Consultative Council on Obstetric and Paediatric Mortality and Morbidity

Victoria's Mothers, Babies and Children

2020

Safer Care Victoria

59th survey of deaths in Victoria

ABOUT THE COVER IMAGE

The 'radar' on the front cover signifies the multifaceted and interconnected focus of the Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM), leading to a central focus point or learning.

The layers symbolise the depth of analysis and review that leads to identifying the underlying circumstances that contributed to the adverse outcomes we see in this report. The central point of the radar also represents a focus on performance improvement for individual care and the broader health system, like a lens in a camera focusing on its subject.

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Acknowledgement of country
Our office is based on the land of the Traditional Owners, the Wurundjeri people of the Kulin Nation. We acknowledge and pay respect to their history, culture, and Elders past and present.

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Abbreviations

ACCHO – Aboriginal Community Controlled Health Organisation

AIHW – Australian Institute of Health and Welfare

BMI – body mass index

CCOPMM – Consultative Council on Obstetric and Paediatric Mortality and Morbidity

EFRP – estimated female resident population

GDM – gestational diabetes mellitus

GPP – good practice points

ICU – intensive care unit

IHI – Institute for Healthcare Improvement

KMS – Koori Maternity Services

LHS – learning health system

MMR – maternal mortality ratio

PMHp – Perinatal Mental Health pilot

PMR – perinatal mortality rate

PPH – postpartum haemorrhage

PSANZ – Perinatal Society of Australia and New Zealand

PSPI – Perinatal Services Performance Indicators

RRSC – Research and Reporting Subcommittee

SAMM – severe acute maternal morbidity

SCV – Safer Care Victoria

SUDI – sudden unexpected death in infants

VACCHO – Victorian Aboriginal Community Controlled Health Organisation

VAHI – Victorian Agency for Health Information

VCAR – Victorian Congenital Anomalies Register

VPDC – Victorian Perinatal Data Collection

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Message from the chair

2020 was an extraordinary 12 months. The unprecedented scale of the COVID-19 pandemic had far-reaching impacts on women, babies, children, and their families as well as our clinicians, the wider health care team, and our community.

The pandemic changed the way we were able to engage with and support those in our care and was at times challenging and difficult. It has compounded existing social and health challenges in our health care system and community, and we have seen that play out with increased stress, anxiety and uncertainty.

This report, and the accompanying presentations and data, reflect the 2020 year.

By March 2020, it became clear that the COVID-19 pandemic would significantly impact maternity, neonatal and child health services, with changes made to the way care was provided in every Victorian public and private health service.

In May 2021, CCOPMM published the COVID-19 communique, a rapid review looking at some of our routinely collected data. While we didn't see any significant impact on key clinical outcomes for women and babies at a state-wide level, CCOPMM recognised we were not able to monitor all aspects of the care provided and received. We are committed to ongoing monitoring of the impact of the pandemic.

As in previous years, we continue to see poorer outcomes in our most vulnerable women and children. It is imperative the health system responds to adequately address the gaps in access and quality of care, with a stronger focus on early intervention and prevention strategies. Forming strategic partnerships with critical partners to inform targeted initiatives and to improve services for our most vulnerable populations is a key recommendation to strengthen and enhance existing services and to continue to close the gap in care.

The diligent work of CCOPMM has continued throughout the pandemic. While some aspects of our work slowed or changed, CCOPMM continues its critical work: undertaking case reviews, collecting and analysing data on birthing episodes provided by our health services (we thank you), conducting and providing data for research, and contributing to national reporting while adapting to new technologies and changed work practices.

All members of the council and our subcommittees should be proud of what we have achieved. For all your hard work around our tables and the many other tables you sit behind, I thank you on behalf of those who matter most – women, babies, children, families and the Victorian community.

Adj Prof Tanya Farrell
Chair, CCOPMM

Executive summary

Victoria's mothers, babies and children 2020 report presents data and trends on births and deaths, recommendations and feedback on the progress of the previous year's recommendations. This report and the presentations and supplementary tables that support it highlight areas that require further focus and improvement priorities for clinical practice, health and community policy development, service delivery and planning for women, babies and children across Victoria.

Each year, the Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM) provides expert independent advice, reports on the state's annual birth data and makes recommendations based on our in-depth case reviews. Alongside the recommendations, CCOPMM develops good practice points to guide best practice in service delivery and clinical care.

Implementation of the recommendations and good practice points occurs in close collaboration with our key partners including consumers, Safer Care Victoria (SCV), the Department of Health (the department), clinicians and Victorian health services.

This year, CCOPMM applied a different approach to the way recommendations and good practice points were developed. The new approach considers the impact of the whole healthcare and human service system on outcomes. Our systems of care are complex. This approach recognises that the interactions and relationships between different aspects of the system impact outcomes in a variety of ways. It particularly acknowledges that clinical care is complex and the associated outcomes for women, babies and children are often due to the interaction of multiple contributing factors, rather than one factor alone.

In addition, we reflected on the issues and themes from this year and their alignment and connection with issues and themes that have been reported in the past. It is important for us all to continue to reflect on how harm can be reduced, and how the experience of care can be improved. CCOPMM will continue to refine its processes, be more targeted in addressing harm, reflect a whole systems approach, and consider the impact we have for Victoria's mothers, babies and children over time.

SNAPSHOT OF BIRTHS IN VICTORIA

- In 2020, 75,870 women gave birth to 76,990 babies. That's 1,909 fewer women and 1,964 fewer babies than in 2019.
- The median age of women giving birth in 2020 was 32 years, and the median age of women having their first birth was 30.
- 77.9 per cent of women gave birth under the care of a public maternity service, including 108 public home births. 21.7 per cent of women gave birth in a private hospital. An additional 313(0.4%) gave birth at home under the care of a private midwife.
- Of the women giving birth in 2020, 39.3 per cent were born outside of Australia.
- 8.0 per cent of women smoked at some time during their pregnancy (an increase from 7.7 per cent in 2019).
- The proportion of women giving birth by caesarean section continues to increase from 37.2 per cent in 2019 to 38.4 per cent in 2020.
- In 2020, 7.9 per cent of babies were born before 37 weeks.

During the COVID-19 pandemic, CCOPMM measured and reported key outcomes for women and babies at a statewide level. These preliminary findings were reported in the CCOPMM COVID-19 communique[1]. Overall, the statewide data suggested no significant areas of concern requiring immediate interventions. CCOPMM has recommended further investigation of the impact of COVID-19 by continuing to measure and report on selected outcomes for women, babies and children.

MATERNAL MORTALITY AND MORBIDITY

- There were eight maternal deaths in 2020, with 31 deaths now reported in the 2018-20 triennium.
- The Victorian maternal mortality ratio for the three years between 2018 and 2020 is 7.0 deaths per 100,000 women who gave birth.

CCOPMM has identified multiple complexities for women who died by suicide. These women lived with a combination of complex mental health and social conditions, substance use, family violence, intellectual disability and/or contact with child protection services. CCOPMM has recommended that there is more support for these women by ensuring early intervention programs and preventative care focuses on improving outcomes for priority populations.

CCOPMM uses intensive care unit admissions to identify severe acute maternal morbidity cases in Victoria, with reporting commencing on 1 July 2017. In 2020, there were 195 maternal intensive care admissions reported to CCOPMM.

PERINATAL MORTALITY

- In 2020, 77203 babies were born with a gestation greater than or equal to 20 weeks (or, if gestation unknown, greater than or equal to 400 g birthweight), [adjusted total births].
- There were 687 adjusted perinatal deaths; 492 stillbirths and 195 neonatal deaths.
- Victoria's adjusted perinatal mortality rate was 8.9 per 1,000 births, which was slightly higher than 2019 (8.7 per 1,000 births).
- The stillbirth mortality rate was 6.4 per 1,000 births (the same as 2019) and the neonatal mortality rate was 2.5 per 1,000 births (slightly higher than 2.3 per 1,000 births in 2019).
- The leading cause of adjusted stillbirth (excluding terminations for congenital anomalies) was unexplained antepartum fetal death (13.4 per cent), where a definitive cause could not be established.
- Extreme prematurity (less than 24 weeks gestation, 33.8 per cent) and cardio-respiratory disorder (10.8 per cent) were the most common causes of neonatal deaths (excluding terminations for congenital anomalies).
- In 2020, 210 (44.3 per cent) of the 474 perinatal deaths reviewed had contributing factors identified (excluding termination of pregnancy for maternal psychosocial indication or congenital anomaly).
- The perinatal mortality rate in women who smoked at all during pregnancy was higher (10.1 per 1,000 births) than in those who did not smoke while pregnant (exluding termination of pregnancy for maternal psychosocial indication).

[1] CCOPMM COVID-19 communique: https://www.bettersafercare.vic.gov.au/sites/default/files/2021-07/CCOPMM%20COVID19%20Communique%20FINAL.pdf

Improving smoking cessation rates continues to be key to many stillbirth reduction initiatives. An ongoing focus on strategies to improve smoking cessation rates is likely to lead to further reductions in stillbirth rates. Programs that support women to stop smoking should be prioritised.

CCOPMM recommends and will actively support the development of a learning system model for Victorian maternity, newborn and paediatric services to create an environment where consumers, health services and government can work together to learn and improve in an integrated way. CCOPMM will also commission specific safety reviews into reoccurring issues including fetal monitoring to identify system level contributing factors.

ABORIGINAL BIRTHS, MORTALITY AND MORBIDITY[2]

Aboriginal women and babies continue to have poorer outcomes than non-Aboriginal women and babies.

- In 2020, 1,134 women who identified as Aboriginal gave birth to 1,151 babies in Victoria (1.5 per cent of all women and 1.5 per cent of all babies born).
- For the 2018–2020 triennium, the perinatal mortality rate of babies born to Aboriginal women was higher than that of non-Aboriginal women (11.3 and 8.7 per 1,000 births respectively).
- For the 2018–2020 triennium, the stillbirth rate of babies born to Aboriginal women was higher than that of non-Aboriginal women (7.8 and 6.3 per 1,000 births respectively).
- For the 2018–2020 triennium, the neonatal mortality rate of babies born to Aboriginal women was higher than that of non-Aboriginal women (3.5 and 2.5 per 1,000 births respectively).
- Aboriginal women were more likely to smoke compared to non-Aboriginal women (41.3 per cent compared with 7.5 per cent respectively).
- Babies of Aboriginal women were more likely to be born with a birthweight less than 2500g than non-Aboriginal women (10.9 per cent compared with 6.5 per cent respectively) and be born prematurely (13.3 per cent compared with 7.8 per cent respectively).

As the numbers of Aboriginal women and babies are small, there is a high degree of variability from year to year. Further analysis of this data is important to understand these outcomes and prioritise areas where improvements are required.

CCOPMM has recommended that there is more focus on improving health outcomes for Victorian Aboriginal mothers, babies and children by supporting research and quality improvement initiatives, informed by Aboriginal health partners and with the Aboriginal community.

[2] Note: Where the term 'Aboriginal' is used it refers to both Aboriginal and Torres Strait Islander people.

INFANT, CHILD AND ADOLESCENT MORTALITY

In Victoria, child and adolescent mortality rates are low, but there are deaths that can be prevented. From the review of these deaths there are important findings that inform improvements that need to be made by both our health services and our community to prevent these deaths.

- In 2020, CCOPMM was notified of 181 Victorian residents aged 28 days–17 years who died. This is 53 fewer deaths than in 2019.
- These 181 deaths include 126 deaths in children aged one to 17 years and 55 deaths of infants aged 28-364 days.
- In 2020, the Victorian infant and under-five-year mortality rates were 2.7 and 3.2 deaths per 1000 live births respectively.
- There were 39 deaths due to unintentional injury in 2020, including 14 motor vehicle accidents, 11 drownings, seven asphyxia deaths and seven deaths from other unintentional injuries.

Areas of focus include water safety, safe sleeping and correct use of baby equipment, and assessing and remediation of choking hazards in the home.

CCOPMM has recommended that clinical governance, incident review, reporting processes and quality improvement capability is strengthened across maternity, neonatal and paediatric services by developing and implementing targeting improvement programs. A key requirement of every clinical governance system is a clinical incident management system where cases of serious harm or death are reviewed and reported and opportunities for improvement identified, implemented and audited.

Introduction

Victoria's mothers, babies and children 2020 presents data and trends on the births and deaths reported to and reviewed by CCOPMM and its subcommittees. The report includes recommendations for government, health and community services, clinicians and the wider health and community sectors. Good practice points are also developed 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. However, we can and should always strive to improve health outcomes and experiences for women, babies children and their families and for our community.

Through its processes, CCOPMM captures birth data, identifies trends and instances of preventable mortality and morbidity and highlights factors that contribute to these outcomes. Monitoring trends and reporting instances of preventability ensures that we can continually improve the quality and safety of care and experiences.

THE REPORT HAS FIVE SPECIFIC SECTIONS

1. Women and babies
2. Maternal mortality and morbidity
3. Perinatal mortality
4. Aboriginal women and babies
5. Infant, child and adolescent mortality

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).

The reviews undertaken by CCOPMM occur in one of four subcommittees:

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

In addition, CCOPMM undertakes research and reports on its activities annually through a range of publications and resources. These include this annual report, a series of PowerPoint presentations for health services and clinicians to easily share good practice points, and supplementary data tables that complement this report.

CCOPMM provides independent advice, quality and safety monitoring and information to the Victorian Government. This helps to prioritise improvement activities, contributes to policy and guideline development and provides feedback to the Victorian health and human services systems and to the community. More information is available in the 'About CCOPMM' section of this report.

CCOPMM reporting

This report is part of a suite of tools aimed at improving the use of data and supporting you to share our recommendations and good practice points. The births flow diagram (Appendix 3) outlines the scope of the data collections and case inclusions and exclusions.

Resources in the 2020 reporting suite

1. This Victoria's mothers, babies and children 2020 report contains the annual perinatal data and summary data on the deaths of mothers, babies, children and adolescents as well as selected morbidity for mothers. This report encompasses the 2020 CCOPMM recommendations and feedback on the progress 2019 CCOPMM recommendations.
2. A slide pack with additional summary data, trends, recommendations and good practice points.
3. Supplementary tables with more detailed data from 2020.

All resources will be available on the Better safer care website.

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
  www.lifeline.org.au
- Red Nose
  rednosegriefandloss.org.au
- SANDS
  www.sands.org.au

CCOPMM recommendations and good practice points

Our recommendations and good practice points reflect the findings of CCOPMM's review of all cases of maternal, perinatal and paediatric mortality and SAMM for 2020.

In Victoria, these recommendations and good practice points are shared, and implementation occurs through close collaborations with Safer Care Victoria (SCV), the Department of Health (the department), health services, the Coroners Court of Victoria, and the Victorian Managed Insurance Authority.

Good practice points 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 good practice points in the context of their settings and implement those that will improve the care they provide.

To ensure ongoing improvement and prioritisation of areas 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 within their service to determine contributing factors. This should be done by a multidisciplinary mortality and morbidity committee that is accountable to review, action any learning and monitor ongoing performance.

Health services should ensure that 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, and make policy and planning decisions across our state. The VPDC data is analysed for use in this report.

The data provided by the VPDC is also used to produce the annual Perinatal Services Performance Indicators (PSPI) report. The PSPI report provides benchmarks and transparent site-specific outcome data across public and private maternity services. Both reports are used by services to prioritise their improvement programs.

Recommendations

2020: A NEW APPROACH

Historically, CCOPMM has provided expert independent advice, making recommendations based on our in-depth case reviews. Alongside the recommendations, CCOPMM has developed good practice points to guide best practice in service delivery and clinical care. Implementation of the recommendations and good practice points occurs in close collaboration with our key partners including consumers, SCV, the department, clinicians, and Victorian health services.

A 'systems thinking' approach

In 2020, CCOPMM applied a different approach to the way we have developed our recommendations and good practice points. This new approach uses what is known as 'systems thinking'.

This approach uses contemporary safety science and emphasises the complexity of healthcare by considering interactions and relationships between the different factors that are part of the system, ranging from governmental and regulatory influences to patient characteristics.[3,4] It particularly acknowledges that clinical care is complex and that when harm occurs it is often due to the interaction of multiple contributing factors, rather than being caused by one single factor.

In addition, CCOPMM reflected on the issues and themes from the 2020 case reviews, how these align across maternal, perinatal and child and adolescent mortality and morbidity cohorts, and the connection with issues and themes that have been reported and the recommendations made from previous years.

We continue to discuss and reflect on how we can further reduce harm, improve care and experiences. As we do this, we are constantly refining our processes to be more targeted in addressing preventable harm, reflect a whole systems approach, and consider how we measure the impact our recommendations are having on improving outcomes for Victoria's mothers, babies and children over time.

Areas of focus in 2020

CCOPMM has identified focus areas that require action to prevent unwarranted and devastating outcomes for individuals, families and the Victorian community.

CCOPMM's 2020 recommendations relate to:

- the impact of COVID-19
- creating a learning system
- clinical governance
- supporting high-priority groups
- improving the health and wellbeing of Aboriginal and Torres Strait Islander women and children.

[3] Read, G.J.M., Shorrock, S., Walker, G.H. & Salmon, P.M. (2021). State of science: evolving perspectives on human error'. Ergonomics, 64:9, 1091-1114

[4] Taylor-Adams, S & Vincent, C. (2001), *Systems analysis of clinical incidents – The London Protocol*, Imperial College London, London, viewed Jan 2022, https://www.imperial.ac.uk/media/imperial-college/medicine/surgery-cancer/pstrc/londonprotocol_e.pdf

MEASURING THE IMPACT OF COVID-19 ON THE MATERNITY, NEONATAL AND PAEDIATRIC HEALTH SYSTEM

Recommendation 1

CCOPMM and SCV collaborate with key partners in continuing to measure and report on the impact of the COVID-19 pandemic on selected outcomes for women, babies and children.

Proposed collaborative partners

Consumers, clinicians, health services, universities and research institutes, CCOPMM, SCV, the department and the Victorian Agency for Health Information (VAHI).

About this recommendation

CCOPMM collects data on mortality and selected morbidity related to direct and indirect causes of COVID-19. This data is used to monitor and report on outcomes for these population groups to help inform prevention strategies and clinical care.

During 2020, key outcomes were measured for women and babies at a statewide level. These preliminary findings were reported in the CCOPMM COVID-19 communique.

- Overall, the statewide data suggested no significant areas of concern requiring immediate interventions.
- The analysis was limited, however; it did not report on mental health outcomes or the experiences of women and families.
- Other outcomes, such as breastfeeding, separation of mother and baby, quality of care, service specific variabilities, and impact on specific demographic groups were also not included.

National qualitative and quantitative data did report significant impacts on women and partners across Australia including women from Victoria.[5] The findings highlighted that:

- becoming a mother during the COVID-19 pandemic in Australia was a profound experience for women
- the sense of isolation, and limited availability of social and peer support were common experiences
- many partners and support persons were also negatively impacted by restrictions placed on maternity services during the pandemic.

Further research is needed to understand the direct and indirect impacts of the COVID-19 pandemic on women, babies and children in Victoria. The findings of this research can be used to inform system changes that need to be made to meet their ongoing needs and further inform care provision and priorities as the COVID-19 pandemic continues and as we transition to post pandemic care.

- CCOPMM has been working with the VAHI to include COVID-19 specific measures in the VPDC for ongoing monitoring and reporting.
- In 2022, CCOPMM and SCV will continue to work with key partners to review and refine the current suite of COVID-19 indicators to monitor the effects of policy and practice change with the plan to incorporate patient experience.
- CCOPMM will continue reporting of outcome data and trends to inform policy and practice via the CCOPMM COVID-19 communique.

[5] Homer, C., et al., Counting stillbirths and COVID 19—there has never been a more urgent time: 2020

Proposed process and outcome measures for monitoring and improvement

- Maternal and perinatal mortality and selected morbidity rates associated with COVID-19 infection during pregnancy.
- Mortality and selected morbidity rates in babies and children with COVID-19.
- Mortality rates and selected morbidity for mothers, babies and children where care has been impacted by model of care changes (including telehealth) and/or service restrictions due to COVID-19.
- Understanding the experience of care and satisfaction rates during COVID-19.

STRENGTHENING LEARNING SYSTEMS IN MATERNITY, NEONATAL AND PAEDIATRIC CARE

Recommendation 2

CCOPMM will actively support the development of a learning system model[6] for Victorian maternity, neonatal and paediatric services to create an environment where consumers, health services and government can work together to learn and improve in an integrated way.

Proposed collaborative partners

Consumers, Victorian health services, universities and research institutes, CCOPMM, SCV and the department.

About this recommendation

A learning health system (LHS) is based on the concept of rapid learning from data and evidence, and timely application of that knowledge to produce continual improvement in care. A LHS is underpinned by the principles of whole system learning; that is, where learning and improvement is enabled by partnerships across all stakeholder groups including consumers, health services and government.

Collaboration between health services and government is required to enable an integrated maternity, neonatal and paediatric system for all consumers in Victoria.

[6] Olsen L, Aisner D, McGinnis JM (2007). The Learning Healthcare System: Workshop Summary. Institute of Medicine (US). National Academies Press (US). ISBN 978-0-309-10300-8.

To assist this process, CCOPMM has recommended the development of a proposal for a learning system model and plan for Victorian maternity, neonatal and paediatric services including:

- local maternity dashboards and tools to support boards and clinical leaders to use the data to identify and address risk, improve incident review and to drive improvement
- leveraging the work of existing surveillance systems and dashboards currently in use or being developed
- an integrated system level dashboard with aggregate outcome data to assist with system level learning and reporting
- reviewing, refining and integrating the Victorian PSPI suite, using CCOPMM and system safety data, to measure the impact of the learning system to improve key health outcomes.

Understanding key drivers for improvement and ensuring this information is fed back into the system is essential to a learning system. CCOPMM will commission specific safety reviews into reoccurring issues, starting with neonatal resuscitation and fetal monitoring to identify system level contributing factors.

To capture these systems factors, the AcciMap methodology[7] will be applied. AcciMap is a contemporary, systems-focused review method used in many high-risk industries. AcciMap identifies how factors at different levels of a complex system interact, and how this interaction contributed to an adverse outcome.

Applying a systems lens to reviewing recurring issues is critical in the development and implementation of stronger, system-based recommendations. AcciMap will ensure we move away from a focus on individual actions at the frontline by consistently looking at contributing factors across the entire system, ranging from external and regulatory influences through to patient characteristics.

It is also recommended that a mortality and morbidity case review tool is piloted with select services to build internal capability in systems thinking and incident review capability, and to improve processes for rapid review, reporting, learning from serious adverse events and systems improvement.

Proposed process and outcome measures for monitoring and improvement

- The rates of maternal, perinatal and paediatric deaths where preventable harm has been identified are reviewed, have actions implemented and are audited.
- The rates of preventable harm are monitored.

Additional resources

- Whole System Quality - Institute for Healthcare Improvement
- Improving maternity care in Victoria: An accidental learning healthcare system
- A Learning Health System: Learning together for better health - brief report (monash.edu)

[7] Waterson, P., Jenkins, D.P., Salmon, P.M. Underwood, P. (2017). 'Remixing Rasmussen': The evolution of AcciMaps within systemic accident analysis. *Applied Ergonomics*, 59, 483-503.

STRENGTHENING CLINICAL GOVERNANCE WITHIN MATERNITY, NEONATAL AND PAEDIATRIC SERVICES

Recommendation 3

Develop and implement targeted improvement programs for maternity, neonatal and paediatric services to strengthen clinical governance, incident review, reporting processes and quality improvement capability.

Proposed collaborative partners

Consumers, Victorian health service boards, the department and SCV.

About this recommendation

Clinical governance was a key area of concern outlined in the Targeting zero[8] report.

To ensure Victorian maternity, neonatal and paediatric health service boards and executives continue to provide services that are safe and high-quality, clinical governance capability must continue to be an area of focus. It is recommended health service boards and executives participate in SCV clinical governance training to strengthen their leadership, culture and improve quality and safety practice.

In addition, these health service boards and executives can use the SCV clinical governance assessment tool[9] to determine clinical governance capability and performance, and to identify areas for improvement.

CCOPMM recommends inclusion of clinical governance improvement plans and progress reports in the department's performance monitoring process to improve accountability and oversight of a service's clinical governance processes.

A key requirement of every clinical governance system is a clinical incident management system where cases of serious harm or death are reviewed and reported and opportunities for improvement identified, implemented and audited. Where mandated, this information should be reported to CCOPMM and SCV to provide further monitoring and learning across the system. More information about reporting requirements can be found on the Safer Care Victoria website.

An effective quality and safety system should also have in place clear and robust escalation policies for addressing the deteriorating patient. These systems should have clear credentialing, education and training requirements that include a regular auditing program to ensure that policies, procedures and processes are adhered too. For example – recognition of and appropriate response to fetal compromise, neonatal and paediatric resuscitation.

Victorian health service boards should set specific clinical governance measures and targets that can then be monitored at a system level.

Proposed process and outcome measures for monitoring and improvement

- Improved timeliness of reporting and quality of information on reportable deaths and severe morbidity be provided to CCOPMM.
- Improved quality and timeliness of case review reports (including in-depth review and root cause analysis) received by CCOPMM.

Additional resources

- SCV's Delivering high-quality healthcare: Victorian clinical governance framework.

[8] Targeting Zero, executive summary: https://www.health.vic.gov.au/sites/default/files/migrated/files/collections/research-and-reports/h/hospital-safety-and-quality-assurance-in-victoria-executive-summary.pdf

[9] Clinical governance assessment tool, Safer Care Victoria: https://www.bettersafercare.vic.gov.au/support-and-training/clinical-governance

SUPPORTING WOMEN, CHILDREN AND FAMILIES FROM HIGH PRIORITY GROUPS

Recommendation 4

Ensure early intervention and preventative care programs focus on improving outcomes for priority maternal and child populations including:

- children who are involved with the child protection and out-of-home care system
- those who identify with being Aboriginal and Torres Strait Islander
- children involved with the youth justice system
- those with socioeconomic disadvantage
- those who are from diverse communities
- those living with mental health challenges
- those facing family violence.

Proposed collaborative partners

Consumer groups representing diverse populations, CCOPMM, Victorian government health and human services agencies including child and family services, Victorian healthcare providers (including aboriginal and culturally and linguistically diverse health services), primary care networks, the Commissioner for Children and Young People, and the Victorian Children's Council.

About this recommendation

Successive CCOPMM reports have highlighted the disproportionate mortality and morbidity experienced by priority populations of women, children and their families.

A consistent theme in the cases examined by CCOPMM is a lack of access to appropriate and timely health care, and disparities in the social determinants of health.

In order to understand and address these inequities, CCOPMM recommends a system-focused approach. This would involve leveraging work of existing maternal, child and adolescent health partnerships and advisory groups across the system to guide and inform the Victorian government's approach for at-risk women, children and families.

The focus of this work would include:

- examining evidence to support system reforms such as funding models and accountability mechanisms (including those focussed on prevention/early intervention)
- mapping governance structures across government for increased accountability and easier navigation by clinicians and service providers
- exploring and evaluating integrated care models such as community-based 'hospitals' program and Infant, Child and Family Mental Health and Wellbeing hubs
- increased investment/expansion of evidence-based models including the expansion of continuity of care models for pregnant women with complex needs
- evaluation of existing initiatives/programs such as Pathways to Good Health and new initiatives for example Putting Families First, the Infant, Child and Family Mental Health and Wellbeing hubs and Family Preservation and Reunification Response[10]
- development of a measurement strategy to measure improvement in outcomes at a systems level.

[10] Family preservation and reunification response: https://providers.dffh.vic.gov.au/family-preservation-and-reunification-response

CCOPMM recognises the importance of measuring health equity and is developing a research plan to examine the data relating to vulnerability and disparities in outcomes experienced by certain groups. This is to gain a better understanding of the drivers of these inequities and to inform further targeted initiatives.

CCOPMM has identified a gap in perinatal mental health data, specifically examining the impact of COVID-19 on the wellbeing of women and babies. CCOPMM and SCV are engaging with the Australian Institute for Health and Welfare (AIHW) on the Perinatal Mental Health pilot (PMHp).

The PMHp aims to build the evidence on the mental health status and needs of parents during the perinatal period. The PMHp will support routine mental health and psychosocial screening in accordance with the national perinatal mental health guidelines.

Proposed process and outcome measures for monitoring and improvement

- Mortality rates for subgroups identified under recommendation 4.
- Perinatal mental health data items included in the 2022 VPDC for reporting in 2023.

CLOSING THE GAP: IMPROVING ABORIGINAL AND TORRES STRAIT ISLANDER MATERNAL AND CHILD HEALTH AND WELLBEING

Recommendation 5

Actively support the research and quality improvement initiatives that are being led by our Aboriginal health partners, to ensure best practice and improve health outcomes and wellbeing.

Proposed collaborative partners

Consumers, Victorian Aboriginal Community Controlled Health Organisation (VACCHO), Aboriginal Community Controlled Health Organisation (ACCHOs), Koori Maternity Services (KMS), universities and research institutes, SCV, the department, CCOPMM.

About this recommendation

CCOPMM data continues to show Aboriginal mothers and babies disproportionally experience poorer health outcomes than non-Aboriginal mothers and babies.

This recommendation aims to build on existing evidence and research that is underpinned by self-determination, co design and genuine partnership between the broader maternity sector and ACCHOs.

CCOPMM plans to work with our Aboriginal health and research partners to identify evidence gaps and research priorities for addressing the health needs of Aboriginal children and families. This includes increasing access to culturally safe health care.

Cultural safety is defined as *'... individuals, organisations and systems taking responsibility to support self-determination for Aboriginal peoples – this includes sharing power (decision making and governance) and resources with Aboriginal communities, and is especially relevant for the design, delivery and evaluation of services for Aboriginal peoples.*[11]*'* (Aboriginal and Torres Strait Islander cultural safety framework Phillips 2015).

CCOPMM and SCV will continue to collaborate with VACCHO and KMS to design maternity improvement projects focused on reducing smoking during pregnancy and reducing risk factors for stillbirth.

Proposed outcome measures for monitoring and improvement

- Aboriginal perinatal mortality rates
- Aboriginal smoking in pregnancy rates
- Sudden unexpected deaths in infants (SUDI) rates
- Aboriginal cultural safety measures

Additional resources

- Department of Health Aboriginal and Torres Strait Islander Cultural Safety webpage
- Code of ethics and guidelines for Aboriginal and Torres Strait Islander research (AIATSIS 2020)
- Indigenous evaluation strategy (Australian Government Productivity Commission 2020)
- Effect of a Birthing on Country service redesign on maternal and neonatal health outcomes for First Nations Australians: a prospective, non-randomised, interventional trial
- Indigenous birthing services vital to health of mothers and babies

[11] Aboriginal and Torres Strait Islander Cultural Safety Framework - https://www.dhhs.vic.gov.au/sites/default/files/documents/202004/Part%201-Aboriginal%20and%20Torres%20Strait%20Islander%20cultural%20safety%20framework-20190620.pdf

Progress on 2019 recommendations

The 2019 Victoria's Mothers, Babies and Children report provided **10 recommendations** for improvement across **three themes**:

1. Perinatal care
2. Maternal care
3. Child and adolescent care.

Detailed information on these recommendations is available in the Victoria's mothers, babies and children report 2019.

Progress on implementing these recommendations is summarised below.

MATERNITY SERVICES MUST DEVELOP AND REGULARLY AUDIT A PATHWAY THAT FACILITATES RAPID ACCESS TO AN EMERGENCY OPERATING THEATRE 24/7 TO PREVENT SIGNIFICANT MATERNAL OR PERINATAL MORBIDITY OR MORTALITY

Recommendation 1a

This recommendation is being considered by the department. The *Capability frameworks for Victorian maternity and Newborn Services* (2019) requires 24/7 access to the workforce, equipment and space required for emergency caesarean section for all birthing services (levels 2-6).

The framework currently defines 'access/accessible' in relation to workforce as an available staff member who is formally on-call and can be immediately contacted to provide advice and/or deliver face-to-face care within the timeframes agreed by the health service. The department will consider whether the existing capability framework requirements can be strengthened to support the intent of the recommendation.

The maternity a newborn policy team, in consultation with the Chair of CCOPMM, considered whether the existing capability framework requirements could be strengthened to support the intent of the recommendation; however, without an agreed definition for 'rapid access', this was not achieved.

FOR ALL CATEGORY 1 CAESAREAN SECTIONS, SERVICES MUST RECORD THE TIME IN WHICH THE DECISION WAS MADE TO PERFORM THE CAESAREAN SECTION – TO ENABLE THE ACCURATE RECORDING OF THE TIME TAKEN FROM THE 'DECISION TO DELIVER' TO THE BIRTH OF THE BABY

Recommendation 1b

SCV has worked to add three new data items to the VPDC relating to caesarean sections. From 1 July 2021, Victorian maternity services will be required to submit the following information:

- Category of unplanned caesarean section urgency
- Date of decision for unplanned caesarean section
- Time of decision for unplanned caesarean section.

Collection of this information will enable the accurate recording of the time taken from the 'decision to deliver' to the birth of the baby.

DEVELOP AND IMPLEMENT A FORMAL TIME OUT PROCESS PRIOR TO EVERY INSTRUMENTAL BIRTH AND EMERGENCY CAESAREAN SECTION, WHETHER IN A BIRTH ROOM OR IN THE OPERATING THEATRE, TO IMPROVE SITUATIONAL AWARENESS AND DECISION MAKING ABOUT WHETHER IT IS THE RIGHT MODE OF BIRTH, IN THE RIGHT LOCATION, WITH THE RIGHT INSTRUMENT/S, AND THE RIGHT CLINICAL TEAM IN ATTENDANCE

Recommendation 2

Preliminary planning to progress this recommendation is underway. SCV is holding discussions to identify the right form of action. Members have been recruited to establish a Clinical Network Coordinating Committee; however, the date of the first meeting has not yet been set due to the current COVID-19 situation. These discussions are anticipated to commence in 2022.

DEVELOP AND IMPLEMENT A CREDENTIALING PROCESS FOR MEDICAL STAFF PRACTISING OBSTETRICS AT ALL LEVELS OF TRAINING AND EXPERIENCE WHO ARE UNDERTAKING INSTRUMENTAL BIRTHS AND COMPLEX CAESAREAN SECTIONS

Recommendation 3

The *Capability frameworks for Victorian maternity and Newborn Services* (2019)[12] requires all maternity services (levels 1-6) have in place credentialing processes for medical staff providing maternity care, including for the provision of shared care. An update of the capability framework in 2021 will seek to update current requirements to include a link to SCV's *Credentialing and scope of clinical practice for senior medical practitioners policy* (2020)[13] and require that health services' credentialing processes are in line with this policy.

An updated framework was distributed for sector feedback and consultation in June 2021. 2021-22 capability assessments are in progress.

FORMALISE PATHWAYS FOR WOMEN TO HAVE TIMELY ACCESS TO SPECIALIST CLINICAL CONSULTATIONS FROM A NAMED TERTIARY (LEVEL 6) SERVICE FOR SECONDARY AND PRIMARY MATERNITY SERVICES

Recommendation 4

Preliminary planning to progress this recommendation is underway. SCV is holding discussions to identify the right form of action. These discussions are anticipated to continue into 2022.

DEVELOP AND IMPLEMENT A SYSTEM-WIDE IMPROVEMENT PROGRAM TO PREVENT WOMEN EXPERIENCING POSTPARTUM HAEMORRHAGE (PPH)

Recommendation 5

Work to progress this recommendation will be completed in the form of a breakthrough series (BTS) collaborative led by the improvement partner in SCV. The collaborative is scheduled to begin in February 2022.

[12] The capability framework for Victorian maternity and newborn service 2019: https://www.health.vic.gov.au/patient-care/maternity-and-newborn-care-in-victoria

[13] Credentialing and scope of clinical practice for senior medical practitioners policy, 2020: https://www.bettersafercare.vic.gov.au/publications/credentialing-and-scope-of-clinical-practice-for-senior-medical-practitioners-policy

EVALUATE THE EFFECTIVENESS OF CURRENT SERVICES IN MEETING THE SPECIFIC NEEDS OF WOMEN DURING PREGNANCY AND IN THE YEAR FOLLOWING BIRTH. IF GAPS ARE IDENTIFIED, IMPLEMENT STRATEGIES TO IMPROVE THE HEALTH AND WELLBEING OF WOMEN AND FAMILIES. THE AREAS OF MENTAL HEALTH AND FAMILY VIOLENCE REQUIRE SPECIFIC FOCUSED ATTENTION

Recommendation 6

The mental health aspect of this recommendation is being progressed by the Department of Health's Mental Health and Wellbeing Division. The final report from the Royal Commission into Victoria's Mental Health System[14] made two recommendations (Recommendation 18) in relation to perinatal mental health to improve the mental health and wellbeing of expectant and new parents:

- Expand and reform the community perinatal mental health teams in each Adult and Older Adult Area Mental Health and Wellbeing Service across Victoria to adapt and deliver the core functions as set out in recommendation 5, including by providing consultation to primary and secondary care and related services for prospective and new parents, including maternal and child health nurses.
- Review approaches to perinatal mental health screening.

Subject to budget allocation, the Mental Health and Wellbeing Division will progress implementation of these recommendations in consultation with the sector and people with a lived experience of perinatal mental health challenges.

As the Mental Health and Wellbeing Division is delivering the aspect of this recommendation relating to perinatal mental health, the full recommendation has not been accepted for implementation in the department. This will be discussed with the Secretary.

REFORM OF STATEWIDE SERVICES IS NEEDED TO ENSURE THERE IS A COORDINATED AND TIMELY SYSTEM RESPONSE THAT SUPPORTS THE HEALTH AND WELLBEING OF VICTORIAN CHILDREN IN VULNERABLE SITUATIONS

Recommendation 7

The Department of Families, Fairness and Housing (DFFH) have released the *Roadmap for Reform: Strong Families, Safe Children* which focuses on transforming the child and family system focusing on earlier intervention and prevention to reduce vulnerability and improve outcomes.

The 2020 CCOPMM recommendations continue to build on this recommendation with specific actions with a greater focus on what is needed to further support vulnerable families and improve health outcomes.

[14] Royal Commission into Victoria's Mental Health System, final report: https://finalreport.rcvmhs.vic.gov.au/

DEVELOP AND ROLL OUT AN ANNUAL PUBLIC HEALTH CAMPAIGN ON THE IMPORTANCE OF INFLUENZA VACCINATION FOR CHILDREN USING CO-DESIGN PRINCIPLES WITH FAMILIES AND THEIR COMMUNITIES

Recommendation 8

The annual influenza campaign was launched on 17 May 2021. The campaign included a televised media event in which the Chief Health Officer urged all Victorians to go and get the influenza vaccine. Children aged six months to under five and all Aboriginal and/or Torres Strait Islander children over six months are key audiences in the campaign. The campaign also meets the specific needs of our culturally and linguistically diverse community and advocates who is eligible for free influenza vaccines.

The campaign is being rolled out across multiple channels including digital, social media, radio, YouTube, Spotify and print media across the state. There will also be outreach to culturally and linguistically diverse communities. Information is also available via the Better Health Channel www.betterhealth.vic.gov.au/flu.

ENSURE ALL CHILDREN HAVE EASY ACCESS TO FREE INFLUENZA VACCINATION ANNUALLY

Recommendation 9

All Australians aged six months or more are recommended to receive annual influenza vaccination, with free influenza vaccines provided to those who are most at risk. This includes children aged six months to under five years and all Aboriginal and/or Torres Strait Islander children over six months. Influenza vaccines for children can be accessed from several immunisation providers, including local councils, general practices, community pharmacies, the Royal Children's Hospital drop-in vaccination clinic and community health centres.

DEVELOP AND IMPLEMENT A PUBLIC INFORMATION CAMPAIGN REGARDING THE DANGERS FOR CHILDREN ON FARMS, USING CO-DESIGN PRINCIPLES WITH FAMILIES AND THEIR COMMUNITIES, IN CONJUNCTION WITH ORGANISATIONS SUCH AS WORKSAFE VICTORIA AND THE VICTORIAN FARMERS FEDERATION

Recommendation 10

The department is implementing public information for child safety on farms via the Better Health Channel and has advised $1.5 million will support a family farm safety campaign to help protect family members, workers and visitors from workplace hazards.

WorkSafe Victoria has recently released updated public awareness information/guidance on Children on farms[15] and keeping children safe, and continues to develop actions to support implementation of their Agriculture strategy 2020-23[16].

Kidsafe Victoria has been funded by Agriculture Victoria (as part of Smarter Safer Farms) over three years (2020-22) to run 'Reducing harm on the farm' project in primary schools. This is a creative competition and farm safety social media campaign to increase awareness of farm risks among school-aged children and their families. The National Centre for Farmer Health is delivering the GearUp for Ag Health & Safety[17] program in secondary schools to advocate for child safety on farms.

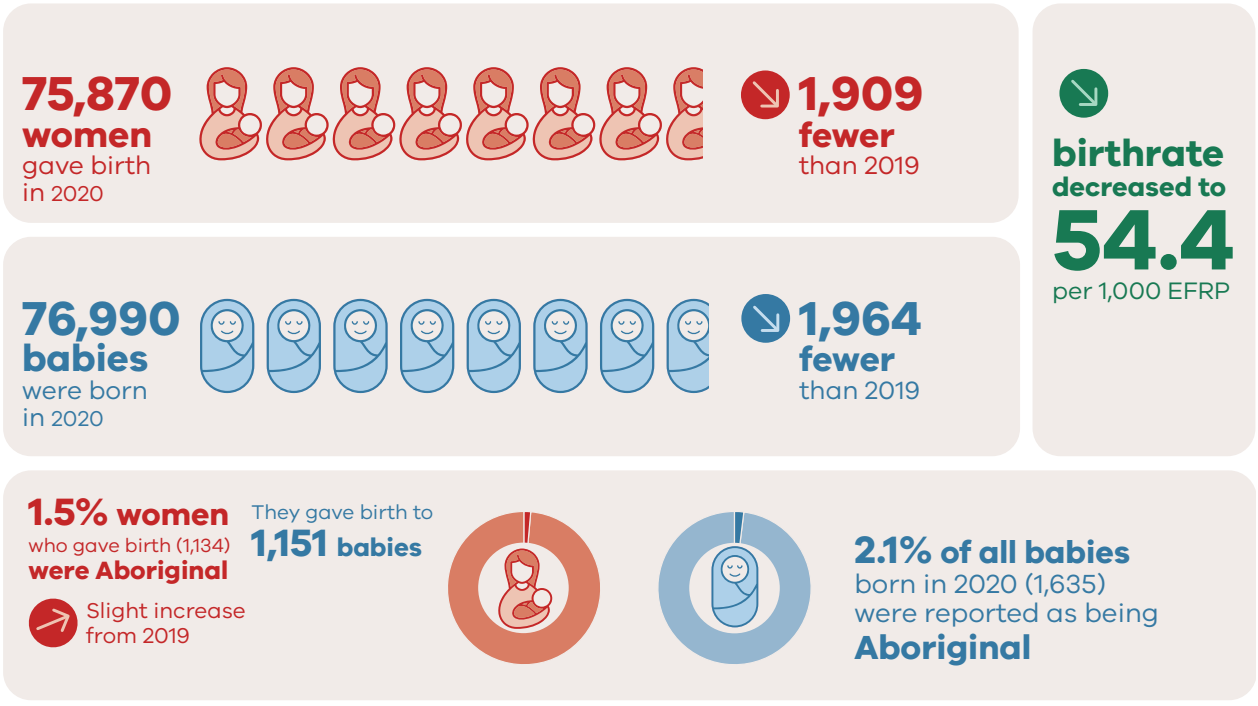
[15] Children on farms, WorkSafe Victoria: https://www.worksafe.vic.gov.au/children-farms

[16] Agriculture strategy 2020-23, WorkSafe Victoria: https://www.worksafe.vic.gov.au/resources/agriculture-strategy-2020-23

[17] Gear Up for Ag Health & Safety: https://farmerhealth.org.au/gear-up-for-ag-health-safety

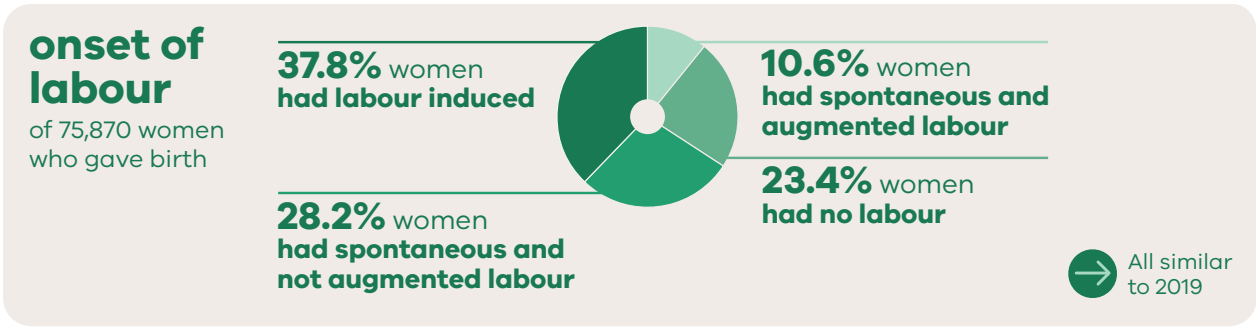
Mothers and babies

The provision of care that is safe and of high quality is a priority. However, we continue to see disparities in clinical outcomes and experiences between different groups of women. These disparities are based on a variety of factors, are complex in their nature and will require a variety of solutions to resolve and be sustainable. Data also demonstrates an ongoing and steady rise in intervention rates that require further analysis and commentary.



PREGNANCY AND BIRTH

- In 2020, 75,870 women gave birth to 76,990 babies. This is 1909 fewer women and 1964 fewer babies than in 2019.
- 1,134 Aboriginal women gave birth to 1,151 babies (1.5 per cent of all women and 1.5 per cent of all babies born in Victoria). 1635 babies (2.1 per cent) were themselves reported as being Aboriginal.
- 77.9 per cent of women gave birth under the care of a public maternity service, including 108 public home births (0.1 per cent, compared to 76 women (0.1 per cent) in 2019).
- 21.7 per cent of women gave birth in a private hospital. An additional 313 women had a planned homebirth under the care of a private midwife (0.4 per cent, compared to 193 (0.2 per cent) in 2019).
- There were 32 more public and 120 more private homebirths in 2020 compared to 2019.



- 38.8 per cent of women started labour spontaneously, including 10.6 per cent had labour augmented, 37.8 per cent had labour induced (including failed induction in 1.8 per cent) and 23.4 per cent had no labour.
- There continues to be a trend of increasing caesarean rates (29,172 women, 38.4 per cent) and decreasing unassisted vaginal birth rates (34,612 women, 45.6 per cent). Further analysis into the ongoing and steady rise of the caesarean rate is required.
- During the first three quarters of 2020, birth numbers were similar to previous years. In quarter four, a slight decrease in the number of births was recorded.[18]
- The COVID-19 pandemic did not impact the rate of babies admitted to a Special Care Nursery or Neonatal Intensive Care Unit at term (excluding congenital anomalies) in 2020 or the rate of maternity or newborn readmissions during 2020.

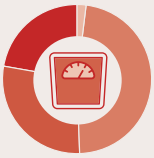
[18] Portions of the data in this section are replicated from the CCOPMM COVID-19 Communique. As preliminary data was used in the Communique and finalised data was used for this report, there may be slight differences in the results.

Number of births per quarter, 2018-2020

At booking:

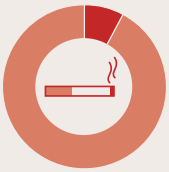
2.3% women underweight
46.6% women healthy weight
27.6% women overweight
21.7% women obese

Similar to 2019



8.0% women smoked
at some time during their pregnancy in 2020

23 more women (0.3%) than 2019



7.8% women smoked in first half pregnancy

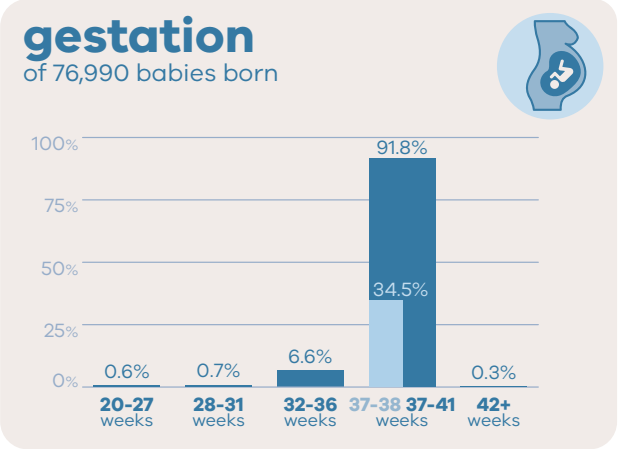
4.7% women smoked in second half pregnancy

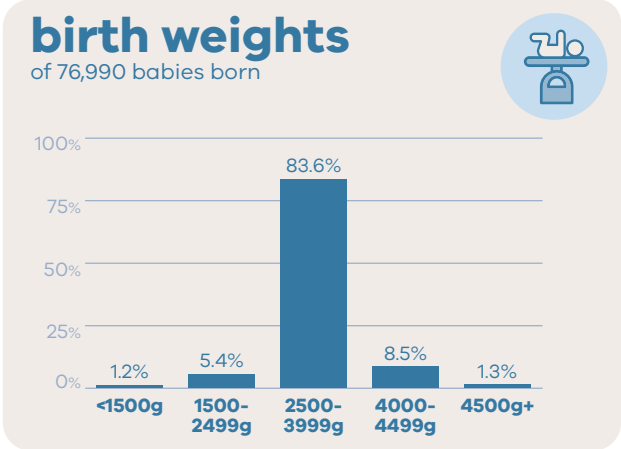
MOTHERS AND BABIES

- The median age of women giving birth in 2020 was 32 years. The median age of women having a first birth was 30. These are the same as in 2019.
- At booking, almost half of all pregnant women were overweight (27.6 per cent) or obese (21.7 per cent).[19] This is a slight increase from 2019 where 26.9 per cent of women were overweight and 21.2 per cent obese. 46.6 per cent of women were in a healthy weight range and 2.3 per cent were underweight.
- 39.3 per cent of women giving birth were born outside of Australia. This is similar to 2019 (39.9 per cent).
- 8.0 per cent of women[20] (6,039) smoked at some time during their pregnancy. This is a small increase from 7.7 per cent of women in 2019.

[19] Body mass index (BMI) Better Health Channel: https://www.betterhealth.vic.gov.au/health/healthyliving/body-mass-index-bmi

[20] The data in this section refer to the smoking status of all mothers, whereas the 'Smoking and perinatal mortality' section, 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 psychosocial indications).





- 7.8 per cent of women (5,899) smoked in the first half of pregnancy and 4.7 per cent (3,567) smoked in the second half of pregnancy.
- The impact of COVID-19 on pre-term births (birth before 37 weeks of gestation) has shown mixed results. Our data for 2020 shows a continued decrease in the rate of pre-term birth, from 9.0 per cent in 2018, to 8.7 per cent in 2019 and 7.9 per cent in 2020.
- Over the past 10 years, there has been an increase in women giving birth at 32–36 weeks; however, in 2020 we saw a decrease, from 7.0 per of women giving birth in 2019 to 5.9 per cent in 2020.
- Of 462 babies born at 20–27 weeks (0.6 per cent of all births), 203 were born at 20–23 weeks, and 259 were born at 24–27 weeks. This is similar to 2019.
- The rate of babies with a low Apgar score at five minutes did not change significantly in 2020.
- In 2020, 3.5 per cent of babies were born with a congenital anomaly. This is similar to previous years, with 3.5 per cent reported in 2019 and 3.1 per cent in 2018.
- We did not see an increase in the rate of women with severe preeclampsia or eclampsia during pregnancy during 2020.
- There was an increase in the number of women giving birth before arrival at hospital for a planned hospital birth in 2020 compared with previous years. There were 410 in 2020 compared to 253 in 2019.
- In 2020, the rate of babies born with severe fetal growth restriction continued to decrease. In contrast, the rate of singleton babies born large for gestational age increased.

Rate of small and large for gestational age babies by quarter, 2018-2020

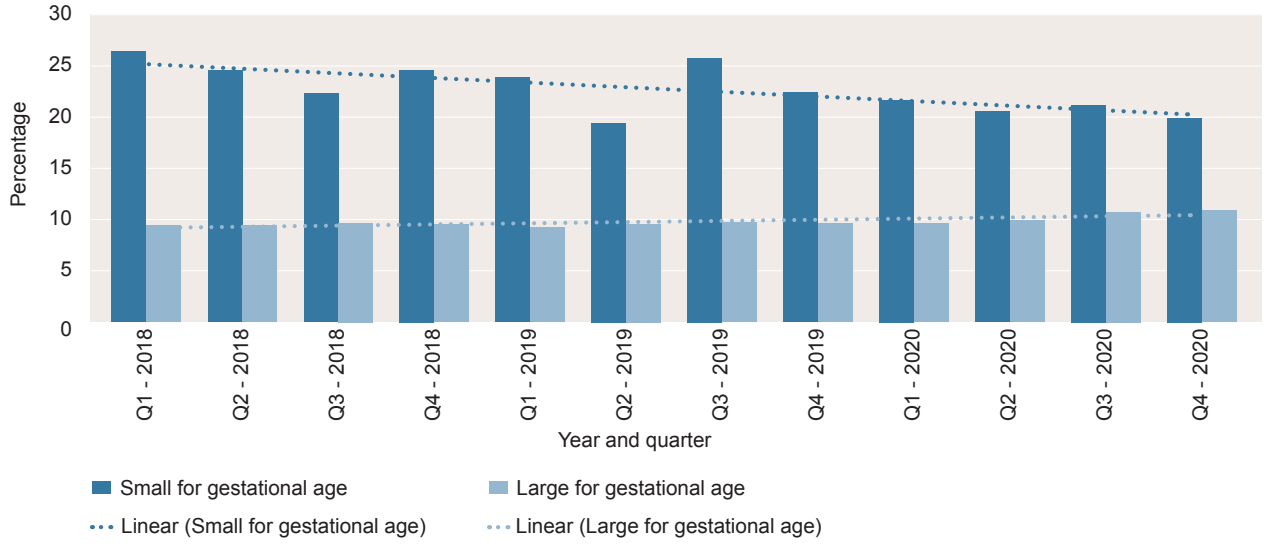


Table 1: Trends in birthing episodes (number of women giving birth) and gestation (%), 2000–2020

	2000	2005	2010	2015	2016	2017	2018	2019	2020
Gestation	**61,562**	**65,115**	**72,864**	**77,752**	**79,319**	**78,226**	**77,355**	**77,779**	**76,990**
20–27 weeks	0.7	0.6	0.6	0.5	0.6	0.5	0.6	0.5	0.5
28–31 weeks	0.7	0.6	0.7	0.7	0.6	0.7	0.6	0.6	0.6
32–36 weeks	5.5	5.5	5.8	6.4	6.2	6.4	6.4	6.2	5.9
37–41 weeks	91.8	91.9	91.6	92.0	92.2	92.1	92.1	92.4	92.7
42+ weeks	1.3	1.3	1.2	0.5	0.4	0.3	0.2	0.3	0.3
Not reported	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0

Note: this table refers to birthing episodes (the number of women giving birth, as opposed to number of babies born).

Over recent years, there has been increasing interest in the births at early term, particularly before 39 weeks. In 2020, 26,547 babies (34.5 per cent) were born at 37 or 38 weeks and, of those, 9,996 (37.7 per cent) had labour induced. An additional 9,294 (35.0 per cent) had a pre-labour caesarean section. Of those who were induced at 37 or 38 weeks, no medical indication was reported for 2.9 per cent.

NEW MEASURES IN 2020

Diabetes

- In 2020, 19.0 per cent (14,406) of pregnant women had diabetes.
- 262 women (0.3 per cent) had pre-existing type 1 diabetes.
- 441 women (0.6 per cent) had pre-existing type 2 diabetes.
- 95.0 per cent of pregnant women with diabetes had gestational diabetes mellitus (GDM).
- Of women with GDM, diagnosis mostly occurred between 26 and 28 weeks (55.1 per cent)
- Most women with GDM used diet and exercise to control their diabetes (54.1 per cent).

Excessive blood loss

- The main reason for excessive blood loss (blood loss greater than or equal to 500mls) following birth was uterine atony (47.7 per cent), followed by trauma (32.4 per cent).
- Blood loss was assessed by estimating all blood loss in 57.6 per cent of cases. This typically involves a visual assessment to estimate how much blood has been lost.
- All blood loss was measured in 33.6 per cent of cases. Measuring blood loss may include weighing blood-soaked items and subtracting the dry weight of the item to ascertain the volume of blood loss.
- In 8.2 per cent of cases, a combination of measured and estimated blood loss was used. Blood loss assessment data was missing in 0.6 per cent of cases.

Maternal mortality and morbidity

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

Victorian maternal mortality ratio (MMR)

6.9 deaths per 100,000 women who gave birth during 2018-20 triennium

this is fewer than 7.2 deaths per 100,000 women who gave birth during the 2017-19 triennium

Maternal deaths are rare in Victoria. Every maternal death is 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 or up to 42 days after the end of pregnancy are classified as 'early' deaths and can be either:

- **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 physiologic effects of pregnancy
- **coincidental** – causally unrelated to the pregnancy or birth.

Maternal deaths occurring more than 42 days after the end of the pregnancy and up to one year post birth are reported as 'late'. These deaths may have direct, indirect or coincidental causes.

The incidence of maternal deaths is expressed as the maternal mortality ratio (MMR), 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.[21]

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

[21] Please note that the methodology for death classifications has changed over time to align with national standards. Numbers may differ from previous reports due to revisions to the data.

Maternal deaths per year

2020
8 maternal deaths

2 early direct deaths

2 early indirect deaths

2 early coincidental deaths

2 late deaths

2018-2020
31 maternal deaths

4 early direct deaths

12 early indirect deaths

2 early coincidental deaths

13 late deaths

SNAPSHOT

- In 2020, there were eight maternal deaths, compared to nine reported deaths in 2019 and 14 in 2018.
- Of the eight deaths in 2020, six were early deaths (two direct, two indirect, two coincidental) and two were late deaths.
- In the 2018–2020 triennium, there were 31 maternal deaths. Of these, 18 were early deaths (of which four were direct, 12 were indirect and two were coincidental). There were 13 late deaths.
- For the triennium, early direct deaths were due to obstetric haemorrhage, pulmonary embolism and pre-eclampsia. Half of early indirect deaths were related to pre-existing medical conditions (cardiac, respiratory and neurological). The remainder were due to infection, non-obstetric haemorrhage, cardiac causes, suicide, and homicide. Early coincidental deaths related to respiratory causes.
- For the triennium, late deaths were due to motor vehicle accidents, homicide, suicide, drug toxicity, thromboembolism, cardiac causes, cancer and complications of other injury. The cause of one late death was unascertained.
- The Victorian MMR from 2018 to 2020 was 6.9 per 100,000 women who gave birth. This is less than the previous triennium that was 7.2 per 100,000.

CONTRIBUTING FACTORS IDENTIFIED IN MATERNAL DEATHS

The review of maternal deaths over the most recent triennium (2018–2020) revealed a range of contributing factors and in many cases, multiple contributing factors. Sadly, women with specific vulnerabilities continue to feature in the cases we review.

CCOPMM has identified multiple complexities for the women who died by suicide in this triennium. Each of these women lived with some combination of complex mental health and social conditions, substance use, family violence, intellectual disability and/or contact with child protection services. Systemic factors may have provided barriers for some women to access the care they need. Individualised and coordinated multidisciplinary, multiagency care that is available close to home is needed across the whole pregnancy and postnatal period.

We need to ensure that care plans are done in partnership with women, and that barriers to accessing timely and woman centred care are removed. Careful and coordinated handover to and between primary care is an important step to improving outcomes and keeping women safe.

CCOPMM continues to see these recurring themes:

- Mental health issues or social circumstances that limit women's ability to access and engage with care.
- Access to care, in particular care close to home.
- Care that does not meet best practice standards.
- Lack of recognition by clinicians, the woman or her family of the complexity or seriousness of her condition, particularly where there was substance use.
- Inadequate communication and timely actions by clinicians and services when an issue or complication had been identified.

2020 DATA

- 195 women were reported with SAMM compared to 262 in 2019.
- There was one reported SAMM with a COVID-19 diagnosis in 2020. SAMM cases with a COVID-19 diagnosis are likely to be underreported. Further work is in progress to develop data linkage to enable better identification of women with COVID-19 to enable further analysis.
- 36.9 per cent of these women (72) were born overseas, compared with 39.4 per cent of all women giving birth who were born overseas.
- 3.6 per cent of the total SAMM cases were Aboriginal women (seven women), compared with 1.5 per cent of all women who gave birth in 2020. Aboriginal women continue to be over-represented in SAMM cases.
- 26.7 per cent of women admitted to ICU had a body mass index (BMI) of 30 or higher[22] compared with 21.7 per cent of all women who gave birth in 2020.
- The median age of women with SAMM was 32 years. Nine women with SAMM were over 40 years.

195
women were
admitted to an ICU with SAMM

SEVERE ACUTE MATERNAL MORBIDITY (SAMM)

In countries with low maternal mortality, such as Australia, there is increasing interest in severe morbidity related to pregnancy, labour and birth and the days following birth to understand changes across time, to monitor outcomes for women and guide areas for improvement.

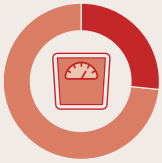
In July 2017, Victoria was the first jurisdiction in Australia to introduce mandatory reporting of SAMM cases. In Victoria, SAMM is measured as an admission to an ICU during pregnancy and up to 42 days after birth.

ICU admission was chosen because it is an easily identifiable criterion and captures the most severe cases. The criteria for ICU admission may vary across hospitals, and not all maternity services in Victoria have direct access to an ICU. CCOPMM is exploring leveraging existing databases (for example, the Victorian Admitted Episodes Dataset and VPDC) to validate cases notified to CCOPMM and to capture additional cases.

Of these 195 women
36.9% (72)
were born overseas

Of these 195 women
3.6% (7)
were Aboriginal

Of these 195 women
26.7% (52)
had a BMI of 30 or higher



[22] BMI is calculated using the 'weight – self reported – mother' and 'height – self reported - mother' variables in the VPDC. These variables capture self-reported weight and height about the time of conception. Where these variables are unavailable BMI data may be captured from another time in the perinatal period.

SUMMARY OF SEVERE ACUTE MATERNAL MORBIDITY (SAMM)

In 2020[23] :

- Twenty-four (12.3 per cent) of the 195 women were pregnant at the time of admission to ICU. Four women were in the first trimester, 11 were in the second trimester and nine were in the third trimester.
- 87.7 per cent (171) of women were admitted to an ICU in the postpartum period.
- The most common condition was PPH, contributing to 36.9 per cent of all admissions (72 out of 195). This was unchanged from 37.0 per cent in 2019.
- Preeclampsia was the second most common condition, contributing 12.8 per cent of all ICU admissions (25 out of 195). This increased from 10.3 per cent in 2019.
- Sepsis and septic shock combined were the next most common conditions, contributing 9.2 per cent of all ICU admissions (18 out of 195). This is also similar to 2019 when it was 9.5 per cent.

Recurrent themes that have emerged from analysis of the SAMM cases

- PPH management which did not meet best practice standard particularly delayed recognition and treatment of PPH.
- Problems with communication between members of the care team and especially with timely escalation to the appropriate senior clinician.
- Inadequate recognition and treatment of preeclampsia.
- Complications of anaesthesia are rare, but often severe.

Preventing postpartum haemorrhage (PPH)

Research suggests that PPH is often avoidable. In 2018 and 2019 CCOPMM recommended the development of state-wide improvement program to prevent postpartum haemorrhage. In 2022 SCV will commence a Postpartum Haemorrhage Collaborative. This collaborative aims to improve outcomes for Victoria's birthing women by working with the Institute for Healthcare Improvement and partnering health services to reduce PPH for women planning vaginal birth.

The maternity e-handbook guidance for PPH prevention, management and assessment can be found at www.bettersafercare.vic.gov.au/clinical-guidance/maternity/postpartum-haemorrhage-pph-prevention-assessment-and-management

[23] Note: There may be small variances in the data over time due to incomplete reporting of SAMM cases. The total number and report information may not reflect complete SAMM data for Victoria in 2020.

Perinatal mortality

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 for psychosocial indications are excluded. This provides a more accurate measure for assessing avoidable mortality and for comparisons with other jurisdictions both nationally and internationally. Statistics for unadjusted perinatal mortality can be found in the online supplementary tables for this report.

816
perinatal deaths 2020
Slight decrease from 860 in 2019

687 **adjusted perinatal deaths** 2020
Slight decrease from 688 in 2019

8.9 per 1,000 births
adjusted perinatal mortality rate 2020
Slight increase from 8.7 in 2019

34.9% of adjusted perinatal deaths in 2020
underwent an autopsy
Up from 31.1% in 2019

38.0% of stillbirths
underwent an autopsy
Up from 34.1% in 2019

27.2% of neonatal deaths
underwent an autopsy
Up from 22.8% in 2019

6.4 per 1,000 births
adjusted stillbirth rate 2020
for babies born after 20 weeks' gestation
Compared with 6.4 per 1,000 in 2019

2.5 per 1,000 live births
neonatal mortality rate 2020
Compared with 2.3 per 1,000 live births in 2019

10.1 per 1,000 births adjusted perinatal mortality rate 2020 in women who **smoked at any time** while pregnant

8.8 per 1,000 births adjusted perinatal mortality rate 2020 in women who **did not smoke** while pregnant

SNAPSHOT

- There were 687 adjusted[24] perinatal deaths in 2020, compared to 688 in 2019.
- These include 492 adjusted stillbirths and 195 neonatal deaths.
- As there were slightly fewer births in 2020 compared to 2019, the adjusted perinatal mortality rate (PMR) was 8.9 per 1,000 births, compared with 8.7 per 1,000 births in 2019.
- In 2020, 0.1 per cent of births resulted in a stillbirth. This is similar to 2018 and 2019. The adjusted stillbirth rate for babies born after 20 weeks' gestation was 6.4 per 1,000 births, the same as in 2019.
- The neonatal mortality rate was 2.5 per 1,000 livebirths in 2020 compared with 2.3 per 1,000 livebirths in 2019.
- The adjusted PMR in women smoking at any time during pregnancy was 10.1 per 1,000 births compared with 8.8 per 1,000 births in those who did not smoke while pregnant.
- In 2020, 34.9 per cent of adjusted perinatal deaths underwent a full perinatal autopsy (38.0 per cent of stillbirths and 27.2 per cent of neonatal deaths). This is an increase from 31.1 per cent in 2019.
- Among the mothers whose country of birth was reported, adjusted perinatal mortality rate was the highest in mothers born in the North Africa and the Middle East (Table 2).

There is currently national work which aims to reduce the number of stillbirths, excluding perinatal deaths from congenital anomaly and terminations of pregnancy for maternal psychosocial indications.[25]

In 2020, there were 129 stillbirths from congenital anomaly and terminations of pregnancy for maternal psychosocial indications, which is the same as 2019.

In 2020, there were 322 stillbirths not due to congenital anomaly or termination of pregnancy for maternal psychosocial indications, compared with 326 in 2019.

Perinatal mortality rates

The 2020 adjusted PMR was:

- 8.4 per 1,000 births for singletons
- 25.0 per 1,000 births for twin pregnancies
- 121.2 per 1,000 births for other multiple pregnancies.

[24] 'Adjusted' perinatal deaths exclude terminations of pregnancy for maternal psychosocial indications. Unadjusted, there were 816 perinatal deaths in 2020 compared to 860 in 2019.

[25] The Safer Baby Bundle, Stillbirth Centre of Research Excellence: https://stillbirthcre.org.au/about-us/our-work/the-safer-baby-bundle/

Trend in adjusted PMR, SB and NN mortality rate, 2010-2020

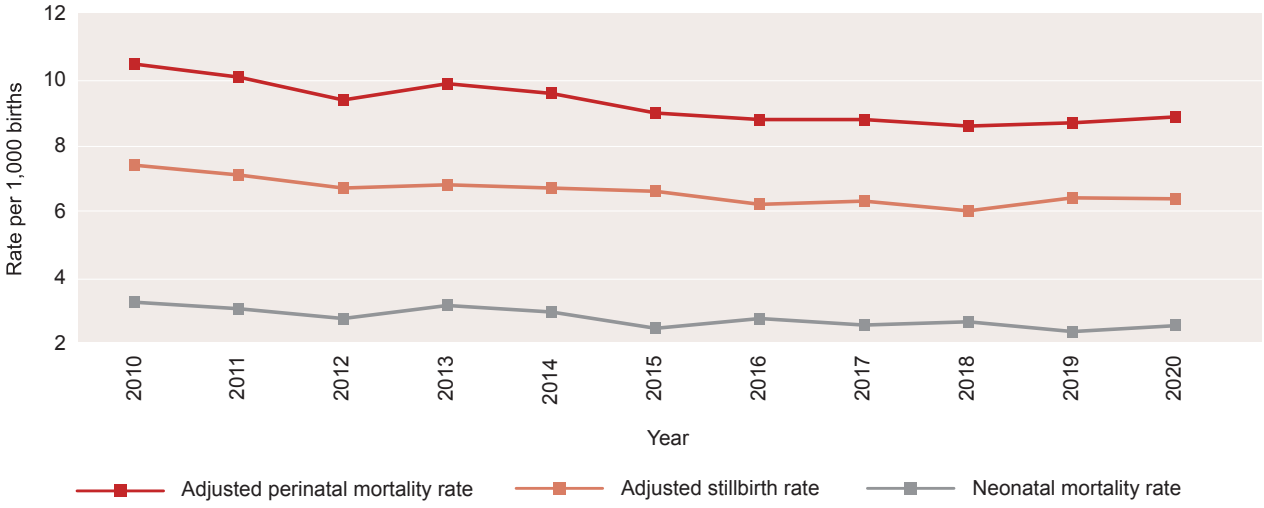


Table 2: Adjusted PMR by maternal place of birth, Victoria 2020[26,27]

	Adjusted total births		Livebirths[28]		Adjusted stillbirths	Neonatal deaths	Adjusted PND	% of all PND	Adjusted PMR
	N	%	N	%	N	N	N	%	
North-West Europe	2160	2.8	2152	2.8	8	2	10	1.5	4.6
South-East Asia	5143	6.7	5118	6.7	25	15	40	5.8	7.8
Australia	46582	60.3	46304	60.4	278	96	374	54.4	8.0
Oceania and Antarctica (excl Australia)	2236	2.9	2221	2.9	15	4	19	2.8	8.5
Americas	1132	1.5	1122	1.5	10	0	10	1.5	8.8
North-East Asia	3588	4.6	3564	4.6	24	12	36	5.2	10.0
Southern and Central Asia	10408	13.5	10335	13.5	73	43	116	16.9	11.1
Sub-Saharan Africa	1785	2.3	1772	2.3	13	8	21	3.1	11.8
Southern and Eastern Europe	1296	1.7	1285	1.7	11	5	16	2.3	12.3
North Africa and the Middle East	2571	3.3	2547	3.3	24	8	32	4.7	12.4
Unknown	302	0.4	291	0.4	11	2	13	1.9	43.0
Total	77203	100	76711	100	492	195	687	100	8.9

[26] The figures and calculations in this table exclude stillbirths from terminations of pregnancy for maternal psychosocial indications

[27] This table is ranked by PMR (excluding unknown data)

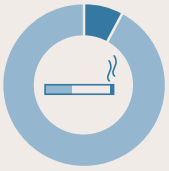
[28] Livebirths include all livebirths, including those who later die as neonatal deaths

SMOKING AND PERINATAL MORTALITY

- In 2020, 6,150 babies were born to women who reported smoking at any time during pregnancy (8.0 per cent of all adjusted births).
- The adjusted PMR in women smoking at any time during pregnancy was 10.1 per 1,000 births (slight reduction from 10.5 in 2019) compared with 8.8 per 1,000 births in those who did not smoke while pregnant (slight increase from 8.6 in 2019).[29]

An ongoing focus on strategies to improve smoking cessation rates is likely to lead to further reduction in stillbirth rates and continue to be a key feature in many stillbirth reduction initiatives.[30]

6,150 babies born
to women who smoked
at any time during their pregnancy in 2020.
(8.0% of all adjusted births)



10.1
adjusted PMR
per 1,000 births

42
stillbirths

20
neonatal deaths

in women who smoked at any time during their pregnancy in 2020.

8.8
adjusted PMR
per 1,000 births

428
stillbirths

171
neonatal deaths

in women who did not smoke at any time during their pregnancy in 2020.

Programs that support women to stop smoking should be prioritised. These programs need to include women, families and community in program design to aid in successfully supporting women to cease smoking during pregnancy and beyond the end of pregnancy.

Ongoing evaluation of these programs is important to ensure they are meeting the needs of women and lead to successful sustainable smoking cessation.

[29] The data in this section refer to the smoking status of mothers whose babies were included in the adjusted number of births (which excludes terminations of pregnancy for psychosocial indications), whereas the sections on page 18, 'Smoking and pregnancy' and 31, 'Smoking and Aboriginal births, mortality and morbidity', refer to the smoking status of all mothers.

[30] The Safer Baby Bundle, Stillbirth Centre of Research Excellence: https://stillbirthcre.org.au/about-us/our-work/the-safer-baby-bundle/

MOST COMMON 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. Congenital anomaly accounts for:

- 199 adjusted stillbirths (40.5 per cent of all adjusted stillbirths)
- 70 neonatal deaths (35.9 per cent of all neonatal deaths)
- 269 adjusted perinatal deaths (39.2 per cent of all adjusted perinatal deaths).

After congenital anomalies, the most common causes of perinatal death in 2020, according to the Perinatal Society of Australia and New Zealand (PSANZ) perinatal death classification, were:

- spontaneous preterm labour or rupture of membranes (<37 weeks' gestation, 115 deaths, 16.8 per cent)
- unexplained antepartum fetal death (66 deaths, 9.6 per cent)
- placental dysfunction or causative placental pathology (61 deaths, 8.9 per cent).

After congenital anomalies, the most common causes of stillbirth in 2020, according to the PSANZ perinatal death classification, were:

- unexplained antepartum fetal death (66 stillbirths, 13.4 per cent)
- placental dysfunction or causative placental pathology (59 stillbirths, 12.0 per cent)
- spontaneous preterm labour or rupture of membranes (<37 weeks) (46 stillbirths, 9.4 per cent).

After congenital anomalies, the most common causes of neonatal death in 2020, according to the PSANZ neonatal death classification, were:

- extreme prematurity, less than 24 weeks gestation (66 deaths, 33.8 per cent)
- cardio-respiratory disorders (21 deaths, 10.8 per cent)
- neurological (21 deaths, 10.8 per cent).

FACTORS CONTRIBUTING TO PERINATAL DEATH

CCOPMM reviews all perinatal deaths to examine whether there were factors contributing to the death that could have been prevented. Identifying these contributing factors is key to improving the care and experiences of women and improving perinatal outcomes. Perinatal deaths identified as having contributing factors are reviewed by the Stillbirth or the Neonatal Subcommittee of CCOPMM. Identified contributing factors are categorised using the PSANZ classification as:

- unlikely to have contributed to the outcome (insignificant)
- might have contributed to the outcome (possible)
- likely to have contributed to the outcome (significant)
- insufficient information available (undetermined)
- unknown.

It is important to recognise that not all contributing factors may be preventable or indicative of unacceptable standards of care. CCOPMM is continuing to refine its case review processes to further strengthen the reporting of contributing factors and ensure that lessons learnt can be shared with services, clinicians and consumers.

The PSANZ list of contributing factors acknowledge that they may be systemic, for example:

- resources such as staffing
- access to appropriate services
- ability to communicate or share information.

Or relate to personnel, for example:

- availability of appropriately skilled staff
- adequate staff numbers
- level and availability of training and education.

Or be attributable to other factors, for example:

- no or low attendance for clinical care
- poor compliance with advice.

In 2020, contributing factors were identified in 210 of 474 perinatal deaths (44.3 per cent of cases), excluding termination of pregnancy for maternal psychosocial indication or congenital anomaly (Table 3).

Table 3: Factors identified in adjusted perinatal deaths, Victoria 2020

Significance of identified factors in...	Factors relating to organisational and/ or management identified	Factors relating to personnel identified	Barriers to accessing/engaging with care identified	Total
Stillbirths				
Insignificant: Sub-optimal factors identified but unlikely to have contributed to outcome	2	8	17	27
Possible: Sub-optimal factors identified might have contributed to outcome	12	28	89	129
Significant: Sub-optimal factors identified were likely to have contributed to outcome	10	18	24	52
Total number of factors	**24**	**54**	**130**	**208**
Total number of cases	**14**	**37**	**89**	**140**
Neonatal deaths				
Insignificant: Sub-optimal factors identified but unlikely to have contributed to outcome	2	2	6	10
Possible: Sub-optimal factors identified might have contributed to outcome	24	28	23	75
Significant: Sub-optimal factors identified were likely to have contributed to outcome	5	22	9	36
Total number of factors	**31**	**52**	**38**	**121**
Total number of cases	**21**	**30**	**19**	**70**

Note: Cases can have more than one factor identified, so the total number of cases does not equal the sum of individual cases identified by factor.

There were 474 total perinatal deaths of infants born in Victoria not from termination of pregnancy for maternal psychosocial indication or congenital anomaly (322 stillbirths and 152 neonatal deaths).

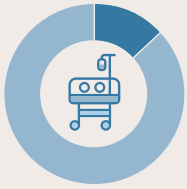
Aboriginal births, mortality and morbidity

Aboriginal births, mortality and morbidity focuses on births and outcomes for Aboriginal women. For this reason, births to Aboriginal fathers and non-Aboriginal women are not included.

1,134
Aboriginal women gave birth in 2020 (1.5% of all women who gave birth)

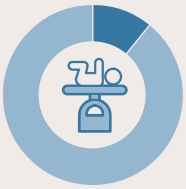
Increase from 1,118 (0.1%) women in 2019

13.4%
of babies born to Aboriginal women **were born before 37 weeks' gestation**



Compared with **7.8%** of babies born to non-Aboriginal women

1,151
babies were born to Aboriginal women (1.5% of all babies born)



10.9%
of babies born to Aboriginal women had a **birthweight below the 10th centile**

Compared with **8.4%** of babies born to non-Aboriginal women

Aboriginal women and babies continue to experience poorer outcomes than non-Aboriginal women and babies. The perinatal mortality rate (PMR) for babies born to Aboriginal women has been substantially and consistently higher than for those babies born to non-Aboriginal women over many years.

SNAPSHOT

- In 2020, 1,134 Aboriginal women gave birth to 1,151 babies (1.5 per cent of all women who gave birth and 1.5 per cent of all babies born in Victoria).
- 13.4 per cent of babies born to Aboriginal women were born before 37 weeks' gestation, compared with 7.8 per cent of those born to non-Aboriginal women.
- 10.9 per cent of babies born to Aboriginal women had with a birthweight below the 10th percentile compared with 8.4 per cent of those born to non-Aboriginal women.
- The PMR for babies born to Aboriginal mothers for the triennium 2018–2020 was 11.3 per 1,000 births, and 8.7 per 1,000 births for non-Aboriginal mothers. This compares with 12.6 and 8.7 per 1,000 births respectively for the triennium 2017–2019. The PMR for babies born to Aboriginal mothers has improved this triennium.
- The stillbirth rate for babies born to Aboriginal mothers for the triennium 2018–2020 was 7.8 per 1,000 births, and 6.3 per 1,000 births for non-Aboriginal mothers. This compares with 7.9 and 6.2 per 1,000 births respectively for the triennium 2017–2019.

	Aboriginal women	Non-Aboriginal women
Perinatal Mortality Rate (PMR)	**11.3** deaths per 1,000 births **for 2018-2020** Compared with **12.6** in 2017-2019	**8.7** deaths per 1,000 births **for 2018-2020** Compared with **8.7** in 2017-2019
Stillbirth Mortality Rate	**7.8** deaths per 1,000 births **for 2018-2020** Compared with **7.9** in 2017-2019	**6.3** deaths per 1,000 births **for 2018-2020** Compared with **6.2** in 2017-2019
Neonatal Mortality Rate	**3.5** per 1,000 live births **for 2018-2020** Compared with **4.7** in 2017-2019	**2.5** per 1,000 live births **for 2018-2020** Compared with **2.5** in 2017-2019

The gap has decreased between Aboriginal and non-Aboriginal PMR for the triennium 2018-2020 from the 2017-2019 triennium. The improvement is predominantly in neonatal deaths.

Closing the gap

To address the continuing gap in outcomes between Aboriginal and non-Aboriginal women, we recommend supporting research and quality improvement initiatives, informed by our Aboriginal health partners, to inform best practice and improve health outcomes for Victorian Aboriginal and Torres Strait Islander mothers, babies and children.

This includes working with Aboriginal health research partners to identify evidence gaps and research priorities to address the health needs of Aboriginal children and families.

- The neonatal mortality rate for babies born to Aboriginal mothers for the triennium 2018–2020 was 3.5 per 1,000 livebirths, and 2.5 per 1,000 livebirths for non-Aboriginal mothers. This compares with 4.7 and 2.5 per 1,000 livebirths respectively for the triennium 2017– 2019. The neonatal mortality rate for babies born to Aboriginal mothers has improved this triennium.

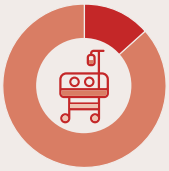
The gap between Aboriginal and non-Aboriginal PMR for the triennium 2018–2020 has decreased (improved) from the 2017–2019 triennium. The improvement is predominantly in neonatal deaths.

41.3%
of Aboriginal women
smoked during pregnancy

Compared with
7.5% non-Aboriginal women

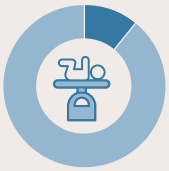
13.4%
of Aboriginal women
gave birth preterm

Compared with
7.8% non-Aboriginal women



10.9% of babies born to Aboriginal women weighed <2,500g

Compared with
6.5% non-Aboriginal babies



Babies comparisons

In 2020:

- 11.1 per cent of babies born to Aboriginal women were born at 32-36 weeks' gestation compared with 6.5 per cent of those born to non-Aboriginal women
- 10.9 per cent of babies born to Aboriginal women had a birthweight below the 10th centile compared with 8.4 per cent of those born to non-Aboriginal women.

SMOKING AND ABORIGINAL BIRTHS, MORTALITY AND MORBIDITY

- 41.3 per cent of Aboriginal women reported that they smoked during pregnancy (down from 42.3 per cent in 2019) compared with 7.5 per cent of non-Aboriginal women.[31]
- 10.9 per cent of babies born to Aboriginal women had low birthweight (under 2,500 grams) compared with 6.5 per cent of babies born to non-Aboriginal women.
- 13.3 per cent of Aboriginal women gave birth preterm (before 37 weeks) compared with 7.8 per cent of non-Aboriginal women.

In previous reports, CCOPMM has recommended focused action to improve smoking cessation rates. In 2020, we have seen a slight decrease in Aboriginal smoking rates. Further analysis is required to determine what actions are successful in supporting Aboriginal women to cease smoking during pregnancy and following birth.

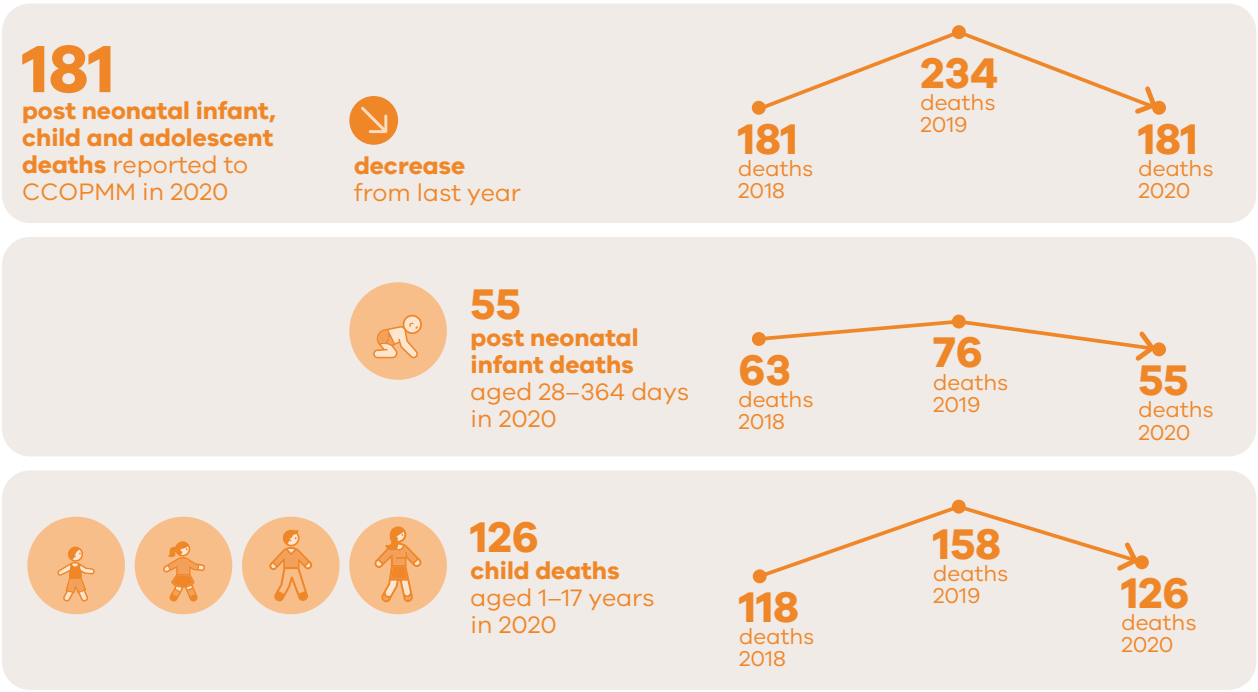
Maternal comparisons

- 2.5 per cent of Aboriginal women were underweight (with a BMI under 18.5) compared with 2.3 per cent of non-Aboriginal women.
- Aboriginal women were also more likely to be obese (with a BMI of 30 or over) than non-Aboriginal women (34.6 per cent and 21.5 per cent respectively).

[31] The data in this section refer to the smoking status of all mothers, whereas the 'Smoking and perinatal mortality' section, 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 psychosocial indications).

Child and adolescent mortality

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



In Victoria, child and adolescent mortality rates are low, but there are deaths that can be prevented. From the review of these deaths there are important findings that inform improvements that need to be made by both our health services and our community to prevent these deaths.

The role of our specialist children's hospitals is significant. Many of the child and adolescent deaths occur in these services; however, it is important to acknowledge this may not be where they have most of their care provided or where the harm has occurred. In fact, when children and adolescents access health care, it is mostly outside of our specialist hospitals.

The role of general paediatric services, general practice and primary care throughout the state cannot be underestimated. Good practice points (GPPs) are targeted at all health professionals providing care. Our GPPs have addressed themes around communication, particularly management plans for complex health conditions between health providers and with families, recognition of deterioration, and escalation of care. The importance of listening to families when they escalate concerns are critical to assessment and timely care.

Deaths from unintentional injury are tragic, yet preventable. Opportunities to reduce these deaths, include using targeted messages across the community to keep children safe and away from harm. This coupled with empowering and listening to parents who escalate their concerns following injury to their child must continue to be an area of focus.

infant mortality rate
age 0 – 364 days

2.7 deaths
per 1,000 live births for infants in Victoria in 2020

3.1 deaths
per 1,000 live births for infants in Australia in 2019*

under-5 mortality rate

3.2 deaths
per 1,000 live births for under-5 in Victoria in 2020

3.6 deaths
per 1,000 live births for under-5 in Australia in 2019*

* 2020 data is not yet available.

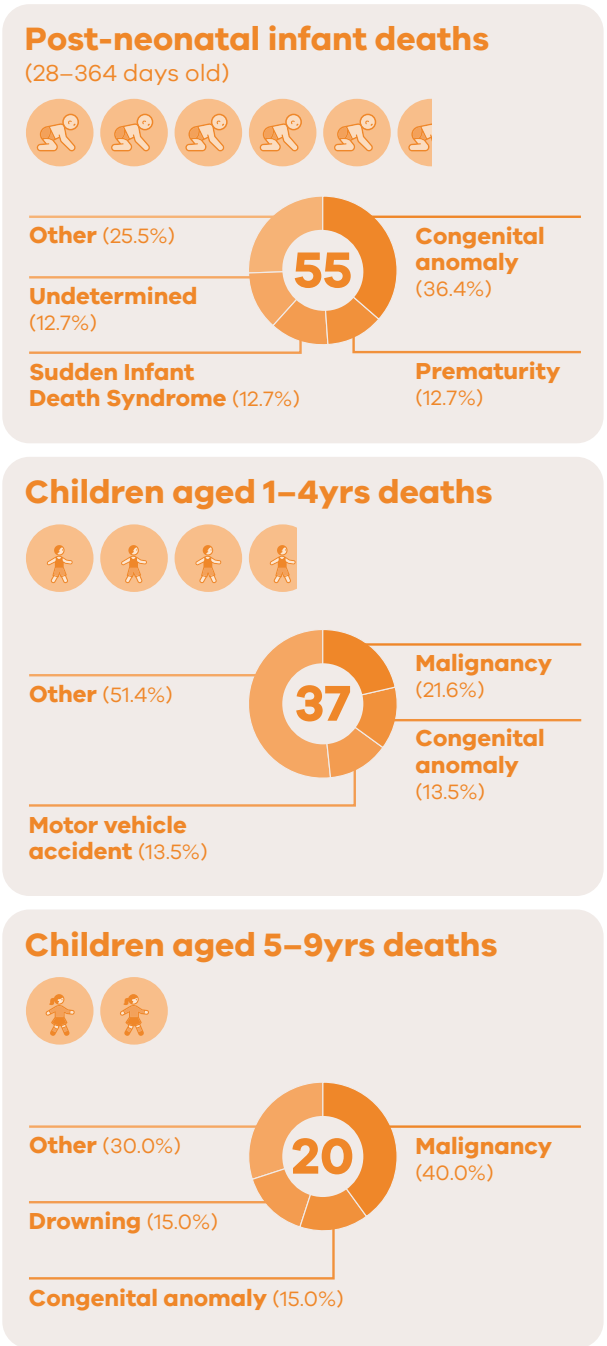
SNAPSHOT

- There were 181 post-neonatal infant, child and adolescent deaths reported in 2020, fewer than the 234 deaths in 2019.
- There were 126 deaths in children aged one to 17 years, compared with 158 in 2019 and 118 in 2018.
- There were 55 post-neonatal infant deaths (28–364 days) compared with 76 in 2019 and 63 in 2018.
- The highest rate of death was in the 28–364 day age group.
- The infant mortality rate in Victoria in 2020 was 2.7 per 1,000 livebirths for infants (0–364 days), compared with the Australian infant mortality rate of 3.1 per 1,000 livebirths in 2019 (2020 data not yet available).[32]

The under-five mortality rate in Victoria in 2020 was 3.2 per 1,000 livebirths compared with the Australian rate of 3.6 per 1,000 livebirths in 2019 (2020 data not yet available).[33]

[32] The World Bank Open Data: https://databank.worldbank.org/reports.aspx?source=2&series=SP.DYN.IMRT.IN&country=

[33] The World Bank Open Data: https://databank.worldbank.org/reports.aspx?source=2&series=SH.DYN.MORT&country=



LEADING CAUSES OF DEATHS BY AGE GROUPS IN 2020

Post-neonatal infants (28–364 days)

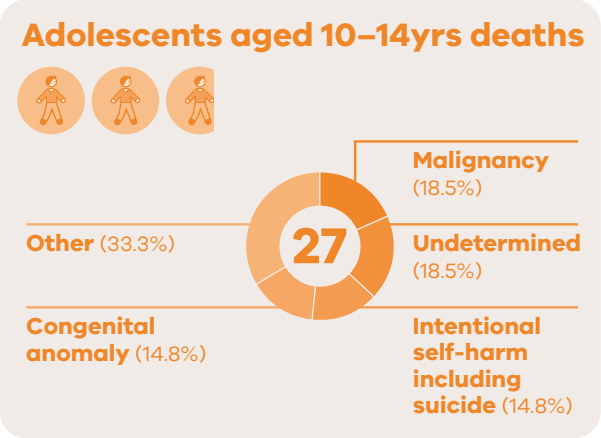
- The leading cause of post-neonatal infant deaths was congenital anomaly (36.4 per cent of 55 deaths). Sudden infant death syndrome, prematurity and undetermined causes of death were the next most common causes of post-neonatal infant deaths, each accounting for 12.7 per cent.

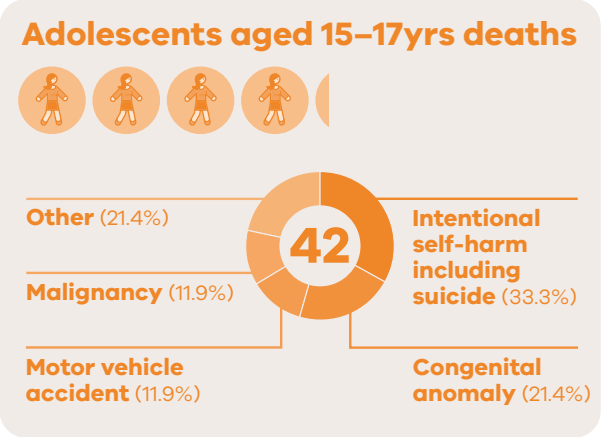
Children aged one to four years

- The leading cause of death of children aged one to four years was malignancy (21.6 per cent of 37 deaths).
- Congenital anomaly and motor vehicle accidents were next most common, each accounting for 13.5 per cent of deaths.

Children aged five to nine years

- The leading cause of death of children aged five to nine years was malignancy (40.0 per cent of 20 deaths).
- Congenital anomaly and drowning were next most common, each accounting for 15.0 per cent of deaths.





Children and adolescents aged 10–14 years

- The leading causes of death of children and adolescents aged 10 to 14 years were malignancy (18.5 per cent of 27 deaths) and undetermined causes of death (18.5 per cent).
- Congenital anomaly and intentional self-harm (including suicide) were next most common, each accounting for 14.8 per cent.

Adolescents aged 15–17 years

- The leading cause of death of adolescents aged 15 to 17 years was intentional self-harm, (including suicide, 33.3 per cent of 42 deaths).
- Congenital anomaly accounted for 21.4 per cent of deaths.
- Malignancy and motor vehicle accidents were next most common, each accounting for 11.9 per cent of deaths.

There were an increased number of unintentional injury deaths in 2020. Of significant concern was the number of drowning and deaths from asphyxia.

Drowning

Of the 11 drowning deaths in 2020, features included:

- issues of adult supervision
- changed supervision arrangements related to the pandemic year (for example, supervision by parents or caregivers while also working from home)
- co-morbidities, for example, epilepsy, cerebral palsy, intellectual disability, autism spectrum disorder, which make closer supervision around water especially important
- over-representation of priority groups – almost half of the children and young people who drowned were known to child protection
- access to water sources (pools, dams) without adequate fencing or where the child could manipulate doors or locks
- varied sites of drowning, including bathtubs, dams, rivers, pools and other bodies of water in outdoor home environments and open water
- confidence around water and access to swimming lessons. More than half of the children who drowned were aged 28 days to 2 years and too young to be confident around water. Children with a disability or those recently arrived in Australia may not have had access to swimming lessons.

For more information on water safety, visit the Play it Safe website

Asphyxia

There were seven asphyxial deaths in 2020, all in children under five years of age, including five aged between 28 days and 364 days. Features of these deaths included:

- unsafe sleeping in a variety of sleep environments
- other household hazards (for example, choking on food, blind cords, etc.).

These deaths highlight the importance of following guidance on safe sleeping, correctly using baby equipment, assessing for choking hazards and assessing and remediating hazards in the home.

For more information, visit the Red Nose guidelines on safe sleeping and the KidSafe guidelines on home safety.

Unintentional injuries

There were 39 deaths due to unintentional injury in 2020, including:

- 14 motor vehicle accidents
- 11 drownings
- seven asphyxial deaths
- seven deaths from other unintentional injuries (including fire-related injuries).

CCOPMM is particularly concerned about the high number of deaths from drowning and asphyxia.

Research, audit and quality improvement

CCOPMM is legislated to conduct research related to mortality and morbidity that will benefit women, babies, children and adolescents, making research a core function of CCOPMM. In addition to this core function, the Public Health and Wellbeing Regulations allow CCOPMM to make perinatal data available to researchers.

RESEARCH AND REPORTING SUBCOMMITTEE

CCOPMM's Research and Reporting Subcommittee (RRSC) is a multidisciplinary group combining specialist clinical and research knowledge and is responsible to lead and to drive CCOPMM's research functions. The group began as the Research Special Interest Group in 2019, before being formalised as a subcommittee.

The RRSC was formed to:

- report to CCOPMM on research, audit and quality improvement
- 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 Mothers, Babies and Children report, the periodic Victorian Congenital Anomalies report and relevant benchmarking activities
- provide advice and support on data used in the Perinatal Services Performance Indicators (PSPI) report; data governance issues in relation to CCOPMM and national reporting regulatory requirements
- review and approve the annual changes to the VPDC
- approve the process for data requests considering Regulation 10 of the Public Health and Wellbeing Regulations 2009
- monitor Data Hub requests and national reporting requirements in relation to CCOPMM data
- approve publication of research using CCOPMM data (including presentations).

RESPONDING TO THE COVID-19 PANDEMIC

With the arrival of COVID-19 in Victoria and declaration of a pandemic in early 2020, this work was reprioritised in line with the evolving COVID-19 pandemic. Planned work and focus on analysis of the VPDC was postponed.

A key piece of work was the COVID-19 communique. This rapid report, prepared and published by CCOPMM in 2021, examined the results of 10 key maternity indicators during 2020 and compared them with similar time points in 2018 and 2019.

This snapshot has been used to inform the ongoing COVID-19 response in Victoria and contributes to national and international data on the effects of the pandemic. The communique did not cover the impacts of the pandemic on children, adolescents, or the impact for families. Further work is required in this space and is linked to one of the CCOPMM recommendations.

COVID-19 Communique

In the COVID-19 communique, CCOPMM suggested five areas for improvement:

1. More agile data systems.
2. Analysis to improve understanding of women's experiences.
3. Analysis to understand impacts on priority populations.
4. A survey to understand the impacts of changes to care provision.
5. Development of a plan for future use during a pandemic.

While responding to the pandemic, several key projects progressed, including:

- establishing Terms of Reference for the new subcommittee
- providing oversight and advocacy in relation to data requests submitted via the VAHI Data Hub
- providing oversight of national reporting requirements, including reporting to AIHW
- review and approval of annual changes to the VPDC
- representing CCOPMM in the National Congenital Anomalies Advisory Group and the National Perinatal Data Development Committee.

In 2022, the subcommittee intend to expand the work of the COVID-19 communique: a rapid report by revisiting the maternal indicators for 2021, and expanding the reach of the report to look closely at women's experiences of care during the pandemic and the impacts of the pandemic response on children and adolescents.

The rapid implementation of telehealth across the healthcare system requires review and further analysis. Benefits were reported from a single health service in the early stages of the pandemic . If this approach to care delivery is to remain a core component in the Victorian maternity care, a fuller understanding of the impact on women and babies is needed.

CCOPMM case reviews have identified telehealth as a potential contributing factor in preventable harm in some cases. It must be recognised that telehealth is not the same in all services (some are by telephone only, some use video) and there is no single approach or standard for telehealth across the sector.

CCOPMM is concerned about the variation in the way telehealth is implemented and:

- the impact of reduced opportunities to recognise clinical signs and deterioration
- the limitations relating to visual observation and nonverbal cues
- a limited capacity for private interactions with women.

A greater understanding of the impact on people from priority groups such as those with complex health conditions, socioeconomic disadvantage, those who do not speak English at home and those without private access to internet is needed. State-based guidance on core components and delivery of telehealth is needed and this will be a focus for work in 2022 and beyond.

[34] Palmer KR, Tanner M, Davies-Tuck M, Rindt A, Papacostas K, Giles ML, Brown K, Diamandis H, Fradkin R, Stewart AE, Rolnik DL, Stripp A, Wallace EM, Mol BW, Hodges RJ. Widespread implementation of a low-cost telehealth service in the delivery of antenatal care during the COVID-19 pandemic: an interrupted time-series analysis. ***Lancet***. 2021 Jul 3;398(10294):41-52.

CCOPMM DATABASES

CCOPMM is responsible for the following databases:

- **Victorian Perinatal Data Collection (VPDC)** – A register recording more than 100 data items for all births in Victoria of at least 20 weeks' gestation or (if gestation is unknown) 400 grams birthweight.
- **Victorian Congenital Anomalies Register (VCAR)** – Information on all congenital anomalies for livebirths, stillbirths and terminations of pregnancy diagnosed before birth to six years old, voluntarily notified to CCOPMM.
- **CCOPMM Mortality Database** – Information on all cases of maternal, perinatal and paediatric mortality in Victoria.

Severe Acute Maternal Morbidity (SAMM) Dataset – Information on maternal admissions to intensive care during pregnancy and up to 42 days after birth.

ACCESSING CCOPMM DATA

Each year CCOPMM receives requests for data from researchers outside SCV and the department. In 2020 there were 62 requests to access extracts of the VPDC.

Requests for data are submitted through the VAHI Data Request Hub. Approved research involving data linkage may be facilitated by the Centre for Victorian Data Linkage. All requests for research are reviewed in accordance with CCOPMM's legislative requirements.

The subcommittee is working towards publication of approved projects and data requests using CCOPMM data so that this information is accessible to researchers and duplication of effort is minimised.

CCOPMM is making improvements to accessibility and equity of CCOPMM-supported student research projects by partnering with Victorian universities and medical research institutes in 2022.

RESEARCH AREAS OF FOCUS IN 2020

CCOPMM undertakes internal research projects on key priority areas. Two areas of focus in 2020 are highlighted here.

Fetal growth restriction

Fetal growth restriction remains one of the strongest risk factors for stillbirth, particularly when it is undetected during pregnancy. CCOPMM has recognised this risk and is supporting a MD-PhD candidate under the supervision of CCOPMM-associated researchers to investigate the impact of the suite of practice recommendations made to help increase the detection of fetal growth restriction in Victoria.

Recent work explored the childhood school outcomes for infants suspected of fetal growth restriction using CCOPMM data. This work has shown that early birth of severely growth-restricted infants was associated with poorer developmental and educational outcomes in school.[35] This highlights the mortality-morbidity tradeoff associated with earlier birth of babies suspected to be affected by fetal growth restriction.

CCOPMM is now supporting a diverse set of projects to understand whether other events in the perinatal period are associated with longer-term childhood impacts. This work has been disseminated widely, including an Honours thesis and PhD thesis, several published manuscripts, and presentations at local, national and international conferences. Recent publications in peer-reviewed journals include:

- Preventing harm: A balance measure for improving the detection of fetal growth restriction (DOI: 10.1111/ajo.13340)
- Association between iatrogenic delivery for suspected fetal growth restriction and childhood school outcomes (DOI: 10.1001/jama.2021.8608)
- Stillbirth: are we making more progress than we think? A retrospective cohort study (DOI: 10.1111/1471-0528.16665)
- Does detection of fetal growth restriction improve neonatal outcomes? (DOI: 10.1111/jpc.15310)
- Improving maternity care in Victoria: An accidental learning healthcare system (DOI: 10.1111/ajo.13317)
- Increasing obstetric intervention for fetal growth restriction is shifting birthweight centiles: a retrospective cohort study (DOI: 10.1111/1471-0528.16215)
- Reducing stillbirth safely in Australia (DOI: 10.5694/mja2.50658)
- Risk factor assessment for fetal growth restriction, are we providing best care? (DOI: 10.1111/ajo.13147)
- The pitfalls of using birthweight centile charts to audit care (DOI: 10.1371/journal.pone.0235113)
- Does public reporting of the detection of fetal growth restriction improve clinical outcomes? A retrospective cohort study (DOI: 10.1111/1471-0528.16038)

[35] Selvaratnam RJ, Wallace EM, Wolfe R, Anderson PJ, Davey M. Association Between Iatrogenic Delivery for Suspected Fetal Growth Restriction and Childhood School Outcomes. *JAMA*. 2021;326(2):145–153.

Perinatal mortality

Perinatal mortality includes fetal deaths (stillbirths) and deaths of live-born babies within the first 28 days after birth (neonatal deaths). While Victoria is one of the safest places in the world to have a baby, some perinatal deaths continue to occur and there are potentially opportunities to reduce the number of deaths.

CCOPMM recognised the need to identify causes of variation across perinatal mortality. Identifying variation in care between services can provide an opportunity for hospitals to share information and improve care protocols.

A MD candidate was supported to review the characteristics of perinatal deaths, including gestation, type of death (stillbirth or neonatal death) and cause of death across Victoria's level 6 capability maternity services. The findings of this study[36] will be used to inform the extent to which differences in care between health services result in variation in perinatal mortality and the associated improvement activities that need to be implemented and evaluated.

IMPROVEMENT PROJECTS

Safer Baby Collaborative

Safer Care Victoria partnered with the Institute for Healthcare Improvement (IHI), the Stillbirth Centre for Research Excellence, consumers with lived experience of stillbirth and Victorian maternity services to reduce stillbirth in the third trimester of pregnancy. This collaborative work commenced in June 2019 and concluded in May 2021 with a pause due to the COVID-19 pandemic from March to November 2020.

Maternity services participating in the Safer Baby Collaborative sought to reduce stillbirth after 28 weeks of pregnancy by 30 per cent. Data collected indicates that 20 stillbirths were prevented during the collaborative. Other improvements seen included:

- increase in smoking cessation rates (the proportion of women stopping smoking) during pregnancy by 200 per cent, from an average rate of 11 per cent to 33 per cent
- decrease in the stillbirth rate by 21 per cent, from an average rate of 0.24 per cent to 0.19 per cent
- increase in the days between stillbirths by 131 per cent, from an average of 3.5 days to 8.1 days, including periods of 47 days and 32 days without a stillbirth occurring at any of the reporting sites.

Find out more about the Safer Baby Collaborative here.

Better Births for Women Collaborative

SCV partnered with the IHI, consumers with a lived experience of severe perineal trauma and 12 Victorian maternity services to reduce the rate of perineal injury.

A bundle of evidence-based interventions was introduced to reduce the rates of third- and fourth-degree perineal injury. This collaborative work ran from June 2019 and concluded in May 2021 with a pause during 2020 due to the COVID-19 pandemic.

Data collected throughout the collaborative indicates that 155 severe perineal tears were prevented, reducing harm and trauma for 155 women. Data also shows the rate of severe injury dropped by 45 per cent, from an average rate of 4.4 per cent to 2.4 per cent.

Find out more about the Better Births for Women Collaborative here

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About CCOPMM

CCOPMM FUNCTIONS

As described in the *Public Health and Wellbeing Act 2008*, CCOPMM's functions are to:

- conduct study, research and analysis into the incidence and causes in Victoria of maternal deaths, stillbirths and the deaths of children
- conduct study, research and analysis into the incidence and causes of obstetric and paediatric morbidity
- conduct a perinatal data collection unit for the purpose of:
  - collecting, studying, researching and interpreting information on and in relation to births in Victoria
  - identifying and monitoring trends in respect of perinatal health including birth defects and disabilities
  - providing information to the Secretary on the requirements for and the planning of neonatal care units
  - providing information for research into the epidemiology of perinatal health including birth defects and disabilities
  - establishing and maintaining a register of birth defects and disabilities
- provide to health service providers:
  - information on obstetrics and paediatrics
  - strategies to improve obstetric and paediatric care
- consider, investigate and report on any other matters in respect of obstetric and paediatric mortality and morbidity referred to CCOPMM by the Minister or the Secretary
- liaise with any other consultative council (whether or not prescribed) on any matter relevant to the functions of CCOPMM
- publish an annual report on the research and activities of CCOPMM
- perform any other prescribed function
- collect information for the purpose of performing its functions as outlined in the Act.

In addition to the above functions, CCOPMM must report preventable harm to the Secretary:

- if CCOPMM determines that a maternal death, stillbirth or death of a child was likely to have been preventable
- if CCOPMM determines that an instance of severe obstetric or paediatric morbidity was likely to have been preventable.

A report of preventable harm to the Secretary must include the following:

- the type of incident causing the mortality or morbidity
- the health service connected with the mortality or morbidity (if any)
- how the mortality or morbidity was likely to have been preventable
- the status of any investigation by CCOPMM of the incident
- any remedial action taken by the relevant health service.

Review of deaths

CCOPMM's primary role is to review all maternal, perinatal and paediatric deaths and severe maternal morbidity in Victoria, determine factors that may have contributed to these deaths and severe morbidity, 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 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 accordance with the PSANZ's Perinatal Mortality Classification System 2020. Post-neonatal infant, child and adolescent death are classified using the International statistical classification of diseases and health related problems, 10th revision, Australian modification (6th edition).

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

Complex or contentious mortality and morbidity cases are referred to CCOPMM's specialist subcommittees for review. CCOPMM assesses preventability and makes recommendations to improve clinical practice and systems, based on the findings from each review and the best available evidence. We cannot always identify avoidable factors from the information available during case review, meaning that the actual number of cases that may have preventable factors could be higher.

Review of births

The *Public Health and Wellbeing Act 2008* requires all births that occur in Victoria to be reported to CCOPMM within a prescribed period. This period is defined within the Public Health and Wellbeing Regulations as 30 days after the birth.

CCOPMM has statutory responsibility for the VPDC and VCAR. The department and SCV manage the data collections on the CCOPMM's behalf. The data collections enable information about the health of women, babies and children to be analysed and help support improvements in their health. 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.

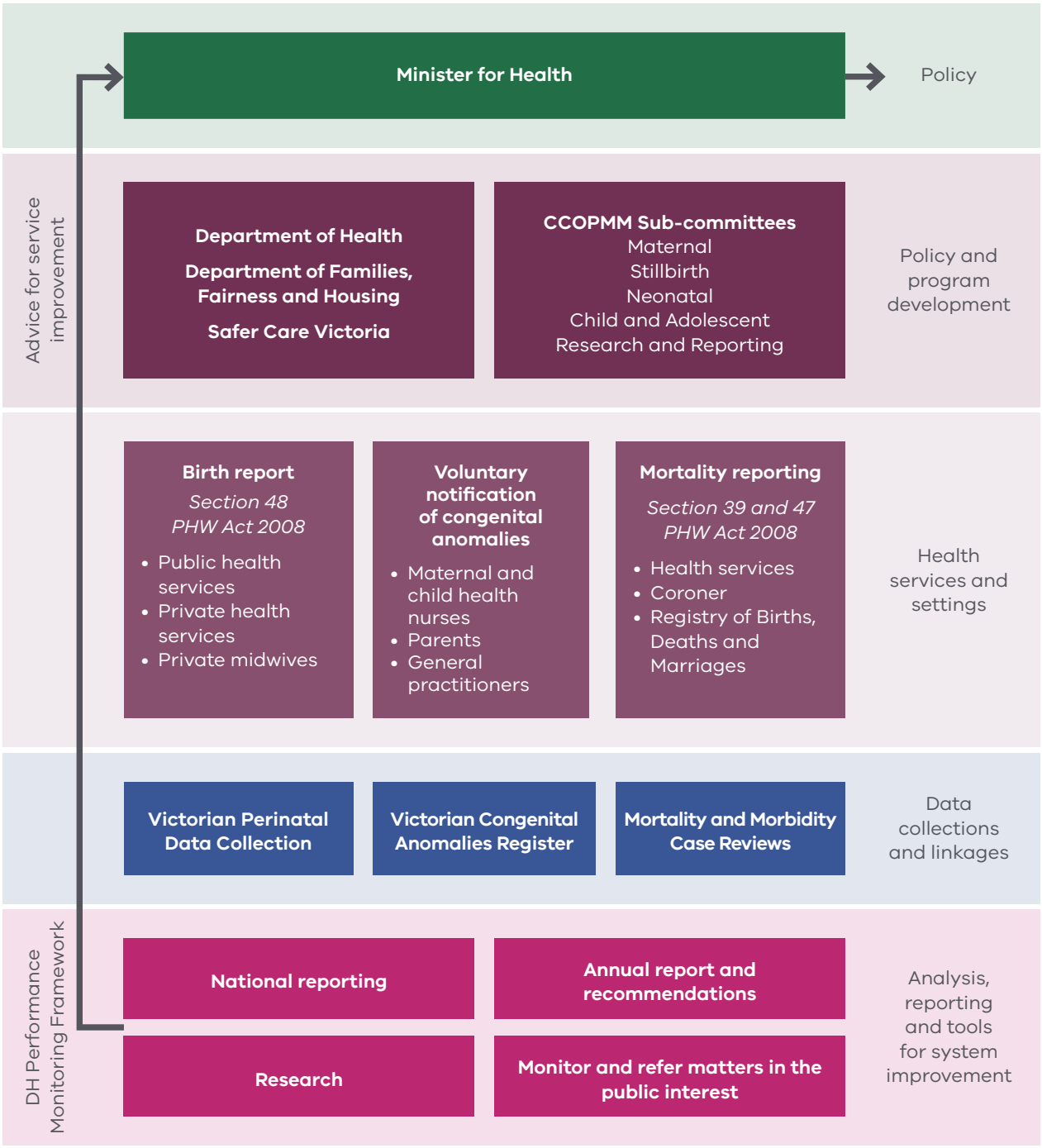
Reporting and analysis

The VPDC contributes to the AIHW 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 previous chapter.

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

An illustration of CCOPMM's relationships accountabilities and role is shown in Figure 1.

Figure 1: CCOPMM's relationships, accountabilities and role



CCOPMM MEMBERS, 2018–2021

Adj Prof Tanya Farrell (Chair)

Prof Susan McDonald (Deputy Chair)

Dr David Fuller

Dr Alison Green

Prof Caroline Homer

Ms Robyn Hudson

Prof Rod Hunt

Ms Ann Jorgensen

Dr Niroshini Kennedy

Prof John McNeil

Prof Paul Monagle (resigned February 2021)

Adj Clin Assoc Prof Robert Roseby

Ms Karen Sawyer

Assoc Prof Alexis Shub

Assoc Prof Glyn Teale

Mr Nicolas Thomas

Prof Mark Umstad

Maternal Mortality and Morbidity Subcommittee

Prof Mark Umstad (Chair)

Dr Malcolm Barnett

Ms Bree Bulle

Dr Jackie Collett

Dr Mary-Ann Davey

Adj Prof Tanya Farrell

Dr Alison Green

Dr Elizabeth Hessian

Assoc Prof Ryan Hodges (appointed July 2020)

Prof Caroline Homer

Ms Kim Howland

Dr Matthew Lynch

Prof Susan McDonald

Ms Abby Monaghan

Prof Louise Newman

Prof Daniel O'Connor

Prof Michael Permezel

Dr Wendy Pollock (resigned February 2020)

Ms Karen Sawyer

Assoc Prof Glyn Teale

Dr Craig Walker

Stillbirth Subcommittee

Prof Susan McDonald (Chair)

Dr Lisa Begg

Dr Jodie Benson

Dr Jackie Collett

Dr Mary-Ann Davey

Adj Prof Tanya Farrell

Ms Kym Harrison

Assoc Prof Lisa Hui

Dr Emily Olive

Dr Kirsten Palmer (appointed August 2019)

Dr Warrick Pill

Assoc Prof Joanne Said

Ms Sonia Shaw

Prof Mark Umstad

Ms Colleen White

Neonatal Mortality and Morbidity Subcommittee

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Ms Jane Bailey

Dr Lisa Begg

Dr Rosemarie Boland

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Dr Annie Moulden

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Prof Katrina Williams

Research and Reporting Subcommittee

Prof Caroline Homer (Chair)

Dr Miranda Davies-Tuck

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Prof Rod Hunt

Prof John McNeil

Assoc Prof Alexis Shub

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Appendix 1: Definitions

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 coloration. 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.

Child death

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

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. PSANZ 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 live births (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 (EFRP), aged 15–44 years, in its tables.

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 less 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 42 days 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 history of 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.
- **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 MMR.

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 as it is less skewed by ages that sit at extreme ends of the range.

Neonatal death

Death of a liveborn infant less 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 (PPH)

Primary postpartum haemorrhage is maternal blood loss of 500mL or more in the 24 hours following birth.

Preeclampsia

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

Sepsis/septic shock

Sepsis is 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 (SUDI)

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

SUDI can be classified 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 of 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 pathologic findings; minor respiratory system inflammatory infiltrates are acceptable; intrathoracic petechial haemorrhage is a supportive but not obligatory or diagnostic finding
  - no evidence of unexplained trauma, abuse, neglect or unintentional injury
  - no evidence of substantial thymic stress effect (thymic weight of < 15 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 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 recognised suspect for infanticide or recognised genetic disorders
  - neonatal or perinatal conditions (for example, those resulting from preterm birth) that have resolved by the time of death.
- Circumstances of death:
  - mechanical asphyxia or suffocation caused by overlaying not determined with certainty.
- Autopsy:
  - abnormal growth or development not thought to have contributed to death
  - marked inflammatory changes or abnormalities not sufficient to be unequivocal causes of death.

Unclassified sudden infant death: Includes deaths that do not meet the criteria for category I or II 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.[37]

[37] Krous HF, Beckwith JB, Byard RW, Rognum TO, Bajanowski T, Corey T, Cutz E, Hanzlick R, Keens TG, Mitchell EA 2004, 'Sudden infant death syndrome and unclassified sudden infant deaths: a definitional and diagnostic approach', ***Pediatrics*** 114(1):234-238.

Appendix 2: Measures

MATERNAL MORTALITY RATIO (MMR)

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

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.[38]

'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 WHO).

NEONATAL MORTALITY RATE (NMR)

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

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.

STILLBIRTH RATE

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

INFANT MORTALITY RATE (IMR)

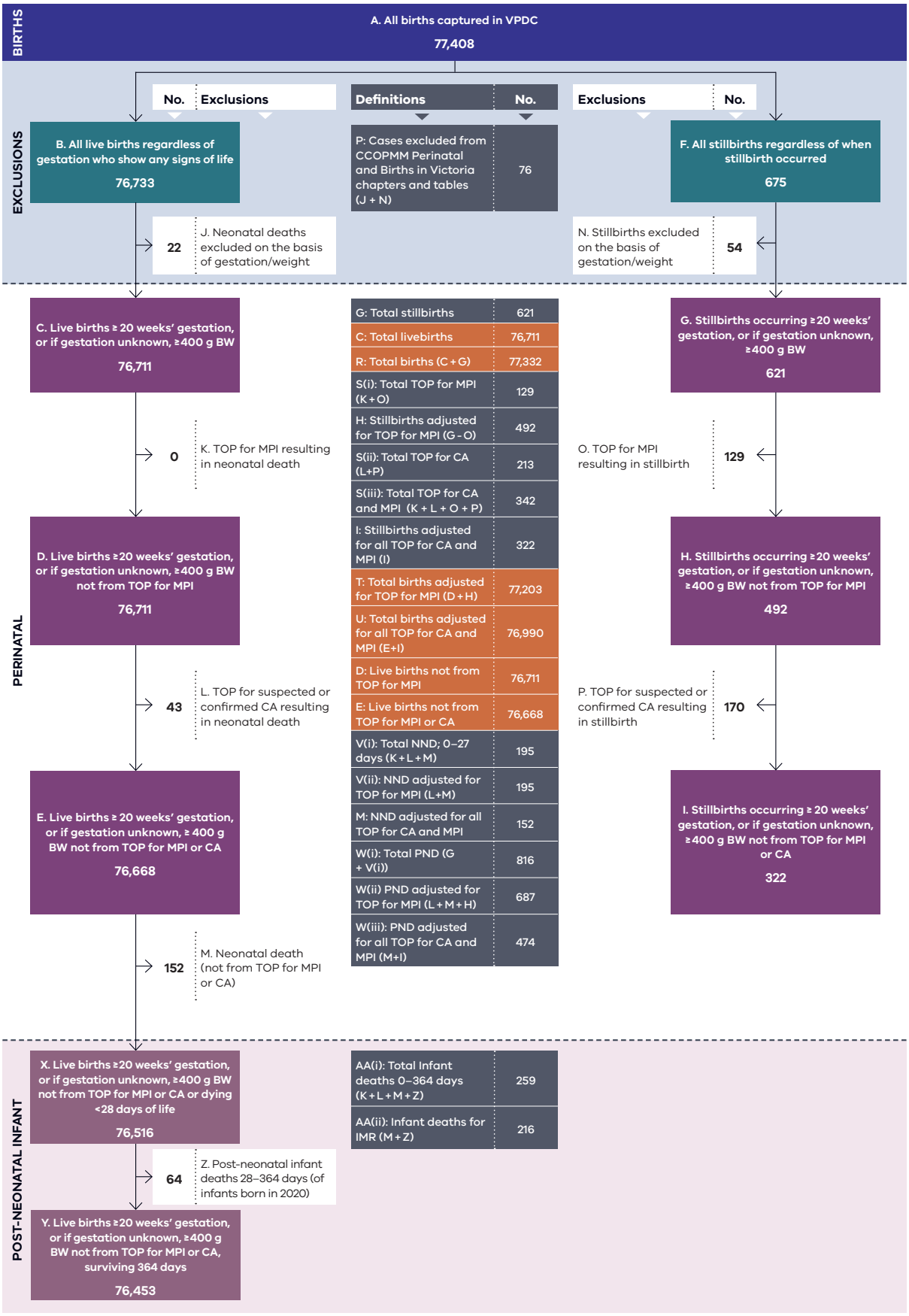
IMR = number of infant deaths × 1,000 total livebirths

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.

[38] Please note that the methodology for death classifications has changed over time to align with national standards. Numbers may differ from previous reports due to revisions to the data.

Appendix 3: Flow diagram for births in Victoria, 2020



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+ U(i)) / (G+ C) × 1,000

IMR = Z(ii)/E × 1,000

NOTES

a. The diagram includes only births occurring in Victoria and their outcomes.

b. Neonatal death exclusions (J) comprise:

J(i). Those live born < 20 weeks' gestation

J(ii). Those live born at unknown gestation with a birthweight < 400 grams.

c. Stillbirth exclusions (N) comprise:

N(i). Stillbirths where death is known to have occurred < 20 weeks' gestation but birth ≥ 20 weeks' gestation with BW < 400 grams

N(ii). Stillbirths where death and birth occurred at unknown gestation, with a BW < 400 grams

N(iii). Stillbirths where death is known to have occurred < 20 weeks' gestation but born ≥ 20 weeks' gestation, with unknown BW

N(iv). Stillbirths where death occurred at unknown gestation, birth occurred ≥ 20 weeks' gestation, but where BW < 150 grams

N(v). Stillbirths where death is known to have occurred > 20 weeks' gestation but born with unknown but very small BW

N(vi) stillbirths where death and birth are known to have occurred, 20 weeks' gestation.

d. Post-neonatal infant deaths reported to CCOPMM as at 11 November 2021. Final figures will be given in the 2021 annual report.

e. Numbers of births can differ slightly between the 'Mothers and babies' section and Appendix 3: Flow diagram for births in Victoria, 2019 and 'Perinatal deaths' section of the report, as Births in Victoria uses gestation at birth, regardless of when the fetal death occurred, whereas Appendix 3 and the 'Perinatal deaths' 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, if the birthweight was ≥ 150 grams, this would be counted as a birth in the sections of this report dealing with births but excluded from Appendix 3 and the 'Perinatal deaths' section.

Appendix 4: 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 VPDC. Vital information relating to 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
- PIPER service
- individual treating practitioners
- palliative care services
- maternal and child health nurses
- Ambulance Victoria
- child protection services.

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