CCOPMM annual report 2024

For births and perinatal, maternal and child and adolescent deaths in Victoria in 2023

OFFICIAL

Consultative Council on Obstetric and Paediatric Mortality and Morbidity

Safer Care Victoria

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VICTORIA State Government

Contents

Acknowledgement of country

We proudly acknowledge Victoria's Aboriginal communities and their rich culture and pay respect to their Elders past and present. We acknowledge Aboriginal people as Australia's First Peoples and as the Traditional Owners and custodians of the land and water on which we rely. We recognise and value the ongoing contribution of Aboriginal people and communities to Victorian life and how this enriches us. We embrace the spirit of reconciliation, working towards the equality of outcomes and ensuring an equal voice.

Looking after yourself

This report contains information and data on deaths and harm occurring for women, babies, children and adolescents. While it is important to share the findings from our reviews, we acknowledge this information can be confronting to read.

We encourage all readers, including consumers, women, families, patients and clinicians, to look after themselves and to reach out to their own support networks, specific support networks and websites, and any relevant employee assistance program, for support and guidance. Additional resources available to help include:

- Beyond Blue beyondblue.org.au
- Headspace 1800 650 890 headspace.org.au
- Kids Helpline: 1800 551 800 kidshelpline.com.au
- Lifeline 13 11 14 lifeline.org.au
- Red Nose rednose.org.au
- Red Nose Grief and Loss rednosegriefandloss.org.au

Acknowledgement of lived experience

We acknowledge the lived experience of families, individuals and communities who have been affected by death and harm occurring to women, babies, children and adolescents. These tragic events have a deep impact on the lives of many.

To honour those affected, we have a duty to learn from these tragic events. We are committed to improving and creating a system that is safe for all mothers, babies and children in Victoria.

Abbreviations

BMI body mass index

CCOPMM Consultative Council on Obstetric and Paediatric Mortality and Morbidity

EMR electronic medical record

EFRP estimated female resident population

GPPs good practice points

ICU intensive care unit

IMR infant mortality rate

MMR maternal mortality rate

NMR neonatal mortality rate

PDC perinatal death classification

PMR perinatal mortality rate

PPH postpartum haemorrhage

PSANZ Perinatal Society of Australia and New Zealand

SAMM severe acute maternal morbidity

SUDI sudden unexpected death in infancy

TOP termination of pregnancy

VCAR Victorian Congenital Anomalies Register

VPDC Victorian Perinatal Data Collection

Terminology

This report uses the terms ‘woman’ and ‘women’ when referring to data collected in the Victorian Perinatal Data Collection (VPDC) and the CCOPMM mortality database.

Information on gender is not recorded in these data collections. The terms ‘women’ and ‘mothers’ refers to people who were pregnant and within the scope of these data collections.

We respectfully acknowledge that this report includes people who do not identify as women or mothers and that individual parents and families may use different words from those used in this report. This may include women, transgender men, intersex people, non-binary and gender diverse people.

In this report, ‘Aboriginal’ refers to both Aboriginal and Torres Strait Islander mothers, babies and children.

Aboriginal status is identified as recorded in the Victorian Perinatal Data Collection (VPDC), Medical Certificate of Cause of Perinatal Death (MCCPD) or Medical Certificate of Cause of Death (MCCD) form or as determined by any previous evidence of Aboriginality.

Assigning Aboriginal status to a baby is a determination made by the parents.

Introduction

In this section

Message from the Chair

Professor Mark Umstad

Welcome to the 2024 Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM) Annual Report. This report presents the data on Victoria's mothers and babies through surveillance of the Victorian Perinatal Data Collection (VPDC) and the activities of CCOPMM through review of cases of maternal, perinatal, infant, child and adolescent mortality and morbidity in 2023.

Increased digitisation of CCOPMM data has been a major undertaking, with the 'Notify CCOPMM' online forms launch giving the ability for health services to upload documents at the time of notification directly into a secure, searchable, unified database. This modernisation allows rapid access to maternal, perinatal and paediatric data throughout Victoria, enabling earlier recognition of areas or health services of concern. CCOPMM is now equipped to provide expert advice to the health sector in a contemporaneous manner in multiple formats.

CCOPMM developed a communication strategy which aims to influence system level change in the health sector or beyond, to reduce avoidable mortality and severe morbidity. This includes urgent Clinical Alerts reflecting the findings of case review of maternal, perinatal and paediatric mortality and severe acute maternal morbidity. These alerts will be distributed to hospital chief executive officers, quality leads and directors of clinical services immediately if an issue is of significant concern. The introduction of a CCOPMM newsletter to be published every three months and include current areas of concern, Recommendations and Good Practice Points developed by our expert subcommittees. To receive this information personally, you can subscribe here.

CCOPMM identifies persistent and significant disparities in health outcomes for Aboriginal and Torres Strait Islander women and children. There are plans for CCOPMM to institute an Aboriginal and Torres Strait Islander Advisory Group to provide expert guidance to all CCOPMM subcommittees and CCOPMM Council on First Nations experience, concerns and priorities.

Recent years have seen a substantial increase in women choosing to birth without the support of a registered health professional (freebirthing), resulting in disproportionately worse outcomes compared to traditional maternity care. CCOPMM is working to understand the reasons for this disengagement with Victorian maternity services and is working with a diverse range of stakeholders to understand the underlying causes and to develop strategies to improve outcomes.

Misinterpretation of cardiotocography, inadequate neonatal resuscitation, and failure of escalation continue to appear as contributing factors to adverse outcomes. Previous recommendations in these areas have had an inadequate effect. CCOPMM are currently exploring a range of different approaches to reduce the impact of these factors on adverse outcomes. Outside health services, patient related human behaviours are a significant contributor to adverse outcomes.

I formally acknowledge the contributions to CCOPMM from our senior clinical advisers, subcommittee and Council members, my subcommittee chairs, and our Governance Secretariat. It is through their efforts that change continues to effectively reduce harm across the health sector.

The thorough processes of CCOPMM are always respectful of parents and families involved in circumstances that are often tragic. We also acknowledge the extended impact of death and morbidity on so many more than just the immediate family.

Despite the focus on adverse outcomes in this report, it must be remembered the great majority of clinical interactions in Victoria result in successful outcomes. Victoria continues to be one of the safest places in the world for women to give birth and for our children to thrive.

Professor Mark Umstad

Chair, Consultative Council on Obstetric and Paediatric Mortality and Morbidity

About this report

Introduction

The CCOPMM annual report presents data and trends on the births and deaths reported to and reviewed by the Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM) and its subcommittees. The report includes good practice points for services and clinicians to review, implement and evaluate, supporting continuous improvement.

Rates of maternal, perinatal and child mortality in Victoria are among the lowest in the world. While this is reassuring for all Victorians, we can and must always strive to improve health outcomes and experiences for women, babies, children and their families.

Through its legislative functions, CCOPMM captures birth data, identifies trends and instances of preventable mortality and morbidity and highlights factors that contribute to preventable harm. Monitoring trends and reporting instances of preventability ensures we can collectively continually improve the quality and safety of care and experiences for Victoria's mothers, babies and children.

This report has six specific sections

- Mothers and babies
- Maternal mortality and morbidity
- Perinatal mortality
- Aboriginal births, mortality and morbidity
- Child and adolescent mortality
- Research and quality improvement

Reported measures

This report presents information from the CCOPMM data collections from the 2023 calendar year.

Different specifications are applied across years which can limit comparability i.e. 2023 data use different business rules from 2019. This should be considered when interpreting charts representing multiple years.

What is CCOPMM and what does it do?

CCOPMM is an advisory body to the Victorian Minister for Health. The functions of CCOPMM are legislated in the Public Health and Wellbeing Act 2008 and are supported by the Public Health and Wellbeing Regulations 2019. These functions include collecting perinatal data, reviewing all cases of maternal, perinatal and paediatric mortality, and severe acute maternal morbidity (SAMM).

CCOPMM reviews occur in one of four subcommittees:

1. Maternal Mortality and Morbidity Subcommittee
2. Stillbirth Subcommittee
3. Neonatal Mortality Subcommittee
4. Child and Adolescent Mortality Subcommittee.

The work of CCOPMM is also supported by the Research and Reporting Subcommittee, a multidisciplinary group combining specialist clinical and research knowledge to drive CCOPMM's research function.

CCOPMM good practice points

Our good practice points reflect the findings of CCOPMM's review of all cases of maternal, perinatal and paediatric mortality and SAMM for 2023.

Good practice points (GPPs) are designed to direct local health services and clinicians towards the improvements required in their services and/or in their own clinical practice. All health services and clinicians should develop a plan to consider the GPPs in the context of their settings and implement those that will improve the care they provide.

To ensure ongoing improvement and prioritisation of areas on which to focus service and/or clinician action plans, all health services must review all maternal, perinatal, child and adolescent deaths and significant morbidity that occur in their service to determine contributing factors. This should be done by a multidisciplinary mortality and morbidity committee that is accountable to review all incidents, action any lessons and monitor ongoing performance.

Health services should ensure their clinical governance system:

- has a clearly defined and documented process for case investigation
- is multidisciplinary and includes consumers
- can identify contributing factors and make recommendations that are actioned and evaluated in a timely manner
- shares findings and lessons.

Data informing our work

The Victorian Perinatal Data Collection (VPDC) provides CCOPMM with information about mothers and their babies, including maternal and baby characteristics, medical conditions and complications of pregnancy. This includes details about the labour, birth, neonatal and postnatal periods for every birth in Victoria, whether the baby was born in a public or private hospital or at home. This information helps us:

- monitor and report on the safety and quality of care
- inform our improvement programs
- plan and conduct research activities
- make policy and planning decisions across Victoria.

About CCOPMM

CCOPMM functions

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.

Review of deaths

CCOPMM's primary role is to:

- review all maternal, perinatal and post-neonatal infant, child and adolescent deaths in Victoria
- review all cases of severe acute maternal morbidity
- determine factors that may have contributed to these deaths and morbidities
- provide advice and recommend effective strategies to prevent harm and improve clinical outcomes.

All perinatal deaths from 20 weeks' gestation (or 400 grams birthweight if gestation is not known) and all child deaths under the age of 18 years that occur in Victoria are reviewed. We collect information from multiple sources, including the Victorian Perinatal Data Collection (VPDC), hospital case records, individual doctors and midwives, pathology services, the State Coroner, Ambulance Victoria and Paediatric Infant Perinatal Emergency Retrieval (PIPER). The clinical features of each case are considered and then classified according to the relevant system. Perinatal deaths are classified in line with the PSANZ's Perinatal Mortality Classification System and post-neonatal infant, child and adolescent deaths are classified using the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification (Eleventh Edition).

Review of births

The Act requires all births that occur in Victoria to be reported to CCOPMM within a prescribed period. This period is defined in the Public Health and Wellbeing Regulations 2019 as 30 days after the birth.

CCOPMM has statutory responsibility for the VPDC and Victorian Congenital Anomalies Register (VCAR). The department and Safer Care Victoria manage the data collections on behalf of CCOPMM. The data collections enable information about the health of women, babies and children to be analysed and help support improvements in care provided and policy development. Information is collected on obstetric conditions, procedures and outcomes, 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 grams birthweight.

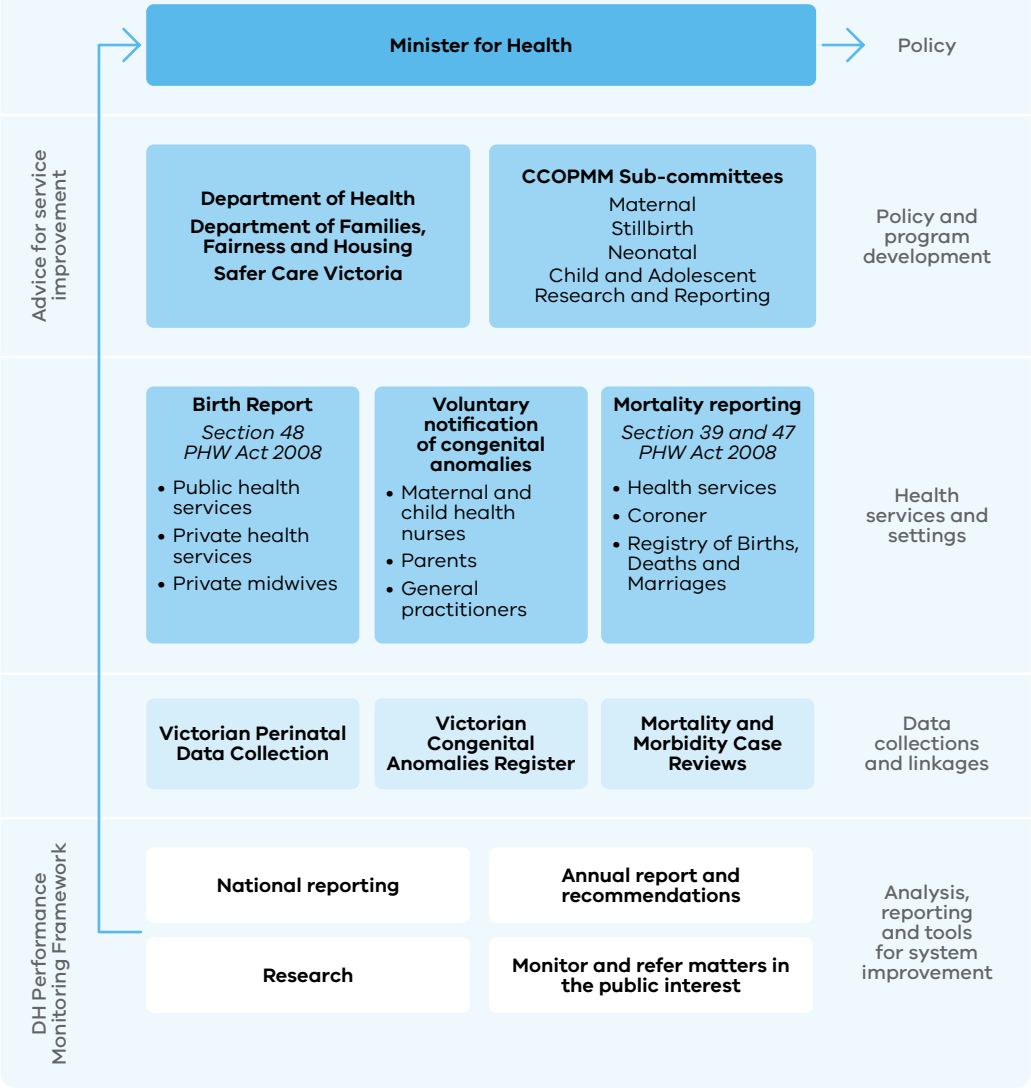
Reporting and analysis

The VPDC contributes to the Australian Institute of Health and Welfare's National Perinatal Data Collection, which informs the annual report Australia's mothers and babies. CCOPMM also supports strategic research that informs clinical outcome improvements, as described in the 'Research and quality improvement' chapter.

You can find previous editions of this annual report, Victoria's mothers, babies and children, on the Safer Care Victoria website.

CCOPMM's relationships, accountabilities and roles are illustrated in **Figure 1**.

Figure 1: CCOPMM's relationships, accountabilities and roles



CCOPMM Data

CCOPMM is responsible for maintaining the following data collections established under the Act.

CCOPMM databases

Victorian Perinatal Data Collection

The VPDC is a register established in 1982 that records more than 100 data items of sociodemographic characteristics and clinical outcome data on all births in Victoria of at least 20 weeks' gestation or, if gestation is unknown, of at least 400 grams birthweight. 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 Department of Health website.

Victorian Congenital Anomalies Register

The VCAR contains information on all congenital anomalies in livebirths, stillbirths and terminations of pregnancy diagnosed before birth to six years old, voluntarily notified to CCOPMM. The data collected in this register provide the necessary information to monitor, research and plan clinical improvement initiatives and includes suspected or confirmed congenital anomalies.

Data are obtained from multiple sources including the VPDC, hospital records, perinatal death certificates, autopsy reports, cytogenetics reports, clinicians and others in the community (such as parents). Any person has the ability to notify to the VCAR via CCOPMM's website. Find more information about the VCAR on the Safer Care Victoria website.

CCOPMM Mortality Database

The CCOPMM Mortality Database contains health and personal information on all cases of maternal, perinatal and paediatric mortality in Victoria. All Victorian health services must report mortality cases to CCOPMM. CCOPMM uses the information in this database to conduct study, research and analysis into the incidence and causes of maternal and neonatal deaths, stillbirths and the deaths of children under 18 in Victoria. CCOPMM shares the lessons learned from this data each year in this report to help health services and medical practitioners improve clinical practice and systems of care. Find more information on what and how to report to CCOPMM on the Safer Care Victoria website.

Severe acute maternal morbidity (SAMM)

Victoria was the first jurisdiction in Australia to introduce mandatory reporting of SAMM cases. CCOPMM's severe acute maternal morbidity dataset includes information on maternal admissions to intensive care during pregnancy and up to 42 days after birth or pregnancy end. Information is also collected on women who nearly died but survived a complication (requiring intensive care unit admission) that occurred during pregnancy, childbirth or within 42 days of birth or termination of pregnancy. Admission to intensive care is used because it is a simple, identifiable criterion and captures the most severe cases. Data are obtained from health services, which are obligated to report these cases under the Act. Find more information on what and how to report to CCOPMM on the Safer Care Victoria website.

Mothers and babies

In this section

This chapter reports (adjusted birthing episodes) which excludes terminations of pregnancy for congenital anomalies and for maternal psychosocial indications.

Mothers and babies

Victoria continues to be a safe place to give birth. However, we still see disparities in outcomes between different groups of women who are complex and based on a variety of factors. Aboriginal women, non–English speaking women, women of low socioeconomic status or without access to free health care, those who are affected by family violence and those with mental health challenges continue to have fewer favourable outcomes.

It is important for these disparities to be identified and addressed to ensure all women birthing in Victoria always receive high-quality care.

EFRP = estimated female resident population

72,782
women gave birth in 2023

2,478 fewer than 2022

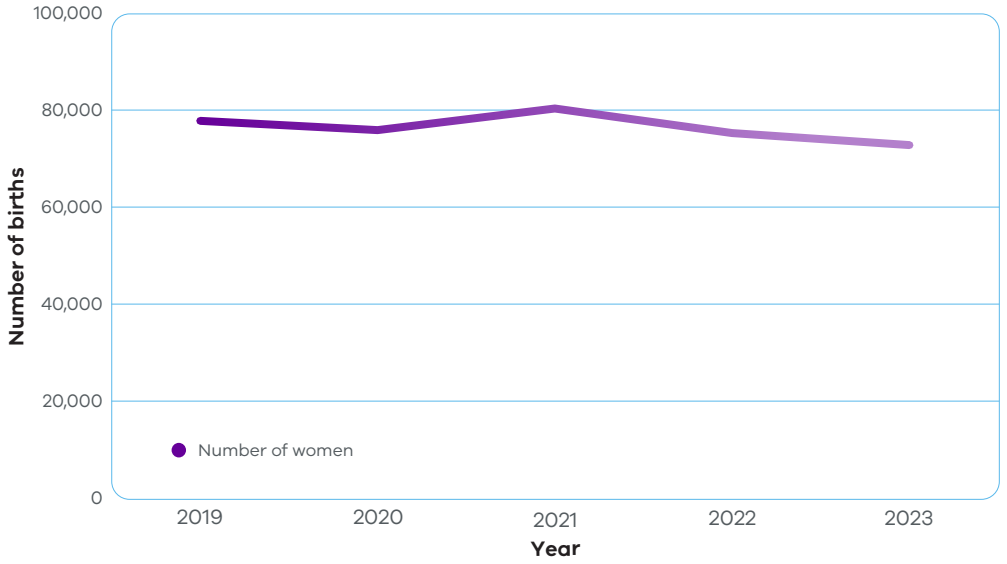
73,905
babies were born in 2023

2,506 fewer than 2022

The birthrate decreased to
51.3
livebirths per 1,000 EFRP

from 55.5 in livebirths per 1,000 EFRP 2022

Figure 2: Number of women who gave birth, 2019–2023



Victoria's mothers in 2023

The median age of women giving birth in 2023 was

32 years

The median age of women having a first birth was

31 years

Just over half of all pregnant women had a high Body Mass Index. **BMI 25–<30 (28.4%)** or **BMI >=30 (23.6%)**.

37.3%

of women giving birth were born outside of Australia.

1.8%

women **(1,289)** who gave birth identified as Aboriginal.

Victoria continues to see an **increase** in caesarean rates:

42.6%

in 2023

compared with 40.9% in 2022

77%

of women gave birth under care of a public maternity service.

Figure 3: Top 10 non-English-speaking countries of birth for mothers giving birth in Victoria, 2023

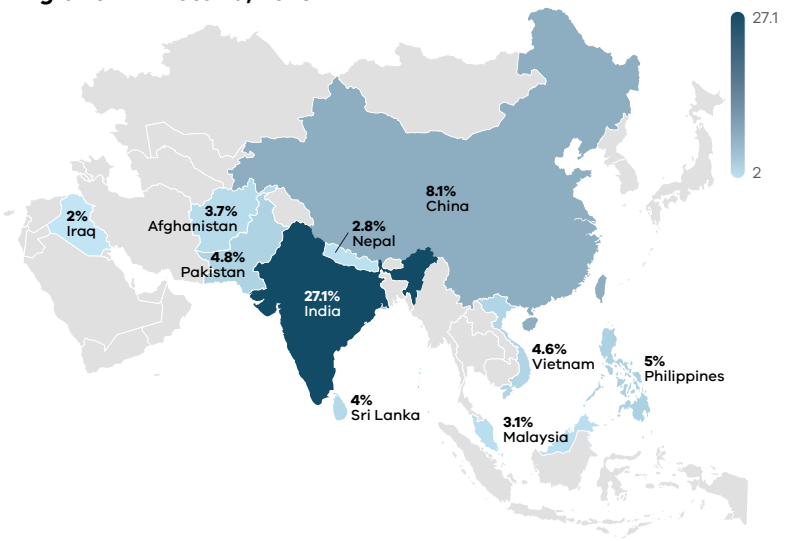
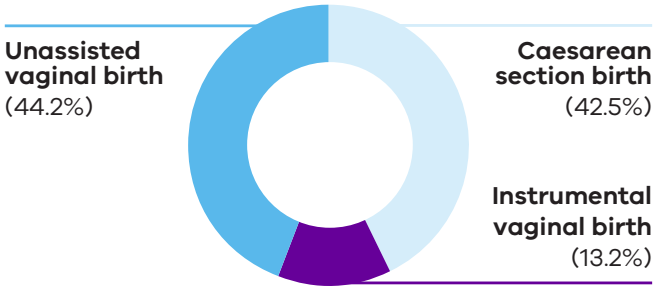
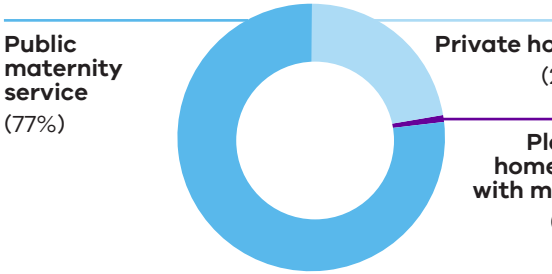


Figure 4: Method of birth, 2023



All births (stillbirths and livebirths) excluding terminations of pregnancy for congenital anomalies or maternal psychosocial indications

Figure 5: Place of birth, 2023

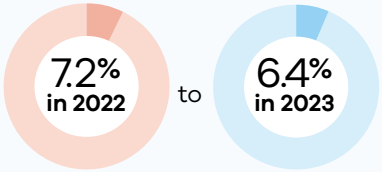


- *All births (stillbirths and livebirths) excluding terminations of pregnancy for congenital anomalies or maternal psychosocial indications*
- *Public maternity service includes: public patient in public maternity service; private patient in public maternity service; homebirth under care of public maternity service*
- *Private hospital includes: private patient in private maternity service*
- *Planned home birth with midwife includes: homebirth under care of private maternity service*
- *Births before arrival at hospital are not shown in this figure*

Smoking in pregnancy

The rate of smoking during pregnancy in Victoria has decreased over time. Less women smoke in the second half of pregnancy than in the first half.

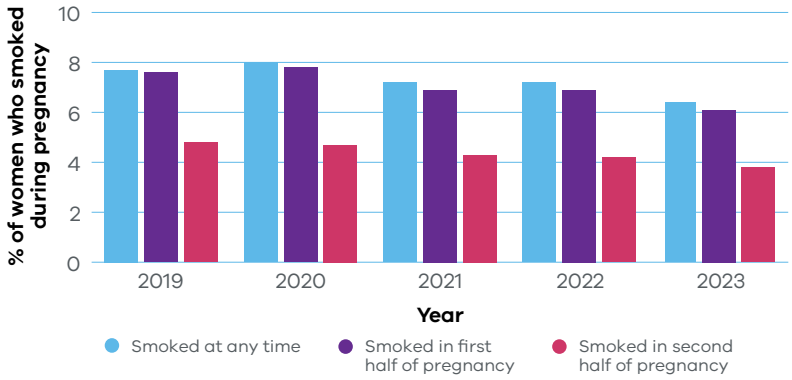
The proportion of women who smoked at any time during pregnancy **decreased** from



6.1%
of women smoked in first half pregnancy

3.8%
of women smoked in second half pregnancy.

Figure 6: Smoking rates during pregnancy, 2019–2023



All births (stillbirths and livebirths) excluding terminations of pregnancy for congenital anomalies or maternal psychosocial indications

Victoria's babies in 2023

2.5%

babies **(1,865)** were identified as Aboriginal.

91.5%

babies **(67,585)** were born between 37-41 weeks' gestation.

37–41 weeks

0.7%

babies **(514)** occurred between 20-27 weeks;

20–27 weeks

0.3%

babies **(243)** were born between 20-23 weeks; and

20–23 weeks

0.4%

babies **(271)** were born between 24-27 weeks.

24–27 weeks

Early term births

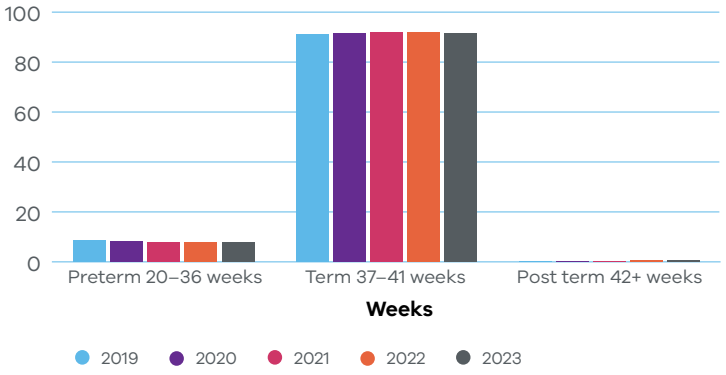
In 2023, **32%** babies (23,659) were born at 37 or at 38 weeks.

Of those, **30.5%** (7,203) were born following an induction of labour.

Another **39.8%** (9,428) were born via pre-labour caesarean section.

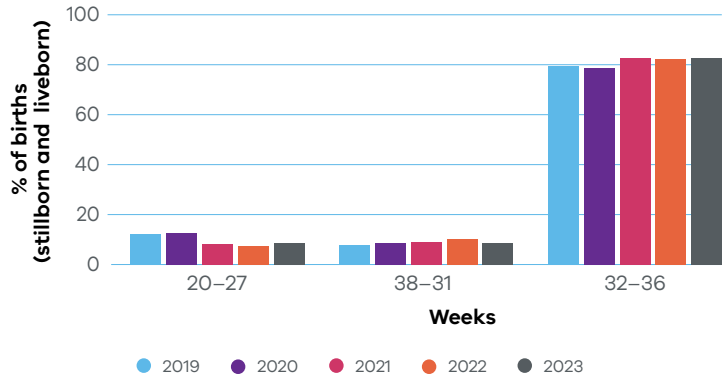
Of those women who were induced at 37 or 38 weeks, no medical indication was reported for **4.9%** of births.

Figure 7: Gestation at birth, 2019 - 2023



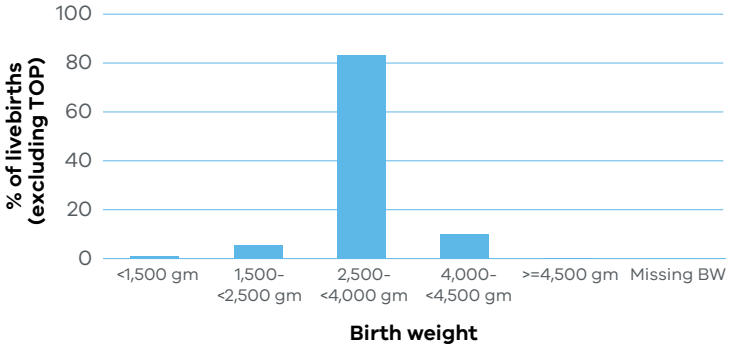
All births (stillbirths and livebirths) excluding terminations of pregnancy for maternal psychosocial indications

Figure 8: Preterm births, 2019–2023



All births (stillbirths and livebirths) excluding terminations of pregnancy for maternal psychosocial indications

Figure 9: Birth weight (livebirths), 2023



All births (stillbirths and livebirths) excluding terminations of pregnancy for maternal psychosocial indications

Case reviews, system thinking and contributing factors

For this year's report, CCOPMM council and subcommittee members have discussed emerging issues and themes from the 2023 case reviews and considered how these align with issues and themes from previous years and those identified by other stakeholders that CCOPMM communicates with as part of our work.

The CCOPMM subcommittee reviews have a systems thinking approach applied to all maternal mortality and morbidity and perinatal and paediatric mortality cases. The key principle when utilising systems thinking methodology is the recognition that adverse events in complex systems are the result of several contributing factors. This is particularly relevant in our complex healthcare system. CCOPMM applies this whole healthcare and human systems approach when reviewing cases and developing recommendations and good practice points.

Table 1: CCOPMM contributing factor themes

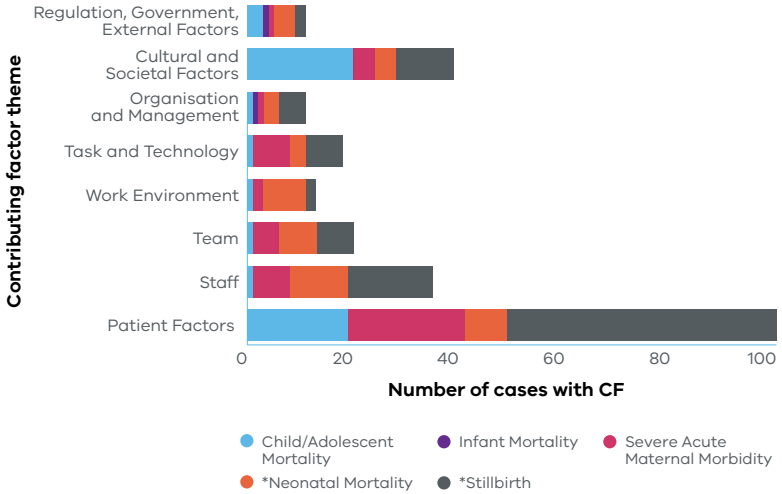
Themes
Regulation, Government, External Factors
Cultural and Societal Factors
Organisational & Management Factors
Task and Technology
Work Environment
Team
Staff Factors
Patient Factors

Table 2: Contributing factors all case type

Case type	Number of cases	Percentage of cases
Child/Adolescent Mortality	27	15.7%
Infant Mortality	9	34.6%
Maternal Mortality	8	61.5%
Severe Acute Maternal Morbidity	37	14.4%
Neonatal Mortality	27*	16.9%
Stillbirth	72*	18.6%

* adjusted births

Figure 10: Contributing factor themes by case type, 2023



Stillbirth and Neonatal Mortality adjusted i.e. all births excluding termination of pregnancy for maternal psychosocial indications or congenital anomalies

Excludes maternal as reported as triennium

Maternal mortality and morbidity

In this section

Maternal mortality and morbidity

Maternal Mortality and Morbidity Subcommittee Chairs report
Assoc. Professor Glyn Teale

By reviewing every maternal death, and understanding contributing factors, recommendations can be made and safety opportunities shared with health and community services and clinicians to improve outcomes for women and their families.

It was determined by the Maternal Mortality and Morbidity Subcommittee that 7 maternal deaths in the 2021–2023 triennium could have been prevented with alternative care. In many of the other deaths, the impact of psychosocial disadvantage was a notable contributory factor.

Review of severe acute maternal morbidity (SAMM) cases continue to highlight the risks from post-partum haemorrhage (PPH) with identified opportunities for earlier escalation via alert codes and more timely initiation of the massive transfusion protocol. A particular issue with PPH due to delayed management of retained placental tissue led to a specific good practice point.

Forty-nine of the SAMM reviews identified contributory factors which included psychosocial disadvantage, late or minimal antenatal care and comorbidities.

The subcommittee also recognised many cases of excellent care with prompt escalation and rapid response to deteriorating women which likely prevented worse outcomes.

The subcommittee continues to encourage local formal review of all SAMM cases and the need to ensure cases are notified as Sentinel Events or Serious Adverse Patient Safety Events (SAPSE) and adherence to the expectations of the Statutory Duty of Candor legislation as appropriate.

Good practice points

Following the review of maternal mortality and morbidity occurring in and from 2023 the subcommittee developed the following good practice points (GPPs).

Aortic Dissection

Management of eclampsia and severe preeclampsia

Review of pregnant women presenting to a general emergency department

Maternal mortality

The methodology for maternal death classifications has changed over time to align with national standards. Numbers may differ from previous reports due to revisions to the data.

Previously, a maternal death occurring after 42 days postnatally (late) which was determined to be causally unrelated to the pregnancy was termed a late coincidental death; this category is no longer reported. These cases have been excluded from the 2023 analysis, including in all related triennia measures. Among coincidental deaths, only those occurring during pregnancy or within 42 postpartum (including after termination of pregnancy) have been included in the analysis.

Due to this change, most common cause of maternal death and contributing factors are only reported for 2022 and 2023, not as a triennium in this report.

Maternal mortality includes all maternal deaths during pregnancy and within a year of birth. Maternal morbidity includes all intensive care unit (ICU) admissions during pregnancy and up to 42 days after birth or pregnancy end.

In Australia maternal deaths are rare, so it is important that all maternal deaths are reviewed to determine the likely cause and the presence of factors that contributed to the death. A maternal death is defined as the death of a woman during pregnancy or within 12 months of the end of pregnancy, from any cause.

In this report, maternal deaths occurring during pregnancy or up to six weeks after the end of pregnancy are classified as:

- **direct** – resulting from obstetric complications of pregnancy or its management
- **indirect** – resulting from diseases or conditions that were not due to a direct obstetric cause but were aggravated by the physiological effects of pregnancy
- **coincidental** – causally unrelated to the pregnancy or birth.

Late maternal deaths are those occurring more than 42 days after the end of the pregnancy and up to one year after birth.

The incidence of maternal deaths is expressed as the maternal mortality ratio, which is calculated using direct and indirect deaths that occur during pregnancy or within 42 days of the end of pregnancy. Late and coincidental deaths are not included in this calculation.

By reviewing every maternal death, and understanding contributing factors, recommendations can be made and safety opportunities shared with health and community services and clinicians to improve outcomes for women and their families.

Maternal mortality

The Victorian maternal mortality ratio (MMR) was

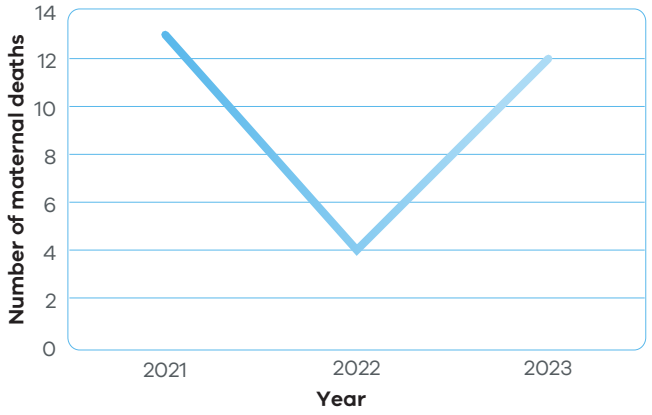
7.4 **deaths per 100,000 women**

who gave birth during the 2021–2023 triennium.

Indirect deaths i.e. resulting from diseases or conditions that were not due to a direct obstetric cause but were aggravated by the physiological effects of pregnancy **were the most common classification** across the triennium 2021 to 2023.

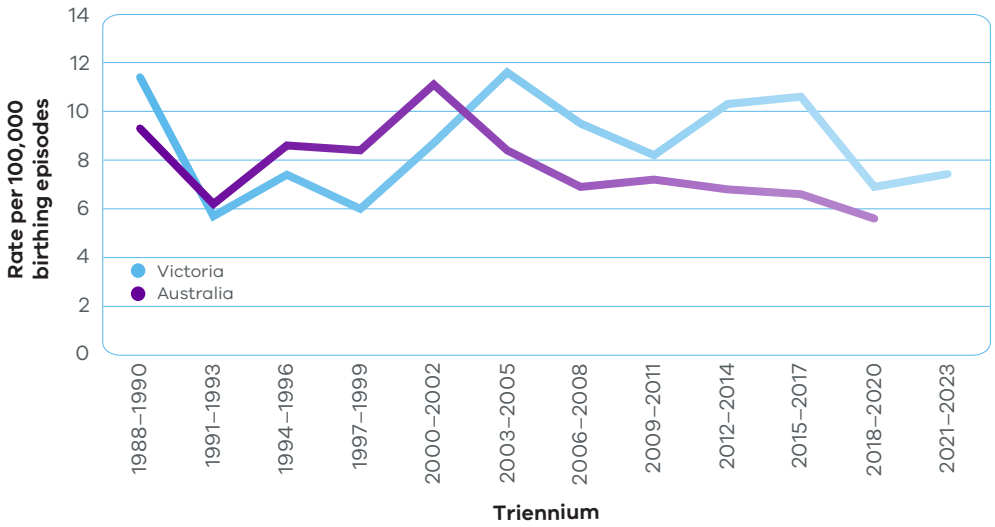
Cardiovascular conditions **(46%)** was the leading cause of death in the 2 year period 2022 to 2023.

Figure 11: Number of maternal deaths, triennium 2021–2023



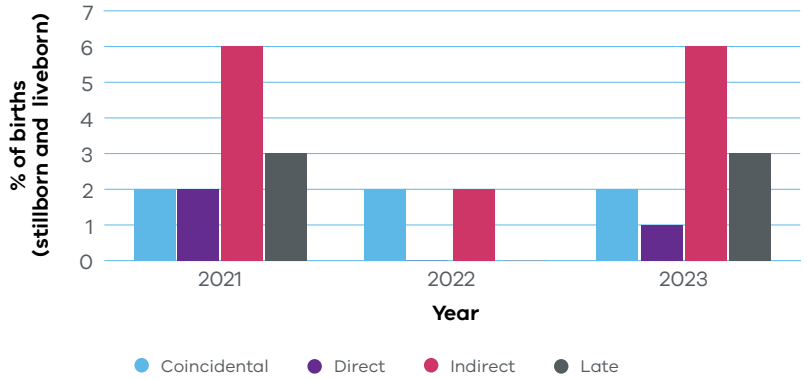
Late coincidental maternal deaths are excluded for 2021–2023 reporting

Figure 12: Maternal mortality ratios by triennia, Victoria and Australia 1988–2023



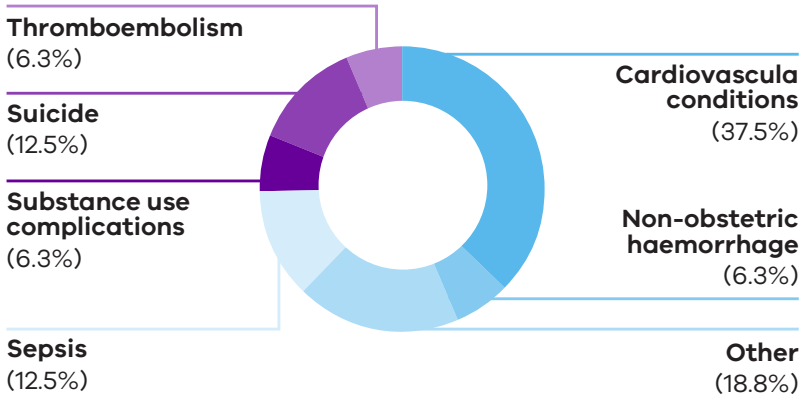
The national MMR for the 2021–2023 triennium was not reported at time of publication

Figure 13: Maternal death classification, triennium 2021–2023



Late coincidental maternal deaths are excluded for 2021-2023 reporting

Figure 14: Leading causes of maternal death, 2022–2023



Contributing factors

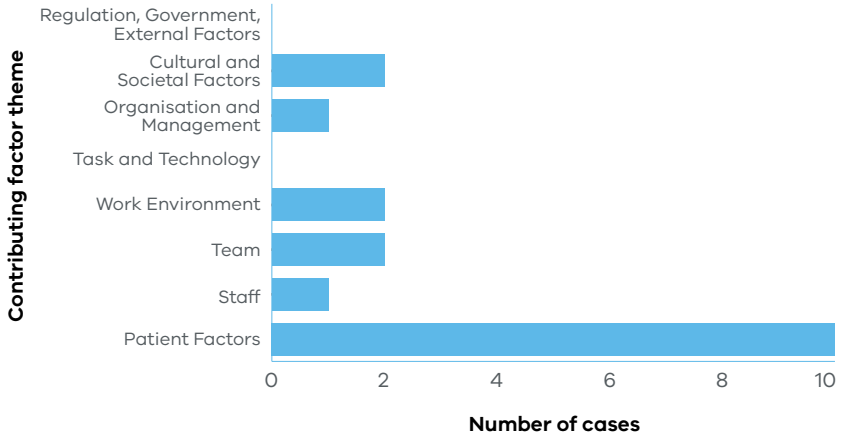
The review of maternal deaths over the most recent triennium (2021–2023) revealed a range of contributing factors and, in many cases, multiple contributing factors. Sadly, women with specific vulnerabilities continue to appear in the cases we review.

Suicide remains a major cause of maternal death in Victoria. Complex social circumstances and mental health issues are frequently identified in these women. Their access to care is often lacking or fragmented. Integration of care between primary carers, hospitals and support services during and following pregnancy in women at risk, and in a manner that is acceptable to them, is vital to ensuring their safety.

Recurrent themes that have emerged from analysis of the maternal mortality cases include:

- mental health issues or social circumstances that limit women's ability to access and engage with care
- access to care, in particular ineligibility for free care
- poor antenatal attendance
- lack of recognition of severity of illness by the woman, her family or by healthcare workers
- substance abuse
- family violence
- obesity.

Figure 15: Contributing factors - Maternal mortality, 2022–2023



Preventability

Table 3: Maternal mortality preventability, triennium 2021–2023

Preventable death	Count
Yes	7
No	22

Severe acute maternal morbidity (SAMM)

The audit of severe acute maternal morbidity (SAMM) outcomes acts as a quality indicator of obstetric care. The focus until recently was on maternal mortality reporting, but this only provides insights to a fraction of the burden of maternal morbidity. A concise and detailed review of SAMM ('maternal near misses' or 'near hits' or 'safety opportunities') is an important step towards promoting reflective practice and safe pregnancy care. It affords learning opportunities to identify underlying and/or preventable causes and contributing factors, and allows for identification of systems improvement strategies which, in turn, lead to an improvement of pregnancy care and maternal outcomes.

Victoria was the first jurisdiction in Australia to introduce mandatory reporting of SAMM cases in 2017. SAMM is measured as an admission to an ICU during pregnancy and up to 42 days after birth or end of pregnancy. Each ICU admission is then categorised into one of 17 morbidities.

Women who do not meet criteria for defined morbidities remain unclassified. In 2022, CCOPMM introduced a context-specific framework to assign contributing factors to each clinical case on a systems level. Currently not all SAMM cases are comprehensively reviewed by local quality and safety teams, which limits insight into each case.

SAMM maternal characteristics

There were **257 SAMM cases** in 2023 among 72,782 women who gave birth accounting for **3.53 per 1000 women** being admitted to an ICU during or after pregnancy.

The mean length of stay in ICU was **2.4 days**

The mean age of women with SAMM was **32 years**

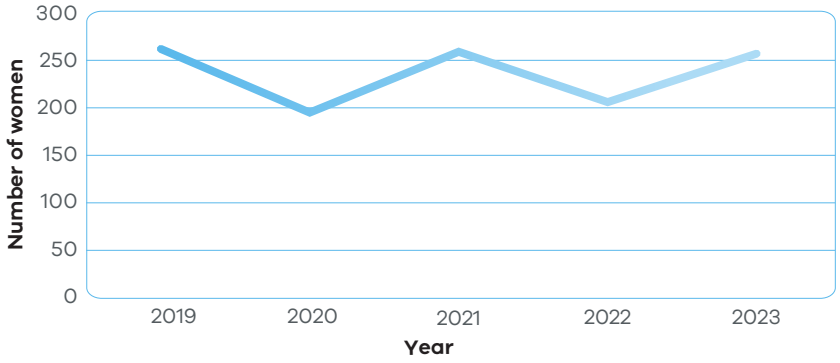
Of these 257 women:

- **41%** (100 women) were born overseas compared with 37.3% of all women giving birth in 2023
- **4.1%** (10 women) were Aboriginal compared with 1.8% of all women giving birth in 2023
- **28.3%** (69 women) had a BMI of 30 or higher compared with 23.6% of all women giving birth in 2023

Of the 257 women with SAMM **70 women** (27.2%) were pregnant at the time of admission to ICU

187 women (72.8%) were admitted to an ICU in the postpartum period

Figure 16: Number of women admitted to ICU with SAMM, 2019-2023



The top three primary reasons for admission to ICU were:

- 11 women (20%) with postpartum haemorrhage
- 5 women (9.1%) with pre-eclampsia
- 4 women (7.3%) with hypotension

153 women (75.7%) had only one reported SAMM classification (Refer to Appendix 3: CCOPMM Criteria and definitions for severe maternal morbidity)

5 women (1.9%) had cardiac arrest.

Figure 17: SAMM ICU admissions during pregnancy by trimester, 2023

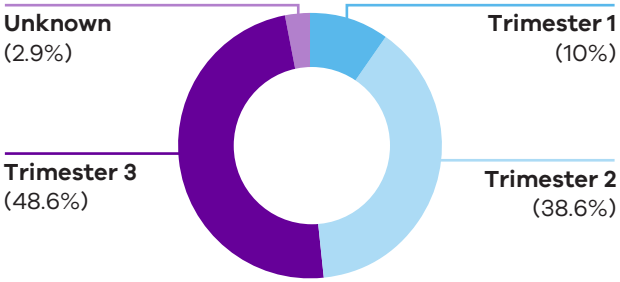
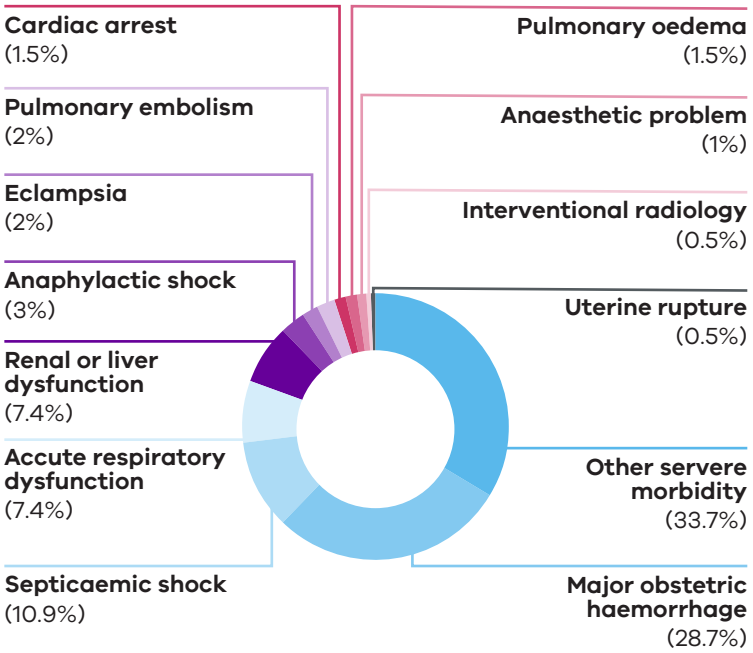


Figure 18: Primary SAMM classification, 2023



Refer to Appendix 3: CCOPMM Criteria and definitions for severe maternal morbidity

SAMM birth outcomes

Of the 244 babies born at or after 20 weeks' gestation,

68.4%

were born via **caesarean section**

227 SAMM cases (88.3%) had a **liveborn** baby. 13 SAMM cases (5.1%) experienced a **pregnancy loss** at less than 20 weeks' gestation. There were **11 stillbirths** (4.3%) and **3 neonatal deaths** (1.2%).

There were

6 births

(2.5%) where gestation was unknown

21 babies

(13.7%) were born under the 10th percentile

Figure 19: Number of SAMM cases by SAMM classification, 2023

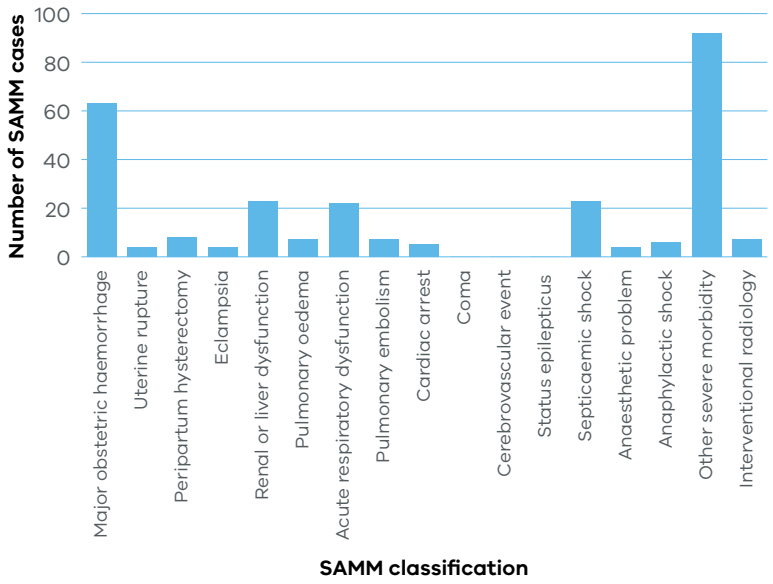


Figure 20: SAMM method of birth, 2023

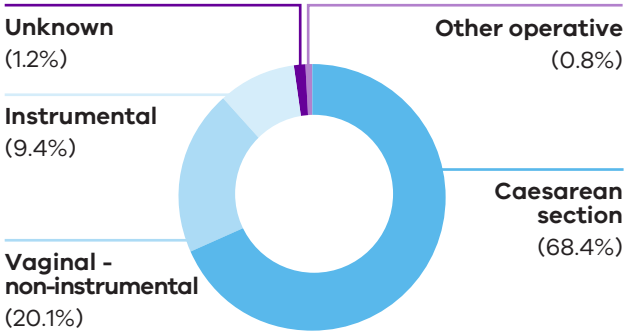
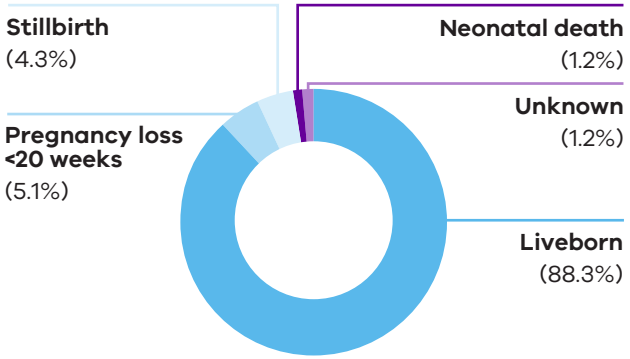
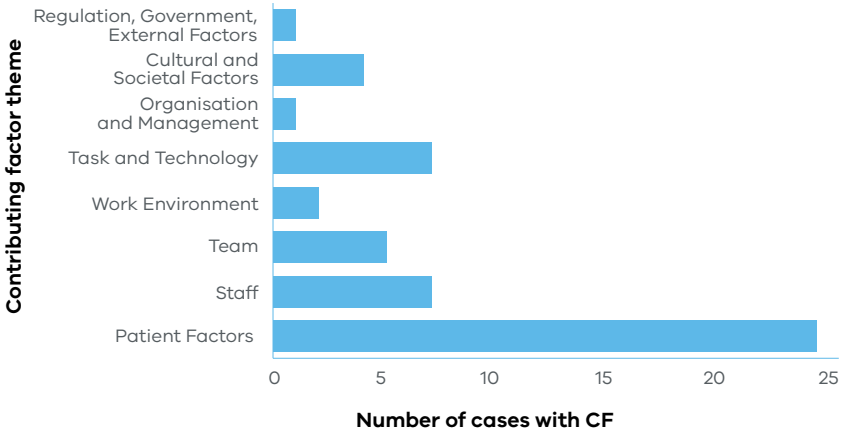


Figure 21: SAMM birth outcomes, 2023



Contributing factors

Figure 22: Contributing factors - SAMM, 2023



Preventability

Table 4: SAMM admission to ICU potentially avoidable, 2023

Potentially avoidable	Count
Yes	36 (14%)
Indeterminate	3
Unknown	7
No	211

Perinatal mortality

In this section

Perinatal mortality

Stillbirth Subcommittee Chairs report

Assoc. Professor Andrea Rindt

In Victoria, all stillbirths ≥20 weeks' gestation are reported to CCOPMM, and these cases are individually reviewed by clinical experts to assign a perinatal death classification, identify instances of preventable harm and ascertain themes to improve clinical outcomes in the future. Incidences of preventable harm are reported to the Chief Executive Officer of Safer Care Victoria and good practice points and clinical alerts are published by the subcommittee in response to identified opportunities for improvement in care provision to help to guide clinical practice across the state.

Concerns regarding maternity ultrasound reporting have prompted the Royal Australian and New Zealand College of Radiologists to standardise biometry centile reporting and the Stillbirth subcommittee to promote improved education for women and the community about specialist maternity ultrasound.

The Stillbirth Subcommittee has identified the following themes around maternity care provision where improvement could impact outcomes:

- Guidance for minimum standards
- Shared decision making
- Information sharing
- Language barriers

Guidance for minimum standards

Case reviews across the years consistently identify contributing factors, including failure to recognise complexity and deficits in safety culture impeding escalation of care. A comprehensive state-wide maternity guideline that has undergone a rigorous process of development and scheduled review process to ensure currency will provide clear clinical direction. Comprehensive state-wide maternity guidelines offer significant benefits by promoting consistency and quality of care across all healthcare settings. Standardised practices for antenatal, intrapartum, and postpartum care reduce variations in treatment and ensure that all women receive evidence-based, consistent safe and effective care, regardless of their location. This reduces the risk of complications, improves clinical outcomes and enhances the overall maternity experience.

State-wide guidelines facilitate the dissemination of best practice and support healthcare professionals with clear clinical direction through the inclusion of decision aids and process mapping, improving maternal and neonatal outcomes. Single Guidelines can be tailored for local settings to allow for capability levels and variation in resourcing across rural, regional and metropolitan health services. Ideally, the guidelines will include multilingual, culturally sensitive and health literate tailored patient information sheets to support effective communication and shared decision making.

Shared decision making

A prevalent theme across stillbirth case reviews is miscommunication and the absence of shared decision making. Shared decision making is integral to quality care provision. It is a collaborative process which combines the consumer's personal values, goals

and preferences with the clinician's best available evidence about treatment benefits, risks and uncertainties, to reach the most appropriate individualised healthcare decision.

Through open communication, clinician and consumer jointly evaluate available options, weighing medical evidence against the patient's individual circumstances and goals. The goal is to reach a mutually agreeable decision that reflects both medical best practices and the patient's informed preferences. This fosters a sense of partnership and ensures alignment of treatment to an individual's values whilst promoting woman centred care.

Information sharing

Inadequate information sharing, both within services and between services and shared care providers continues to hamper best quality care. In the absence of a universal electronic medical record (EMR) with an integrated and visible maternity specific module accessible to all care providers, formal, clear pathways of communication need to be established and maintained by health services. Despite continuity of care being the gold standard, care remains broadly fragmented and maternity modules within EMR systems are hampered with interdepartmental visibility issues.

- Clear and efficient referral pathways for general practitioners (GP's)
- Clear and efficient escalation pathways for radiology providers
- Clear & efficient escalation pathways to increase capability and promote safe care for at risk women
- Integrated maternity EMR modules with clear visibility across all healthcare departments

Communication

Language barriers confound shared decision making and women with non-English speaking backgrounds are represented in a higher volume of critical incidences. It is vital that professional interpreter services are used to enhance communication in the presence of language barriers and written information is provided in women's preferred languages.

Good practice points

Following the review of stillbirths occurring in and from 2023 the subcommittee developed the following good practice point (GPP).

In vitro fertilization (IVF) and pregnancy risk

Neonatal Mortality Subcommittee Chairs report

Professor Rod Hunt

The Neonatal subcommittee continue to meet quarterly to review cases of neonatal death where senior clinical advisors have identified potential preventable harm. Case review requires in-depth analysis of both maternal and neonatal case notes, along with results of investigations and root cause analyses or critical incident review performed by health services.

There remain consistent themes of preventability that are present in many cases including misinterpretation of cardiotocography, or deviation from standard protocols for newborn resuscitation. We now realise that these variations in practice are complex but are probably not the result of inadequate education of frontline staff. In fact, high quality education packages are available to clinical staff in both key areas, alongside requirements from professional bodies and health services that all frontline staff involved in the care of these patients successfully complete the education regularly. System failures occur to the detriment of patients for much more complex reasons, to do with adequacy of resourcing of birthing suites and neonatal units, cultural issues around escalation of concern, and human behaviours that underpin the types of interaction that allow complex tasks like newborn resuscitation to be performed by a team of individually trained clinicians across a variety of disciplines. Addressing these complex systems issues remains challenging, and we continue to work with Safer Care Victoria to find solutions to improve and standardise delivery of clinical care across Victoria.

The subcommittee also engages in the annual review of cases of Sudden Unexpected Death in Infancy (SUDI) where recurrent themes continue to emerge. These pertain in large part to social vulnerability, with lower socio-economic groups being particularly at risk. Co-sleeping coupled with recreational drug use remains a potent devastating cocktail identified in many cases of SUDI. Addressing issues of social vulnerability also remains challenging.

Contrasting against these concerns, it has been heartening to see the high standard of clinical care delivered to the vast majority of women and babies in Victoria, where our rates of neonatal death have remained low, and on par with rates elsewhere in Australia and the developed world.

Good practice points

Following the review of neonatal mortality occurring in and from 2023 the subcommittee developed the following good practice points (GPPs).

Subgaleal haemorrhage

Herpes Simplex Virus (HSV) in the newborn

Perinatal mortality

In 2023, CCOPMM criteria for eligible births was amended to align with national reporting criteria. In previous years, births at 20 weeks or more but with a birthweight of <150g were excluded from the CCOPMM perinatal mortality rate (PMR). Data for 2023 are reported for all births of 20 or more weeks' gestation, or of at least 400g birth weight if gestation was unknown. This allows fetus papyraceous and fetus compresses (with birth weights <150g) to be included in the PMR in 2023. Caution should be taken when comparing the PMR in 2023 with previous years, given the change in reporting criteria.

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

This section uses 'adjusted' perinatal mortality and stillbirths, where terminations of pregnancy (TOP) and maternal psychosocial indications are excluded. This allows infants with a birthweight of <150g to be included in the PMR in 2023. Many of these births involve a multiple pregnancy with an early fetal demise and a liveborn infant. This provides a more accurate measure for assessing avoidable mortality and for comparisons with other jurisdictions both nationally and internationally.

There were
709
perinatal deaths in 2023

(compared to 706 in 2022)

Adjusted perinatal mortality rate in 2023
7.4 **per 1,000**

(compared to 7.0 in 2022)

Adjusted stillbirth rate in 2023
9.6 **per 1,000**

(compared to 9.2 in 2022)

Adjusted neonatal mortality rate in 2023
2.2 **per 1,000**

(compared to 2.2 in 2022)

The 2023 PMR was:

- 9.1 per 1,000 births for singletons
- 22.6 per 1,000 births for twin pregnancies
- 111.1 per 1,000 births for triplet pregnancies.

PMR by maternal place of birth see Appendix 4

Perinatal autopsy

The perinatal autopsy rate remains stable but low. The Centre of Research Excellence in Stillbirth (Stillbirth CRE) & Perinatal Society of Australia and New Zealand (PSANZ) 2024 Edition Care Around Stillbirth and Neonatal Death Clinical Practice Guideline indicates all parents should be offered the option of a post mortem examination as part of the investigations of their baby's death. In late 2023 federal funding, as part of the Stillbirth Action and Implementation Plan, began to flow to the Victorian Perinatal Autopsy Service. These funds are being used to reduce barriers for parents and clinicians in decision making for autopsy. This work is ongoing.

- 32.2% of perinatal deaths in 2023 underwent a full autopsy (34.1% in 2022)
- 35.3% of stillbirths underwent a full autopsy (38.1% in 2022)
- 21.3% of neonatal deaths underwent a full autopsy (21.6% in 2022)

Smoking and perinatal mortality

4,758 babies (6.4% of all births) were born to women who reported smoking at any time during pregnancy in 2023.

There were **32 stillbirths** and **18 neonatal deaths** in women who smoked at any time during pregnancy.

There were 506 **stillbirths** and **137 neonatal deaths** in women who did not smoke at any time.

The PMR in women smoking at any time during pregnancy was 10.5 per 1,000 births compared with 9.5 per 1,000 births in those who did not smoke while pregnant.*

This section reports only on singleton births, whereas the smoking data on page 44 refers to women who smoked in pregnancy regardless of whether they had a singleton or multiple pregnancy.

Causes of perinatal mortality

Congenital anomaly (including termination of pregnancy for congenital anomaly) is the most common cause of death for adjusted stillbirths and neonatal deaths. The Perinatal Society of Australia and New Zealand (PSANZ) Perinatal Death Classification (PDC) Version 4 (2020) is used for the 2023 death classifications.

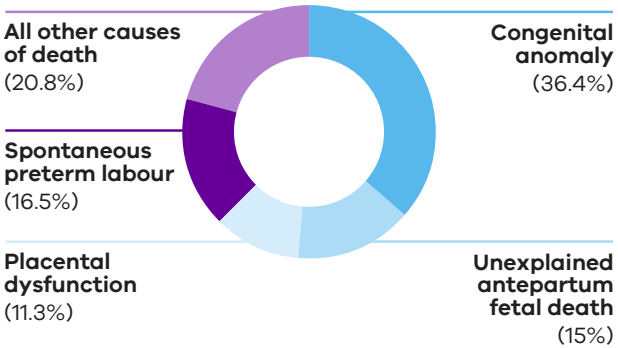
Congenital anomalies were the cause of death in:

- 36.4% of perinatal deaths
- 37.0% of stillbirths
- 34.4% of neonatal deaths

After congenital anomalies, the leading causes of **perinatal death** in 2023 were:

- spontaneous preterm labour or rupture of membranes (< 37 weeks' gestation) (117 deaths, 16.5%)
- unexplained antepartum fetal death (106 deaths, 15%)
- placental dysfunction or causative placental pathology (80 deaths, 11.3%).

Figure 23: Leading causes of perinatal mortality, 2023



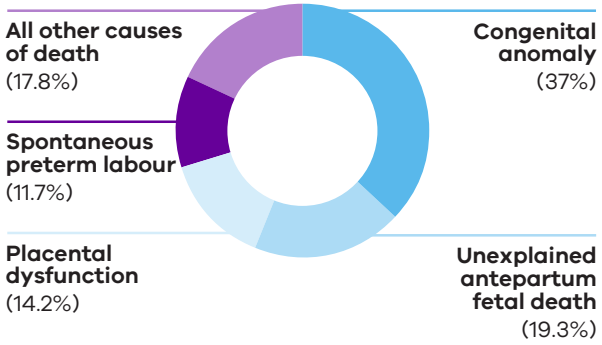
All births (stillbirths and livebirths) excluding terminations of pregnancy for maternal psychosocial indications

Causes of stillbirth

After congenital anomalies, the leading causes of **stillbirth** in 2023 were:

- unexplained antepartum fetal death (106 deaths, 19.3%)
- placental dysfunction or causative placental pathology (78 deaths, 14.2%)
- spontaneous preterm labour or rupture of membranes (< 37 weeks) (64 deaths, 11.7%).

Figure 24: Leading causes of stillbirth, 2023



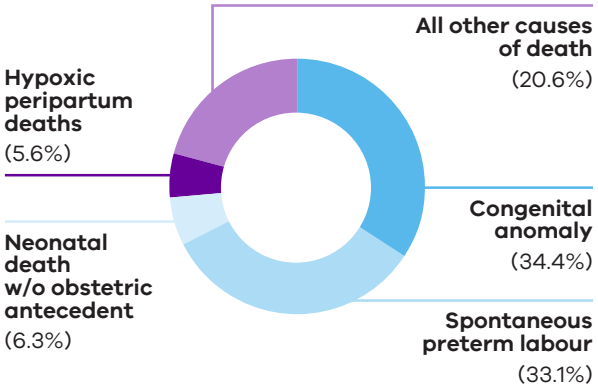
All births (stillbirths and livebirths) excluding terminations of pregnancy for maternal psychosocial indications

Causes of neonatal death

After congenital anomalies, the leading causes of **neonatal death** in 2023 were:

- spontaneous preterm labour or rupture of membranes (< 37 weeks' gestation) (53 deaths, 33.1%)
- neonatal death without obstetric antecedent (10 deaths, 6.3%)
- hypoxic peripartum death (9 deaths, 5.6%).

Figure 25: Leading causes of neonatal death, 2023



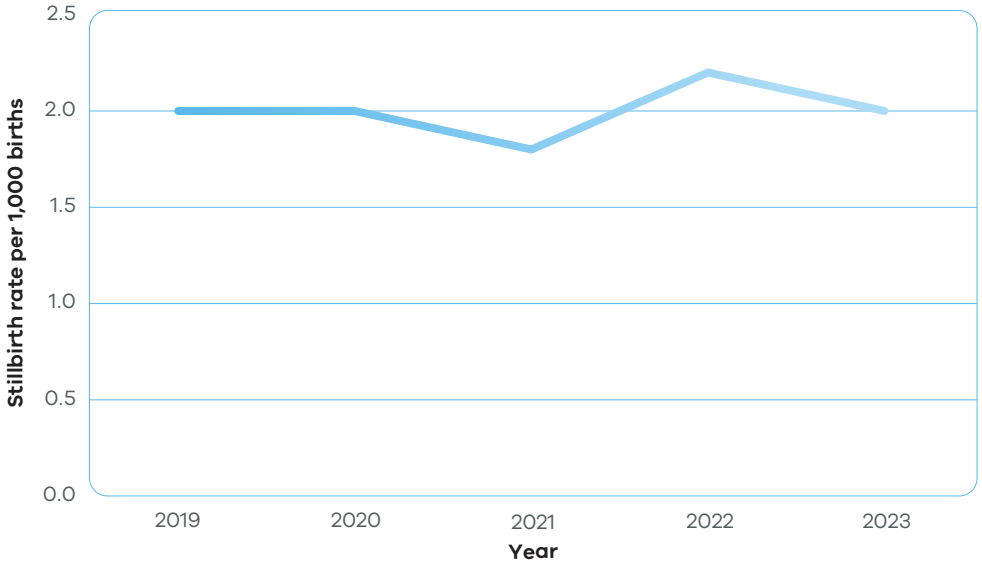
All births (stillbirths and livebirths) excluding terminations of pregnancy for maternal psychosocial indications

Stillbirths at 28 or more weeks' gestation

There is current national work which aims to reduce the number of stillbirths from 28 weeks' gestation.

There has not been much change in the stillbirth rate per 1000 births at 28 or more weeks' gestation over the past 5 years.

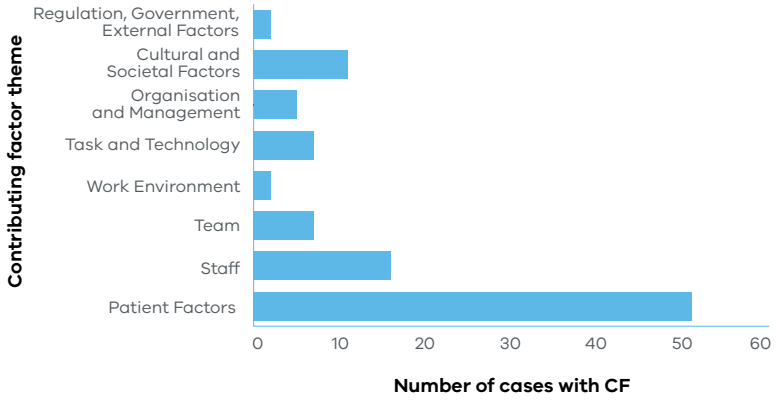
Figure 26: Stillbirth rate per 1000 births at 28 or more weeks' gestation, 2019–2023



Stillbirths excluding terminations of pregnancy for maternal psychosocial indications

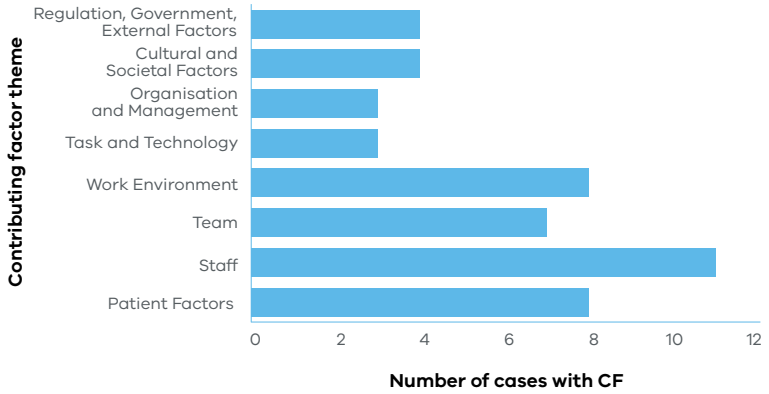
Contributing factors

Figure 27: Contributing factors - Stillbirth, 2023



Stillbirths excluding terminations of pregnancy for congenital anomalies or maternal psychosocial indications

Figure 28: Contributing factors - Neonatal mortality, 2023



Livebirths excluding terminations of pregnancy for congenital anomalies or maternal psychosocial indications

Preventability

Table 5: Preventability stillbirth, 2023

Preventable death	Count
Yes	12 (1.7%)
Not stated/inadequately described	7
Unknown/not clear	41
No	265

*Excluding terminations of pregnancy for maternal psychosocial indications or congenital anomalies

Table 6: Preventability - neonatal mortality, 2023

Preventable death	Count
Yes	11 (5.7%)
Not stated/inadequately described	16
Unknown/not clear	12
No	154

*Excluding terminations of pregnancy for maternal psychosocial indications or congenital anomalies

Aboriginal births, mortality and morbidity

In this section

Aboriginal births, mortality and morbidity

Perinatal outcomes have improved for Victoria's Aboriginal mothers and babies over the past 15 years. However progress has slowed over the past 8 years and we must do more to continue closing the gap.

This chapter focuses only on births to Aboriginal women, mortality and morbidity. Births to Aboriginal fathers and non-Aboriginal women are not included.

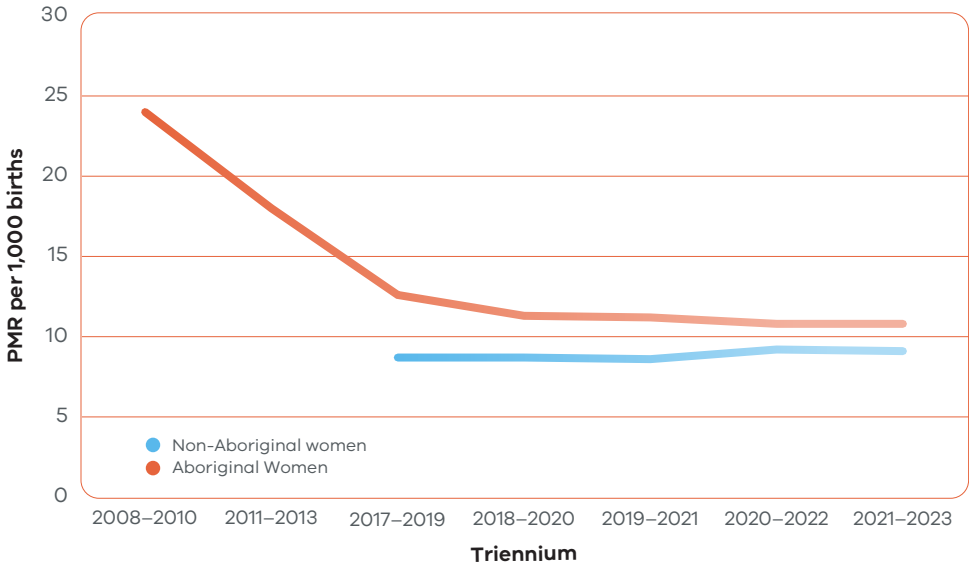
This chapter reports adjusted birthing episodes which excludes terminations of pregnancy for maternal psychosocial indications.

The Adjusted Perinatal Mortality Rate (PMR), Adjusted Stillbirth Rate and Neonatal Mortality Rate (NMR) is higher in Aboriginal women compared to non-Aboriginal women.

In recent times, the PMR for babies born to Aboriginal women has been improving and approaching the PMR for babies born to non-Aboriginal women (10.8 compared to 9.1 per 1,000 births relatively, for this triennium).

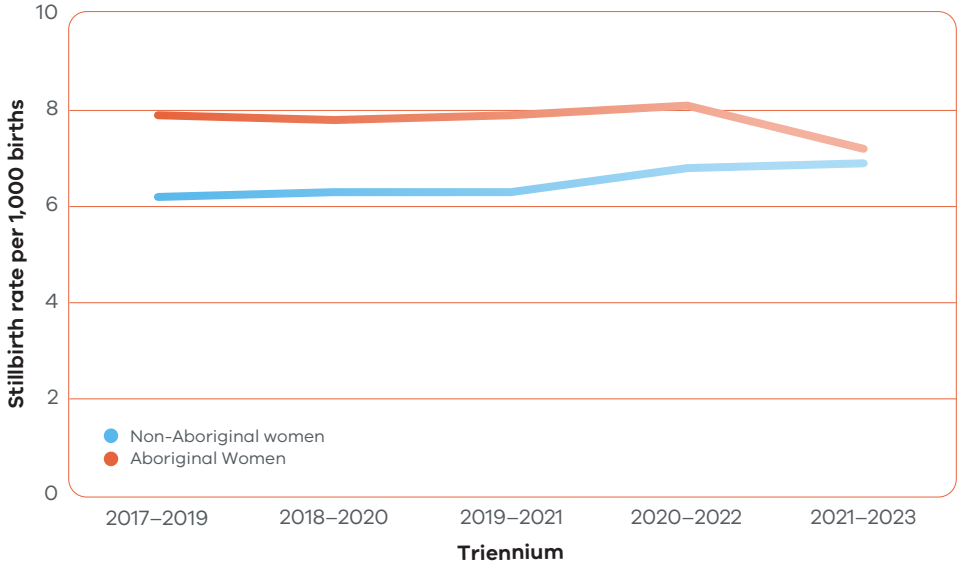
Notably, over the past 15 years the PMR for babies born to Aboriginal women has more than halved (24.0 in the triennium ending in 2010 compared to 10.8 in the triennium ending in 2023).

Figure 29: Perinatal Mortality Rate (PMR), triennia 2008–2023



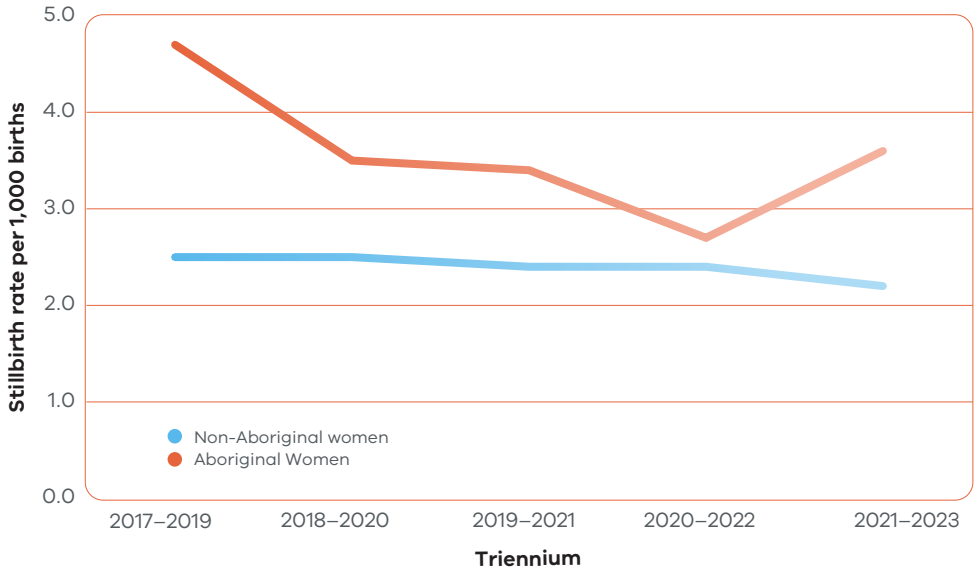
All births (stillbirths and livebirths) excluding terminations of pregnancy for maternal psychosocial indications

Figure 30: Stillbirth Rate, triennia 2017–2023



Stillbirths excluding terminations of pregnancy for maternal psychosocial indications

Figure 31: Neonatal Mortality Rate (NMR), triennia 2017–2023



Livebirths excluding terminations of pregnancy for maternal psychosocial indications

Aboriginal mothers

1.8%

of all women (1,289 Aboriginal women) in 2023 **gave birth to 1.8%** of all babies (1,313 babies) born in Victoria.

37.3%

of Aboriginal women **smoked during pregnancy** (down from 40.0% in 2022) compared with 5.9% of non-Aboriginal women.*

2.5%

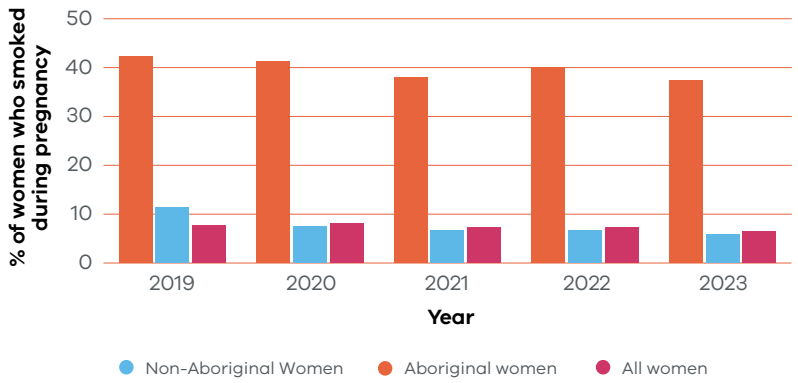
BMI

of Aboriginal women had a **BMI under 18.5** compared with 2.2% of non-Aboriginal women.

BMI

Aboriginal women were also more likely to have a **BMI of 30 or over** than non-Aboriginal women (36.0% and 23.4%, respectively).

Figure 32: Smoking during pregnancy, 2019–2023



All births (stillbirths and livebirths) excluding terminations of pregnancy for maternal psychosocial indications

**The data in this section refer to the smoking status of all mothers, whereas the section on page 36, 'Smoking and perinatal mortality', refers only to the smoking status of the mothers whose babies were included in the adjusted number of births (which excludes terminations of pregnancy for maternal psychosocial indications).*

Aboriginal babies

Babies born to Aboriginal mothers are more likely to be born with **low birthweight and preterm** than those born to non-Aboriginal women.

13.2%

of babies born to Aboriginal women had **low birthweight** (under 2,500 grams) compared with 6.7% of babies born to non-Aboriginal women.

13.9%

of babies born to Aboriginal women had a **birthweight below the 10th percentile** compared with 9.3% of those born to non-Aboriginal women.

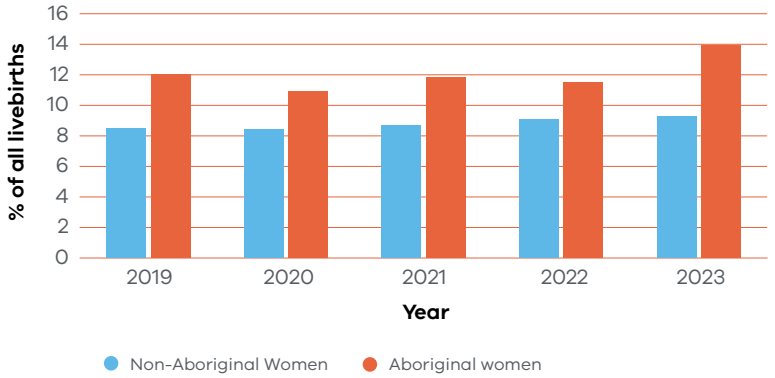
11.2%

of babies born to Aboriginal women were born **before 37 weeks' gestation** compared with 7.0% of those born to non-Aboriginal women.

9.7%

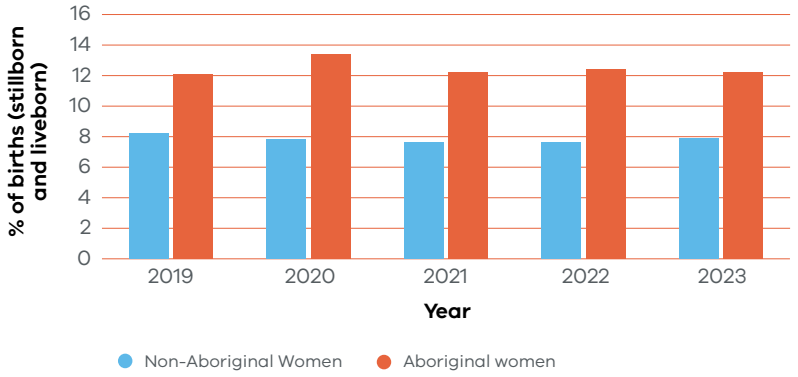
of babies born to Aboriginal women were born between **32-36 weeks' gestation** compared with 6.5% of babies born to non-Aboriginal women.

Figure 33: Livebirths with a birth weight below the 10th percentile, 2023



Livebirths excluding terminations of pregnancy for maternal psychosocial indications

Figure 34: All births before 37 weeks' gestation



All births (stillbirths and livebirths) excluding terminations of pregnancy for maternal psychosocial indications

Child and adolescent mortality

In this section

Child and adolescent mortality

Child and Adolescent Subcommittee Chairs report

Adjunct Clinical Assoc Professor Robert Roseby

The child and adolescent subcommittee process is to review deaths of individuals from 28 days to 17 years 364 days of age. We review cases from the previous year, enabling them to be grouped into themes by the senior clinical advisors prior to review. We are the only body which has line of sight each year over all Victorian child deaths by theme (accidents, infection, intentional self-harm, medical causes, sudden unexplained infant deaths, etc).

Subcommittee members have expertise in paediatrics and child health and examine the materials pertaining to a child death aiming to learn something from the deceased to help the living. We conduct this process in a manner highly respectful to the deceased and their families, although generally unknown by them.

In addition to case work conducted by the subcommittee in 2024 we escalated cases for the attention of Safer Care Victoria if there was a significant preventability factor for consideration, we made recommendations and provided good practice points (GPPs) relevant to practitioners and health services. We liaised with the State Coroner and the Children's Commissioner, who have similar but different review functions to ours. We published a review of 10 years of GPPs. For this we de-identified or rewrote cases to illustrate learning points.

Again, the subcommittee was struck by the disparity in health outcomes between the highest and lowest socioeconomic groups in the Victorian community, and the excess deaths among those in the lowest socioeconomic quintile. We find this disturbing, and it provides a focus of our work for the next triennium.

I thank the subcommittee, senior clinical advisors and SCV Governance Secretariat for their hard work. I especially thank the outgoing subcommittee members and welcome incoming members. It is an enormous honour to lead this subcommittee for the benefit of Victoria's children.

Good practice points

Following the review of child and adolescent mortality occurring in and from 2023 the subcommittee developed the following good practice points (GPPs).

Sedation in children with respiratory distress including asthma

Treatment and referral of children with suspected serious bacterial infection by general practitioners

Fluid resuscitation in septic shock

Child and adolescent mortality

Child and adolescent mortality include post-neonatal infant, child and adolescent deaths between the ages of 28 days and 17 years and 364 days.

This report includes all post-neonatal (28–364 days) and child and adolescent (1–17 years) deaths of children normally living in Victoria who died in Victoria during 2023.

The **highest** rate of death was in the

28–364 days

age group.

The infant mortality rate in Victoria in 2022 was

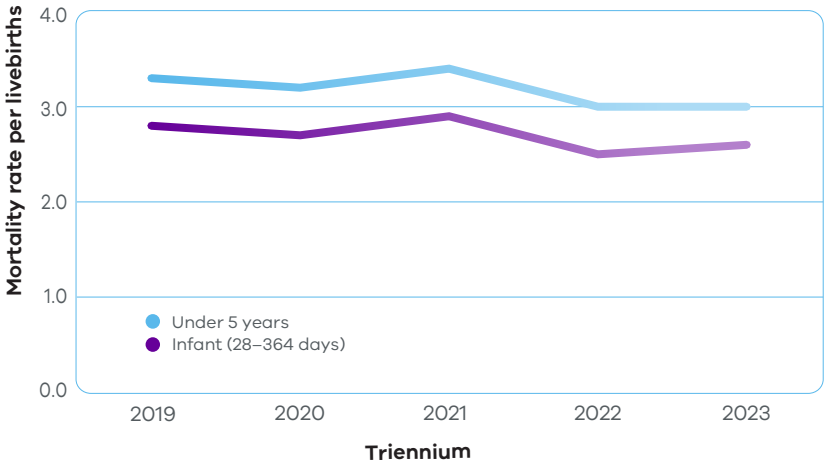
2.6 **per 1,000 livebirths**

for infants (0 364 days).

The under-five mortality rate in Victoria in 2022 was

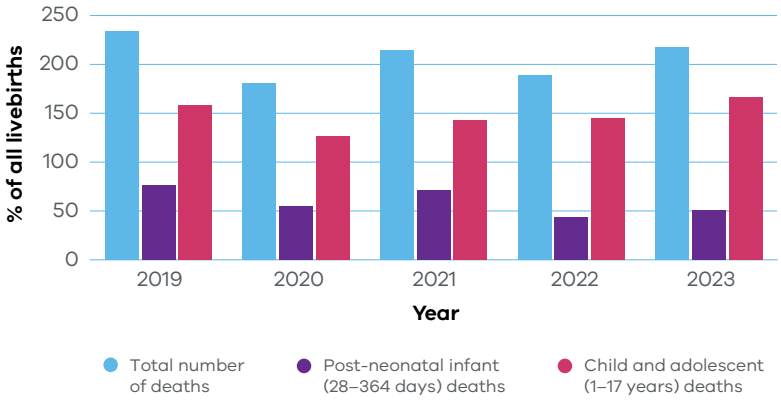
3.0 **per 1,000 livebirths**

Figure 35: Post-neonatal infants and 1-4 years mortality rate per 1000 livebirths, 2019–2023



The cohorts for post neonatal infants and children under 5 years overlap; infants are defined as ages 0–364 days and are included within the under 5 years group

Figure 36: Total number of post-neonatal infant, child and adolescent deaths reported to CCOPMM, 2019–2023



Leading causes of death by age group

The leading cause of **post-neonatal infant deaths** was congenital anomaly.

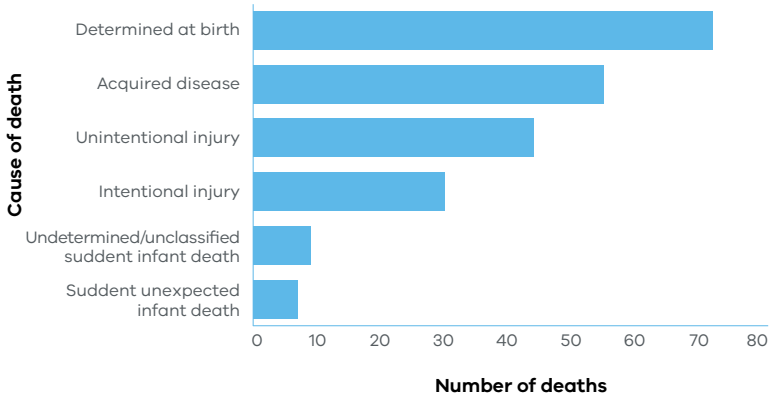
The leading cause of death of children aged **one to four** years was congenital anomaly.

The leading cause of death of children aged **five to nine** years was malignancy.

The leading cause of death of children and adolescents aged **10 to 14** years was congenital anomaly.

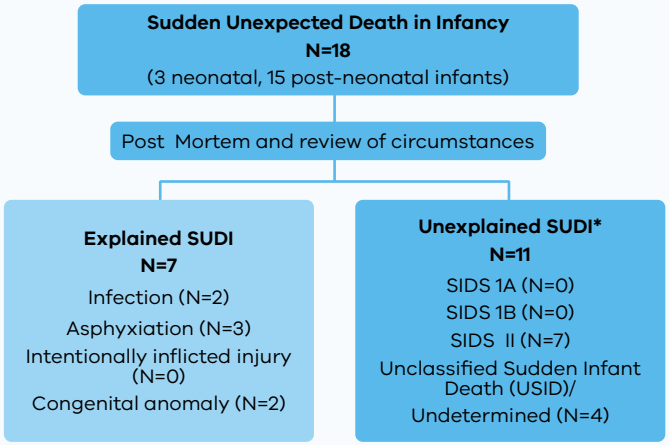
The leading cause of death of children and adolescents aged **15 to 17** years was intentional self-harm.

Figure 37: Number of leading causes of death in children 28 days to 17 years, 2023



The cohorts for post neonatal infants and children under 5 years overlap; infants are defined as ages 0–364 days and are included within the under 5 years group

Figure 38: Sudden Unexpected Death in Infancy (SUDI), 2023



* Classified using the Krous et al definitions

Figure 39: Leading causes of death in post-neonatal infants (28–364 days), 2023

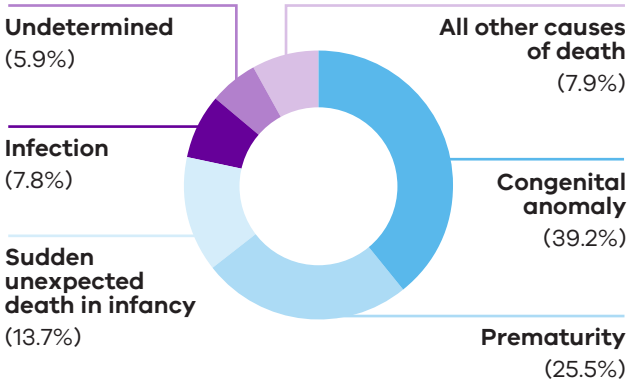


Figure 40: Leading causes of death in children aged 1–4 years, 2023

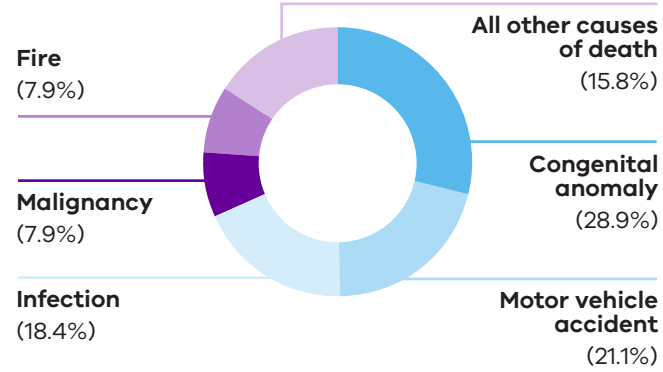


Figure 41: Leading causes of death in children aged 5–9 years, 2023

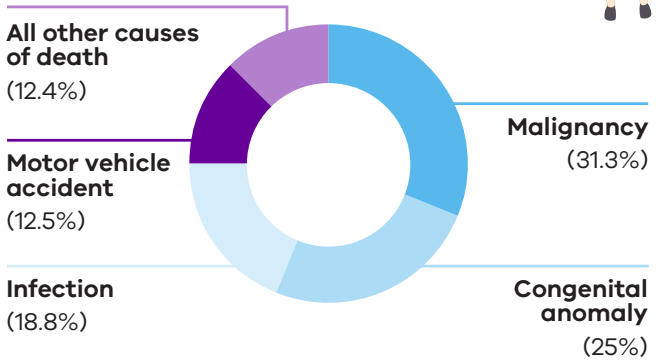


Figure 42: Leading causes of death in children aged 10–14 years, 2023

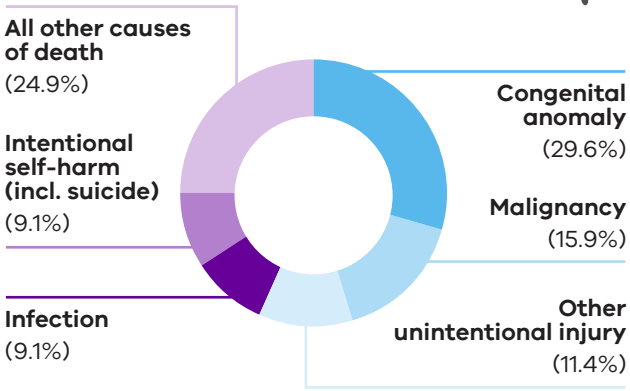
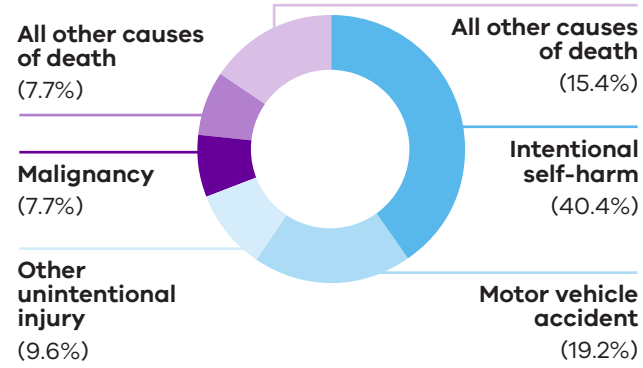


Figure 43: Leading causes of death in children aged 15–17 years, 2023



Contributing factors

Figure 44: Contributing factors – Infant mortality, 2023

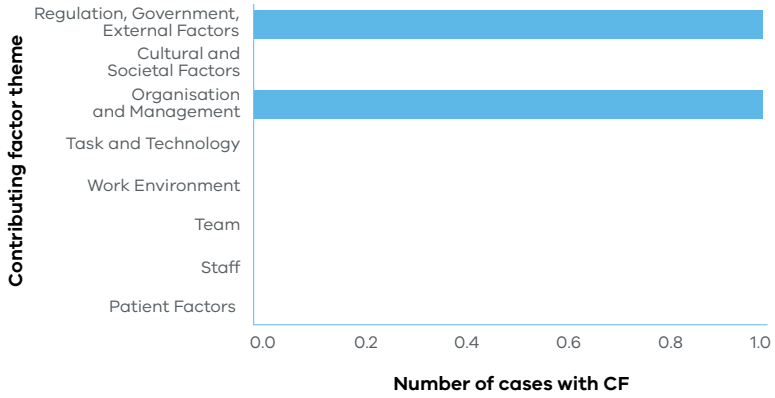
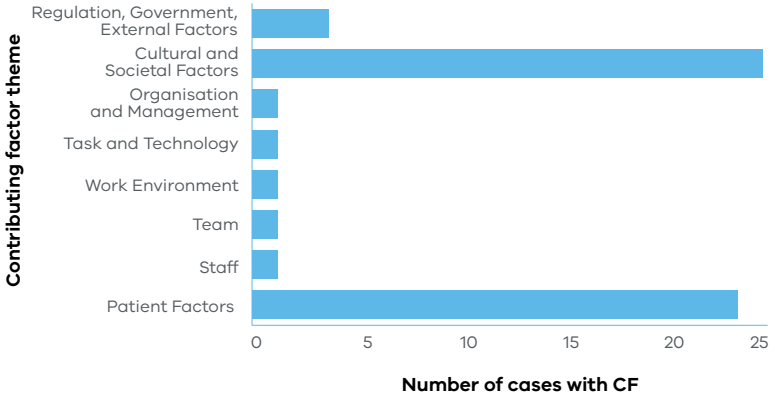


Figure 45: Contributing factors – Child/Adolescent Mortality, 2023



Preventability

Table 7: Infant mortality preventability, 2023

Preventable death	Count
Yes	4 (7%)
Unknown/not clear	3
No	50

Table 8: Child and Adolescent mortality preventability, 2023

Preventable death	Count
Yes	76 (44%)
Unknown/not clear	2
No	94

Research and quality improvement

In this section

Research and quality improvement

CCOPMM is legislated to conduct research into the incidence and causes of mortality and morbidity in women, babies, children and adolescents. Undertaking and supporting research is a critical function of CCOPMM to ensure continuous improvements in quality of care. The Public Health and Wellbeing Regulations allow CCOPMM to make perinatal data available to researchers.

As part of its legislative responsibilities under the Public Health and Wellbeing Act 2008 (Vic), CCOPMM is mandated to collect, analyse, and report on maternal, perinatal, and paediatric mortality and morbidity across Victoria. This includes the Victorian Perinatal Data Collection and Victorian Congenital Anomaly Register, which serve as critical infrastructure for clinical quality improvement, health services planning, epidemiological research, and the identification of emerging trends and health inequities.

Research and Reporting Subcommittee

Established in 2020, CCOPMM's Research and Reporting Subcommittee is a multidisciplinary group combining specialist clinical and research knowledge to drive CCOPMM's research function.

The group was formed to:

- facilitate research and report to CCOPMM on research and quality improvement (the subcommittee also supports research from Safer Care Victoria fellowship programs)
- provide advice and assistance to CCOPMM on research priorities and recommendations as relevant to maternal, perinatal, infant and child and adolescent mortality and morbidity
- assist CCOPMM's reporting activities including the annual Victoria's mothers, babies and children report, the periodic Victorian congenital anomalies report and relevant benchmarking activities including the advice and support on data used in the Perinatal Services Performance Indicators report
- provide advice and guidance on data governance issues in relation to CCOPMM data and support national reporting requirements
- review and approve annual changes to the Victorian Perinatal Data Collection
- approve the process for data requests as per regulation 10 of the Public Health and Wellbeing Regulations 2009
- monitor and support data requests through the Victorian Agency for Health Information Data Request Hub
- review and approve research publications using CCOPMM data (including presentations).

Research and Reporting Subcommittee Chairs report

Professor Lisa Hui

The subcommittee did not meet during 2024 but has resumed its activities in 2025. Despite this pause, CCOPMM reaffirms its enduring commitment to supporting high-quality research and public health policy through the maintenance of comprehensive perinatal data systems. CCOPMM acknowledges the value of these data assets in enabling system-wide improvements in maternity and neonatal care, and remains committed to ensuring their integrity, accessibility, and relevance for clinicians, researchers, and policymakers alike.

During 2023–2024, CCOPMM data supported a substantial body of peer-reviewed research, contributing new insights into clinical care, health outcomes, and policy development in perinatal and neonatal health in Victoria. Studies ranged from the evaluation of clinical guidelines and induction practices to the development of digital tools and large-scale epidemiological investigations. This body of research demonstrates the substantial contribution of CCOPMM data to advancing maternal and newborn health research, clinical improvement, and health policy.

Accessing CCOPMM data

Each year CCOPMM receives requests for data from researchers outside Safer Care Victoria and the Department of Health. In 2023, there were 61 requests for CCOPMM data, many of which required extraction from the Victorian Perinatal Data Collection.

Approved research involving data linkage is facilitated by the Centre for Victorian Data Linkage. All requests for data are reviewed in keeping with CCOPMM's legislative requirements.

In September 2024 the Victorian Agency for Health Information (VAHI) closed the perinatal data hub. As a result no new perinatal data requests could be submitted.

The subcommittee is working towards publishing all approved projects and data requests using CCOPMM or data so this information can be accessible to researchers and duplication of effort is minimised among the research community. Publishing current research requests may also facilitate partnerships for researchers with similar interests.

Appendix 1: Measures

Maternal morality ratio (MMR)

MMR = number of direct and indirect maternal deaths / total number of birthing episodes × 100,000

- The MMR includes all direct and indirect maternal deaths during pregnancy or within 42 days of the end of the pregnancy. It excludes coincidental and late maternal deaths.
- 'Total number of birthing episodes' is the number of pregnancies of 20 weeks' gestation or more (or if gestation is unknown, with birthweight of at least 400 grams) resulting in livebirth 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. This is because the available data on the number of these pregnancies are unreliable.

Perinatal mortality rate (PMR)

PMR = (number of stillbirths + neonatal deaths) / total (stillbirths + livebirths) × 1,000

- The PMR is calculated as the rate of stillbirths and neonatal deaths per 1,000 total births (including all stillbirths and livebirths).
- For CCOPMM statistics, the rate refers to all births of at least 20 weeks' gestation (or a birthweight of at least 400 grams if gestation is unknown), and at least 150 grams birthweight unless known to have been alive at 20 or more weeks' gestation. However, for purposes of continuity, PMR of infants of ≥ 500 grams 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 grams 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).

Stillbirth rate

Stillbirth rate = number of stillbirths × 1,000 total (stillbirths + livebirths)

Neonatal mortality rate (NMR)

NMR = number of neonatal deaths / total livebirths × 1,000

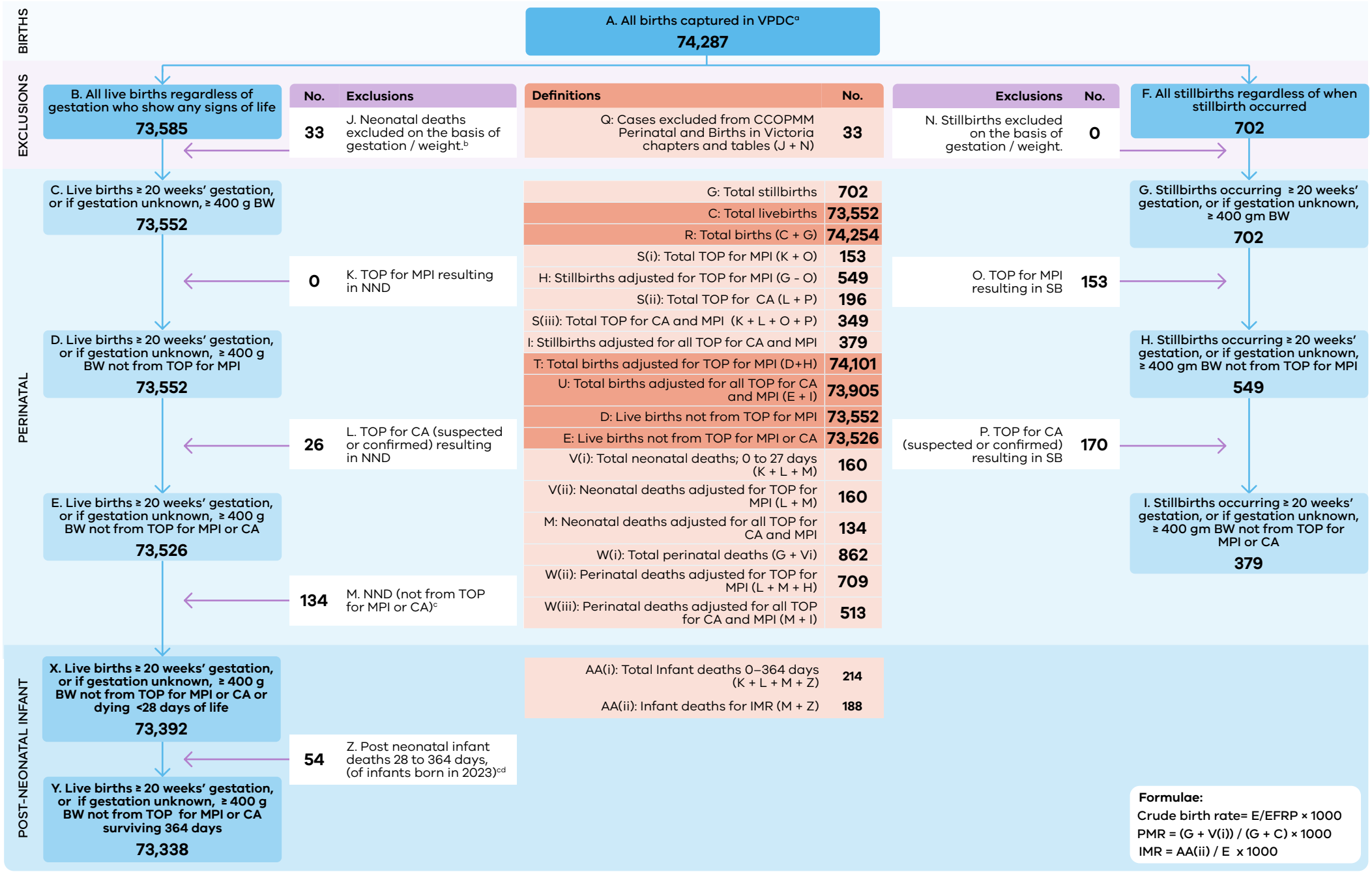
- The NMR is calculated per 1,000 livebirths of at least 20 weeks' gestation or, if gestation is unknown, of birthweight at least 400 grams.

Infant mortality rate (IMR)

IMR = number of infant deaths × 1,000 total livebirths

- The IMR is calculated as the number of infant deaths divided by the number of total (Victorian-born) livebirths for the index year (reported as the rate per 1,000 livebirths). The livebirths are limited to those infants ≥ 20 weeks' gestation (or a birthweight of at least 400 grams if gestation is unknown), and at least 150 grams birthweight unless known to have been alive at 20 or more weeks' gestation.
- 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.

Appendix 2: Flow diagram for births in Victoria, 2023



Appendix 2 continues over page

Abbreviations used in this flow diagram

- BW – birthweight
- CA – congenital anomaly (suspected or confirmed)
- EFRP – estimated female resident population
- IMR – infant mortality rate
- MPI – maternal psychosocial indications
- NND – neonatal death
- PMR – perinatal mortality rate
- SB – stillbirth
- TOP – termination of pregnancy
- VPDC – Victorian Perinatal Data Collection
- Formulae
- Crude birth rate = E / EFRP × 1,000
- PMR = (G + Vi) / (G + C) × 1,000
- IMR = AA(ii) / E × 1,000

NOTES

a. Includes only births occurring in Victoria and their outcomes.

b. Neonatal death exclusions (J) comprise:

   i. Those live born < 20 weeks' gestation (n = 33)

   ii. Those live born at unknown gestation with a birthweight < 400 g (n = 0)

c. Post-neonatal infant deaths includes all those born in 2023 with deaths occurring up until 30 December 2024.

d. Numbers of births can differ slightly between the 'Mothers and babies' section and Appendix 2: Flow diagram for births in Victoria, and 'Perinatal mortality' section of the report, as Births in Victoria uses gestation at birth, regardless of when the fetal death occurred, whereas Appendix 2 and the 'Perinatal mortality' section use gestation at the diagnosis of death, regardless of the gestation at which the birth occurred. For example, where a fetal death is diagnosed at 19 weeks but not born until 21 weeks, this would be counted as a birth in the sections of this report dealing with births but excluded from Appendix 2 and the 'Perinatal mortality' section.

Appendix 3: CCOPMM criteria and definitions for severe maternal morbidity

Code	Category	Definition
1	**Major obstetric haemorrhage**	Estimated blood loss ≥ 2,500 mL, or transfusion ≥ 5 units blood or received treatment for coagulopathy (fresh frozen plasma, cryoprecipitate, platelets) Includes ectopic pregnancy
2	**Uterine rupture**	Complete separation of wall of pregnant uterus +/– expulsion of fetus, involving rupture of membranes at the site of the uterine rupture or extension into uterine muscle separate from any previous scar, and endangering the life of the mother or fetus Excluded: any asymptomatic palpable or visualised defect (e.g. dehiscence noted incidentally at caesarean delivery)
3	**Peripartum hysterectomy**	Peripartum hysterectomy
4	**Eclampsia**	Seizure associated with antepartum, intrapartum or postpartum symptoms and signs of pre-eclampsia
5	**Renal or liver dysfunction**	Acute onset of biochemical disturbance, urea > 15 mmol/L, creatinine > 400 mml/L, AST/ALT > 200 U/L
6	**Pulmonary oedema**	Clinically diagnoses pulmonary oedema associated with acute shortness of breath and oxygen saturation < 95%, requiring oxygen, diuretics or ventilation
7	**Acute respiratory dysfunction**	Requiring intubation or ventilation for > 60 minutes (not including duration of general anaesthetic)
8	**Pulmonary embolism**	Increased respiratory rate (> 20/min), tachycardia, hypotension Diagnosed as 'high' probability on ventilation–perfusion scan or positive spiral chest CT scan Treated by heparin, thrombolysis or embolectomy
9	**Cardiac arrest**	No detectable major pulse
10	**Coma**	Includes diabetic coma Unconscious for > 12 hours
11	**Cerebrovascular event**	Stroke, cerebral/cerebellar haemorrhage or infarction, subarachnoid haemorrhage, dural venous sinus thrombosis
12	**Status epilepticus**	Constant or near constant state of having seizures that last ≥ 30 minutes
13	**Septicaemic shock**	Shock (systolic blood pressure < 80) in association with infection No other cause for decreased blood pressure Pulse ≥ 120 bpm
14	**Anaesthetic problem**	Aspiration, failed intubation, high spinal or epidural anaesthetic
15	**Anaphylactic shock**	An allergic reaction resulting in collapse with severe hypotension, difficulty breathing and swelling/rash
16	**Other severe morbidity**	Other severe morbidity (e.g. amniotic fluid embolism)
17	**Interventional radiology**	Receive planned (a) or unplanned (b) interventional radiology

Appendix 4: PMR by maternal place of birth, Victoria 2023

Maternal place of birth	Adjusted total births		Livebirths		Adjusted stillbirths	Adjusted neonatal deaths	Adjusted perinatal deaths	% of all perinatal deaths	Adjusted PMR per 1000 births
	N	%	N	%	N	N	N	N	
Americas	1021	1.4%	1010	1.4%	11	3	14	2.0%	13.7
Australia	45641	61.6%	45318	61.6%	323	91	414	58.4%	9.1
North Africa and the Middle East	2248	3.0%	2224	3.0%	24	5	29	4.1%	12.9
North-East Asia	2731	3.7%	2715	3.7%	16	2	18	2.5%	6.6
North-West Europe	1772	2.4%	1761	2.4%	11	6	17	2.4%	9.6
Oceania and Antarctica	2007	2.7%	1993	2.7%	14	4	18	2.5%	9.0
South-East Asia	4545	6.1%	4514	6.1%	31	13	44	6.2%	9.7
Southern and Central Asia	10492	14.2%	10406	14.1%	86	27	113	15.9%	10.8
Southern and Eastern Europe	1029	1.4%	1019	1.4%	10	1	11	1.6%	10.7
Sub-Saharan Africa	1748	2.4%	1734	2.4%	14	5	19	2.7%	10.9
Unknown	867	1.2%	858	1.2%	9	3	12	1.7%	13.8
TOTAL	**74101**		**73552**		**549**	**160**	**709**		

Appendix 5: CCOPMM good practice points

Maternal mortality and morbidity GPPs

Aortic Dissection

In a peripartum woman presenting with severe acute chest and/or thoracic backpain, it is important to consider the possibility of an aortic or coronary dissection; this is particularly the case where there are electrocardiogram (ECG) abnormalities. Ideally, an echocardiogram (where possible transoesophageal) should be performed, with the alternative of a CT aortogram suggested in the postpartum period. Echocardiography is available in many large emergency departments, usually via the cardiology service and can be performed at any hour if needed.

Management of eclampsia and severe preeclampsia

First line management of eclampsia and severe hypertension in preeclampsia is stabilisation. Airway, breathing, circulation assessment and stabilisation, then expedient magnesium sulphate loading and infusion, and blood pressure stabilisation to less than 160/110 mm Hg should occur.

Where severe hypertension or eclampsia occurs prior to birth, it is important to carefully plan timing of birth with input from senior obstetric staff. Depending on clinical features, the woman may need urgent coagulation correction prior to birth.

Urgent caesarean section is not recommended until the above steps are completed and the woman is assessed as safe and stable for birth.

Review of pregnant women presenting to a general emergency department

Review of several cases where a woman presented to an emergency department (ED) in advanced pregnancy have identified instances where outcome may have been improved if assessment of the presenting complaint had included review by an obstetrician.

Whilst recognising the vast array of presentations to an ED, several high-risk pregnancy complications (e.g. pre-eclampsia or abruption) can present with vague symptoms that make identification of underlying pathology challenging.

To support prompt recognition of pregnancy related complications, input from the obstetric team is strongly encouraged.

Stillbirth GPP

In vitro fertilization (IVF) and pregnancy risk

AIM

The aim of this good practice point is to alert clinicians to the increased risk profile of pregnancy resultant of assisted reproductive treatment.

BACKGROUND

In 2023, there were 30,152 assisted reproduction treatment cycles for 16,952 women in Victoria (VARTA, 2023). Pregnancies conceived with assisted reproductive technology are associated with greater perinatal risk than those conceived spontaneously.

There is systematic review evidence of more stillbirths in women who conceive with IVF in comparison to women who conceive without medical intervention (OR 1.82 CI-1.37-2.42) (Sarmon et al., 2021). Pregnancies conceived with IVF are also at greater risk of preterm birth. The summary rate of preterm delivery in 2021 at < 37 completed weeks is 11.5% (fresh embryo transfer) and 9.8% (frozen embryo transfer) compared to 8% for those spontaneously conceived pregnancies (Newman, Paul and Chambers, 2023).

Delivery of women with pregnancies conceived with IVF are more likely to be complicated by placental adhesive disorders (Matsuzaki et al., 2021). IVF conception is also considered a minor risk factor for fetal growth restriction (Pandey et al., 2021; PSANZ and Stillbirth CRE, 2023).

RECOMMENDATIONS

Maternity care providers should ensure cervical length screening at the time of the morphology scan is performed optimally. This will usually mean a transvaginal approach with an experienced sonographer / sonologist.

Clinicians should have a low threshold to provide earlier cervical length screening for those with additional risk factors (vaginal bleeding, prior uterine surgery etc).

A comprehensive assessment for risk factors for fetal growth restriction should be performed and fetal growth surveillance planned in accordance with local protocols (PSANZ and Stillbirth CRE, 2023).

In late pregnancy the increased risk of stillbirth and potential placental adhesive disorder should be considered with respect to gestation at birth and place of birth.

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Neonatal GPPs

Subgaleal haemorrhage

AIM

The aim of this good practice point is to emphasise that guidelines and protocols exist for Subgaleal Haemorrhages and it is the expectation of Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM) that all Heath Services in Victoria have a protocol or guideline to identify risk factors, recognise signs and symptoms, observe and treat the newborn with a subgaleal haemorrhage (SGH) to reduce the incidence of neonatal adverse outcomes.

It is also expected that all health professionals involved with the care either before or after birth of the newborn know and follow their local guidelines.

This is especially important as severe subgaleal haemorrhages are rare but eminently treatable in most cases when detected early.

Well referenced and considered guidelines are widely available.

BACKGROUND

In 2006 Jessica Lee STEMMER and in 2007 Thomas William MAHAR died in South Australia, from Subgaleal haemorrhages.

In 2010 Deputy State Coroner Shapel recommended among other things (Coroners Court of South Australia, 2010):

1. That the Royal Australasian College of Physicians draw these findings and recommendations to the attention of its members, and in particular those members who are neonatologists;
2. That the Royal Australasian College of Physicians promulgate and circulate for the benefit of its members a College Statement that replicates that of the Royal Australian and New Zealand College of Obstetricians and Gynaecologists document dated July 2009 and entitled ‘Prevention Detection and Management of Subgaleal Haemorrhage in the Newborn’;
3. That the Royal Australasian College of Physicians draws to the attention of its members, and in particular neonatologists, the following matters:

- That practitioners should recognise that subgaleal haemorrhages can behave in unpredictable ways and can have devastating consequences;
- That undue reliance should not be placed upon a clinical picture of haemodynamic stability alone as the clinical picture may be falsely reassuring;

- That regular monitoring of acidosis and haemoglobin levels, among other parameters, is essential;
- That upon a diagnosis of a subgaleal haemorrhage in a neonate, practitioners should have regard to the potential need for cross matched blood transfusion and transfusion of fresh frozen plasma and that they should immediately take the necessary steps to ensure that cross matched blood and fresh frozen plasma is available to be administered at short notice;
- That if a decision is made to administer a blood transfusion or a transfusion of fresh frozen plasma that practitioners should ensure that it is administered without delay.

Despite these recommendations Victoria has infants dying each year from SGH and in the majority of these cases deficiencies in care have been found.

EXISTING GUIDANCE

RANZCOG Clinical Guidance: Statement Prevention, detection, and management of subgaleal haemorrhage in the newborn

Paediatric Infant Perinatal Emergency Retrieval (PIPER) – NEONATAL Management of Subgaleal Haemorrhage in Neonatal Transport

South Australian Perinatal Practice Guideline: Subgaleal Haemorrhage

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Herpes Simplex Virus (HSV) in the newborn

Perinatally acquired HSV can be lethal if not treated early with anti-viral therapy. Diagnosis is impossible to rule out on clinical history alone and routine tests such as CSF HSV DNA PCR or "Biofire" may give false negatives especially if collected early in the illness.

AIM

The aim of this good practice point is to remind clinicians that a negative cerebrospinal fluid (CSF) HSV DNA polymerase chain reaction (PCR) or "BioFire®" have false negatives, especially if collected early in the illness.

BACKGROUND

Herpes Simplex Virus (HSV) can be acquired perinatally and can be lethal if not treated early with anti-viral therapy such as intravenous acyclovir. Consideration of this potential pathogen in the newborn who presents with sepsis is imperative. Infants may be tested for the presence of HSV by sending CSF or other specimens for detection of HSV1 or 2 related nucleic acid. The most commonly available HSV nucleic acid test is the BioFire®.

RECOMMENDATIONS

Biofire® testing can be falsely negative for a number of reasons i.e. there may be insufficient nucleic acid in the specimen to be detected, there may be strain variation making the nucleic acid sequences unrecognisable, or there can be contamination of the specimen.

All tests have false positives and negatives but being falsely reassured by a negative HSV meningitis/encephalitis test can have devastating consequences if treatment is not started and continued.

HSV has long been identified as occurring in infants whose mothers have no history of clinical HSV, making diagnosis impossible to rule out on clinical history alone (Pinninti and Kimberlin, 2014). Whilst HSV DNA PCR has greatly improved the speed of diagnosis, its sensitivity is reported as low as 75%.

BioFire® has reported sensitivities as low as 51% for HSV-1 (Trujillo-Gómezet al., 2022)

In cases where HSV needs to be ruled out, relying solely on a negative CSF result is insufficient and further tests need to be employed- specifically swabs from mouth, conjunctiva, nasopharynx, rectum, any vesicles (if present) and blood for HSV DNA PCR and LFT (Especially ALT). Repeating CSF two to three days later may also be helpful.

REFERENCES:

Pinninti, S.G. and Kimberlin, D.W., 2014. Management of neonatal herpes simplex virus infection and exposure. Archives of Disease in Childhood-Fetal and Neonatal Edition, 99(3), pp.F240-F244.

Trujillo-Gómez, J., Tsokani, S., Arango-Ferreira, C., Atehortúa-Muñoz, S., Jimenez-Villegas, M.J., Serrano-Tabares, C., Veroniki, A.A. and Florez, I.D., 2022. Biofire FilmArray Meningitis/Encephalitis panel for the aetiological diagnosis of central nervous system infections: a systematic review and diagnostic test accuracy meta-analysis. EClinicalMedicine, 44.

Child and Adolescent GPPs

Sedation in children with respiratory distress including asthma

Clinicians must be vigilant when sedating any child who has respiratory distress including acute asthma.

If sedation is required for a procedure, e.g. intravenous cannulation, suturing, etc, the risk of sedation versus no sedation should be weighed up. Consider if the procedure could be achieved with just local/topical anaesthetic.

The use of nitrous oxide for sedation is contraindicated in children with severe asthma. In patients with asthma, nitrous oxide can decrease forced vital capacity, exacerbate secretions, and reduce respiratory drive (both in response to hypoxaemia and hypercarbia).

Be aware that the application of a sealed mask to the face of a child to deliver nitrous oxide can be distressing to the child, particularly young children. This distress may result in dis-coordinate breathing or breath holding. This is often transient, but for children with respiratory distress, it may worsen oxygenation, compromise ventilation, and increase stress, all of which can make asthma worse.

When administering any form of sedation, a child must be monitored continuously. This includes pulse oximetry (SaO2), heart rate and direct observation of respiratory rate and respiratory effort. Any sedation given to children with respiratory distress, including asthma, should be supervised by a senior doctor skilled in managing unstable patients, and there should be a pre-planned contingency if any deterioration occurs.

Treatment and referral of children with suspected serious bacterial infection by general practitioners

There has been an increase in serious bacterial infections due to severe Group A streptococcal, streptococcus pneumoniae and staphylococcal infections presenting as pneumonia, empyema, septicaemia, meningitis, and bone and soft tissue infections. These bacterial infections are often associated with, or subsequent to a viral infection.

Children can deteriorate rapidly and antibiotic treatment is time-critical and improves outcomes. Whenever serious bacterial infection is suspected in primary care, the first dose of effective antibiotics should be given as soon as possible* and the child referred urgently to hospital via ambulance or by Paediatric Infant Perinatal Emergency Retrieval (PIPER).

Think of serious bacterial infection in a child with fever (temperature >38° C) plus other symptoms and signs of a sick child, such as:

- erythematous, sunburn-like or purpuric skin rash
- lethargy, persistent drowsiness or high-pitched cry
- grunting, apnoea, hypoxaemia, or other signs of severe respiratory distress,
- pneumonia or pleural effusion
- cold or mottled limbs, >3 seconds capillary refill time, tachycardia
- severe limb pain or refusal to walk
- inability to feed or persistent vomiting
- decreased urine output.

No one sign is specific, but the more signs that are present, or the more severe, the more likely it is there is a serious bacterial infection. Prolonged fever (>5 days) or very high fever (temperature >40° C) are also more likely to indicate a serious bacterial infection. Parents of children with serious bacterial infections often correctly express concern about their failure to improve or their significant difference from normal.

*Take a blood culture if you can, but if not possible just give the antibiotics as diagnostic tests can be done at hospital.

Antimicrobial choice may include Ceftriaxone or Benzylpenicillin.

Paediatric Infant Perinatal Emergency Retrieval (PIPER) can be contacted from a primary care clinic or urgent care centre on 1300 137 650 for management and transfer advice and support.

Refer to the Royal Children's Hospital Clinical Practice Guidelines:

Antimicrobial guidelines

Sepsis – Assessment and management

Fluid resuscitation in septic shock

In the setting of septic shock, or evolving septic shock, cardiovascular status is of paramount importance. Severe shock is present if there is hypotension, tachycardia, very prolonged capillary refill time and cold limbs. Such children require fluid resuscitation with early repeated boluses of 10-20mL/kg of normal saline or a balanced salt solution. If shock persists despite 40mL/kg in total, a differentiated approach to shock is needed, and the addition of vasopressor or inotropic agents is required. Many children respond to oxygen, fluid, and low dose vasopressors.

Refer to the Royal Children's Hospital Clinical Practice Guideline:

Sepsis – Assessment and management

Appendix 6: Acknowledgements

The creation of this report each year is not possible without the generous assistance of many people. Midwives across Victoria notify CCOPMM of all births via the Victorian Perinatal Data Collection. Vital information about maternal, perinatal and child deaths is received from:

- health services
- the Registry of Births, Death and Marriages Victoria
- anatomical and forensic pathologists
- the Coroners Court of Victoria
- the Victorian Institute of Forensic Medicine
- the Paediatric Infant Perinatal Emergency Retrieval (PIPER) service
- individual treating practitioners
- palliative care services
- maternal and child health nurses
- Ambulance Victoria
- child protection services.

This report would not be possible without their assistance, and that of many others, and we thank them for their continued support and diligence in providing us with information that makes our work possible.

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- Dr Jim Holberton (Neonatal)
- Professor Susan McDonald (Perinatal)
- Dr Erin Mills (Child and Adolescent)
- Assoc Professor Michael Stewart (Neonatal)
- Dr Sophie Treleaven (Child and Adolescent)
- Dr Julia Unterscheider (Maternal)
- Dr Carmel Walsh (Perinatal)

Expert Panellists

The following experts were invited contributors to the review of 2023 Child and Adolescent cases during themed meetings:

- Prof. Nigel Crawford (Infectious Diseases)
- Dr Linny Phuong (Infectious Diseases)
- Dr Richard Haslam (Intentional self-harm)
- Dr Michael Gordon (Intentional self-harm)
- Dr Ben Goodfellow (Intentional self-harm)
- Dr Maurizio Pacilli (Surgical)
- A/Prof. Warwick Teague (Surgical)
- Sarah Sexton (Injury)

Appendix 7: CCOPMM Member lists (2021–2024 term)

CCOPMM Chair

- Professor Mark Umstad

CCOPMM Council Term 2021–2024

- Melanie Courtney
- Dr Alison Green
- Professor Caroline Homer
- Professor Rodney Hunt
- Ann Jorgensen
- Dr Niroshini Kennedy
- Adj. Professor Alan Lilly
- Professor Susan McDonald
- Jackie Mead
- Assoc. Professor Andrea Rindt
- Adj. Assoc. Professor Robert Roseby
- Assoc. Professor Glyn Teale
- Professor Mark Umstad **(Chair)**

CCOPMM Council Term commencing June 2024

- Kate Booth
- Hannah Chilton
- Dr Alison Green
- Ursula Harrisson
- Professor Lisa Hui
- Professor Rodney Hunt
- Dr Niroshini Kennedy
- Keren Ludski
- Lisa Lynch
- Assoc Professor Andrea Rindt
- Adj. Assoc Professor Robert Roseby
- Assoc. Professor Glyn Teale
- Professor Mark Umstad **(Chair)**
- Dr Nicola Yuen

Maternal Subcommittee

- Dr Malcolm Barnett
- Bree Bulle
- Dr Stephen Cole
- Dr Jackie Collett
- Dr Alison Green
- Assoc Professor Liz Hessian
- Assoc Professor Ryan Hodges
- Helen Lees
- Assoc Professor Christopher MacIsaac
- Professor Susan McDonald
- Professor Louise Newman
- Assoc Professor Andrea Rindt
- Karen Sawyer
- Associate Professor Glyn Teale **(Chair)**
- Professor Mark Umstad (previous Chair)
- Assoc Professor Julia Unterscheider
- Dr Carmel Walsh

Neonatal Subcommittee

- Dr Lisa Begg
- Assoc Professor Rosemarie Boland
- Dr Jackie Collett
- Professor Rod Hunt **(Chair)**
- Dr Jim Holberton
- Assoc Professor Stefan Kane
- Dr Isaac Marshall
- Ms Kirsty Nason
- Ms Suzanne O'Shannessy
- Dr Sarah Parsons
- Assoc Professor Alexis Shub
- Dr Alice Stewart
- Assoc Professor Michael Stewart
- Dr Mark Tarrant
- Assoc Professor Glyn Teale
- Dr Sophie Treleaven
- Professor Sue Walker
- Dr Jennifer Walsh
- Ms Julie Wright

Stillbirth Subcommittee

- Dr Lisa Begg
- Dr Jodie Benson
- Dr Jackie Collett
- Dr Mary-Ann Davey
- Professor Lisa Hui
- Sharon Kirsopp
- Professor Susan McDonald **(Chair)**
- Dr Emily Olive
- Dr Kirsten Palmer
- Dr Warrick Pill
- Mrs Andrea Rindt
- Assoc Professor Joanne Said
- Sonia Shaw
- Dr Penelope Sheehan
- Dr Carmel Walsh
- Colleen White

Child and Adolescent Subcommittee

- Dr Giuliana Antolovich
- Marcia Armstrong
- Dr Mick Creati
- Prof Trevor Duke
- Dr Karen Dunn
- Adj. Assoc Professor Alan Eade
- Assoc Professor David Fuller
- Dr Ric Haslam
- Dr Niroshini Kennedy
- Dr Erin Mills
- Dr Annie Moulden
- Dr Sarah Parsons
- Adj. Clin. Assoc Professor Robert Roseby **(Chair)**
- Dr Greg Rowles
- Dr David Tran
- Dr Sophie Treleaven

Research and Reporting

- Assoc Professor Rosemarie Boland
- Professor Caroline Homer **(Chair)**
- Assoc Professor Emily Callander
- Assoc Professor Cath Chamberlain
- Professor Jeanie Cheong
- Dr Mary-Ann Davey
- Dr Miranda Davis-Tuck
- Assoc Professor Rebecca Giallo
- Professor Lisa Hui
- Professor Rod Hunt
- Assoc Professor Alexis Shub
- Professor Joshua Vogel

Glossary

Adjusted perinatal death

Terminations of pregnancy for psychosocial indications are excluded in adjusted perinatal deaths. This provides a more accurate measure for assessing avoidable mortality and for comparisons with other jurisdictions both nationally and internationally.

Adjusted stillbirth

Terminations of pregnancy for psychosocial indications are excluded when calculating adjusted stillbirths. This provides a more accurate measure for assessing avoidable mortality and for comparisons with other jurisdictions both nationally and internationally.

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 colouration. A score of 10 represents the best possible condition.

Birthing episodes (previously confinements)

The number of women who gave birth (regardless of whether the pregnancy resulted in one or more babies, and regardless of whether the baby/babies were liveborn or stillborn) with a gestation of 20 weeks or more or at least 400g birthweight if gestation unknown.

Body Mass Index (BMI)

Obesity is generally defined as a BMI of 30 or more. Individuals with a BMI between 25 and 30 are considered overweight but not obese. This is in line with international guidelines from the World Health Organization.

Child death

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

Congenital anomaly (formerly 'birth anomaly')

Any abnormality of prenatal origin arising from conception or occurring before the end of pregnancy. This includes structural, functional, genetic, chromosomal and biochemical anomalies. Perinatal Society of Australia and New Zealand coding uses the wording 'congenital abnormality.' CCOPMM uses the wording 'congenital anomaly', and the terms 'congenital abnormality' and 'congenital anomaly' are considered to be synonymous.

Crude birth rate

Measured by the number of livebirths (see definition below) per 1,000 estimated female resident population aged 15–44 years for a given calendar year.

Episiotomy

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

An Australian Bureau of Statistics measure of the population based on residence. It refers to all people, regardless of nationality or citizenship, who usually live in Australia, except for foreign diplomatic personnel and their families. The CCOPMM report uses estimated female resident population, aged 15–44 years, in its reporting.

Fetal growth restriction

Fetal growth restriction is a condition in which an unborn baby (fetus) is smaller than expected for the number of weeks of pregnancy (gestational age).

Infant death

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

Livebirth

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

Maternal death

Maternal death refers to the death of a woman while pregnant or within 12 months of the end of the pregnancy, irrespective of the cause of death. This definition allows for classification of maternal deaths as follows:

Direct – the death is due to a complication of the pregnancy or its management (for example, haemorrhage from placenta praevia).

Indirect – the death is 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 resulting from a known mental health disorder are usually categorised as indirect. If there is no history of mental health disorder, the classification is direct.

Coincidental – the death is considered unrelated to pregnancy (for example, a passenger in a motor vehicle accident). Coincidental deaths are not included in the maternal mortality ratio.

Early maternal death – when the death occurs during pregnancy or within 42 days of birth or end of pregnancy. The death may be due to direct, indirect or coincidental causes.

Late maternal death – when the death occurs after 42 days but within a year of the birth or end of pregnancy. The death may be due to direct, indirect or coincidental causes. Late deaths are not included in the maternal mortality ratio.

Median

The middle point of a set of numbers. The median is chosen rather than the mean (average) when describing the age of women giving birth because it is less skewed by ages that sit at extreme ends of the range.

Neonatal death

Death of a liveborn infant fewer than 28 days after birth. All neonatal deaths must be reported to CCOPMM. However, those included in the report are those of at least 20 weeks' gestation, or if gestation is unknown, weighing at least 400 grams.

Perinatal death

CCOPMM defines perinatal death to include stillbirth and neonatal deaths within 28 days of birth of infants of ≥ 20 weeks' gestation or, if gestation is unknown, of birthweight ≥ 400 grams. Stillbirths and livebirths with only brief survival are grouped into 'perinatal deaths' on the assumption that similar factors are associated with these losses.

CCOPMM also reports nationally on perinatal deaths of infants with a birthweight of ≥ 500 grams 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 livebirths weighing < 500 grams and most cases where the pregnancy was terminated for fetal or maternal indications.

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.

Postpartum haemorrhage

Maternal blood loss of 500 mL or more in the 24 hours following birth.

Pre-eclampsia

A complication of pregnancy characterised by high blood pressure and damage to another organ/system.

Sepsis/septic shock

A life-threatening complication of an infection. Septic shock is also a life-threatening condition caused by severe localised or system-wide infection that requires immediate medical management.

Stillbirth

The birth of an infant of at least 20 weeks' gestation or, if gestation is unknown, weighing at least 400 grams, who shows no signs of life at birth.

Sudden unexpected deaths in infancy

Sudden unexpected deaths in infancy This group of deaths includes all infants (under one year of age) who die suddenly and unexpectedly after they are placed for sleeping.

Sudden unexpected deaths in infancy (SUDI) can be classified as **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
- or 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 in the report.

SUDI deaths are included in the 'explained' category where a cause of death is identified (usually at autopsy) 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 definitions:

General definition: The sudden unexpected death of an infant under one 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: Includes deaths that meet the requirements of the general definition and all the following requirements:

- Clinical:
  - older than 21 days and younger than 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.
- 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 pathological 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 grams 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: Includes infant deaths that meet the requirements of the general definition and the criteria for category IA, except that investigation of the various scenes where incidents leading to death might have occurred was not performed or ≥ one of the following analyses were not performed:

- toxicological
- microbiological
- radiological
- vitreous
- chemistry
- metabolic screening studies.

Category II: Includes infants that meet category I except for one or more of the following:

- Clinical:
  - age range outside that of category IA or IB (that is, 0–21 days or 270 days (nine months to first birthday)
  - similar deaths among siblings, close relatives or infants in the custody of the same caregiver that are not 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.

Trimester gestation values

- First trimester: gestation ≤ 13 completed weeks
- Second trimester: gestation 14–28 completed weeks
- Third trimester: gestation ≥ 29 completed weeks

Unclassified sudden infant death: Includes deaths that do not meet the criteria for category I or II 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 SUDI') may be included in the previous categories, depending on the fulfilment of relevant criteria.

Consultative Council on
Obstetric and Paediatric
Mortality and Morbidity

Safer Care
Victoria