Consultative Council on Obstetric and Paediatric Mortality and Morbidity

Victoria's Mothers, Babies and Children

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2017

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ABOUT THE COVER IMAGE

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The 'radar' on the front cover and in the report signifies the multifaceted and interconnected factors collected and explored by the Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM). These lead to a central focus point or learning. The layers symbolise the depth of analysis and review, leading to the identification of underlying circumstances. The central point of the radar represents a focus for performance improvement for individual care and the broader health system like a lens in a camera focuses clearly on its subject.

The many colours represent the diversity within the Victorian community, which CCOPMM serves. They also symbolise the different speciality subcommittees of CCOPMM and the diverse expertise contained within them.

Safer Care Victoria, which provides secretariat and project support to CCOPMM, works with health services to monitor and improve the quality and safety of care delivered across our health system, with the goal of achieving zero avoidable patient harm. This is symbolised by the central 'focus' on system improvement. Council-held data is used in 'radar graphs' to capture related health service performance measures, contributing a new focus on the use of information for performance improvement.

The colour scheme was selected for its universality and because CCOPMM aims to serve all Victorian mothers, babies and children.

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Message from the Chair

Victoria remains one of the safest places for women to give birth and for our children to grow into adults. As a healthcare system and a community, we should be proud of that; however, challenges continue. In rising to these challenges, we must learn from the events and case reviews that provide us insights into missed opportunities and areas that need further improvement, both from within our hospitals and across our community.

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In the forefront of our minds must always be women, their partners, parents and families who go home without their babies or their children, or mothers who die during pregnancy or in the year following birth and never experience the joy of motherhood. These outcomes may occur even when the best health care has been delivered by the best clinicians, and where access to services has been timely and all possible care provided to keep our mothers and children safe.

In this report, through data analysis, our case reviews of deaths and serious adverse events, we explicitly highlight themes and pose recommendations and good practice points to be considered for implementation. These themes aim to further support and improve the care and experiences for women, babies, children and adolescents. We must always ask ourselves *'If care or the situation was different, would the outcome have been different?'* This approach at times takes courage but will assist us in strengthening our complex healthcare system, as well as provide better outcomes and experiences for those in our care.

This report is the work of the 2015–2018 CCOPMM and marks the end of an era with the retirement of Professor Jeremy Oats who, after 11 years as Chair of CCOPMM, retired in July 2018. His commitment, advocacy, leadership and contribution to the safety of Victorian mothers, babies, children and adolescents has been invaluable and we wish him all the best. As the incoming Chair, first woman, first midwife and nurse, I know I am taking on this role with a CCOPMM that is in a strong position to continue supporting the needs of the Victorian community. I would also like to acknowledge Professor Sue McDonald, who as the Deputy Chair commenced drafting this report and who will continue as Deputy Chair and support the new Council into the coming years. Along with the retirement of our Chair, we farewell and thank many committed members who have dedicated years to the work of CCOPMM.

The new Council's vision and areas of focus for this next three years is being formulated. What are our priorities clinically and through research? How do we wish to report our work and strengthen engagement with the healthcare sector and our community? And how do we enhance the voice of the patient, their families and clinicians in our work? The new Council looks forward to sharing its vision and its path for the next triennium and looks forward to delivering its first report towards the end of 2019.

We work and receive care in a complex system. We all need to ensure that this system delivers care consistently, meets the needs of those it cares for while remembering the needs of those who work in it. For clinicians, it's not just the care we provide but how we provide that care with patients as our partners that is important – and there is always more to do.

I commend this report to you on behalf of the 2015–2018 CCOPMM and I look forward to leading this Council and in ensuring that its work meets the needs of those who matter most.

Tanya Farrell

Chair, Consultative Council on Obstetric and Paediatric Mortality and Morbidity

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Midwives provide notification of all births in Victoria to the Victorian Perinatal Data Collection. Health services provide confidential medical reports on perinatal deaths and additional information on maternal, perinatal and paediatric deaths to CCOPMM. The Registry of Births, Death and Marriages Victoria provides notifications of perinatal, paediatric and maternal deaths to CCOPMM.

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The autopsies undertaken by anatomical and forensic pathologists are vital in the comprehensive consideration of these deaths.

The State Coroner's Office and personnel from the Victorian Institute of Forensic Medicine provide information to CCOPMM on cases investigated by coroners in Victoria.

The Paediatric Infant Perinatal Emergency Retrieval service provides additional information on infants and children transferred to and from tertiary neonatal and children's centres. Information is also received from individual treating practitioners, palliative care services, maternal and child health nurses, Ambulance Victoria, and child protection services, among others. This report would not be possible without their assistance and we thank them for their continued support.

We would also like to acknowledge our retiring Chair, Professor Jeremy Oats, previous Consultative Councils Manager, Ms Vickie Veitch, and long standing retiring members including Dr Virginia Billson, Professor Peter McDougall, Dr Cathie Rose, Professor Mike South, Associate Professor Christine Tippett and Professor Euan Wallace who all tirelessly dedicated years to CCOPMM and its subcommittees.

This report was developed by CCOPMM with support from the following team members of the Consultative Councils Unit at Safer Care Victoria:

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Executive summary

Victoria's Mothers, Babies and Children 2017 presents data and trends on births and deaths, recommendations, themes and good practice points for clinicians, health and community services and the Victorian health system. It highlights areas of improvement for clinical practice, health and community policy development and service planning for mothers, babies, children and adolescents in Victoria. Consumer messages provide information for women, parents and families when making decisions regarding care. The themes, good practice points and recommendations have been formulated after considering the data and maternal, perinatal, child and adolescent morbidity and mortality reviewed by CCOPMM.

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BIRTHS IN VICTORIA

In 2017, 78,226 women gave birth to 79,407¹ babies (excluding terminations of pregnancy) – a reduction of 1.4 per cent births from 2016. The crude birth rate fell slightly from 61.4 in 2016 to 59.2 per 1,000 women of reproductive age (15–44 years) in 2017.

Of all women giving birth in Victoria in 2017, 1.3 per cent were younger than 20 years of age and 26.2 per cent were aged 35 years or older.

Of the women giving birth in 2017, 61.1 per cent were born in Australia. The most frequent place of birth for women born in non-English speaking countries were Southern and Central Asia (11.9 per cent) and South-East Asia (6.6 per cent) – refer to Table 6 on page 25.

The proportion of women giving birth by caesarean section continues to increase from 31.6 per cent in 2010 to 34.0 per cent in 2016 and 34.9 per cent in 2017.

Women having their first birth were four times more likely to experience a severe perineal laceration (third or fourth degree) than those having a subsequent birth.

MATERNAL MORTALITY AND MORBIDITY

The Victorian maternal mortality ratio (MMR) for the three years between 2015 and 2017 was 10.6 per 100,000 women who gave birth.

In the past five years (2013–2017) the most common cause of all maternal deaths² was cardiovascular disease (23.2 per cent). Suicide was the most common cause of direct and indirect maternal deaths (25.0 per cent and 19.3 per cent respectively).

CCOPMM elected to use intensive care unit (ICU) admission to identify severe acute maternal morbidity cases in Victoria, with reporting beginning on 1 July 2017. There were eightythree maternal ICU admissions from 1 July to 31 December 2017 reported to CCOPMM. ۲

^{1.} See Appendix 3: Flow diagram for births in Victoria, 2017 for more information.

^{2.} This includes direct, indirect and incidental.

PERINATAL MORTALITY

In 2017, 79,731 babies were born with a gestation greater than or equal to 20 weeks (or if gestation unknown, greater than or equal to 400 g birthweight) and 842 died. In this section terminations of pregnancy for maternal psychosocial indications are excluded for all births and deaths, and all subsequent rates and figures are reported as 'adjusted'.

For the purposes of adjusted numbers and rates, there were 79,591 births, with 702 perinatal deaths (501 stillbirths and 201 neonatal deaths up to 28 days of age).³

Victoria's adjusted perinatal mortality rate (PMR) was 8.8 per 1,000 births and is among the lowest in Australia and in other countries of similar socioeconomic status.

The leading cause of adjusted stillbirth (excluding terminations for congenital anomalies) was unexplained antepartum (fetal) death (17.8 per cent), where a definitive cause could not be established. Specific perinatal conditions (including twin-to-twin transfusion syndrome, fetomaternal haemorrhage, cord accidents and birth trauma) (13.4 per cent), fetal growth restriction (11.2 per cent) and preterm birth (9.2 per cent) were among the next most common causes. Spontaneous preterm birth (29.4 per cent) and congenital anomalies (16.9 per cent) were the most common causes of neonatal deaths (excluding terminations for congenital anomalies).

In 2017, 128 perinatal deaths (18.2 per cent) out of the 702 deaths reviewed had contributing factors identified.

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The perinatal mortality rate in mothers who smoked during pregnancy was higher (11.8 per 1,000 births) than those who did not smoke while pregnant (6.1 per 1,000 births).

3. See Appendix 3: Flow diagram for births in Victoria, 2017 for more information.

² Victoria's Mothers, Babies and Children 2017

ABORIGINAL BIRTHS, MORTALITY AND MORBIDITY

The proportion of all women giving birth in Victoria who identify as Aboriginal increased from 1.2 per cent in 2010 to 1.4 per cent in 2017.

For the 2015–2017 triennium, the perinatal death rate for babies born to Aboriginal women was slightly higher than that for non-Aboriginal women (10.0 and 8.9 per 1,000 births respectively).

The stillbirth rate for Aboriginal women is similar to that of non-Aboriginal women (5.9 per 1,000 births compared to 6.4 per 1,000 births in 2015–2017).

The stillbirth rate in Aboriginal women in 2015–2017 is slightly higher than for Aboriginal women in 2014–2016 (5.9 compared to 4.8 per 1,000 births respectively).

As the numbers involved are small and associated with a high degree of variability from year to year, further analysis and trend data is required to confirm the results listed above, and therefore rates of perinatal deaths should be interpreted with caution.

Aboriginal women were less likely to initiate breastfeeding than non-Aboriginal women (83.6 per cent compared to 94.6 per cent respectively) and their babies were slightly more likely than others to be given formula in hospital (32.7 per cent compared to 28.1 per cent respectively).

Aboriginal mothers were more likely to smoke in the first half of pregnancy compared to non-Aboriginal mothers (39.3 per cent compared to 8.0 per cent respectively).

Babies of Aboriginal mothers were more likely to be born with a birthweight less than 2,500g than non-Aboriginal mothers (13.7 per cent compared to 6.9 per cent respectively) and be born prematurely (13.5 per cent compared to 8.4 per cent respectively).

CHILD AND ADOLESCENT MORTALITY³

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In 2017 Victoria's infant and under five-year mortality rates were 3.0 per 1,000 live births and 3.5 per 1,000 live births respectively, which are exactly the same as the national rates for 2017.

There were 69 deaths in infants 28–364 days of age (post-neonatal infants) in 2017. The main causes of death were congenital anomaly (34.8 per cent) and sudden infant death syndrome (27.5 per cent).

There were 36 deaths in children aged one to four years in 2017. The main causes of death were malignancy (25.0 per cent), congenital anomaly (19.4 per cent) and motor vehicle accident (13.9 per cent).

There were 30 deaths in children aged five to nine years of age in 2017. The main causes of death were malignancy (40.0 per cent), congenital anomaly (16.7 per cent), other acquired disease (16.7 per cent) and infection (10.0 per cent).

There were 24 deaths in children aged 10–14 years of age in 2017. The main causes of death were congenital anomaly (33.3 per cent), undetermined (16.7 per cent), malignancy (12.5 per cent) and intentional self-harm (including suicide) (12.5 per cent).

There were 46 deaths in adolescents aged 15–17 years in 2017. Causes of death were intentional selfharm (including suicide) (30.4 per cent), congenital anomaly (21.7 per cent), motor vehicle accidents (17.4 per cent) and malignancy (15.2 per cent).

More data is available in the following chapters and separate supplementary tables.

3. Only the main causes are reported in this section. Complete data is available in Section 7.0.

THEMES AND RECOMMENDATIONS AT A GLANCE

CCOPMM has identified several themes which provide the basis for recommendations and good practice points. It is important to note that, in isolation, themes, good practice points and recommendations may not be directly linked to the causes of individual deaths occurring in 2017.

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The themes fit into three broad areas:

- strengthen women, child and family-centred care
- education, training and guidelines
- caring for vulnerable women, children and families.

Through the review of births and deaths for 2017, CCOPMM recommends:

- 1. Annual training and assessment is undertaken for all relevant clinicians in the areas of:
 - fetal surveillance
 - neonatal resuscitation.
- 2. Establish and implement a formalised escalation process for relevant organisations that is consistent 24/7 in the areas of:
 - fetal surveillance
 - neonatal resuscitation.
- 3. Improve access to continuity of care models for pregnant women.
- 4. Develop and implement models of care that meet the specific needs of vulnerable women, children and families.
- 5. Increase the effectiveness of smoking cessation programs and breastfeeding support services for Aboriginal women.
- 6. Ensure safe sleeping of infants is enhanced by:
 - a. having a portable safe sleep space available for families that meets Australian Standards this could then be provided to vulnerable families
 - b. mandatory labelling on nursery products, specifically sleeping furniture, surfaces and accessories that meet Australian Standards.
 - c. providing infant safe sleeping guidelines to women and families in the first 12 weeks of pregnancy.
- 7. A bereavement care education package is developed to support primary health clinicians caring for families who have experienced the death of an infant, child or adolescent.
- 8. An infant, child or adolescent who presents to hospital on three occasions during a single acute illness is admitted and further investigations undertaken.
- 9. All health services providing paediatric care implement an organisation-wide approach to detect and respond to any clinical deterioration that includes parent or caregiver escalation.
- 10. Optimise suicide prevention measures for adolescents by:
 - a. implementing routine screening of emotional health and wellbeing
 - b. improving access to age-appropriate mental health, drug and alcohol services
 - c. increasing access to and follow-up of age-appropriate mental health professionals close to home.

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⁴ Victoria's Mothers, Babies and Children 2017

1 Introduction

Victoria's Mothers, Babies and Children 2017 presents data and trends on births and deaths, recommendations, themes and good practice points for clinicians, health and community services and the Victorian health system. Consumer messages provide information for women, parents and families when making decisions regarding care. The themes, good practice points and recommendations have been formulated after considering the data and maternal, perinatal, child and adolescent morbidity and mortality reviewed by CCOPMM.

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This report highlights areas of improvement for clinical practice, health and community policy development and service planning. Its aim is to assist clinicians, consumers, the community and health and community services to review and prioritise the good practice points and recommendations highlighted. It provides essential data and insights to continue to improve health outcomes for mothers, babies, children and adolescents. In addition, it contains data to support the maternal and child health research agenda by highlighting areas that require further analysis or enquiry.

The report includes specific sections focusing on:

- births in Victoria
- maternal mortality and morbidity
- perinatal mortality
- Aboriginal mothers and babies
- child and adolescent mortality.

While Victoria and Australia experience some of the lowest maternal and perinatal mortality rates internationally, identifying preventable or contributing factors and sharing lessons learnt is vital in continuously improving the safety and quality of health services. Key to this in Victoria is disseminating and implementing these good practice points and recommendations in collaboration with Safer Care Victoria (SCV), the Department of Health and Human Services (DHHS), the Maternity and Newborn Clinical Network and the Victorian Paediatric Clinical Network. These build on the strong collaborative arrangements between CCOPMM, SCV, DHHS, the Coroners Court of Victoria and the Victorian Managed Insurance Authority, who collectively strive to assist care providers to continually improve processes for quality and safety.

The review, reporting and research functions of CCOPMM provide a vital service to the Victorian Government and its community by providing independent advice under its remit following a rigorous process that assists in monitoring safety and quality, in the development of policies and guidelines and in providing feedback to the Victorian health system.

The report provides:

- data on all births that occurred in Victoria
- detailed mortality and morbidity statistics for mothers and babies, with summary information on the main causes of death and any contributing factors
- detailed mortality statistics for infants, children and adolescents, with summary information on the main causes of death
- themes, good practice points and recommendations arising from the review of mortality and morbidity for mothers, babies, infants, children and adolescents
- key messages for consumers and the community.

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2 How to use this report

This report provides summary quantitative data, followed by recommendations, good practice points and consumer messages.

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The data, recommendations and good practice points are outlined in the report in the following sections.

Births in Victoria – Snapshot of quantitative data of all births in Victoria in 2017.

Maternal mortality and morbidity – Snapshot of quantitative data on maternal mortality, followed by recommendations. This section also covers quantitative data of severe acute maternal morbidity (SAMM) cases from 1 July to 31 December 2017. As SAMM is a new collection and review system for CCOPMM, recommendations and good practice points arising from it will be reported in future CCOPMM reports.

Perinatal mortality – Snapshot of quantitative data on stillbirths and neonatal mortality, followed by recommendations and good practice points.

Aboriginal births, mortality and morbidity in Victoria – Snapshot of quantitative data on Aboriginal mothers and babies in Victoria, followed by recommendations. Where the term 'Aboriginal' is used it refers to both Aboriginal and Torres Strait Islander people.

Child and adolescent mortality – Snapshot of quantitative data on infant, child and adolescent mortality, followed by recommendations and good practice points. Child/children may refer to infants, children and adolescents aged from 28 days to 18 years. The detailed data for 2017 are listed separately in the supplementary tables of this report.

Themes, recommendations and good practice points arising from the review of perinatal, maternal and child and adolescent mortality are shown in Figure 1. For the purposes of this report a recommendation is measurable and can have a target date assigned to it. Good practice points are provided when a system improvement is needed or when issues identified by CCOPMM (and/or its subcommittees) were considered important for clinicians and consumers. Consumer messages provide additional information for women, parents and families when making decisions regarding care.

Information provided in the 'Collecting and reviewing information on births and deaths' section and in Appendix 1 under 'Definitions' and 'Abbreviations' should be used to interpret fully this report.

The statistical flowcharts (Appendix 3) outline the scope of the data collections and the case inclusions and exclusions used for reporting. Data outside 2017 are included where it is available and where it provides contextual information. In the mortality sections (maternal, perinatal and child and adolescent mortality), data may refer to deaths that occurred over a period of three or more years (for example, the triennium 2015–2017) due to the low numbers of deaths.

⁶ Victoria's Mothers, Babies and Children 2017

Figure 1: Themes, recommendations and good practice points



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CCOPMM would like to emphasise the following:

- Key to improving care is carefully reviewing all maternal, perinatal and child and adolescent deaths and determining their contributing factors. Often a multidisciplinary mortality and morbidity review committee conducts this review at the health service where the death or severe morbidity occurred. A copy of this review should accompany medical records that are forwarded to CCOPMM.
- The introduction of the Regional Maternal and Perinatal Mortality and Morbidity Committees is providing support to regional and rural maternity services in their case reviews.
 Maternal or perinatal cases in which there are potential contributing factors undergo a review by one of three CCOPMM expert subcommittees

 the Stillbirth Subcommittee, the Neonatal Mortality Subcommittee and/or the Maternal Mortality and Morbidity Subcommittee. Where identified, the contributing factors are graded as (according to the Perinatal Society of Australia and New Zealand classification):

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- unlikely to have contributed to the outcome (insignificant)
- might have contributed to the outcome (possible)
- likely to have contributed to the outcome (significant).

Even significant factors may not necessarily be preventable or imply unacceptable standards of care.

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CCOPMM values your feedback. Please email any comments about this report or other aspects of CCOPMM's work to CCOPMM <ccopmm@safercare. vic.gov.au>.

⁸ Victoria's Mothers, Babies and Children 2017

3 Births in Victoria

Information about maternal characteristics, medical conditions and complications of pregnancy as well as details about the labour, birth, neonate and postnatal stay in hospital are reported to CCOPMM via the Victorian Perinatal Data Collection (VPDC) for every birth in Victoria. This includes babies born in public and private hospitals and in homes. This information is used to monitor and report on the safety and quality of maternity and newborn care, for research related to care and for policy and planning decisions across the state.

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Victoria continues to be a very safe place to give birth. However, disparities in health outcomes exist between different groups of women and are based on a variety of factors. It is important for these to be identified and addressed to ensure that women birthing in Victoria, whoever and wherever they are, receive the right care in the right place at the right time and that they are fully informed and actively involved in their care.

In 2017, 78,226 women gave birth to 79,407 babies – a reduction of 1.4 per cent in births from 2016 (Figure 2).





Births included in this section of the report and supplementary tables exclude all terminations of pregnancy for congenital anomaly or maternal psychosocial indications.



Figure 2: Trend in number of births, Victoria, 2010–2017

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Maternal characteristics

In 2017:

- 1.3 per cent of mothers were younger than 20 years of age and 26.2 per cent were 35 years or older.
- Women giving birth at older ages were more likely to be in more favourable socioeconomic circumstances than younger mothers, with 27.2 per cent of those aged 35–39 years in the least deprived socioeconomic quintile compared to 5.0 per cent of women 20 years of age or younger.
- Women younger than 20 years were more likely to be admitted as public patients (98.0 per cent) compared to women aged 35–39 years (63.8 per cent).
- Rural residents giving birth were increasingly more likely than metropolitan residents to belong to the most disadvantaged socioeconomic group (29.2 per cent compared to 17.4 per cent respectively).
- 61.0 per cent of women giving birth were born in Australia. The most frequent places of birth for women born in non-English speaking countries were Southern and Central Asia and Southeast Asia.

61% of women giving birth were born in Australia

Of those born in other countries **Southern and Central Asia** and **Southeast Asia** were the most common places of birth

- English language proficiency and year of arrival in Australia for women born overseas were also collected for the first time in 2017. The median year of arrival in Australia for women giving birth in 2017 was 2011. Most women not born in Australia spoke English well or very well (83.2 per cent), while 12.7 per cent did not speak English well or at all. This was not reported for 4.1 per cent of women not born in Australia.
- During 2017, the influenza vaccine was recommended for every pregnancy and funded by the Australian Government Department of Health and Ageing as part of the National Immunisation Program. The pertussis vaccine was recommended for every pregnancy from 28 weeks' gestation and funded by the Victorian DHHS. Statewide uptake of the influenza and pertussis vaccines was 53.7 and 77.5 per cent respectively.
- 19.7 per cent of women giving birth were obese, having a body mass index (BMI) of 30 or higher.

Labour, birth and after birth

- The proportion of women who had labour induced increased from 30.8 per cent in 2016 to 33.4 per cent in 2017.
- More women giving birth in 2017 used epidural analgesia to relieve pain in labour – 49.6 per cent of women having their first baby (compared to 47.6 per cent in 2016) and 22.8 per cent of those having subsequent births (compared to 21.1 per cent in 2016) or 35.5 per cent of all women who experienced labour in 2017.
- The proportion of women giving birth by caesarean section continues to increase from 31.6 per cent in 2010 to 34.9 per cent in 2017. More women admitted as private patients gave birth by caesarean section before the onset of labour – 32.1 per cent compared to 19.4 per cent of those admitted as public patients.

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¹⁰ Victoria's Mothers, Babies and Children 2017

- Women having their first birth vaginally were four times as likely to experience a severe perineal laceration (third or fourth degree) compared to those having a subsequent birth vaginally.
- One-quarter (24.5 per cent) of all women giving birth in 2017 experienced a postpartum haemorrhage of 500 mL or more, including 2.1 per cent who experienced a severe postpartum haemorrhage of 1,500 mL or more. A total of 1,327 women (1.7 per cent of all women giving birth) required a blood transfusion.
- 95.4 per cent of women who gave birth to term liveborn babies, initiated breastfeeding. Of these babies, 25.2 per cent in public hospitals and 38.2 per cent in private hospitals were given infant formula in hospital. 76.1 per cent of babies in public hospitals and 71.5 per cent in private hospitals had their last feed before going home directly and entirely from the breast. Most women leave public hospitals within two days of the birth, so longer term breastfeeding outcomes are not reported to the VPDC.

Babies

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- 8.5 per cent of babies were born preterm (before 37 weeks' gestation), most of them at 35 (1.5 per cent) or 36 (3.7 per cent) weeks.
- 7.0 per cent of babies were born with a birthweight under 2,500 g; 1.2 per cent below 1,500 g. The proportion of babies born with a birthweight of at least 4,500 g has reduced from 1.9 per cent in 2010 to 1.3 per cent in 2017.
- 3.0 per cent of babies born were multiple births; the vast majority of these were twins (2.9 per cent). Multiple births were more likely than singletons to be born preterm (69.2 per cent of twins) and by caesarean section (73.5 per cent of twins).



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 The baby's head circumference was reported for the first time in 2017. Because head circumference is measured soon after birth, the effect of moulding is apparent. For example, babies born to first-time mothers at 38 weeks had a lower head circumference if they had an unassisted vaginal birth compared to a planned caesarean before the onset of labour (34.6 cm and 35.1 cm respectively). This pattern was similar at 39 weeks and for women having subsequent births.

Refer to supplementary tables and figures for more details.

Consumer messages

What pregnant women and their families need to know

- If you're facing cultural or linguistic barriers during pregnancy, contact your local maternity hospital and ask for help. All hospitals have staff who are specially trained to help you.
- If you face language barriers, you should be offered an interpreter when you speak with health professionals.
- The Healthy Mothers, Healthy Babies
 Program is available through local
 community health services. The program
 allows women to connect with a wider
 range of services that operate through
 community health such as counselling,
 physiotherapy and dental services. For
 more information visit the department's
 website https://www2.health.vic.gov.
 au/primary-and-community-health/
 community-health/population-groups/
 children-youth-and-families/healthy mothers-healthy-babies.

• Refugee health nurses are in community health services across Victoria in areas of significant refugee settlement.

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 When you are pregnant and when you go home after having your baby, you have many support options to choose from. You can find local services to help you on the Better Health Channel https://www.betterhealth.vic.gov.au/ servicesandsupport/find-a-health-orhuman-service.

Things you should be aware of so you can make informed choices are available from the Better Health Channel <u>https://www.</u> betterhealth.vic.gov.au/health/HealthyLiving/ pregnancy-care-choices.

Further information and where to get help:

- your midwife, obstetrician or general practitioner
- your maternal and child health nurse.

¹² Victoria's Mothers, Babies and Children 2017

4 Maternal mortality and morbidity

Maternal deaths are rare in Australia; however, with the increases in complexity of women's health issues, monitoring of severe acute mortality and morbidity (SAMM) has become an important adjunct to the monitoring of safe care. Maternal deaths are an important indicator of maternal health and the hospital or community service's ability to respond to the physical and psychosocial needs of women during pregnancy and in the first year following birth.

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The increasing complexity of needs for women poses a significant challenge for clinicians in both the acute and primary health sectors. Women are increasingly facing issues such as substance abuse, mental health, family violence and social isolation that, in conjunction with pregnancy and in early parenting, can further increase the challenge of providing appropriate and timely care.

4.1 MATERNAL MORTALITY

In this report maternal deaths are classified as:

- **direct:** relating to the pregnancy or birth
- **indirect:** relating to a pre-existing medical condition or newly diagnosed condition
- incidental: unrelated to the pregnancy or birth
- **early:** within 42 days of the end of the pregnancy
- **late:** occurring more than 42 days from the end of the pregnancy up to one year post birth.

By reviewing every maternal death and understanding any contributing factors, recommendations can be made to assist health and community services and clinicians in improving outcomes for women.

Snapshot

- In 2017 there were seven early maternal deaths

 three direct and four indirect.
- In the 2015–2017 triennia there were 34 deaths, of which 11 were direct and 14 were indirect.
- The Victorian MMR from 2015 to 2017 was 10.6 per 100,000 women who gave birth, which is

slightly higher than the 2012–2014 triennium, which was 10.3 per 100,000 women who gave birth.

- Comparison of Victorian and Australian MMR is shown in Figure 3. Due to small numbers, comparison between the national rate and the Victorian rate should be interpreted with caution.
- In the five years from 2013 to 2017, cardiovascular events were the most common cause for all direct, indirect and incidental deaths combined (13 of 56 deaths, 23.2 per cent). Suicide was the most common cause of the 16 direct deaths and the most common cause for 31 indirect deaths (25.0 per cent and 19.3 per cent respectively). In some cases, it was not possible to determine if a substance-use related death was accidental or intentional, therefore deaths due to suicide may be underestimated (Table 1).



Cardiovascular events

were the most common cause of maternal death in the five years from 2013–2017



Suicide

was the most common cause of direct and indirect maternal deaths in the 2013–2017 period

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Figure 3: Maternal mortality ratios by triennia, Victoria and Australia, 1991–2017

Table 1: Causes of maternal deaths, Victoria, 2013–2017

Type of death	Cause of death	Number
Direct		16
Direct included in MMR (due to a complication of the pregnancy)		15
	Pulmonary embolus	3
	Eclampsia	1
	Suicide	3
	Postpartum haemorrhage	2
	Group A streptococcus	2
	Amniotic fluid embolism	2
	Anaesthetic-related death	1
	Sepsisa	1
Late direct death ^b		1
	Suicide	1

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a. This death did not occur in Victoria.

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b. Late maternal deaths occur after 42 days but within one year of the birth and are not included in the MMR.

¹⁴ Victoria's Mothers, Babies and Children 2017

Type of death	Cause of death	Number
Indirect		31
Indirect included in MMR (related to a pre-existing or ne	wly diagnosed condition exacerbated by pregnancy)	23
	Suicide or suspected suicide	2
	Drug toxicity	4
	Substance abuse	1
	Cardiac arrhythmia	2
	Intracerebral haemorrhage or ruptured arteriovenous malformation	1
	Cerebellar haemorrhage	1
	Dilated cardiomyopathy	2
	Lymphocytic myocarditis	1
	Myocardial infarction	1
	Intracranial haemorrhage	1
	Intraventricular haemorrhage	1
	Aortic aneurysm dissection	1
	Undetermined	3
	Multiple sclerosis	1
	Hypoxic-ischaemic encephalopathy following immersion in water in car accident	1
Late indirect death ^b		8
	Suicide or suspected suicide	4
	Primary pulmonary hypertension	1
	Complications of heart transplant for treatment of peripartum cardiomyopathy	1
	Bronchopneumonia with associated social complexity	1
	Cervical cancer	1
Incidental ^c (where the pregnancy is unlike	ly to have contributed significantly to the death)	9
	Mechanical asphyxia – workplace accident	1
	Subarachnoid haemorrhage secondary to endocarditis	1
	Metastatic melanoma	1
	Traumatic head injury (unintentional)	1
	Traumatic head injury (assault)	1
	Pulmonary embolus	1
	Combined drug toxicity	1
	Multiple injuries (assault)	2
Total		56
Total deaths included for		38
Total late deaths		0

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b. Late maternal deaths occur after 42 days but within one year of the birth and are not included in the MMR.

c. Incidental deaths occur within one year of the birth and are not included in the ${\sf MMR}.$

d. Excluding late deaths.

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Contributing factors identified in maternal deaths

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In the past two triennia (2012–2017), one or more contributing factors were identified in 32 of all 68 maternal deaths (47.0 per cent). Removing the 10 incidental deaths (those unrelated to the pregnancy or birth), the presence of one or more contributing factors increases to 55.0 per cent (32 of 58).

Psychosocial factors including mental health and substance abuse were identified in 19 of all 68 maternal deaths (28.0 per cent). (See also Table 2.)

Table 2: Assessment of contributing factors in maternal deaths, Victoria, 2012–2017

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	34
Anaesthetic issues	3
Delay in diagnosis and transfer	4
Failure to review diagnosis in light of diagnostic evidence	1
Failure to administer antibiotics	1
Failure to maintain an adequate airway and ventilation	1
Over-reliance on test result despite clinical evidence of placenta accreta	1
Inadequate communication or communication breakdown	2
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 documentation	1
Poor crisis management	1
Poor liaison with Koori Maternity Services	1
Failure to recognise eclampsia	1
Lack of recognition of complexity or seriousness of condition by caregiver	2
Delayed involvement of senior experienced staff or failure to escalate care	3
Failure to follow recommended best practice:	
- cessation of antidepressant medication	1
- delayed assessment of coagulation status	1
Factors relating to the pregnant woman, her family and social situation	23
Declining or not following medical advice	2
Delay in seeking medical advice/help	3

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Contributing factor	Number
Family violence	3
Maternal mental health	6
Lack of recognition by the woman or family of the seriousness of the condition	1
Morbid obesity	1
Social isolation	1
Substance misuse	6
Total	60

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The review of maternal deaths over the most recent triennium (2015–2017) revealed a range of contributing factors including substance dependence, mental health issues and inadequate care during pregnancy and post-birth.

It is important to note that the contributing factors may not have directly caused the death or had an influence on the outcome. In addition, multiple contributing factors were present in some cases.

In recent years during the review of maternal mortality cases, an increase in factors contributing to the vulnerability of women have been identified:

- mental health disorders
- barriers accessing and/or engaging in care
- substance use
- postnatal depression
- social isolation
- minimal social support
- family violence
- access to money.

In the deaths reviewed for this report, contributing factors became more complex if Child Protection was involved in the care of children, with the following factors being assessed:

- suitability of home environment
- adequate social supports
- ability to care for the infant/child.

Other contributing factors affecting women were:

- the lack of recognition by the woman or her family of the complexity or seriousness of her condition when substance abuse was a major factor, or her mental state was deteriorating
- communication between staff was inadequate when an issue or complication had been identified
- a mental health illness that contributed in a women's ability to access and engage with care.

Recommendation: Develop and implement models of care that meet the specific needs of vulnerable women, children and families

CCOPMM recommends that the acute and primary health system providing care to vulnerable women develop and implement models of care that are timely and meet the specific needs of vulnerable women, children and families.

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4.2 SEVERE ACUTE MATERNAL MORBIDITY

In countries with low maternal mortality, such as Australia, there is increasing interest in maternal morbidity to monitor maternal health and guide improvements in maternity care. Victoria is the first jurisdiction in Australia to introduce mandatory reporting of SAMM cases.

SAMM is defined by the World Health Organization as 'a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy'. In Victoria, CCOPMM chose to use admission to an intensive care unit (ICU) as the identifier of SAMM cases. ICU admission was chosen because it best captures the most severe cases and is a simple and identifiable criterion for use. It has been acknowledged that the criteria for ICU admission may vary across hospitals,

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and it is recognised that not all maternity services in Victoria have direct access to an ICU. Admission to ICU as the SAMM identifier in Victoria will be reviewed.

Snapshot

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 Eighty-three maternal ICU admissions from 1 July to 31 December 2017 were reported to CCOPMM. There were 28 (33.7 per cent) reported in regional hospitals, 30 (36.2 per cent) in metropolitan hospitals and 25 (30.1 per cent) in tertiary hospitals. Sixty-nine (83.1 per cent) women were admitted to a public hospital ICU and 14 (16.9 per cent) to a private hospital ICU.

Maternal demographics

- Forty-four of the 83 SAMM cases (53 per cent) were born in Australia (Figure 4).
- Three of the total SAMM cases (3.6 per cent) were Aboriginal women.



Figure 4: Maternal ICU admissions by region of birth, Victoria, 2017

Region of birth

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- The mean age of women admitted to an ICU was 31.1 years, with 23.8 per cent being 35 years of age or over. For all women giving birth in 2017, 26.2 per cent were 35 years of age or older.
- The mean maternal BMI was 27.5, with 24.7 per cent with a BMI of 30 or higher (Figure 5).

Pregnancy status on admission into ICU

- 8.3 per cent of women were pregnant on admission to an ICU in 2017. Two women were in their first trimester, two in the second trimester and three in the third trimester.
- 91.7 per cent of women were admitted to an ICU in the postpartum period.
- Pregnancy ended prior to 20 weeks' gestation for 4.8 per cent of women admitted to an ICU, three of whom had ruptured ectopic pregnancies.

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 31.0 per cent of women admitted to an ICU required ventilator support (Figure 6) and 11.9 per cent of women received an inotrope or vasopressor infusion. No woman was reported as receiving renal replacement therapy, any cardiac assist device or extra-corporal membrane oxygenation.

Conditions related to an ICU admission

 The majority of conditions (76.2 per cent) related to an ICU admission were directly related to the woman's pregnancy (Table 3). The dominant condition requiring admission to an ICU was primary severe postpartum haemorrhage (PPH), with preeclampsia the next most common. Cardiac and respiratory conditions were the most common nonpregnancy related conditions requiring admission to an ICU.



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Figure 5: BMI categories of maternal ICU admission, Victoria, 2017

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Table 3: Conditions related to ICU admissions, Victoria, 2017

Primary condition related to ICU admission	Specific condition related to ICU admission	Number of cases
Haemorrhage	PPH*	40
	Placenta accreta/increta/percreta	2
	Obstetric haemorrhage (ruptured ectopic)	2
	Retroperitoneal haemorrhage	1
Total		45
Hypertension in pregnancy	Preeclampsia	9
	Eclampsia	3
	HELLP syndrome	1
Total		13
Other pregnancy condition	Suspected amniotic fluid embolism	3
	Hyperemesis gravidarum	1
Total		4
Cardiac/respiratory condition	Acute pulmonary oedema^	3
	Asthma	2
	Influenza (1 type A; 1 type B)	3
	Pneumonia*	1
	Severe congenital heart disease	1
	Supraventricular tachycardia	1
	Pneumothorax and pneumomediastinum	1
Total		12
Other	Anaphylaxis	3
	Sepsis*	2
	Vertebral artery dissection and cerebellar stroke	1
	Pseudo bowel obstruction	2
	Other unconfirmed diagnosis	1
Total		9
Total ICU admissions		83

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* One woman with pneumonia also had sepsis – counted as pneumonia only because this was her primary condition; one woman with PPH also had sepsis – counted as PPH only because this was her primary condition.

^ No reason identified.

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5 Perinatal mortality

Perinatal mortality includes fetal deaths (stillbirths) and deaths of live-born babies within the first 28 days after birth (neonatal deaths).

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5.1 OVERVIEW

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This section uses 'adjusted' perinatal mortality, where terminations of pregnancy for psychosocial indications are excluded. This provides a more accurate measure for assessing avoidable mortality and for comparisons with other jurisdictions both nationally and internationally. There were 702 perinatal deaths reviewed across 2017. This cohort of cases is the largest group of deaths reviewed by CCOPMM. Statistics for unadjusted perinatal mortality can be found in the appendices of this report.

Snapshot

- In 2017, the Victorian adjusted perinatal mortality rate (PMR) remained the same as in 2016 at 8.8 per 1,000 births and is among the lowest in Australia and comparable with other countries of similar socioeomic status (Figure 7 and Table 4).
- The adjusted stillbirth rate for babies born after 20 weeks' gestation in 2017 was 6.3 per 1,000 births.
- The adjusted neonatal death rate (up to 28 days of age) was 2.5 per 1,000 live births in 2017.



Figure 7: Trends in perinatal mortality rates, Victoria, 2003–2017 (crude and adjusted)

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Catagory	2002	2005	2007	2000	0011	0010	2045	0047
Category	2003	2005	2007	2009	2011	2013	2015	2017
Number								
Live births ^a	63,028	66,041	71,780	72,474	73,389	77,609	78637	79,090
Stillbirths	521	599	672	767	705	712	633	641
Neonatal deaths	237	247	241	226	223	241	189	201
Perinatal deaths	758	846	913	993	928	953	822	842
PMR (crude) (per 1,000 births ^{b,c})								
Stillbirths	8.2	9.0	9.3	10.5	9.5	9.1	8.0	8.0
Neonatal	3.8	3.7	3.4	3.1	3.0	3.1	2.4	2.5
Perinatal	11.9	12.7	12.6	13.6	12.5	12.2	10.4	10.6
Number adjusted ^d								
Live births	63,028	66,039	71,780	72,474	73,389	77,609	78637	79,090
Stillbirths	418	421	508	553	522	533	526	501
Neonatal deaths	237	245	241	226	223	241	189	201
Perinatal deaths	655	666	749	779	745	774	715	702
PMR (adjusted) (per 1,000 births ^{b,c})								
Stillbirths	6.6	6.3	7.0	7.6	7.1	6.8	6.6	6.3
Neonatal	3.8	3.7	3.4	3.1	3.0	3.1	2.4	2.5
Perinatal	10.3	10.0	10.4	10.7	10.1	9.9	9.0	8.8

Table 4: Perinatal deaths and crude and adjusted perinatal mortality rates, Victoria, 2003–2017

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a. Live births include babies born alive who died soon after, following induction of labour for congenital anomalies and other fetal conditions.

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.

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d. Births and deaths excluding those arising from termination of pregnancy for maternal psychosocial indications.

- For international comparison the perinatal mortality (limited to infants with a birthweight of at least 500 g, or if birthweight unknown, gestation ≥ 22 weeks) was 6.6 per 1,000 births (Table 5).
- The adjusted perinatal mortality rate for twin pregnancies for 2017 was 31.7 per 1,000 births, and for triplet pregnancies was 148.1 per 1,000 births, compared to 8.1 per 1,000 births for singletons.



In 2017 the

Perinatal mortality rate was
8.8 per 1,000 births, comprising
6.3 stillbirths per 1,000 births and
2.5 neonatal deaths per 1,000 live births

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Category	2005	2010	2015	2016	2017
Number					
Total births (birthweight ≥ 500 g)	66,226	74,000	78,867	80,501	79,400
Live births	65,948	73,641	78,515	80,158	79,010
Stillbirths	278	359	352	343	390
Neonatal deaths	159	152	129	144	131
Total perinatal deaths	437	511	481	487	521
Rate per 1,000 births ^{b.c}					
Stillbirths	4.2	4.9	4.5	4.3	4.9
Neonatal	2.4	2.1	1.6	1.8	1.7
Perinatal	6.6	6.9	6.1	6.0	6.6

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Table 5: Perinatal mortality rate for international comparison, Victoria (selected years)

a. PMR 500 – perinatal mortality rate per 1,000 births where birthweight > 500 g or, if birthweight unknown, gestation > 22 weeks. The PMR 500 is often used for international comparison.

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.

 The perinatal mortality rates were significantly higher for women born in Sub-Saharan Africa and significantly lower for women born in Northeast Asia compared to women born in Australia (Table 6).

CCOPMM classifies perinatal deaths according to the PSANZ classification system.

 The leading cause of adjusted stillbirth (excluding all terminations for congenital abnormalities) was unexplained antepartum (fetal) death (17.8 per cent), where a definitive cause could not be established. Specific perinatal conditions (including twin-totwin transfusion syndrome, fetomaternal haemorrhage, cord accidents and birth trauma) (13.4 per cent), fetal growth restriction (11.2 per cent) and preterm birth (9.2 per cent) were among the next most common causes (Figure 8).

 For newborns up to the age of 28 days (excluding terminations for congenital abnormalities), spontaneous preterm birth (29.4 per cent) and congenital abnormalities (16.9 per cent) were the two most common causes of death (Figure 9).

²⁴ Victoria's Mothers, Babies and Children 2017

Table 6: PMR (adjusted)^a by maternal place of birth, Victoria, 2017

Place of birth	Adjustedª total births	Live births ^b	Adjusted stillbirths	Neonatal deaths	Adjusted perinatal deaths	Percentage of all perinatal deaths	PMR adjusted by maternal place of birth
Americas	1,121 (1.4%)	1,117 (1.4%)	4	2	6	0.9%	5.4
North-East Asia	4,172 (5.2%)	4,156 (5.3%)	16	7	23	3.3%	5.5
Southern and Eastern Europe	1,491 (1.9%)	1,482 (1.9%)	9	0	9	1.3%	6.0
North-West Europe	2,220 (2.8%)	2,208 (2.8%)	12	3	15	2.1%	6.8
South-East Asia	5,240 (6.6%)	5,210 (6.6%)	30	16	46	6.6%	8.8
Australia	48,643 (61.1%)	48,334 (61.1%)	309	123	432	61.5%	8.9
Southern and Central Asia	9,443 (11.9%)	9,385 (11.9%)	58	29	87	12.4%	9.2
North Africa and the Middle East	2,891 (3.6%)	2,872 (3.6%)	19	8	27	3.8%	9.3
Oceania and Antarctica (excl. Australia)	2,252 (2.8%)	2,231 (2.8%)	21	5	26	3.7%	11.5
Sub-Saharan Africa	1,778 (2.2%)	1,755 (2.2%)	23	8	31	4.4%	17.4
Missing	340 (0.4%)	340 (0.4%)	0	0	0	0.0%	0.0
Total	79,591	79,090	501	201	702	100.0%	8.8

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a. The figures and calculations in this table exclude stillbirths arising from terminations of pregnancy for maternal psychosocial indications.

b. Live births include all live births, including those who later die as neonatal deaths.

This table is ranked by PMR (excluding missing data).

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For complete data including confidence level and relative risk refer to appendices provided in separate report.

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Figure 8: Causes of stillbirths (percentage), PSANZ perinatal death classification, Victoria, 2017

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5.2 CONTRIBUTING FACTORS

Key to improving the quality of care and improving perinatal outcomes is carefully reviewing all perinatal deaths to determine if there were contributing factors and if any of those were preventable. A multidisciplinary perinatal mortality review committee at the health service where the perinatal death occurred should conduct this review in the first instance. The introduction of regional maternal and perinatal mortality and morbidity meetings has provided another level of support to smaller maternity services across Victoria. Finally, cases identified as having potential contributing factors are reviewed by one of the CCOPMM expert subcommittees – the Stillbirth Subcommittee or the Neonatal Mortality and Morbidity Subcommittee. Where identified, the contributing factors are graded as:

- unlikely to have contributed to the outcome (insignificant)
- might have contributed to the outcome (possible)
- likely to have contributed to the outcome (significant).

Even significant factors may not necessarily be preventable or imply unacceptable standards of care.

Contributing factors for perinatal deaths in 2017

128 perinatal deaths (18.2 per cent) out of the 702 deaths reviewed had contributing factors identified.

Detail of these factors are reported in Tables 7 and 8.



In 2017, significant suboptimal factors were likely to have contributed to:

20 stillbirths out of 501 cases; and 12 neonatal deaths out of 201 cases

Table 7a: Factors identified in stillbirths, Victoria, 2017

Significance of identified factors in stillbirths	Factors relating to organisation and/ or management identified	Factors relating to personnel identified	Barriers to accessing/engaging with care identified	Total
Insignificant: Suboptimal factors identified but unlikely to have contributed to outcome	0	5	14	19
Possible: Suboptimal factors identified might have contributed to outcome	4	11	69	84
Significant: Suboptimal factors identified were likely to have contributed to outcome	2	13	9	24
Total number of factors	6	29	92	127
Total number of cases	6	28	86	

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Table 7b: Factors identified in neonatal deaths, Victoria, 2017

Significance of identified factors in neonatal deaths	Factors relating to organisation and/ or management identified	Factors relating to personnel identified	Barriers to accessing/engaging with care identified	Total
Insignificant: Suboptimal factors identified but unlikely to have contributed to outcome	2	2	1	5
Possible: Suboptimal factors identified might have contributed to outcome	5	6	7	18
Significant: Suboptimal factors identified were likely to have contributed to outcome	3	7	6	16
Total number of factors	10	15	14	39
Total number of cases	8	13	12	

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Table 8a: Factors identified in stillbirths with birthweight of 500g or more and excluding terminations, Victoria 2017

Significance of identified factors in stillbirths	Factors relating to organisation and/ or management identified	Factors relating to personnel identified	Barriers to accessing/engaging with care identified	Total
Insignificant: Suboptimal factors identified but unlikely to have contributed to outcome	0	2	8	10
Possible: Suboptimal factors identified might have contributed to outcome	3	10	61	74
Significant: Suboptimal factors identified were likely to have contributed to outcome	2	9	9	20
Total number of factors	5	21	78	104
Total number of cases	5	20	73	

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²⁸ Victoria's Mothers, Babies and Children 2017
Table 8b: Factors identified in neonatal deaths with birthweight of 500g or more and excluding terminations, Victoria 2017

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Significance of identified factors in neonatal deaths	Factors relating to organisation and/ or management identified	Factors relating to personnel identified	Barriers to accessing/engaging with care identified	Total
Insignificant: Suboptimal factors identified but unlikely to have contributed to outcome	2	2	1	5
Possible: Suboptimal factors identified might have contributed to outcome	5	6	5	16
Significant: Suboptimal factors identified were likely to have contributed to outcome	3	7	4	14
Total number of factors	10	15	10	35
Total number of cases	8	13	9	

In reviewing the contributing factors in the 702 cases across 2017, the reviewers, the subcommittee and the Council outlined the following recommendations and good practice points.

As in previous sections of the report, in isolation, these good practice points and recommendations may not have prevented or changed the outcome for these babies. However, CCOPMM believes they have the potential to change outcomes as well as enhance the experience for women and their families in future.

Recommendation: Improve access to continuity of care models for pregnant women

Women should have access to continuity of care/ carer throughout the pregnancy episode from the health service and in the community. This may include a small group of known carers or a sole carer. Continuity of care should be considered a priority for all pregnancy care and extend into labour, birth and the early days following birth. This needs to be prioritised within maternity services and for the move into the community following discharge from the acute care sector.

Recommendation: Annual training and assessment is undertaken for all relevant clinicians in fetal surveillance

Recommendation: Establish and implement a formalised escalation process for relevant organisations that is consistent 24/7 in fetal surveillance

CCOPMM recommends annual assessment for all relevant clinicians to be undertaken in fetal surveillance. Any training program used should be fit for the Victorian context. In addition, organisations need to provide ongoing surveillance and support to maintain appropriate standards. Programs that are currently fit for the Victorian context are provided by the Royal Australian and New Zealand College of Obstetricians and Gynaecologists. In addition to education and training, every organisation must establish and implement a formalised escalation process for recognition, response and management for fetal surveillance that is consistent 24/7. Provision of the training and education program to achieve competence does not ensure quality of application of the learnings in an individual's clinical practice organisations need to provide ongoing surveillance and support to maintain appropriate standards.

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Rationale

Fetal monitoring and failure to recognise and respond to fetal deterioration, particularly during labour, continues to feature as a contributing factor in the reviews. Reviews of perinatal deaths have shown that clinicians continue to be falsely reassured by a normal cardiotocography (CTG) in women who reported persisting decreased fetal movements, especially in term pregnancies. A full and comprehensive assessment of a woman in line with current practice needs to occur when a woman presents with decreased fetal movements – refer to the maternity eHandbook <u>https://www2.</u> health.vic.gov.au/hospitals-and-health-services/ safer-care-victoria/maternity-ehandbook.

Another finding of the 2017 reviews was clinicians presuming an abnormal fetal heart rate was due to a technical problem with the CTG machine. In these cases, it is important that the full clinical scenario is considered, ensuring that the fetal heart rate is being accurately monitored. Time delays resulting from equipment being checked can lead to delayed recognition and response to fetal compromise.

Recommendation: Annual training and assessment is undertaken for all relevant clinicians in neonatal resuscitation

Recommendation: Establish and implement a formalised escalation process for relevant organisations that is consistent 24/7 in neonatal resuscitation

CCOPMM recommends that all clinicians who may be called on to participate in a neonatal resuscitation complete an annual training program that includes both cognitive and behavioural components – as determined by the Australian Resuscitation Council (Australian and New Zealand Committee on Resuscitation – *Neonatal Resuscitation Guidelines*). In addition, there should be training within a multidisciplinary environment to simulate the team mix likely to be present during an actual resuscitation. In addition to education and training, every organisation must have a formalised escalation process for recognition, response and management for neonatal resuscitation that is consistent 24/7.

Rationale

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There were occasions in 2017 when clinicians attending for neonatal resuscitation were not familiar or compliant with the latest evidencebased guidelines; this led to delays in recognition of, and response to the compromised neonate.

In addition, there was an over-reliance on the use of a pulse oximeter to detect the heart rate and oxygen saturation value. When resuscitating a newborn, recognition and responding accurately is vital. If there is uncertainty about the accuracy of the heart rate and oxygen saturation values displayed by a pulse oximeter, immediate clarification of the heart rate by auscultation over the precordium should be undertaken. Delays in recognising and responding to an unwell neonate leads to poor outcomes.

Good practice point: Transfer of women in late pregnancy

When a woman in the third trimester of pregnancy requests a transfer to the care of a new care provider or practice, the clinician or service should carefully review the woman's past and present medical and pregnancy history. This will ensure appropriate care can be provided by the clinician(s) or service taking on the care, considering service capability, relevant scope of practice(s) and guidelines before ongoing care is accepted.

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³⁰ Victoria's Mothers, Babies and Children 2017

Good practice point: Support informed decision making

All women have a right to a positive birth experience. This should be characterised by respectful, dignified and compassionate care that enables women to make informed decisions. Should a woman request care that is at variance with hospital guidelines, she should be given information in a form she can understand and her request discussed respectfully. She should be supported in her wishes. If complying with her request is likely to place her health or the health of her baby at risk, this needs to be discussed sensitively and the most senior clinician should be involved in the discussion.

Good practice point: Do not rely on an ultrasound scan to detect fetal growth restriction late in the third trimester

Ultrasound can be a valuable tool in assessing fetal size; however, it is important to remember the limitations of ultrasound when assessing fetal growth. Ultrasound estimates of fetal weight can vary by as much as 15 per cent from the true fetal weight, even when performed by experienced operators. Ultrasound performed in the late third trimester (after 37 weeks) should always be interpreted in conjunction with the full clinical picture.

Good practice point: Reporting deaths to the Coroner

The Coroners Act 2008 requires the reporting to the Coroner of any reportable death.

A reportable death to the Coroner is defined as:

- a death that appears to have been unexpected, unnatural or violent or to have resulted, directly or indirectly, from an accident or injury; or
- a death that occurs:

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- during a medical procedure; or
- following a medical procedure where the death is or may be causally related to the medical procedure and a registered medical practitioner would not, immediately before the procedure was undertaken, have reasonably expected the death. (Coroners Act, 2008).

Reporting (especially) early neonatal deaths to the Coroner, should be the default position.

The Coroner's Office should be consulted even when the cause of death of a child is known but unexpected (eg asthma or epilepsy).

The best rule is: When in doubt, report or at least seek advice from the Coroners Office.

The Coroners Court of Victoria also provides clear advice on its easily accessible website at http://www.coronerscourt.vic.gov.au.

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Consumer messages – What pregnant women and their families need to know

What is informed decision making?

- Informed decision making means that your care provider has given you the information you need to fully understand the choices you are making so that you can be involved in decisions about care. This includes decisions about treatment and tests, and fully understanding the benefits, risks and expected results of each.
- If you are unclear about any aspect of care, you should ask your care provider for more information.
- Being pregnant means you have a responsibility for yourself and for your unborn baby. You are responsible for making informed decisions about your care during pregnancy, labour, birth and after birth.
- When you are planning a baby or are pregnant, you have a number of care options. You can read about things that you should be aware of to help make informed choices on the Better Health Channel https://www.betterhealth.vic. gov.au/health/HealthyLiving/pregnancycare-choices and in the Pregnancy Care Guidelines https://beta.health.gov.au/ resources/pregnancy-care-guidelines.

Further information and where to get help

• Your midwife, obstetrician or general practitioner.

Consumer messages – What families need to know

Coronial investigations

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- The parent of an infant or child who has died following an unexpected death may request an investigation by the Coroners Court of Victoria.
- The Coronial Admissions and Enquiries team will provide advice and support to any person wishing to explore if a death is reportable to the Coroner.

For further information or where to get help

 Coroners Court of Victoria <u>https://www.</u> coronerscourt.vic.gov.au/ or 1300 309 519.

5.3 SMOKING AND PERINATAL MORTALITY

In 2017 in Victoria:

- 8.6 per cent (n = 6,750) of mothers smoked at some time during pregnancy.
- 8.4 per cent (n = 6,588) of mothers smoked in the first half of pregnancy and 5.1 per cent (n = 4,003) smoked in the second half of pregnancy.
- Among women who reported smoking at any time during pregnancy (n = 6,750), 1.1 per cent (n = 76) had a stillbirth or neonatal death compared to 0.6 per cent (n = 391) having a stillbirth or neonatal death among nonsmoking mothers (n = 68,340). PMR in mothers smoking at any time during pregnancy was 11.8 per 1,000 births compared to 6.1 per 1,000 births in those who did not smoke while pregnant (Table 9).

³² Victoria's Mothers, Babies and Children 2017

- Among women who smoked at all during pregnancy (n = 6,750), 11.5 per cent (n = 781) had a preterm birth (gestation < 37 weeks) compared to 7.1 per cent (n = 4,862) having a preterm birth among non-smoking pregnant women (n = 68,340).
- Babies born to mothers who smoked were twice as likely to be born with a birthweight less than 2500g compared to those who did not smoke during pregnancy (Figure 10).

Table 9: Maternal smoking associated with perinatal mortality, Victoria, 2017

Smoking status of mother		Perinatal death per 1,000 births	Stillbirths per 1,000 births	Neonatal deaths per 1,000 births
Smoking at any time during pregnancy	Yes	11.8	7.4	4.4
	No	6.1	4.1	2
Smoking in first half of pregnancy	Yes	11.8	7.5	4.3
	No	5.9	4	2
Smoking in second half of pregnancy	Yes	11.8	7.9	3.9
	No	6.1	4.1	2

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Figure 10: Maternal smoking related to birthweight less than 2,500g, Victoria, 2017

Smoking status of mother

Note: Adjusted for termination.

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6 Aboriginal births, mortality and morbidity

Aboriginal mothers and babies have had poorer outcomes than non-Aboriginal mothers and babies. The PMR for babies born to Aboriginal women has been substantially and consistently higher than for those babies born to non-Aboriginal women over many years. In Victoria over time the gap between Aboriginal and non-Aboriginal mothers and babies in relation to mortality has reduced.

Snapshot

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- 1,103 Aboriginal women gave birth to 1,121 babies (1.4 per cent of all mothers and 1.4 per cent of all babies born in Victoria) in 2017. This is comparable to 2016 (Figure 11).
- The proportion of babies born to Aboriginal mothers has more than doubled from 0.6 per cent in 2000 to 1.3 per cent in 2011 and has remained relatively stable since then (1.4 per cent in 2017). This may be the result of better ascertainment of Aboriginal status as well as an increase in the number of Aboriginal women of childbearing age.
- In 2017 Aboriginal mothers were more likely to be younger than 20 years of age, have

smoked during pregnancy, have a BMI of 30 or higher, live in a rural location and be more socioeconomically disadvantaged (Table 10).



Figure 11: Aboriginal women as a percentage of all women giving birth, Victoria, 2000 to 2017



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- The preterm birth rate for babies of Aboriginal women is 60 per cent higher than for those of non-Aboriginal women; this difference has not changed over recent years (Figure 12).
- Aboriginal babies were more likely to be born preterm and have lower birthweight than non-Aboriginal babies (Table 11).
- A birthweight of less than 2,500 g for babies born to Aboriginal mothers increased from 9.8 per cent in 2016 to 13.7 per cent in 2017 (Figure 13).

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- The adjusted perinatal mortality rate for babies of Aboriginal women rose slightly in triennium 2015–2017 (10.0 compared to 9.0 per 1,000 births in triennium 2014–2016) (Figure 14). This increase is primarily due to a slight rise in stillbirths (5.9 per 1,000 births in Aboriginal women in 2015–2017 compared to 4.8 per 1,000 births in 2014–2016).
- The neonatal mortality rate in Aboriginal women remains similar for 2015–2017 as for 2014–2016 (4.1 compared to 4.2 per 1,000 live births, respectively).

Table 10: Maternal characteristics, Aboriginal and non-Aboriginal women, Victoria, 2017

Characteristic	Aboriginal women	Non-Aboriginal women	
Younger than 20 years	107 (9.7%)	941 (1.2%)	
Smoked at all during pregnancy	448 (40.6%)	6,275 (8.2%)	
Obese (BMI ≥ 30)	354 (32.1%)	15,002 (19.5%)	
Rural residence	536 (48.6%)	16,262 (21.1%)	
Lowest socioeconomic quintile	497 (45.6%)	14,996 (19.8%)	

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Figure 12: Preterm birth (before 37 weeks) for babies of Aboriginal and non-Aboriginal mothers, Victoria, 2012–2017 (percentage of all births)



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Table 11: Perinatal outcomes of Aboriginal babies compared to non-Aboriginal babies, Victoria, 2017

Characteristic	Babies of Aboriginal women	Babies of non- Aboriginal women	Mother and/or baby Aboriginal	Neither mother nor baby Aboriginal
Birthweight < 10th centile	126 (11.2%)	6,579 (8.4%)	180 (10.8%)	6,386 (8.3%)
Birthweight < 2,500 g	154 (13.7%)	5,395 (6.9%)	192 (11.6%)	5,048 (6.6%)
Preterm birth (before 37 weeks)	151 (13.5%)	6,586 (8.4%)	200 (12.1%)	6,200 (8.1%)

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- Overall, however, perinatal mortality is higher for babies of Aboriginal women compared to non-Aboriginal women (10.0 compared to 8.9 per 1,000 births respectively for triennium 2015–2017).
- The stillbirth rate for Aboriginal women is similar to that of non-Aboriginal women (5.9 per 1,000 births compared to 6.4 per 1,000 births in 2015–2017 respectively).
- The stillbirth rate in Aboriginal women in 2015–2017 is slightly higher than for Aboriginal women in 2014–2016 (5.9 compared to 4.8 per 1,000 births respectively).
- The neonatal mortality rate for infants of Aboriginal women had dropped in live births in 2014–2016 (4.2 per 1,000 live births in Aboriginal women, and this is maintained in the triennium 2015–2017. However, it remains higher than that of non-Aboriginal women (4.1 compared to 2.5 per 1,000 live births respectively).

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• As the numbers involved are small and associated with a high degree of variability from year to year, further analysis and trend data are required to confirm the results listed above, and therefore the rates of perinatal deaths, stillbirths and neonatal deaths should be interpreted with caution. Aboriginal women were less likely to initiate breastfeeding than non-Aboriginal women (83.6 per cent compared to 94.6 per cent respectively). For those babies born at 37 or more weeks' gestation whose mothers initiated breastfeeding, Aboriginal babies were slightly more likely than others to be given formula in hospital (32.7 per cent compared to 28.1 per cent respectively) and were slightly less likely to be fully breastfeeding at the time of discharge from hospital (72.5 per cent compared to 75.1 per cent respectively).



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In 2017

83.6 per cent of Aboriginal women initiated breastfeeding compared to

94.6 per cent of non-Aboriginal women

Recommendation: Increase the effectiveness of smoking cessation programs and breastfeeding support services for Aboriginal women.

CCOPMM recommends the effectiveness of smoking cessation programs available to Aboriginal mothers during pregnancy is reviewed to improve smoking cessation rates. The Council also recommends the establishment of culturally appropriate community-based services to support and encourage increased duration of breastfeeding for infants of Aboriginal women.

³⁸ Victoria's Mothers, Babies and Children 2017

7 Child and adolescent mortality

In Victoria, child mortality rates are low, but young Victorians continue to die from preventable causes, and this section highlights opportunities for Victoria to reduce rates even further for infants, children and adolescents between the ages of 28 days up to the age of 18 years.

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7.1 **OVERVIEW**

Vulnerable children continue to be overrepresented in deaths, providing opportunities for targeted interventions in this group in both the acute and primary heath sectors and in the community.

Snapshot

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- Overall, mortality rates continue to decline, with slight year-on-year variation.
- In 2017 there were 205 deaths reported to CCOPMM, similar to 2016 (when 206 deaths were reported).
- In 2017 there was a slight increase in the number of deaths (n = 136) compared with 2016 (n = 131) for children and adolescents aged between one and 17 years, but the total remains

lower than that in 2015 (155). There were 69 deaths of post neonatal infants in 2017, a slight reduction from 2016 when 75 post neonatal infants died (Figure 15).

 Rates of death are shown in Figure 16. The highest rate of death is in the age group 28-364 days.



post-neonatal infant, child and adolescent 16.3 per cent

from 245 to 205



Figure 15: Post-neonatal infant, child and adolescent deaths by age group, Victoria, 1985–2017

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- In 2017 mortality rates per 1,000 live births in Victoria for infants (0–364 days) and those aged under five years were the same as the Australian national rates (3.0 compared with 3.0; 3.5 compared with 3.5) respectively (Figure 17). However, Australia's rates in 2017 were ranked 15th and 13th respectively for infants and children aged under five years of all the 34 Organisation for Economic Cooperation and Development countries.
- There were 69 deaths in infants 28–364 days old (post neonatal infants). The main causes of deaths were:
 - congenital anomaly (35 per cent)
 - sudden unexpected death in infancy (SUDI) (28 per cent)
 - prematurity (17 per cent).

Figure 16: Rates of death by age group, Victoria, 1985–2017





In 2015–2017, the rate of **infant mortality** for babies of Aboriginal mothers was **66 per cent higher** than the rate for babies of non-Aboriginal mothers



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Figure 18: Infant (0–364 days) mortality rate by Aboriginal status of the mother, Victoria, 2009–2017 (rolling triennia)



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- The main causes of the 36 deaths in children aged one to four years in 2017 were:
 - malignancy (25 per cent)
 - congenital anomaly (19 per cent)
 - motor vehicle accident (14 per cent).
- Victoria's mortality rate for those aged under five years was 3.5 per 1,000 live births in 2017.
- The main causes of the 30 deaths in children aged five to nine years in 2017 were:
 - malignancy (40 per cent)
 - congenital anomaly and other acquired disease (both 17 per cent)
 - infection (10 per cent).
- The main causes of the 24 deaths in children aged 10–14 years in 2017 were:
 - congenital anomaly (33 per cent)
 - undetermined (17 per cent)
 - malignancy and intentional self-harm (including suicide) (both 13 per cent).
- The main causes of the 46 deaths in adolescents aged 15–17 years in 2017 were:
 - intentional self-harm (including suicide) (30 per cent)
 - congenital anomaly (22 per cent)
 - motor vehicle accidents (17 per cent)
 - malignancy (15 per cent).

Complete data on causes of death is available in the separate appendices document accompanying this report.

Recommendation: A bereavement care education package is developed to support clinicians caring for families who have experienced the death of a child

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CCOPMM acknowledges the importance of the care and support parents and families receive from hospitals and clinicians following the death of a child.

To strengthen further the care provided CCOPMM recommends an education package is developed to support primary health clinicians caring for families who have experienced the death of an infant, child or adolescent.

This would further assist primary health clinicians in caring for parents and caregivers at such a difficult time. This education and support package should be easily accessible and contain local referral pathways, evidence-based information and resources.

Good practice point: Reporting deaths to the Coroner

The Coroners Act 2008 requires the reporting to the Coroner of any reportable death.

A reportable death to the Coroner is determined as:

- a death that appears to have been unexpected, unnatural or violent or to have resulted, directly or indirectly, from an accident or injury; or
- a death that occurs:
 - during a medical procedure; or
 - following a medical procedure where the death is or may be causally related to the medical procedure and a registered medical practitioner would

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not, immediately before the procedure was undertaken, have reasonably expected the death. (Coroners Act, 2008).

Reporting (especially) early neonatal deaths to the coroner, should be the default position.

The Coroner's Office should be consulted even when the cause of death of a child is known but **unexpected** (eg asthma or epilepsy).

The best rule is: When in doubt, report or at least seek advice from the Coroners Office.

The Coroners Court of Victoria also provides clear advice on its easily accessible website at http://www.coronerscourt.vic.gov.au.

Consumer messages – What families need to know

Coronial investigations

- The parent of an infant or child who has died following an unexpected death may request an investigation by the Coroners Court of Victoria.
- The Coronial Admissions and Enquiries team will provide advice and support to any person wishing to explore if a death is reportable to the Coroner.

For further information or where to get help

 Coroners Court of Victoria <u>https://www.</u> coronerscourt.vic.gov.au/ or 1300 309 519.

Consumer messages – What parents need to know

Bereavement follow-up

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If you have experienced the death of a child, we strongly encourage you to see your general practitioner. Even if you think you are doing okay, grief can surface at unexpected times and in unexpected ways. Your doctor can help you recognise the signs and get you the help you need.

7.2 PROVIDING THE BEST CARE FOR INFANTS, CHILDREN AND ADOLESCENTS

Recommendation: Detect and respond to clinical deterioration

CCOPMM recommends that all health services providing paediatric care implement an organisation-wide approach to detect and respond to any clinical deterioration that includes parent or caregiver escalation and is consistent 24/7.

Recommendation: Listen to concerns of families – admit an infant, child or adolescent who has presented three times to an acute service or health practitioner

CCOPMM recommends that any child or adolescent who presents to hospital or a medical practitioner on three occasions during a single acute illness is admitted and further investigations undertaken.

All health services providing paediatric care need to implement a comprehensive and integrated organisation-wide approach to detect and respond to any clinical deterioration. This approach requires multiple processes and practices including:

- triggers for admission (such as repeated presentations for the same illness)
- specific processes for clinical escalation in the event of deterioration
- specific skills for staff attending paediatric medical emergency team (MET) calls
- addressing and considering parental concerns about a child's condition or change in condition
- addressing and considering nursing, midwifery, allied health or medical staff concerns about a child's condition or change in condition
- use of specific paediatric observation charts such as the Victorian Children's Tool for Observation and Response (ViCTOR) – these charts provide the most recent evidence in newborn and paediatric vital sign parameters to assist clinicians in identifying deterioration
- embedding the value of review and reassessment by a second, independent clinician at critical points in the care pathway including when:
 - questions remain about a child's diagnosis
 - the signs and symptoms are atypical
 - normal clinical resolution is not occurring with adequate treatment
 - requested by parents, caregivers or staff caring for the child
- standardised thresholds for contacting the Paediatric Infant Perinatal Emergency Retrieval (PIPER) service
- informing parents and carers about the expected clinical course of their child's illness

and the symptoms or signs to look for that should prompt medical review

- 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, including links to tertiary hospitals that can provide liaison and support
- having an institution-wide patient or carerinitiated trigger system where:
 - parents or carers can formally escalate their concern about their child
 - it is part of a system-wide escalation process that includes the option to trigger an emergency/MET response (the actual response may vary from institution to institution) when the degree of concern is significant or other attempts at escalation have not succeeded
 - parents or carers are made aware of the escalation process at the point of admission, and the mechanism is prominently displayed in hospitals
 - it is clear and easy for parents to escalate (for example, it needs to be clear who initial concerns should be escalated to, and how to activate the MET).

Rationale

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Every year infants, children and adolescents die because it has been assumed they have a common or non-serious illness, but their presentation or course of illness has been atypical in several ways. It is imperative that other diagnoses are considered and actively looked for if the presentation has features that do not completely fit with that of a benign diagnosis, or where their health does not improve.

⁴⁴ Victoria's Mothers, Babies and Children 2017

Deaths have been reviewed where infants, children and adolescents have presented multiple times to one or more practitioners and this has led to poor outcomes. If a child presents on three occasions during an acute illness, serious consideration must be given to the need for a hospital admission and further investigation. A doctor experienced in paediatrics should be involved in assessment and decision making on the third encounter. It is important to ask parents if they have taken the child to see any other health professionals during the current illness.

Repeated presentations to one or more medical practitioners or hospital emergency departments may indicate that the parents are not coping with the care of their unwell child, or that the condition is fluctuating or getting worse. Parents are not always able to explain the reasons for their concerns, but they should be listened to and their concerns taken seriously.

Many of the situations outlined below may occur concurrently, whether the child is an inpatient or outpatient, and are important situations for clinicians to recognise and respond to appropriately.

CCOPMM has historically seen child death occur in the following scenarios:

The **wrong diagnosis** was made initially, and the diagnosis was not reconsidered when clinical deterioration occurred, or the clinical course did not follow the usual pattern for that diagnosis. Subsequent clinicians may be biased towards the initial diagnosis, despite clear evidence of deterioration or atypical features suggesting alternative diagnoses. The diagnosis was accurately identified but the child's condition deteriorated with progression of the disease or a secondary complication, and there was **a failure to modify treatment or to escalate care**.

Health practitioners **failed to respond appropriately to parental concerns** regarding their child's condition or multiple presentations and to consider alternate diagnoses, progress of the disease and complications of the disease.

Medical practitioners **failed to appropriately respond to the concerns of nursing, midwifery, allied health or medical staff** about the clinical state of the child.

The child's condition was **beyond the scope** of practice for the admitting hospital – either at admission or when the child's condition deteriorated, and the hospital did not transfer the child to a hospital capable of managing their illness.

A complication of a disease developed (for example, bacterial sepsis following a recent viral infection); however, the child's caregivers were not aware of the **symptoms or signs that should trigger re-presentation** for medical care.

Treating clinicians **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.

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Parents or guardians took the child to **multiple practitioners during the same illness** to have their continued concerns addressed. After having sought advice on three occasions and being sent home, many parents thought it was not worth trying again – even if there were symptoms and signs of serious clinical deterioration.

Good practice point: Use of personalised medical information cards

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Some children with complex or chronic medical conditions require treatment in the event of an acute illness that is not covered by emergency services protocols (for example, caution with certain drugs). Some families of these children have a personalised medical information card that they can give to emergency services clinicians (ambulance, emergency departments, general practitioners) to guide them in an emergency. All specialties should adopt the practice of providing a personalised medical information card, where appropriate, for the children and young people they care for.

Good practice point: Children in a non-specialist setting receive care from clinicians with appropriate paediatric expertise

Staff who provide clinical care to children must have adequate training and experience in providing that care.

Good practice point (continued)

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Most children in Victoria receive their care outside of paediatric-specific specialist centres. It is imperative that all health services ensure children receive care from clinicians with appropriate paediatric expertise, or that sub-specialty expertise is combined with staff who have paediatric-specific skills.

When children are admitted with a surgical condition and are managed by teams that have a background in adult surgery, there should be consideration as to whether the team is sufficiently trained and experienced to manage the child, or whether the child should be jointly cared for by a paediatric team (or a medical team with experience in paediatrics if a paediatric team is not available).

If it is decided not to have a paediatric team (or a medical team with experience in paediatrics if a paediatric team is not available) involved in the care of inpatient children, there should be clear criteria and mechanisms to escalate their care to involve a paediatric team (or a medical team with experience in paediatrics if a paediatric team is not available) if their condition does not follow an expected path.

For any paediatric inpatient in any health service, the age-appropriate ViCTOR charts should be used, with clear local protocols for escalating care.

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⁴⁶ Victoria's Mothers, Babies and Children 2017

Good practice point: Care provided within service capability

All health services should have a clear understanding of their service capability and the scope of practice of clinicians that is consistent with their defined capability (for example, resources and health practitioner cover).

Health services and practitioners should only admit children to their health service who meet the capability of that service. Children whose condition or treatment needs do not meet the capability at presentation, or whose condition changes during admission and no longer meet the capability, should be transferred to a health service with the capability to meet the child's clinical needs.

Recommendation: Supporting vulnerable women, children and families

CCOPMM recommends developing and implementing specific models of care that meet the needs of women, children and families in vulnerable situations. These models of care need to occur in community service organisations, community health centres and in hospitals.

Models of care should include:

 an increase in care providers and/or care workers with skills in child and adolescent health, assessment, early child growth and development and social welfare – care providers would have close links to hospitals, paediatricians, general practitioners and other specialist health professionals

- improved access to health professionals, especially paediatricians and general practitioners – this requires more community health centre-based paediatricians and closer links between community service organisations and the health sector
- maternal and child health services reinforce education to families to seek medical assistance when their child displays signs of significant illness, including education on the signs and symptoms of significant illness
- an increase in mental health specialists (psychiatrists/psychologists) to ensure children with acute serious mental health problems are seen in a timely manner
- promotion of safe sleeping guidelines.

Rationale

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CCOPMM has identified a high number of deaths among vulnerable children with social risk factors including:

- having been previously reported to child protection services
- living in households where there is higher social disadvantage, or reduced access to services
- living in households where there is family violence, mental health disorders or drug abuse, or where the environment is unsafe
- social marginalisation, including coming from an immigrant, Aboriginal or refugee family.

Among adolescents, additional social risk factors include disengagement from school, substance dependence and mental health problems.

The causes of death among such children and adolescents span the range of diagnoses: SUDI,

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unintentional injuries, intentional self-harm (including suicide), epilepsy, asthma, infections, malignancy, congenital problems and other chronic health conditions.

Children with chronic health conditions who are socially marginalised, or who have these risk factors, are more likely to have poor adherence to medications, poor engagement with healthcare and other services, nutritional problems, educational failure, poor psychological health, poor wellbeing and lack continuity of care and monitoring of their health condition. Sometimes this leads to deaths that are preventable.

Mitigating the effect of these vulnerabilities and social risks on children's health is urgently needed. Children with chronic health conditions and social risk factors require close monitoring and follow-up, linking with skilled community doctors (general practitioners and paediatricians) and other health professionals (social work, maternal health, specialist medical and psychology services) as needed.

The needs of vulnerable children are currently being addressed by not-for-profit, non-government organisations or specific community and family support organisations (such as Aboriginal support services for some communities). However, these agencies may have limited access to staff with paediatric and adolescent health skills, with limited linkages between child welfare services, community health services and paediatric hospital services.

Deaths of children referred to the coroner who were from families known to Child Protection

Thirty-four of the 141 (24 per cent) deaths of postneonatal infants, children and adolescents who died in Victoria and whose deaths were referred to the coroner in 2017 were from families known to child protection services, either prior to, at the time of or following death.

Good practice point: Use of interpreters

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Clear and effective communication is essential for good clinical care. Patients from non-English-speaking backgrounds are at a disadvantage in the health system and can receive inadequate care if there is no assessment of the need for an interpreter or inadequate support for communication. Patients' and families' understanding may be satisfactory at a superficial level but not at a more detailed level, so complex information on treatment may not be understood, and treatment decisions may not be fully informed. Clinicians should consider a patient's and family's need for additional resources such as interpreters or information sheets in the patient's or family's first language. It is important for all patients and families from a non-Englishspeaking background that:

- the need for an interpreter is considered
- the family is offered the use of an interpreter (Translating and Interpreting Service – National phone 13 14 50)
- the need for an interpreter is documented in the patient's notes
- relatives should not be used as interpreters.

⁴⁸ Victoria's Mothers, Babies and Children 2017

Good practice point: Discharge of mentally unwell adults who live with young children

Adults who are admitted for acute psychiatric management of mental health issues may be parents or carers of children.

Medical, midwifery and nursing staff are mandatory reporters to child protection services and must be aware of their obligations. Health services have protocols for escalating cases to child protection services where there is concern about a parent's capacity to look after their children. To make a report, health professionals only need to have reasonable grounds to believe that a child has been abused or neglected or is 'at risk' of abuse or neglect.

To support family-centred practice and the best interests of children, all clinicians must assess whether their patients have dependent children. They must ensure the parents and family have the appropriate supports in place to be able to appropriately care for any children.

Prior to discharge, the mental health service must determine if there is any risk or concerns about the adult patient's capacity to look after children in their care. While it is important to recognise that people with mental health issues can live well with symptoms and be caring and responsible parents, *it is necessary to undertake case planning and a risk assessment*. If there is risk to dependent children, then the clinician is legally obligated to make a report to Child Protection.

Good practice point (continued)

Where Child Protection is involved, there should be a case conference between agencies and others involved to determine any safety concerns. This is essential where there is a history of harm to others.

Good practice point: Treatment decisions

Communication between clinicians and families about how to best care for a child requires openness, sensitivity, compassion and continuity in a non-judgemental way so that families feel heard, supported and respected. Keeping families engaged with services and providing reasonable care should remain the focus of these discussions. However, in a small number of cases it may become impossible to meet the parents' wishes while also upholding the rights of the child, at which time referral to another institution or Child Protection involvement may be necessary.

Rationale

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It is increasingly common for clinicians and parents/caregivers to have different opinions about best care. This can occur when parents/ caregivers decline treatment for the unborn child, newborn infant or child or when they opt for interventions that are not recommended by a medical practitioner, especially in situations in which there are no effective treatments.

All clinicians have an important role in promoting children's wellbeing and monitoring their risk in a manner that is acceptable to parents. Optimising communication with parents and families is vital to this endeavour and can be achieved by:

- being sensitive during consultations and able to empathise with and explore the desire for parents to be 'good parents'
- exploring recommendations for best care and specific treatments that parents have received from other people and sources
- being willing to answer questions about established and emerging interventions
- being willing to discuss the benefits and risks of all treatments, including those that are evidence-based
- developing agreed approaches to interventions that are clear, including information about what is not available
- avoiding opportunities for conflicting or mixed messages about the best care available – this is often achieved with the most senior medical practitioner identified as the care coordinator and lead communicator
- offering advice without personal judgement.

If interactions break down between a clinician and a family, the health service should offer an alternative health care path with another provider at the same site or arrange connection to another service.

Where differences in opinion about best care are unlikely to affect the outcome of the child's life

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One such situation is when premature death of a child is highly likely, even if the timing is uncertain. In these situations, a child can be at further risk because the family disengages from mainstream services. It is also not uncommon in this situation for there to be a difference of opinion about best care between clinicians, and this can add complexity to planning and clinician-parent communication.

Families seek information about care and treatment from multiple sources including their social support networks, social media and the Internet, their family and other parents.

A helpful framework for making decisions about how to respond when parents' views about treatment differ from doctors' views is the '**Zone of Parental Discretion**'. The key question to ask when parents disagree with doctors about medical treatment is: *What would be the impact on the child of going along with the parents' wishes*? Health services should develop a framework for clinical ethics referral or '**roundtable**' discussions to assist both the clinician and the family in such cases.

If the outcome would be less-than-perfect but 'good enough', then it is ethically appropriate to go along with parents' wishes. In considering the overall impact on the child, it is important to consider the possible negative impact on the child of seeking to intervene against the parents' wishes.

⁵⁰ Victoria's Mothers, Babies and Children 2017

Good practice point: Escalating to child protection services

Health services and clinicians should be aware of protocols for escalating cases to Child Protection. Clinicians and health services should also uphold the rights of the child, whatever their age, given that Australia is a signatory state to the *Convention of the Rights of the Child*, which describes that children have the right to a full life (Article 6) and to good-quality health care (Article 24).

Rationale

Address differences in opinion about the child's best care

There are situations where clinicians and parents/ caregivers have different opinions about best care and clinicians perceive the child will be harmed if parental wishes are followed. In this situation, the parents'/caregivers' wishes may need to be resisted or overridden. In such discussions, the most senior clinician should be involved to provide clarity and support to the family to make decisions in the best interests of their child.

Service providers should be aware that under the *Child Youth and Families Act 2005*, Child Protection can:

- receive a report about an unborn child
- share information about the mother of an unborn child with an information holder or service provider for the purpose of assessing risk or seeking advice on the most appropriate service to provide assistance
- provide advice to a person who makes a report
- provide advice and assistance to the mother of an unborn child

 refer the mother of an unborn child to a community-based child and family service or a service agency for advice, service and support.

For an unborn child report:

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- intervention can only occur with the mother's consent
- the report cannot be classified as a protective intervention report so there can be no investigation, substantiation decision or protective intervention
- a protection application cannot be made before the child is born.

Beyond medical issues for newborns and children a report to Child Protection should be considered if, after examining the available information, the medical practitioner believes there will be serious impacts on the child's immediate safety, stability or development.

Child abuse is defined as an act by parents/ caregivers or others that endangers a child's physical or emotional health or development.

As previously noted, health professionals only need to have reasonable grounds to believe that a child has been abused or neglected or is 'at risk' of abuse or neglect to make a report. When lifesaving medical treatment is refused this should constitute a report to Child Protection.

Guardianship applications to convey responsibility for healthcare decisions are rarely required but are necessary to protect a child's rights to appropriate health care.

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Consumer messages – What families need to know

- When children are sick, their condition can worsen quickly.
- If you're worried about the diagnosis your child has been given, or if they are not recovering as expected, go back to your health practitioner, regardless of previous advice you've been given.
- If you're not satisfied with the advice you've been given, speak to another medical practitioner or visit an emergency department.
- If your child is in hospital and you feel his/ her condition is deteriorating, tell a nurse or other member of the medical team. There is usually a way for you to escalate your concerns too – ask the nursing staff for help.

7.3 SERIOUS INFECTIONS

In children, symptoms of a serious infection can be difficult to distinguish from symptoms of less serious illnesses and can develop over time. When a child is not following the expected clinical path or has atypical symptoms, it is of paramount importance that alternative diagnoses are considered and a second opinion from an experienced colleague is sought.

Snapshot

 Infection is a significant cause of death in children in Victoria. In 2017, 11 children in Victoria died from infection. This compares with six deaths from infection in 2016 and 13 deaths from infection in 2015. There has recently been an increase in infants and children with respiratory virus infections complicated by empyema and secondary bacterial pneumonia caused by Group A Streptococcus, Streptococcus pneumoniae and Staphylococcus aureus.

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 It is important to note that children may become seriously unwell from *Streptococcus pneumoniae* empyema from vaccine-included strains, despite having been fully vaccinated.

Good practice point: Management of respiratory infections and empyema in children

There has recently been an increase in infants and children with respiratory virus infections complicated by empyema and secondary bacterial pneumonia caused by Group A *Streptococcus*, *Streptococcus pneumoniae* and *Staphylococcus aureus*.

Although less common than viral bronchiolitis, it is very important to be alert for children with bacterial pneumonia and complications.

The signs that point to a serious bacterial infection include:

- persistent fever
- tachycardia
- poor feeding
- lethargy or other signs of toxicity
- failure to follow the expected course of recovery in the presence of a positive viral nasopharyngeal aspirate.

⁵² Victoria's Mothers, Babies and Children 2017

Recognition

A child with acute viral bronchiolitis is generally not toxic, has minimal fever or a low-grade (< 39°C) non-persisting fever, and is alert and active.

If a child has a high or persisting fever or persisting tachycardia even when calm, an alternative diagnosis should be considered.

A child who is sicker than expected, or is not following the expected path of improvement, should be reassessed by a paediatrician or senior doctor and examined for signs of:

- effusion (dullness to percussion and reduced air entry on auscultation)
- other complications including signs of systemic sepsis or signs of heart failure (pallor, cyanosis, tachycardia, gallop rhythm, enlarged liver) such as those that occur with acute viral myocarditis.

An infant with a diagnosis of bronchiolitis and high or persisting fever or persisting tachycardia should have a:

- chest x-ray to investigate for effusion or consolidation, or cardiomegaly suggestive of myocarditis
- full blood examination
- blood culture
- venous blood gas.

Signs on laboratory investigations that suggest serious bacterial infection include neutropenia, marked neutrophilia, left shift or high immature to total granulocyte ration (> 0.2) and a venous blood lactate > 3 mmol/L.

Good practice point (continued)

A child with pleural effusion or any of these signs should be considered to have a serious bacterial infection.

Despite being fully vaccinated, several children in 2017 had *Streptococcus pneumoniae* empyema from vaccineincluded strains. Please note that having had pneumococcal vaccine does not mean a child cannot develop empyema.

Treatment

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Treatment of empyema should follow the guideline on severe pneumonia <u>https://www.</u> rch.org.au/clinicalguide/guideline_index/ Pneumonia/.

Some children with effusion do not need urgent drainage and can be referred for review by a respiratory paediatrician or surgeon. However, a child with a large effusion and severe respiratory distress, hypoxaemia or severe sepsis should have the effusion drained urgently. This should be done with an experienced operator who is trained to insert a pleural drainage catheter in the presence of an anaesthetist or other senior doctor to monitor the airway and give sedation. The procedure should occur in the safest possible place depending on the urgency of the situation, ideally in an operating theatre. In a severe situation, draining a pleural effusion using a dose of intravenous ketamine (0.5–1 mg/kg), local anaesthetic and intercostal insertion of an intravenous cannula and aspiration of the fluid is sufficient to stabilise the child.

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A PIPER paediatric ICU consultant is available for consultation 24 hours a day on 1300 137 650, and PIPER registrars are trained to insert intercostal catheters to drain large effusions.

In summary

Children with unrecognised empyema can deteriorate because of failure to:

- consider the possibility of empyema due to assumptions made about the diagnosis of bronchiolitis
- reassess, including a proper clinical examination, and recognise when a child is not following the expected clinical path
- listen to nurses' or parents' concerns
- escalate when a child is persistently in the Purple Zone of the ViCTOR charts
- conduct a chest x-ray and blood test in infants with a diagnosis of bronchiolitis but atypical features
- urgently drain the empyema in children with hypoxaemia, severe respiratory distress or severe sepsis.

Good practice point: Identifying sepsis

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Identifying sepsis is a challenge in all age groups. The signs of fever, tachycardia and tachypnoea are common to both serious bacterial infection and systemic viral infections, especially in young infants. Serious bacterial infection can be preceded by a typical viral illness.

A high index of suspicion is needed to detect an uncommon condition among the many children who present with a viral infection.

Beware that serious bacterial sepsis can occur in children with features of viral illness (such as coryza or a sore throat) and in families where other members have viral symptoms.

Could this be sepsis?

Clinicians should have this thought whenever they see a febrile, unwell child. Consider the diagnosis if the child: has more severe features; is persistently tachypnoeic or tachycardic; is not alert and interactive; is not walking (and is normally ambulant); is moaning or appears in pain; or is not recovering as expected. The child needs to be re-examined by an experienced clinician and, if necessary, a second opinion sought.

Any child with significant compromise of airway, breathing, circulation or conscious state should have bacterial sepsis included in the differential diagnosis. A severely unwell child should be treated for sepsis in the first instance.

Specific presentations that are worth noting

Airway – not all stridor is viral croup. If a child has a high fever and systemic signs of sepsis they may have a bacterial infection. If there are signs of sepsis (see below) or the child is not following an expected course (for example, a longer period of stridor than expected), or has other risk factors (for example, ex-premature), consider other causes of upper airway obstruction. A chest x-ray may assist and reassessment will be needed.

Breathing – take note of a child who appears to have bronchiolitis but has atypical features or is very unwell. Consider bacterial pneumonia and empyema, do a chest x-ray and reassess. Respiratory syncytial virus can also present with apnoea and shock in neonates and young infants.

Circulation – poor circulation is a worrying sign. Mottled appearance, cool periphery and slow capillary return can be seen in bacterial sepsis but also may occur in febrile infants with viral infections. If there is doubt, then treat for bacterial sepsis. Viral myocarditis can also present with poor circulation (tachypnoea, cyanosis, tachycardia, pallor and/or enlarged liver). A chest x-ray should be performed looking for cardiomegaly. Frequent assessment and consultation with an experienced clinician is needed.

Good practice point (continued)

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Neurological – features of encephalopathy include a reduced level of alertness, wanting to sleep far more than usual, irritability and seizures. Febrile encephalopathy may be due to bacterial infection or viruses including herpes simplex virus, human herpesvirus 6, parechovirus in young infants, enterovirus, influenza or other viruses. The child must be treated for bacterial meningitis until proven otherwise and should be managed in a setting with appropriate capability.

Criteria for rapid ICU admission of children with sepsis

It is important to recognise children with suspected sepsis who are at high risk for deterioration.

Any child with suspected severe sepsis who has any one or more of the following criteria should be rapidly escalated and discussed urgently with a PIPER paediatric ICU consultant:

- venous blood lactate > 3 mmol/L
- neutropenia (neutrophil count < 1,000 / mm3) – unexpected and not related to cancer chemotherapy
- large pleural effusion (for example, near white-out of hemi-thorax)
- coagulopathy (INR > 1.6, APTT > 60, Fib < 1)
- signs of shock¹ persisting despite a total of 40 mL/kg fluid.
- 1 Signs of shock include capillary refill > 3 seconds, low-volume pulses, hypotension, tachypnoea and lethargy or poor conscious state.

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7.4 DEATHS DUE TO UNINTENTIONAL INJURIES

Despite declines in child and adolescent deaths over the past 30 years from unintentional injuries, children die in Victoria each year from avoidable injuries.

Children continue to die from a lack of supervision around water including baths, swimming pools and dams, and from a lack of protection from other hazards such as roadways, guns that are incorrectly stored, motorised vehicles (as a pedestrian, passenger or driver), and foreign objects and medications that can be inhaled or swallowed.

Legislation and regulation of safety measures (for example, seatbelts, child car restraints, pool fencing, blood alcohol testing and product design standards) together with parental education have reduced the number of unintentional injuries; however, not all hazards can be removed with these methods. Parental supervision and awareness of potential hazards is essential to minimise the deaths from unintentional injury.

It is illegal to have a child not properly restrained in a car.

Snapshot

In 2017:

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- Twenty-five children and adolescents died from unintentional injury.
- Nine of these children (36 per cent) were under the age of five years, and 11 (44 per cent) were aged 15–17 years.
- Fifteen (60 per cent) died from accidents related to motor vehicles or other nonmotorised conveyances on roadways.
- Four children under the age of 10 years drowned.
- Five children and adolescents died from other unintentional injuries, including three with unintentional drug overdose.

See Figures 19-22.

⁵⁶ Victoria's Mothers, Babies and Children 2017



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Figure 19: Rates of unintentional injury deaths by age group, Victoria, 1985–2017

Note: CCOPMM began reporting in the 15–17-year age group in 2005.

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Figure 20: Rates of unintentional injury deaths, 28 days to 14 years, Victoria, 1985–2017

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Figure 21: Rates of unintentional injury deaths, 28 days to 17 years, Victoria, 2005–2017

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Note: CCOPMM began reporting in the 15–17-year age group in 2005.

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Figure 22: Motor vehicle accidents by age group, Victoria, 1985–2017

Consumer messages – What parents need to know

Using e-cigarettes around children

In Victoria children have become severely unwell or died after swallowing liquid nicotine from an e-cigarette. Many products available online do not appear to have any childproof lids or flow restrictors to limit a young child's ability to access or empty the contents of the bottles. The volume and concentration of liquid nicotine in refill bottles can be lethal to an average young child and the flavours used are attractive to young children.

Parents/caregivers using e-cigarettes must ensure:

- e-cigarettes and refill products are stored where children cannot see or reach them – preferably in a locked and secure location
- refills are not used or discarded around children
- products are safely refilled, cleaned and disposed of.

Contact the Victorian Poisons Information Centre on 13 11 26 if you have any concerns regarding human exposure to e-cigarette liquid.

In an emergency call 000.

Further information on e-cigarettes is available on the Better Health Channel at: https://www.betterhealth.vic.gov.au/health/ HealthyLiving/e-cigarettes.

Consumer messages – What parents need to know

Motor vehicle accidents

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Most children and adolescents die in motor vehicle accidents for one of the following reasons:

- the child restraints are inadequate
- children are located next to moving cars and either are not seen or move unexpectedly into the path of the moving vehicle
- teenage passengers in a car driven by a friend or peer
- drivers in off-road and rural areas not following safe standards.

Car restraints

The best protection for young children travelling in a car is to sit in a well-fitted, five-point harness child car seat. These seats need to be properly fitted in every car that a child travels in.

Children older than seven years can legally use an adult seatbelt; however, an adult lap-sash seatbelt is designed for people with a minimum height of 145 cm. The average child will reach this height between 10 and 12 years of age.

Children who are not tall enough to use an adult seatbelt can slump into their seat. The lap part of the seatbelt is then too high on their stomach, which will cause serious injuries in a crash.

It is best that your child continues using a booster seat until they have outgrown it.

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Consumer messages (continued)

There are some booster seats available for children up to the age of 10 years. For more information, visit the VicRoads website https://www.vicroads.vic.gov.au/safety-androad-rules/vehicle-safety/child-restraints.

Consumer messages – What parents need to know

Choking prevention

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Anything smaller than a D-size battery can be a choking hazard for babies and toddlers. All parents and carers of babies and toddlers must be vigilant in reducing choking risks by:

- ensuring children are always seated while eating
- cooking, peeling, grating or mashing hard foods
- cutting dense foods into small pieces (smaller than a pea) such as:
 - grapes
 - melon
 - cheese
 - raw carrot, peas, apple or other hard fruits and vegetables
 - sausages, hot dogs or other meats
 - popcorn (including kernels), seeds or pips
- avoiding foods such as nuts, corn chips and lollies
- keeping small objects out of reach
- avoiding toys with small parts, breakable parts or brittle surfaces

Consumer messages (continued)

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 keeping toys for older children (for example, Lego bricks, beads, jewellery, screws) separate to toys for younger children.

More information is available from:

- Raising Children at: <u>https://</u> raisingchildren.net.au/babies/safety/ choking-strangulation/chokingprevention#tips-for-preventing-chokingnav-title
- The Royal Children's Hospital site <u>https://</u> www.rch.org.au/kidsinfo/fact_sheets/ Choking_suffocation_and_strangulation_ prevention/.

D-size battery

Approximate size of a **D-size battery:**

59mm high **33mm** in diameter

⁶⁰ Victoria's Mothers, Babies and Children 2017

7.5 SUDDEN UNEXPECTED DEATH IN INFANCY

In 2017 there were 31 SUDI deaths of infants under one year of age. Of these:

- 18 infants (58 per cent) were co-sleeping in an adult bed or on a couch at the time of their death
- three of the 13 non-co-sleeping infants (23 per cent) were not in a safe bed designed for infants
- 13 (42 per cent) infants were exposed to maternal smoking during pregnancy or after birth
- 11 (35 per cent) infants were not breastfed at the time of their death
- 10 (32 per cent) infants were born preterm
- seven (23 per cent) infants were born with a birthweight under 2,500 g
- two (6 per cent) infants had illicit drugs detected in their blood on post mortem toxicology
- four (13 per cent) infants did not have a full post mortem
- 30 (97 per cent) infants had no diagnosis at post mortem.

Recommendation: safe sleeping for infants, including creating a safe portable infant sleep space

CCOPMM recommends having a portable safe sleep space available that meets Australian standards. This could then be provided to vulnerable families under a dedicated program.

Rationale

CCOPMM's recommendation remains that the safest place for babies to sleep is in their own cot, in the same room as an adult caregiver for the first 6–12 months of the infant's life. CCOPMM recommends that babies sleep in a lightweight sleeping bag of the correct size that has a fitted neck, armholes or sleeves, and no hood.

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However, a portable infant sleep space that can be used in shared sleep environments (for example, taken into the parental bed), if used correctly as part of a safe sleep education program, is likely to protect vulnerable babies from asphyxia in a co-sleeping situation. Such a program would best be delivered before or at the time of birth, include extensive safe sleep education and be culturally appropriate for families. An impact and outcome evaluation should be part of the program. The portable infant sleep space, its mattress and bedding must meet Australian standards. As standards for portable sleep spaces do not currently exist, these would need to be developed.

Recommendation: Mandatory labelling on nursery products

Mandatory labelling should be introduced on nursery products, specifically sleeping furniture, surfaces and accessories, stating whether the nursery equipment does or does not meet the Australian standard.

Recommendation: Providing parents and caregivers with information

Ensure women and families are provided with safe sleeping guidelines and information on safe nursery products in the first 12 weeks of pregnancy.

Rationale

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Women in their first trimester of pregnancy should be provided with both verbal and written information on safe sleeping guidelines and told about the Australian Competition and Consumer Commission's (ACCC) publication Keeping baby

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safe: A guide to infant and nursery products (available at https://www.productsafety.gov. au/news/keeping-baby-safe) which is a guide to buying and using safe infant and nursery products. This will allow them to consider the safety of nursery products early in their pregnancy, before buying or accepting new or second-hand nursery items as gifts.

Consumer messages – What parents need to know

Safe sleeping recommendations for parents

Red Nose (formerly SIDS and Kids) has the following six recommendations to sleep baby safely and reduce the risk of sudden unexpected death in infancy.

- Sleep baby on the back from birth, not on the tummy or side.
- Sleep baby with head and face uncovered.
- Keep baby smoke-free before and after birth.
- Provide a safe sleeping environment night and day.
- Sleep baby in their own safe sleeping place in the same room as an adult caregiver for the first six to 12 months.
- Breastfeed baby.

Based on the case review of infant deaths and consideration of the wider literature, CCOPMM provides the following additional recommendations on safe sleeping for parents.

 Always sleep babies in a safe cot that meets the current Australian Standard (AS2172:2003), with a safe mattress (firm,

Consumer messages (continued)

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clean mattress that is the right size for the cot and is flat – not tilted or elevated) and safe bedding (no soft surfaces or bulky bedding such as a pillow, cot bumper, lamb's wool, soft toy or doona).

- The best place for a baby to sleep is in a safe cot next to their parents' bed.
- In the first six to 12 months, babies should 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.
- Ensure that adults caring for babies understand the dangers that alcohol, illicit drugs and sedating medications pose on their ability to remain alert and responsive to the needs of the infant.
 Fatal sleep accidents can occur if a person under the influence of alcohol, drugs or sedating medication shares a sleep surface (eg overlaying in bed or on other surfaces - chairs, couches and sofas), even inadvertently.
- A dummy can be offered to a baby as a sleep aid for the first six to 12 months.
 Dummies must not be forced on the baby, or have a neck cord, or be covered in anything sweet.
- Babies should sleep in a lightweight sleeping bag of correct size that has a fitted neck, armholes or sleeves, and no hood.
- There should be nothing else in the cot.
- The mattress in the safe cot should be covered with only a tightly-fitted sheet and, if required, a thin, tightly-fitted mattress-protector under the fitted sheet.

⁶² Victoria's Mothers, Babies and Children 2017

Consumer messages (continued)

- During the day, or when parents are not sleeping, babies should sleep in an area visible to the caregiver.
- A baby should never be put down to sleep on a sofa, bean bag, sheepskin or pillow. There is no Australian Standard for bassinettes or 'baby boxes'.
- Babies should always be placed on a firm, flat surface to sleep.
- Do not use devices that claim to aid in positioning babies.
- Don't put baby to sleep in a sling. Babies have suffocated in slings that have not been used correctly.

Consumer messages – What parents need to know

Check that the nursery equipment is safe

Parents often assume that nursery products sold in retail stores or online must be safe, but many products have not been formally tested. There is no Australian Standard for bassinettes, for example.

Before buying or accepting new or secondhand nursery items as gifts, it's a good idea to read the ACCC publication *Keeping baby safe: A guide to infant and nursery products* <u>https://www.productsafety.gov.au/news/</u> <u>keeping-baby-safe.</u>

Consumer messages (continued)

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When buying or accepting a nursery product as a gift consider the following:

- Is the product I am thinking of buying or using safe for my baby, especially during sleep?
- What are the potential benefits of using this product and what are the potential hazards?
- Am I using the product in a safe way?
- Have I checked this product with the ACCC publication *Keeping baby safe: A guide to infant and nursery products?*
- Have I reviewed any recent advice on new products, safety issues or product recalls from the ACCC by visiting:
 - the Product Safety Australia webpage https://www.productsafety.gov.au
 - the ACCC recalls webpage https://:www.productsafety.gov.au/ recalls
 - the ACCC Twitter account (@ ACCCProdSafety)
 - the ACCC Product Safety Facebook page
 - ACCC Product Safety on YouTube?

(Adapted from the Red Nose website https:// rednose.com.au/article/baby-safe-sleepingproducts and Product Safety Australia https://www.productsafety.gov.au/news/ keeping-baby-safe.

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7.6 SUICIDE

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Intentional self-harm (including suicide) was the leading cause of death for adolescents aged 15-17 years in 2017 (Figure 23). Children as young as 13 were recorded as having died from intentional self-harm (including suicide) in 2017. Some deaths in 2017 occurred in ambiguous circumstances and may therefore be classified as accidental when they were, in fact, suicide, even in children younger than 15 years of age. Rates of death due to intentional self-harm (including suicide) should therefore be viewed as an underestimate.

In 2017:

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- Seventeen young people died from intentional self-harm (including suicide), 14 in the age group 15–17 years.
- Males accounted for 71 per cent of the deaths from intentional self-harm (including suicide).

Children and adolescents with previous or current involvement with Child Protection or Youth Justice are overrepresented among those who committed suicide.

Figure 23: Rate of death due to intentional self-harm (including suicide), by age group, Victoria, 2005-2017



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Recommendation: Suicide prevention, screening and management of children and adolescents with mental health issues

To optimise suicide prevention measures, CCOPMM recommends: implement routine screening for emotional health and wellbeing; improved access to and follow up of age-appropriate mental health, drug and alcohol services; and increased access to and follow-up of age-appropriate local mental health professionals.

Routine screening for emotional health and wellbeing

A health professional should check not only the emotional health and wellbeing of any young person who consults them, but also routinely assess their drug and alcohol use. Family violence, child abuse, alcohol and drug misuse, disengagement from school, bullying, stigma and discrimination are all known risk factors for suicide. Any indicators for at-risk children should be acted on and referred for more specialised assessment if outside of the scope of practice of the health professional who is performing the screening. Health services should accurately record intentional self-harm episodes, including suicide attempts, to monitor preventive efforts and guide resource allocation. The Royal Australasian College of Physicians' Routine adolescent psychosocial health assessment (2008) https://www.racp.edu.au/docs/defaultsource/advocacy-library/routine-adolescentpsychosocial-health-assessment.pdf, is written for all primary, secondary and tertiary care physicians and paediatricians who consult with adolescent patients.

Management of adolescents with mental health issues

At-risk adolescents and their families need direct support and follow up from responsive

professionals in the community, educational and health sectors. Treatment and follow-up is an urgent priority. Where a health service believes it does not have the capacity to support adolescents at risk, referral and liaison with specialised adolescent mental health services must be undertaken. Mental health services must develop and implement strategies to ensure atrisk adolescents are reviewed regularly and attend scheduled patient engagements. Where an atrisk adolescent misses a scheduled appointment, structures need to be in place that allow the health service to detect and follow up with an appropriate course of action.

Good practice point: Confidentiality

Occasionally, at times of very high risk, professionals are required to break a young person's desire for confidentiality (regarding the young person not wanting to let others know the extent of their distress) to keep them safe.

Many young people can be supported to share their distress with people (such as their parents) to help keep them safe.

Rationale

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While awareness of mental health issues in young people has grown significantly over the past decade, it is still not always identified. Assessing emotional health and wellbeing, as well as drug and alcohol use, should be conducted routinely for adolescents. A comprehensive history of drug and alcohol use should always be taken from an adolescent with mental health concerns. Their drug and alcohol history should be revisited regularly because patterns of use often change over time. In many cases, addressing an adolescent's drug and alcohol issues may

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take priority over referral to a mental health practitioner. Services such as YSAS (Youth Support and Advocacy Service) can provide specialist drug and alcohol services to young people. YoDAA (Youth Drug and Alcohol Advice) is a statewide advice service for health practitioners, young people, families and schools.

Even when a child or young person is identified as having mental health issues, they may not receive the proper care due to engagement issues as well as a lack of access to appropriate services.

Managing mental health issues can be particularly complex in young people who have coexisting drug and alcohol issues, a disability or a chronic illness. General practitioners and paediatricians are managing increasing numbers of children and adolescents with complex mental health needs. Access to bulk billing community-based child and adolescent psychiatrists, psychologists and other mental health practitioners who can provide the required long-term specialist and therapeutic care is extremely limited in Victoria.

Known risk factors for suicide include family violence, child abuse, involvement with the child protection system, alcohol and illicit drug use, disengagement from school, bullying, stigma, discrimination and close contact with someone who has died as a result of self-harm.

The reasons for poor school attendance or disengagement from school are complex and often multifactorial. Reasons for poor school attendance can include: chronic illness or disability; behavioural issues (including attention deficit hyperactivity disorder); learning difficulties; primary mental health issues such as anxiety or depression; peer issues; and parental illness, capacity or beliefs. Health professionals caring for children with such issues should routinely assess a child or young person's attendance. If school attendance is affected, the health professional should screen the child or young person's mental health or arrange for this to be done. Health professionals are in a unique position to advocate for additional support for children or young people who are struggling to attend school, and to refer to appropriate mental health services if needed.

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

Threats of suicide need to be taken seriously by all community, educational and health professionals working with young people. Threats of suicide require specialist mental health assessment.

Consumer messages – What parents need to know

Further information and where to get help

Kids Helpline: https://kidshelpline.com.au/ parents/issues/supporting-child-whothinking-suicide. This service is a free, private and confidential 24/7 phone and online counselling service for young people aged 5 to 25.

The National Youth Mental Health Foundation's *headspace* <u>https://www.</u> <u>headspace.org.au/</u> service provides general health advice, mental health and counselling services, education and 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 help when managing self-harm. ۲

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Consumer messages (continued)

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

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

- Kids Helpline <u>https://kidshelpline.com.au</u> or telephone 1800 551 800
- Lifeline <u>https://www.lifeline.org.au</u> or telephone 13 11 14
- Beyond Blue <u>https://www.beyondblue.org</u>. au/ or telephone 1300 22 4636
- headspace https://www.headspace.org.au/.

7.7 MANAGEMENT OF INDIVIDUAL HEALTH CONDITIONS

The following good practice points relate to specific medical conditions arising from CCOPMM's review of child and adolescent deaths. The medical condition may not have been the actual cause of death.

Good practice points: Management of specific health issues in children and adolescents

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The dangers of co-existent asthma and anaphylaxis

Prompt and repeated administration of adrenaline could prevent death in children and adolescents with known potential for anaphylaxis who present with the symptoms and signs of severe asthma.

For children known to have **asthma** and **anaphylaxis**:

- health workers and parents need to appreciate the dangers of asthma and anaphylaxis together
- affected children and parents should be encouraged to carry an adrenaline auto-injector and to use it immediately if symptoms of anaphylaxis occur, or if symptoms of asthma do not respond to initial therapy
- in the event of severe or critical asthma, and/or if there are any signs of anaphylaxis, give adrenaline, (and intravenous fluid if there is hypotension) according to the state-wide guidelines in addition to the management of asthma

Children and adolescents with **asthma** should have asthma plans that are:

- reviewed regularly and encompass asthma control, medication review, education and understanding of emergency care
- easy to follow by the patient and/or their families and carers.

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The Victorian statewide clinical practice guidelines on managing acute asthma and anaphylaxis have recently been revised to emphasise this (https://www2.health.vic.gov. au/hospitals-and-health-services/qualitysafety-service/clinical-networks/clinicalnetwork-paediatric/vpcn-guidelines).

The Australian asthma handbook http:// www.asthmahandbook.org.au/about/ updates/version1_3 (version 1.3, 2017) from the National Asthma Council Australia provides new national asthma guidelines to assist all health professionals.

Children with food allergy or anaphylaxis need to have a 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 the management plan can be changed if needed
- ensure competence in recognition and emergency management of anaphylaxis, including the use of adrenaline autoinjector by parents/carers is maintained.

A history of food allergy is not a contraindication to exercise. However, children who have had an acute allergic reaction or any signs of anaphylaxis to food should not undertake strenuous

Good practice points (continued)

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exercise for two to four hours to minimise the risk of worsening asthma or developing anaphylaxis.

In the event of anaphylaxis the early administration of adrenaline is essential. 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 the skills and equipment are available.

Children who have suffered anaphylaxis should be admitted for observation to an emergency department or short-stay unit for at least four to six hours.

Dangers of a seizure disorder

Between three and five unexpected deaths occur in children with epilepsy (or a history of seizures) per year. Some of these deaths are sudden unexplained death in epilepsy (SUDEP), some are drownings, and some are due to other unintentional injuries. While some deaths are not predictable or preventable, children with epilepsy should never be left unattended in the bath or near water. For more information visit The Royal Children's Hospital website https://www.rch. org.au/kidsinfo/fact_sheets/Seizures_safety_ issues_and_how_to_help/.

Although the causes of SUDEP are uncertain, improved seizure control has been shown in randomised trials to reduce the risk. Children and adolescents with refractory or difficultto-control epilepsy should have an ۲

⁶⁸ Victoria's Mothers, Babies and Children 2017

individualised care plan and be under the care of a paediatrician with expertise in epilepsy, with regular review of the adequacy of seizure control.

Children and adolescents with epilepsy should have a regular review with their medical practitioner for dose adequacy. As children grow and gain weight, their dose will need to be increased. This could explain poor seizure control in cases of good compliance.

Recognition and investigation of persistent jaundice

Although jaundice occurs in approximately 60 per cent of newborn infants and is usually self-limiting, it is important to recognise pathological jaundice early and to investigate and treat it to prevent serious sequelae. After 10 days of life, a diagnosis of breastfeeding jaundice should only be considered if other conditions have been excluded. Maternal and child health nurses should be encouraged to refer infants to their general practitioner for assessment of jaundice at any point if they are concerned, or after 10 days to rule out other causes.

Jaundice should be investigated if:

- it occurs within the first 24 hours of life
- the serum bilirubin concentration exceeds 200–250 mmol/L between 24 hours and 10 days of life
- it continues past 10 days of life, and especially after two weeks of age
- there is conjugated hyperbilirubinaemia or any signs suggestive of conjugated hyperbilirubinaemia (for example, dark

Good practice points (continued)

urine, pale stools, baby not thriving). Conjugated hyperbilirubinaemia is abnormal and needs to be investigated.

Tracheostomy care

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A tracheostomy is inserted for airway protection or for mechanical ventilation (such as continuous positive airway pressure). Among children under two years of age, tracheostomies are predominantly inserted for congenital or acquired airway stenosis, ventilator dependence or neuromuscular weakness. For older children and adolescents, tracheostomies are sometimes used in recovery from trauma when airway protection or frequent suctioning is required.

A child with a tracheostomy requires regular monitoring to avoid complications. Healthcare workers, parents and caregivers of children with a tracheostomy need proper training in the skills to look after a tracheostomy; these skills include suctioning, humidification, bag ventilation, resuscitation and monitoring. All parents of children who have tracheostomies need to have this training. They must also have the relevant equipment at home and whenever they travel.

The most common complications of tracheostomies are obstruction from dry secretions and tube dislodgement. Proper training in tracheostomy care, and adequate humidification, reduce the risk of these complications.

Children with tracheostomies are at risk of complications and an increased risk of death.

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They are prone to lower respiratory tract infections, during which time tracheostomy obstruction from secretions is an increased risk as is oxygen desaturation. Monitoring, humidification and maintaining the patency of the tracheostomy is therefore essential. **All children with tracheostomies should have an annual influenza vaccine**.

To help health professionals involved in caring for children with tracheostomies the Global Tracheostomy Collaborative http://globaltrach.org/ provides standards and an audit process to reduce centre-tocentre variability in management and to aid in international data collection. This will ultimately improve care and safety for patients with tracheostomies.

Severe bleeding in children: Early use of tranexamic acid in severe bleeding

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The National Health and Medical Research Council (NHMRC) / National Blood Authority guidelines state that for acutely bleeding critically ill paediatric trauma patients, tranexamic acid should be administered within three hours of injury. A loading dose of 15 mg/kg (maximum 1 g) is given over 10 minutes, with subsequent infusion of 2 mg/ kg/hr (max 125 mg/hr) for at least eight hours or until bleeding ceases.

The evidence suggests that tranexamic acid should be used in any child with critical major blood loss, even if it was not caused by trauma – for example, bleeding from liver disease coagulopathy or post-surgical bleeding. If intravenous access is limited, 10–15 mg/kg of tranexamic acid can be given

Good practice points (continued)

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intravenously eight-hourly rather than by constant infusion.

Paediatric-specific massive transfusion protocol: all hospitals managing children should have one

Massive transfusions occur in a variety of clinical circumstances and require close communication between the managing senior clinician, laboratory staff and a paediatric haematologist or transfusion medicine specialist. Clear role definitions, communication pathways, supportive care and blood product support are all important. Every hospital that manages children should have a paediatric-specific massive transfusion or critical bleeding protocol. The NHMRC's Patient blood management guidelines: module 6 – neonatal and paediatrics https://www.blood.gov.au/pbmmodule-6 guideline provides the framework and guidance for such protocols.

Management of severe malnutrition in children

Among children whose nutritional status is borderline, severe acute malnutrition and death can occur within a few weeks if they are underfed. For children who are living in high-risk social environments where they are vulnerable to neglect, growth monitoring and assessment of risk are essential. The mortality rate of children with severe malnutrition is high. Death may be caused by sepsis, hypoglycaemia, hypophosphataemia, hypothermia, heart failure and fluid overload.

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Malnutrition may mimic the signs of dehydration, and administering excess sodium and water is dangerous, especially with intravenous fluids. After initial correction of hypovolaemia, start enteral nutrition early, orally or by a nasogastric tube.

Useful sources of information are available online:

- WHO 2000, Management of the child with a serious infection or severe malnutrition. Geneva, WHO, Geneva.
- Bhan MK et al. 2003, 'Management of the severely malnourished child', *BMJ* 326:146–151.
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- WHO 2018 <u>https://www.who.int/elena/</u> titles/full_recommendations/sam_ management/en/index4.html.

Consumer messages – What parents need to know

Asthma management

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Adolescents with growing autonomy and independence need to be able to manage their asthma and to recognise when their health is deteriorating. They need assistance from their parents, carers and health professionals to make sure they have a full understanding of regular and emergency care of their asthma and should be encouraged to ask for help.

Further information and where to get help

My Asthma Guide <u>https://www.</u> nationalasthma.org.au/living-with-asthma/ resources/patients-carers/brochures/ my-asthma-guide from the National Asthma Council Australia. This is an easy to understand guide to actions and strategies for people with asthma and their families.

Consumer messages – What families need to know

Importance of cardiopulmonary resuscitation

All families should learn cardiopulmonary resuscitation (CPR). Initiating CPR before paramedics arrive can increase the chance of survival, and the first few minutes of a cardiac arrest are critical. Courses in CPR are widely available.

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8 CCOPMM and its functions

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8.1 ABOUT CCOPMM

CCOPMM was established in 1962 under the *Health Act 1958*, which has been repealed and replaced by the *Public Health and Wellbeing Act 2008* ('the Act').

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 for Health. Four substantive subcommittees also report to CCOPMM:

- Maternal Mortality and Morbidity Subcommittee
- Stillbirth Subcommittee
- Neonatal Mortality and Morbidity Subcommittee
- Child and Adolescent Mortality and Morbidity Subcommittee.

CCOPMM works closely with DHHS and SCV in its role to advise on strategies to reduce avoidable mortality and morbidity. The Consultative Councils Unit, within the Stewardship and Support Division of SCV, manages and supports CCOPMM's work programs and those of two other consultative councils.

8.2 CCOPMM FUNCTIONS

Under the Act, CCOPMM's functions 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—
 - 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. Collect information for the purpose of performing its functions as outlined in the Act.

⁷² Victoria's Mothers, Babies and Children 2017

8.3 CCOPMM MEMBERS, 2015–2018

Consultative Council on Obstetric and Paediatric Mortality and Morbidity

Prof. Jeremy Oats (Chair) Prof. Susan McDonald (Deputy Chair) Dr Mary Belfrage Ms Lisa Dunlop Dr David Fuller Ms Ann Jorgensen Dr Mark Lubliner Prof. Peter McDougall Prof. Peter McDougall Prof. John McNeil Prof. Paul Monagle Ms Karen Sawyer Dr Alexis Shub Mr Nicolas Thomas Prof. Euan Wallace (until March 2017)

Maternal Mortality and Morbidity Subcommittee

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Prof. Jeremy Oats (Chair) Dr Malcolm Barnett Dr Virginia Billson Dr Dennis Handrinos Dr Matthew Lynch Prof. Susan McDonald Ms Abby Monaghan (from August 2016) Prof. Michael Permezel Dr Wendy Pollock Assoc. Prof. Scott Simmons Prof. Mark Umstad Dr Craig Walker Prof. Euan Wallace (until March 2017)

Stillbirth Subcommittee

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Prof. Euan Wallace (Chair, first meeting March 2017) Prof. Susan Mc Donald (Chair from March 2017) Dr Lisa Begg Dr Jodie Benson Dr Virginia Billson Assoc. Prof. Lisa Hui Prof. Jeremy Oats Assoc. Prof. Joanne Said (from April 2017) Dr David Simon Assoc. Prof. Christine Tippett Prof. Mark Umstad Dr Bernadette White Ms Colleen White

Neonatal Mortality and Morbidity Subcommittee

Prof. Peter McDougall (Chair) Ms Jane Bailey Assoc. Prof. Charles Barfield Dr Lisa Begg (from February 2017) Dr Virginia Billson Dr Rosemarie Boland Dr Simon Fraser Dr Jim Holberton Dr Paul Howat Prof. Rod Hunt Assoc. Prof. Carl Kuschel Ms Abby Monaghan (from June 2016) Prof. Jeremy Oats Dr Sarah Parsons Dr Alexis Shub Assoc. Prof. Michael Stewart Dr Mark Tarrant Assoc. Prof. Glyn Teale (from May 2017) Dr Sophie Trelegven Prof. Susan Walker

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Child and Adolescent Mortality and Morbidity Subcommittee

Prof. Paul Monagle (Chair) Ms Tracy Beaton Dr Mick Creati Prof. Richard Doherty Prof. Trevor Duke Dr Karen Dunn Dr David Fuller Assoc. Prof. Duncan MacGregor (until March 2017) Dr Annie Moulden Dr Sarah Parsons (from March 2017) Prof. Jeremy Oats (until July 2018) **Dr Jenny Proimos** Dr Cathie Rose Adj. Assoc. Prof. Rob Roseby Dr Greg Rowles Prof. Frank Shann Prof. Mike South (until June 2017) Dr Sophie Treleaven Dr Peter Wearne Prof. Katrina Williams

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8.4 CCOPMM MEMBERS, 2018-2021

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Consultative Council on Obstetric and Paediatric Mortality and Morbidity

Adj. Prof. Tanya Farrell (Chair) Prof. Susan McDonald (Deputy Chair) Dr David Fuller Dr Alison Green Prof. Caroline Homer Ms Robyn Hudson Prof. Rodney Hunt Ms Ann Jorgensen Dr Niroshini Kennedy Dr Mark Lubliner (resigned January 2019) Prof. John McNeil Prof. Paul Monagle Adj. Assoc. Prof. Robert Roseby Ms Karen Sawyer Dr Alexis Shub Assoc. Prof. Glyn Teale Mr Nicolas Thomas Prof. Mark Umstad

Maternal Mortality and Morbidity Subcommittee

Prof. Mark Umstad (Chair) Dr Malcolm Barnett Ms Bree Bulle Dr Jackie Collett Dr Mary-Ann Davey Adj. Prof. Tanya Farrell Dr Alison Green Prof. Caroline Homer Ms Kim Howland Dr Matthew Lynch Prof. Susan McDonald Ms Abby Monaghan

Prof. Daniel O'Connor Prof. Michael Permezel Dr Wendy Pollock Ms Karen Sawyer Assoc. Prof. Glyn Teale Dr Craig Walker

Stillbirth Subcommittee

Prof. Susan McDonald (Chair) Dr Lisa Begg Dr Jodie Benson Dr Jackie Collett Dr Mary-Ann Davey Adj. Prof. Tanya Farrell Ms Kym Harrison Assoc. Prof. Lisa Hui Dr Emily Olive Dr Warrick Pill Assoc. Prof. Joanne Said Ms Sonia Shaw Prof. Mark Umstad Ms Colleen White

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Neonatal Mortality and Morbidity Subcommittee

Prof. Rod Hunt (Chair) Ms Jane Bailey Dr Lisa Begg Dr Rosemarie Boland Dr Jackie Collett Dr Mary-Ann Davey Adj. Prof. Tanya Farrell Dr Jim Holberton Dr Isaac Marshall Dr Sarah Parsons Ms Cindy Scott Dr Alexis Shub Dr Alice Stewart Assoc. Prof. Michael Stewart Dr Mark Tarrant Assoc. Prof. Glyn Teale Dr Sophie Treleaven Prof. Susan Walker Ms Julie Wright Dr Melanie Archer (co-opted)

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Child and Adolescent Mortality and Morbidity Subcommittee

Prof. Paul Monagle (Chair) Ms Marcia Armstrong Ms Tracy Beaton Dr Mick Creati Prof. Richard Doherty Prof. Trevor Duke Dr Karen Dunn Mr Alan Eade Adj. Prof. Tanya Farrell Dr David Fuller Dr Richard Haslam Dr Annie Moulden Dr Sarah Parsons Adj. Assoc. Prof. Robert Roseby Dr Greg Rowles Prof. Frank Shann Dr David Tran Dr Sophie Treleaven Dr Peter Wearne Prof. Katrina Williams Dr Joanna Glengarry (co-opted)

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9 Collecting and reviewing information on births and deaths

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9.1 REVIEW OF DEATHS

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 child deaths under the age of 18 years 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 PIPER. CCOPMM considers the clinical features of each case and classifies each perinatal death according to the Perinatal Society of Australia and New Zealand's Perinatal Mortality Classification System and classifies each post-neonatal infant, child and adolescent death using the International statistical classification of diseases and health related problems, 10th revision, Australian modification (6th edition).

In many cases, 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 a change in the classification assigned to a particular death or group of deaths.

Complex or contentious mortality cases are referred to CCOPMM's specialist subcommittees for review. CCOPMM assesses 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.

9.2 REVIEW OF BIRTHS

The Act requires that births that occur in Victoria are reported to CCOPMM within a prescribed time period. CCOPMM has statutory responsibility for the VPDC and the Victorian Congenital Anomalies Register (VCAR). DHHS and SCV manage the data collections on CCOPMM's behalf.

The collections enable information to be analysed 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, as well as 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

The VPDC was established in 1982. It operates under the Act 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.

Find more information about the VPDC on the Better Safer Care website <u>https://bettersafercare.</u> vic.gov.au/about-us/about-scv/councils/ccopmm/ notifying-the-vpdc.

⁷⁶ Victoria's Mothers, Babies and Children 2017

Victorian Congenital Anomalies Register

As per the Act, CCOPMM has a legislative responsibility to maintain a register of congenital anomalies and disabilities. The data collected in this register provides the necessary information to monitor, research and plan clinical improvement initiatives. The VCAR includes suspected or confirmed congenital anomalies. Data is obtained from multiple sources including the VPDC, hospital records, perinatal death certificates, autopsy reports, cytogenetics reports, clinicians and others in the community such as parents. Any person has the ability to notify the VCAR via CCOPMM's website.

Find more information about VCAR on the Better Safer Care website <u>https://bettersafercare.vic.</u> gov.au/about-us/about-scv/councils/ccopmm/ victorian-congenital-anomalies-register.

Reporting and analysis

The VPDC contributes to the National Perinatal Data Collection managed by the University of New South Wales National Perinatal Epidemiology and Statistics Unit. This unit produces the annual report *Australia's mothers and babies* on behalf of the Australian Institute of Health and Welfare using the National Perinatal Data Collection and other data. The VPDC contains additional items to enable more detailed analysis on the health of mothers and babies in Victoria.

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

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

Find more information about data and research requests on the Better Safer Care website <u>https://</u> bettersafercare.vic.gov.au/about-us/about-scv/ councils/ccopmm/reporting-to-ccopmm. See also Figure 24.

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Figure 24: CCOPMM's relationships, accountabilities and role

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10 Resources

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⁸⁰ Victoria's Mothers, Babies and Children 2017

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Appendix 1: Definitions and acronyms

DEFINITIONS

Apgar score

A measure of the physical condition of a newborn infant. It is obtained by adding points (2, 1 or 0) for heart rate, respiratory effort, muscle tone, response to stimulation and skin coloration. A score of 10 represents the best possible condition.

Child death

The death of a child occurring after and including the first birthday and up to, but not including, the 18th birthday (one to 17 years).

Confinements

The number of women who gave birth to one or more live births or stillbirths (regardless of plurality) with a pregnancy of 20 weeks' gestation or more.

Congenital anomaly (formerly 'birth anomaly')

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 coding uses the wording 'congenital abnormality', and where PSANZ codes are used or listed in this report 'congenital abnormality' is used.

CCOPMM uses the wording 'congenital anomaly' in all other areas of this report.

The terms 'congenital abnormality' and 'congenital anomaly' are used interchangeably.

Crude birth rate

Measured by the number of live births (see definition below) per 1,000 estimated female

resident population aged 14–44 years for a given calendar year.

Episiotomy

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A surgical cut made at the opening of the vagina during childbirth to aid a difficult delivery and prevent rupture of tissues.

Estimated resident population

The ERP is an Australian Bureau of Statistics 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. The CCOPMM report uses estimated female resident population (EFRP), aged 15–44 years, in its tables.

Infant death

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 liveborn 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

The death of a woman after 42 days but within a year of the birth or end of the pregnancy. The death may be due to direct, indirect or incidental causes. These late deaths are not included in the MMR.

Live birth

The birth of a child who, after delivery, breathes or shows any evidence of life such as a heartbeat.

⁸² Victoria's Mothers, Babies and Children 2017

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, a passenger in a motor vehicle accident)
- late maternal death when the death occurs after 42 days but within a year of the birth or end of pregnancy.

For calculating the MMR

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 maternal deaths to be identified 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. CCOPMM uses the WHO definition to calculate the MMR.

Perinatal death

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Stillbirths and live births with only brief survival. These are grouped on the 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 \ge 20 weeks or, if gestation is unknown, of birthweight \ge 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 and 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.

Post-neonatal infant, child and adolescent deaths classification

These deaths are classified under the following categories:

- determined at birth
- sudden unexpected deaths in infancy, including sudden infant death syndrome
- unintentional injury
- acquired disease
- intentional injury
- undetermined.

Standardised mortality ratio

A risk ratio where the observed mortality pattern in a group is compared to 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

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)

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:
 - sudden infant death syndrome the sudden unexpected death of an infant under one year of age, with onset of the fatal episode apparently occurring during sleep
 - unclassified sudden infant death, 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). 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 following definition:¹

General definition of SIDS

The sudden unexpected death of an infant <1 year of age, with onset of the fatal episode apparently occurring during sleep, that remains unexplained after a thorough investigation, including performance of a complete autopsy and review of the circumstances of death and the clinical history.

Category IA SIDS

Includes deaths that meet the requirements of the general definition and also all of the following requirements.

Clinical:

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- >21 days and <nine 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 of the same caregiver.
- 1 Krous HF, Beckwith JB, Byard RW, Rognum TO, Bajanowski T, Corey T, Cutz E, Hanzlick R, Keens TG, Mitchell EA 2004, 'Sudden infant death syndrome and unclassified sudden infant deaths: a definitional and diagnostic approach', *Pediatrics* 114(1):234-238.

⁸⁴ Victoria's Mothers, Babies and Children 2017

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.

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 toxicological, microbiological, radiological, vitreous chemistry and metabolic screening studies.

Category IB SIDS

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: toxicological, microbiological, radiological, vitreous, chemistry or metabolic screening studies.

Category II SIDS

Includes infants that meet category I except for ≥ 1 of the following.

Clinical:

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- age range outside that of category IA or IB (that is, 0–21 days or 270 days (nine 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.

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Twin-to-twin transfusion syndrome

A disease that affects identical twins who share a common placenta. Blood vessels that connect the two umbilical cords on the surface of the placenta allow blood from one twin (the donor) to flow into the other twin (the recipient). This transfusion of blood occurs when there is an imbalance of blood flow from the donor twin to the recipient twin, which causes twin-to-twin transfusion syndrome.

ACRONYMS

ACCC – Australian Competition and Consumer Commission

AS – Australian Standard

BMI – body mass index

CPR – cardiopulmonary resuscitation

CTG - cardiotocography

CCOPMM – Consultative Council on Obstetric and Paediatric Morbidity and Mortality

DHHS – Department of Health and Human Services

ICU - intensive care unit

IMR - infant mortality rate

MMR – maternal mortality ratio

MET – Medical emergency team

NHMRC – National Health and Medical Research Council

NMR - neonatal mortality rate

PIPER – Paediatric Infant Perinatal Emergency Retrieval

PMR - perinatal mortality rate

PPH – postpartum haemorrhage

SAMM – severe acute maternal morbidity

SCV – Safer Care Victoria

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SIDS - sudden infant death syndrome

SUDEP - sudden unexplained death in epilepsy

SUDI – sudden unexpected death in infancy

TOP – termination of pregnancy

VCAR – Victorian Congenital Anomalies Register

VPDC – Victorian Perinatal Data Collection

ViCTOR – Victorian Children's Tool for Observation and Response

WHO - World Health Organization

YoDAA - Youth Drug and Alcohol Advice

YSAS – Youth Support and Advocacy Service

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⁸⁶ Victoria's Mothers, Babies and Children 2017

Appendix 2: Measures of obstetric and paediatric mortality and morbidity

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Maternal mortality ratio (MMR)

The MMR is defined as follows:

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 1,000 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 \geq 500 g or, where the birthweight is unknown, of at least 22 weeks' gestation, is also presented (PMR500). For international comparisons, the rate refers to all births of at least 1,000 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 the World Health Organization).

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Perinatal mortality rate = \frac{(number of stillbirths + neonatal deaths)}{total (stillbirths + live births)} \times 1,000
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Neonatal mortality rate (NMR)

The NMR is calculated per 1,000 live births of at least 20 weeks' gestation or, if gestation is unknown, of birthweight at least 400 g.

× 1,000

Neonatal mortality rate =

number of neonatal deaths

total live births

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Stillbirth rate

Stillbirth rate =

Infant mortality rate =

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number of stillbirths

total (stillbirths + 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 1,000 live births). The live births are limited to those infants \geq 20 weeks' gestation or, if the gestation is unknown, of birthweight \geq 400 g.

× 1,000

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Deaths during the neonatal period of infants born as the result of termination of pregnancy for congenital anomaly or maternal psychosocial indications are excluded from the IMR calculation.

number of infant deaths total live births × 1,000

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Appendix 3: Flow diagram for births in Victoria, 2017

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Acronyms used in this flow diagram

BW - birthweight

CA - congenital anomaly

EFRP – estimated female resident population (see supplementary tables detailing births in Victoria)

IMR - infant mortality rate

MPI - maternal pyschosocial indications

NND – neonatal death – death of a liveborn infant less than 28 days of age

PMR – perinatal mortality rate

SB – stillbirth

TOP – termination of pregnancy

VPDC – Victorian Perinatal Data Collection

Formulae



(G+ C)

× 1,000

 $IMR = \frac{Z(ii)}{E}$

Notes for flow diagram

a Includes only births occurring in Victoria and their outcomes

- b Neonatal death exclusions (J) comprise:
 J(i). Those live born < 20 weeks' gestation (n = 23)
 J(ii). Those live born at unknown gestation with a birthweight < 400 g (n = 0)
- Stillbirth exclusions (N) comprise:
 N(i). Stillbirths where death known to have occurred < 20 weeks' gestation but birth ≥ 20 weeks' gestation (n = 4)
 N(ii). Stillbirths where death and birth occurred at unknown gestation, with

a birthweight < 400 g (n = 0) N(iii). Stillbirths where death known to have occurred < 20 weeks' gestation but born ≥ 20 weeks' gestation, with unknown BW (n = 1)

N(iv). Stillbirths where death occurred at unknown gestation, birth

occurred ≥ 20 weeks' gestation, but where BW <150 g (n = 32) N(v). Stillbirths where death known to have occurred > 20 weeks' gestation but born with unknown but very small BW (n = 1)

- d An additional neonatal death occurred in Victoria but is not included in this figure because the neonate was not born in Victoria.
- e Two of these deaths occurred in infants who were born and died in Victoria but did not normally live in Victoria so are included in Victoria's IMR but excluded from death tables in the child and adolescent section (describing deaths of Victorian residents occurring in Victoria)
- f Deaths reported to CCOPMM as at 1 November 2018. Final figures will be given in the 2018 annual report.

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