1 |
| 1.6 Metabolic | 0 | 0.0 | 1 | 0.4 | 1 | 0.1 |
| TOP Metabolic | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 1.7 Multiple | 4 | 0.6 | 1 | 0.4 | 5 | 0.6 |
| TOP Multiple | 18 | 2.7 | 2 | 0.9 | 20 | 2.2 |
| 1.8 Other congenital abnormality | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| TOP Other congenital abnormality | 1 | 0.1 | 0 | 0.0 | 1 | 0.1 |
| 1.81 Musculoskeletal | 2 | 0.3 | 5 | 2.2 | 7 | 0.8 |
| TOP Musculoskeletal | 7 | 1.0 | 2 | 0.9 | 9 | 1.0 |
| 1.82 Respiratory | 1 | 0.1 | 1 | 0.4 | 2 | 0.2 |
| TOP Respiratory | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 1.83 Diaphragmatic hernia | 0 | 0.0 | 2 | 0.9 | 2 | 0.2 |
| TOP Diaphragmatic hernia | 2 | 0.3 | 1 | 0.4 | 3 | 0.3 |
| 1.84 Haematological | 0 | 0.0 | 1 | 0.4 | 1 | 0.1 |
| Haematological (termination) | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 1.85 Tumours | 1 | 0.1 | 1 | 0.4 | 2 | 0.2 |
| TOP Tumours | 1 | 0.1 | 1 | 0.4 | 2 | 0.2 |
| 1.88 Other specified congenital abnormality | 2 | 0.3 | 0 | 0.0 | 2 | 0.2 |
| TOP Other specified congenital abnormality | 1 | 0.1 | 0 | 0.0 | 1 | 0.1 |
| 1.9 Unspecified congenital abnormality | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| TOP Other specified congenital abnormality | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| **2. Infection** | **22** | **3.3** | **13** | **5.6** | **35** | **3.9** |
| 2.11 Group B Streptococcus | 2 | 0.3 | 3 | 1.3 | 5 | 0.6 |
| 2.12 E coli | 7 | 1.0 | 1 | 0.4 | 8 | 0.9 |
| 2.13 Listeria | 0 | 0.0 | 1 | 0.4 | 1 | 0.1 |
| 2.18 Other bacterial | 6 | 0.9 | 1 | 0.4 | 7 | 0.8 |
| 2.19 Unspecified bacterial | 2 | 0.3 | 0 | 0.0 | 2 | 0.2 |
| 2.2 Perinatal infection | | | | | | |
| 2.21 Perinatal infection (Viral) – Cytomegalovirus | 2 | 0.3 | 0 | 0.0 | 2 | 0.2 |
| 2.22 Parvovirus | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 2.24 Rubella | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |

| PSANZ PDC | Stillbirths (Fetal death) n | Stillbirths (Fetal death) % | Neonatal death n | Neonatal death % | Total n | Total % |
|---|---|---|---|---|---|---|
| 2.28 Other viral | 0 | 0.0 | 1 | 0.4 | 1 | 0.1 |
| 2.29 Unspecified viral | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 2.3 Protozoal e.g. toxoplasma | 1 | 0.1 | 0 | 0.0 | 1 | 0.1 |
| 2.5 Fungal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 2.8 other unspecified organism | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 2.9 other unspecified organism | 2 | 0.3 | 6 | 2.6 | 8 | 0.9 |
| **3. Hypertension** | **12** | **1.8** | **2** | **0.9** | **14** | **1.6** |
| 3.1 Chronic hypertension: essential | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 3.2 Chronic hypertension: secondary e.g. renal disease | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 3.3 Chronic hypertension: unspecified | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 3.4 Gestational Hypertension | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 3.5 Pre-eclampsia | 10 | 1.5 | 2 | 0.9 | 12 | 1.3 |
| 3.51 Pre-eclampsia with evidence thrombophilia | 1 | 0.1 | 0 | 0.0 | 1 | 0.1 |
| 3.6 Pre-eclampsia superimposed on chronic hypertension | 1 | 0.1 | 0 | 0.0 | 1 | 0.1 |
| 3.9 Unspecified hypertension | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| **4. Antepartum Haemorrhage** | **47** | **7.0** | **21** | **9.1** | **68** | **7.5** |
| 4.1 Placental abruption | 38 | 5.7 | 19 | 8.2 | 57 | 6.3 |
| 4.11 Placental abruption with laboratory evidence of Thrombophilia | 2 | 0.3 | 1 | 0.4 | 3 | 0.3 |
| 4.2 Placenta praevia | 1 | 0.1 | 0 | 0.0 | 1 | 0.1 |
| 4.3 Vasa Praevia | 0 | 0.0 | 1 | 0.4 | 1 | 0.1 |
| 4.8 Other APH | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 4.9 APH of unknown origin | 6 | 0.9 | 0 | 0.0 | 6 | 0.7 |
| **5. Maternal Conditions** | **169** | **25.1** | **7** | **3.0** | **176** | **19.5** |
| 5.1 TOP maternal psychosocial indications | 146 | 21.7 | 1 | 0.4 | 147 | 16.3 |
| 5.2 Diabetes/gestational diabetes | 12 | 1.8 | 0 | 0.0 | 12 | 1.3 |
| 5.3 Maternal injury | | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 5.31 Maternal injury (accidental) | 1 | 0.1 | 0 | 0.0 | 1 | 0.1 |
| 5.32 Maternal injury (non-accidental) | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 5.4 Maternal sepsis | 2 | 0.3 | 0 | 0.0 | 2 | 0.2 |
| 5.5 Antiphospholipid syndrome | 3 | 0.4 | 1 | 0.4 | 4 | 0.4 |
| 5.6 Obstetric cholestasis | 2 | 0.3 | 0 | 0.0 | 2 | 0.2 |
| 5.8 Other specified maternal conditions | 3 | 0.4 | 5 | 2.2 | 8 | 0.9 |
| **6. Specific Perinatal Conditions** | **33** | **4.9** | **23** | **10.0** | **56** | **6.2** |
| 6.1 Twin-twin transfusion | 7 | 1.0 | 11 | 4.8 | 18 | 2.0 |
| 6.2 Fetomaternal haemorrhage | 3 | 0.4 | 2 | 0.9 | 5 | 0.6 |
| 6.30 Antepartum cord complications | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 6.31 Antepartum cord complications (Cord haemorrhage) | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 6.32 Antepartum cord complications (True knot with evidence of occlusion) | 1 | 0.1 | 0 | 0.0 | 1 | 0.1 |
| 6.38 Antepartum cord complications (Other) | 5 | 0.7 | 0 | 0.0 | 5 | 0.6 |

| | Stillbirths (Fetal death) | | Neonatal death | | Total | |
|---|---|---|---|---|---|---|
| **PSANZ PDC** | **n** | **%** | **n** | **%** | **n** | **%** |
| 6.39 Antepartum cord complications (Unspecified) | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 6.4 Uterine abnormalities | 9 | 1.3 | 5 | 2.2 | 14 | 1.6 |
| 6.5 Birth trauma | 0 | 0.0 | 1 | 0.4 | 1 | 0.1 |
| 6.61 Alloimmune disease: Rhesus | 1 | 0.1 | 0 | 0.0 | 1 | 0.1 |
| 6.7 Idiopathic hydrops | 2 | 0.3 | 4 | 1.7 | 6 | 0.7 |
| 6.8 Other specific perinatal conditions | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 6.81 Rupture of membranes after amniocentesis | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 6.82 TOP for suspected but not confirmed CA | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 6.88 Other | 5 | 0.7 | 0 | 0.0 | 5 | 0.6 |
| 6.89 Unspecified | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| **7. Hypoxic Peripartum Death** | **13** | **1.9** | **17** | **7.4** | **30** | **3.3** |
| 7.1 Uterine rupture | 2 | 0.3 | 1 | 0.4 | 3 | 0.3 |
| 7.12 Cord prolapse | 0 | 0.0 | 2 | 0.9 | 2 | 0.2 |
| 7.13 Shoulder dystocia | 0 | 0.0 | 1 | | 1 | 0.1 |
| 7.18 Other intrapartum complication | 1 | 0.1 | 2 | 0.9 | 3 | 0.3 |
| 7.2 No intrapartum complication (evidence of non-reassuring fetal status) | 9 | 1.3 | 10 | 4.3 | 19 | 2.1 |
| 7.3 No intrapartum complication(no evidence of non-reassuring fetal status) | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 7.9 Unspecified hypoxic peripartum death | 1 | 0.1 | 1 | 0.4 | 2 | 0.2 |
| **8. Fetal Growth Restriction (FGR)** | **46** | **6.8** | **4** | **1.7** | **50** | **5.5** |
| 8.1 Evidence of uteroplacental insufficiency | 31 | 4.6 | 2 | 0.9 | 33 | 3.7 |
| 8.2. With chronic villitis | 2 | 0.3 | 0 | 0.0 | 2 | 0.2 |
| 8.3 No placental pathology | 11 | 1.6 | 0 | 0.0 | 11 | 1.2 |
| 8.4 No examination of placenta | 0 | 0.0 | 1 | 0.4 | 1 | 0.1 |
| 8.8 Other specified placental pathology | 1 | 0.1 | 0 | 0.0 | 1 | 0.1 |
| 8.9 Unspecified or not known whether placenta examined | 1 | 0.1 | 1 | 0.4 | 2 | 0.2 |
| **9. Spontaneous Preterm** | **40** | **6.0** | **64** | **27.7** | **104** | **11.5** |
| 9.10 Spontaneous preterm with intact membranes or membrane rupture <24hrs before delivery | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 9.11 Chorioamnionitis (placental histology) | 4 | 0.6 | 16 | 6.9 | 20 | 2.2 |
| 9.12 No chorioamnionitis (placental histology) | 1 | 0.1 | 16 | 6.9 | 17 | 1.9 |
| 9.13 With clinical evidence of chorioamnionitis, no examination of placenta | 2 | 0.3 | 1 | 0.4 | 3 | 0.3 |
| 9.17 No clinical signs of chorioamnionitis, no examination of placenta | 4 | 0.6 | 6 | 2.6 | 10 | 1.1 |
| 9.19 Unspecified or not known whether placenta examined | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 9.20 Spontaneous preterm with intact membranes or membrane rupture <24hrs before delivery | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 9.21 Chorioamnionitis (placental histology) | 12 | 1.8 | 13 | 5.6 | 25 | 2.8 |
| 9.22 No chorioamnionitis (placental histology) | 2 | 0.3 | 8 | 3.5 | 10 | 1.1 |
| 9.23 With clinical evidence of chorioamnionitis, no examination of placenta | 2 | 0.3 | 0 | 0.0 | 2 | 0.2 |

| PSANZ PDC | Stillbirths (Fetal death) n | Stillbirths (Fetal death) % | Neonatal death n | Neonatal death % | Total n | Total % |
|---|---|---|---|---|---|---|
| 9.27 No clinical signs of chorioamnionitis, no examination of placenta | 9 | 1.3 | 0 | 0.0 | 9 | 1.0 |
| 9.29 Unspecified or not known whether placenta examined | 2 | 0.3 | 1 | 0.4 | 3 | 0.3 |
| 9.31 Chorioamnionitis (placental histology) | 1 | 0.1 | 2 | 0.9 | 3 | 0.3 |
| 9.32 No chorioamnionitis (placental histology) | 1 | 0.1 | 1 | 0.4 | 2 | 0.2 |
| 9.33 With clinical evidence of chorioamnionitis, no examination of placenta | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 9.37 No clinical signs of chorioamnionitis, no examination of placenta | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 9.39 Unspecified or not known whether placenta examined | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| **10. Unexplained Antepartum Death** | **120** | **17.9** | **0** | **0** | **120** | **13.3** |
| 10.1 Evidence of uteroplacental insufficiency | 12 | 1.8 | 0 | 0 | 12 | 1.3 |
| 10.2 With chronic villitis | 3 | 0.4 | 0 | 0 | 3 | 0.3 |
| 10.3 No placental pathology | 93 | 13.8 | 0 | 0 | 93 | 10.3 |
| 10.4 No examination of placenta | 5 | 0.7 | 0 | 0 | 5 | 0.6 |
| 10.8 Other specified placental pathology | 1 | 0.1 | 0 | 0 | 1 | 0.1 |
| 10.9 Unspecified or not known whether placenta examined | 6 | 0.9 | 0 | 0 | 6 | 0.7 |
| **11. No Obstetric Antecedent** | **0** | **0.0** | **4** | **1.7** | **4** | **0.4** |
| 11.2 Postnatally acquired infection | 0 | 0.0 | 2 | 0.9 | 2 | 0.2 |
| 11.13 No obstetric antecedent – Sudden Infant Death Syndrome (SIDS) (SIDS Category II : Infant deaths that meet Category I except for one or more features.) | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 11.2 No obstetric antecedent – Postnatally acquired infection | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 11.9 No obstetric precedent – Unknown/ undetermined | 0 | 0.0 | 1 | 0.4 | 1 | 0.1 |
| 11.92 No obstetric antecedent – Unknown/ undetermined (Other unknown/undetermined) | 0 | 0.0 | 1 | 0.4 | 1 | 0.1 |
| Total | 672 | 100 | 231 | 100 | 903 | 100 |

**Table 19b: Perinatal deaths by PSANZ PDC expanded categories and type, Victoria 2015**

| | Stillbirths (Fetal death) | | Neonatal death | | Total | |
|---|---|---|---|---|---|---|
| **PSANZ PDC** | **n** | **%** | **n** | **%** | **n** | **%** |
| **1. Congenital Abnormality** | **208** | **32.9** | **66** | **34.9** | **274** | **33.3** |
| 1.1 Central nervous system abnormalities | 4 | 0.6 | 12 | 6.3 | 16 | 1.9 |
| TOP Central nervous system abnormalities | 53 | 8.4 | 8 | 4.2 | 61 | 7.4 |
| 1.2 Cardiovascular system | 2 | 0.3 | 7 | 3.7 | 9 | 1.1 |
| TOP Cardiovascular system | 29 | 4.6 | 4 | 2.1 | 33 | 4.0 |
| 1.3 Urinary Tract | 0 | 0.0 | 2 | 1.1 | 2 | 0.2 |
| TOP Urinary Tract | 9 | 1.4 | 3 | 1.6 | 12 | 1.5 |
| 1.4 Gastrointestinal | 2 | 0.3 | 0 | 0.0 | 2 | 0.2 |
| TOP Gastrointestinal | 1 | 0.2 | 1 | 0.5 | 2 | 0.2 |
| 1.5 Chromosomal | 19 | 3.0 | 5 | 2.6 | 24 | 2.9 |
| TOP Chromosomal | 35 | 5.5 | 6 | 3.2 | 41 | 5.0 |
| 1.6 Metabolic | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| TOP Metabolic | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 1.7 Multiple | 8 | 1.3 | 4 | 2.1 | 12 | 1.5 |
| TOP Multiple | 23 | 3.6 | 5 | 2.6 | 28 | 3.4 |
| 1.8 Other congenital abnormality | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| TOP Other congenital abnormality | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 1.81 Musculoskeletal | 0 | 0.0 | 3 | 1.6 | 3 | 0.4 |
| TOP Musculoskeletal | 14 | 2.2 | 3 | 1.6 | 17 | 2.1 |
| 1.82 Respiratory | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| TOP Respiratory | 2 | 0.3 | 0 | 0.0 | 2 | 0.2 |
| 1.83 Diaphragmatic hernia | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| TOP Diaphragmatic hernia | 4 | 0.6 | 0 | 0.0 | 4 | 0.5 |
| 1.84 Haematological | 0 | 0.0 | 1 | 0.5 | 1 | 0.1 |
| Haematological (termination) | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 1.85 Tumours | 2 | 0.3 | 1 | 0.5 | 3 | 0.4 |
| TOP Tumours | 1 | 0.2 | 0 | 0.0 | 1 | 0.1 |
| 1.88 Other specified congenital abnormality | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| TOP Other specified congenital abnormality | 0 | 0.0 | 1 | 0.5 | 1 | 0.1 |
| 1.9 Unspecified congenital abnormality | | 0.0 | | 0.0 | 0 | 0.0 |
| TOP Other specified congenital abnormality | | 0.0 | | 0.0 | 0 | 0.0 |
| **2. Infection** | **26** | **4.1** | **12** | **6.3** | **38** | **4.6** |
| 2.11 Group B Streptococcus | 7 | 1.1 | 3 | 1.6 | 10 | 1.2 |
| 2.12 E coli | 6 | 0.9 | 0 | 0.0 | 6 | 0.7 |
| 2.13 Listeria | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 2.18 Other bacterial | 4 | 0.6 | 1 | 0.5 | 5 | 0.6 |
| 2.19 Unspecified bacterial | 2 | 0.3 | 1 | 0.5 | 3 | 0.4 |
| 2.2 Perinatal infection | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 2.21 Perinatal infection (Viral) – Cytomegalovirus | 3 | 0.5 | 0 | 0.0 | 3 | 0.4 |
| 2.22 Parvovirus | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 2.24 Rubella | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |

| | Stillbirths (Fetal death) | | Neonatal death | | Total | |
|---|---|---|---|---|---|---|
| **PSANZ PDC** | **n** | **%** | **n** | **%** | **n** | **%** |
| 2.28 Other viral | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 2.29 Unspecified viral | 1 | 0.2 | 0 | 0.0 | 1 | 0.1 |
| 2.3 Protozoal e.g. toxoplasma | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 2.5 Fungal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 2.8 Other specified organism | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 2.9 Other unspecified organism | 3 | 0.5 | 7 | 3.7 | 10 | 1.2 |
| **3. Hypertension** | **14** | **2.2** | **2** | **1.1** | **16** | **1.9** |
| 3.1 Chronic hypertension: essential | 1 | 0.2 | 0 | 0.0 | 1 | 0.1 |
| 3.2 Chronic hypertension: secondary e.g renal disease | | 0.0 | | 0.0 | 0 | 0.0 |
| 3.3 Chronic hypertension: unspecified | | 0.0 | | 0.0 | 0 | 0.0 |
| 3.4 Gestational Hypertension | | 0.0 | | 0.0 | 0 | 0.0 |
| 3.5 Pre-eclampsia | 10 | 1.6 | 2 | 1.1 | 12 | 1.5 |
| 3.51 Pre-eclampsia with evidence thrombophilia | | 0.0 | | 0.0 | 0 | 0.0 |
| 3.6 Pre-eclampsia superimposed on chronic hypertension | 2 | 0.3 | 0 | 0.0 | 2 | 0.2 |
| 3.61 Pre-eclampsia superimposed on chronic hypertension with laboratory eveidence of thrombophilia | 1 | | 0 | | | |
| 3.9 Unspecified hypertension | | 0.0 | | 0.0 | 0 | 0.0 |
| **4. Antepartum Haemorrhage** | **25** | **3.9** | **22** | **11.6** | **47** | **5.7** |
| 4.1 Placental abruption | 23 | 3.6 | 19 | 10.1 | 42 | 5.1 |
| 4.11 Placental abruption with laboratory evidence of Thrombophilia | | 0.0 | | 0.0 | 0 | 0.0 |
| 4.2 Placenta praevia | | 0.0 | | 0.0 | 0 | 0.0 |
| 4.3 Vasa Praevia | 1 | 0.2 | 0 | 0.0 | 1 | 0.1 |
| 4.8 Other APH | | 0.0 | | 0.0 | 0 | 0.0 |
| 4.9 APH of unknown origin | 1 | 0.2 | 3 | 1.6 | 4 | 0.5 |
| **5. Maternal Conditions** | **116** | **18.3** | **1** | **0.5** | **117** | **14.2** |
| 5.1 TOP maternal psychosocial indications | 107 | 16.9 | 0 | 0.0 | 107 | 13.0 |
| 5.2 Diabetes/gestational diabetes | 5 | 0.8 | 0 | 0.0 | 5 | 0.6 |
| 5.3 Maternal injury | | 0.0 | | 0.0 | 0 | 0.0 |
| 5.31 Maternal injury (accidental) | | 0.0 | | 0.0 | 0 | 0.0 |
| 5.32 Maternal injury (non-accidental) | | 0.0 | | 0.0 | 0 | 0.0 |
| 5.4 Maternal sepsis | | 0.0 | | 0.0 | 0 | 0.0 |
| 5.5 Antiphospholipid syndrome | 2 | 0.3 | 1 | 0.5 | 3 | 0.4 |
| 5.6 Obstetric cholestasis | 1 | 0.2 | 0 | 0.0 | 1 | 0.1 |
| 5.8 Other specified maternal conditions | 1 | 0.2 | 0 | 0.0 | 1 | 0.1 |
| **6. Specific Perinatal Conditions** | **43** | **6.8** | **17** | **9.0** | **60** | **7.3** |
| 6.1 Twin-twin transfusion | 8 | 1.3 | 2 | 1.1 | 10 | 1.2 |
| 6.2 Fetomaternal haemorrhage | 8 | 1.3 | 2 | 1.1 | 10 | 1.2 |
| 6.30 Antepartum cord complications | | 0.0 | | 0.0 | 0 | 0.0 |
| 6.31 Antepartum cord complications (Cord haemorrhage) | 3 | 0.5 | 0 | 0.0 | 3 | 0.4 |

| | Stillbirths (Fetal death) | | Neonatal death | | Total | |
|---|---|---|---|---|---|---|
| **PSANZ PDC** | **n** | **%** | **n** | **%** | **n** | **%** |
| 6.32 Antepartum cord complications (True knot with evidence of occlusion) | 7 | 1.1 | 0 | 0.0 | 7 | 0.9 |
| 6.38 Antepartum cord complications (Other) | 6 | 0.9 | 0 | 0.0 | 6 | 0.7 |
| 6.39 Antepartum cord complications (Unspecified) | | 0.0 | | 0.0 | 0 | 0.0 |
| 6.4 Uterine abnormalities | 5 | 0.8 | 7 | 3.7 | 12 | 1.5 |
| 6.5 Birth trauma | 0 | 0.0 | 3 | 1.6 | 3 | 0.4 |
| 6.61 Alloimmune disease: Rhesus | 2 | 0.3 | 0 | 0.0 | 2 | 0.2 |
| 6.7 Idiopathic hydrops | 3 | 0.5 | 3 | 1.6 | 6 | 0.7 |
| 6.8 Other specific perinatal conditions | | 0.0 | | 0.0 | 0 | 0.0 |
| 6.810 Rupture of membranes after amniocentesis | | 0.0 | | 0.0 | 0 | 0.0 |
| 6.82 TOP for suspected but not confirmed CA | | 0.0 | | 0.0 | 0 | 0.0 |
| 6.88 Other | 1 | 0.2 | 0 | 0.0 | 1 | 0.1 |
| 6.89 Unspecified | | 0.0 | | 0.0 | 0 | 0.0 |
| **7. Hypoxic Peripartum Death** | **6** | **0.9** | **11** | **5.8** | **17** | **2.1** |
| 7.10 Hypoxic peripartum death | 0 | 0.0 | 1 | 0.5 | 1 | 0.1 |
| 7.11 Uterine rupture | 0 | 0.0 | 2 | 1.1 | 2 | 0.2 |
| 7.12 Cord prolapse | 1 | 0.2 | 0 | 0.0 | 1 | 0.1 |
| 7.13 Shoulder dystocia | | 0.0 | | | 0 | 0.0 |
| 7.18 Other intrapartum complication | 0 | 0.0 | 1 | 0.5 | 1 | 0.1 |
| 7.2 No intrapartum complication (evidence of non-reassuring fetal status) | 2 | 0.3 | 7 | 3.7 | 9 | 1.1 |
| 7.3 No intrapartum complication(no evidence of non-reassuring fetal status) | 1 | 0.2 | 0 | 0.0 | 1 | 0.1 |
| 7.9 Unspecified hypoxic peripartum death | 2 | 0.3 | 0 | 0.0 | 2 | 0.2 |
| **8. Fetal Growth Restriction (FGR)** | **48** | **7.6** | **0** | **0.0** | **48** | **5.8** |
| 8.1 Evidence of uteroplacental insufficiency | 26 | 4.1 | 0 | 0.0 | 26 | 3.2 |
| 8.2. With chronic villitis | 2 | 0.3 | 0 | 0.0 | 2 | 0.2 |
| 8.3 No placental pathology | 12 | 1.9 | 0 | 0.0 | 12 | 1.5 |
| 8.4 No examination of placenta | 3 | 0.5 | 0 | 0.0 | 3 | 0.4 |
| 8.8 Other specified placental pathology | 2 | 0.3 | 0 | 0.0 | 2 | 0.2 |
| 8.9 Unspecified or not known whether placenta examined | 3 | 0.5 | 0 | 0.0 | 3 | 0.4 |
| **9. Spontaneous Preterm** | **54** | **8.5** | **49** | **25.9** | **103** | **12.5** |
| 9.10 Spontaneous preterm with intact membranes or membrane rupture < 24hrs before delivery | | 0.0 | | 0.0 | 0 | 0.0 |
| 9.11 Chorioamnionitis (placental histology) | 9 | 1.4 | 9 | 4.8 | 18 | 2.2 |
| 9.12 No chorioamnionitis (placental histology) | 8 | 1.3 | 5 | 2.6 | 13 | 1.6 |
| 9.13 With clinical evidence of chorioamnionitis, no examination of placenta | 1 | 0.2 | 1 | 0.5 | 2 | 0.2 |
| 9.13 With clinical evidence of chorioamnionitis, no examination of placenta | | | | | | |
| 9.17 No clinical signs of chorioamnionitis, no examination of placenta | 4 | 0.6 | 11 | 5.8 | 15 | 1.8 |
| 9.19 Unspecified or not known whether placenta examined | 2 | 0.3 | 2 | 1.1 | 4 | 0.5 |

| | Stillbirths (Fetal death) | | Neonatal death | | Total | |
|---|---|---|---|---|---|---|
| **PSANZ PDC** | **n** | **%** | **n** | **%** | **n** | **%** |
| 9.20 Spontaneous preterm with intact membranes or membrane rupture < 24hrs before delivery | | 0.0 | | 0.0 | 0 | 0.0 |
| 9.21 Chorioamnionitis (placental histology) | 18 | 2.8 | 7 | 3.7 | 25 | 3.0 |
| 9.22 No chorioamnionitis (placental histology) | 6 | 0.9 | 2 | 1.1 | 8 | 1.0 |
| 9.23 With clinical evidence of chorioamnionitis, no examination of placenta | 1 | 0.2 | 6 | 3.2 | 7 | 0.9 |
| 9.27 No clinical signs of chorioamnionitis, no examination of placenta | 3 | 0.5 | 1 | 0.5 | 4 | 0.5 |
| 9.29 Unspecified or not known whether placenta examined | | 0.0 | | 0.0 | 0 | 0.0 |
| 9.31 Chorioamnionitis (placental histology) | 1 | 0.2 | 1 | 0.5 | 2 | 0.2 |
| 9.32 No chorioamnionitis (placental histology) | 0 | 0.0 | 2 | 1.1 | 2 | 0.2 |
| 9.33 With clinical evidence of chorioamnionitis, no examination of placenta | 0 | 0.0 | 1 | 0.5 | 1 | 0.1 |
| 9.37 No clinical signs of chorioamnionitis, no examination of placenta | 1 | 0.2 | 0 | 0.0 | 1 | 0.1 |
| 9.39 Unspecified or not known whether placenta examined | 0 | 0.0 | 1 | 0.5 | 1 | 0.1 |
| **10. Unexplained Antepartum Death** | **93** | **14.7** | **0** | **0** | **93** | **11.3** |
| 10.1 Evidence of uteroplacental insufficiency | 16 | 2.5 | 0 | 0 | 16 | 1.9 |
| 10.2 With chronic villitis | 2 | 0.3 | 0 | 0 | 2 | 0.2 |
| 10.3 No placental pathology | 59 | 9.3 | 0 | 0 | 59 | 7.2 |
| 10.4 No examination of placenta | 8 | 1.3 | 0 | 0 | 8 | 1.0 |
| 10.8 Other specified placental pathology | 5 | 0.8 | 0 | 0 | 5 | 0.6 |
| 10.9 Unspecified or not known whether placenta examined | 3 | 0.5 | 0 | 0 | 3 | 0.4 |
| **11. No Obstetric Antecedent** | **0** | **0.0** | **9** | **4.8** | **9** | **1.1** |
| 11.0 No obstetric antecedent | 0 | 0.0 | 4 | 2.1 | 4 | 0.5 |
| 11.2 Postnatally acquired infection | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 11.13 No obstetric antecedent – Sudden Infant Death Syndrome (SIDS) (SIDS Category II: Infant deaths that meet Category I except for one or more features.) | 0 | 0.0 | 1 | 0.5 | 1 | 0.1 |
| 11.2 No obstetric antecedent – Postnatally acquired infection | 0 | 0.0 | 2 | 1.1 | 2 | 0.2 |
| 11.9 No obstetric precedent – Unknown/ undetermined | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 11.92 No obstetric antecedent – Unknown/ undetermined (Other unknown/undetermined) | 0 | 0.0 | 2 | 1.1 | 2 | 0.2 |
| Total | 633 | 100 | 189 | 100 | 822 | 100 |

**Table 20a: Perinatal deaths (adjusted) in singleton and multiple births by cause (PSANZ PDC), Victoria 2014**

| PSANZ PDC | Singleton | | Multiple | | Total | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| 1. Congenital abnormality | 224 | 34.7 | 22 | 20.0 | 246 | 32.5 |
| 2. Infection | 30 | 4.6 | 5 | 4.5 | 35 | 4.6 |
| 3. Hypertension | 13 | 2.0 | 1 | 0.9 | 14 | 1.9 |
| 4. Antepartum haemorrhage | 64 | 9.9 | 4 | 3.6 | 68 | 9.0 |
| 5. Maternal conditions | 29 | 4.5 | 0 | 0.0 | 29 | 3.8 |
| 6. Specific perinatal conditions | 32 | 5.0 | 24 | 21.8 | 56 | 7.4 |
| 7. Hypoxic peripartum death | 27 | 4.2 | 3 | 2.7 | 30 | 4.0 |
| 8. Fetal growth restriction (FGR) | 45 | 7.0 | 5 | 4.5 | 50 | 6.6 |
| 9. Spontaneous preterm | 68 | 10.5 | 36 | 32.7 | 104 | 13.8 |
| 10. Unexplained antepartum death | 110 | 17.0 | 10 | 9.1 | 120 | 15.9 |
| 11. No obstetric antecedent | 4 | 0.6 | 0 | 0.0 | 4 | 0.5 |
| Total | 646 | 100.0 | 110 | 100.0 | 756 | 100.0 |

**Table 20b: Perinatal deaths (adjusted) in singleton and multiple births by cause (PSANZ PDC), Victoria 2015**

| PSANZ PDC | Singleton | | Multiple | | Total | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| 1. Congenital abnormality | 263 | 40.8 | 11 | 15.5 | 274 | 38.3 |
| 2. Infection | 33 | 5.1 | 5 | 7.0 | 38 | 5.3 |
| 3. Hypertension | 16 | 2.5 | 0 | 0.0 | 16 | 2.2 |
| 4. Antepartum haemorrhage | 43 | 6.7 | 4 | 5.6 | 47 | 6.6 |
| 5. Maternal conditions | 10 | 1.6 | 0 | 0.0 | 10 | 1.4 |
| 6. Specific perinatal conditions | 47 | 7.3 | 13 | 18.3 | 60 | 8.4 |
| 7. Hypoxic peripartum death | 17 | 2.6 | 0 | 0.0 | 17 | 2.4 |
| 8. Fetal growth restriction (FGR) | 46 | 7.1 | 2 | 2.8 | 48 | 6.7 |
| 9. Spontaneous preterm | 73 | 11.3 | 30 | 42.3 | 103 | 14.4 |
| 10. Unexplained antepartum death | 88 | 13.7 | 5 | 7.0 | 93 | 13.0 |
| 11. No obstetric antecedent | 8 | 1.2 | 1 | 1.4 | 9 | 1.3 |
| Total | 644 | 100.0 | 71 | 100.0 | 715 | 100.0 |

**Table 20c: Perinatal deaths (adjusted) by PSANZ PDC and Aboriginal status, Victoria 2003–2015**

| PSANZ PDC | ATSI | | | Non-Aboriginal | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | Count | % | rate | Count | % | rate | Count | % | rate |
| 1. Congenital abnormality | 31 | 16.1 | 3.0 | 2,963 | 32.9 | 3.2 | 2,994 | 32.6 | 3.2 |
| 2. Infection | 4 | 2.1 | 0.4 | 247 | 2.7 | 0.3 | 251 | 2.7 | 0.3 |
| 3. Hypertension | 13 | 6.7 | 1.3 | 256 | 2.8 | 0.3 | 269 | 2.9 | 0.3 |
| 4. Antepartum haemorrhage | 24 | 12.4 | 2.4 | 703 | 7.8 | 0.8 | 727 | 7.9 | 0.8 |
| 5. Maternal conditions | 4 | 2.1 | 0.4 | 244 | 2.7 | 0.3 | 248 | 2.7 | 0.3 |
| 6. Specific perinatal conditions | 13 | 6.7 | 1.3 | 777 | 8.6 | 0.8 | 790 | 8.6 | 0.8 |
| 7. Hypoxic peripartum death | 4 | 2.1 | 0.4 | 263 | 2.9 | 0.3 | 267 | 2.9 | 0.3 |
| 8. Fetal growth restriction | 15 | 7.8 | 1.5 | 591 | 6.6 | 0.6 | 606 | 6.6 | 0.6 |
| 9. Spontaneous preterm | 54 | 28.0 | 5.3 | 1,507 | 16.7 | 1.6 | 1,561 | 17.0 | 1.7 |
| 10. Unexplained antepartum death | 26 | 13.5 | 2.5 | 1,386 | 15.4 | 1.5 | 1,412 | 15.4 | 1.5 |
| 11. No obstetric antecedent | 5 | 2.6 | 0.5 | 63 | 0.7 | 0.1 | 68 | 0.7 | 0.1 |
| Total | 193 | 100.0 | 18.9 | 9,000 | 100.0 | 9.7 | 9,193 | 100.0 | 9.8 |

This table excludes births and perinatal deaths in which Aboriginal status was unknown.
This table is based on data relating to Aboriginal status of infant (not mother) , and therefore may differ from other tables based on Aboriginal status of mother.

**Table 21a: Perinatal deaths as a result of terminations of pregnancy, Victoria 2014**

| Cause of death PSANZ PDC | Stillbirths (Fetal death) | Neonatal death | Total |
|---|---|---|---|
| | n | n | n |
| Termination for suspected or confirmed congenital abnormality | 135 | 37 | 172 |
| Terminations for psychosocial indications | 146 | 1 | 147 |
| Total | 281 | 38 | 319 |

**Table 21b: Perinatal deaths as a result of terminations of pregnancy, Victoria 2015**

| Cause of death PSANZ PDC | Stillbirths (Fetal death) | Neonatal death | Total |
|---|---|---|---|
| | n | n | n |
| Termination for suspected or confirmed congenital abnormality | 171 | 31 | 202 |
| Terminations for psychosocial indications | 107 | 0 | 107 |
| Total | 278 | 31 | 309 |

**Table 22a: Perinatal deaths by PSANZ PDC and gestational age, Victoria 2014**

| PSANZ PDC | 20–27 weeks | | 28–31 weeks | | 32–36 weeks | | 37+ weeks | | Total | | Total excluding PSANZ PDC 5.1[a] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % | n | % |
| 1. Congenital abnormality | 164 | 27.6 | 28 | 35.0 | 26 | 26.0 | 28 | 21.9 | 246 | 27.2 | 246 | 32.5 |
| 2. Infection | 20 | 3.4 | 5 | 6.3 | 2 | 2.0 | 8 | 6.3 | 35 | 3.9 | 35 | 4.6 |
| 3. Hypertension | 9 | 1.5 | 2 | 2.5 | 2 | 2.0 | 1 | 0.8 | 14 | 1.6 | 14 | 1.9 |
| 4. Antepartum haemorrhage | 45 | 7.6 | 7 | 8.8 | 11 | 11.0 | 5 | 3.9 | 68 | 7.5 | 68 | 9.0 |
| 5. Maternal conditions (excluding terminations of pregnancy for psychosocial indications) | 10 | 1.7 | 2 | 2.5 | 11 | 11.0 | 6 | 4.7 | 29 | 3.2 | 29 | 3.8 |
| 5.1 Maternal conditions (terminations for psychosocial indications only) | 146 | 24.5 | 0 | 0.0 | 1 | 1.0 | 0 | 0.0 | 147 | 16.3 | NA | NA |
| 6. Specific perinatal conditions | 35 | 5.9 | 8 | 10.0 | 7 | 7.0 | 6 | 4.7 | 56 | 6.2 | 56 | 7.4 |
| 7. Hypoxic peripartum death | 3 | 0.5 | 3 | 3.8 | 5 | 5.0 | 19 | 14.8 | 30 | 3.3 | 30 | 4.0 |
| 8. Fetal growth restriction | 24 | 4.0 | 10 | 12.5 | 8 | 8.0 | 8 | 6.3 | 50 | 5.5 | 50 | 6.6 |
| 9. Spontaneous preterm | 102 | 17.1 | 1 | 1.3 | 1 | 1.0 | 0 | 0.0 | 104 | 11.5 | 104 | 13.8 |
| 10. Unexplained antepartum death | 37 | 6.2 | 14 | 17.5 | 25 | 25.0 | 44 | 34.4 | 120 | 13.3 | 120 | 15.9 |
| 11. No obstetric antecedent | 0 | 0.0 | 0 | 0.0 | 1 | 1.0 | 3 | 2.3 | 4 | 0.4 | 4 | 0.5 |
| **Total** | **595** | **100.0** | **80** | **100.0** | **100** | **100.0** | **128** | **100.0** | **903** | **100.0** | **756** | **100.0** |

a. Total excluding PSANZ PDC 5.1 (terminations of pregnancy ≥ 20 weeks for psychosocial indications).

NA – not applicable

**Table 22b: Perinatal deaths by PSANZ PDC and gestational age, Victoria 2015**

| PSANZ PDC | 20–27 weeks | | 28–31 weeks | | 32–36 weeks | | 37+ weeks | | Total | | Total excluding PSANZ PDC 5.1[a] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % | n | % |
| 1. Congenital abnormality | 204 | 37.0 | 17 | 26.6 | 32 | 35.6 | 21 | 18.1 | 274 | 33.3 | 274 | 38.3 |
| 2. Infection | 26 | 4.7 | 1 | 1.6 | 4 | 4.4 | 7 | 6.0 | 38 | 4.6 | 38 | 5.3 |
| 3. Hypertension | 6 | 1.1 | 6 | 9.4 | 4 | 4.4 | 0 | 0.0 | 16 | 1.9 | 16 | 2.2 |
| 4. Antepartum haemorrhage | 25 | 4.5 | 5 | 7.8 | 8 | 8.9 | 9 | 7.8 | 47 | 5.7 | 47 | 6.6 |
| 5. Maternal conditions (excluding terminations of pregnancy for psychosocial indications) | 5 | 0.9 | 0 | 0.0 | 2 | 2.2 | 3 | 2.6 | 10 | 1.2 | 10 | 1.4 |
| 5.1 Maternal conditions (terminations for psychosocial indications only) | 107 | 19.4 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 107 | 13.0 | NA | NA |
| 6. Specific perinatal conditions | 29 | 5.3 | 10 | 15.6 | 10 | 11.1 | 11 | 9.5 | 60 | 7.3 | 60 | 8.4 |
| 7. Hypoxic peripartum death | 1 | 0.2 | 0 | 0.0 | 3 | 3.3 | 13 | 11.2 | 17 | 2.1 | 17 | 2.4 |
| 8. Fetal growth restriction | 20 | 3.6 | 12 | 18.8 | 6 | 6.7 | 10 | 8.6 | 48 | 5.8 | 48 | 6.7 |
| 9. Spontaneous preterm | 99 | 17.9 | 1 | 1.6 | 3 | 3.3 | 0 | 0.0 | 103 | 12.5 | 103 | 14.4 |
| 10. Unexplained antepartum death | 30 | 5.4 | 12 | 18.8 | 17 | 18.9 | 34 | 29.3 | 93 | 11.3 | 93 | 13.0 |
| 11. No obstetric antecedent | 0 | 0.0 | 0 | 0.0 | 1 | 1.1 | 8 | 6.9 | 9 | 1.1 | 9 | 1.3 |
| Total | 552 | 100.0 | 64 | 100.0 | 90 | 100.0 | 116 | 100.0 | 822 | 100.0 | 715 | 100.0 |

a. Total excluding PSANZ PDC 5.1 (terminations of pregnancy ≥ 20 weeks for psychosocial indications).

NA – not applicable

**Figure 8a: Causes of perinatal death, PSANZ PDC, Victoria 2014**

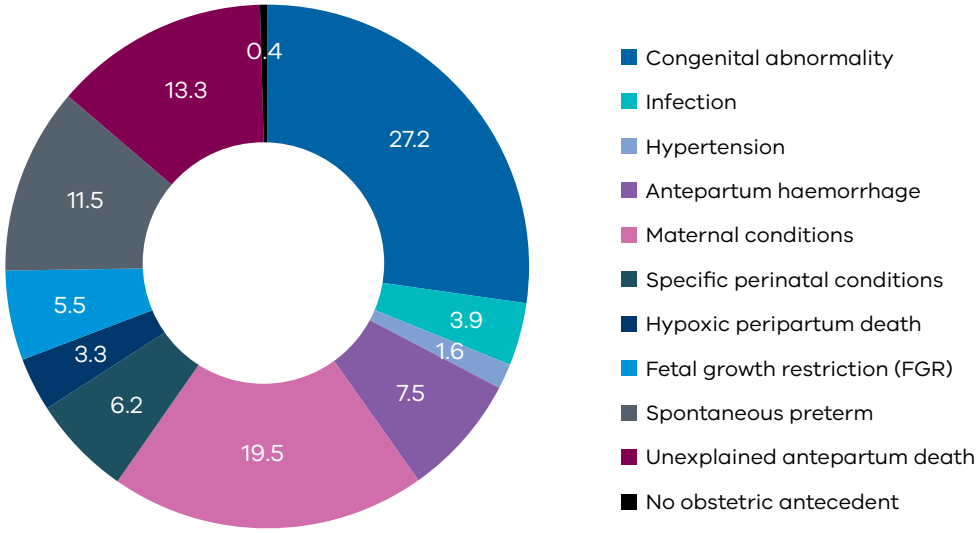



**Figure 8b: Causes of perinatal death, PSANZ PDC, Victoria 2015**

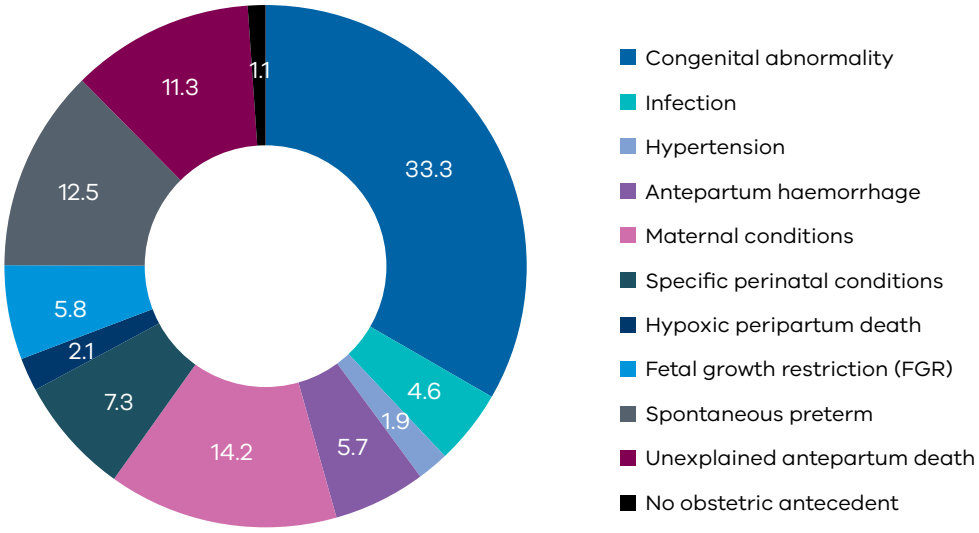



**Figure 9a: Causes of perinatal death (adjusted), PSANZ PDC, Victoria 2014**

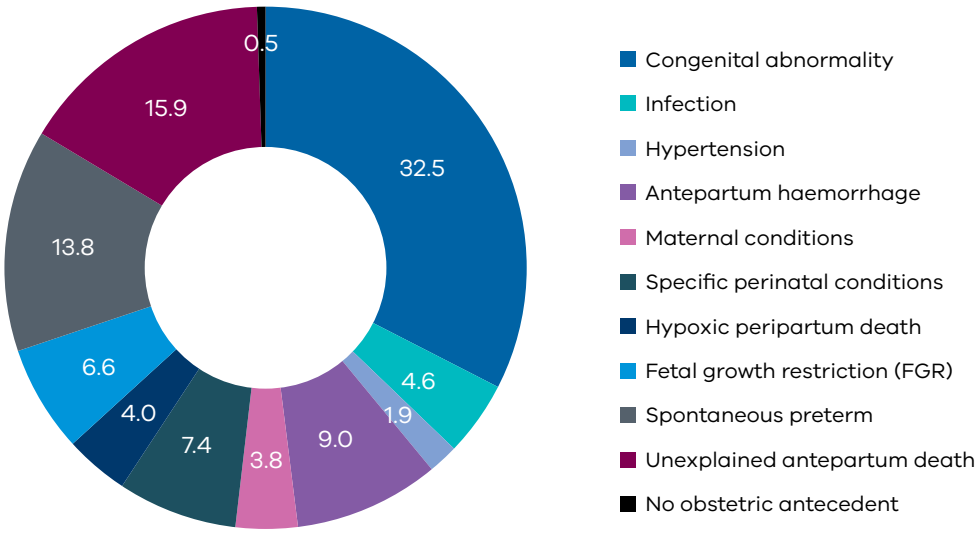


**Figure 9b: Causes of perinatal death (adjusted), PSANZ PDC, Victoria 2015**

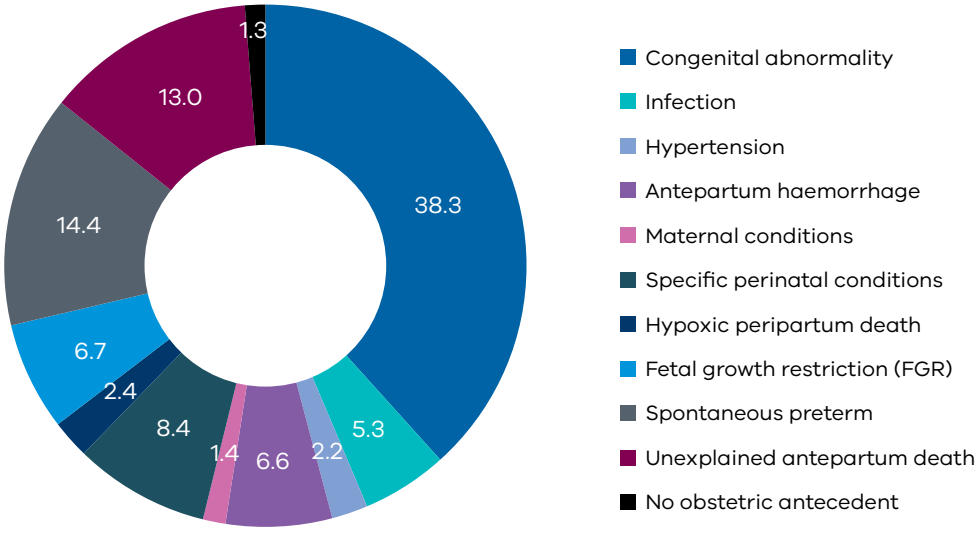



**Table 23a: Stillbirths by PSANZ PDC and gestational age, Victoria 2014**

| PSANZ PDC | 20–27 weeks | | 28–31 weeks | | 32–36 weeks | | 37+ weeks | | Total | | Total excluding PSANZ PDC 5.1[a] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % | n | % |
| 1. Congenital abnormality | 124 | 27.9 | 21 | 35.0 | 17 | 20.2 | 8 | 9.5 | 170 | 25.3 | 170 | 32.3 |
| 2. Infection | 11 | 2.5 | 4 | 6.7 | 2 | 2.4 | 5 | 6.0 | 22 | 3.3 | 22 | 4.2 |
| 3. Hypertension | 7 | 1.6 | 2 | 3.3 | 2 | 2.4 | 1 | 1.2 | 12 | 1.8 | 12 | 2.3 |
| 4. Antepartum haemorrhage | 27 | 6.1 | 5 | 8.3 | 11 | 13.1 | 4 | 4.8 | 47 | 7.0 | 47 | 8.9 |
| 5. Maternal conditions (excluding terminations of pregnancy for psychosocial indications) | 8 | 1.8 | 0 | 0.0 | 11 | 13.1 | 4 | 4.8 | 23 | 3.4 | 23 | 4.4 |
| 5.1 Maternal conditions (terminations for psychosocial indications only) | 145 | 32.7 | 0 | 0.0 | 1 | 1.2 | 0 | 0.0 | 146 | 21.7 | NA | NA |
| 6. Specific perinatal conditions | 21 | 4.7 | 5 | 8.3 | 4 | 4.8 | 3 | 3.6 | 33 | 4.9 | 33 | 6.3 |
| 7. Hypoxic peripartum death | 2 | 0.5 | 0 | 0.0 | 3 | 3.6 | 8 | 9.5 | 13 | 1.9 | 13 | 2.5 |
| 8. Fetal growth restriction | 22 | 5.0 | 9 | 15.0 | 8 | 9.5 | 7 | 8.3 | 46 | 6.8 | 46 | 8.7 |
| 9. Spontaneous preterm | 40 | 9.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 40 | 6.0 | 40 | 7.6 |
| 10. Unexplained antepartum death | 37 | 8.3 | 14 | 23.3 | 25 | 29.8 | 44 | 52.4 | 120 | 17.9 | 120 | 22.8 |
| **Total** | **444** | **100** | **60** | **100** | **84** | **100** | **84** | **100** | **672** | **100** | **526** | **100** |

a. Total excluding PSANZ PDC 5.1 (terminations of pregnancy ≥ 20 weeks for psychosocial indications).
NA – not applicable

**Table 23b: Stillbirths by PSANZ PDC and gestational age, Victoria 2015**

| PSANZ PDC | 20–27 weeks | | 28–31 weeks | | 32–36 weeks | | 37+ weeks | | Total | | Total excluding PSANZ PDC 5.1[a] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % | n | % |
| 1. Congenital abnormality | 172 | 39.2 | 11 | 21.6 | 16 | 24.6 | 9 | 11.5 | 208 | 32.9 | 208 | 39.5 |
| 2. Infection | 17 | 3.9 | 0 | 0.0 | 4 | 6.2 | 5 | 6.4 | 26 | 4.1 | 26 | 4.9 |
| 3. Hypertension | 5 | 1.1 | 5 | 9.8 | 4 | 6.2 | 0 | 0.0 | 14 | 2.2 | 14 | 2.7 |
| 4. Antepartum haemorrhage | 11 | 2.5 | 3 | 5.9 | 5 | 7.7 | 6 | 7.7 | 25 | 3.9 | 25 | 4.8 |
| 5. Maternal conditions (excluding terminations of pregnancy for psychosocial indications) | 4 | 0.9 | 0 | 0.0 | 2 | 3.1 | 3 | 3.8 | 9 | 1.4 | 9 | 1.7 |
| 5.1 Maternal conditions (terminations for psychosocial indications only) | 107 | 24.4 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 107 | 16.9 | NA | NA |
| 6. Specific perinatal conditions | 19 | 4.3 | 7 | 13.7 | 9 | 13.8 | 8 | 10.3 | 43 | 6.8 | 43 | 8.2 |
| 7. Hypoxic peripartum death | 1 | 0.2 | 0 | 0.0 | 2 | 3.1 | 3 | 3.8 | 6 | 0.9 | 6 | 1.1 |
| 8. Fetal growth restriction | 20 | 4.6 | 12 | 23.5 | 6 | 9.2 | 10 | 12.8 | 48 | 7.6 | 48 | 9.1 |
| 9. Spontaneous preterm | 53 | 12.1 | 1 | 2.0 | 0 | 0.0 | 0 | 0.0 | 54 | 8.5 | 54 | 10.3 |
| 10. Unexplained antepartum death | 30 | 6.8 | 12 | 23.5 | 17 | 26.2 | 34 | 43.6 | 93 | 14.7 | 93 | 17.7 |
| **Total** | **439** | **100** | **51** | **100** | **65** | **100** | **78** | **100** | **633** | **100** | **526** | **100** |

a. Total excluding PSANZ PDC 5.1 (terminations of pregnancy ≥ 20 weeks for psychosocial indications: 107 stillbirths).
NA – not applicable

**Figure 10a: Causes of stillbirth, PSANZ PDC, Victoria 2014**

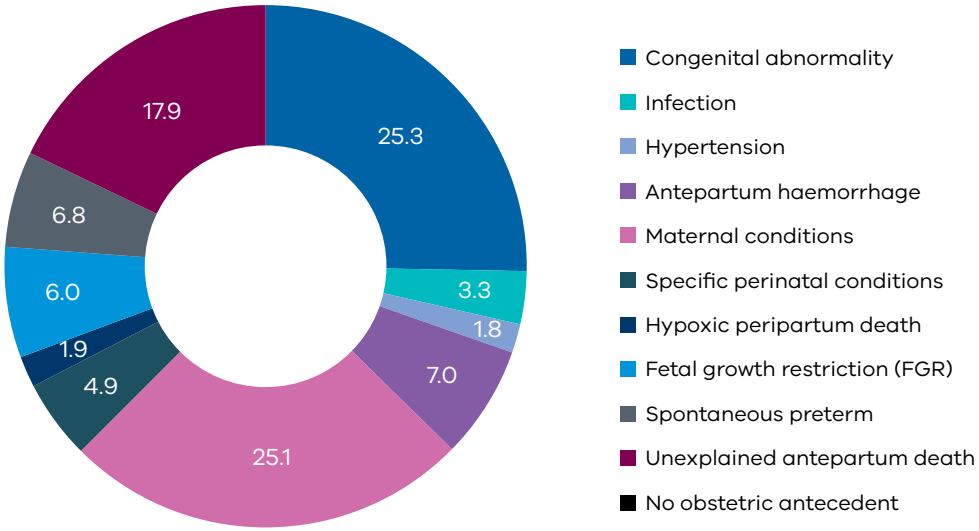


**Figure 10b: Causes of stillbirth, PSANZ PDC, Victoria 2015**

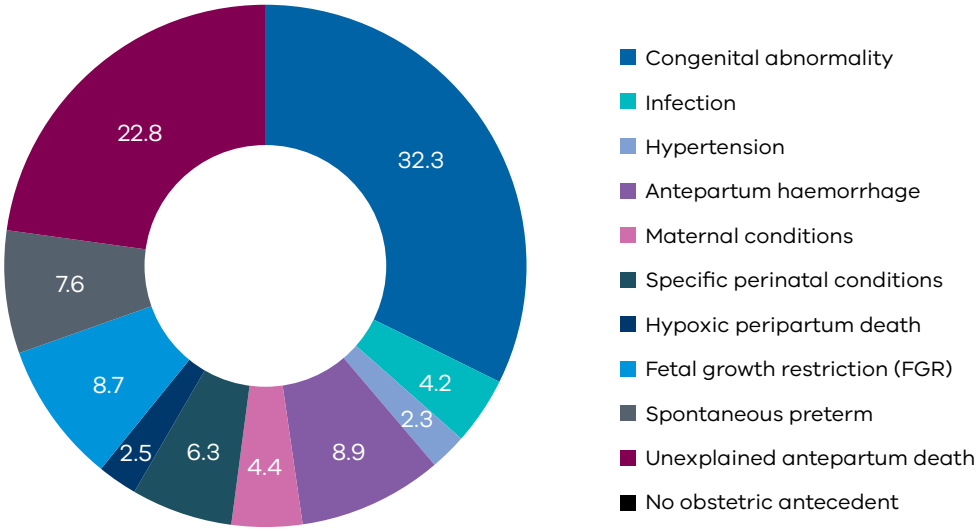



**Figure 11a: Causes of stillbirth (adjusted), PSANZ PDC, Victoria 2014**

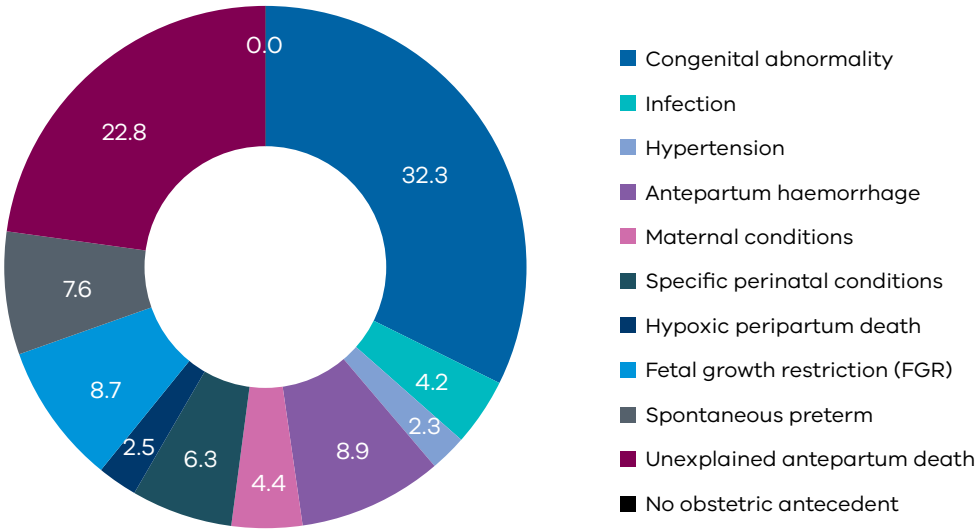



**Figure 11b: Causes of stillbirth (adjusted), PSANZ PDC, Victoria 2015**

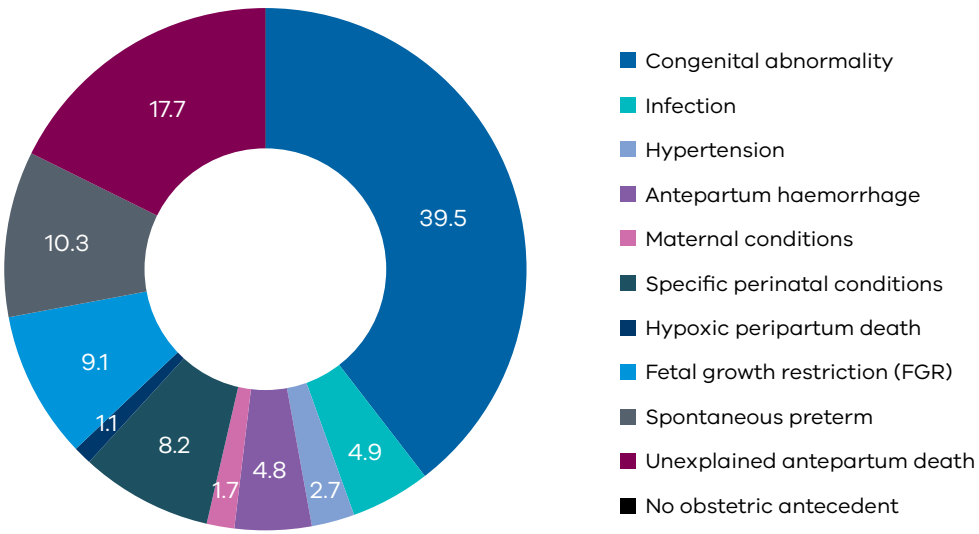


**Table 24a: Neonatal deaths by PSANZ PDC and gestational age, Victoria 2014**

| PSANZ PDC | 20–27 weeks | | 28–31 weeks | | 32–36 weeks | | 37+ weeks | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % |
| 1. Congenital abnormality | 40 | 26.5 | 7 | 35.0 | 9 | 56.3 | 20 | 45.5 | 76 | 32.9 |
| 2. Infection | 9 | 6.0 | 1 | 5.0 | 0 | 0.0 | 3 | 6.8 | 13 | 5.6 |
| 3. Hypertension | 2 | 1.3 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2 | 0.9 |
| 4. Antepartum haemorrhage | 18 | 11.9 | 2 | 10.0 | 0 | 0.0 | 1 | 2.3 | 21 | 9.1 |
| 5. Maternal conditions | 3 | 2.0 | 2 | 10.0 | 0 | 0.0 | 2 | 4.5 | 7 | 3.0 |
| 6. Specific perinatal conditions | 14 | 9.3 | 3 | 15.0 | 3 | 18.8 | 3 | 6.8 | 23 | 10.0 |
| 7. Hypoxic peripartum death | 1 | 0.7 | 3 | 15.0 | 2 | 12.5 | 11 | 25.0 | 17 | 7.4 |
| 8. Fetal growth restriction | 2 | 1.3 | 1 | 5.0 | 0 | 0.0 | 1 | 2.3 | 4 | 1.7 |
| 9. Spontaneous preterm | 62 | 41.1 | 1 | 5.0 | 1 | 6.3 | 0 | 0.0 | 64 | 27.7 |
| 11. No obstetric antecedent | 0 | 0.0 | 0 | 0.0 | 1 | 6.3 | 3 | 6.8 | 4 | 1.7 |
| Total | 151 | 100 | 20 | 100 | 16 | 100 | 44 | 100 | 231 | 100 |

**Table 24b: Neonatal deaths by PSANZ PDC and gestational age, Victoria 2015**

| PSANZ PDC | 20–27 weeks | | 28–31 weeks | | 32–36 weeks | | 37+ weeks | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % |
| 1. Congenital abnormality | 32 | 28.3 | 6 | 46.2 | 16 | 64.0 | 12 | 31.6 | 66 | 34.9 |
| 2. Infection | 9 | 8.0 | 1 | 7.7 | 0 | 0.0 | 2 | 5.3 | 12 | 6.3 |
| 3. Hypertension | 1 | 0.9 | 1 | 7.7 | 0 | 0.0 | 0 | 0.0 | 2 | 1.1 |
| 4. Antepartum haemorrhage | 14 | 12.4 | 2 | 15.4 | 3 | 12.0 | 3 | 7.9 | 22 | 11.6 |
| 5. Maternal conditions | 1 | 0.9 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.5 |
| 6. Specific perinatal conditions | 10 | 8.8 | 3 | 23.1 | 1 | 4.0 | 3 | 7.9 | 17 | 9.0 |
| 7. Hypoxic peripartum death | 0 | 0.0 | 0 | 0.0 | 1 | 4.0 | 10 | 26.3 | 11 | 5.8 |
| 8. Fetal growth restriction | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 9. Spontaneous preterm | 46 | 40.7 | 0 | 0.0 | 3 | 12.0 | 0 | 0.0 | 49 | 25.9 |
| 11. No obstetric antecedent | 0 | 0.0 | 0 | 0.0 | 1 | 4.0 | 8 | 21.1 | 9 | 4.8 |
| Total | 113 | 100.0 | 13 | 100.0 | 25 | 100.0 | 38 | 100.0 | 189 | 100.0 |

**Figure 12a: Causes of neonatal deaths, PSANZ PDC, Victoria 2014**

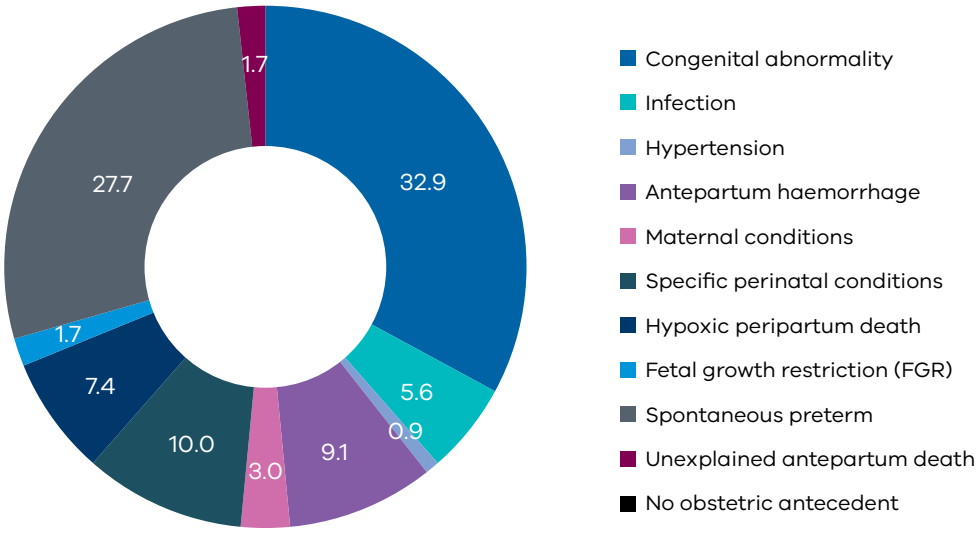



**Figure 12b: Causes of neonatal deaths, PSANZ PDC, Victoria 2015**

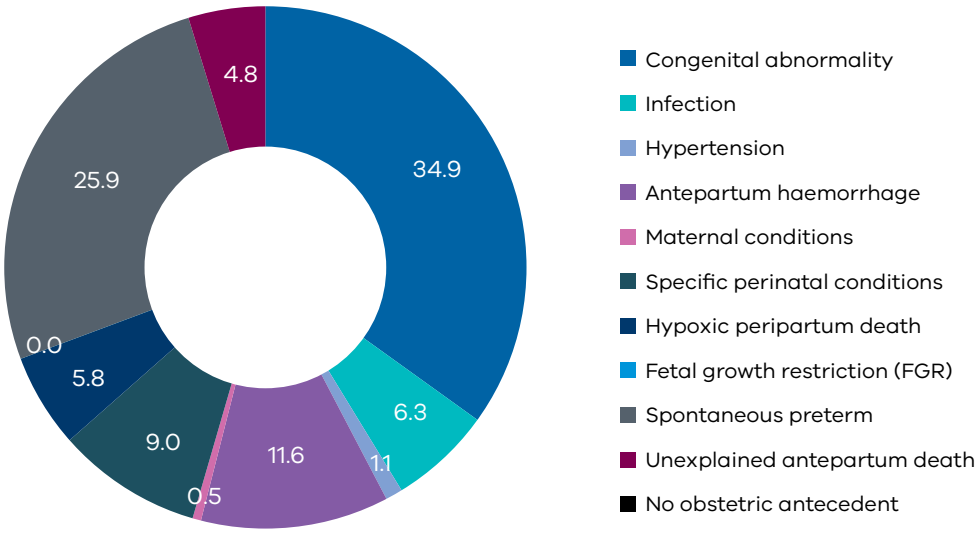


**Table 25a: Neonatal deaths by PSANZ NDC and gestational age, Victoria 2014**

| Cause of death PSANZ NDC | 20–27 weeks | | 28–31 weeks | | 32–36 weeks | | 37+ weeks | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % |
| 1. Congenital abnormality | 40 | 26.5 | 7 | 35.0 | 9 | 56.3 | 20 | 45.5 | 76 | 32.9 |
| 2. Extreme prematurity | 89 | 58.9 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 89 | 38.5 |
| 3. Cardio-respiratory disease | 11 | 7.3 | 2 | 10.0 | 2 | 12.5 | 1 | 2.3 | 16 | 6.9 |
| 4. Infection | 4 | 2.6 | 3 | 15.0 | 1 | 6.3 | 5 | 11.4 | 13 | 5.6 |
| 5. Neurological | 5 | 3.3 | 7 | 35.0 | 3 | 18.8 | 15 | 34.1 | 30 | 13.0 |
| 6. Gastrointestinal | 2 | 1.3 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2 | 0.9 |
| 7. Other | 0 | 0.0 | 1 | 5.0 | 1 | 6.3 | 3 | 6.8 | 5 | 2.2 |
| Total | 151 | 100 | 20 | 100 | 16 | 100 | 44 | 100 | 231 | 100 |

**Table 25b: Neonatal deaths by PSANZ NDC and gestational age, Victoria 2015**

| Cause of death PSANZ NDC | 20–27 weeks | | 28–31 weeks | | 32–36 weeks | | 37+ weeks | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % |
| 1. Congenital abnormality | 32 | 28.3 | 6 | 46.2 | 16 | 64.0 | 12 | 31.6 | 66 | 34.9 |
| 2. Extreme prematurity | 62 | 54.9 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 62 | 32.8 |
| 3. Cardio-respiratory disease | 6 | 5.3 | 2 | 15.4 | 1 | 4.0 | 1 | 2.6 | 10 | 5.3 |
| 4. Infection | 2 | 1.8 | 1 | 7.7 | 1 | 4.0 | 3 | 7.9 | 7 | 3.7 |
| 5. Neurological | 9 | 8.0 | 3 | 23.1 | 4 | 16.0 | 17 | 44.7 | 33 | 17.5 |
| 6. Gastrointestinal | 1 | 0.9 | 0 | 0.0 | 1 | 4.0 | 1 | 2.6 | 3 | 1.6 |
| 7. Other | 1 | 0.9 | 1 | 7.7 | 2 | 8.0 | 4 | 10.5 | 8 | 4.2 |
| Total | 113 | 100 | 13 | 100 | 25 | 100 | 38 | 100.0 | 189 | 100 |

**Table 25c: Neonatal deaths by PSANZ NDC, expanded categories and gestational age, Victoria 2014**

| PSANZ NDC | Gestational age | | | | |
|---|---|---|---|---|---|
| | 20–27 weeks | 28–31 weeks | 32–36 weeks | 37+ weeks | Total |
| | n | n | n | n | n |
| 1. Congenital abnormality | 40 | 7 | 9 | 20 | 76 |
| 1 Congenital abnormality | 0 | 1 | 0 | 0 | 1 |
| 1.1 Central nervous system | 8 | 3 | 2 | 2 | 15 |
| 1.2 Cardiovascular system | 13 | 1 | 2 | 8 | 24 |
| 1.3 Urinary Tract | 3 | 0 | 0 | 1 | 4 |
| 1.5 Chromosomal | 9 | 0 | 1 | 4 | 14 |
| 1.6 Metabolic | 0 | 0 | 0 | 1 | 1 |
| 1.7 Multiple | 2 | 0 | 1 | 0 | 3 |
| 1.81 Musculoskeletal | 3 | 0 | 3 | 1 | 7 |
| 1.82 Respiratory | 0 | 0 | 0 | 1 | 1 |
| 1.83 Diaphragmatic hernia | 1 | 0 | 0 | 2 | 3 |
| 1.84 Haematological | 0 | 1 | 0 | 0 | 1 |
| 1.85 Tumours | 1 | 1 | 0 | 0 | 2 |

| PSANZ NDC | Gestational age | | | | |
|---|---|---|---|---|---|
| | 20–27 weeks | 28–31 weeks | 32–36 weeks | 37+ weeks | Total |
| | n | n | n | n | n |
| **2. Extreme prematurity** | **89** | **0** | **0** | **0** | **89** |
| 2.10 Not resuscitated | 85 | 0 | 0 | 0 | **85** |
| 2.20 Unsuccessful resuscitation | 4 | 0 | 0 | 0 | **4** |
| **3. Cardio-respiratory disease** | **11** | **2** | **2** | **1** | **16** |
| 3.1 Hyaline membrane disease/Respiratory Distress Syndrome | 7 | 0 | 0 | 0 | 7 |
| 3.2 Meconium aspiration syndrome | 0 | 0 | 0 | 1 | 1 |
| 3.3 Primary persistent pulmonary hypertension | 0 | 0 | 1 | 0 | 1 |
| 3.4 Pulmonary hypoplasia | 2 | 1 | 0 | 0 | 3 |
| 3.6 Pulmonary haemorhhage | 0 | 1 | 0 | 0 | 1 |
| 3.8 Other cardio-respiratory | 2 | 0 | 1 | 0 | 3 |
| **4. Infection** | **4** | **3** | **1** | **5** | **13** |
| 4.11 Congenital bacterial | 0 | 1 | 0 | 0 | **1** |
| 4.111 Group B Streptococcus | 1 | 0 | 0 | 0 | **1** |
| 4.112 Bacterial – E coli | 1 | 0 | 0 | 0 | **1** |
| 4.12 Acquired bacterial | | | | | |
| 4.125 Other gram negative bacilli (other than E Coli) | 0 | 2 | 0 | 0 | **2** |
| 4.127 Coagulase negative Staphylococcus | 1 | 0 | 0 | 0 | **1** |
| 4.21 Congenital viral | 0 | 0 | 0 | 1 | **1** |
| 4.228 Other specified viral | 1 | 0 | 0 | 2 | **3** |
| 4.9 Unspecified organism | 0 | 0 | 1 | 2 | **3** |
| **5. Neurological** | **5** | **7** | **3** | **15** | **30** |
| 5.1 Hypoxic ischaemic encephalopathy/perinatal asphyxia | 1 | 3 | 2 | 14 | 20 |
| 5.2 Intracranial haemorrhage | | | | | |
| 5.21 Intraventricular haemorrhage | 4 | 2 | 1 | 0 | 7 |
| 5.23 Subarachnoid haemorrhage | 0 | 0 | 0 | 1 | 1 |
| 5.28 Other intracranial haemorrhage | 0 | 1 | 0 | 0 | 1 |
| 5.8 Other | 0 | 1 | 0 | 0 | 1 |
| **6. Gastrointestinal** | **2** | **0** | **0** | **0** | **2** |
| 6.1 Necrotising enterocolitis | 1 | 0 | 0 | 0 | 1 |
| 6.8 Other | 1 | 0 | 0 | 0 | 1 |
| 7. Other | 0 | 1 | 1 | 3 | 5 |
| 7.2 Multisystem failure | 0 | 0 | 0 | 1 | 1 |
| 7.28 Other specified multisystem failure | 0 | 1 | 0 | 0 | 1 |
| 7.92 Other – Unknown/undetermined (Other unknown/ undetermined) | 0 | 0 | 1 | 2 | 3 |
| **Total** | **151** | **20** | **16** | **44** | **231** |

**Table 25d: Neonatal deaths by PSANZ NDC, expanded categories and gestational age, Victoria 2015**

| PSANZ NDC | Gestational age | | | | |
|---|---|---|---|---|---|
| | 20–27 weeks | 28–31 weeks | 32–36 weeks | 37+ weeks | Total |
| | n | n | n | n | n |
| **1. Congenital abnormality** | **32** | **6** | **16** | **12** | **66** |
| 1.1 Central nervous system | 8 | 1 | 6 | 5 | 20 |
| 1.2 Cardiovascular system | 5 | 1 | 3 | 3 | 12 |
| 1.3 Urinary Tract | 3 | 0 | 2 | 0 | 5 |
| 1.4 Gastrointestinal system | 1 | 0 | 0 | 0 | 1 |
| 1.5 Chromosomal | 6 | 0 | 3 | 2 | 11 |
| 1.6 Metabolic | 0 | 0 | 0 | 0 | 0 |
| 1.7 Multiple | 5 | 2 | 1 | 1 | 9 |
| 1.81 Musculoskeletal | 3 | 1 | 1 | 0 | 5 |
| 1.82 Respiratory | 0 | 0 | 0 | 0 | 0 |
| 1.83 Diaphragmatic hernia | 0 | 0 | 0 | 0 | 0 |
| 1.84 Haematological | 0 | 0 | 0 | 1 | 1 |
| 1.85 Tumours | 0 | 1 | 0 | 0 | 1 |
| 1.88 Other specified congenital abnormality | 1 | 0 | 0 | 0 | 1 |
| **2. Extreme prematurity** | **62** | **0** | **0** | **0** | **62** |
| 2.10 Not resuscitated | 59 | 0 | 0 | 0 | **59** |
| 2.20 Unsuccessful resuscitation | 3 | 0 | 0 | 0 | **3** |
| **3. Cardio-respiratory disease** | **6** | **2** | **1** | **1** | **10** |
| 3.1 Hyaline membrane disease/Respiratory Distress Syndrome | 4 | 0 | 0 | 0 | 4 |
| 3.2 Meconium aspiration syndrome | 0 | 0 | 0 | 0 | 0 |
| 3.3 Primary persistent pulmonary hypertension | 0 | 0 | 0 | 1 | 1 |
| 3.4 Pulmonary hypoplasia | 0 | 1 | 0 | 0 | 1 |
| 3.5 Chronic neonatal lung disease | 1 | 0 | 0 | 0 | 1 |
| 3.6 Pulmonary haemorhhage | 0 | 0 | 0 | 0 | 0 |
| 3.7 Pneumothorax | 0 | 0 | 1 | 0 | 1 |
| 3.8 Other cardio-respiratory | 1 | 1 | 0 | 0 | 2 |
| **4. Infection** | **2** | **1** | **1** | **3** | **7** |
| 4.11 Congenital bacterial | | | | | 0 |
| 4.111 Group B Streptococcus | 0 | 0 | 0 | 1 | 1 |
| 4.118 Other bacterial | 1 | 0 | 0 | 0 | 1 |
| 4.12 Acquired bacterial | | | | | |
| 4.121 Acquired bacterial – Group B Streptococcus | 0 | 0 | 0 | 1 | 1 |
| 4.122 Acquired Bacterial – E coli | 1 | 0 | 0 | 0 | 1 |
| 4.129 Unspecified bacterial | 0 | 0 | 1 | 0 | 1 |
| 4.21 Congenital viral | | | | | |
| 4.218 Other specified viral | 0 | 1 | 0 | 0 | 1 |
| 4.22 Acquired viral | | | | | |
| 4.223 Herpes Simplex Virus | 0 | 0 | 0 | 1 | 1 |

| PSANZ NDC | Gestational age | | | | |
|---|---|---|---|---|---|
| | 20–27 weeks | 28–31 weeks | 32–36 weeks | 37+ weeks | Total |
| | n | n | n | n | n |
| **5. Neurological** | **9** | **3** | **4** | **17** | **33** |
| 5.1 Hypoxic ischaemic encephalopathy/perinatal asphyxia | 2 | 1 | 3 | 14 | 20 |
| 5.2 Intracranial haemorrhage | | | | | |
| 5.21 Intraventricular haemorrhage | 6 | 2 | 0 | 0 | 8 |
| 5.22 Subgaleal haemorrhage | 0 | 0 | 0 | 2 | 2 |
| 5.28 Other intracranial haemorrhage | 1 | 0 | 0 | 1 | 2 |
| 5.8 Other | 0 | 0 | 1 | 0 | 1 |
| **6. Gastrointestinal** | **1** | **0** | **1** | **1** | **3** |
| 6.1 Necrotising enterocolitis | 1 | 0 | 1 | 0 | 2 |
| 6.8 Other | 0 | 0 | 0 | 1 | 1 |
| **7. Other** | **1** | **1** | **2** | **4** | **8** |
| 7.13 SIDS Category II Infant deaths that meet category I except for one or more features | 0 | 0 | 1 | 0 | 1 |
| 7.210 Multisystem failure seoncdary to intrauterine growth restriction | 1 | 0 | 0 | 0 | 1 |
| 7.310 Trauma (accidental) | 0 | 0 | 1 | 1 | 2 |
| 7.920 Other – unknown/undetermined | 0 | 1 | 0 | 3 | 4 |
| **Total** | **113** | **13** | **25** | **38** | **189** |

**Table 26: Trends in maternal and infant characteristics relating to perinatal deaths (PND), Victoria 2007 to 2015 (%)**

| | Perinatal deaths not relating to termination of pregnancy for CA or MPI | | | | | | | | | Termination of pregnancy for suspected or confirmed CA | | | | | | | | | Termination of pregnancy for MPI | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| | n = 568 | n = 569 | n = 583 | n = 607 | n = 550 | n = 539 | n = 595 | n = 584 | n = 513 | n = 181 | n = 150 | n = 196 | n = 175 | n = 195 | n = 198 | n = 179 | n = 172 | n = 202 | n = 164 | n = 178 | n = 214 | n = 191 | n = 183 | n = 132 | n = 179 | n = 147 | n = 107 |
| | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % |
| **Maternal age** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| < 20 years | 5.8 | 4.9 | 6.1 | 5.1 | 5.6 | 2.8 | 6.6 | 4.3 | 3.3 | 2.2 | 2.0 | 2.0 | 2.3 | 2.6 | 2.0 | 0.6 | 0.6 | 1.0 | 38.4 | 36.5 | 26.6 | 28.8 | 31.7 | 25.8 | 21.8 | 18.4 | 16.8 |
| 20–24 years | 13.3 | 14.4 | 13.8 | 13.3 | 12.2 | 12.4 | 12.3 | 11.0 | 13.1 | 12.7 | 13.3 | 7.6 | 12.0 | 8.2 | 9.1 | 5.6 | 9.3 | 7.4 | 29.3 | 30.9 | 32.7 | 31.4 | 25.7 | 28.0 | 31.8 | 32.7 | 41.1 |
| 25–29 years | 25.3 | 25.8 | 24.2 | 25.7 | 25.3 | 24.5 | 25.5 | 23.6 | 25.7 | 25.4 | 32.0 | 21.9 | 26.9 | 27.7 | 26.8 | 22.9 | 23.8 | 23.8 | 15.2 | 12.4 | 19.6 | 19.4 | 21.9 | 17.4 | 14.5 | 19.7 | 15.0 |
| 30–34 years | 28.3 | 14.4 | 24.1 | 28.3 | 28.9 | 32.1 | 26.9 | 33.7 | 31.4 | 26.0 | 26.0 | 42.3 | 31.4 | 30.3 | 33.3 | 37.4 | 36.6 | 39.6 | 5.5 | 9.0 | 9.3 | 11.0 | 12.0 | 13.6 | 16.2 | 15.0 | 15.0 |
| 35–39 years | 21.9 | 25.8 | 23.9 | 19.8 | 22.2 | 20.8 | 22.4 | 20.9 | 21.8 | 28.7 | 21.3 | 23.5 | 21.7 | 25.6 | 20.7 | 24.6 | 19.8 | 24.3 | 6.1 | 4.5 | 7.5 | 6.3 | 4.4 | 8.3 | 11.7 | 8.2 | 8.4 |
| ≥40 years | 5.3 | 6.7 | 7.9 | 7.1 | 5.5 | 7.4 | 6.4 | 5.5 | 4.1 | 5.0 | 5.3 | 2.0 | 5.1 | 5.6 | 8.1 | 8.9 | 9.3 | 4.0 | 2.4 | 3.4 | 4.2 | 2.1 | 4.3 | 6.0 | 2.8 | 6.1 | 3.7 |
| Unknown | 0.0 | 7.9 | 0.0 | 0.7 | 0.4 | 0.0 | 0.0 | 1 | 1.0 | 0.0 | 0.0 | 0.5 | 0.6 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 3.0 | 3.4 | 0.0 | 1.0 | 0.0 | 0.8 | 1.1 | 0.0 | 0.0 |
| **Place of residence** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Victoria | 97.5 | 97.7 | 95.3 | 98.2 | 96.5 | 96.7 | 96.1 | 96.4 | 97.1 | 94.5 | 95.3 | 87.8 | 92.0 | 90.8 | 96.0 | 98.3 | 99.4 | 95.5 | 35.4 | 37.1 | 46.3 | 48.7 | 45.9 | 48.5 | 43.6 | 46.3 | 60.7 |
| Interstate | 2.1 | 2.1 | 4.7 | 1.8 | 3.5 | 3.2 | 3.9 | 3.6 | 2.5 | 4.4 | 3.3 | 12.2 | 8.0 | 9.2 | 4.0 | 1.7 | 0.6 | 4.0 | 51.8 | 49.4 | 53.7 | 48.2 | 45.9 | 50.0 | 49.2 | 46.3 | 36.4 |
| Overseas | 0.4 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.6 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 10.4 | 11.2 | 0.0 | 3.1 | 8.2 | 1.5 | 7.3 | 7.5 | 2.8 |
| Unknown | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.6 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.4 | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Gestation** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20–22 weeks | 26.2 | 27.2 | 23.6 | 26.5 | 24.4 | 28.2 | 26.4 | 28.9 | 31.4 | 76.2 | 67.3 | 61.7 | 54.3 | 63.6 | 56.1 | 61.5 | 55.8 | 61.9 | 48.8 | 48.3 | 51.4 | 51.8 | 51.9 | 59.8 | 72.6 | 59.9 | 72.9 |
| 23–27 weeks | 23.7 | 22.5 | 25.3 | 23.9 | 27.8 | 22.1 | 28.4 | 21.6 | 21.6 | 21.0 | 27.3 | 25.5 | 30.3 | 26.2 | 31.8 | 31.3 | 33.7 | 31.2 | 49.4 | 48.9 | 43.5 | 44.5 | 42.1 | 40.2 | 27.4 | 39.5 | 27.1 |
| ≥28 weeks | 50.1 | 50.1 | 50.9 | 49.6 | 47.8 | 49.7 | 45.2 | 49.5 | 49.5 | 2.2 | 5.3 | 3.9 | 15.4 | 10.3 | 12.1 | 7.3 | 18.0 | 6.9 | 1.2 | 1.1 | 5.1 | 3.7 | 6.0 | 0.0 | 0.0 | 0.7 | 0.0 |
| Unknown | 0.0 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 8.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Infant sex** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Male | 49.2 | 53.1 | 54.4 | 51.7 | 58.5 | 47.1 | 51.8 | 46.9 | 52.2 | 51.0 | 52.0 | 49.5 | 54.3 | 55.9 | 52.0 | 56.4 | 48.8 | 52.0 | 43.0 | 53.0 | 45.6 | 43.5 | 41.0 | 31.8 | 33.5 | 43.5 | 40.2 |
| Female | 49.0 | 45.7 | 43.2 | 46.0 | 39.1 | 50.3 | 46.9 | 50.5 | 45.8 | 46.0 | 47.0 | 46.3 | 43.4 | 41.5 | 46.5 | 41.3 | 45.9 | 46.5 | 51.0 | 38.0 | 41.9 | 43.5 | 44.8 | 34.8 | 36.3 | 35.4 | 44.9 |
| Indeterminate | 0.0 | 0.0 | 1.9 | 2.3 | 2.2 | 2.6 | 1.3 | 2.1 | 1.9 | 2.0 | 1.0 | 1.0 | 2.3 | 2.6 | 1.0 | 2.3 | 4.7 | 1.5 | 0.0 | 0.0 | 1.4 | 8.4 | 10.9 | 28.8 | 28.5 | 21.1 | 15.0 |
| Unknown | 1.8 | 1.2 | 0.5 | 0.0 | 0.2 | 0.0 | 0.0 | 0.5 | 0.0 | 1.0 | 0.0 | 3.2 | 0.0 | 0.0 | 0.5 | 0.0 | 0.6 | 0.0 | 6.0 | 9.0 | 11.2 | 4.7 | 3.3 | 4.5 | 1.7 | 0.0 | 0.0 |

### Table 27a: Time of fetal death in stillbirths (by gestational age), Victoria 2014

| Gestation (weeks) | Prior to labour | | During labour | | Total | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| 20–21 | 47 | 14.5 | 30 | 45.5 | 77 | 19.7 |
| 22–23 | 38 | 11.7 | 12 | 18.2 | 50 | 12.8 |
| 24–25 | 28 | 8.6 | 6 | 9.1 | 34 | 8.7 |
| 26–27 | 20 | 6.2 | 1 | 1.5 | 21 | 5.4 |
| 28–31 | 48 | 14.8 | 1 | 1.5 | 49 | 12.5 |
| 32–36 | 75 | 23.1 | 3 | 4.5 | 78 | 19.9 |
| 37+ | 69 | 21.2 | 13 | 19.7 | 82 | 21.0 |
| **Total** | **325** | **100.0** | **66** | **100.0** | **391** | **100.0** |

Terminations of pregnancy for suspected or confirmed congenital abnormality and maternal psychosocial indications have been excluded from this table.
Time of fetal death data is provided by the VPDC. This is a compulsory field on the birth form so there are no missing or unknown cases.

### Table 27b: Time of fetal death in stillbirths (by gestational age), Victoria 2015

| Gestation (weeks) | Prior to labour | | During labour | | Total | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| 20–21 | 55 | 19.2 | 25 | 36.8 | 80 | 22.5 |
| 22–23 | 30 | 10.5 | 22 | 32.4 | 52 | 14.6 |
| 24–25 | 15 | 5.2 | 4 | 5.9 | 19 | 5.4 |
| 26–27 | 23 | 8.0 | 1 | 1.5 | 24 | 6.8 |
| 28–31 | 39 | 13.6 | 4 | 5.9 | 43 | 12.1 |
| 32–36 | 58 | 20.2 | 2 | 2.9 | 60 | 16.9 |
| 37+ | 67 | 23.3 | 10 | 14.7 | 77 | 21.7 |
| **Total** | **287** | **100.0** | **68** | **100.0** | **355** | **100.0** |

Terminations of pregnancy for suspected or confirmed congenital abnormality and maternal psychosocial indications have been excluded from this table.
Time of fetal death data is provided by the VPDC. This is a compulsory field on the birth form so there are no missing or unknown cases.

**Table 28a: Age at time of death of neonates, Victoria 2014**

| Gestation (weeks) | Early neonatal death 0–6 days | Late neonatal death 7–27 days | Total |
|---|---|---|---|
| 20–21 | 39 | 0 | 39 |
| 22–23 | 42 | 0 | 42 |
| 24–25 | 17 | 6 | 23 |
| 26–27 | 6 | 3 | 9 |
| 28–31 | 12 | 8 | 20 |
| 32–36 | 11 | 5 | 16 |
| 37+ | 27 | 17 | 44 |
| Total | 154 | 39 | 193 |
| % of Total | 79.8 | 20.2 | 100 |

Neonatal deaths that were a result of termination of pregnancy for maternal psychosocial indications or suspected or confirmed congenital abnormality are excluded from this table.

**Table 28b: Age at time of death of neonates, Victoria 2015**

| Gestation (weeks) | Early neonatal death 0–6 days | Late neonatal death 7–27days | Total |
|---|---|---|---|
| 20–21 | 30 | 0 | 30 |
| 22–23 | 29 | 1 | 30 |
| 24–25 | 11 | 5 | 16 |
| 26–27 | 4 | 2 | 6 |
| 28–31 | 10 | 3 | 13 |
| 32–36 | 15 | 10 | 25 |
| 37+ | 28 | 10 | 38 |
| Total | 127 | 31 | 158 |
| % of Total | 80.4 | 19.6 | 100.0 |

Neonatal deaths that were a result of termination of pregnancy for maternal psychosocial indications or suspected or confirmed congenital abnormality are excluded from this table.

**Figure 13: Perinatal autopsy rates (adjusted), Victoria 2000–2015**

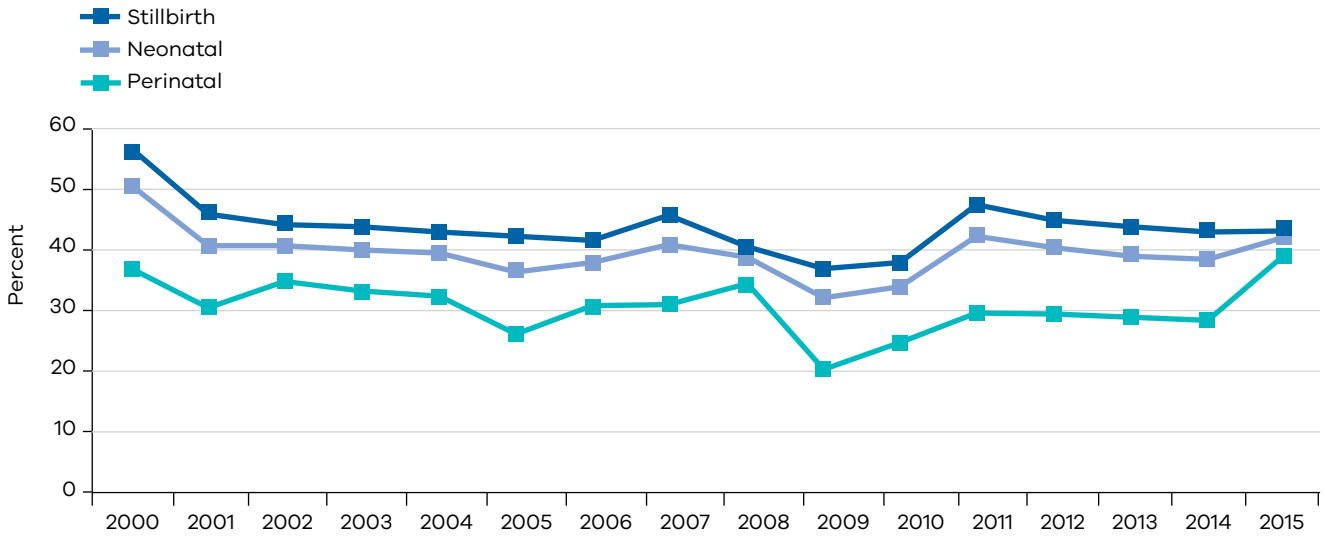



**Table 29: Adjusted perinatal autopsy rates, Victoria 2000–2015**

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stillbirth (%) | 56.6 | 45.9 | 44.2 | 43.8 | 42.9 | 42.2 | 41.6 | 45.7 | 40.5 | 36.9 | 37.9 | 47.5 | 44.8 | 43.8 | 42.9 | 43.2 |
| Neonatal (%) | 36.8 | 30.4 | 34.8 | 33.3 | 32.4 | 26.1 | 30.8 | 31.0 | 34.4 | 20.3 | 24.7 | 29.6 | 29.5 | 28.9 | 28.3 | 39.2 |
| Perinatal (%) | 50.5 | 40.6 | 40.7 | 40.0 | 39.4 | 36.4 | 37.9 | 40.9 | 38.7 | 32.1 | 33.9 | 42.2 | 40.4 | 39.0 | 38.5 | 42.1 |

**Table 30a: Placental pathology, Victoria 2014**

| Placental pathology available | n | % |
|---|---|---|
| Yes | 526 | 69.6 |
| No | 128 | 16.9 |
| Missing/unknown | 102 | 13.5 |
| **Total** | **756** | **100.0** |

**Table 30b: Placental pathology, Victoria 2015**

| Placental pathology available | n | % |
|---|---|---|
| Yes | 482 | 67.4 |
| No | 124 | 17.3 |
| Missing/Unknown | 109 | 15.2 |
| **Total** | **715** | **100.0** |

**Table 31: Contributing factors in perinatal deaths (birthweight ≥ 500 g), Victoria 2012–2015**

| Suspected Contributing factor | Count of contributing factor identified | | | | Total perinatal deaths | % of Total |
|---|---|---|---|---|---|---|
| | Stillbirths | % of stillbirth factors identified | Neonates | % of neonatal death factors identified | | |
| Obstetric factors | | | | | | |
| **Antenatal care:** | **49** | **26.9** | **14** | **9.9** | **63** | **19.5** |
| Delay or lack of consultation in high-risk pregnancy | 12 | 6.6 | 5 | 3.5 | 17 | 5.3 |
| Inadequate care of diabetic mother | 18 | 9.9 | 0 | 0 | 18 | 5.6 |
| Insufficient antenatal care | 18 | 9.9 | 8 | 5.7 | 26 | 8 |
| Cervical incompetence | 1 | 0.5 | 0 | 0 | 1 | 0.3 |
| No clinical evidence apparent | 0 | 0 | 1 | 0.7 | 1 | 0.3 |
| **Inadequate management of:** | **24** | **13.2** | **3** | **2.1** | **27** | **8.4** |
| Hypertension/PET/eclampsia | 1 | 0.5 | 0 | 0 | 1 | 0.3 |
| Multiple pregnancy | 1 | 0.5 | 0 | 0 | 1 | 0.3 |
| Growth-restricted fetus | 15 | 8.2 | 2 | 1.4 | 17 | 5.3 |
| Macrosomia | 2 | 1.1 | 0 | 0 | 2 | 0.6 |
| Inadequate management of Rh immunised mother | 1 | 0.5 | 0 | 0 | 1 | 0.3 |
| Prolonged pregnancy | 1 | 0.5 | 0 | 0 | 1 | 0.3 |
| Premature rupture of membranes | 2 | 1.1 | 1 | 0.7 | 3 | 0.9 |
| Cervical incompetence | 1 | 0.5 | 0 | 0 | 1 | 0.3 |
| **Inadequate antenatal monitoring:** | **25** | **13.7** | **11** | **7.8** | **36** | **11.1** |
| Clinical need for test apparent | 8 | 4.4 | 3 | 2.1 | 11 | 3.4 |
| Misinterpretation of or undue reliance on tests | 17 | 9.3 | 8 | 5.7 | 25 | 7.7 |
| Failure of transfer of patient | | | | | | |
| PRM < 34 weeks | 0 | 0 | 0 | 0 | 0 | 0 |
| PET < 34 weeks | 0 | 0 | 0 | 0 | 0 | 0 |
| **Factors relating to the pregnant woman, her family and her social situation** | **49** | **26.9** | **18** | **12.8** | **67** | **20.7** |
| Inappropriate maternal drugs | 5 | 2.7 | 7 | 5 | 12 | 3.7 |
| Failure/delay in reporting decreased movements | 13 | 7.1 | 1 | 0.7 | 14 | 4.3 |
| Family neglect or ignorance | 25 | 13.7 | 8 | 5.7 | 33 | 10.2 |
| Maternal smoking | 6 | 3.3 | 2 | 1.4 | 8 | 2.5 |
| **Intrapartum care:** | **29** | **15.9** | **50** | **35.5** | **79** | **24.5** |
| Caesarean section too late | 6 | 3.3 | 9 | 6.4 | 15 | 4.6 |
| Failure to perform caesarean section | 0 | 0 | 3 | 2.1 | 3 | 0.9 |
| Failure to expedite delivery | 13 | 7.1 | 16 | 11.3 | 29 | 9 |
| Inadequate intrapartum monitoring | 8 | 4.4 | 16 | 11.3 | 24 | 7.4 |
| Surgical induction too late | 1 | 0.5 | 2 | 1.4 | 3 | 0.9 |
| Unsuitable hospital for delivery | 0 | 0 | 3 | 2.1 | 3 | 0.9 |
| Forceps delivery | 1 | 0.5 | 1 | 0.7 | 2 | 0.6 |

| Suspected Contributing factor | Count of contributing factor identified | | | | Total perinatal deaths | % of Total |
|---|---|---|---|---|---|---|
| | Stillbirths | % of stillbirth factors identified | Neonates | % of neonatal death factors identified | | |
| **Inadequate intrapartum management of:** | **6** | **3.3** | **10** | **7.1** | **16** | **5** |
| Sepsis | 1 | 0.5 | 1 | 0.7 | 2 | 0.6 |
| Breech/other malpresentation | 0 | 0 | 1 | 0.7 | 1 | 0.3 |
| Obstructed labour | 0 | 0 | 3 | 2.1 | 3 | 0.9 |
| Fetal distress | 1 | 0.5 | 2 | 1.4 | 3 | 0.9 |
| Other maternal factor (includes poor compliance) | 4 | 2.2 | 1 | 0.7 | 5 | 1.5 |
| Haemorrhage | 0 | 0 | 2 | 1.4 | 2 | 0.6 |
| **Paediatric factors[a]:** | | | | | | |
| **Delay in recognition/treatment of:** | | | **23** | **16.3** | **23** | **7.1** |
| Delay or lack of consultation | | | 9 | 6.4 | 9 | 2.8 |
| Delay/difficulties/failure to transfer infant | | | 4 | 2.8 | 4 | 1.2 |
| Family neglect or ignorance | | | 5 | 3.5 | 5 | 1.5 |
| Malformation | | | 2 | 1.4 | 2 | 0.6 |
| Sepsis | | | 3 | 2.1 | 3 | 0.9 |
| **Inadequate:** | | | **9** | **6.4** | **9** | **2.8** |
| Paediatric management | | | 4 | 2.8 | 4 | 1.2 |
| Resuscitation | | | 4 | 2.8 | 4 | 1.2 |
| Nursery care | | | 1 | 0.7 | 1 | 0.3 |
| **Inadequate management of:** | | | **3** | **2.1** | **3** | **0.9** |
| Haemorrhage | | | 3 | 2.1 | 3 | 0.9 |
| **Total number of preventable factors identified** | **182** | **100** | **141** | **100** | **323** | **100** |
| **Total number of cases** | **109** | | **59** | | **168** | |

a. There are no paediatric factors in stillbirths.

## Definitions, methods and measures

### Congenital anomaly/congenital abnormality

A congenital anomaly is any anomaly of prenatal origin, arising from conception or occurring before the end of pregnancy.

This includes structural, functional, genetic, chromosomal and biochemical anomalies.

PSANZ uses the wording 'congenital abnormality', and where PSANZ codes are used in this report, 'congenital abnormality' is used.

CCOPMM uses the wording 'congenital anomaly' in other areas of this report.

### Perinatal death

Perinatal deaths refer to stillbirths and live births with only brief survival and are grouped on assumption that similar factors are associated with these losses.

CCOPMM defines perinatal death to include stillbirth and neonatal deaths within 28 days of birth of infants of gestation ≥ 20 weeks gestation or if gestation is unknown, of birthweight ≥ 400 g.

For national statistics, CCOPMM also reports on perinatal deaths of infants with a birthweight of ≥ 500 g or, if the birthweight is unknown, infants of ≥ 22 weeks gestation.

This definition has certain advantages because it excludes from the calculation those mostly pre-viable live births of < 500 g and also the majority of cases where the pregnancy was terminated for fetal or maternal indications.

For international comparison as recommended by WHO, only fetuses and infants of at least 1,000 g birthweight, or where birthweight is unavailable, the corresponding gestational age (28 weeks) or body length (35 cm crown-heel) are included in the perinatal mortality ratio.

# Appendix 7: Post-neonatal infant, child and adolescent deaths in Victoria 2014 and 2015

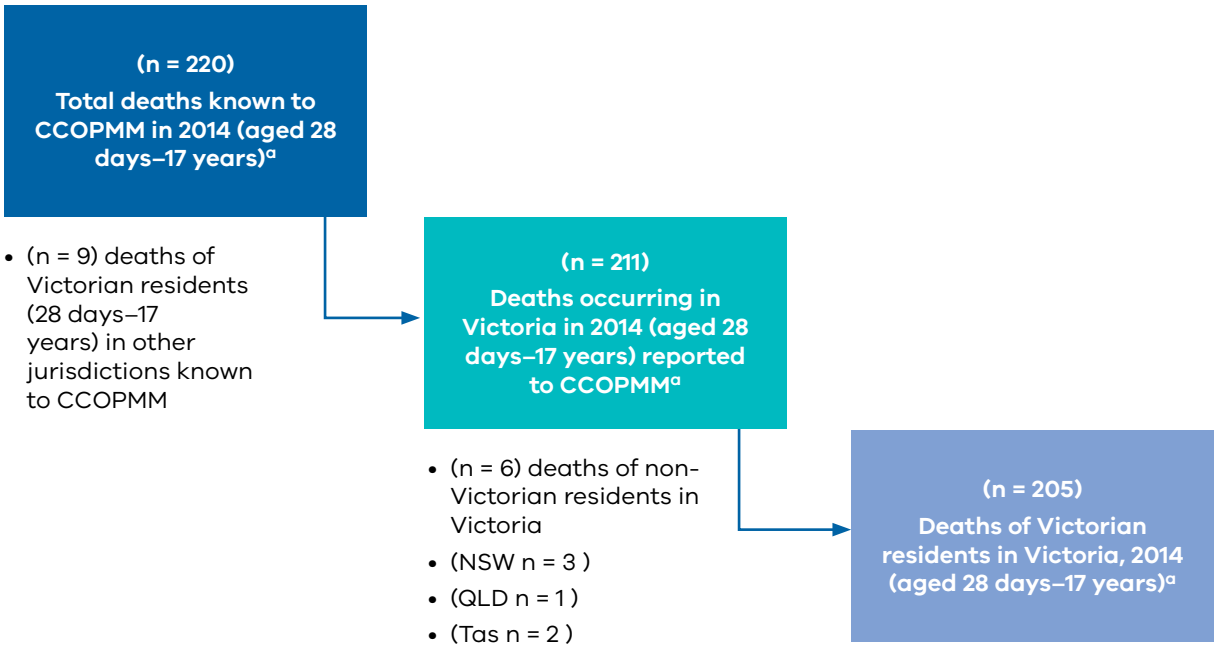
## Contents



## List of tables

## List of figures

**Figure 1a: Cases included in the review of post-neonatal infant, child and adolescent deaths in 2014[a]**




a. Neonatal deaths 0-27 days are not included in this section.

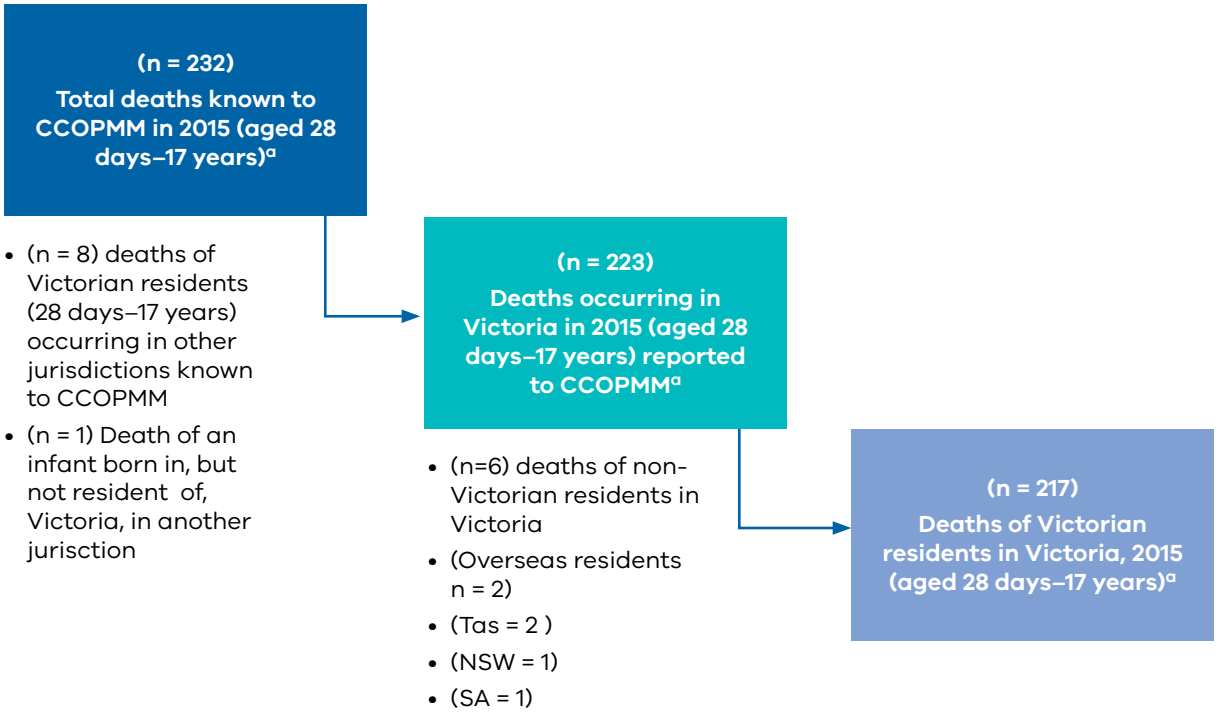
There were 9 deaths of Victorian residents in other jurisdictions (overseas 3 and interstate 6). The cause of death was other transport accident (5), drowning (1) , malignancy (1), asphyxiation (1) and diseases and morbid conditions (1). The age groups of these children were 28-364 days (1), 1-4 years (1), 5-9 years (4), 10-14 years (2) and 15-17 years (1).

There were 6 deaths in Victoria of post-neonatal infants and children not resident in Victoria. The causes of death were motor vehicle accident (2), malignancy (1), infection (1), other acquired illness (1) and intentional self-harm (1). The place of residence was listed as NSW (3), Tasmania (2) and QLD (1).

Aboriginal status: Where Aboriginal status was known, fewer than 10 infants and children/adolescents were identified as Aboriginal or Torres Strait Islander, or were identified as having at least one parent who was ATSI. The causes of death in these infants and children were congenital anomaly, SIDS, infection, other conditions determined at birth and undetermined.

Data on Victorian residents dying in other jurisdictions received from:
ACT – Child and Young People Death Review Committee
NSW – NSW Ombudsman
NT – NT Child Deaths Review and Prevention Committee
QLD – Queensland Family and Child Commission
SA – SA Child Death and Serious Injury Review Committee
TAS – Council on Obstetric and Paediatric Mortality and Morbidity

**Figure 1b: Cases included in the review of post-neonatal infant, child and adolescent deaths in 2015[a]**




a. Neonatal deaths 0-27 days are not included in this section.

There were 8 deaths of Victorian residents in other jurisdictions (overseas 2 and interstate 6). The cause of death was congenital anomaly (3), other injury (3), transport related (1) and undetermined (1). The age groups of these children were 28-364 days (1), 1-4 years (4), 10-14 years (1) and 15-17 years (2).

There was one death of an infant, born in Victoria (to non-Victorian resident parents), resident in another state, who is known to have died interstate (NSW).

There were 6 deaths in Victoria of post-neonatal infants and children not resident in Victoria. The causes of death were motor vehicle accident (2), malignancy (1), infection (1), other acquired illness (1) and intentional self-harm (1). The place of residence was listed as overseas residents (2), Tasmania (2) NSW (1) and SA (1).

Aboriginal status: Where Aboriginal status was known, fewer than 10 infants and children/adolescents were identified as Aboriginal or Torres Strait Islander, or were identified as having at least one parent who was ATSI. The causes of death in these infants and children were congenital anomaly, SIDS and intentional self-harm.

Data on Victorian residents dying in other jurisdictions received from:
ACT – Child and Young People Death Review Committee
NSW – NSW Ombudsman
NT – NT Child Deaths Review and Prevention Committee
QLD – Queensland Family and Child Commission
SA – SA Child Death and Serious Injury Review Committee
Tas – Council on Obstetric and Paediatric Mortality and Morbidity

## Rates of death by age and gender

**Table 1a: Infant, child and adolescent deaths (0–17 years), age at death by gender, Victoria 2014**

| Age at death | Females | | Males | | Total | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| Under 1 year | | | | | | |
| Less than 28 days | 112 | *56.0* | 81 | *40.9* | 193 | *48.5* |
| ≥ 28 days to < 1 year | 28 | *14.0* | 44 | *22.2* | 72 | *18.1* |
| ***Subtotal 0–1 year*** | ***140*** | ***70.0*** | ***125*** | ***63.1*** | ***265*** | ***66.6*** |
| 1 to 4 years | 20 | *10.0* | 25 | *12.6* | 45 | *11.3* |
| ***Subtotal 0–4 years*** | ***160*** | ***80.0*** | ***150*** | ***75.8*** | ***310*** | ***77.9*** |
| 5 to 9 years | 15 | *7.5* | 13 | *6.6* | 28 | *7.0* |
| 10 to 14 years | 11 | *5.5* | 12 | *6.1* | 23 | *5.8* |
| 15 to 17 years | 14 | *7.0* | 23 | *11.6* | 37 | *9.3* |
| ***Subtotal 1–17 years*** | ***60*** | ***30.0*** | ***73*** | ***36.9*** | ***133*** | ***33.4*** |
| **Total: 0–17 years[a]** | **200** | **100.0** | **198** | **100.0** | **398** | **100.0** |

a. This table excludes:
- Live births < 20 w gestation, or, if gestation unknown, < 400 gm
- Neonates where birth occurred interstate or overseas, with death occurring in Victoria (N = 1)
- Neonatal deaths following termination of pregnancy for suspected or confirmed congenital anomaly or maternal psychosocial indication
- Post-neonatal infants, children and adolescents not resident of Victoria, dying in Victoria (N = 6)
- Victorian resident children dying out of Victoria (N = 9).

**Table 1b: Infant, child and adolescent deaths (0–17 years), age at death by gender, Victoria 2015**

| Age at death | Females | | Males | | Total | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| Under 1 year | | | | | | |
| Less than 28 days | 69 | 42.9 | 89 | 41.6 | 158 | 42.1 |
| ≥ 28 days to < 1 year | 29 | 18.0 | 33 | 15.4 | 62 | 16.5 |
| ***Subtotal 0–1 year*** | ***98*** | ***60.9*** | ***122*** | ***57.0*** | ***220*** | ***58.7*** |
| 1–4 years | 22 | 13.7 | 26 | 12.1 | 48 | 12.8 |
| ***Subtotal 0–4 years*** | ***120*** | ***74.5*** | ***148*** | ***69.2*** | ***268*** | ***71.5*** |
| 5–9 years | 8 | 5.0 | 8 | 3.7 | 16 | 4.3 |
| 10–14 years | 17 | 10.6 | 18 | 8.4 | 35 | 9.3 |
| 15–17 years | 16 | 9.9 | 40 | 18.7 | 56 | 14.9 |
| ***Subtotal 1–17 years*** | ***63*** | ***39.1*** | ***92*** | ***43.0*** | ***155*** | ***41.3*** |
| **Total: 0–17 years[a]** | **161** | **100.0** | **214** | **100.0** | **375** | **100.0** |

a. This table excludes:
- Live births < 20 w gestation, or, if gestation unknown, < 400 gm
- Neonates where birth occurred interstate or overseas, with death occurring in Victoria (N = 0)
- Neonatal deaths following termination of pregnancy for suspected or confirmed congenital anomaly
- Post-neonatal infants, children and adolescents not resident of Victoria, dying in Victoria (N = 6)
- Victorian resident children dying out of Victoria (N = 8)
- One infant, born in Victoria but resident elsewhere, dying interstate.

**Table 2a: Infant, child and adolescent deaths (0–17 years), death rates for age group by gender, Victoria 2014**

| Age category | Females | | Males | | Total | |
|---|---|---|---|---|---|---|
| | n | Rate per 100,000a | n | Rate per 100,000[a] | n | Rate per 100,000[a] |
| Less than 28 days | 112 | 300.2 | 81 | 206.9 | 193 | 252.4 |
| ≥ 28 days to < 1 year | 28 | 75.0 | 44 | 112.4 | 72 | 94.2 |
| *Subtotal 0–1 year* | *140* | *375.2* | *125* | *319.3* | *265* | *346.6* |
| 1 to 4 years | 20 | 13.7 | 25 | 16.2 | 45 | 15.0 |
| *Subtotal 0–4 years* | *160* | *87.4* | *150* | *77.6* | *310* | *82.3* |
| 5 to 9 years | 15 | 8.6 | 13 | 7.1 | 28 | 7.8 |
| 10 to 14 years | 11 | 6.7 | 12 | 7.0 | 23 | 6.8 |
| 15 to 17 years | 14 | 13.9 | 23 | 21.5 | 37 | 17.8 |
| *Subtotal 1–17 years* | *60* | *10.3* | *73* | *11.8* | *133* | *11.1* |
| Total: 0–17 years | 200 | 32.1 | 198 | 30.2 | 398 | 31.1 |

Notes: Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016

This table excludes:

- Live births < 20 w gestation, or, if gestation unknown, < 400 gm
- Neonates where birth occurred interstate or overseas, with death occurring in Victoria (N = 1)
- Neonatal deaths following termination of pregnancy for suspected or confirmed congenital anomaly or maternal psychosocial indication
- Post-neonatal infants, children and adolescents not resident of Victoria, dying in Victoria (N = 6)
- Victorian resident children dying elsewhere (N = 9).

**Table 2b: Infant, child and adolescent deaths (0–17 years), death rates for age group by gender, Victoria 2015**

| Age category | Females | | Males | | Total | |
|---|---|---|---|---|---|---|
| | n | Rate per 100,000[a] | n | Rate per 100,000[a] | n | Rate per 100,000[a] |
| Less than 28 days | 69 | 195.7 | 89 | 239.1 | 158 | 218.0 |
| ≥ 28 days to < 1 year | 29 | *82.3* | 33 | *88.6* | 62 | *85.5* |
| *Subtotal 0–1 year* | *98* | *278.0* | *122* | *327.7* | *220* | *303.5* |
| 1 to 4 years | 22 | 14.8 | 26 | 16.5 | 48 | 15.7 |
| *Subtotal 0–4 years* | *120* | *65.3* | *148* | *76.1* | *268* | *70.9* |
| 5 to 9 years | 8 | 4.5 | 8 | 4.3 | 16 | 4.4 |
| 10 to 14 years | 17 | 10.3 | 18 | 10.3 | 35 | 10.3 |
| 15 to 17 years | 16 | 15.7 | 40 | 37.5 | 56 | 26.9 |
| *Subtotal 1–17 years* | *63* | *10.6* | *92* | *14.7* | *155* | *12.7* |
| Total: 0–17 years | 161 | 25.6 | 214 | 32.2 | 375 | 29.0 |

Notes: Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016

This table excludes:

- Live births < 20 w gestation, or, if gestation unknown, < 400 gm
- Neonates where birth occurred interstate or overseas, with death occurring in Victoria (N = 0)
- Neonatal deaths following termination of pregnancy for suspected or confirmed congenital anomaly
- Post-neonatal infants, children and adolescents not resident of Victoria, dying in Victoria (N = 6)
- Victorian resident children dying elsewhere (N = 8)
- One infant, born in Victoria but resident elsewhere, dying interstate.

## Infant mortality rate

**Table 3: Neonatal, post-neonatal and infant mortality rates, Victoria 2000–2015 (by calendar year of birth)**

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Live births[a] | 62,127 | 61,670 | 62,658 | 62,987 | 63,047 | 65,996 | 69,187 | 71,728 | 71,811 | 724,32 | 73,731 | 73,349 | 77,659 | 77,566 | 78,400 | 78,606 |
| Neonatal deaths[a] | 154 | 169 | 197 | 196 | 172 | 207 | 185 | 189 | 183 | 184 | 211 | 183 | 157 | 198 | 193 | 158 |
| Post-neonatal infant deaths | 73 | 86 | 78 | 60 | 75 | 87 | 88 | 87 | 84 | 54 | 95 | 56 | 54 | 77 | 67 | 78 |
| Total infant deaths[b] | 227 | 255 | 275 | 256 | 247 | 294 | 273 | 276 | 267 | 238 | 306 | 239 | 211 | 275 | 260 | 236 |
| Mortality rate per 1,000 live births | | | | | | | | | | | | | | | | |
| Neonatal mortality rate | 2.5 | 2.7 | 3.1 | 3.1 | 2.7 | 3.1 | 2.7 | 2.6 | 2.5 | 2.5 | 2.9 | 2.5 | 2.0 | 2.6 | 2.5 | 2.0 |
| Post-neonatal infant mortality rate | 1.2 | 1.4 | 1.2 | 1.0 | 1.2 | 1.3 | 1.3 | 1.2 | 1.2 | 0.7 | 1.3 | 0.8 | 0.7 | 1.0 | 0.9 | 1.0 |
| Infant mortality rate | 3.7 | 4.1 | 4.4 | 4.1 | 3.9 | 4.5 | 3.9 | 3.8 | 3.7 | 3.3 | 4.2 | 3.3 | 2.7 | 3.5 | 3.3 | 3.0 |

a. The following are excluded:
- Live births and neonatal deaths from terminations of pregnancy for suspected or confirmed congenital anomaly or maternal psychosocial indication
- Births occurring interstate or overseas, with death occurring in Victoria (neonates N = 1 in 2014, 0 in 2015) post-neonatal infants (N = 4 in 2014, N = 2 in 2015)
- Deaths of Victorian-born infants occurring in other jurisdictions not reported to CCOPMM.

b. The deaths in all categories (neonatal, post-neonatal infant and infant deaths), and the corresponding rates, refer to all those who died who were ***born in the index year***, regardless of whether they died in the index year or the following year.

For 2014: There were 66 post-neonatal infants born in Victoria in 2014 who died in Victoria. Forty-nine of these infants died in 2014, and 17 died in 2015. In addition, one infant born in Victoria in 2014 died overseas in 2015.

For 2015: There were 77 post-neonatal infants born in Victoria in 2015 who died in Victoria. Forty-four of these infants died in 2015 and 33 died in 2016. In addition, one infant born in Victoria in 2015 (but whose mother's usual place of residence was interstate) died interstate in 2015.

**Figure 2: Neonatal, post-neonatal infant and infant mortality rates, Victoria 2000–2015**

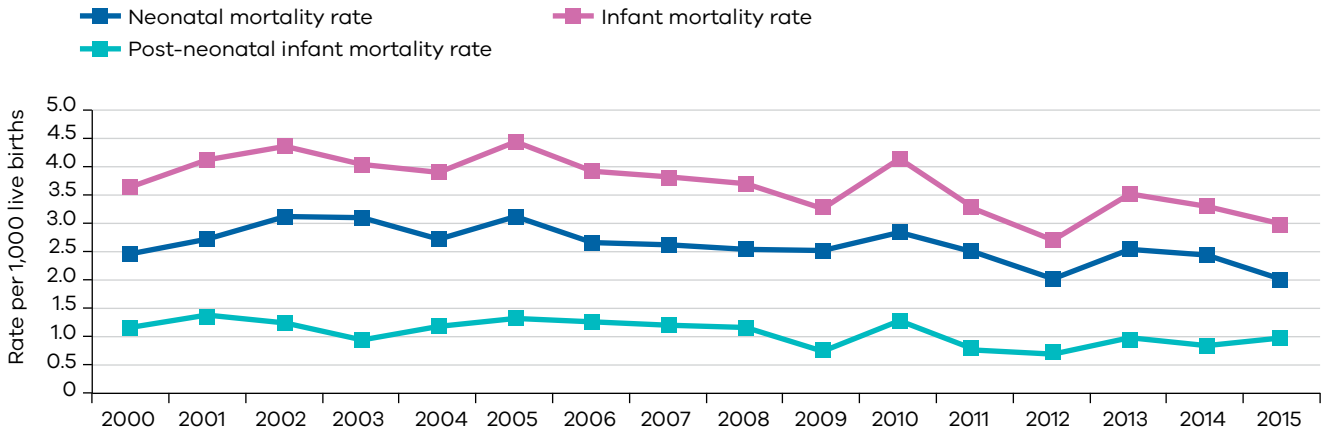


**Table 4: Infant mortality rates (per 1,000 live births) of 34 OECD countries[a,b], 1960–2015**

| | | 1960 | 1970 | 1980 | 1990 | 2000 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Luxembourg | .. | 19.3 | 11.2 | 7.3 | 3.9 | 2.8 | 1.9 | 1.8 | 1.6 | 1.6 | 1.6 | 1.5 |
| 2 | Iceland | 17.5 | 12.8 | 7.8 | 5.1 | 3.1 | 2.4 | 1.9 | 1.8 | 1.7 | 1.6 | 1.6 | 1.6 |
| 3 | Finland | 21.9 | 13.2 | 7.2 | 5.5 | 3.5 | 3.1 | 2.5 | 2.4 | 2.2 | 2.1 | 2 | 1.9 |
| 4 | Japan | 30.4 | 13.4 | 7.4 | 4.6 | 3.3 | 2.7 | 2.4 | 2.3 | 2.2 | 2.1 | 2.1 | 2.0 |
| 5 | Norway | 18.4 | 13.1 | 8.2 | 7 | 4 | 3.2 | 2.6 | 2.5 | 2.3 | 2.3 | 2.2 | 2.0 |
| 6 | Slovenia | .. | .. | .. | 8.8 | 4.5 | 3.5 | 2.7 | 2.6 | 2.4 | 2.3 | 2.2 | 2.1 |
| 7 | Estonia | .. | .. | 22.4 | 16.5 | 8.8 | 5.8 | 3.6 | 3.2 | 2.9 | 2.7 | 2.5 | 2.3 |
| 8 | Sweden | 16.3 | 11.3 | 7.2 | 5.8 | 3.4 | 3 | 2.5 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 |
| 9 | Czech Republic | .. | .. | .. | 12.7 | 5.6 | 4.4 | 3.4 | 3.2 | 3.2 | 3 | 2.9 | 2.8 |
| 10 | Austria | 37.3 | 25 | 13.9 | 8 | 4.6 | 4 | 3.6 | 3.4 | 3.3 | 3.2 | 3 | 2.9 |
| 11 | Korea, Rep. | 80.2 | 41.4 | 12.3 | 6.1 | 5.2 | 4.8 | 3.5 | 3.4 | 3.3 | 3.2 | 3 | 2.9 |
| 12 | Italy | 44.2 | 29.7 | 14.3 | 8.3 | 4.7 | 3.7 | 3.4 | 3.3 | 3.2 | 3.1 | 3 | 2.9 |
| 13 | Denmark | 21.3 | 13.9 | 8.3 | 7.3 | 4.6 | 4.1 | 3.3 | 3.2 | 3.2 | 3.1 | 3 | 2.9 |
| 14 | Portugal | 84.6 | 55.4 | 22.8 | 11.5 | 5.5 | 3.7 | 3.1 | 3.1 | 3.1 | 3.1 | 3 | 3.0 |
| 15 | Ireland | 30.4 | 19 | 12 | 7.7 | 5.9 | 4.4 | 3.5 | 3.4 | 3.4 | 3.2 | 3.1 | 3.0 |
| 16 | Australia | 20.3 | 17.8 | 10.8 | 7.6 | 5.1 | 4.8 | 4.1 | 3.8 | 3.6 | 3.4 | 3.2 | 3.0 |
| | Victoria[b] | | | | | 3.7 | 4.5 | 4.2 | 3.3 | 2.7 | 3.5 | 3.3 | 3.0 |
| 17 | Germany | .. | 22.1 | 12.6 | 7 | 4.4 | 3.9 | 3.5 | 3.4 | 3.3 | 3.3 | 3.2 | 3.1 |
| 18 | Netherlands | 16.4 | 12.6 | 8.8 | 6.8 | 5.1 | 4.5 | 3.7 | 3.6 | 3.5 | 3.3 | 3.3 | 3.2 |
| 19 | Israel | .. | .. | 15.3 | 9.7 | 5.6 | 4.5 | 3.7 | 3.5 | 3.4 | 3.3 | 3.3 | 3.2 |
| 20 | Belgium | 29.5 | 20.6 | 12.2 | 8.3 | 4.8 | 4.1 | 3.6 | 3.5 | 3.5 | 3.4 | 3.4 | 3.3 |
| 21 | Switzerland | 21.6 | 15 | 8.4 | 6.7 | 4.6 | 4.3 | 3.9 | 3.8 | 3.7 | 3.6 | 3.5 | 3.4 |
| 22 | Spain | 47.7 | 25.5 | 15.3 | 9.3 | 5.4 | 4.8 | 3.9 | 3.8 | 3.7 | 3.7 | 3.6 | 3.5 |
| 23 | France | 23.7 | 15.1 | 10.2 | 7.4 | 4.4 | 3.8 | 3.5 | 3.5 | 3.5 | 3.6 | 3.6 | 3.5 |
| 24 | United Kingdom | 22.9 | 18 | 12 | 7.9 | 5.6 | 5.1 | 4.4 | 4.2 | 4.1 | 3.9 | 3.7 | 3.5 |
| 25 | Greece | 48.3 | 33.7 | 21.3 | 11.3 | 6.9 | 4.8 | 4.1 | 4 | 3.9 | 3.8 | 3.7 | 3.6 |
| 26 | Canada | 27.8 | 18.5 | 10.3 | 6.8 | 5.2 | 5.3 | 4.9 | 4.7 | 4.7 | 4.6 | 4.4 | 4.3 |
| 27 | Poland | 57.8 | 32.2 | 21 | 15.1 | 8.1 | 6.6 | 5 | 4.7 | 4.6 | 4.5 | 4.5 | 4.5 |
| 28 | New Zealand | 22.6 | 16.9 | 12.7 | 9.2 | 6.1 | 5.4 | 5.1 | 5 | 4.9 | 4.9 | 4.8 | 4.7 |
| 29 | Hungary | 53.4 | 39 | 23.8 | 16.9 | 9.7 | 7.2 | 5.7 | 5.5 | 5.4 | 5.4 | 5.3 | 5.3 |
| 30 | United States | 25.9 | 19.9 | 12.6 | 9.4 | 7.1 | 6.8 | 6.3 | 6.1 | 6.1 | 5.9 | 5.7 | 5.6 |
| 31 | Slovak Republic | .. | .. | .. | 15.6 | 10.2 | 8.4 | 7 | 6.8 | 6.5 | 6.3 | 6.1 | 5.8 |
| | OECD members | 48.5 | 38.7 | 26.6 | 17.0 | 10.7 | 8.6 | 7.2 | 6.9 | 6.6 | 6.4 | 6.1 | 5.9 |
| 32 | Chile | 127.6 | 67.6 | 28.2 | 16 | 9.2 | 7.7 | 7.6 | 7.5 | 7.4 | 7.3 | 7.2 | 7.0 |
| 33 | Mexico | .. | 77.5 | 56.1 | 37.1 | 21.6 | 16.7 | 14.4 | 13.8 | 13.1 | 12.5 | 11.9 | 11.3 |
| 34 | Turkey | 166 | 126.2 | 90.2 | 55.8 | 32.1 | 23.2 | 16.4 | 15.3 | 14.2 | 13.2 | 12.3 | 11.6 |

a. Selected data (ranked by 2015 value), taken from data series SP.DYN.IMRT.IN.
Data from database: World Development Indicators. Last updated: 11/17/2016.
http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators#advancedDownloadOptions Accessed December 13, 2016.

b. This table includes the measured IMR for Victoria.

## Under 5 mortality rate

**Table 5: Under 5 mortality rate (U5MR), Victoria, 2000–2015**

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Live births[a] | 62,127 | 61,670 | 62,658 | 62,987 | 63,047 | 65,996 | 69,187 | 71,728 | 71,811 | 72,432 | 73,731 | 73,349 | 77,659 | 77,566 | 78,400 | 78,606 |
| Neonatal deaths[a] | 154 | 169 | 197 | 196 | 172 | 207 | 185 | 189 | 183 | 184 | 211 | 183 | 157 | 198 | 193 | 158 |
| Post-neonatal infant deaths[b] | 89 | 73 | 86 | 67 | 75 | 82 | 84 | 86 | 84 | 64 | 93 | 60 | 67 | 67 | 72 | 62 |
| 1–4 year deaths | 52 | 45 | 62 | 62 | 40 | 44 | 35 | 47 | 47 | 50 | 49 | 49 | 55 | 33 | 45 | 48 |
| Total 0–4 deaths | 295 | 287 | 345 | 325 | 287 | 333 | 304 | 322 | 314 | 298 | 353 | 292 | 279 | 298 | 310 | 268 |
| U5MR | 4.7 | 4.7 | 5.5 | 5.2 | 4.6 | 5.0 | 4.4 | 4.5 | 4.4 | 4.1 | 4.8 | 4.0 | 3.6 | 3.8 | 4.0 | 3.4 |

The U5MR refers to deaths of children 0-4 years (per 1,000 live births) occurring in the index year.

a. The following are excluded:

- Live births and neonatal deaths from terminations of pregnancy for suspected or confirmed congenital anomaly or maternal psychosocial indication
- Neonates or infants where birth occurred interstate or overseas, with death occurring in Victoria
- Post-neonatal infants and children not normally resident in Victoria, dying in Victoria
- Deaths of Victorian residents 0-4 years, known to have occurred outside Victoria.

Note that the post-neonatal infant numbers are different to those tables and calculations for infant mortality rate (Figure 2 and Table 3). For the U5MR calculation, post-neonatal infant deaths ***occurring in the index year*** are counted. For the infant mortality rate, post-neonatal infant deaths ***occurring in infants born in the index year*** are counted, regardless of when they occurred.

**Figure 3: Under 5 mortality rate (U5MR), Victoria, 2000–2015**

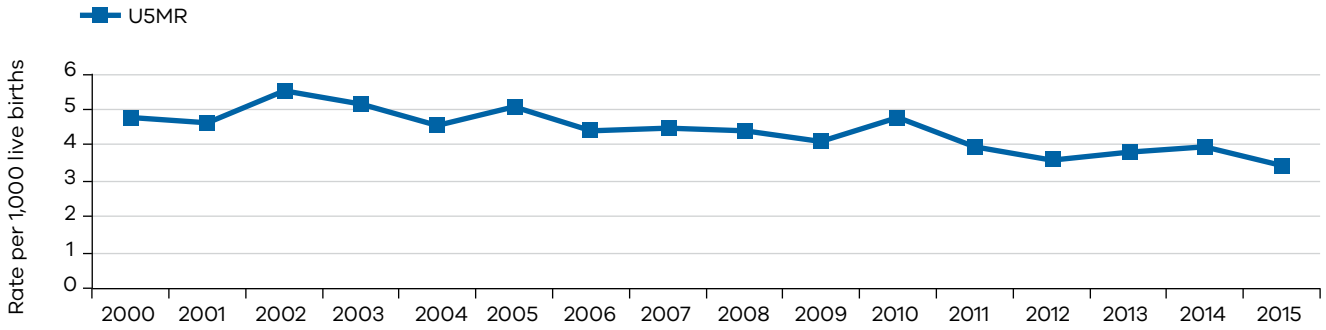


**Table 6: Under 5 mortality rate (probability of dying by age 5 per 1,000 live births), of 34 OECD countries, 1960–2015[a,b]**

| Rank | Country Name | 1960 | 1970 | 1980 | 1990 | 2000 | 2005 | 2010 | | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Luxembourg | .. | 22.4 | 13.3 | 8.8 | 4.8 | 3.5 | 2.4 | | 2.1 | 2 | 2 | 1.9 |
| 2 | Iceland | 21.4 | 15.8 | 9.8 | 6.4 | 4 | 3.1 | 2.4 | | 2.2 | 2.1 | 2.1 | 2 |
| 3 | Finland | 26.8 | 16.1 | 8.7 | 6.7 | 4.3 | 3.8 | 3 | | 2.7 | 2.6 | 2.4 | 2.3 |
| 4 | Norway | 22.6 | 16.2 | 10.1 | 8.7 | 4.9 | 4 | 3.2 | | 3 | 2.8 | 2.7 | 2.6 |
| 5 | Slovenia | .. | .. | .. | 10.4 | 5.5 | 4.3 | 3.3 | | 3 | 2.8 | 2.7 | 2.6 |
| 6 | Japan | 39.7 | 17.5 | 9.9 | 6.3 | 4.5 | 3.7 | 3.2 | | 3 | 2.9 | 2.8 | 2.7 |
| 7 | Estonia | .. | .. | 27.1 | 20.2 | 11 | 7.3 | 4.6 | | 3.8 | 3.5 | 3.2 | 2.9 |
| 8 | Sweden | 19.6 | 13.4 | 8.5 | 6.9 | 4.1 | 3.6 | 3.1 | | 3 | 3 | 3 | 3 |
| 9 | Czech Republic | .. | .. | .. | 14.6 | 6.6 | 5.2 | 4.1 | | 3.8 | 3.7 | 3.5 | 3.4 |
| 10 | Korea, Rep. | 112.9 | 52.8 | 14.3 | 7.1 | 6.1 | 5.6 | 4.1 | | 3.8 | 3.7 | 3.6 | 3.4 |
| | **Victoria[b]** | | | | | **4.7** | **5** | **4.8** | | **3.6** | **3.8** | **4.0** | **3.4** |
| 11 | Italy | 52 | 33.6 | 16.1 | 9.7 | 5.5 | 4.4 | 4 | | 3.8 | 3.7 | 3.6 | 3.5 |
| 12 | Denmark | 25 | 16.6 | 10 | 8.9 | 5.6 | 4.9 | 4 | | 3.8 | 3.7 | 3.6 | 3.5 |
| 13 | Austria | 42.8 | 29.1 | 16.3 | 9.5 | 5.5 | 4.9 | 4.4 | | 4 | 3.9 | 3.7 | 3.5 |
| 14 | Ireland | 35.3 | 22.2 | 14.3 | 9.2 | 7.1 | 5.2 | 4.2 | | 4 | 3.8 | 3.7 | 3.6 |
| 15 | Portugal | 114.6 | 68.2 | 27.6 | 14.7 | 7.2 | 4.7 | 3.9 | | 3.8 | 3.8 | 3.7 | 3.6 |
| 16 | Germany | .. | 25.7 | 15 | 8.5 | 5.4 | 4.7 | 4.2 | | 4 | 3.9 | 3.8 | 3.7 |
| 17 | Netherlands | 20.8 | 15.8 | 10.9 | 8.3 | 6.2 | 5.4 | 4.4 | | 4.2 | 4 | 3.9 | 3.8 |
| **18** | **Australia** | **24.9** | **21.4** | **13** | **9.2** | **6.2** | **5.7** | **4.8** | | **4.3** | **4.1** | **3.9** | **3.8** |
| 19 | Switzerland | 26.5 | 18.4 | 10.4 | 8.2 | 5.6 | 5.1 | 4.5 | | 4.3 | 4.2 | 4 | 3.9 |
| 20 | Israel | .. | .. | 18 | 11.6 | 6.9 | 5.6 | 4.6 | | 4.3 | 4.2 | 4.1 | 4 |
| 21 | Spain | 55.6 | 29.2 | 17.8 | 11 | 6.5 | 5.7 | 4.6 | | 4.4 | 4.3 | 4.2 | 4.1 |
| 22 | Belgium | 33.9 | 23.9 | 14.5 | 10 | 5.8 | 5 | 4.5 | | 4.3 | 4.3 | 4.2 | 4.1 |
| 23 | United Kingdom | 26.6 | 21 | 14.1 | 9.3 | 6.6 | 6 | 5.2 | | 4.8 | 4.6 | 4.4 | 4.2 |
| 24 | France | 28.5 | 18.2 | 12.4 | 9 | 5.4 | 4.6 | 4.3 | | 4.3 | 4.4 | 4.4 | 4.3 |
| 25 | Greece | 55.8 | 37.6 | 23.5 | 12.6 | 7.8 | 5.5 | 4.7 | | 4.7 | 4.7 | 4.6 | 4.6 |
| 26 | Canada | 32.6 | 22 | 12.5 | 8.3 | 6.2 | 6.1 | 5.6 | | 5.3 | 5.2 | 5 | 4.9 |
| 27 | Poland | 64.7 | 36.3 | 23.9 | 17.3 | 9.3 | 7.6 | 5.8 | | 5.3 | 5.2 | 5.2 | 5.2 |
| 28 | New Zealand | 27.9 | 20.8 | 15.6 | 11.2 | 7.4 | 6.6 | 6.2 | | 6 | 5.9 | 5.8 | 5.7 |
| 29 | Hungary | 58.9 | 42.7 | 26.2 | 19.1 | 11.2 | 8.3 | 6.6 | | 6.3 | 6.2 | 6.1 | 5.9 |
| 30 | United States | 30.1 | 23.3 | 15 | 11.2 | 8.4 | 8 | 7.4 | | 7.1 | 6.9 | 6.7 | 6.5 |
| | OECD members | 63.5 | 51.2 | 34.9 | 21.4 | 12.9 | 10.2 | 8.4 | | 7.8 | 7.5 | 7.2 | 6.9 |
| 31 | Slovak Republic | .. | .. | .. | 17.7 | 11.7 | 9.9 | 8.4 | | 7.9 | 7.7 | 7.5 | 7.3 |
| 32 | Chile | 157.3 | 79.6 | 33.2 | 19.1 | 10.9 | 9.1 | 8.8 | | 8.6 | 8.4 | 8.3 | 8.1 |
| 33 | Mexico | .. | 108.6 | 75.1 | 46.6 | 25.6 | 19.5 | 16.8 | | 15.3 | 14.5 | 13.8 | 13.2 |
| 34 | Turkey | 249 | 186.9 | 128.7 | 74.5 | 39.6 | 27.7 | 19.1 | | 16.5 | 15.4 | 14.3 | 13.5 |

a. Selected data (ranked by 2015 value), taken from data series SH.DYN.MORT.
Data from database: World Development Indicators. Last updated: 11/17/2016.
http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators#advancedDownloadOptions
Accessed December 13, 2016.

b. This table includes the measured U5MR for Victoria.

**Table 7: Neonatal, post-neonatal, infant and under-5 mortality rates, Victoria 2000–2015**

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Neonatal mortality rate | 2.5 | 2.7 | 3.1 | 3.1 | 2.7 | 3.1 | 2.7 | 2.6 | 2.5 | 2.5 | 2.9 | 2.5 | 2.0 | 2.6 | 2.5 | 2.0 |
| Post-neonatal infant mortality rate | 1.2 | 1.4 | 1.2 | 1.0 | 1.2 | 1.3 | 1.3 | 1.2 | 1.2 | 0.7 | 1.3 | 0.8 | 0.7 | 1.0 | 0.9 | 1.0 |
| Infant mortality rate | 3.7 | 4.1 | 4.4 | 4.1 | 3.9 | 4.5 | 3.9 | 3.8 | 3.7 | 3.3 | 4.2 | 3.3 | 2.7 | 3.5 | 3.3 | 3.0 |
| Under 5 mortality rate | 4.7 | 4.7 | 5.5 | 5.2 | 4.6 | 5.0 | 4.4 | 4.5 | 4.4 | 4.1 | 4.8 | 4.0 | 3.6 | 3.8 | 4.0 | 3.4 |

Note: For the U5MR calculation, post-neonatal infant deaths ***occurring in the index year*** are counted. For neonatal, post-neonatal infant and overall infant mortality rate post-neonatal infant deaths ***occurring in infants born in the index year*** are counted, regardless of when they occurred.

**Figure 4: Neonatal, post-neonatal, infant and under-5 mortality rates, Victoria 2000–2015**

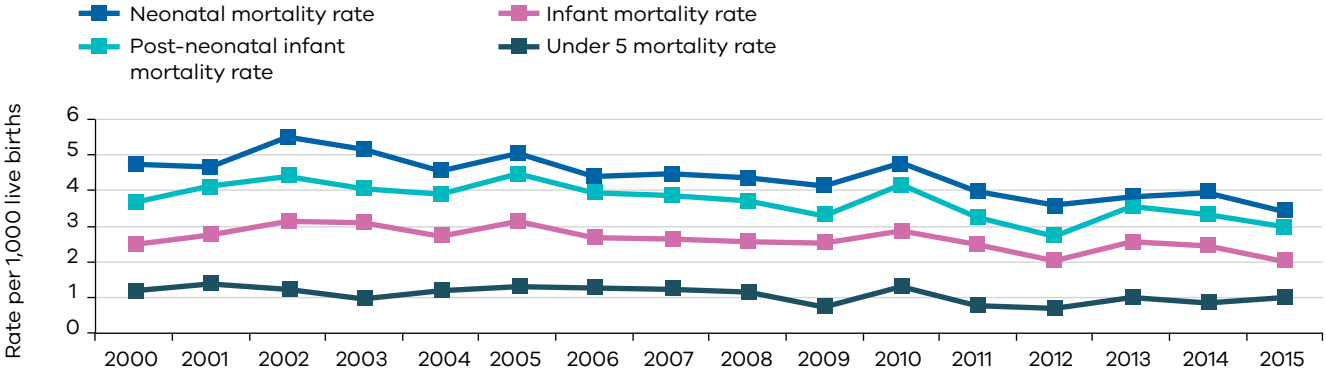
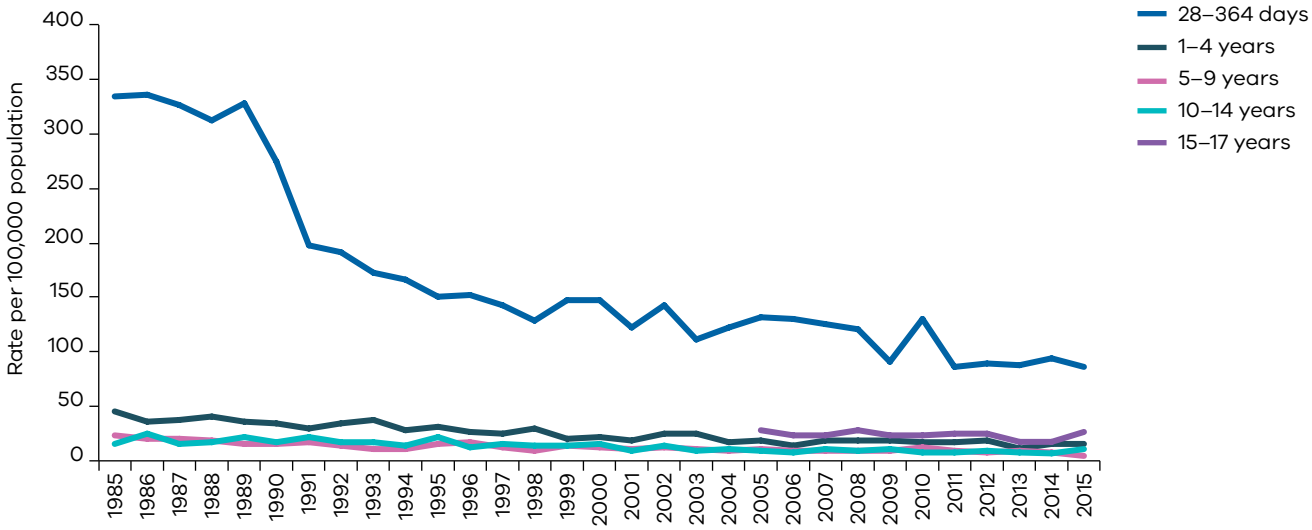


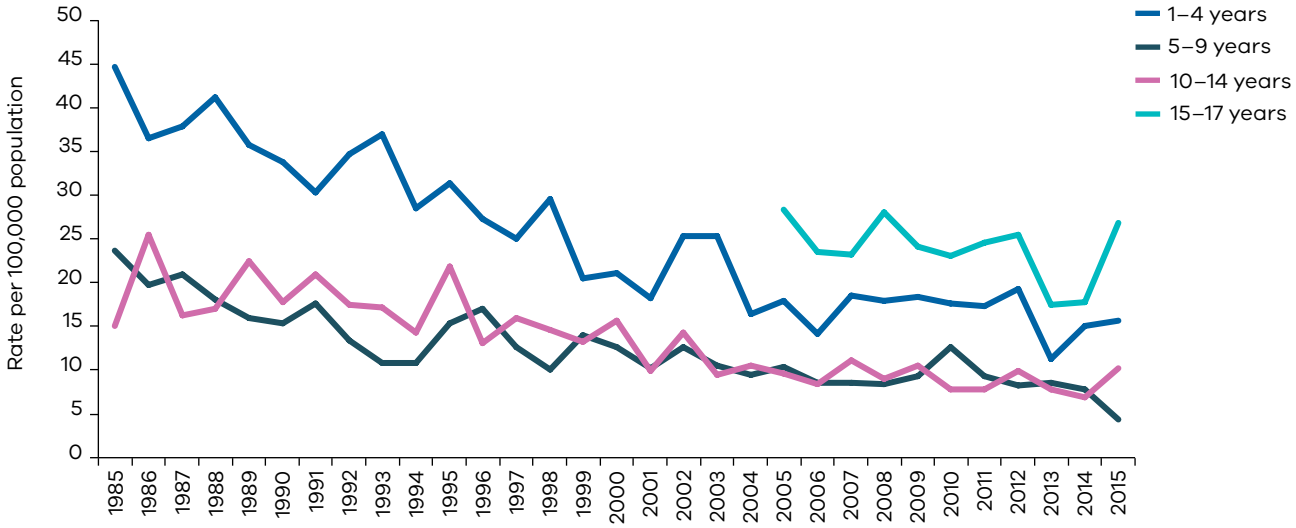
**Figure 5a: Rates of death by age group, Victoria, 1985–2015[a,b]**




a. For post-neonatal infants, the denominator includes all Victorian resident infants 0–364 days of age; while the numerator includes only post-neonatal infants aged 28–364 days.
Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016

b. CCOPMM commenced reporting on the 15–17 year age group in 2005.

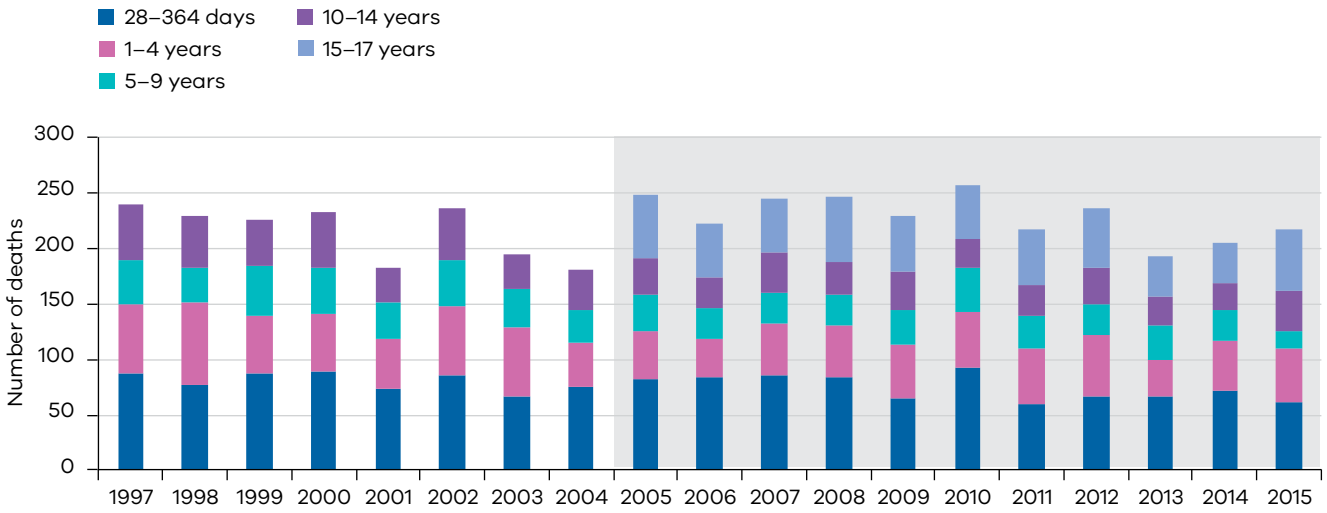
**Figure 5b: Rates of death by age group, (excluding 28–364 days) Victoria 1985–2015[a,b]**




a. Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016.

b. CCOPMM commenced reporting on the 15–17 year age group in 2005.

**Figure 6: Post-neonatal infant, child and adolescent deaths by age group, Victoria 1997–2015[a]**




a. CCOPMM commenced reporting on the 15–17 year age group in 2005.

**Table 8: Post-neonatal infant, child and adolescent deaths by age group, Victoria 1997–2015**

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 28–364 days | 87 | 77 | 88 | 89 | 73 | 86 | 67 | 75 | 82 | 84 | 86 | 84 | 64 | 93 | 60 | 67 | 67 | 72 | 62 |
| 1–4 years | 63 | 74 | 51 | 52 | 45 | 62 | 62 | 40 | 44 | 35 | 47 | 47 | 50 | 49 | 49 | 55 | 33 | 45 | 48 |
| 5–9 years | 40 | 32 | 45 | 41 | 33 | 41 | 34 | 30 | 33 | 27 | 27 | 27 | 30 | 41 | 31 | 28 | 30 | 28 | 16 |
| 10–14 years | 50 | 46 | 42 | 50 | 32 | 47 | 31 | 35 | 32 | 28 | 37 | 30 | 35 | 26 | 26 | 33 | 26 | 23 | 35 |
| 15–17 years | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 57 | 48 | 48 | 58 | 50 | 48 | 51 | 53 | 36 | 37 | 56 |
| **Total** | **240** | **229** | **226** | **232** | **183** | **236** | **194** | **180** | **248** | **222** | **245** | **246** | **229** | **257** | **217** | **236** | **192** | **205** | **217** |

N/A – not applicable. CCOPMM commenced reporting in the 15–17 year age group in 2005

## Most common causes of death by age group

**Table 9: Rank cause of death, post-neonatal infants (28 to 364 days), Victoria 2014**

| Rank | Cause of death | n | % | Rate per 100,000[a] |
|---|---|---|---|---|
| 1 | Congenital anomaly | 28 | 38.9 | 36.6 |
| 2 | Infection | 12 | 16.7 | 15.7 |
| 3 | Prematurity | 10 | 13.9 | 13.1 |
| 4 | Sudden infant death syndrome (SIDS II) | 9 | 12.5 | 11.8 |
| 5 | Undetermined | 6 | 8.3 | 7.8 |
| 6 | Malignancy | 2 | 2.8 | 2.6 |
| 6 | Other acquired disease | 2 | 2.8 | 2.6 |
| 8 | Motor vehicle accident | 1 | 1.4 | 1.3 |
| 8 | Drowning | 1 | 1.4 | 1.3 |
| 8 | Asphyxiation | 1 | 1.4 | 1.3 |
| Total | | 72 | 100.0 | 94.2 |

Notes:

- Denominator includes all Victorian resident infants 0 to 364 days of age; while the numerator includes only post-neonatal infants aged 28–364 days. Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016.
- This table excludes one death of a Victorian resident aged 28–364 days known to have died interstate from diseases and morbid conditions.
- This table excludes deaths of non-Victorian residents aged 28–364 days occurring in Victoria.

**Table 10: Rank cause of death, post-neonatal infants (28 to 364 days), Victoria 2015**

| Rank | Cause of death | n | % | Rate per 100,000[a] |
|---|---|---|---|---|
| 1 | Congenital anomaly | 25 | 40.3 | 34.5 |
| 2 | Prematurity | 11 | 17.7 | 15.2 |
| 2 | Sudden infant death syndrome (SIDS IB, SIDS II) | 11 | 17.7 | 15.2 |
| 4 | Infection | 7 | 11.3 | 9.7 |
| 5 | Undetermined | 4 | 6.5 | 5.5 |
| 6 | Intentional trauma (inflicted by other) | 2 | 3.2 | 2.8 |
| 7 | Drowning | 1 | 1.6 | 1.4 |
| 7 | Malignancy | 1 | 1.6 | 1.4 |
| Total | | 62 | 100.0 | 85.5 |

Notes:

- Denominator includes all Victorian resident infants 0 to 364 days of age; while the numerator includes only post-neonatal infants aged 28–364 days. Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016.
- This table excludes the death of a Victorian resident aged 28–364 days known to have occurred overseas from a congenital anomaly.
- This table excludes the death of a Victorian born (but interstate resident) post-neonatal infant who died interstate from unknown cause.
- This table excludes deaths of non-Victorian residents aged 28–364 days occurring in Victoria.

**Table 11: Rank cause of death, children aged 1 to 4 years, Victoria 2014**

| Rank | Cause of death | n | % | Rate per 100,000[a] |
|---|---|---|---|---|
| 1 | Congenital anomaly | 13 | 28.9 | 4.3 |
| 2 | Infection | 6 | 13.3 | 2.0 |
| 3 | Motor vehicle accident | 5 | 11.1 | 1.7 |
| 3 | Malignancy | 5 | 11.1 | 1.7 |
| 5 | Drowning | 4 | 8.9 | 1.3 |
| 5 | Intentional trauma (inflicted by other) | 4 | 8.9 | 1.3 |
| 7 | Other acquired disease | 3 | 6.7 | 1.0 |
| 8 | Fire | 2 | 4.4 | 0.7 |
| 8 | Undetermined | 2 | 4.4 | 0.7 |
| 10 | Prematurity | 1 | 2.2 | 0.3 |
| | **Total** | **45** | **100.0** | **15.0** |

Notes:

- Denominator includes all Victorian resident children aged 1 to 4 years. Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016.
- This table excludes one death of a Victorian resident aged 1–4 years known to have died interstate from a transport accident.
- This table excludes deaths of non-Victorian residents aged 1–4 years occurring in Victoria.

**Table 12: Rank cause of death, children aged 1 to 4 years, Victoria 2015**

| Rank | Cause of death | n | % | Rate per 100,000[a] |
|---|---|---|---|---|
| 1 | Congenital anomaly | 17 | 35.4 | 5.6 |
| 2 | Malignancy | 6 | 12.5 | 2.0 |
| 2 | Intentional trauma (inflicted by other) | 6 | 12.5 | 2.0 |
| 4 | Infection | 5 | 10.4 | 1.6 |
| 5 | Other unintentional injury | 3 | 6.3 | 1.0 |
| 5 | Other acquired disease | 3 | 6.3 | 1.0 |
| 5 | Undetermined | 3 | 6.3 | 1.0 |
| 8 | Drowning | 2 | 4.2 | 0.7 |
| 9 | Prematurity | 1 | 2.1 | 0.3 |
| 9 | Motor vehicle accident | 1 | 2.1 | 0.3 |
| 9 | Asphyxiation | 1 | 2.1 | 0.3 |
| | **Total** | **48** | **100.0** | **15.7** |

Notes:

- Denominator includes all Victorian resident children aged 1 to 4 years.Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016
- This table excludes four Victorian residents aged 1–4 years known to have died interstate (3) or overseas (1), from congenital anomaly (2) and injury (2).
- This table excludes deaths of non-Victorian residents aged 1–4 years occurring in Victoria.

**Table 13: Rank cause of death, children aged 5 to 9 years, Victoria 2014**

| Rank | Cause of death | n | % | Rate per 100,000[a] |
|---|---|---|---|---|
| 1 | Malignancy | 10 | 35.7 | 2.8 |
| 2 | Congenital anomaly | 6 | 21.4 | 1.7 |
| 3 | Motor vehicle accident | 5 | 17.9 | 1.4 |
| 4 | Prematurity | 1 | 3.6 | 0.3 |
| 4 | Other conditions determined at birth | 1 | 3.6 | 0.3 |
| 4 | Drowning | 1 | 3.6 | 0.3 |
| 4 | Asphyxiation | 1 | 3.6 | 0.3 |
| 4 | Infection | 1 | 3.6 | 0.3 |
| 4 | Other acquired disease | 1 | 3.6 | 0.3 |
| 4 | Undetermined | 1 | 3.6 | 0.3 |
| | **Total** | **28** | **100.0** | **7.8** |

Notes:

– Denominator includes all Victorian resident children 5 to 9 years. Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016.

– This table excludes four deaths of Victorian residents aged 5–9 years known to have died interstate (three) and overseas (one) from transport injury (2), drowning (1) and malignancy (1).

– This table excludes deaths of non-Victorian residents aged 5–9 years occurring in Victoria.

**Table 14: Rank cause of death, children aged 5 to 9 years, Victoria 2015**

| Rank | Cause of death | n | % | Rate per 100,000[a] |
|---|---|---|---|---|
| 1 | Malignancy | 8 | 50.0 | 2.2 |
| 2 | Congenital anomaly | 3 | 18.8 | 0.8 |
| 2 | Motor vehicle accident | 3 | 18.8 | 0.8 |
| 4 | Other acquired disease | 2 | 12.5 | 0.5 |
| | **Total** | **16** | **100.0** | **4.4** |

Notes:

– Denominator includes all Victorian resident children 5 to 9 years. Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016.

– This table excludes deaths of non-Victorian residents aged 5–9 years occurring in Victoria.

**Table 15: Rank of cause of death, children aged 10 to 14 years, Victoria 2014**

| Rank | Cause of death | n | % | Rate per 100,000[a] |
|---|---|---|---|---|
| 1 | Malignancy | 7 | 30.4 | 2.1 |
| 2 | Motor vehicle accident | 5 | 21.7 | 1.5 |
| 3 | Congenital anomaly | 3 | 13.0 | 0.9 |
| 4 | Birth hypoxia/asphyxia | 1 | 4.3 | 0.3 |
| 4 | Prematurity | 1 | 4.3 | 0.3 |
| 4 | Fire | 1 | 4.3 | 0.3 |
| 4 | Other unintentional injury | 1 | 4.3 | 0.3 |
| 4 | Other acquired disease | 1 | 4.3 | 0.3 |
| 4 | Undetermined | 1 | 4.3 | 0.3 |
| 4 | Intentional trauma (inflicted by other) | 1 | 4.3 | 0.3 |
| 4 | Intentional self-harm | 1 | 4.3 | 0.3 |
| Total | | 23 | 100.0 | 6.8 |

Notes:

- Denominator includes all Victorian resident children 10 to 14 years. Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016.
- This table excludes two deaths of Victorian residents aged 10–14 years known to have died overseas from transport injury.
- This table excludes deaths of non-Victorian residents aged 10–14 years occurring in Victoria.

**Table 16: Rank of cause of death, children aged 10 to 14 years, Victoria 2015**

| Rank | Cause of death | n | % | Rate per 100,000[a] |
|---|---|---|---|---|
| 1 | Congenital anomaly | 12 | 34.3 | 3.5 |
| 2 | Malignancy | 10 | 28.6 | 2.9 |
| 3 | Intentional self-harm | 5 | 14.3 | 1.5 |
| 4 | Other acquired disease | 4 | 11.4 | 1.2 |
| 5 | Birth hypoxia/asphyxia | 2 | 5.7 | 0.6 |
| 6 | Motor vehicle accident | 1 | 2.9 | 0.3 |
| 6 | Intentional trauma (inflicted by other) | 1 | 2.9 | 0.3 |
| Total | | 35 | 100.0 | 10.3 |

Notes:

- Denominator includes all Victorian resident children 10 to 14 years. Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016
- This table excludes one death of a Victorian resident aged 10–14 years known to have died interstate from injury.
- This table excludes deaths of non-Victorian residents aged 10–14 years occurring in Victoria.

**Table 17: Rank of cause of death, adolescents aged 15 to 17 years, Victoria 2014**

| Rank | Cause of death | n | % | Rate per 100,000[a] |
|---|---|---|---|---|
| 1 | Intentional self-harm | 16 | 43.2 | 7.7 |
| 2 | Congenital anomaly | 6 | 16.2 | 2.9 |
| 3 | Motor vehicle accident | 5 | 13.5 | 2.4 |
| 3 | Malignancy | 5 | 13.5 | 2.4 |
| 5 | Other acquired disease | 2 | 5.4 | 1.0 |
| 6 | Other conditions determined at birth | 1 | 2.7 | 0.5 |
| 6 | Train | 1 | 2.7 | 0.5 |
| 6 | Other unintentional injury | 1 | 2.7 | 0.5 |
| Total | | 37 | 100.0 | 17.8 |

Notes:

– Denominator includes all Victorian resident adolescents aged 15 to 17 years. Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016.

– This table excludes the death of a Victorian resident aged 15–17 years known to have died interstate from other injury.

– This table excludes deaths of non-Victorian residents aged 15–17 years occurring in Victoria.

**Table 18: Rank of cause of death, adolescents aged 15 to 17 years, Victoria 2015**

| Rank | Cause of death | n | % | Rate per 100,000[a] |
|---|---|---|---|---|
| 1 | Motor vehicle accident | 16 | 28.6 | 7.7 |
| 2 | Intentional self-harm | 14 | 25.0 | 6.7 |
| 3 | Other acquired disease | 7 | 12.5 | 3.4 |
| 4 | Malignancy | 6 | 10.7 | 2.9 |
| 5 | Congenital anomaly | 4 | 7.1 | 1.9 |
| 6 | Undetermined | 3 | 5.4 | 1.4 |
| 7 | Other unintentional injury | 2 | 3.6 | 1.0 |
| 7 | Intentional trauma (inflicted by other) | 2 | 3.6 | 1.0 |
| 9 | Other conditions determined at birth | 1 | 1.8 | 0.5 |
| 9 | Infection | 1 | 1.8 | 0.5 |
| Total | | 56 | 100.0 | 26.9 |

Notes:

– Denominator includes all Victorian resident adolescents aged 15 to 17 years. Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016.

– This table excludes two deaths of Victorian residents aged 15–17 years known to have died interstate from transport-related injury (1) and undetermined cause (1).

– This table excludes deaths of non-Victorian residents aged 15–17 years occurring in Victoria.

## Causes of death by age group

**Table 19: Cause of death by age group, 28 days to 17 years, Victoria 2014**

| Category | Age group | | | | | Total | % |
|---|---|---|---|---|---|---|---|
| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | | |
| **Determined at birth** | | | | | | | |
| Birth hypoxia/ asphyxia | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 |
| Congenital anomaly | 28 | 13 | 6 | 3 | 6 | 56 | 27.3 |
| Prematurity | 10 | 1 | 1 | 1 | 0 | 13 | 6.3 |
| Other | 0 | 0 | 1 | 0 | 1 | 2 | 1.0 |
| ***Subtotal*** | ***38*** | ***14*** | ***8*** | ***5*** | ***7*** | ***72*** | ***35.1*** |
| **Sudden infant death syndrome/ USID[a]** | | | | | | | |
| Category 1A SIDS | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Category 1B SIDS | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Category II SIDS | 9 | 0 | 0 | 0 | 0 | 9 | 4.4 |
| Unclassified sudden infant death | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| ***Subtotal*** | ***9*** | ***0*** | ***0*** | ***0*** | ***0*** | ***9*** | ***4.4*** |
| **Unintentional injury** | | | | | | | |
| Motor vehicle accident | 1 | 5 | 5 | 5 | 5 | 21 | 10.2 |
| Drowning | 1 | 4 | 1 | 0 | 0 | 6 | 2.9 |
| Fire | 0 | 2 | 0 | 1 | 0 | 3 | 1.5 |
| Asphyxiation | 1 | 0 | 1 | 0 | 0 | 2 | 1.0 |
| Train | 0 | 0 | 0 | 0 | 1 | 1 | 0.5 |
| Other | 0 | 0 | 0 | 1 | 1 | 2 | 1.0 |
| ***Subtotal*** | ***3*** | ***11*** | ***7*** | ***7*** | ***7*** | ***35*** | ***17.1*** |
| **Acquired disease** | | | | | | | |
| Infection | 12 | 6 | 1 | 0 | 0 | 19 | 9.3 |
| Malignancy | 2 | 5 | 10 | 7 | 5 | 29 | 14.1 |
| Other | 2 | 3 | 1 | 1 | 2 | 9 | 4.4 |
| ***Subtotal*** | ***16*** | ***14*** | ***12*** | ***8*** | ***7*** | ***57*** | ***27.8*** |
| **Undetermined** | | | | | | | |
| Undetermined | 6 | 2 | 1 | 1 | 0 | 10 | 4.9 |
| ***Subtotal*** | ***6*** | ***2*** | ***1*** | ***1*** | ***0*** | ***10*** | ***4.9*** |
| **Intentional injury** | | | | | | | |
| Intentional trauma (inflicted by other) | 0 | 4 | 0 | 1 | 0 | 5 | 2.4 |
| Suicide | 0 | 0 | 0 | 1 | 16 | 17 | 8.3 |
| ***Subtotal*** | ***0*** | ***4*** | ***0*** | ***2*** | ***16*** | ***22*** | ***10.7*** |
| **Total** | **72** | **45** | **28** | **23** | **37** | **205** | **100** |

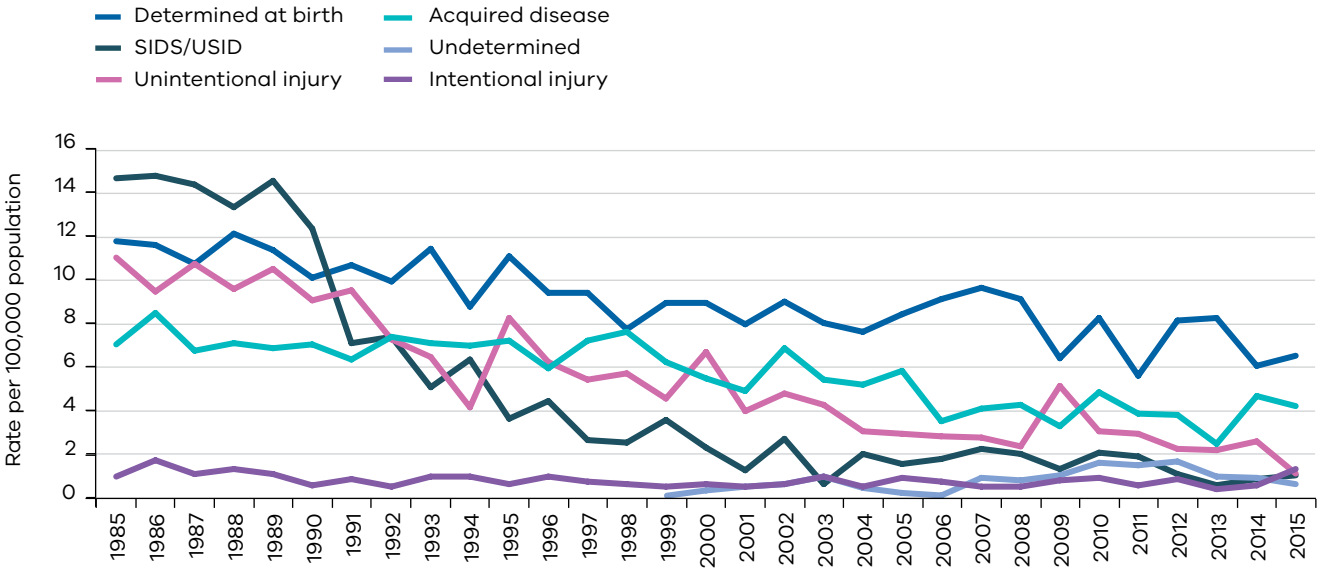
a. The classification of SIDS/USID is detailed in Appendix 1.

**Table 20: Cause of death by age group, 28 days to 17 years, Victoria 2015**

| Category | Age group | | | | | Total | % |
|---|---|---|---|---|---|---|---|
| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | | |
| **Determined at birth** | | | | | | | |
| Birth hypoxia/ asphyxia | 0 | 0 | 0 | 2 | 0 | 2 | 0.9 |
| Congenital anomaly | 25 | 17 | 3 | 12 | 4 | 61 | 28.1 |
| Prematurity | 11 | 1 | 0 | 0 | 0 | 12 | 5.5 |
| Other | 0 | 0 | 0 | 0 | 1 | 1 | 0.5 |
| ***Subtotal*** | ***36*** | ***18*** | ***3*** | ***14*** | ***5*** | ***76*** | ***35.0*** |
| **Sudden infant death syndrome/ USID[a]** | | | | | | | |
| Category 1A SIDS | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Category 1B SIDS | 1 | 0 | 0 | 0 | 0 | 1 | 0.5 |
| Category II SIDS | 10 | 0 | 0 | 0 | 0 | 10 | 4.6 |
| Unclassified sudden infant death | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| ***Subtotal*** | ***11*** | ***0*** | ***0*** | ***0*** | ***0*** | ***11*** | ***5.1*** |
| **Unintentional injury** | | | | | | | |
| Motor vehicle accident | 0 | 1 | 3 | 1 | 16 | 21 | 9.7 |
| Drowning | 1 | 2 | 0 | 0 | 0 | 3 | 1.4 |
| Fire | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Asphyxiation | 0 | 1 | 0 | 0 | 0 | 1 | 0.5 |
| Train | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Other | 0 | 3 | 0 | 0 | 2 | 5 | 2.3 |
| ***Subtotal*** | ***1*** | ***7*** | ***3*** | ***1*** | ***18*** | ***30*** | ***13.8*** |
| **Acquired disease** | | | | | | | |
| Infection | 7 | 5 | 0 | 0 | 1 | 13 | 6.0 |
| Malignancy | 1 | 6 | 8 | 10 | 6 | 31 | 14.3 |
| Other | 0 | 3 | 2 | 4 | 7 | 16 | 7.4 |
| ***Subtotal*** | ***8*** | ***14*** | ***10*** | ***14*** | ***14*** | ***60*** | ***27.6*** |
| **Undetermined** | | | | | | | |
| Undetermined | 4 | 3 | 0 | 0 | 3 | 10 | 4.6 |
| ***Subtotal*** | ***4*** | ***3*** | ***0*** | ***0*** | ***3*** | ***10*** | ***4.6*** |
| **Intentional injury** | | | | | | | |
| Intentional trauma (inflicted by other) | 2 | 6 | 0 | 1 | 2 | 11 | 5.1 |
| Suicide | 0 | 0 | 0 | 5 | 14 | 19 | 8.8 |
| ***Subtotal*** | ***2*** | ***6*** | ***0*** | ***6*** | ***16*** | ***30*** | ***13.8*** |
| **Total** | **62** | **48** | **16** | **35** | **56** | **217** | **100** |

The classification of SIDS/USID is detailed in Appendix 1.

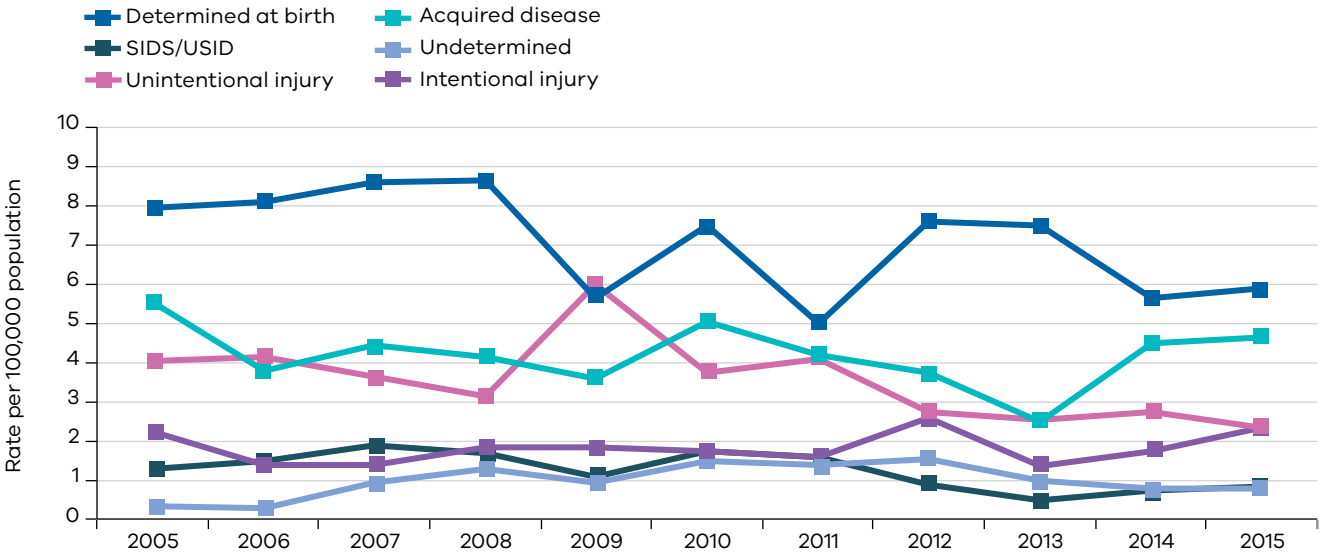
**Figure 7a: Rates of major cause of death of post-neonatal infants and children 28 days to 14 years, 1985 to 2015[a,b]**




a. Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016.

b. Denominator includes all Victorian residents 0 to 14 years of age; while the numerator includes only those aged 28 days to 14 years.

**Figure 7b: Rates of major cause of death of post-neonatal infants and children 28 days to 17 years, 2005 to 2015[a,b]**




a. Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016

b. Denominator includes all Victorian residents 0 to 17 years of age; while the numerator includes only those aged 28 days to 17 years. CCOPMM commenced reporting in the 15-17 year age group in 2015.

**Figure 8a: Post-neonatal infant and child deaths (28 days to 14 years) by major cause, Victoria 1997–2015**

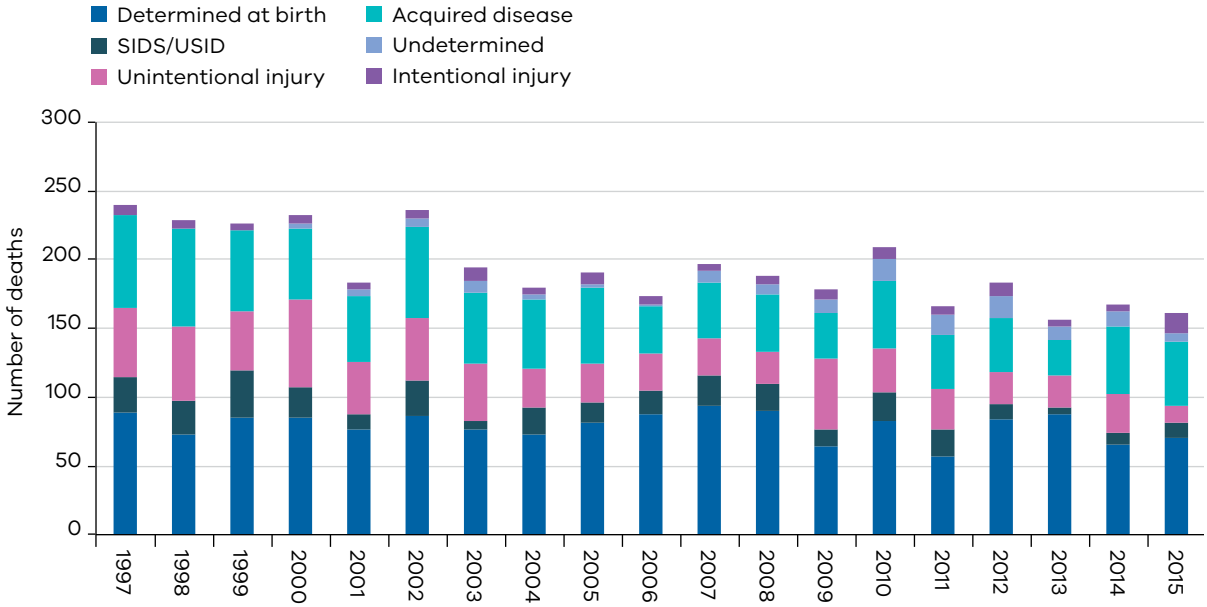


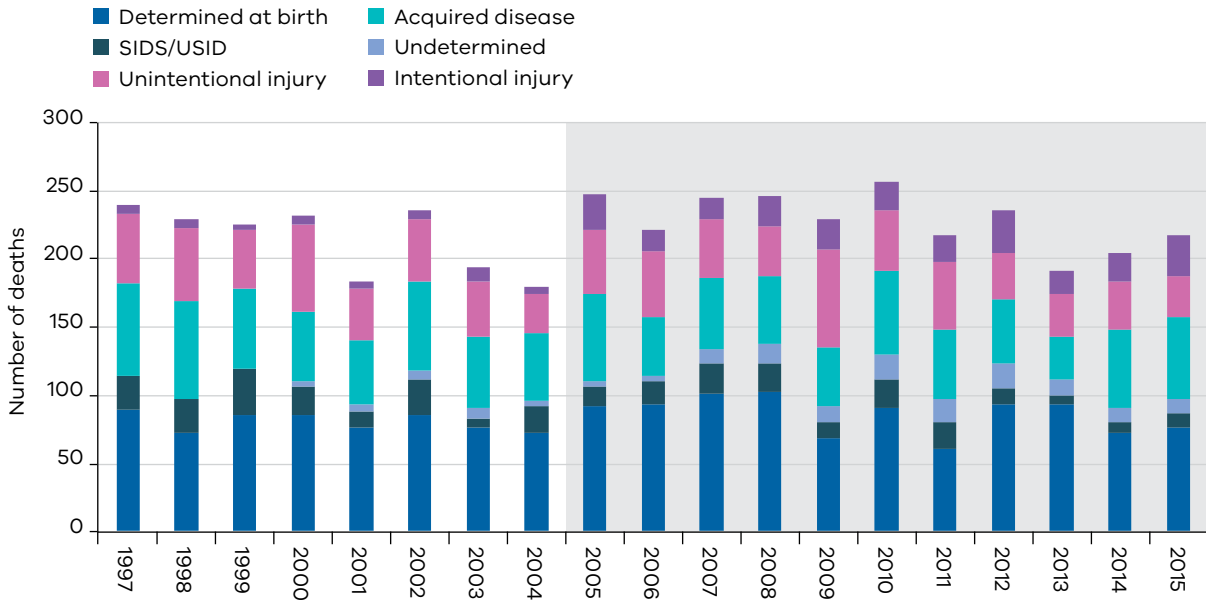

**Table 21: Post-neonatal infant and child deaths (28 days to 14 years) by major cause, Victoria 1997–2015**

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Determined at birth | 89 | 73 | 85 | 85 | 76 | 86 | 77 | 73 | 81 | 88 | 94 | 90 | 64 | 83 | 57 | 84 | 87 | 65 | 71 |
| SIDS/ USID[a] | 25 | 24 | 34 | 22 | 12 | 26 | 6 | 19 | 15 | 17 | 22 | 20 | 13 | 21 | 19 | 11 | 6 | 9 | 11 |
| Unintentional injury | 51 | 54 | 43 | 64 | 38 | 46 | 41 | 29 | 28 | 27 | 27 | 23 | 51 | 31 | 30 | 23 | 23 | 28 | 12 |
| Acquired disease | 68 | 72 | 59 | 52 | 47 | 66 | 52 | 50 | 56 | 34 | 40 | 42 | 33 | 49 | 39 | 39 | 26 | 50 | 46 |
| Undetermined[b] | N/A | N/A | 0 | 3 | 5 | 6 | 8 | 4 | 2 | 1 | 9 | 7 | 10 | 16 | 15 | 17 | 10 | 10 | 7 |
| Intentional injury | 7 | 6 | 5 | 6 | 5 | 6 | 10 | 5 | 9 | 7 | 5 | 6 | 8 | 9 | 6 | 9 | 4 | 6 | 14 |
| **Total cases** | **240** | **229** | **226** | **232** | **183** | **236** | **194** | **180** | **191** | **174** | **197** | **188** | **179** | **209** | **166** | **183** | **156** | **168** | **161** |

a. SIDS/USID (Sudden Unexpected Death Syndrome and Unclassified Sudden Infant Death) represent all infants who die suddenly and unexpectedly and for whom no cause is determined at autopsy. It includes, prior to 2004, all SIDS infants. Since 2004, this category includes infants classified to SIDS 1A, SIDS 1B, SIDS II and USID. Prior to 2004, USID equivalent infants were classified as 'Undetermined'.

b. In reports prior to 2002 where a cause of death was not identified or has been classified as unascertained, it was included in 'Acquired Disease', under subcategory 'Other Acquired'. Since the 2002 annual report (incorporating data since 1999) these deaths have been classified under the category 'Undetermined'.

**Figure 8b: Post-neonatal infant, child and adolescent deaths[a,b] by major cause, Victoria 1997–2015**




a. 1997–2004 children aged 28 days to 14 years.
b. 2005–2015 children aged 28 days to 17 years.

**Table 22: Post-neonatal infant, child and adolescent deaths[a,b] by major cause, Victoria 1997–2015**

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Determined at birth | 89 | 73 | 85 | 85 | 76 | 86 | 77 | 73 | 92 | 94 | 101 | 103 | 68 | 91 | 61 | 94 | 94 | 72 | 76 |
| SIDS/USID[c] | 25 | 24 | 34 | 22 | 12 | 26 | 6 | 19 | 15 | 17 | 22 | 20 | 13 | 21 | 19 | 11 | 6 | 9 | 11 |
| Unintentional injury | 51 | 54 | 43 | 64 | 38 | 46 | 41 | 29 | 47 | 48 | 43 | 37 | 72 | 45 | 50 | 34 | 32 | 35 | 30 |
| Acquired disease | 68 | 72 | 59 | 52 | 47 | 66 | 52 | 50 | 64 | 44 | 52 | 49 | 43 | 61 | 51 | 46 | 31 | 57 | 60 |
| Undetermined[d] | 0 | 0 | 0 | 3 | 5 | 6 | 8 | 4 | 4 | 3 | 11 | 15 | 11 | 18 | 17 | 19 | 12 | 10 | 10 |
| Intentional injury | 7 | 6 | 5 | 6 | 5 | 6 | 10 | 5 | 26 | 16 | 16 | 22 | 22 | 21 | 19 | 32 | 17 | 22 | 30 |
| **Total cases** | **240** | **229** | **226** | **232** | **183** | **236** | **194** | **180** | **248** | **222** | **245** | **246** | **229** | **257** | **217** | **236** | **192** | **205** | **217** |

a. 1997–2004 children aged 28 days to 14 years.
b. 2005–2015 children aged 28 days to 17 years.
c. SIDS/USID (Sudden Unexpected Death Syndrome and Unclassified Sudden Infant Death) represent all infants who die suddenly and unexpectedly and for whom no cause is determined at autopsy. It includes, prior to 2004, all SIDS infants. Since 2004, this category includes infants classified to SIDS 1A, SIDS 1B, SIDS II and USID. Prior to 2004, USID equivalent infants were classified as 'Undetermined'.
d. In reports prior to 2002 where a cause of death was not identified or has been classified as unascertained, it was included in 'Acquired Disease', under subcategory 'Other Acquired'. Since the 2002 annual report (incorporating data since 1999) these deaths have been classified under the category 'Undetermined'.

## Deaths from conditions determined at birth

**Figure 9a: Causes of death determined at birth: post-neonatal infants and children (28 days to 14 years), Victoria 1997–2015**

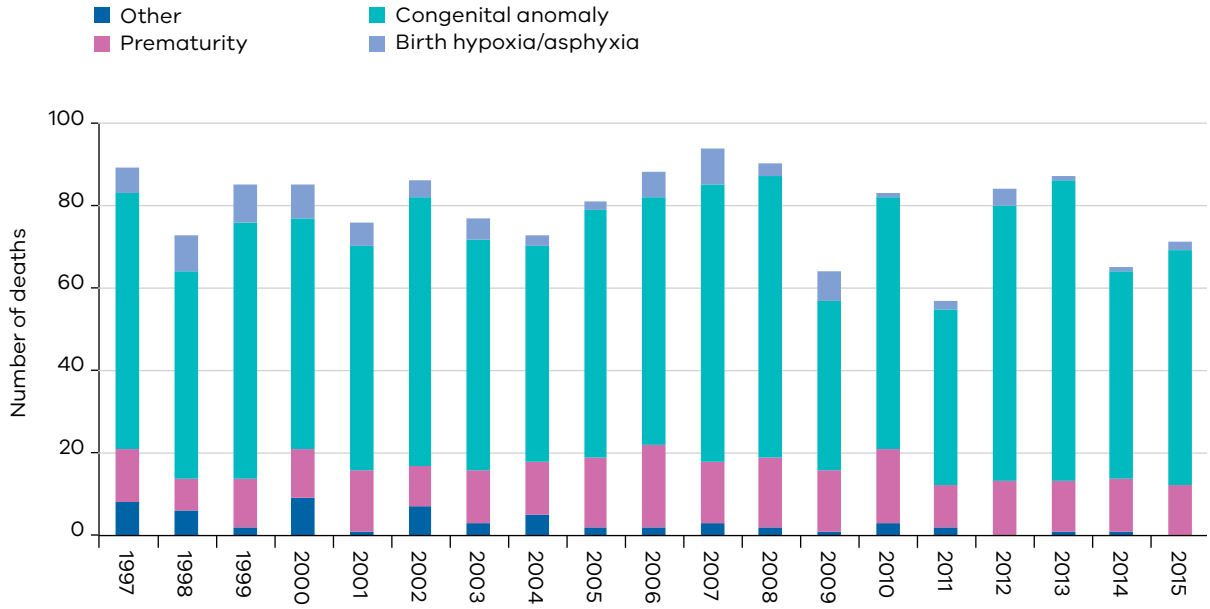
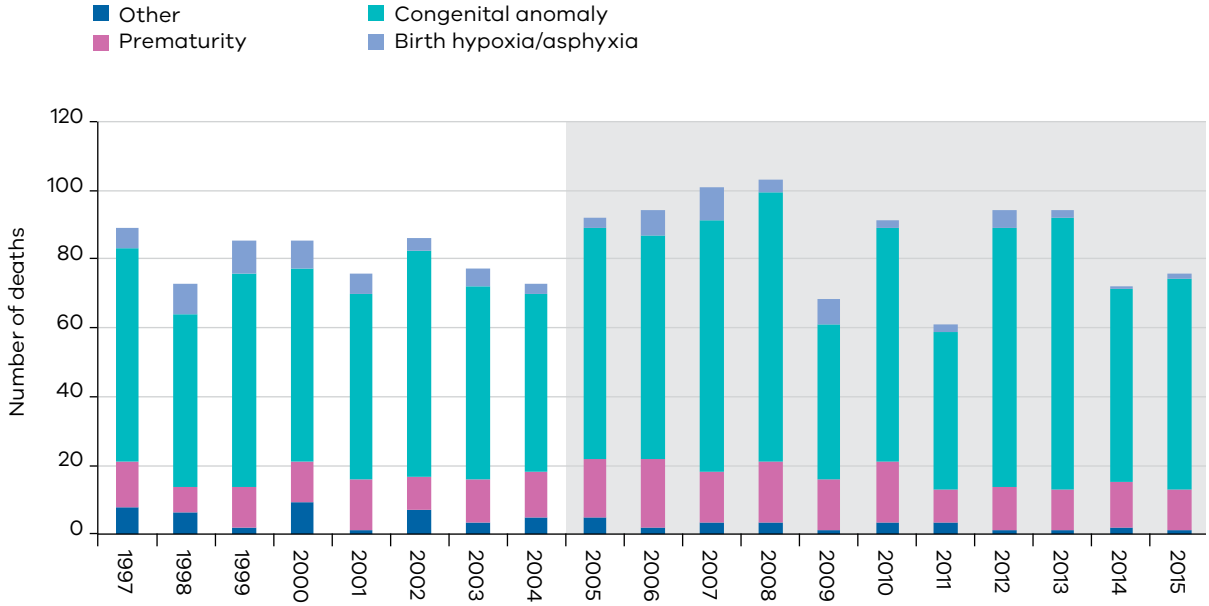



**Table 23: Causes of death determined at birth: post-neonatal infants and children (28 days to 14 years), Victoria 1997–2015**

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Birth hypoxia/ asphyxia | 6 | 9 | 9 | 8 | 6 | 4 | 5 | 3 | 2 | 6 | 9 | 3 | 7 | 1 | 2 | 4 | 1 | 1 | 2 |
| Congenital anomaly | 62 | 50 | 62 | 56 | 54 | 65 | 56 | 52 | 60 | 60 | 67 | 68 | 41 | 61 | 43 | 67 | 73 | 50 | 57 |
| Prematurity | 13 | 8 | 12 | 12 | 15 | 10 | 13 | 13 | 17 | 20 | 15 | 17 | 15 | 18 | 10 | 13 | 12 | 13 | 12 |
| Other | 8 | 6 | 2 | 9 | 1 | 7 | 3 | 5 | 2 | 2 | 3 | 2 | 1 | 3 | 2 | 0 | 1 | 1 | 0 |
| **Total cases** | **89** | **73** | **85** | **85** | **76** | **86** | **77** | **73** | **81** | **88** | **94** | **90** | **64** | **83** | **57** | **84** | **87** | **65** | **71** |

**Figure 9b: Causes of death determined at birth: post-neonatal infants, children and adolescents[a,b], Victoria 1997–2015**




a. 1997–2004 children aged 28 days to 14 years.
b. 2005–2015 children and adolescents aged 28 days to 17 years.

**Table 24: Causes of death determined at birth: post-neonatal infants, children and adolescents[a,b], Victoria 1997–2015**

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Birth hypoxia/ asphyxia | 6 | 9 | 9 | 8 | 6 | 4 | 5 | 3 | 3 | 7 | 10 | 4 | 7 | 2 | 2 | 5 | 2 | 1 | 2 |
| Congenital anomaly | 62 | 50 | 62 | 56 | 54 | 65 | 56 | 52 | 67 | 65 | 73 | 78 | 45 | 68 | 46 | 75 | 79 | 56 | 61 |
| Prematurity | 13 | 8 | 12 | 12 | 15 | 10 | 13 | 13 | 17 | 20 | 15 | 18 | 15 | 18 | 10 | 13 | 12 | 13 | 12 |
| Other | 8 | 6 | 2 | 9 | 1 | 7 | 3 | 5 | 5 | 2 | 3 | 3 | 1 | 3 | 3 | 1 | 1 | 2 | 1 |
| **Total cases** | **89** | **73** | **85** | **85** | **76** | **86** | **77** | **73** | **92** | **94** | **101** | **103** | **68** | **91** | **61** | **94** | **94** | **72** | **76** |

a. 1997–2004 children aged 28 days to 14 years.
b. 2005–2015 children and adolescents aged 28 days to 17 years.

**Table 25: Deaths from conditions determined at birth by age group, Victoria, 2014**

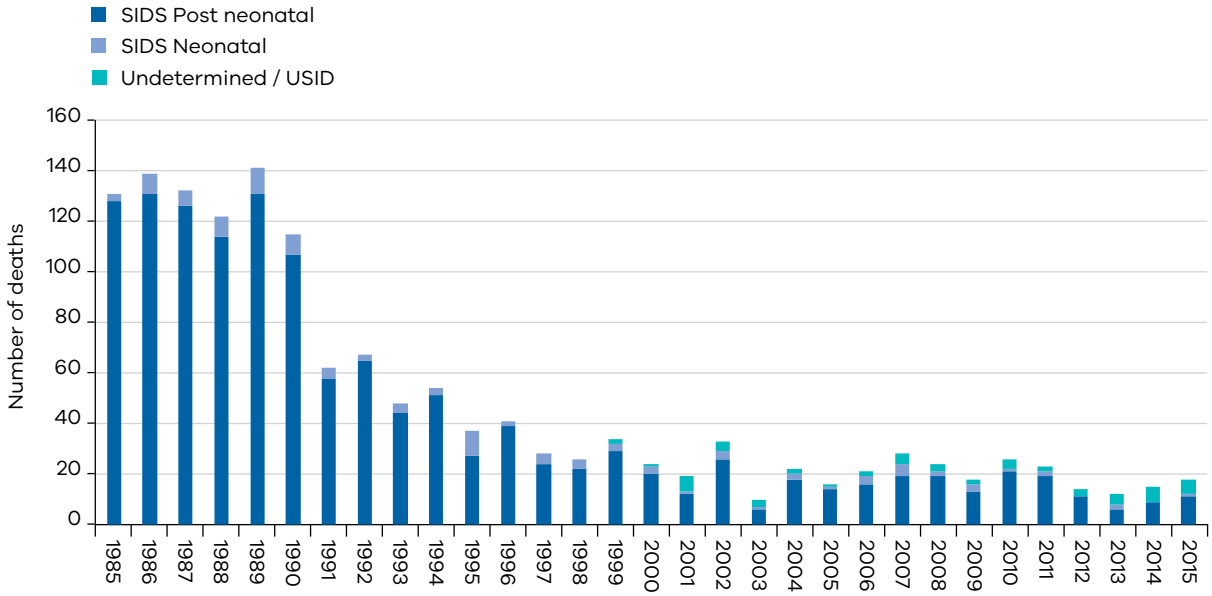
| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
|---|---|---|---|---|---|---|
| Birth asphyxia/hypoxia | 0 | 0 | 0 | 1 | 0 | 1 |
| Congenital anomaly | 28 | 13 | 6 | 3 | 6 | 56 |
| Prematurity | 10 | 1 | 1 | 1 | 0 | 13 |
| Other | 0 | 0 | 1 | 0 | 1 | 2 |
| Total | 38 | 14 | 8 | 5 | 7 | 72 |

**Table 26: Deaths from conditions determined at birth by age group, Victoria, 2015**

| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
|---|---|---|---|---|---|---|
| Birth asphyxia/hypoxia | 0 | 0 | 0 | 2 | 0 | 2 |
| Congenital anomaly | 25 | 17 | 3 | 12 | 4 | 61 |
| Prematurity | 11 | 1 | 0 | 0 | 0 | 12 |
| Other | 0 | 0 | 0 | 0 | 1 | 1 |
| Total | 36 | 18 | 3 | 14 | 5 | 76 |

# Sudden unexpected deaths in infants (SUDI)

**Figure 10: Unexplained sudden unexpected death in infants, Victoria 1985–2015[a,b]**




a. SIDS categories 2A/2B/2C/2D until 2003 and since 2004 SIDS 1A/1B/II.

b. This figure has been amended to include USID/Undetermined SUDI cases as a separate category from 1999. From 2004–2007 unclassified sudden infant death (USID) was previously included in the SIDS categories in this figure, but is now listed in the undetermined category. Prior to 1999, USID equivalent cases were classified as 'undetermined', and are not included in this amended figure.

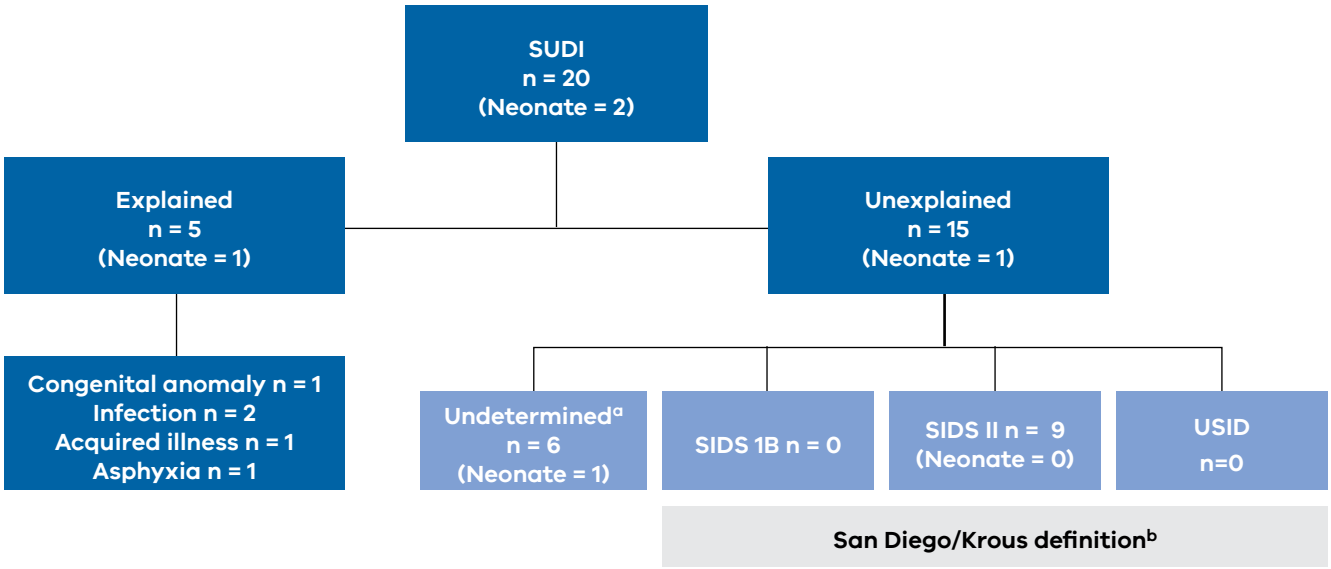
**Table 27: Unexplained sudden unexpected death in infants, Victoria 1985-2015[a,b]**

| | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SIDS Post-neonatal | 128 | 131 | 126 | 114 | 131 | 107 | 58 | 65 | 44 | 51 | 27 | 39 | 24 | 22 | 29 | 20 | 12 | 26 | 6 | 18 | 14 | 16 | 19 | 19 | 13 | 21 | 19 | 11 | 6 | 9 | 11 |
| SIDS Neonatal | 3 | 8 | 6 | 8 | 10 | 8 | 4 | 2 | 4 | 3 | 10 | 2 | 4 | 4 | 3 | 3 | 1 | 3 | 1 | 2 | 1 | 3 | 5 | 2 | 3 | 1 | 2 | 0 | 2 | 0 | 1 |
| Undetermined/ USID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 6 | 4 | 3 | 2 | 1 | 2 | 4 | 3 | 2 | 4 | 2 | 3 | 4 | 6 | 6 |
| **Total** | **131** | **139** | **132** | **122** | **141** | **115** | **62** | **67** | **48** | **54** | **37** | **41** | **28** | **26** | **34** | **24** | **19** | **33** | **10** | **22** | **16** | **21** | **28** | **24** | **18** | **26** | **23** | **14** | **12** | **15** | **18** |

a. SIDS categories 2A/2B/2C/2D until 2003 and since 2004 SIDS 1A/1B/II.

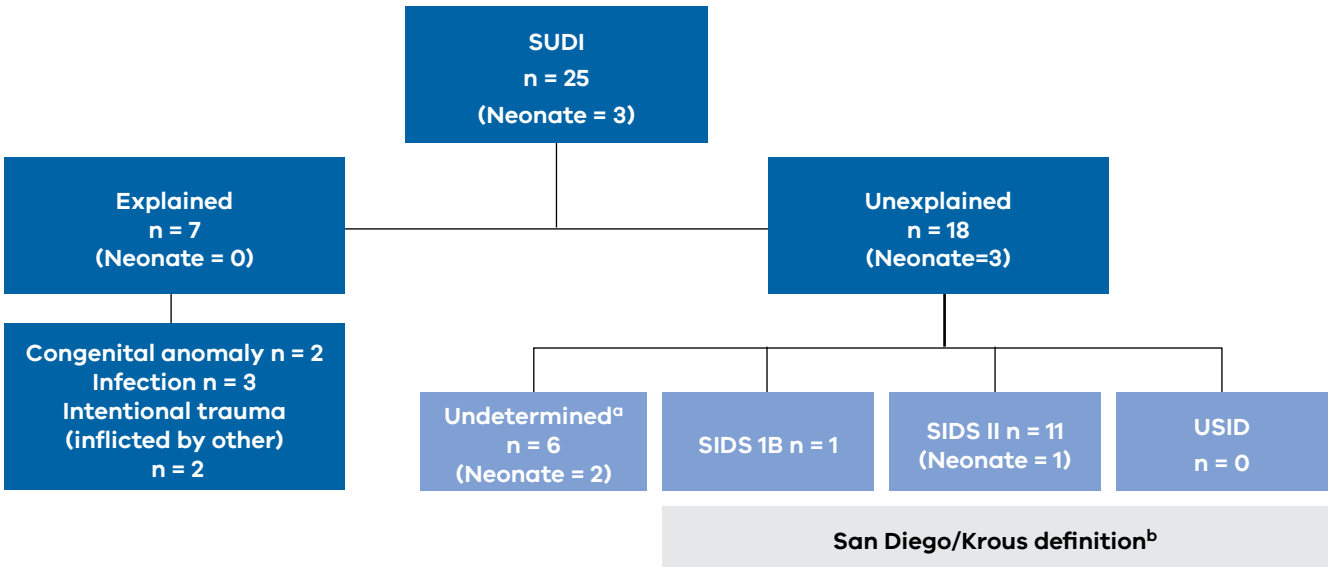
b. This table has been amended to include USID/Undetermined SUDI cases as a separate category from 1999. From 2004–2007 unclassified sudden infant death (USID) was previously included in the SIDS categories in this figure, but is now listed in the undetermined category. Prior to 1999, USID equivalent cases were classified as 'undetermined', and are not included in this amended figure.

**Figure 11a: Sudden unexpected deaths of infants, Victoria 2014**




a. See Table 52
b. See Appendix 1 for full definition

**Figure 11b: Sudden unexpected deaths of infants, Victoria 2015**




a. See Table 53
b. See Appendix 1 for full definition

**Table 28: SUDI[a,b] deaths: cause of death, Victoria 2004–2015**

| | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unexplained deaths | | | | | | | | | | | | | |
| ICD 10 code | San Diego (Krous) definition | | | | | | | | | | | | |
| R95 | Sudden infant death syndrome (category SIDS 1B) | 4 | 2 | 1 | 2 | 1 | 0 | 2 | 0 | 1 | 2 | 0 | 1 |
| R95 | Sudden infant death syndrome (category SIDS II) | 16 | 13 | 18 | 22 | 20 | 16 | 20 | 21 | 10 | 6 | 9 | 11 |
| | Undetermined[b]/ undetermined sudden infant death | 2 | 1 | 2 | 4 | 3 | 2 | 4 | 2 | 3 | 4 | 6 | 6 |
| Explained deaths | | | | | | | | | | | | | |
| Congenital anomaly/ genetic condition | | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 2 |
| Asphyxiation | | 1 | 1 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 |
| Infection | | 5 | 5 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 3 |
| Intentional injury | | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Acquired illness | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Aspiration pneumonia | | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Intestinal ischaemia | | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Complications of prematurity | | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | | 30 | 26 | 27 | 33 | 25 | 20 | 26 | 23 | 14 | 14 | 20 | 25 |

a. See Appendix 1 for full definition

b. See Tables 52 and 53

**Table 29: Selected features of the (n = 20) infants categorised as SIDS II[a], Victoria 2014 and 2015**

| SIDS II features[a] | n | % of cases (N = 20) |
|---|---|---|
| Prematurity | 6 | 30 |
| Age ≤ 21 days | 1 | 5 |
| Age ≥ 9 months | 1 | 5 |
| History of similar death among siblings, close relatives or infants in care of same caregiver | 0 | 0 |
| Neonatal or perinatal conditions which had resolved by the time of death | 4 | 20 |
| Mechanical asphyxia or suffocation caused by overlaying not determined with certainty (as co-sleeping or unsafe sleeping environment) | 18 | 90 |
| Marked inflammatory changes not sufficient to be unequivocal causes of death | 8 | 40 |
| Abnormal growth or development not thought to have contributed to death | 4 | 20 |
| Total | 42 | N/A |

a. Infants can have more than one feature

N/A – not applicable

**Table 30: Selected features of the (n = 33) unexplained SUDI deaths, 2014 and 2015[a]**

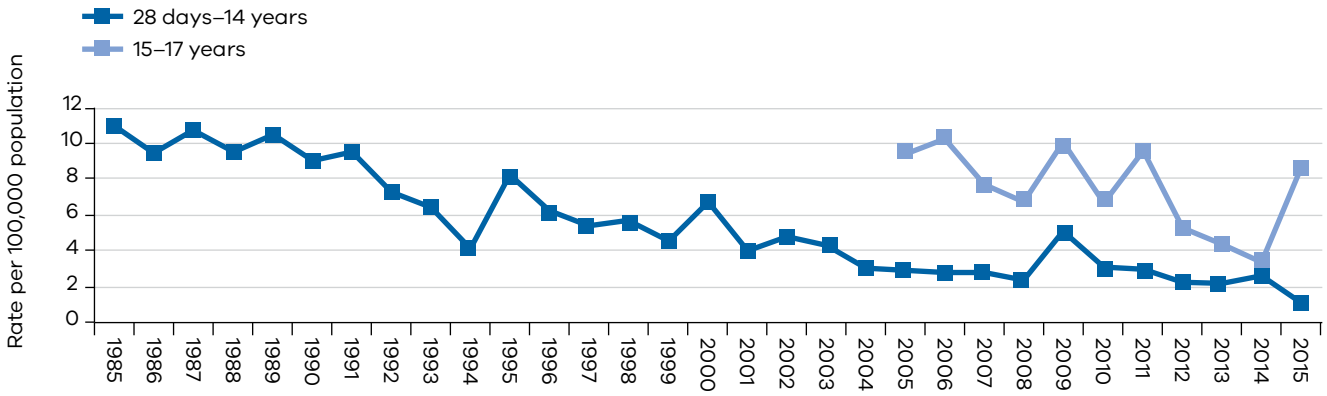
| | | Females | Males | Total | |
|---|---|---|---|---|---|
| | | n | n | n | % |
| Sex and age at death | < 21 days | 1 | 2 | 3 | 9.1 |
| | 21 days to < 1 month | 1 | 0 | 1 | 3.0 |
| | 1 month | 5 | 5 | 10 | 30.3 |
| | 2 months | 3 | 1 | 4 | 12.1 |
| | 3 months | 1 | 1 | 2 | 6.1 |
| | 4 months | 2 | 3 | 5 | 15.2 |
| | 5 months | 0 | 1 | 1 | 3.0 |
| | ≥ 6 months | 3 | 4 | 7 | 21.2 |
| | **Total** | **16** | **17** | **33** | **100** |
| | | **n** | **%** | | |
| Gestational age | Preterm < 37 | 7 | 21.2 | | |
| | Term | 26 | 78.8 | | |
| | **Total** | **33** | **100** | | |
| Birthweight | < 2500 g | 5 | 15.2 | | |
| | ≥ 2500 gm | 27 | 81.8 | | |
| | Unknown[b] | 1 | 3.0 | | |
| | **Total** | **33** | **100** | | |
| Mother's age at delivery (years) | 15–19 | 4 | 12.1 | | |
| | 20–24 | 8 | 24.2 | | |
| | 25–29 | 6 | 18.2 | | |
| | ≥ 30 years | 14 | 42.4 | | |
| | Unknown[b] | 1 | 3.0 | | |
| | **Total** | **33** | **100** | | |
| Position when placed to sleep | Prone | 3 | 9.1 | | |
| | Side | 6 | 18.2 | | |
| | Supine | 12 | 36.4 | | |
| | Being held | 3 | 9.1 | | |
| | Not adequately described | 9 | 27.3 | | |
| | **Total** | **33** | **100** | | |
| Co-sleeping | Yes | 16 | 48.5 | | |
| | No | 17 | 51.5 | | |
| | **Total** | **33** | **100** | | |
| Co-sleeping site | Couch/chair | 4 | 25.0 | | |
| | Adult bed | 10 | 62.5 | | |
| | Other type of bed | 2 | 12.5 | | |
| | **Total** | **16** | **100** | | |
| Non co-sleeping bed[c] | Cot | 5 | 29.4 | | |
| | Bassinette | 4 | 23.5 | | |
| | Portable cot | 1 | 5.9 | | |
| | Adult bed | 6 | 35.3 | | |
| | Other type of bed | 1 | 5.9 | | |
| | **Total** | **17** | **100** | | |

| | | Females | Males |
|---|---|---|---|
| | | n | % |
| Position when found | Prone | 10 | 30.3 |
| | Not adequately described | 23 | 69.7 |
| | **Total** | **33** | **100** |
| DHHS region | Metropolitan | 22 | 66.7 |
| | Non-metropolitan | 11 | 33.3 |
| | **Total** | **33** | **100** |
| Season of death | **Spring** | **10** | **30.3** |
| | Summer | 6 | 18.2 |
| | Autumn | 10 | 30.3 |
| | Winter | 7 | 21.2 |
| | **Total** | **33** | **100** |

a. The 2014 (n = 15) unexplained SUDI deaths are coded as: SIDS 1A (n = 0), IB (n = 0), SIDS II (n = 9), USID (n = 0) and Undetermined (n = 6).
The 2015 (n = 18) unexplained SUDI deaths are coded as: SIDS 1A (n = 0), IB (n = 1), SIDS II (n = 11), USID (n = 0) and Undetermined (n = 6).
b. Unknown mother's age and weight for baby as the birth occurred interstate resulting in birth details not being available.
c. Sleeping site may not have been safe according to recommendations, all adult beds are considered unsafe sleep environments.

# Deaths from unintentional injury

**Figure 12: Rates of unintentional injury deaths by age group, Victoria 1985–2015[a]**

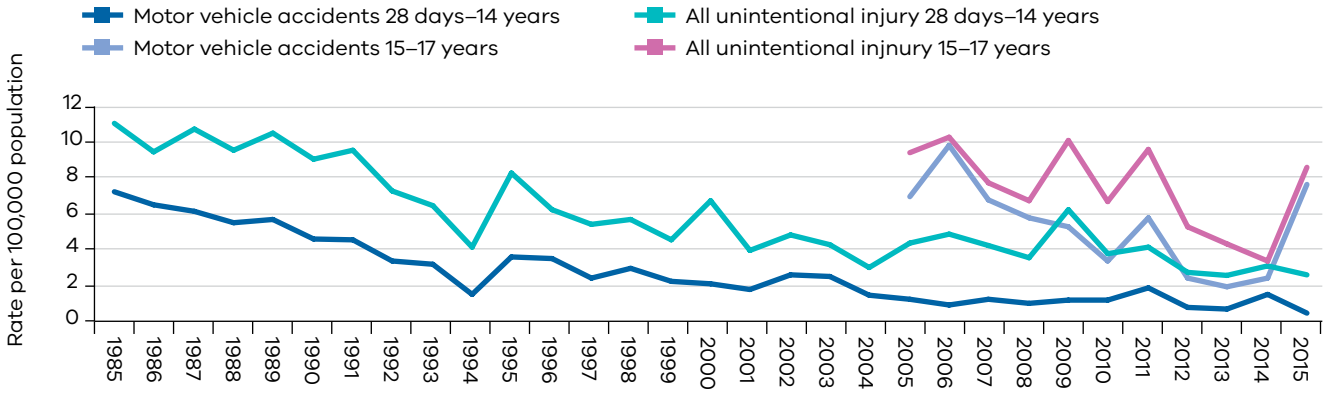



a. Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015. Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016.

Notes:

- For 28 days–14 years the denominator includes all Victorian resident infants 0–14 years of age; while the numerator includes only children aged 28 days–14 years.
- CCOPMM commenced reporting in the 15–17 year age group in 2005.

**Figure 13: Rates of motor vehicle accidents and all unintentional injury deaths by age group, Victoria 1985–2015[a]**

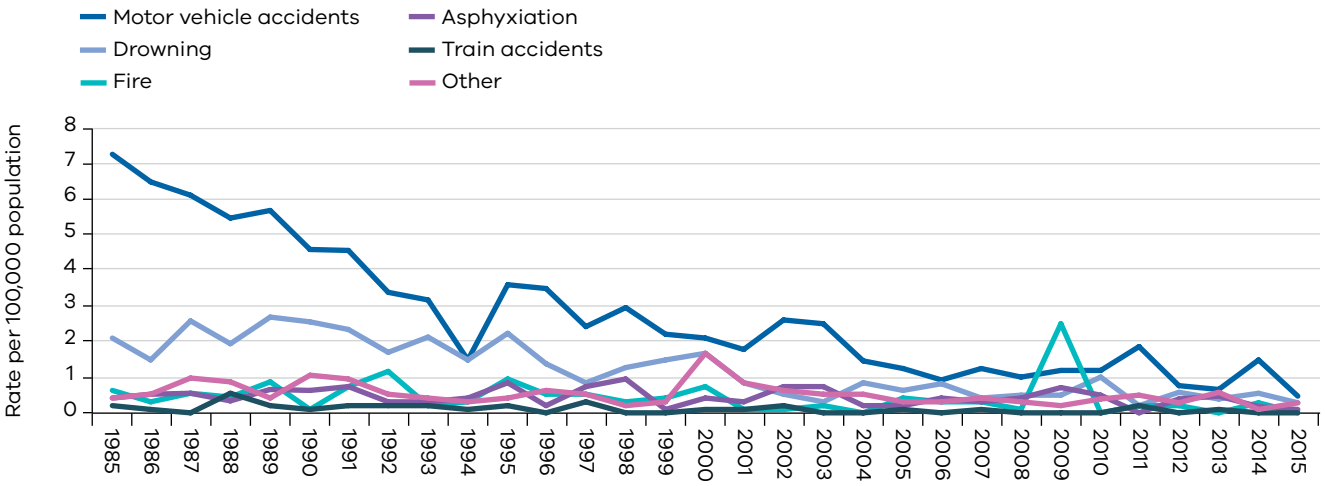



a. Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015. Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016.

Notes:

- For 28 days–14 years the denominator includes all Victorian resident infants 0–14 years of age; while the numerator includes only children aged 28 days–14 years.
- CCOPMM commenced reporting in the 15–17 year age group in 2005.

**Figure 14: Rates of unintentional injury deaths, 28 days to 14 years, Victoria 1985–2015[a]**

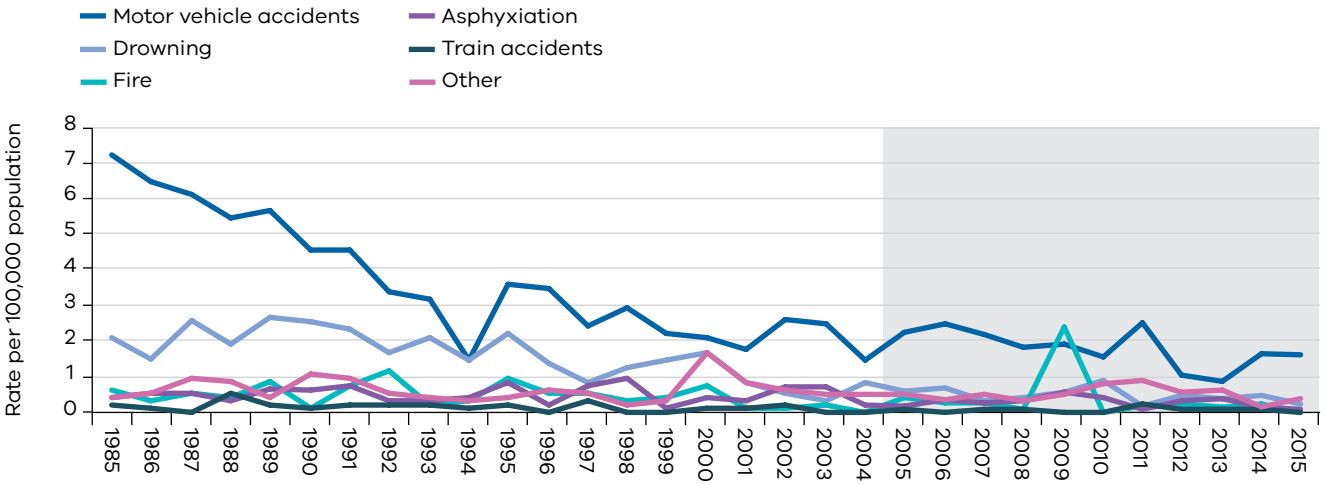



a. Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015. Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016.

Notes:

- For 28 days–14 years the denominator includes all Victorian resident infants 0–14 years of age; while the numerator includes only children aged 28 days–14 years.
- The spike in fire-related deaths in 2009 relates to the Victorian bushfires of February 2009.

**Figure 15: Rates of unintentional injury deaths, Victoria 1985–2015[a]**

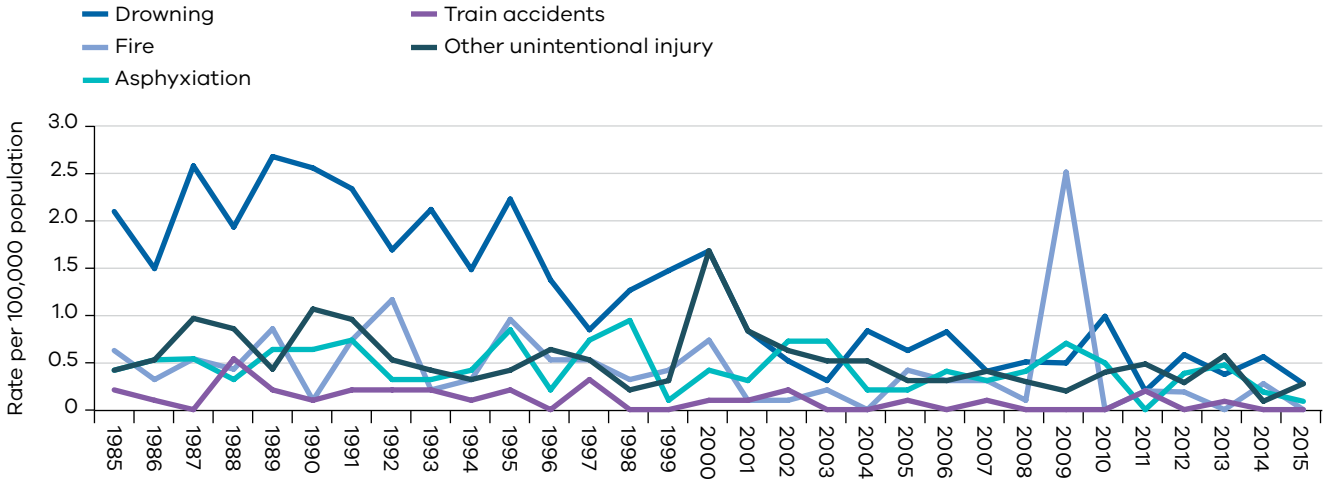



a Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016.

Notes:

- For 1985–2004, the denominator includes all Victorian resident children 0–14 years of age; while the numerator includes only children aged 28 days–14 years.
- For 2005 onwards, the denominator includes all Victorian resident children 0–17 years of age; while the numerator includes only children aged 28 days–17 years.
- The spike in fire-related deaths in 2009 relates to the Victorian bushfires of February 2009.

**Figure 16: Rates of unintentional injury deaths (excluding motor vehicle accidents), 28 days to 14 years, Victoria 1985–2015[a]**

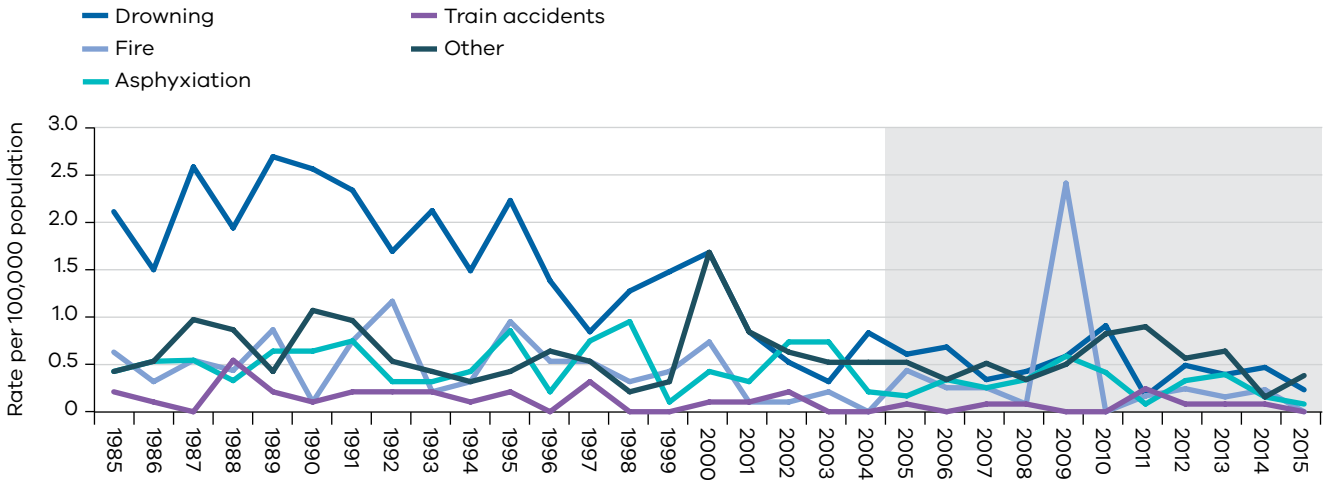



a. Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016

Note:

– For 0–14 years, the denominator includes all Victorian resident children 0–14 years of age; while the numerator includes only children aged 28 days–14 years.

**Figure 17: Rates of unintentional injury deaths (excluding motor vehicle accidents), Victoria 1985–2015[a]**




a. Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016

Notes:

– CCOPMM commenced reporting in the 15–17 year age group in 2005

– For 1985–2004, the denominator includes all Victorian resident children 0–14 years of age; while the numerator includes only children aged 28 days–14 years.

– For 2005 onwards, the denominator includes all Victorian resident children 0–17 years of age; while the numerator includes only children aged 28 days–17 years.

**Figure 18a: Unintentional injury deaths: post-neonatal infants and children (28 days to 14 years), Victoria 1997–2015**

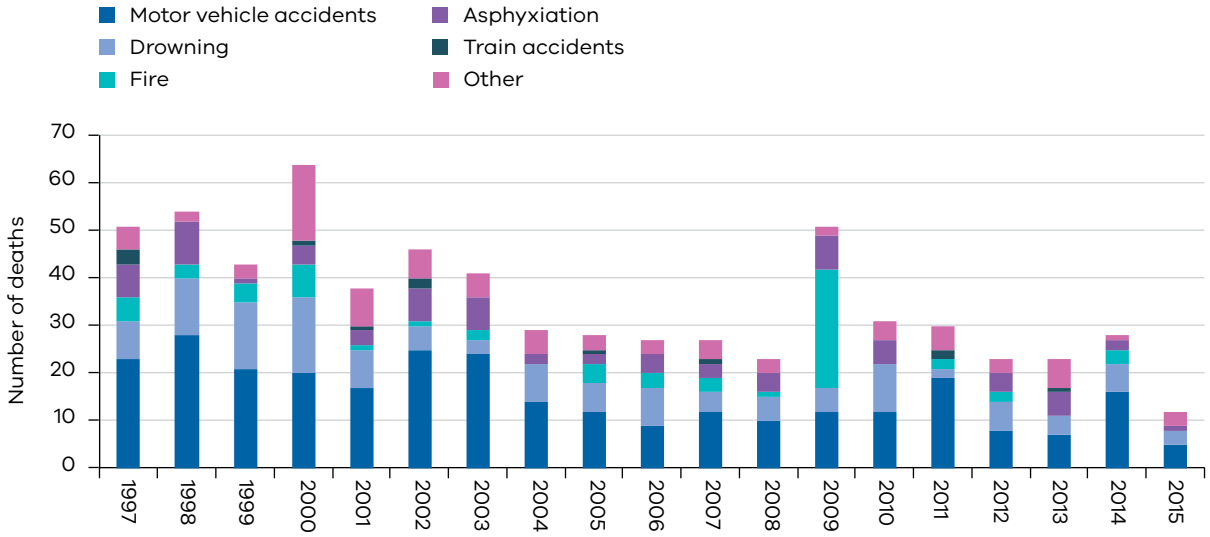
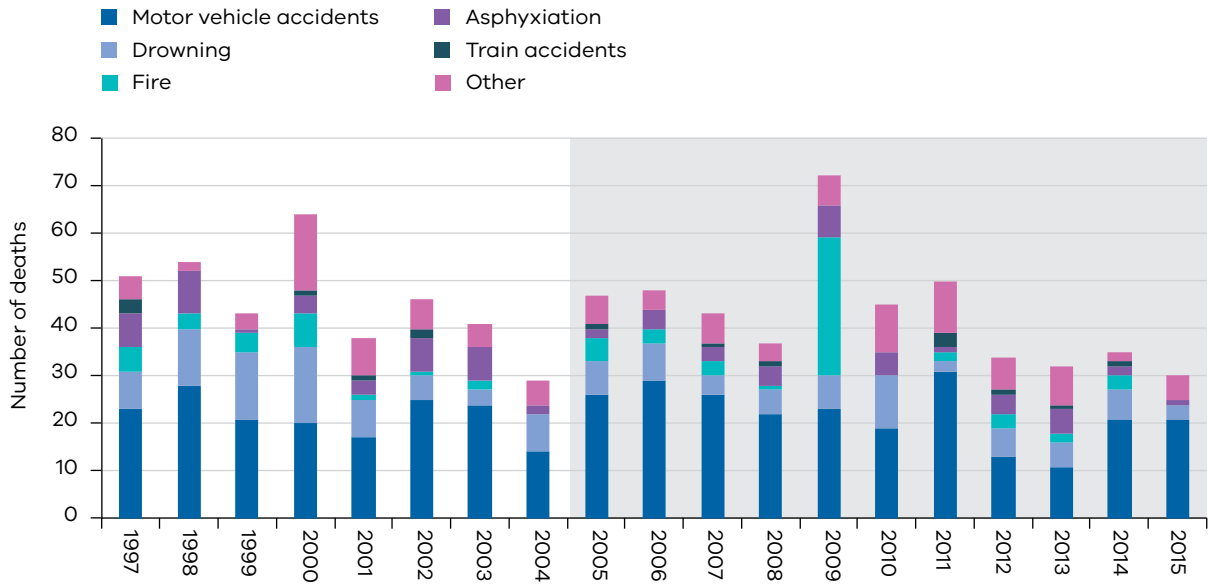



**Table 31: Unintentional injury deaths: post-neonatal infants and children (28 days to 14 years), Victoria 1997–2015**

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Motor vehicle accidents | 23 | 28 | 21 | 20 | 17 | 25 | 24 | 14 | 12 | 9 | 12 | 10 | 12 | 12 | 19 | 8 | 7 | 16 | 5 |
| Drowning | 8 | 12 | 14 | 16 | 8 | 5 | 3 | 8 | 6 | 8 | 4 | 5 | 5 | 10 | 2 | 6 | 4 | 6 | 3 |
| Fire | 5 | 3 | 4 | 7 | 1 | 1 | 2 | 0 | 4 | 3 | 3 | 1 | 25 | 0 | 2 | 2 | 0 | 3 | 0 |
| Asphyxiation | 7 | 9 | 1 | 4 | 3 | 7 | 7 | 2 | 2 | 4 | 3 | 4 | 7 | 5 | 0 | 4 | 5 | 2 | 1 |
| Train accidents | 3 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 |
| Other | 5 | 2 | 3 | 16 | 8 | 6 | 5 | 5 | 3 | 3 | 4 | 3 | 2 | 4 | 5 | 3 | 6 | 1 | 3 |
| **Total** | **51** | **54** | **43** | **64** | **38** | **46** | **41** | **29** | **28** | **27** | **27** | **23** | **51** | **31** | **30** | **23** | **23** | **28** | **12** |

**Figure 18b: Unintentional injury deaths: post-neonatal infants, children and adolescents[a,b], Victoria 1997–2015**




a. 1997–2004 children aged 28 days to 14 years.
b. 2005–2015 children aged 28 days to 17 years.

**Table 32: Unintentional injury deaths: post-neonatal infants, children and adolescents[a,b], Victoria 1997–2015**

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Motor vehicle accidents | 23 | 28 | 21 | 20 | 17 | 25 | 24 | 14 | 26 | 29 | 26 | 22 | 23 | 19 | 31 | 13 | 11 | 21 | 21 |
| Drowning | 8 | 12 | 14 | 16 | 8 | 5 | 3 | 8 | 7 | 8 | 4 | 5 | 7 | 11 | 2 | 6 | 5 | 6 | 3 |
| Fire | 5 | 3 | 4 | 7 | 1 | 1 | 2 | 0 | 5 | 3 | 3 | 1 | 29 | 0 | 2 | 3 | 2 | 3 | 0 |
| Asphyxiation | 7 | 9 | 1 | 4 | 3 | 7 | 7 | 2 | 2 | 4 | 3 | 4 | 7 | 5 | 1 | 4 | 5 | 2 | 1 |
| Train accidents | 3 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 3 | 1 | 1 | 1 | 0 |
| Other | 5 | 2 | 3 | 16 | 8 | 6 | 5 | 5 | 6 | 4 | 6 | 4 | 6 | 10 | 11 | 7 | 8 | 2 | 5 |
| **Total** | **51** | **54** | **43** | **64** | **38** | **46** | **41** | **29** | **47** | **48** | **43** | **37** | **72** | **45** | **50** | **34** | **32** | **35** | **30** |

a. 1997–2004 children aged 28 days to 14 years.
b. 2005–2015 children aged 28 days to 17 years.

**Figure 19a: Motor vehicle accident fatalities: post-neonatal infants and children (28 days to 14 years), Victoria 1997–2015**

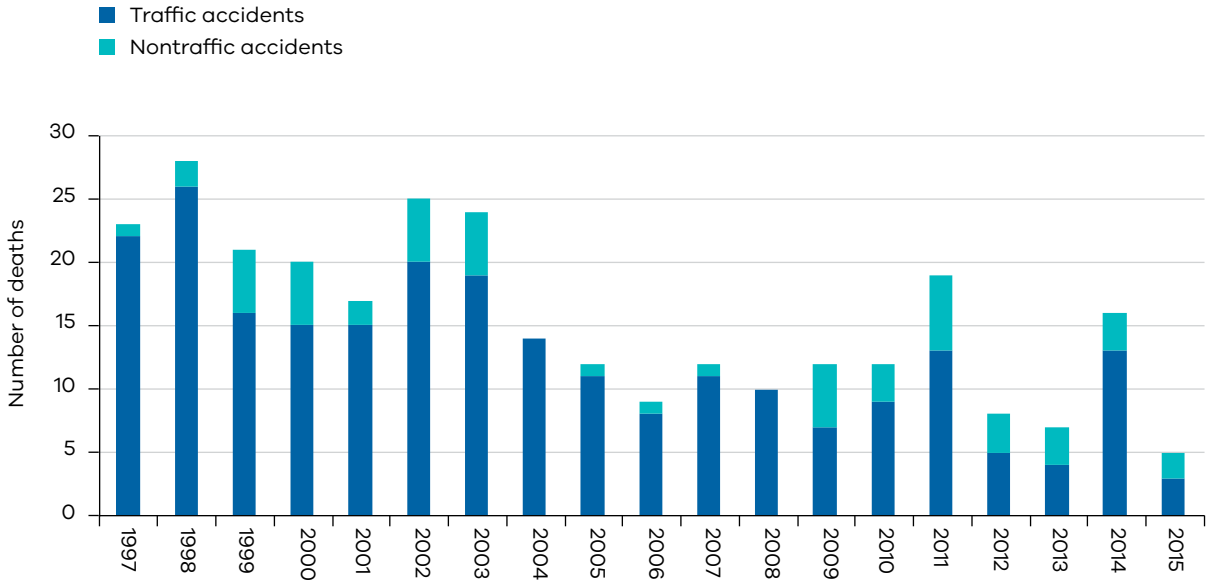
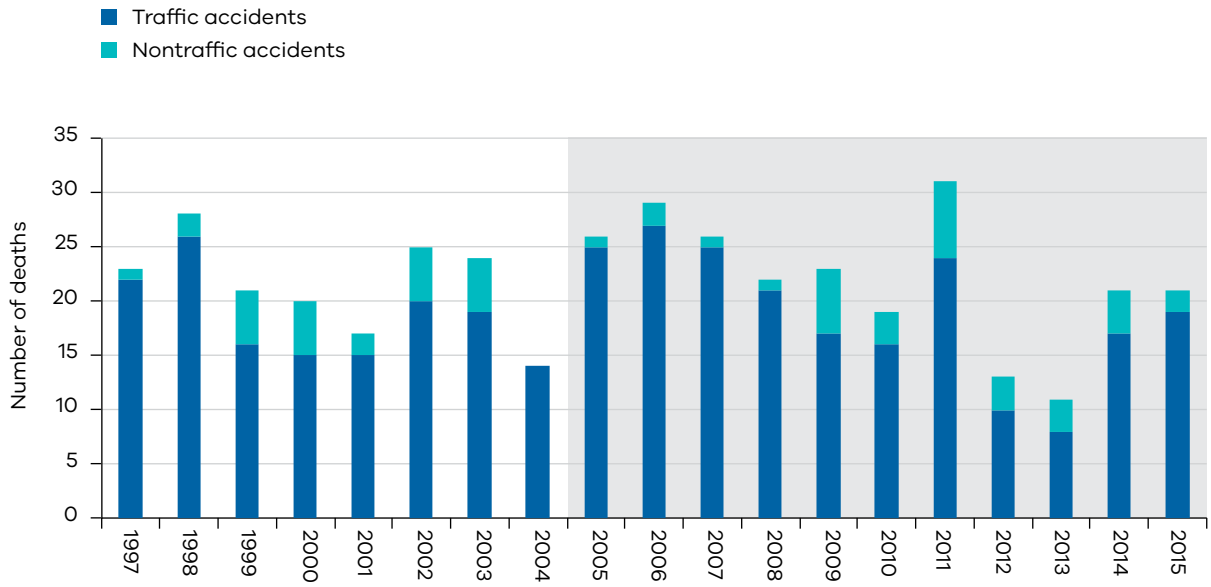



**Table 33: Motor vehicle accident fatalities: post-neonatal infants and children (28 days to 14 years), Victoria 1997–2015**

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Traffic accidents[a] | 22 | 26 | 16 | 15 | 15 | 20 | 19 | 14 | 11 | 8 | 11 | 10 | 7 | 9 | 13 | 5 | 4 | 13 | 3 |
| Non-traffic accidents[a] | 1 | 2 | 5 | 5 | 2 | 5 | 5 | 0 | 1 | 1 | 1 | 0 | 5 | 3 | 6 | 3 | 3 | 3 | 2 |
| **Total** | **23** | **28** | **21** | **20** | **17** | **25** | **24** | **14** | **12** | **9** | **12** | **10** | **12** | **12** | **19** | **8** | **7** | **16** | **5** |

a. A traffic accident is defined (ICD-10) as a vehicle on the public highway (originating on, terminating on or involving a vehicle party on the highway), whereas a non-traffic accident is defined as any vehicle accident that occurs entirely in any place other than a public highway (for example, a private property or involving only off-road motor vehicles).

**Figure 19b: Motor vehicle accident fatalities: post-neonatal infants, children and adolescents[a,b], Victoria 1997–2015**




a. 1997–2004 children aged 28 days to 14 years.

b. 2005–2015 children aged 28 days to 17 years.

**Table 34: Motor vehicle accident fatalities: post-neonatal infants, children and adolescents[a,b], Victoria 1997–2015**

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Traffic accidents[c] | 22 | 26 | 16 | 15 | 15 | 20 | 19 | 14 | 25 | 27 | 25 | 21 | 17 | 16 | 24 | 10 | 8 | 17 | 19 |
| Non-traffic accidents[c] | 1 | 2 | 5 | 5 | 2 | 5 | 5 | 0 | 1 | 2 | 1 | 1 | 6 | 3 | 7 | 3 | 3 | 4 | 2 |
| **Total** | **23** | **28** | **21** | **20** | **17** | **25** | **24** | **14** | **26** | **29** | **26** | **22** | **23** | **19** | **31** | **13** | **11** | **21** | **21** |

a. 1997–2004 children aged 28 days to 14 years.

b. 2005–2015 children and adolescents aged 28 days to 17 years.

c. A traffic accident is defined (ICD-10) as a vehicle on the public highway (originating on, terminating on or involving a vehicle party on the highway), whereas a non-traffic accident is defined as any vehicle accident that occurs entirely in any place other than a public highway (for example, a private property or involving only off-road motor vehicles).

**Table 35: Mode of travel in motor vehicle accident fatalities by age group, Victoria 2014**

| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
|---|---|---|---|---|---|---|
| Passenger in motor vehicle | 0 | 3 | 3 | 4 | 3 | 13 |
| Driver of motor vehicle | 0 | 0 | 0 | 0 | 1 | 1 |
| Pedestrian | 1 | 2 | 2 | 0 | 0 | 5 |
| Motorcycle/trailbike rider | 0 | 0 | 0 | 1 | 0 | 1 |
| Forklift driver | 0 | 0 | 0 | 0 | 1 | 1 |
| **Total** | **1** | **5** | **5** | **5** | **5** | **21** |

**Table 36: Mode of travel in motor vehicle accident fatalities by age group, Victoria 2015**

| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
|---|---|---|---|---|---|---|
| Passenger in motor vehicle | 0 | 1 | 2 | 1 | 11 | 15 |
| Driver of motor vehicle | 0 | 0 | 0 | 0 | 1 | 1 |
| Pedestrian | 0 | 0 | 1 | 0 | 4 | 5 |
| **Total** | **0** | **1** | **3** | **1** | **16** | **21** |

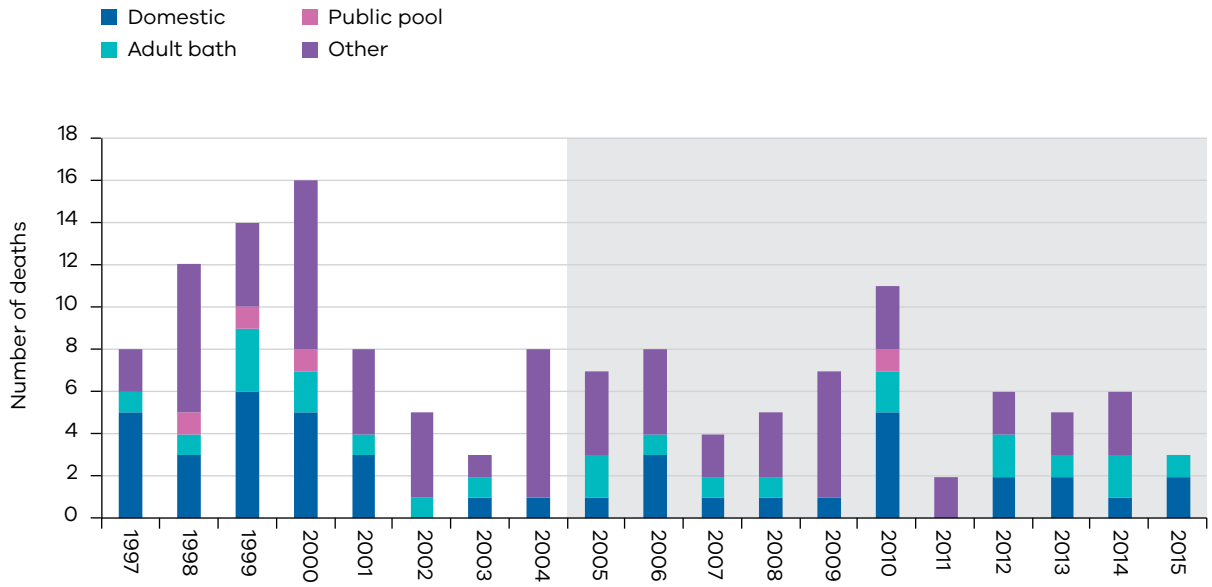
**Table 37: Location of drowning fatalities by age group, Victoria 2014**

| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
|---|---|---|---|---|---|---|
| Bath tub | 1 | 1 | 0 | 0 | 0 | 2 |
| Domestic pool | 0 | 1 | 0 | 0 | 0 | 1 |
| Sea | 0 | 1 | 0 | 0 | 0 | 1 |
| Drain | 0 | 1 | 0 | 0 | 0 | 1 |
| Lake | 0 | 0 | 1 | 0 | 0 | 1 |
| **Total** | **1** | **4** | **1** | **0** | **0** | **6** |

**Table 38: Location of drowning fatalities by age group, Victoria 2015**

| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
|---|---|---|---|---|---|---|
| Spa bath | 1 | 0 | 0 | 0 | 0 | 1 |
| Domestic pool | 0 | 2 | 0 | 0 | 0 | 2 |
| **Total** | **1** | **2** | **0** | **0** | **0** | **3** |

**Figure 20: Drowning fatalities: post-neonatal infants, children and adolescents[a,b], Victoria 1997–2015**




a. 1997–2004 children aged 28 days to 14 years.
b. 2005–2015 children aged 28 days to 17 years.

**Table 39: Drowning fatalities: post-neonatal infants, children and adolescents[a,b], Victoria 1997–2015**

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Domestic pool[c] | 5 | 3 | 6 | 5 | 3 | 0 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 5 | 0 | 2 | 2 | 1 | 2 |
| Adult bath | 1 | 1 | 3 | 2 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 0 | 2 | 0 | 2 | 1 | 2 | 1 |
| Public pool | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Other[d] | 2 | 7 | 4 | 8 | 4 | 4 | 1 | 7 | 4 | 4 | 2 | 3 | 6 | 3 | 2 | 2 | 2 | 3 | 0 |
| **Total** | **8** | **12** | **14** | **16** | **8** | **5** | **3** | **8** | **7** | **8** | **4** | **5** | **7** | **11** | **2** | **6** | **5** | **6** | **3** |

a. 1997–2004 children aged 28 days to 14 years.
b. 2005–2015 children and adolescents ages 28 days to 17 years.
c. 'Domestic pool' includes spa, wading pool.
d. 'Other' includes bucket, river, sea, dam, irrigation channel, reservoir, storm drain, creek, river, lake.

**Table 40: Fire fatalities by age group, Victoria 2014**

| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
|---|---|---|---|---|---|---|
| House fire | 0 | 2 | 0 | 1 | 0 | 3 |
| **Total** | **0** | **2** | **0** | **1** | **0** | **3** |

**Table 41: Fire fatalities by age group, Victoria 2015**

| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
|---|---|---|---|---|---|---|
| House fire | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **0** | **0** | **0** | **0** | **0** | **0** |

**Table 42: Deaths from asphyxiation, train and other types of injury, by age group, Victoria 2014**

| | Age group | | | | | |
|---|---|---|---|---|---|---|
| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
| **Asphyxiation** | | | | | | |
| Suffocation | 0 | 0 | 1 | 0 | 0 | 1 |
| Smothered (co-sleeping) | 1 | 0 | 0 | 0 | 0 | 1 |
| **Train** | | | | | | |
| Train deaths | 0 | 0 | 0 | 0 | 1 | 1 |
| **Other injury type** | | | | | | |
| Boating accident | 0 | 0 | 0 | 1 | 0 | 1 |
| Head injury – fall | 0 | 0 | 0 | 0 | 1 | 1 |
| **Total** | 1 | 0 | 1 | 1 | 2 | 5 |

**Table 43: Deaths from asphyxiation, train and other types of injury, by age group, Victoria 2015**

| | Age group | | | | | |
|---|---|---|---|---|---|---|
| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
| **Asphyxiation** | | | | | | |
| Crush injury | 0 | 1 | 0 | 0 | 0 | 1 |
| **Train** | | | | | | |
| Train deaths | 0 | 0 | 0 | 0 | 0 | 0 |
| **Other injury type** | | | | | | |
| Heat stroke | 0 | 1 | 0 | 0 | 0 | 1 |
| Head injuries | 0 | 0 | 0 | 0 | 2 | 2 |
| Haemorrhage – ingestion of foreign body | 0 | 1 | 0 | 0 | 0 | 1 |
| Complications following infusion | 0 | 1 | 0 | 0 | 0 | 1 |
| **Total** | 0 | 4 | 0 | 0 | 2 | 6 |

# Deaths from acquired disease and undetermined deaths

**Figure 21: Acquired disease and undetermined deaths: post-neonatal infants and children (28 days to 14 years) Victoria 1997–2015**

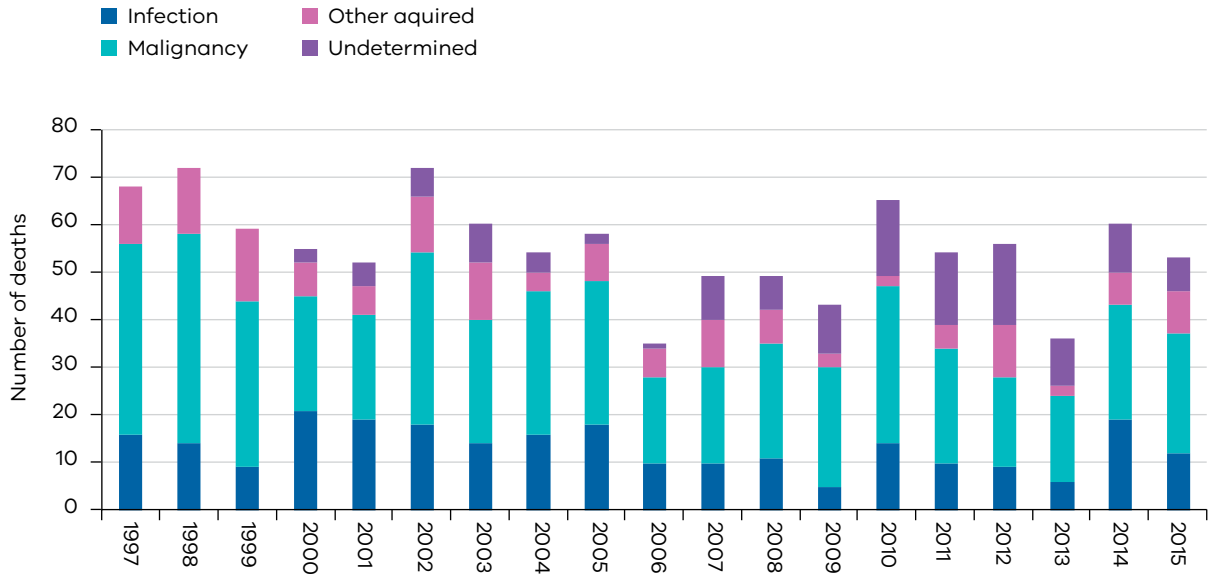



**Table 44: Acquired disease and undetermined deaths: post-neonatal infants and children (28 days to 14 years) Victoria 1997–2015**

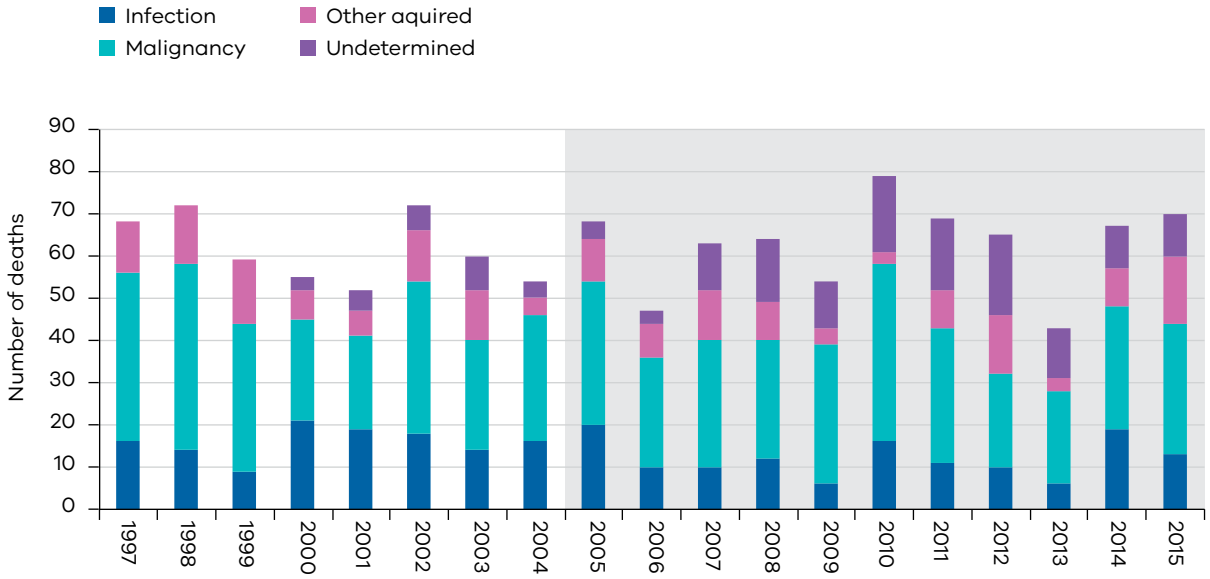
| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Infection | 16 | 14 | 9 | 21 | 19 | 18 | 14 | 16 | 18 | 10 | 10 | 11 | 5 | 14 | 10 | 9 | 6 | 19 | 12 |
| Malignancy | 40 | 44 | 35 | 24 | 22 | 36 | 26 | 30 | 30 | 18 | 20 | 24 | 25 | 33 | 24 | 19 | 18 | 24 | 25 |
| Other acquired[a] | 12 | 14 | 15 | 7 | 6 | 12 | 12 | 4 | 8 | 6 | 10 | 7 | 3 | 2 | 5 | 11 | 2 | 7 | 9 |
| Undetermined[b] | N/A | N/A | 0 | 3 | 5 | 6 | 8 | 4 | 2 | 1 | 9 | 7 | 10 | 16 | 15 | 17 | 10 | 10 | 7 |
| **Total** | **68** | **72** | **59** | **55** | **52** | **72** | **60** | **54** | **58** | **35** | **49** | **49** | **43** | **65** | **54** | **56** | **36** | **60** | **53** |

a. Other acquired category: this category is summarised in Tables 50 and 51.

b. Undetermined category: in reports prior to 2002 (backdated to 1999), where a cause of death was not identified or had been classified as 'unascertained/undetermined' it was included in the 'other acquired' category.

N/A – not applicable

**Figure 22: Acquired disease deaths: post-neonatal infants, children and adolescents[a,b], Victoria 1997–2015**




a. 1997–2004 children aged 28 days to 14 years.
b. 2005–2015 children aged 28 days to 17 years.

**Table 45: Acquired disease deaths: post-neonatal infants, children and adolescents[a,b], Victoria 1997–2015.**

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Infection | 16 | 14 | 9 | 21 | 19 | 18 | 14 | 16 | 20 | 10 | 10 | 12 | 6 | 16 | 11 | 10 | 6 | 19 | 13 |
| Malignancy | 40 | 44 | 35 | 24 | 22 | 36 | 26 | 30 | 34 | 26 | 30 | 28 | 33 | 42 | 32 | 22 | 22 | 29 | 31 |
| Other acquired[c] | 12 | 14 | 15 | 7 | 6 | 12 | 12 | 4 | 10 | 8 | 12 | 9 | 4 | 3 | 9 | 14 | 3 | 9 | 16 |
| Undetermined[d] | N/A | N/A | 0 | 3 | 5 | 6 | 8 | 4 | 4 | 3 | 11 | 15 | 11 | 18 | 17 | 19 | 12 | 10 | 10 |
| **Total** | **68** | **72** | **59** | **55** | **52** | **72** | **60** | **54** | **68** | **47** | **63** | **64** | **54** | **79** | **69** | **65** | **43** | **67** | **70** |

a. 1997–2004 children aged 28 days to 14 years.
b. 2005–2015 children and adolescents ages 28 days to 17 years.
c. Other acquired category. This category is summarised in Tables 50 and 51.
d Undetermined category. In reports prior to 2002 (backdated to 1999), where a cause of death was not identified or had been classified as 'unascertained/undetermined' it was included in 'other acquired'.
N/A – not applicable

**Table 46: Deaths from infection by age group, Victoria 2014**

| | Age group | | | | | |
|---|---|---|---|---|---|---|
| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
| Viral myocarditis | 2 | 2 | 0 | 0 | 0 | 4 |
| Meningococcal meningitis | 1 | 0 | 0 | 0 | 0 | 1 |
| Pneumococcal meningitis | 1 | 0 | 0 | 0 | 0 | 1 |
| Bacterial meningitis (no organism detected) | 0 | 0 | 1 | 0 | 0 | 1 |
| Enteroviral meningoencephalitis | 1 | 0 | 0 | 0 | 0 | 1 |
| Enteroviral encephalitis | 1 | 0 | 0 | 0 | 0 | 1 |
| Septicaemia, unspecified | 1 | 0 | 0 | 0 | 0 | 1 |
| Septicaemia due to *Staphylococcus aureus* | 1 | 1 | 0 | 0 | 0 | 2 |
| Septicaemia due to *Streptococcus, Group A* | 0 | 1 | 0 | 0 | 0 | 1 |
| Influenza with other respiratory manifestations | 1 | 0 | 0 | 0 | 0 | 1 |
| Pneumonia due to *Haemophilus influenzae* | 0 | 1 | 0 | 0 | 0 | 1 |
| Bronchopneumonia | 1 | 0 | 0 | 0 | 0 | 1 |
| Urinary tract infection | 1 | 0 | 0 | 0 | 0 | 1 |
| Gastroenteritis | 1 | 1 | 0 | 0 | 0 | 2 |
| **Total** | **12** | **6** | **1** | **0** | **0** | **19** |

**Table 47: Deaths from infection by age group, Victoria 2015**

| | Age group | | | | | |
|---|---|---|---|---|---|---|
| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
| Meningoencephalitis due to *Human Herpes Virus 6* | 1 | 0 | 0 | 0 | 0 | 1 |
| Meningoencephalitis due to *Parechovirus* | 1 | 0 | 0 | 0 | 0 | 1 |
| Encephalitis to due *Herpes Simplex Virus Type 1* | 1 | 0 | 0 | 0 | 0 | 1 |
| Septicaemia due to *Escherichia coli* | 1 | 1 | 0 | 0 | 0 | 2 |
| Septicaemia due to *Streptococcus, Group A* | 0 | 1 | 0 | 0 | 0 | 1 |
| Pneumonia due to *Haemophilus influenzae* | 0 | 1 | 0 | 0 | 0 | 1 |
| Pneumonia due to other streptococci | 0 | 1 | 0 | 0 | 0 | 1 |
| Pneumonia, organism unspecified | 1 | 0 | 0 | 0 | 0 | 1 |
| Interstitial pneumonitis | 1 | 0 | 0 | 0 | 0 | 1 |
| Acute bronchiolitis | 1 | 0 | 0 | 0 | 0 | 1 |
| Lower respiratory tract infection | 0 | 1 | 0 | 0 | 0 | 1 |
| Infective endocarditis | 0 | 0 | 0 | 0 | 1 | 1 |
| **Total** | **7** | **5** | **0** | **0** | **1** | **13** |

**Table 48: Deaths from malignancy by age group, Victoria 2014**

| | Age group | | | | | |
|---|---|---|---|---|---|---|
| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
| **Nervous system** | | | | | | |
| Neoplasm of brain stem | 0 | 3 | 2 | 0 | 1 | 6 |
| Neoplasm of brain, unspecified | 0 | 0 | 1 | 0 | 0 | 1 |
| Neoplasm of cerebellum | 0 | 0 | 1 | 0 | 0 | 1 |
| Neoplasm of frontal lobe | 0 | 0 | 0 | 1 | 0 | 1 |
| Neoplasm of optic nerve | 0 | 0 | 1 | 0 | 0 | 1 |
| Neoplasm of peripheral nerves and autonomic nervous system | 0 | 0 | 0 | 1 | 0 | 1 |
| Neoplasm of the pineal gland | 0 | 1 | 0 | 0 | 1 | 2 |
| **Lymphoma** | | | | | | |
| Large cell (diffuse) non-Hodgkin's lymphoma | 0 | 0 | 0 | 0 | 1 | 1 |
| Hodgkin's disease, unspecified | 0 | 0 | 0 | 1 | 0 | 1 |
| Hepatoblastoma | 0 | 0 | 1 | 0 | 1 | 2 |
| **Leukaemia** | | | | | | |
| Acute lymphoid leukaemia | 0 | 0 | 0 | 2 | 0 | 2 |
| Acute myeloid leukaemia | 1 | 0 | 1 | 1 | 0 | 3 |
| **Other** | | | | | | |
| Neoplasm of anterior mediastinum | 1 | 0 | 0 | 0 | 0 | 1 |
| Neoplasm of accessory sinus | 0 | 0 | 1 | 0 | 0 | 1 |
| Neoplasm of adrenal gland | 0 | 1 | 1 | 0 | 0 | 2 |
| Neoplasm of kidney | 0 | 0 | 1 | 0 | 0 | 1 |
| Neoplasm of thorax | 0 | 0 | 0 | 0 | 1 | 1 |
| Unknown primary, secondary neoplasm of liver | 0 | 0 | 0 | 1 | 0 | 1 |
| **Total** | **2** | **5** | **10** | **7** | **5** | **29** |

**Table 49: Deaths from malignancy by age group, Victoria 2015**

| | Age group | | | | | |
|---|---|---|---|---|---|---|
| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
| **Central nervous system** | | | | | | |
| Neoplasm of brain stem | 0 | 2 | 1 | 3 | 1 | 7 |
| Neoplasm of brain | 0 | 0 | 1 | 0 | 1 | 2 |
| Neoplasm of the pituitary fossa | 0 | 0 | 1 | 0 | 0 | 1 |
| **Leukaemia** | | | | | | |
| Acute lymphoblastic leukaemia | 0 | 0 | 4 | 1 | 2 | 7 |
| Acute myeloid leukaemia | 0 | 2 | 0 | 0 | 0 | 2 |
| Prolymphocytic leukaemia | 0 | 0 | 0 | 1 | 0 | 1 |
| **Other** | | | | | | |
| Neoplasm of anterior mediastinum | 1 | 0 | 0 | 0 | 1 | 2 |
| Neoplasm of adrenal gland, unspecified | 0 | 0 | 0 | 1 | 0 | 1 |
| Neoplasm of orbit | 0 | 1 | 0 | 0 | 0 | 1 |
| Neoplasm of retroperitoneum | 0 | 0 | 0 | 1 | 0 | 1 |
| Neoplasm of craniofacial bones | 0 | 0 | 0 | 1 | 0 | 1 |
| Neoplasm of heart | 0 | 0 | 0 | 1 | 0 | 1 |
| Neoplasm of scapula and long bones of upper limb | 0 | 0 | 0 | 0 | 1 | 1 |
| Neoplasm of long bones of lower limb | 0 | 0 | 1 | 1 | 0 | 2 |
| Neoplasm of liver and intrahepatic bile ducts | 0 | 1 | 0 | 0 | 0 | 1 |
| **Total** | **1** | **6** | **8** | **10** | **6** | **31** |

**Table 50: Deaths from other acquired disease by age group, Victoria 2014**

| | Age group | | | | | |
|---|---|---|---|---|---|---|
| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
| Anaphylaxis | 0 | 0 | 0 | 0 | 1 | 1 |
| Asthma | 0 | 0 | 1 | 0 | 1 | 2 |
| Epilepsy | 0 | 1 | 0 | 0 | 0 | 1 |
| Cardiomyopathy | 1 | 1 | 0 | 0 | 0 | 2 |
| Kawasaki disease | 1 | 0 | 0 | 0 | 0 | 1 |
| Haemolytic-uraemic syndrome | 0 | 1 | 0 | 0 | 0 | 1 |
| Portal vein thrombosis | 0 | 0 | 0 | 1 | 0 | 1 |
| **Total** | **2** | **3** | **1** | **1** | **2** | **9** |

**Table 51: Deaths from other acquired disease by age group, Victoria 2015**

| | Age group | | | | | |
|---|---|---|---|---|---|---|
| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
| Anaphylaxis | 0 | 0 | 0 | 1 | 0 | 1 |
| Malignant hyperthermia due to anaesthesia | 0 | 0 | 0 | 1 | 0 | 1 |
| Haemophagocytic syndrome, infection-associated | 0 | 1 | 0 | 0 | 0 | 1 |
| Juvenile dermatomyositis | 0 | 1 | 0 | 0 | 0 | 1 |
| Grave's Disease | 0 | 0 | 0 | 0 | 1 | 1 |
| Diabetes mellitus with ketoacidosis | 0 | 0 | 0 | 0 | 1 | 1 |
| Primary adrenocortical insufficiency | 0 | 0 | 0 | 1 | 0 | 1 |
| Hypoxic ischaemic injury from seizure | 0 | 0 | 0 | 0 | 1 | 1 |
| Primary pulmonary hypertension | 0 | 0 | 0 | 0 | 1 | 1 |
| Portal vein thrombosis and pulmonary hypertension | 0 | 0 | 0 | 1 | 0 | 1 |
| Chronic renal failure | 0 | 0 | 1 | 0 | 0 | 1 |
| Acute appendicitis with generalized peritonitis | 0 | 0 | 0 | 0 | 1 | 1 |
| Acute peritonitis | 0 | 0 | 0 | 0 | 2 | 2 |
| Intussusception | 0 | 0 | 1 | 0 | 0 | 1 |
| Acute and subacute hepatic failure | 0 | 1 | 0 | 0 | 0 | 1 |
| **Total** | **0** | **3** | **2** | **4** | **7** | **16** |

**Table 52: Deaths from unascertained cause by age group, Victoria 2014**

| | Age group | | | | | |
|---|---|---|---|---|---|---|
| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
| Undetermined (autopsy performed) | 5 | 2 | 1 | 1 | 0 | 9 |
| Undetermined (no autopsy performed) | 1 | 0 | 0 | 0 | 0 | 1 |
| **Total** | **6** | **2** | **1** | **1** | **0** | **10** |

**Table 53: Deaths from unascertained cause by age group, Victoria 2015**

| | Age group | | | | | |
|---|---|---|---|---|---|---|
| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
| Undetermined (autopsy performed) | 3 | 1 | 0 | 0 | 2 | 6 |
| Undetermined (no autopsy performed) | 1 | 2 | 0 | 0 | 1 | 4 |
| **Total** | **4** | **3** | **0** | **0** | **3** | **10** |

## Deaths from intentional trauma and intentional self-harm

**Figure 23a: Intentional trauma (inflicted by other) and intentional self-harm deaths: post-neonatal infants and children (28 days to 14 years), Victoria 1997–2015**

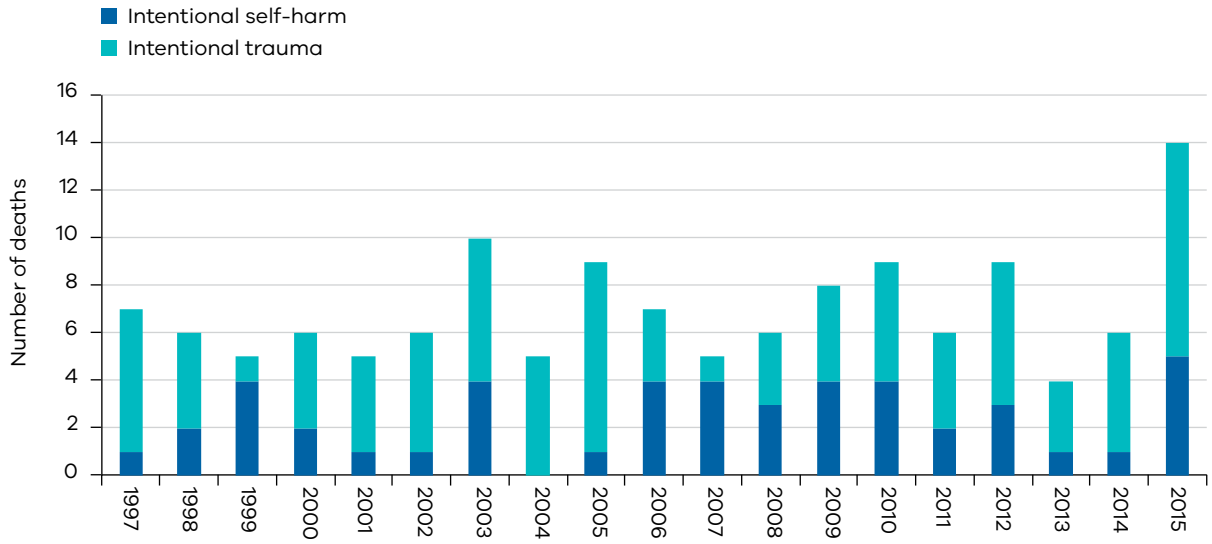
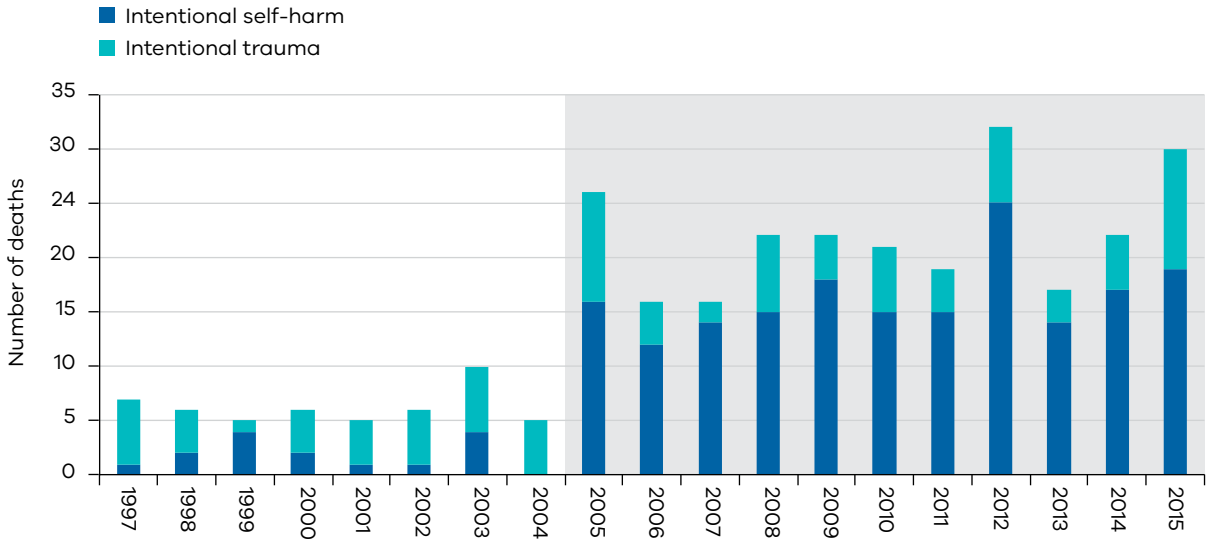



**Table 54: Intentional trauma (inflicted by other) and intentional self-harm deaths: post-neonatal infants and children (28 days to 14 years), Victoria 1997–2015**

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intentional trauma | 6 | 4 | 1 | 4 | 4 | 5 | 6 | 5 | 8 | 3 | 1 | 3 | 4 | 5 | 4 | 6 | 3 | 5 | 9 |
| Intentional self-harm | 1 | 2 | 4 | 2 | 1 | 1 | 4 | 0 | 1 | 4 | 4 | 3 | 4 | 4 | 2 | 3 | 1 | 1 | 5 |
| **Total** | **7** | **6** | **5** | **6** | **5** | **6** | **10** | **5** | **9** | **7** | **5** | **6** | **8** | **9** | **6** | **9** | **4** | **6** | **14** |

**Figure 23b: Intentional trauma (inflicted by other) and intentional self-harm deaths: post-neonatal infants, children and adolescents,[a,b] Victoria 1997–2015**




a. 1997–2004 children aged 28 days to 14 years.
b. 2005–2015 children aged 28 days to 17 years.

**Table 55: Intentional trauma (inflicted by other) and intentional self-harm deaths: post-neonatal infants, children and adolescents,[a,b] Victoria 1997–2015**

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intentional trauma | 6 | 4 | 1 | 4 | 4 | 5 | 6 | 5 | 10 | 4 | 2 | 7 | 4 | 6 | 4 | 7 | 3 | 5 | 11 |
| Intentional self-harm | 1 | 2 | 4 | 2 | 1 | 1 | 4 | 0 | 16 | 12 | 14 | 15 | 18 | 15 | 15 | 25 | 14 | 17 | 19 |
| **Total** | **7** | **6** | **5** | **6** | **5** | **6** | **10** | **5** | **26** | **16** | **16** | **22** | **22** | **21** | **19** | **32** | **17** | **22** | **30** |

a. 1997–2004 children aged 28 days to 14 years.
b. 2005–2015 children and adolescents aged 28 days to 17 years.

**Table 56: Deaths from intentional trauma (inflicted by other) by age group, Victoria 2014**

| | Age group | | | | | |
|---|---|---|---|---|---|---|
| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
| Skull fracture | 0 | 1 | 0 | 1 | 0 | 2 |
| Head injury | 0 | 1 | 0 | 0 | 0 | 1 |
| Suffocation | 0 | 2 | 0 | 0 | 0 | 2 |
| **Total** | **0** | **4** | **0** | **1** | **0** | **5** |

**Table 57: Deaths from intentional trauma (inflicted by other) by age group, Victoria 2015**

| | Age group | | | | | |
|---|---|---|---|---|---|---|
| | 28–364 days | 1–4 years | 5–9 years | 10–14 years | 15–17 years | Total |
| Head injury | 2 | 1 | 0 | 0 | 0 | 3 |
| Multiple trauma | 0 | 0 | 0 | 0 | 1 | 1 |
| Trauma to lung | 0 | 1 | 0 | 0 | 1 | 2 |
| Trauma to liver | 0 | 1 | 0 | 0 | 0 | 1 |
| Asphyxiation | 0 | 0 | 0 | 1 | 0 | 1 |
| Drowning | 0 | 3 | 0 | 0 | 0 | 3 |
| **Total** | **2** | **6** | **0** | **1** | **2** | **11** |

**Table 58: Deaths from intentional self-harm: age at death by gender, Victoria 2014**

| Age at death | Females | Males | Total |
|---|---|---|---|
| 13 years | 0 | 0 | 0 |
| 14 years | 1 | 0 | 1 |
| 15 years | 0 | 3 | 3 |
| 16 years | 3 | 5 | 8 |
| 17 years | 2 | 3 | 5 |
| **Total** | **6** | **11** | **17** |
| **Rate[a] 13 to 17 years** | **3.6** | **6.3** | **5.0** |
| **Rate[a] 15 to 17 years** | **5.0** | **10.3** | **7.7** |

a. Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016.

Rates expressed per 100,000 population aged 13–17 years or 15–17 years.

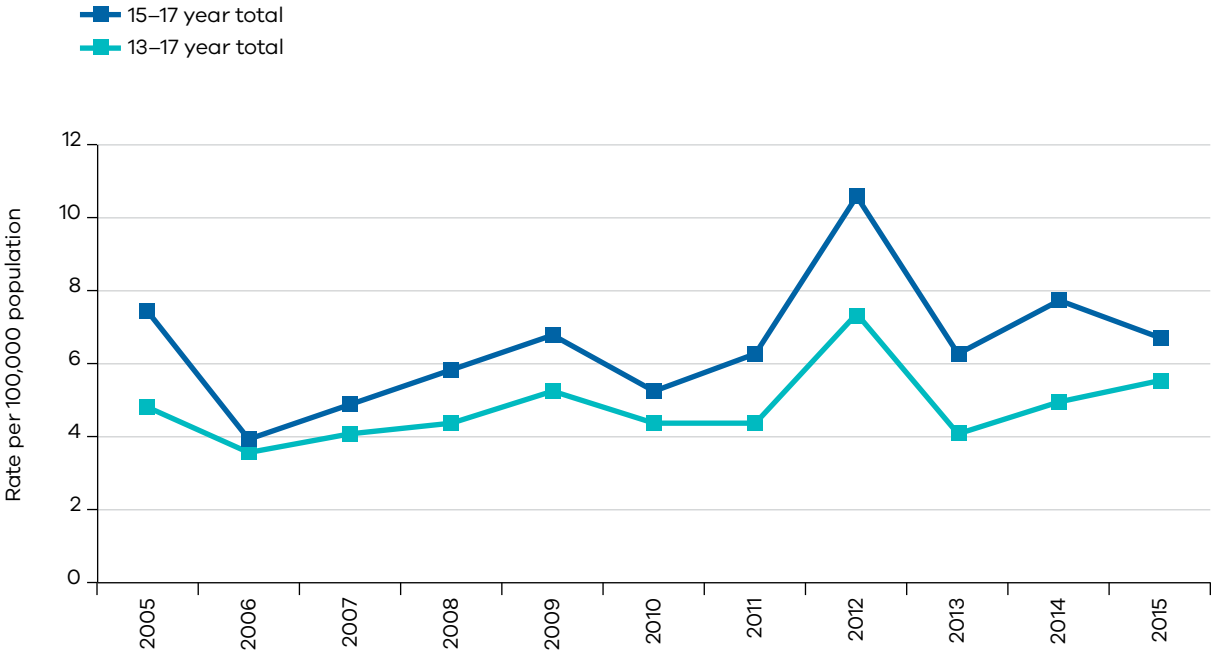
**Table 59: Deaths from intentional self-harm: age at death by gender, Victoria 2015**

| Age at death | Females | Males | Total |
|---|---|---|---|
| 13 years | 1 | 1 | 2 |
| 14 years | 1 | 2 | 3 |
| 15 years | 2 | 2 | 4 |
| 16 years | 2 | 4 | 6 |
| 17 years | 0 | 4 | 4 |
| **Total** | **6** | **13** | **19** |
| **Rate[a] 13 to 17 years** | **3.6** | **7.4** | **5.5** |
| **Rate[a] 15 to 17 years** | **3.9** | **9.4** | **6.7** |

a. Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015 Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016.

Rates expressed per 100,000 population aged 13–17 years or 15–17 years.

**Figure 24: Trends in intentional self-harm rates in adolescents, Victoria 2005–2015**




Notes:

- Note that in 2011, one 12 year old is included in the rate of intentional self-harm for the 13–17 year age group. Excluding this case decreases the intentional self-harm rate in the 13–17 year age group from 4.4 to 4.1 /100,000.
- Slight differences across the rates are noted from previously published annual reports as population denominators used to generate this data have been updated.
- Denominators were obtained from Australian Bureau of Statistics 2016, Australian Demographic Statistics, September 2015. Table 52: Estimated Resident Population by Single Year of Age, Victoria, cat. no. 3101.0, Commonwealth Government of Australia, Canberra. Issue 24 March 2016.