# Queensland Mothers and Babies 2016 and 2017

Report of the Queensland Maternal and Perinatal Quality Council 2019

Queensland Government

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# Foreword

It has been most gratifying to have served as a member of the Queensland Maternal and Perinatal Quality Council (QMPQC) for the past six years, including four years as QMPQC Chair and co-Chair of the Perinatal Mortality Sub-Committee (PMSC). The work of the QMPQC is extremely important and relies on the dedication of its membership to carry out its work plan. Membership is voluntary and I take this opportunity to applaud all who provide their time and expertise with one thing in mind, which is to improve outcomes for Queensland mothers and their babies.

The QMPQC functions under the quality assurance provisions of Part 6, Division 1, Quality Assurance Committees, of the *Hospital and Health Boards Act 2011*. As the advisory body to the Minister for Health and Minister for Ambulance Services, the QMPQC is responsible for undertaking confidential enquiry into maternal and perinatal morbidity and mortality and the surveillance for prevalence of congenital anomalies, to identify areas for improvement in healthcare outcomes.

Much of the work of the QMPQC is driven by the activities of the three Sub-Committees and I would like to acknowledge the Chairs and the members of all three, for their unwavering efforts. In this report the Congenital Anomaly Sub-Committee (CASC) draws attention to areas for improvement in the perinatal care of babies with critical congenital heart disease, and those with gastroschisis. For both conditions, which are amongst the more common of the potentially correctable congenital anomalies, detailed reviews have shown areas for improvement in terms of detection and both place and timing of birth. I hope the lessons from these important pieces of work are translated into clinical practice over the next few years.

The Maternal Mortality Sub-Committee (MMSC) carries out very detailed case reviews of all maternal deaths. Although these are now thankfully quite infrequent, the MMSC is very diligent in looking for areas of practice improvement which might lead to prevention of future deaths. In this report it has drawn attention to the issues of workplace culture and psychological safety, as they both relate to the safety and wellbeing of mothers and babies.

There are many contributors to workplace culture. A shared commitment to the values of respect, integrity, compassion and teamwork is fundamental in developing a positive, vibrant and psychologically safe workplace. Systems and processes need to be implemented so that unprofessional behaviour and workplace incivility is identified and promptly addressed [1,2,3,4]. Workload management requires consistent attention to ensure continuity of service provision to a safe standard and in terms of the job satisfaction of providers. Queensland Health is to be commended on its efforts around the Communication and Patient Safety Program (CAPS), which has been designed to improve workplace culture, teamwork and effective communication in the delivery of safe patient care. It remains important to assess whether these efforts actually improve workplace culture.

1 The wellbeing of clinicians must be a priority. Dr Alex Markwell, Chair, Queensland Clinical Senate *https://clinicalexcellence.qld.gov.au/sites/default/files/docs/clinical-senate/article-workforce-wellbeing.pdf*

2 Prevalence of bullying, discrimination and sexual harassment among trainees and Fellow of the College of Intensive Care Medicine of Australia and New Zealand. Venkatesh et al, Crit Care Resusc Dec; 18(4):230-234.

3 Bullying and sexual harassment of junior doctors in New South Wales, Australia: rate and reporting outcomes. Australian Health Review, 2019, 43, 328-334.

4 Workplace bullying and mental health. Butterworth, P et al. Centre for Research on Ageing, Health and Wellbeing. ANU. Canberra

The PMSC oversees all classification of causes of perinatal deaths for Queensland. While some maternity services provide classified perinatal deaths, around half of perinatal deaths are reviewed and classified by the PMSC. It also conducts in-depth review for contributing factors relating to care for all perinatal deaths occurring after 34 weeks gestation, excluding those with major congenital anomalies. A careful and comprehensive review by a multi-disciplinary team was undertaken according to the Perinatal Society of Australia and New Zealand (PSANZ) guidelines [5]. This review identified some broad themes of deficiencies in care. It is hoped this work can continue and lead to practice improvements. Fragmentation of antenatal care and inadequate communication between different health professionals providing care, are prominent areas which stand out and which can also be improved by addressing workplace culture. Other specific practice improvement areas identified included the need for better care for women with risk factors for stillbirth, such as fetal growth restriction, decreased fetal movements, diabetes and smoking. These elements of care are addressed in the Safer Baby Bundle initiative [6] and it is hoped that practice and outcomes will improve with the implementation of the Bundle across Queensland during 2020.

In the detailed case reviews of maternal and perinatal deaths, it is apparent that poor communication, negative workplace culture and disregard of the importance of promoting psychological safety for staff, contribute to avoidable adverse outcomes. This is a nationally and internationally well-documented issue that impacts directly on patient safety [7,8].

It must also be noted that during the case reviews, the QMPQC found many examples of exceptional teamwork in the face of challenging clinical situations. Some of the profoundly humane and compassionate conversations documented in the medical records, demonstrate that our capacity to care and appropriately respond, occurs in the most heartening of ways.

Finally, as this is my last official duty as Chair of the QMPQC, I would like to sincerely acknowledge the excellent support that has been provided to myself and others by all Queensland Health staff involved in ensuring that this Council has functioned at such a high standard. The mothers and babies of Queensland deserve the very best of care and it is through the activities of bodies such as the QMPQC, that we can strive to guarantee that the high standards of both quality and safety are assured.

**Professor David Ellwood**
**Outgoing Chair**
**Queensland Maternal and Perinatal Quality Council**

5 PSANZ Clinical Practice Guidelines 2018. *https://sanda.psanz.com.au/clinical-practice/clinical-guidelines/*

6 Safer Baby Bundle. *https://www.stillbirthcre.org.au/safer-baby-bundle/*

7 Thorp et al, J Patient Safety, 2012: 8: 194-201

8 Braithwaite J, Herkes J, Ludlow K, et al. Association between organisational and workplace cultures, and patient outcomes: systematic review. BMJ Open 2017; *https://bmjopen.bmj.com/content/bmjopen/7/11/e017708.full.pdf*

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## Acknowledgements

The QMPQC acknowledges and respects the traditional owners and Aboriginal and Torres Strait Islander elders past and present, on whose land we work to support the provision of safe and quality healthcare.

The work of the QMPQC is maintained by exemplary secretariat support and a team of high-level perinatal epidemiologists, provided by the Queensland Department of Health, Patient Safety and Quality Improvement Service, Clinical Excellence Queensland and the Statistical Services Branch, Strategy, Policy and Planning Branch. Without this steadfast support, the QMPQC could not function.

Preparation of this report has been made possible through the support and guidance of the Queensland Department of Health, Statistical Services Branch. Thanks especially to Miles Utz and Michelle Dihn for epidemiological analysis, data interpretation and for graciously attending to the many amendments requested along the way.

The Maternal Mortality and Perinatal Mortality Sub-Committees wish to acknowledge the support of staff in the health information access; release of information; and patient safety and quality units of both public and private health service providers. Their timely response to requests for mortality information has greatly assisted with in-depth case review; identification of potential avoidable factors and the appropriate classification of the maternal and perinatal deaths included in this report.

All Queensland Hospital and Health Services and private healthcare providers are to be commended for:

- allowing staff who volunteer as members of the QMPQC and its Sub-Committees, to take time during working hours to attend meetings and contribute to its quality assurance agenda. All recommendations and good practice points have been developed by members with their colleagues in mind, to assist them in providing best practice health care
- accepting the invitation and supporting their staff to attend the biennial Report Conference, enabling attendees to share their gained knowledge with health service colleagues; fundamentally, benefitting Queensland mothers and babies.

The QMPQC also acknowledges and thanks the clinicians who participate in perinatal and maternal mortality review and classification through local case review committees. This is a critical function at the local level which contributes significantly to improving outcomes.

The contribution of consumers to the work of the QMPQC and its Sub-Committees is also acknowledged. Their input is appreciated in discussions at all levels and is of enormous value, especially in relation to the content of the QMPQC biennial reports and during mortality case review.

The support of the following is also acknowledged with gratitude:

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# Summary

This report focuses primarily on the 121,275 mothers who gave birth to 123,105 babies in Queensland in 2016 and 2017. This includes the 8,311 (6.9 per cent) women who identified as Aboriginal and/or Torres Strait Islander and their 8,427 babies. Unless otherwise mentioned, all data relate to the years 2016 and 2017.

### Mothers and pregnancy

The proportion of women giving birth at 35 years of age and over increased slightly between 2008 and 2017, while the proportion of mothers aged under 20 decreased. Indigenous women giving birth were approximately five times more likely to be aged under 20 than non-Indigenous women.

Multiple pregnancies represented 1.5 per cent of all pregnancies, almost all (98.7 per cent) being twins. One in five (20.9 per cent) multiple pregnancies occurred where assisted conception techniques had been used.

Higher rates of antenatal care during the first trimester were found among women who gave birth in private facilities (92.2 per cent) than among women who gave birth at home (58.9 per cent) or in public facilities (72.4 per cent). Indigenous women less than 20 years of age were less likely to attend the recommended number of at least five antenatal care visits.

Smoking during pregnancy is more common among women in Queensland than nationally (12.0 per cent vs 9.9 per cent), particularly during the first 20 weeks of pregnancy (11.9 per cent vs 9.5 per cent). Women who stop smoking during pregnancy can reduce the risk of adverse outcomes [9], and 17.9 per cent of women who smoked in the first 20 weeks did not continue to smoke after 20 weeks gestation.

The proportion of women giving birth in private hospitals has reduced over the last decade, with 24.8 per cent giving birth in a private hospital (down from 30.2 per cent in 2008 and 2009) and 74.1 per cent of women giving birth in a public hospital. The overall rate of births with no labour in private facilities is much higher than the rate in public facilities (38.8 per cent and 16.6 per cent, respectively).

### Babies and birth

Gestational age is an important determinant of perinatal outcome with 9.4 per cent of babies born preterm (before 37 weeks) and 0.3 per cent born post-term (42 weeks and over). There has been little change in these proportions over the past decade.

There has not been a significant change in the percentage of babies born with low birthweight (less than 2500g) over the past 10 years (6.4 per cent in 2008 and 2009; 6.9 per cent in 2016 and 2017).

The percentage of liveborn babies admitted to a special care or intensive care nursery was 22.6 per cent. This is often due to being born preterm or due to a congenital anomaly (and sometimes both).

### Congenital anomalies

Over the decade for which data are available (2008-2017) there was an increase in cardiovascular congenital anomalies (from 15.1 to 22.6 per 1,000 births), respiratory system defects (from 3.6 to 6.4 per 1,000 births), gastrointestinal defects (from 19.8 to 35.6 per 1,000 births) and musculoskeletal defects (from 32.2 to 42.4 per 1,000 births). At least some of these increases may be due to improved detection through advances in ultrasound diagnosis, or increases in the ease with which hospitals are able to report congenital anomalies, due to the introduction of online reporting systems to replace or supplement forms-based reporting.

Congenital heart defects (CHD) are the most common group of congenital anomalies, with an incidence between 4 and 10 per 1000 livebirths. This report examines all fetal and neonatal cases of four critical Congenital Health Defect (cCHD) lesions born between 2007-2015, that require early detection to improve mortality and morbidity by planned tertiary birth and prompt cardiology assessment.

Babies of mothers older than 40 years had higher rates of chromosomal abnormalities and cardiovascular defects (particularly septal defects and patent ductus arteriosus). Babies of mothers younger than 20 years of age had higher rates of gastroschisis.

### Congenital syphilis

In 2017, Infectious syphilis and the re-emergence of congenital syphilis affecting babies in Queensland was identified as an important issue by the QMPQC. Consequently, a Congenital Syphilis Working Group (CSWG) was convened during 2018, tasked with the review of all Queensland cases of congenital syphilis that occurred between 2010 and 2018 (15 cases).

9 Stillbirth Centre of Research Excellence Position Statement – Smoking – one of the most important things to prevent in pregnancy and beyond *https://www.stillbirthcre.org.au/resources/clinical-practice-guidelines/*

### Maternal mortality

There were 37 maternal deaths either during pregnancy or up to one year after the end of pregnancy. Ten of these deaths occurred in pregnancy or during the first six weeks postpartum. These were classified as direct or indirect, thereby contributing to a Maternal Mortality Ratio (MMR) for 2016 and 2017 of 8.2 per 100,000 births, which is slightly higher than the national figure of 7.2 per 100,000 births. Most prominently, nine deaths in Queensland occurred by suicide, which continues to be a public health issue of concern that requires urgent attention. Eight women died from malignancy and five from cardiac related conditions.

Attention is drawn to the importance of mental health follow up. Antenatal and postnatal screening has led to a higher identification of women at risk of mental health issues during pregnancy.

Suicide is the leading cause of maternal death and little is known about the circumstances in which these deaths occur. To gain a better understanding of this tragedy, the QMPQC gave an undertaking in its 2017 Report to conduct a review of the 59 maternal suicides that occurred between 2004 and 2017.

### Perinatal mortality

There were 1,196 perinatal deaths, giving a perinatal mortality rate of 9.7 per 1,000 births (stillbirth rate 6.6 per 1,000 births, and neonatal mortality rate 3.1 per 1,000 live births). The national perinatal mortality rate for the same period was 9.4 per 1,000 births (stillbirth rate 7.0 per 1,000 births, and neonatal mortality rate 2.6 per 1,000 live births). The rate of stillbirths has not changed significantly over the decade 2008 to 2017 (annual percent change: -0.1; 95 per cent CI: -1.1, 1.0) while the neonatal death rate has declined modestly (annual percent change: -1.9; 95 per cent CI: -3.4, -0.4).

Babies born to Indigenous women have higher rates of perinatal deaths. Stillbirths and neonatal deaths occur at 1.7 and 1.8 times the rate of babies born to non-Indigenous women, respectively.

The leading cause of stillbirths was congenital abnormality, accounting for one-third of all stillbirths (including termination of pregnancy for major anomalies). More than one-quarter (27 per cent) of stillbirths were classified as unexplained and at term this proportion increased to 55 per cent.

Autopsy rates remain low, with 37.3 per cent of stillbirth and 22.3 per cent of neonatal deaths having an autopsy examination.

While most stillbirths are due to antepartum fetal death, attention to intrapartum deaths is important due to the potential for prevention, particularly in late gestation.

The leading cause of neonatal deaths was spontaneous preterm birth with related complications accounting for 41 per cent of all neonatal deaths.

In-depth review of a subset of perinatal deaths that occurred in the twelve-month period, 1 January to 31 December 2018, was undertaken by the PMSC to identify contributing factors relating to care (substandard care factors). Seventy-four perinatal deaths (60 stillbirths and 14 neonatal deaths) in 2018 fulfilled the review inclusion criteria of 34 weeks gestation or more without major congenital anomalies. Contributing factors were identified in 46 (71 per cent) of perinatal deaths reviewed; 39 (69.6 per cent) of stillbirths and seven (77.8 per cent) of neonatal deaths. In 20 cases (30.8 per cent) these factors were considered to have significantly contributed to the outcome, and most of these deaths were stillbirths (80 per cent). The review has demonstrated the value of generating information about the causes of perinatal death and modifiable factors.

# Recommendations

- That Queensland Health develop strategies to improve access to culturally safe antenatal care, to increase early engagement and frequency of attendance by Indigenous women. *(see page 15)*
- That all fetal ultrasound screen providers receive training around, and utilise, published guidelines for standard fetal cardiac views, particularly of ventricular outflow tracts, as noted in the International Society of Ultrasound in Obstetrics and Gynaecology Fetal Cardiology Guidelines. *(see page 38)*
- That consideration be given by each birth hospital for all newborn infants to have pulse oximetry screening prior to discharge, as stated in the Queensland Maternity and Neonatal Clinical Guidelines 2019. *(see page 38)*
- That all Queensland Hospital and Health Services use the 'single pack' perinatal and fetal autopsy consent form. *(see page 39)*
- That consideration be given to the promotion of education regarding the new Medicare numbers for screening for perinatal mental health in the private sector, including increasing awareness of local referral pathways. *(see page 46)*
- That consideration be given to prioritising the development of a Queensland clinical guideline on perinatal mental health. *(see page 47)*
- That consideration be given to the development of a systematic, holistic approach to appropriate high intensity intervention, including case management with a continuity of care midwifery model, for women who are at risk of disengaging from antenatal care and who may have complex mental health/ psychosocial issues. *(see page 48)*
- That State and Federal jurisdictions improve education and rapid access to safe reliable contraception for women. This should preferably occur through education for early secondary school students and a suitably targeted public health campaign. *(see page 49)*
- That culturally safe programs targeting education and provision of suitable contraception in Indigenous women be developed as a priority. *(see page 49)*
- That priority be given to developing an integrated electronic Medical Record (ieMR) solution that allows linking of mother and infant medical records. *(see page 53)*
- That an appropriate electronic solution to replace the functionality of a patient hand-held record, which can be shared between hospitals, midwives, general practitioners and women, be urgently prioritised. *(see page 53)*
- That an autopsy, and where appropriate and available, molecular investigations, be performed in all cases of maternal mortality. Consideration should be given to amending the Queensland Coroners Act 2003 to include investigation of all maternal deaths (including late deaths) except where there is a clear and unequivocally diagnosed cause of death, for example, a known metastatic malignancy. *(see page 54)*
- That a systematic approach to reporting and reducing workplace intimidation, bullying, harassment and poor culture be developed for statewide implementation within all Queensland hospitals. *(see page 55)*
- That Queensland Health consider designating appropriately resourced tertiary perinatal pathology centres, for the performing of perinatal and neonatal autopsy investigation by perinatal pathologists. This, together with appropriate staffing, to ensure timely high-quality investigation of stillbirths and neonatal deaths, is vital. *(see page 67)*
- That all maternity hospitals have effective processes (e.g. via Perinatal and Maternal Mortality Review Committees (PMMRCs) in place to ensure all perinatal deaths are appropriately investigated and classified according to the PSANZ national guidelines, for cause of death and contributing factors relating to care. *(see page 69)*
- That all maternity services implement best practice care according to the Safer Baby Bundle. *(see page 78)*
- That all maternity care providers undertake the Safer Baby Bundle online education program. *(see page 78)*
- That the Queensland Department of Health review the temporary perinatal mortality Clinical Midwife Consultant Project Officer position, with a view to establishing it as a permanent resource allocated to the QMPQC. *(see page 78)*

# Good practice points

- Due to the risk of adverse perinatal outcomes in multiple pregnancies, the same attention should be given to the monitoring of the fertility assistance treatments, regardless of whether extracorporeal or ovulation induction techniques are used to improve fertility. *(see page 14)*
- All women should be screened for smoking status in early pregnancy. Smokers and recent quitters should be offered individualised support at every antenatal visit. *(see page 16)*
- Specialised, evidence-based programs to individually assist Indigenous women and other high-risk groups to stop smoking before and during pregnancy should be prioritised, particularly those developed for groups of women with higher incidence of smoking during pregnancy. *(see page 16)*
- A Body Mass Index (BMI) greater than or equal to 35 is recognised as a risk factor for both pregnancy and birth complications and should be regarded as a contraindication to assisted fertility. *(see page 17)*
- Birth before 40 weeks gestation may be necessary to treat pregnancy problems. In deciding to end a pregnancy before the due date, each clinician must be aware of the short and long-term benefits and risks to the fetus, that accrue from remaining in utero until term. There should be an evidence-based reason for each induction or elective caesarean section that attempts to avoid, where possible, late prematurity, as outlined in campaigns such as 'Every Week Counts'. *(see page 24)*
- Pregnant women should be provided with appropriate counselling regarding antenatal screening tests. The purpose, benefits and potential risks of recommended procedures must be explained to ensure women are empowered to make an informed decision. *(see page 30)*
- It is imperative that accessible multidisciplinary postnatal support is available to all women after giving birth. *(see page 30)*
- Clinicians need to be aware of the grief response and provide compassionate care and understanding to assist women to develop positive coping tools. *(see page 31)*
- All clinicians should be provided with training in bereavement care and have knowledge of appropriate referral pathways. *(see page 32)*
- Isolated gastroschisis continues to have a significant perinatal mortality in Queensland and elsewhere. There is an elevated risk of late stillbirth, hence careful fetal growth monitoring of affected pregnancies with planned birth no later than 37 weeks gestation remains in current recommendations. *(see page 35)*
- Fetal detection for Transposition of the Great Arteries and Tetralogy of Fallot remains low in Queensland. Important improvements in fetal detection and in neonatal outcome for these infants can be achieved with focussed fetal cardiac views at the second trimester fetal ultrasound screen. *(see page 38)*
- Clinicians must complete in detail, the perinatal and fetal autopsy consent and placental histology request forms and provide details of the requesting medical officer. *(see page 39)*
- Private obstetric services need to be aware of local referral pathways to refer women for further perinatal mental health assessment and management. *(see page 47)*
- All health professionals working with pregnant and postpartum women need to be skilled in psychosocial and mental health assessment. *(see page 47)*
- As a routine, the Queensland Termination of Pregnancy Guideline must be easily accessible for all providers of termination of pregnancy, including private providers. *(see page 47)*
- Women with a history of serious mental illness (for example, schizophrenia, bipolar affective disorder, schizoaffective disorder) must always be offered mental health follow-up for at least the first twelve months postpartum. *(see page 47)*
- Women who have pre-existing mental health disorders or are diagnosed during pregnancy require a specific discharge plan provided by hospital maternity care providers, for mental health follow-up. *(see page 48)*
- Transparent communication between all stakeholders involved in the woman's care must be a priority and led by the primary maternity care provider. *(see page 48)*
- Within each facility, in-depth review by a senior clinician needs to be undertaken for any woman who misses two consecutive antenatal appointments, to determine why this has occurred and how it can be addressed. *(see page 48)*

- Engagement by women, with regular antenatal care, needs to be emphasised at each point of care occasion. *(see page 48)*
- Maternity units need to have a process for women with complex needs where their cases are appropriately discussed, and an agreed management plan put in place between all relevant parties and which is reviewed regularly. *(see page 48)*
- Women with a history of complex trauma benefit from sensitive trauma informed care with support from multidisciplinary services through collaboration with maternity services, alcohol and other drugs services, mental health services, domestic violence services, continuity of midwifery care, general practice and other services as required. *(see page 49)*
- Psychosocial assessment should be an integral part of the care of women requesting termination of pregnancy and instituted by all providers of this procedure. Appropriate follow-up should be arranged as required. *(see page 49)*
- Hospital pharmacies need to ensure adequate resources are available to meet patient demand and need to review current policies to remove any barriers in the prescription of common contraceptives, such as the various types of oral contraceptive pills. *(see page 49)*
- Focussed education and training for all maternity care staff is recommended, to assist with identification of eating disorders in pregnancy; early intervention and referral. *(see page 50)*
- Any rise in blood pressure during pregnancy needs to be carefully assessed, and decisions made by senior clinical staff about appropriate management, including the frequency of ongoing monitoring. *(see page 50)*
- Women with a recent history of cancer who are considering a pregnancy, require suitable inter-professional preconception counselling, and those women undertaking cancer treatment require appropriate contraception advice. *(see page 50)*
- Appropriate investigation must be recommended to any pregnant woman who presents with PV spotting or bleeding. This needs to be performed at the time of presentation to exclude a significant lower genital tract cause of the bleeding +/- a Co-test, if one has not been performed within a suitable time frame. *(see page 50)*
- Improved training and diligence in estimation of postpartum maternal blood loss is needed, including measures such as weighing of blood-stained bedding, in both birthing areas and in the operating theatres, to improve quantitation of maternal blood loss. *(see page 51)*
- Maternity care team training needs to occur in all maternity care units to ensure protocols are followed for the effective management of massive obstetric haemorrhage. *(see page 51)*
- Consideration needs to be given to making appropriate Point of Care Coagulation Testing (POCCT) (including training), available in all facilities with a maternity service. *(see page 51)*
- Senior medical officers should be consulted regarding early postpartum discharge, if there are any risk factors, clinical concerns or new issues that have arisen during labour or the early postpartum. Care needs to be taken to ensure that length of stay targets and bed pressure within maternity units do not inadvertently compromise patient safety. *(see page 51)*
- Consultant review is required prior to discharge for any woman who has suffered a significant adverse event during labour, birth or early postpartum period. Patient care and timing of discharge needs to be individualised and not driven by hospital protocols. *(see page 52)*
- That each hospital providing maternity care engage in inter-professional team training to improve the management of maternity emergencies, and to identify systemic problems in their hospitals which may predispose towards delay in provision of required care. *(see page 52)*
- Waiting times for any investigations require monitoring by each Hospital and Health Service and improved where necessary. *(see page 53)*
- Imaging with non-contrasted MRI or CT scanning during pregnancy must be undertaken if it is indicated. *(see page 53)*
- Compliance with the Australian College of Midwives (ACM) Referral Guidelines should occur to an auditable standard. *(see page 54)*
- It is important to emphasise that unexpected and/or sudden death in women of child bearing age has a broad differential diagnosis which should be considered in all cases. Clinical diagnosis does not override the importance of an autopsy. *(see page 54)*

- All health professionals who had primary responsibility for the care or treatment of a woman while she was pregnant or within 365 days after the end of her pregnancy, and who are aware of the maternal death of a woman, are required by legislation to provide the QMPQC with a maternal death reporting form completed with as much information as possible. *(see page 56)*
- When considering suicide risk, clinicians should be aware of the population groups more vulnerable to peripartum mental illness and should consider all available suicide prevention strategies. *(see page 59)*
- The option of a high-quality autopsy examination should be offered to all parents following, or who are anticipating a perinatal death, with counselling on the procedure provided by a senior clinician working in collaboration with a clinician with whom the family has an established relationship. *(see page 67)*
- In addition to the offer of autopsy, as a minimum for all stillbirths, a comprehensive maternal and pregnancy history plus placental histopathology; testing for feto-maternal haemorrhage; cytogenetics, molecular and other investigations, as indicated according to the PSANZ Guidelines, should be performed. *(see page 67)*
- Parents need to be given the opportunity to discuss the results of all investigations with someone skilled and experienced in the relevant specialised field, recognising that in some cases this may mean referral to a tertiary perinatal centre. *(see page 67)*
- Hospital and Health Services should conduct multidisciplinary review of all perinatal deaths to identify contributing factors across all levels of the service. To achieve this, multidisciplinary mortality and morbidity review committees (e.g. PMMRCs) led by a senior clinician, need to be established and convened on a regular basis, for example, quarterly. According to the PSANZ Guidelines, these committees need to have a clearly defined process for case review, which includes identification of contributing factors from which recommendations are developed and documented. An action schedule should be generated and reviewed at the next meeting to ensure completion. Any findings should be shared with appropriate staff to facilitate learnings and improvements in healthcare provision. *(see page 69)*
- Hospital and Health Services should prepare and provide quarterly mortality and morbidity review committee reports to the QMPQC for monitoring and to enable support of the review process as necessary. *(see page 69)*
- Classification of all perinatal deaths by health service providers needs to be carried out in an efficient manner and provided to the Department of Health, Perinatal Data Collection to allow for validation and timely national reporting. *(see page 69)*
- All women should be screened for risk factors at the booking-in visit and care planned accordingly, including individualised informed shared decision-making about the timing of birth. *(see page 78)*
- Care for women with risk factors should include careful antenatal monitoring and consideration of referral for serial growth and wellbeing ultrasound scans to inform appropriate timing of birth. *(see page 78)*
- Models of antenatal care that enable continuity by the same provider should be promoted; especially for higher risk groups of women—for example, Indigenous mothers, Pacific Islanders and young women aged less than 20 years. *(see page 78)*
- Health professionals working with pregnant women need to be skilled in the assessment of symphysis fundal height measurement and plotting and when to refer women with suspected fetal growth restriction (FGR). *(see page 78)*
- Women with diabetes in pregnancy require a multi-disciplinary approach and appropriate management and referral to minimise maternal and fetal/neonatal complications. *(see page 78)*
- Pregnant women should be reminded at every antenatal visit after 28 weeks gestation to know their baby's movements and to contact their health care provider if they have any concerns. *(see page 78)*
- Women who are smokers (or recent quitters) should be provided with individualised smoking cessation support at every antenatal care visit. *(see page 78)*

# Mothers and pregnancy

## Births in Queensland

In 2016 and 2017, 121,275 mothers gave birth to 123,105 babies. The number of mothers giving birth and the number of babies born each year for the last 10 years are shown in Table 1. While the number of births has remained relatively stable, the fertility rate has decreased from 2.1 to 1.8 over the same time period [10].

**Table 1: Number of mothers and babies, Queensland, 2008 to 2017**

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Mothers** | 60,327 | 61,022 | 61,027 | 61,125 | 62,667 | 62,182 | 62,811 | 60,942 | 61,876 | 59,399 |
| **Babies** | 61,401 | 62,050 | 62,032 | 62,181 | 63,727 | 63,171 | 63,823 | 61,903 | 62,779 | 60,326 |

### Maternal age

The proportion of mothers aged 35 and over increased slightly from 19.8 per cent in 2008 to 20.6 per cent in 2017, while the proportion of mothers aged under 20 years decreased from 5.7 per cent to 3.4 per cent. Indigenous mothers were approximately five times more likely to be aged less than 20 years than non-Indigenous mothers (13.8 per cent vs 2.6 per cent) and were approximately half as likely to be 35 years and older (9.3 per cent vs 20.9 per cent).

10 Australian Bureau of Statistics. Births, Australia. Cat. No. 3301.0. Canberra: ABS. *https://www.abs.gov.au/ausstats/abs@.nsf/mf/3301.0*

Older maternal age is associated with a higher risk of complications and adverse outcomes. For example, mothers 35 years and older had increased rates of medical conditions such as gestational diabetes and hypertension. They also had higher rates of adverse outcomes, including antepartum haemorrhage, babies with a chromosomal congenital anomaly, preterm birth and stillbirth, even after adjustment for parity (where applicable) compared with women aged 20-34 years. Further details about rates of complications and adverse outcomes in older mothers compared with those observed for women aged 20-34 years are available in Statbite#75 *https://www.health.qld.gov.au/__data/assets/pdf_file/0031/692860/statbite75.pdf*

**Older maternal age is associated with a higher risk of complications and adverse outcomes.**

Younger mothers (those less than 20 years of age) are also at increased risk of being underweight, smoking during pregnancy; and preterm birth, than women aged 20-34 years. They are also less likely to attend the recommended minimum number of antenatal visits. Models of antenatal care that promote continuity of care by the same provider, could have a very important role in reducing these risks for a range of socially disadvantaged women.

## Multiple pregnancies

In 2016 and 2017 multiple pregnancies represented 1.5 per cent of all pregnancies. Almost all multiple pregnancies (98.7 per cent) were twins. Assisted conception techniques were used in 20.9 per cent of all multiple pregnancies.

Women aged 35 years or older were 2.7 times as likely to have a multiple pregnancy compared to women of less than 20 years of age, and 1.4 times as likely as women aged 20-34. However, as 11.4 per cent of pregnancies among mothers 35 and older were a result of assisted conception techniques (compared with 3.6 per cent for mothers under 35 years), it is important to distinguish between these effects. Among women who did not use assisted reproductive technology (ART) to conceive, multiple pregnancies were 2.0 times as likely in women 35 years and older, than in women aged less than 20 years and 1.2 times as likely than in women aged 20-34, suggesting an independent effect of age.

Babies of multiple pregnancies have a higher risk of being born preterm (less than 37 weeks gestation). Seventy per cent of multiple pregnancies ended preterm compared with 7.5 per cent of singleton pregnancies. Fifty-two per cent of preterm multiple pregnancies had no labour; 13.1 per cent had their labours induced and only 35 per cent went into spontaneous labour. This indicates that most preterm births in multiple pregnancies are the result of medical intervention. Preterm birth carries several risks, including a higher risk of perinatal mortality.

### In Queensland

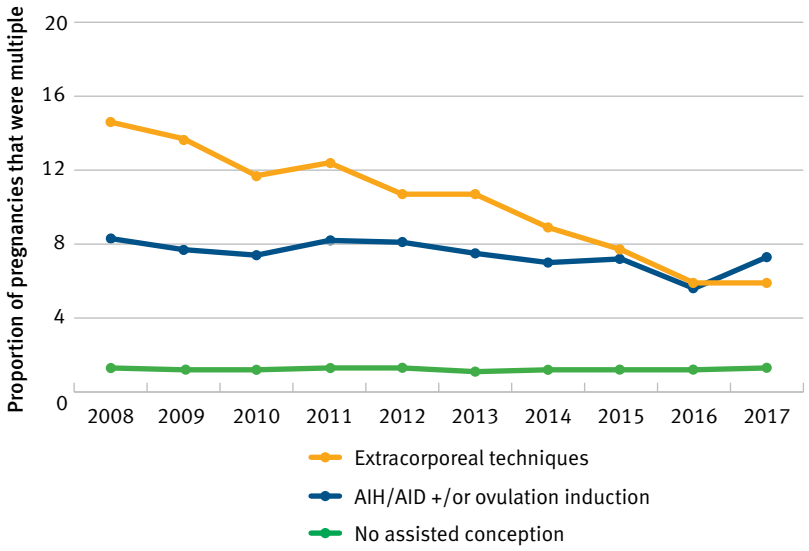
98.7% of multiple pregnancies were twins.

Assisted conception techniques were used in 20.9% of all multiple pregnancies.

## Assisted conception

Due to improvements in assisted reproductive technologies (ART) and clinical practice, there has been a steady decline in the proportion of multiple pregnancies conceived with various types of ART (Figure 1). There has been no change in the proportion of pregnancies conceived with ovulation induction and/or artificial insemination that are multiple.

**Figure 1: Multiple pregnancies conceived with or without assisted conception. Queensland, 2008 to 2017**




*Pregnancies that utilised multiple assisted conception techniques are counted under each technique. As a result, categories are not mutually exclusive and cannot be summed.*

*AIH/AID/ovulation induction/donor egg/embryo transfer: artificial insemination and/or ovulation induction processes and/or donor egg and/or embryo transfer.*

*Extracorporeal techniques: in-vitro fertilisation, gamete intra-fallopian transfer, intracytoplasmic sperm injection, embryo transfer or related techniques.*

*Other/unknown/not stated assisted conception techniques are not graphed.*

Further information regarding assisted conception and pregnancy outcomes can be found in Statbites#34 (Characteristics of women in Queensland who gave birth following conception by ART, 1998 to 2008)[11] and #39 (Trends in caesarean section rates amongst women giving birth following conception by ART in Queensland, 1998 to 2008)[12].

### Good practice point

Due to the risk of adverse perinatal outcomes in multiple pregnancies, the same attention should be given to the monitoring of the fertility assistance treatments, regardless of whether extracorporeal or ovulation induction techniques are used to improve fertility.

11 Statbite#34 Characteristics of women in Queensland who gave birth following conception by ART, 1998 to 2008 https://www.health.qld.gov.au/__data/assets/pdf_file/0019/361540/statbite34.pdf

12 Statbite#39 Trends in caesarean section rates amongst women giving birth following conception by ART in Queensland, 1998 to 2008 https://www.health.qld.gov.au/__data/assets/pdf_file/0033/361599/statbite39.pdf

## Antenatal care

Attending less than the recommended minimum number of antenatal visits is associated with increased risks of adverse pregnancy outcomes including preterm birth, stillbirth, neonatal deaths and maternal deaths. In Queensland, it is recommended that all pregnant women attend at least five antenatal visits during pregnancy[13]. This level of antenatal care was achieved by 95.8 per cent (based on women who gave birth at 32 weeks or more gestation). This is an increase from 93.2 per cent in 2008. Although the proportion of Indigenous women attending the recommended number of antenatal visits is lower than for non-Indigenous women, it has also increased significantly from 77.5 per cent in 2008 to 89.3 per cent.

Younger mothers (less than 20 years of age) were less likely to attend the recommended number of antenatal visits than older mothers (91.5 per cent and 96.0 per cent respectively; Table 2). This difference between younger and older mothers was evident for non-Indigenous mothers (92.5 per cent and 96.4 per cent) but not for Indigenous mothers (88.9 per cent and 88.8 per cent).

**Table 2: Mothers birthing in Queensland, at least 32 weeks gestation, who attended five or more antenatal visits, by Indigenous status of mother, 2016 and 2017**

| Indigenous status of mother | Age | 5+ visits | No. Mothers | % 5+ visits |
|---|---|---|---|---|
| Indigenous | <20 | 993 | 1,117 | 88.9 |
| | 20+ | 6,165 | 6,945 | 88.8 |
| Non-Indigenous | <20 | 2,680 | 2,898 | 92.5 |
| | 20+ | 104,424 | 108,283 | 96.4 |
| **Total** | **<20** | **3,673** | **4,015** | **91.5** |
| | **20+** | **110,589** | **115,228** | **96.0** |

*Women who attended an unknown or unspecified number of antenatal visits or gave birth at less than 32 weeks gestation are excluded.*

*Women with an Indigenous status of 'not-stated' are included in non-Indigenous counts.*

To enable the early detection and management of pregnancy-related conditions, all women need to attend antenatal care in the first trimester. Higher rates of antenatal care during the first trimester were found among women who gave birth in private facilities (92.2 per cent) than among women who gave birth at home (58.9 per cent) or in public facilities (72.4 per cent). Indigenous women were less likely to receive antenatal care in the first trimester (61.4 per cent) compared to non-Indigenous women (78.4 per cent).

**To enable the early detection and management of pregnancy-related conditions, all women need to attend antenatal care in the first trimester.**

### Recommendation

That Queensland Health develop strategies to improve access to culturally safe antenatal care, to increase early engagement and frequency of attendance by Indigenous women.

### In Queensland

Higher rates of antenatal care during the first trimester were found among women who gave birth in private facilities than among women who gave birth at home or in public facilities.

13 Australian Government Department of Health, Pregnancy Care Guidelines *https://www.health.gov.au/resources/pregnancy-care-guidelines*

## Smoking during pregnancy

Smoking during pregnancy is associated with worse perinatal outcomes, including low birth weight, being small for gestational age, preterm birth and perinatal death [14]. In 2016 and 2017, 12.0 per cent of women in Queensland smoked at any time during pregnancy. This was higher than the national rate for the same period (9.9 per cent) [15]. Rates were higher in the first 20 weeks of pregnancy where 11.9 per cent of mothers smoked compared with 9.7 per cent who smoked at or after 20 weeks gestation. Nationally, for the same period, 9.5 per cent of mothers smoked in the first 20 weeks of pregnancy. Smoking cessation during pregnancy is associated with improved pregnancy outcomes compared to women who continue to smoke [16]. In 2016 and 2017, 17.9 per cent of women who smoked in the first 20 weeks did not continue to smoke after 20 weeks gestation. Indigenous women were less likely to stop smoking after 20 weeks gestation (10.0 per cent) compared to non-Indigenous women (20.5 per cent).

An analysis of the impact of smoking during pregnancy on adverse outcomes in Queensland found that the most influential risk factor was smoking at or after 20 weeks. Smoking after 20 weeks of pregnancy was associated with a 1.4 times higher risk of preterm birth, after adjusting for other risk factors. Smoking is also an important risk factor for stillbirth[17]. There has been a steady decline in the proportion of women who reported smoking after 20 weeks gestation since 2010, when 14.1 per cent of women smoked after 20 weeks.

Higher rates of smoking after 20 weeks gestation persist among some groups:

- 38.6 per cent of Indigenous women smoked after 20 weeks gestation (down from 46.7 per cent in 2010)
- 24.4 per cent of younger women (those aged under 20 years) smoked after 20 weeks gestation compared to 9.9 per cent of women aged 20-34 and 6.6 per cent of women aged 35 and older
- 25.0 per cent of women who lived in remote or very remote areas smoked after 20 weeks gestation compared to 6.8 per cent in metropolitan areas
- 20.1 per cent of women living in areas with the lowest socioeconomic status (SES) quintile smoked after 20 weeks gestation compared to 2.8 per cent in the highest SES quintile
- There is variation, determined by Hospital and Health Service of usual residence, in the percentage of women who smoke after 20 weeks gestation [18].

### Good practice point

All women should be screened for smoking status in early pregnancy. Smokers and recent quitters should be offered individualised support at every antenatal visit.

**Smoking cessation during pregnancy is associated with improved pregnancy outcomes.**

### Good practice point

Specialised, evidence-based programs to individually assist Indigenous women and other high-risk groups to stop smoking before and during pregnancy should be prioritised, particularly those developed for groups of women with higher incidence of smoking during pregnancy. [19]

14 Australian Institute of Health and Welfare 2019. Australia's mothers and babies 2017—in brief. Perinatal statistics series no. 35. Cat. no. PER 100. Canberra: AIHW. *https://www.aihw.gov.au/reports/mothers-babies/australias-mothers-and-babies-2017-in-brief/contents/table-of-contents*

15 Australian Institute of Health and Welfare 2019. Australia's mothers and babies data visualisations. Cat. No. PER 101. Canberra: AIHW. Viewed 14 January 2020, *https://www.aihw.gov.au/reports/mothers-babies/australias-mothers-babies-data-visualisations/data*

16 Stillbirth Centre of Research Excellence Position Statement – Smoking – one of the most important things to prevent in pregnancy and beyond *https://www.stillbirthcre.org.au/resources/clinical-practice-guidelines/*

17 Flenady V et al. Major risk factors for stillbirth in high-income countries: a systematic review and meta-analysis. The Lancet 2011; 377:1331-40

18 Queensland Health, Rate of perinatal mortality and selected perinatal risk factors, 2014/2015—2016/2017, by Hospital and Health Service (HHS) of mothers' usual residence, compared with Queensland. *https://www.health.qld.gov.au/__data/assets/pdf_file/0030/948324/hhs_peri_scorecard_1617.pdf*

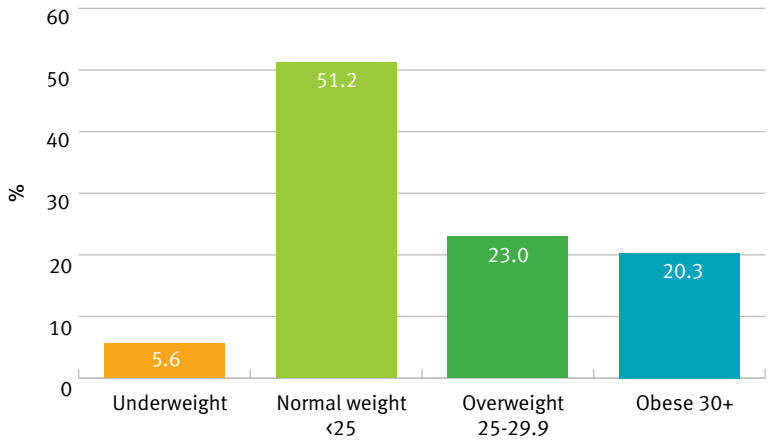
19 Stillbirth Centre of Research Excellence. Priority Area One: Improving care and outcomes for women with risk factors for stillbirth. *https://www.stillbirthcre.org.au/our-research/priority-area-1/*

## Maternal weight

Among women who gave birth in Queensland in 2016 and 2017:

- 51.2 per cent were in the normal weight range (BMI of 18.5-24.9)
- 23.0 per cent were overweight (BMI of 25.0 to 29.9)
- 20.3 per cent were classified as obese (body mass index (BMI) of 30.0 or more)

**Figure 2: Distribution of BMI for women who gave birth in Queensland, 2016 and 2017**




*BMI based on self-reported weight and self-reported or measured height at conception.*

Maternal BMI is a risk factor for pregnancy and birth complications. For example, higher pre-pregnancy BMI has been linked to a greater risk of gestational diabetes and hypertension; pre-eclampsia; caesarean section; thromboembolism; postpartum haemorrhage and wound infections. Babies of obese mothers have a higher risk of macrosomia, some congenital anomalies, stillbirth and neonatal death [20,21,22,23]. Higher rates of mothers who were overweight or obese were observed in older mothers, multiparous mothers and mothers who smoked during pregnancy (*https://www.health.qld.gov.au/__data/assets/pdf_file/0029/929540/statbite79.pdf*). However, a higher rate of many of these complications was observed among births to overweight and obese women even after adjusting for these factors.

Further information on the impacts of increased maternal BMI is available at *https://www.health.qld.gov.au/__data/assets/pdf_file/0029/929540/statbite79.pdf*

**Maternal BMI is a risk factor for pregnancy and birth complications.**

### Good practice point

A Body Mass Index (BMI) greater than or equal to 35 is recognised as a risk factor for both pregnancy and birth complications and should be regarded as a contraindication to assisted fertility.[24]

20 Flenady V et al. Major risk factors for stillbirth in high-income countries: a systematic review and meta-analysis. The Lancet 2011; 377:1331-40

21 CMACE & RCOG (Centre for Maternal and Child Enquiries & Royal College of Obstetricians and Gynaecologists) 2010. Management of women with obesity in pregnancy. CMACE/RCOG Joint Guideline. *https://www.rcog.org.uk/globalassets/documents/guidelines/cmacercogjointguidelinemanagementwomenobesitypregnancya.pdf* *https://www.rcog.org.uk/globalassets/documents/guidelines/cmacercogjointguidelinemanagementwomenobesitypregnancya.pdf*

22 A multivariate approach to the disparity in perinatal outcomes between Indigenous and non-Indigenous women, Queensland. Utz M, Johnston T, Zarate D and Humphrey M. Health Statistics Branch, Queensland Health. 2014. *www.health.qld.gov.au/hsu/peri/indigenous-peridisparity.pdf*

23 Watson M, MacLeod SL, Cornes S, Howell S. Maternal obesity and selected pregnancy risks and outcomes in nulliparous mothers in Queensland, 2008. Statbite 27 Health Statistics Centre, Queensland Health. *https://www.health.qld.gov.au/__data/assets/pdf_file/0031/361687/statbite27.pdf*

24 Ovarian Simulation in Assisted Reproduction RANZCOG *https://ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical%20-%20Gynaecology/Ovarian-Stimulation-in-infertility-(C-Gyn-2)-Review-Mar-14_1.pdf?ext=.pdf*

## Place of birth

Most women in Queensland (96.8 per cent) gave birth in a hospital, with only 2.1 per cent giving birth in a birthing centre, 0.3 per cent (n=328) at home and 0.8 per cent (n=983) in other locations, including those where the birth occurred before arrival at hospital. For 74.1 per cent of women the birth occurred in a public hospital and for 24.8 per cent in a private hospital. This is comparable to national rates where 74 per cent of women gave birth in a public hospital[25]. The proportion of women giving birth in private hospitals has reduced over the last decade, down from 30.2 per cent in 2008 and 2009.

Women giving birth in public hospitals tend to have higher risk pregnancies. In 2016 and 2017:

- 22.3 per cent who gave birth in public facilities were obese compared with 14.7 per cent who birthed in private hospitals
- 12.7 per cent who gave birth in public facilities smoked after 20 weeks compared with 0.5 per cent who birthed in private hospitals
- 94.8 per cent of women who gave birth in public facilities attended the recommended minimum number of antenatal visits compared with 99.2 per cent who birthed in private hospitals
- Only 2.1 per cent of Indigenous women gave birth in a private hospital compared with 26.5 per cent of non-Indigenous women.

Women giving birth in private hospitals tended to be older than women who gave birth in public hospitals (30.6 per cent were 35 years and older compared to 16.6 per cent, respectively) and were more likely to have an assisted conception. Public hospitals had a higher proportion of younger women (under 20 years of age) (4.5 per cent) than private hospitals (0.2 per cent).

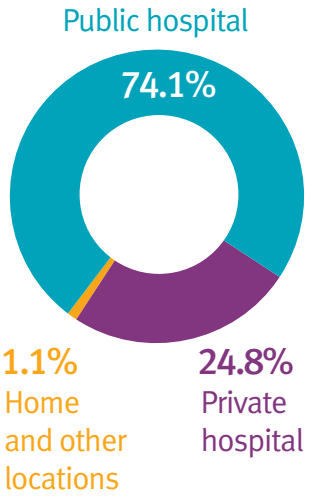
### In Queensland

96.8% of births took place in hospital

2.1% in birthing centres

0.3% at home

0.8% in other locations
(including before arrival at hospital)




## Onset of labour

The onset of labour may be either spontaneous or induced. When a birth is categorised as 'no labour' this means it occurred by caesarean section prior to any labour commencing.

Just under half (48.8 per cent) of women had a spontaneous onset of labour, 29.3 per cent of women had their labour induced and 21.9 per cent had no labour. The proportion of women whose labour began spontaneously has declined steadily over the last decade, from 57.1 per cent in 2008 to 47.1 per cent in 2017.

Over this period there was a substantial increase in the proportion of women whose labour was induced from 22.6 per cent in 2008 to 30.8 per cent in 2017 and a small increase in the proportion with no labour, that is, caesarean section before labour onset (from 20.3 per cent in 2008 to 22.1 per cent in 2017).

Table 3 shows the 10 most frequent primary reasons for induction of labour (ICD-10-AM) and the change in these from 2008 to 2017. While the number of pregnancies that are induced due to prolonged pregnancy has decreased, the number of pregnancies induced due to poor or excessive fetal growth and diabetes mellitus has increased.

### In Queensland

Just under half (48.8%) of women had a spontaneous onset of labour

Nearly 30% (29.3%) of women had their labour induced

21.9% had no labour

25 Australian Institute of Health and Welfare 2019. Australia's mothers and babies 2017—in brief. Perinatal statistics series no. 35. Cat. no. PER 100. Canberra: AIHW. *https://www.aihw.gov.au/reports/mothers-babies/australias-mothers-and-babies-2017-in-brief/contents/table-of-contents*

This is reflective of the anticipated adverse outcomes of the 'obesity epidemic'. Evidence suggests improved perinatal outcomes from induction of labour for fetal macrosomia (birth weight ›4500g) at 39 weeks [26].

**Table 3: Most frequent primary reasons for induction, Queensland, 2008 and 2017**

| ICD-10-AM Code | | Frequency | | % of Inductions | |
|---|---|---|---|---|---|
| | | 2008 | 2017 | 2008 | 2017 |
| O48 | Prolonged pregnancy | 4,953 | 2,217 | 36.4 | 12.1 |
| Z34.8 | Supervision of other normal pregnancy | 1,356 | 1,426 | 10.0 | 7.8 |
| O42.0 | Premature rupture of membranes, onset of labour within 24 hours | 1,021 | 968 | 7.5 | 5.3 |
| O36.5 | Maternal care for poor fetal growth | 456 | 1,380 | 3.3 | 7.5 |
| O42.11 | Premature rupture of membranes, onset of labour between 1-7 days later | 698 | 670 | 5.1 | 3.7 |
| Z34.0 | Supervision of normal first pregnancy | 365 | 847 | 2.7 | 4.6 |
| O13 | Gestational [pregnancy-induced] hypertension | 716 | 821 | 5.3 | 4.5 |
| O24.42 | Diabetes mellitus arising during pregnancy, insulin treated | 532 | 902 | 3.9 | 4.9 |
| O24.44 | Diabetes mellitus arising during pregnancy, other | 122 | 835 | 0.9 | 4.6 |
| O36.6 | Maternal care for excessive fetal growth | 287 | 1,261 | 2.1 | 6.9 |
| **Total Inductions** | | **13,615** | **18,321** | **100.0** | **100.0** |

*For multiple births, mother was categorised by the reason of induction recorded for the first baby.*

Indigenous women had slightly higher rates of spontaneous onset of labour (56.3 per cent), slightly lower rates of induction (27.4 per cent) and no labour (16.2 per cent), in contrast with non-Indigenous women and rates observed in the public sector overall.

The mode of onset of labour varies by facility sector over time (Figure 3). In 2016 and 2017 women in public hospitals were much more likely to have a spontaneous onset of labour (53.7 per cent) than women in private hospitals (32.0 per cent) and much less likely to have no labour (16.6 per cent vs 38.8 per cent). The rate of women undergoing induction of labour has increased in the public sector over the last decade (21.2 per cent in 2008-2009 to 29.7 per cent in 2016-2017) and is now comparable with the rate in the private sector (29.2 per cent).

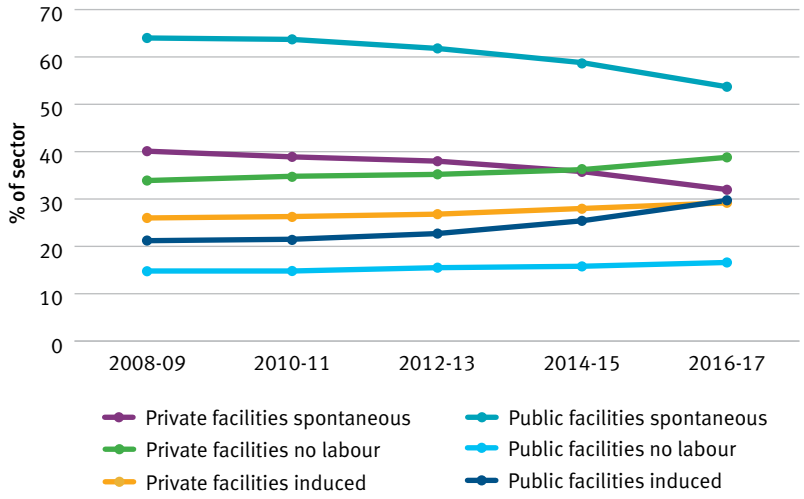
Rates of induction of labour in selected women (first time mothers) and in all women in Queensland by hospital are shown in *www.health.qld.gov.au/hsu/dashboards/ncmi_ funnel.xlsm.*

## In Queensland

The rate of women undergoing induction of labour has increased in the public sector over the last decade (21.2% in 2008-2009 to 29.7% in 2016-2017) and is now comparable with the rate in the private sector (29.2%).

26 Ref Induction of labour vs Expectant Management for Large For dates Fetuses: a Randomised Controlled Trial. *www.thelancet.com* Published online April 9, 2015 *http://dx.doi.org/10.1016/S0140-6736(14)61904-8*

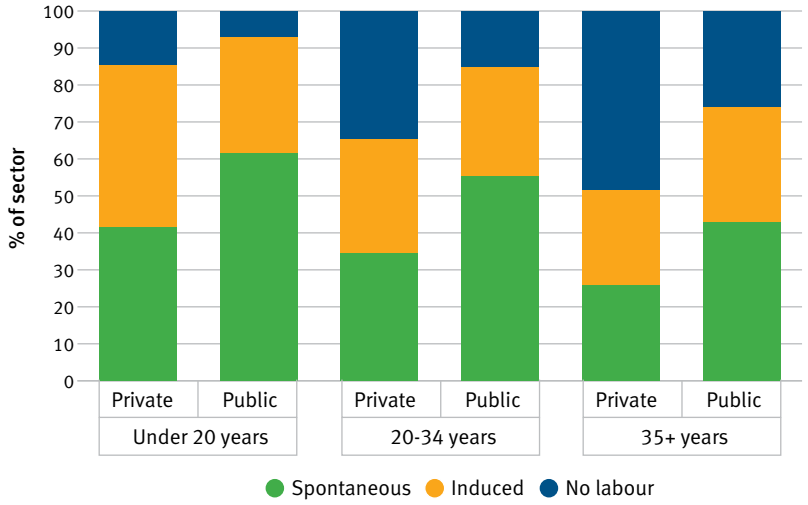
**Figure 3: Onset of labour by facility sector, for women birthing in Queensland, 2008 to 2017**




*For multiple births, mother was categorised by the labour onset of the first baby.*

The rate of induction of labour varied with gestational age. A high proportion of births 42 weeks or over were the result of induction (55.2 per cent). For term births (37-41 weeks) the induction rate was comparable between public hospitals (30.4 per cent) and private hospitals (30.5 per cent). There was a correspondingly higher spontaneous labour rate in public hospitals. For babies born prior to term (32-36 weeks) more than half of births in private hospitals had no labour (51.6 per cent) compared with 30.3 per cent in public hospitals.

**Figure 4: Labour onset distribution by maternal age, public and private facilities, 2016 and 2017**




*For multiple births, mother was categorised by the facility/labour onset of the first baby.*

Figure 4 shows that women aged 35 and older had a higher rate of caesarean section births without labour in both public and private hospitals. However, within each age group, the proportion of no labour caesarean sections was higher in private hospitals.

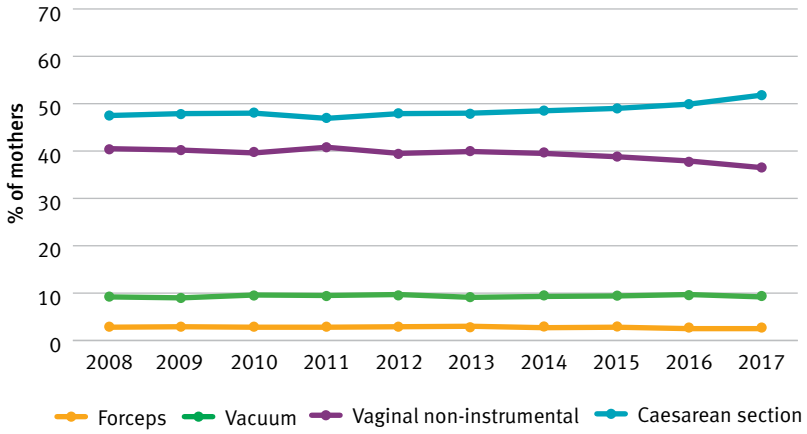
**Women aged 35 and older had a higher rate of caesarean section births without labour in both public and private hospitals.**

## Method of birth

In 2016 and 2017, 55.7 per cent of births were vaginal non-instrumental births; 34.0 per cent were by caesarean section and 10.3 per cent were instrumental vaginal births (7.4 per cent vacuum extraction and 2.9 per cent forceps). In the last decade there has been a decrease in vaginal non-instrumental births and a slight increase in caesarean section and vacuum extraction assisted births, in both public and private facilities (see Figures 5 and 6).

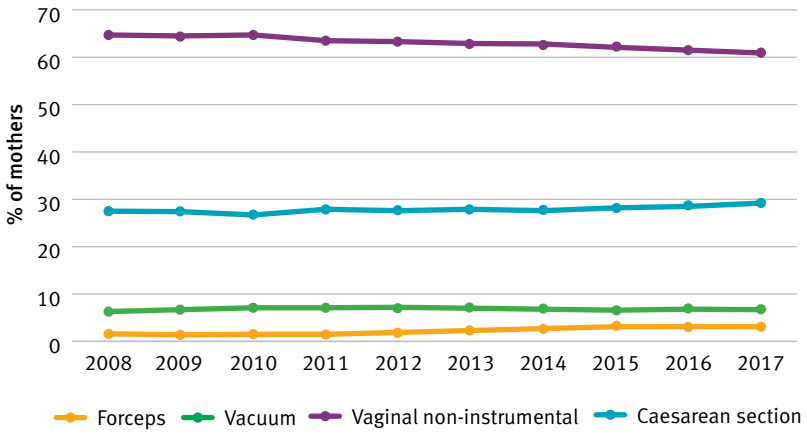
In 2016 and 2017, women birthing in a private hospital were more likely to have a caesarean section than women in public hospitals (50.8 per cent compared with 28.9 per cent). This has also been observed elsewhere in Australia and in other Organisation for Economic Co-operation and Development (OECD) countries [27,28].

**Figure 5: Method of birth of babies in private facilities, Queensland, 2008 to 2017**




*For multiple births, mother was categorised by the facility/birth method of the first baby.*

**Figure 6: Method of birth of babies in public facilities, Queensland, 2008 to 2017**




*For multiple births, mother was categorised by the facility/birth method of the first baby.*

### In Queensland

In the last decade there has been a decrease in vaginal non-instrumental births and a slight increase in caesarean section and vacuum extraction assisted births in both public and private facilities.

**50.0%**
**of women had a caesarean section**
Private facilities

**28.9%**
**of women had a caesarean section**
Public facilities

27 Australian Institute of Health and Welfare 2019. Australia's mothers and babies 2017—in brief. Perinatal statistics series no. 35. Cat. no. PER 100. Canberra: AIHW. *https://www.aihw.gov.au/reports/mothers-babies/australias-mothers-and-babies-2017-in-brief/contents/table-of-contents*

28 Organisation for Economic Co-operation and Development (OECD) 2017. Health at a glance 2017: OECD indicators. Paris: OECD Publishing. Viewed 26 July 2019, *http://dx.doi.org/10.1787/health_glance-2017-en.*

## Aboriginal and Torres Strait Islander mothers

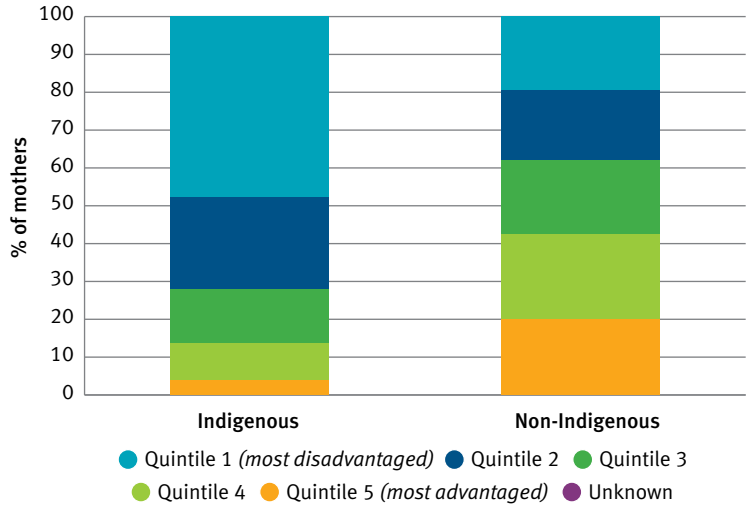
Cultural safety is essential for engaging Indigenous women in maternity care. In 2016 and 2017, 8,311 women giving birth in Queensland identified as Aboriginal and/or Torres Strait Islander, representing 6.9 per cent of women giving birth, compared to 4.5 per cent nationally in 2017 [29].

Indigenous women gave birth to 8,427 babies of which 95.6 per cent were identified as Indigenous, based on the 'baby Indigenous' status field within the perinatal statistics report [30]. Most health indicators use the Indigenous status of the mother to define Indigenous status for the birth event, because these indicators are primarily designed to monitor pregnancy outcomes for these women. For further information about risk indicators for Indigenous mothers and babies, please see Statbite#67 [31].

Indigenous women giving birth in Queensland have higher rates of disadvantage (Figure 7), and higher rates of risk factors and adverse outcomes than non-Indigenous women. Issues highlighted in earlier sections of this report that relate to Aboriginal and Torres Strait Islander women and their babies include:

- Indigenous women are more than five times likely to have babies when aged less than 20 years, which carries a higher risk of complications and adverse outcomes
- though improvement has occurred over the last 10 years, Indigenous women were less likely than non-Indigenous women to attend the recommended minimum number of antenatal visits in 2016 and 2017
- Indigenous women had much higher rates of smoking during pregnancy than non-Indigenous women
- Indigenous women had higher rates of obesity, gestational diabetes, pre-existing diabetes, and chronic hypertension, than non-Indigenous women [32]
- Indigenous women were very unlikely to give birth in a private hospital and had lower rates of intervention such as induction of labour [33].

**Figure 7: Mothers who gave birth in Queensland hospitals, by Indigenous status and socio-economic Indexes for Areas (SEIFA), Queensland, 2016 and 2017**




*Excludes non-Queensland residents.*

### In Queensland

Indigenous women giving birth in Queensland have higher rates of disadvantage and higher rates of risk factors and adverse outcomes than non-Indigenous women.

*"Aboriginal and Torres Strait Islander babies have a better chance of a healthy start to life when their mothers are healthy, before and during pregnancy..." from Growing Deadly Families. Aboriginal and Torres Strait Islander Maternity Services Strategy 2019-2025*

29 Australian Institute of Health and Welfare 2019. Australia's mothers and babies 2017—in brief. Perinatal statistics series no. 35. Cat. no. PER 100. Canberra: AIHW. *https://www.aihw.gov.au/reports/mothers-babies/australias-mothers-and-babies-2017-in-brief/contents/table-of-contents*

30 Queensland Health Perinatal Annual Reports 2016 and 2017. *https://www.health.qld.gov.au/hsu/peri#annual*

31 Statbite#67 Identification of Indigenous status for measurement of perinatal risk factors and outcomes: Insights gained through use of both mother and baby status. Health Statistics Branch, Queensland Health. June 2015. *www.health.qld.gov.au/__data/assets/pdf_file/0021/144750/statbite67.pdf*

32 A multivariate approach to the disparity in perinatal outcomes between Indigenous and non-Indigenous women, Queensland. Utz M, Johnston T, Zarate D and Humphrey M. Health Statistics Branch, Queensland Health. 2014. *www.health.qld.gov.au/hsu/peri/indigenous-peridisparity.pdf*

33 Statbite#79 Maternal overweight and obesity in Queensland, 2008 to 2017. *https://www.health.qld.gov.au/__data/assets/pdf_file/0029/929540/statbite79.pdf*

# Babies and birth

## Gestational age

This section refers to the gestational age of the baby in completed weeks as determined by clinical assessment after birth and is an important determinant of pregnancy outcome. For example, preterm births (prior to 37 weeks gestation) accounted for 84.1 per cent of perinatal deaths occurring during this time period.

In 2016 and 2017, 9.4 per cent of babies were born preterm and 0.3 per cent were born post-term (42 weeks and over). There has been some change in these proportions over the past decade, with a statistically significant increase in preterm births from 8.6 per cent in 2008 to 9.5 per cent in 2017, and a statistically significant decrease in the post-term group from 0.7 per cent of births in 2008 to 0.3 per cent of births in 2017.

Factors that increase the risk for preterm birth include multiple pregnancy, maternal underweight; smoking during pregnancy; pre-existing or gestational diabetes; pre-existing or gestational hypertension and older maternal age (35 years and older). Other factors, such as the presence of a fetal congenital anomaly, a previous stillbirth, a previous caesarean section and having pre-eclampsia, also resulted in the earlier birth of babies. Iatrogenic prematurity, resulting from medical interventions, is also a significant factor, especially in multiple pregnancies.

A higher proportion of babies whose mothers are either Indigenous, live in remote locations or who are more socioeconomically disadvantaged, are born at earlier gestations. A multivariate analysis [34] of risk factors for preterm birth found that a mother's Indigenous status, remoteness and socioeconomic status are not strongly associated with preterm birth once other risk factors are considered. This suggests higher preterm birth rates in these groups are due to higher rates of other risk factors such as smoking, attendance at recommended levels of antenatal visits, and other complications such as gestational diabetes (see Table 4).

34 A multivariate approach to the disparity in perinatal outcomes between Indigenous and non-Indigenous women, Queensland. Utz M, Johnston T, Zarate D and Humphrey M. Health Statistics Branch, Queensland Health. 2014. *https://www.health.qld.gov.au/__data/assets/pdf_file/0022/370318/indigenous-peridisparity.pdf*

Table 4: Rate of selected perinatal risk factors, by Indigenous Status, SEIFA quintile and Remoteness, Queensland, 2016 and 2017

| | preterm [a] | < 5 antenatal visits [b] | smoking after 20 weeks [c] | obesity [d] |
|---|---|---|---|---|
| Indigenous | 13,4 | 11.2 | 38.6 | 28.6 |
| Non-Indigenous | 9.1 | 3.7 | 7.6 | 19.7 |
| | | | | |
| Quintile 1 (most disadvantaged) | 10.8 | 6.3 | 20.1 | 28.5 |
| Quintile 2 | 9.4 | 4.7 | 12.7 | 23.5 |
| Quintile 3 | 9.0 | 3.6 | 7.4 | 18.7 |
| Quintile 4 | 8.5 | 3.5 | 5.4 | 17.9 |
| Quintile 5 (most advantaged) | 8.5 | 2.5 | 2.8 | 12.4 |
| Unknown/Interstate | 19.8 | 6.4 | 4 | 18.4 |
| | | | | |
| Major City | 8.9 | 4.1 | 6.8 | 18.2 |
| Inner Regional | 9.6 | 4.1 | 14.1 | 25.1 |
| Regional | 10.0 | 4.4 | 14.2 | 22.3 |
| Remote/Very Remote | 10.7 | 4.4 | 25 | 24.9 |
| Interstate | 19.9 | 6.4 | 4.1 | 18.4 |

*(a) Rate per 100 babies. Excludes babies of unknown gestational age.*

*(b) Rate per 100 mothers. Excludes mothers with unknown number of antenatal visits and births at less than 32 weeks gestation.*

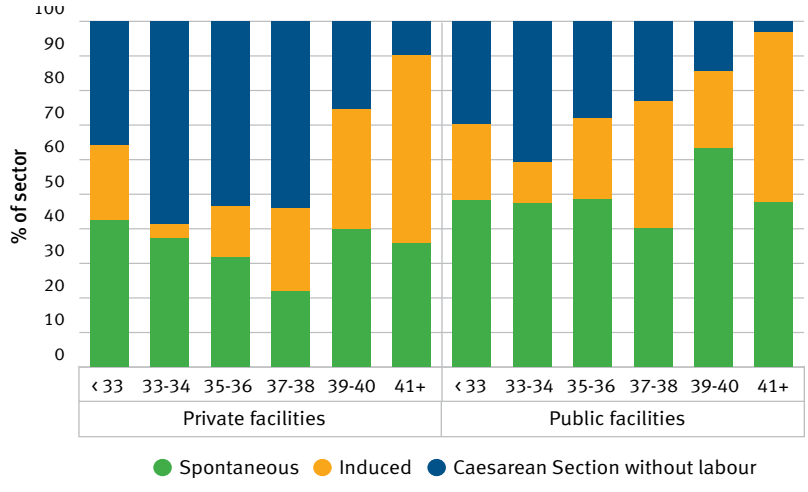
*(c) Rate per 100 mothers. Excludes mothers of unknown smoking status after 20 weeks.*

*(d) Rate per 100 mothers. Excludes mothers of unknown BMI.*

Improved access to culturally safe antenatal care and screening could assist in closing the gap for Indigenous women.

The rate of preterm birth is similar in public (9.4 per cent) and private facilities (9.3 per cent). There is a much higher rate of caesarean section without labour in private facilities at earlier gestations than in public facilities (Figure 8). In early term deliveries (37-38 weeks), 77.9 per cent of babies in private facilities were born by means other than spontaneous vaginal birth, compared to 59.7 per cent of babies born in public facilities. Recent guidelines [35] recommend that planned births (by induction of labour or caesarean section) should ideally be performed as close to 40 weeks as possible. Shared decision-making about timing of birth for women is needed to enable them to make an informed decision, based on a clear understanding of their individualised risks and benefits and which reflects their preferences and values. Timing of birth is the focus of one element in the Safer Baby Bundle initiative [36].

Figure 8: Labour onset distribution, by gestational age and facility sector, Queensland, 2016 and 2017




*For multiple births, mother was categorised by the facility/labour onset of the first baby.*

## Good practice points

Birth before 40 weeks gestation may be necessary to treat pregnancy problems. In deciding to end a pregnancy before the due date, each clinician must be aware of the short and long-term benefits and risks to the fetus, that accrue from remaining in utero until term. There should be an evidence-based reason for each induction or elective caesarean section that attempts to avoid, where possible, late prematurity, as outlined in campaigns such as 'Every Week Counts' [37].

**Improved access to culturally safe antenatal care and screening could assist in closing the gap for Indigenous women.**

35 Perinatal Society of Australia and New Zealand and Centre of Research Excellence Stillbirth. Position statement: Improving decision-making about the timing of birth for women with risk factors for stillbirth. Centre of Research Excellence in Stillbirth, Brisbane, Australia, September 2019. https://www.stillbirthcre.org.au/resources/clinical-practice-guidelines/

36 Stillbirth Centre of Research Excellence. Safer Baby Bundle. https://www.stillbirthcre.org.au/safer-baby-bundle/

37 Every Week Counts. https://www.everyweekcounts.com.au/

## Birthweight

In 2016 and 2017, 6.9 per cent of babies born were low birthweight (less than 2500g) and this rate has not changed substantially over the past 10 years.

While for most babies, low birthweight is strongly related to gestation (that is, babies born earlier are smaller), a subgroup of babies have weight-related complications or adverse outcomes that are independent of gestation. These babies are referred to as being small for their gestational age (SGA) and are commonly defined as the lowest 10 per cent of weights within a group defined by gestational age and sex, according to national birthweight percentiles. Of particular clinical interest are babies who are SGA at or near term, as this can be the result of fetal growth restriction caused by placental dysfunction and can lead to adverse outcomes such as perinatal asphyxia and stillbirth. Improved detection of fetal growth restriction and earlier birth may help to reduce both mortality and morbidity.

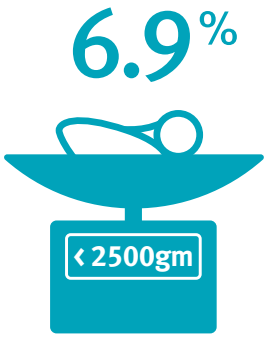
Some characteristics of mothers are linked to an increased risk of giving birth to an SGA baby:

- 12.5 per cent of babies of Indigenous mothers were SGA compared with 8.2 per cent of babies of non-Indigenous mothers
- 11.9 per cent of babies of mothers aged less than 20 years were SGA compared with 8.5 per cent of babies of mothers aged 20-34 years
- 16.8 per cent of babies of mothers who were underweight were SGA compared with 9.3 per cent of babies whose mothers were in the normal weight range
- 16.0 per cent of babies whose mothers smoked during pregnancy were SGA compared with 7.5 per cent of babies whose mothers did not smoke.

### In Queensland

12.5% of babies of Indigenous mothers were small for gestational age compared with 8.2% of babies of non-Indigenous mothers.

16% of babies whose mothers smoked during pregnancy were small for gestational age compared with 7.5% of babies whose mothers did not smoke.




## Neonatal morbidity

Neonatal morbidity is a term used to describe illness or injury in babies during the first 28 days of life. Monitoring neonatal morbidity is important to enable a better understanding of perinatal service requirements and to assist with monitoring of quality of care.

The Apgar score is a clinical scale used to describe a baby's condition at one minute and five minutes after birth based on **a**ppearance, **p**ulse, **g**rimace response to foot stimulation, **a**ctivity and **r**espiration (Apgar). It is used as an indicator of the health of the baby, which decides the need for and adequacy of, resuscitation. An Apgar score of seven or more at five minutes indicates that the baby is adapting well to life outside the uterus. An Apgar score of seven or more at five minutes indicates that the baby is adapting well to life outside the uterus. An Apgar score of less than seven at five minutes is an indication of either poor adaptation or perinatal asphyxia.

In this period, 97.9 per cent of liveborn babies had an Apgar score of seven or more at five minutes of age, whilst 2.1 per cent had a score that was less than seven. The incidence of Apgar scores less than seven occurred more commonly for babies born at lower gestations (Figure 9).

### In Queensland

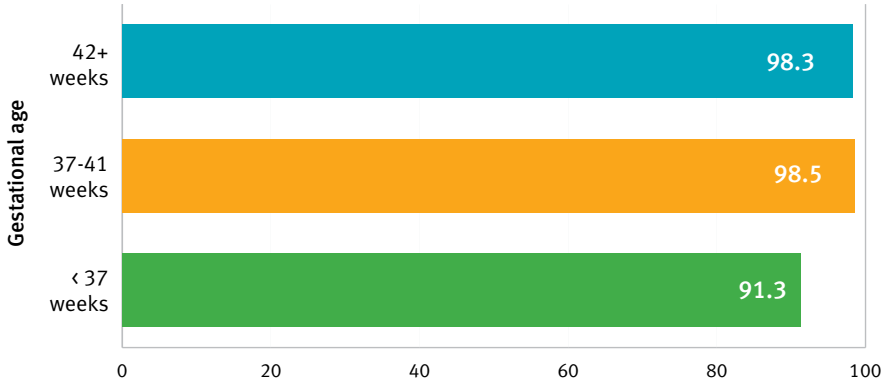
in 2016–2017, 97.9% of liveborn babies have an Apgar score of 7 or more at 5 minutes.

16% of liveborn babies required some form of resuscitation immediately after birth. The majority of these involved only a minor intervention.

The median length of stay for babies born in hospital was 2 days – down from 3 days in 2014–2015.

22.6% of liveborn babies were admitted to a special care or intensive care nursery.

**Figure 9: Proportion of liveborn babies with an Apgar score greater than or equal to seven at five minutes, by gestational age, Queensland, 2016 and 2017**




*Excludes babies of unknown Apgar score at 5 minutes and/or unknown gestational age*

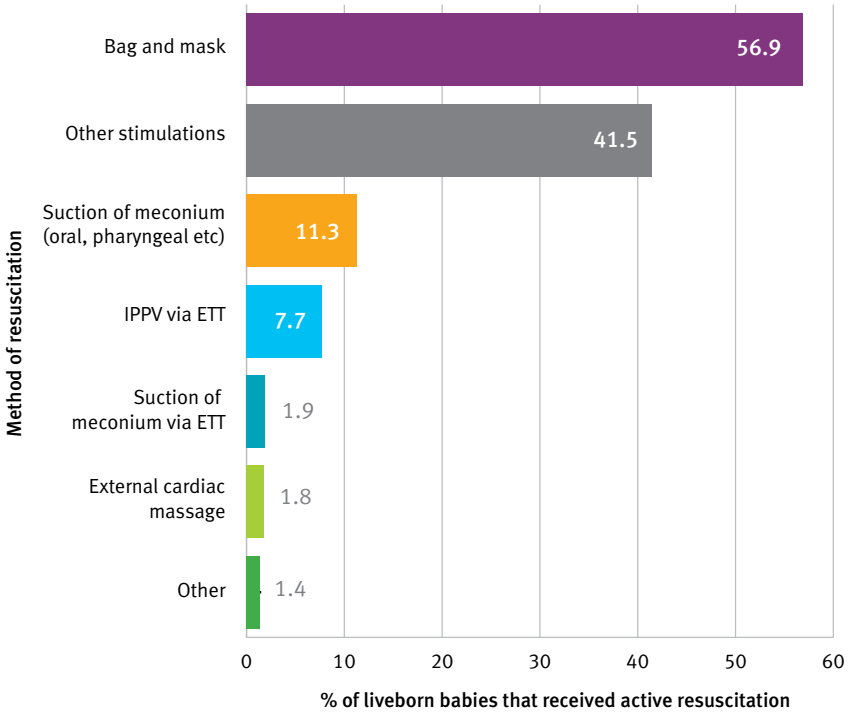
## Resuscitation

16.1 per cent of liveborn babies required some form of active resuscitation immediately after birth (excluding suction and facial oxygen). The majority of these involved a minor intervention, with only a small proportion requiring more advanced resuscitation measures (Figure 10).

**16.1%**

**of liveborn babies required some form of active resuscitation**


**Figure 10: Proportion of liveborn babies that received active resuscitation*, by resuscitation measure, Queensland, 2016 and 2017**




*A single baby could receive multiple resuscitation measures. Categories are not mutually exclusive.*

**Excluding suction and facial oxygen.*

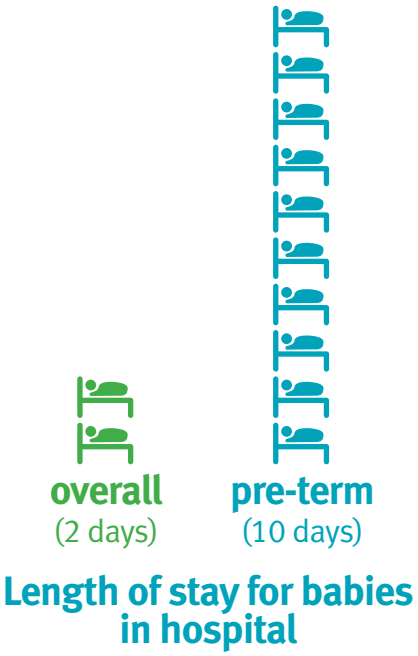
## Length of stay in hospital

The median length of stay (LOS) for babies born in hospital was two days. This number includes babies who were transferred elsewhere but excludes babies who died. Factors impacting on LOS include gestational age, birthweight, method of birth and hospital sector. Complications of pregnancy, birth and co-morbidities affecting the mother or baby, may result in a longer hospital stay. There has been a reduction in LOS globally in recent decades. However, these changes need to be interpreted with caution, as many maternal and neonatal factors can have an impact.

Length of stay varies between public and private sectors. In the public sector, LOS for babies born vaginally is two days and caesarean section is three days. In comparison, in private sector hospitals, the median LOS for vaginal births was four days and for caesarean births was five days

Length of stay is often used as a surrogate marker of morbidity. For babies born preterm, the median LOS was 10 days. For those born at term who were SGA, the median LOS was two days.

Examination of hospital LOS needs to take into consideration breast feeding rates, peripartum mental health and parenting skills.




## Admission to special care and intensive care nursery

When there are complications or medical conditions affecting the baby, admission to the special care or intensive care nursery often occurs. In 2016-2017, 22.6 per cent of liveborn babies (27,648 babies) were admitted to a nursery. Of these, 9,110 were preterm and 5,547 had a congenital anomaly (note that these categories can overlap). There were 15,079 babies born at term who were admitted to a special care or intensive care nursery and did not have an identified congenital anomaly.

## Transfer between hospitals

Some women and babies require transfer of care from one facility to another to enable access to a higher level of clinical service. Where possible, potential complications or medical conditions affecting the mother or baby will be identified before birth. Women are then booked antenatally into a hospital with an appropriate level of clinical service capability. This is one example of why attendance for a minimum of five antenatal visits is recommended and why antenatal care should start early in pregnancy. In other cases, women will require transfer just prior to, or during labour, or babies will require transfer after birth. This transfer may be required for emerging issues or for complications that were not detected during antenatal care, or where adequate antenatal care was not obtained.

Of those women who gave birth, 3.4 per cent were transferred prior to the onset of labour, 1.0 per cent were transferred during labour and 2.5 per cent of babies were transferred to another hospital after birth.

The 10 most commonly recorded reasons for antenatal transfer are shown in Table 5.

**Table 5: Top 10 reasons for antenatal transfer and percentage of transferred mothers birthing in Queensland, 2016 and 2017**

| Transfer Reason Description (ICD-10-AM) | | Frequency | Per cent of transferred mothers |
|---|---|---|---|
| Unavailability and inaccessibility of health-care facilities | Z75.3 | 1041 | 19.4 |
| Persons encountering health services in other specified circumstances | Z76.8 | 847 | 15.8 |
| Maternal care for poor fetal growth | O36.5 | 275 | 5.1 |
| Premature rupture of membranes, onset of labour between 1-7 days later | O421.1 | 237 | 4.4 |
| Maternal care for other (suspected) fetal abnormality and damage | O35.8 | 231 | 4.3 |
| Premature rupture of membranes, onset of labour within 24 hours | O42.0 | 156 | 2.9 |
| Other problems related to medical facilities and other health care | Z75.8 | 148 | 2.8 |
| False labour before 37 completed weeks of gestation | O47.0 | 148 | 2.8 |
| Labour and birth complicated by meconium in amniotic fluid | O68.1 | 126 | 2.4 |
| Obesity, unspecified | E66.9 | 119 | 2.2 |

*There can be multiple reasons for transfer for an individual woman.*

*Categories are not mutually exclusive.*

For the of babies transferred after birth, 89.8 per cent were admitted to a special care or intensive care nursery. The median length of stay for babies transferred after birth (excluding babies who died) was 17 days.

There was a higher perinatal mortality rate for all types of transfers than for the overall population, which reflects the higher rates of complications and medical conditions for babies where transfer was required.

# Consumer guidance

The QMPQC is fortunate to have four consumer representatives as part of its membership. Their contribution to discussions provides insight from the perspective of mothers and families, which is highly valued. Areas for attention as expressed by consumers include:

## Informed decision making

Women's informed decision making remains central to their experiences of maternity care. That is, it is not necessarily, and certainly not only what happens during pregnancy, labour and birth that impacts on women's experiences, but also how they feel about those events, how they were treated and whether they felt in control of decisions. Sensitive conversations with pregnant women, such as those about antenatal screening or the risk of stillbirth, need to be managed with care. For those women who receive an adverse diagnosis or who suffer a bereavement, experienced counselling and ongoing support must be provided.

**Women's informed decision making remains central to their experiences of maternity care.**

In speaking with QMPQC consumer representatives, women have voiced confusion regarding the array of current prenatal testing options. In terms of screening tests, all pregnant women should be provided with information and have timely access to investigations for fetal chromosome and genetic conditions. All such testing should be voluntary and only undertaken when the woman has been informed about the nature of the screening test, the possible results, and the options available to her.

Prenatal screening options need to be discussed and offered in the first trimester whenever possible.

Acceptable first-line screening tests for fetal chromosome abnormalities in the first trimester include either:

- Combined first trimester screening (CFTS). This is performed at 11+0 to 13+6 weeks by incorporating maternal age, ultrasound measurement of fetal nuchal translucency and maternal serum markers to generate an overall likelihood of trisomy 21 (Down Syndrome). Calculations for the risk of trisomy 13 (Patau syndrome) and 18 (Edward's syndrome) are also provided from the test. It should be noted that this is not a diagnostic test.
- Non-invasive prenatal test (NIPT). This is now available throughout Australia and uses a sample of maternal blood to estimate the chance of the baby having a chromosomal condition such as trisomy 21 (Down Syndrome). This test has the highest sensitivity for screening for Down Syndrome and other chromosomal conditions. However, NIPT is not available under Medicare or private health funds, so both the cost and availability of the test must be considered.

Similarly, women should be offered a 20-week morphology scan in the second trimester. This needs to be carefully considered after a thorough discussion between the antenatal care provider and the woman, about the benefits and potential risks, and the clinical purpose of the procedure. This would allow women to make an informed decision about whether to proceed with the scan or not. Some women may misunderstand its importance and purpose, focusing more on identifying the sex of their baby. Detailed explanation by antenatal care providers of the purpose and benefits of the scan would help to address this misunderstanding.

**Good practice point**

Pregnant women should be provided with appropriate counselling regarding antenatal screening tests. The purpose, benefits and potential risks of recommended procedures must be explained to ensure women are empowered to make an informed decision.

## Postnatal care

Women's experiences of postnatal care continue to be less positive than other aspects of their maternity care. While short postnatal stays are appealing to many women, early discharge from hospital must be accompanied by expedient communication between hospitals and community-based health services. Seamless pathways to access lactation support, community midwifery and perinatal mental health services should be a priority. Length of stay in hospital needs to be examined in the context of what other support is readily accessible to new parents.

Improving access to perinatal mental health services remains a high priority for consumers. For significant adverse birth outcomes, women should be offered a formal 'birth review' with care providers and senior staff who were involved in, and responsible for their intrapartum care. Not all women may feel ready to participate in a birth review during their immediate postnatal care and maternity services should develop a process to allow such conversations to occur in future, when the woman may feel more prepared to request it. There is also a pressing need to increase the capacity of perinatal mental health services in Queensland, including increasing the number of public 'Mother and Baby' beds in inpatient perinatal mental health services. Consumers are aware that this is being considered by the Department of Health, Mental Health, Alcohol and Other Drugs Branch, as part of ongoing service planning.

**Good practice point**

It is imperative that accessible multidisciplinary postnatal support is available to all women after giving birth.

**Improving access to perinatal mental health services remains a high priority for consumers.**

## Perinatal mortality contributing factors

The recent in-depth case review of late gestation perinatal deaths that occurred in 2018, sought to identify substandard care factors that potentially contributed to perinatal mortality. Consumers took part in the case review meetings and view it as an important body of work that needs to continue as a recurrent task of the QMPQC. The results of the review indicate there is work to do in reducing the fragmentation of care in some maternity services. Sporadic attendance at antenatal appointments was a common factor, as was communication between regional and rural facilities and their tertiary support services. The findings of the case review provide a timely reminder for maternity service planners, that care provision must be designed with women and families in mind. The outcomes of the case review forms part of this report (see Perinatal mortality section page 60).

### In Queensland

The findings of the perinatal deaths case review provide a timely reminder for maternity service planners, that care provision must be designed with women and families in mind.

## Models of care

The benefits, safety and cost effectiveness of continuity of carer, are well established [38]. There is an increasing demand from consumers for midwifery continuity of care models [39]. All women, regardless of risk, benefit from developing a trusting relationship with a known care provider. Women may also be more receptive to screening and referral for psychosocial and mental health concerns when these are offered by trusted care providers, such as in continuity of care models. Women experiencing a complex pregnancy especially have a need for consistent information, strong relationships with care providers and care navigation. Innovative models of care, incorporating telehealth and midwifery navigators, can also improve the safety and quality of maternity care for women in rural and remote areas, who relocate for birth or to access higher levels of care.

Models of care that meet the needs of women are most likely to yield high level engagement. Reasons for not attending the recommended minimum number of antenatal care visits are likely to be multifaceted. Non-engagement by women with healthcare services is an opportunity to re-orientate service provision and develop models of care that are acceptable and accessible to women. Such models of care are likely to be delivered in community outreach centres. Where women have not engaged in ongoing antenatal care, the reasons for disengagement should be explored.

## Bereavement care

Bereavement care for families whose baby dies should be given a high priority, including memory making for families, such as hands and footprints, a lock of baby's hair and photographs. All clinical staff need training in bereavement care, as specialised bereavement midwives are not always available. All staff need tools to provide compassionate care to these families [40]. Postnatal continuity of care should occur whenever possible for women whose baby dies. Specialised continuity of care models in subsequent pregnancies after a previous bereavement, are also highly valued.

### Good practice point

Clinicians need to be aware of the grief response and provide compassionate care and understanding to assist women to develop positive coping tools. [41]

38 Midwifery Continuity of Care. Australian College of Midwives. *https://www.midwives.org.au/midwifery-continuity-care*

39 National Maternity Services Plan 2010. *https://www1.health.gov.au/internet/main/publishing.nsf/Content/maternityservicesplan*

40 PSANZ Clinical Practice Guideline for Care Around Stillbirth and Neonatal Death. Ch 3 – Respectful and supportive perinatal bereavement care. *https://sanda.psanz.com.au/clinical-practice/clinical-guidelines/*

41 Ibid

Likewise, given the sensitivities involved in autopsy decision making for bereaved families, discussions should be undertaken by a care provider with an established relationship with the family, in collaboration with a senior health care professional who has a detailed understanding of the procedure and the options available to families.

Women who terminate their pregnancies following a poor or fatal fetal diagnosis should also be offered appropriate bereavement and postnatal care [42]. Many are faced with the devastation of an unexpected diagnosis of a much wished for pregnancy and some may feel self-blame and guilt.

Clinicians can find useful information on how to support bereaved women and their families through organisations such as *SANDS*, *Red Nose*, *PSANZ*, *Harrison's Little Wings* and the *Queensland Health* website.

Hospital and Health Services are encouraged to host events on International Pregnancy and Infant Loss Remembrance Day (15 October); "Say their Name Day" (25 March - instigated by Sands from consumer feedback), and similar activities, which provide an opportunity for women, their families and clinicians to join together in remembering that every baby matters and deserves to be celebrated.

### Good practice points

All clinicians should be provided with training in bereavement care and have knowledge of appropriate referral pathways .

**Every baby matters and deserves to be celebrated.**

## Congenital syphilis

Syphilis is a notifiable disease with prevalence increasing in Queensland as well as in some other States. Pregnant women with syphilis may be in complex personal circumstances and grappling with other health issues. These issues may be further complicated by both their pregnancy and being diagnosed with syphilis. The stigma associated with a syphilis diagnosis may inhibit the uptake of initial screening and/or recommended treatment and avoidance of reinfection. Efforts to prevent congenital syphilis must address these barriers. Awareness raising efforts should highlight both the prevalence of syphilis, as well as its significance and treatability, including during pregnancy. Women must be informed of the potential risk of congenital syphilis in the newborn [43]. Screening and treatment programs that incorporate steps to protect women from stigma are essential. Support must incorporate sensitive counselling, particularly regarding contact tracing.

42 Queensland Maternity and Neonatal Clinical Guidelines. Termination of pregnancy. *https://www.health.qld.gov.au/__data/assets/pdf_file/0029/735293/g-top.pdf*

43 Queensland Maternity and Neonatal Clinical Guidelines. Syphilis in pregnancy. *https://www.health.qld.gov.au/qcg/publications*

# Congenital anomalies

Congenital anomaly rates are reported based on a linked data resource, the Congenital Anomaly Linked File (CALF). This data source combines records from the Queensland Perinatal Data Collection (QPDC); the Queensland Hospital Admitted Patient Data Collection (QHAPDC) (including terminations of pregnancy prior to 20 weeks gestation); Australian Bureau of Statistics cause of death, and Queensland death registration data where a congenital anomaly has been recorded. This tool enables improved surveillance of congenital anomalies in Queensland.

All recorded congenital anomalies are included in the CALF for children up to the age of five years. This allows congenital anomalies that were not detected during the period covered by the Perinatal Data Collection (~20 weeks gestation to 28 days after birth) to be included in reporting. As the data collections have been linked at the person level, the reported rates do not include duplicates where a congenital anomaly is reported in more than one data collection. As data from multiple sources over longer periods of time feed into the CALF, care should be taken when retrospectively comparing figures reported using CALF from older reports. Furthermore, cases reported using CALF will increase in subsequent extracts, as further morbidity details are determined in the five years following an individual's birth.

Rates of congenital anomalies are reported in categories that are based on those used in the Western Australian Register of Developmental Anomalies (Table 6). Additional information on the number and rate of congenital anomalies over time and for selected subgroups is available at *https://www.health.qld.gov.au/hsu/dashboards/calf.xlsm*.

**Table 6: Cases of congenital anomalies, Queensland, 2016 and 2017**

| Congenital anomaly | Count |
|---|---|
| **Nervous system defects** | 583 |
| Neural tube defects | 156 |
| Anencephalus | 58 |
| Spina Bifida | 72 |
| Encephalocoele | 17 |
| Microcephaly | 71 |
| Congenital hydrocephalus (excl. those with NTD) | 51 |
| **Congenital anomalies of eye** | **246** |
| Anophthalmia | 2 |
| Microphthalmia | 17 |
| Congenital cataract and lens anomalies | 38 |
| **Congenital anomalies of ear, face and neck** | **432** |
| Anotia, microtia | 33 |
| Branchial Remnants | 56 |
| **Cardiovascular defects** | **2,739** |
| Transposition of great vessels | 76 |
| Tetralogy of Fallot | 57 |
| Ventricular Septal Defect | 666 |
| Atrial Septal Defects | 792 |
| Hypoplastic Left Heart Syndrome | 46 |
| Patent Ductus Arteriosus | 902 |
| Coarctation of Aorta | 87 |
| **Respiratory system defects** | **786** |
| Choanal Atresia | 34 |
| **Gastro-intestinal defects** | **4,665** |
| Cleft palate/Cleft lip | 238 |
| Tracheo-oesophageal fistula, oesophageal atresia/s | 47 |
| Pyloric stenosis | 125 |
| Stenosis/atresia small intestine | 37 |
| Stenosis/atresia anus | 44 |
| Hirschprung's disease | 39 |

| Congenital anomaly | Count |
|---|---|
| **Uro-genital defects** | **2,627** |
| Undescended testis (treated) | 1034 |
| Hypospadias | 524 |
| Renal agenesis or dysgenesis | 187 |
| Cystic kidney disease | 32 |
| Obstructive defects renal pelvis | 456 |
| Vesico-ureteric reflux | 34 |
| Other anomalies of ureter | 64 |
| **Musculo-skeletal defects** | **5,468** |
| Developmental dysplasia of hip | 341 |
| Talipes | 2,447 |
| Polydactyly | 163 |
| Syndactyly | 111 |
| Reduction deformities Upper and/or lower limbs | 103 |
| Craniosynostosis | 113 |
| Diaphragmatic hernia | 37 |
| Exomphalos | 51 |
| Gastroschisis | 65 |
| **Congenital anomalies of integument** | **3,199** |
| Birth marks, naevus | 2,053 |
| **Chromosomal and genetic anomalies** | **661** |
| Trisomy 21 (Down syndrome) | 264 |
| Trisomy 13 (Patau Syndrome) | 26 |
| Trisomy 18 (Edwards' Syndrome) | 79 |
| Turner syndrome | 21 |
| Congenital hypothyroidism | 35 |
| Adrenogenital syndrome | 10 |
| Disorders of amino acid transport and metabolism | 43 |
| Disorders of carbohydrate transport and metabolism | 14 |
| Phenylketonuria | 6 |
| Cystic fibrosis | 14 |
| G6PD deficiency | 5 |
| Thalassaemias | 3 |
| Haemophilia | 15 |
| Muscular dystrophies/myopathies | 16 |
| Fetal Alcohol Syndrome/FASD | 8 |

*Source: Congenital Anomaly Linked File, Statistical Services Branch, Queensland Department of Health.*

*Prepared by: Statistical Analysis and Linkage Unit, Statistical Services Branch, Queensland Department of Health.*

*The table includes cases where the birth was recorded in Queensland or the termination of pregnancy was conducted at a facility in Queensland.*

** Categories within nervous system defects are not mutually exclusive as anencephalus, spina bifida and encephalocele are all sub-categories of neural tube defects.*

*** Please note - this list does not encompass the full set of neural tube defects.*

*Data are preliminary and subject to change. Subsequent reports are likely to show additional cases of congenital anomalies, as further morbidity details are determined in the 5 years following an individual's birth.*

Examination of data over time and by subgroup *https://www.health.qld.gov.au/hsu/dashboards/calf.xlsm* suggests:

- Over the decade for which data are available (2008-2017) there was an increase in cardiovascular congenital anomalies (from 15.1 to 22.6 per 1,000 births), respiratory system defects (from 3.6 to 6.4 per 1,000 births), gastro-intestinal defects (from 19.8 to 35.6 per 1,000 births) and musculoskeletal defects (from 32.2 to 42.4 per 1,000 births). At least some of these increases may be attributed to improved detection of anomalies through advances in ultrasound diagnosis. Furthermore, hospitals have enhanced capability to report congenital anomalies because of the introduction of online reporting systems, which have replaced or supplemented forms-based reporting. [44]

44 Technical Report#13 Endo T, Johnston T, Ellerington J. Data quality issues to be aware of when using the Queensland Perinatal Data Collection to estimate the prevalence of congenital anomalies at birth in Queensland. Health Statistics Centre, Queensland Health, 2014. *https://www.health.qld.gov.au/__data/assets/pdf_file/0027/145494/techreport_13.pdf*

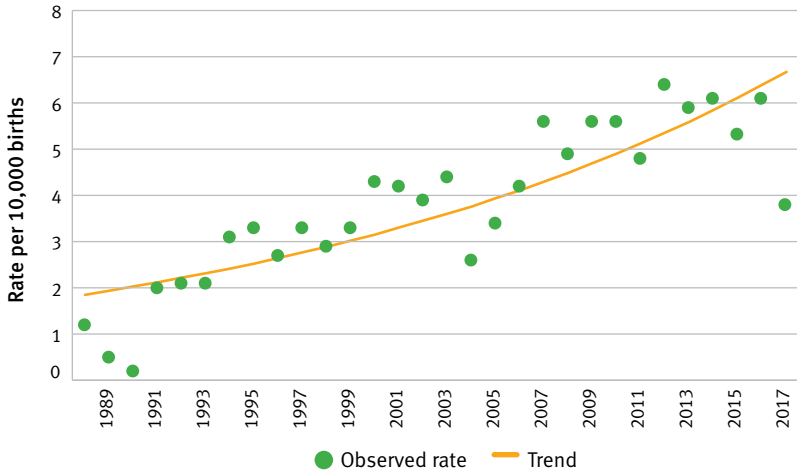
- Babies of mothers older than 40 years had higher rates of chromosomal abnormalities and cardiovascular defects (particularly septal defects and patent ductus arteriosus); babies of mothers younger than 20 years had higher rates of gastroschisis (see Statbite#80 [45] for further details regarding the rates of this congenital anomaly in Queensland).

## Gastroschisis in Queensland

Gastroschisis is a congenital anomaly of the abdominal wall, characterised by herniation of the gut and other organs where the herniated organs lack a protective membrane. Previous analysis in Queensland and elsewhere has suggested an increase in the incidence of gastroschisis. Trends, risk factors and outcomes for babies born with gastroschisis were investigated up to 2017 and are reported more fully at Statbite#80. Key points are:

- The aggregated rate of gastroschisis for the three-year period, 2015 to 2017 was 5.5 per 10,000 births (Figure 11).

**Figure 11: Gastroschisis rate per 10,000 births, Queensland 1988 to 2017**




- The rate has stabilised in recent years and when limited to the latest decade (2008 to 2017), there has not been a significant change in the proportion of babies born with gastroschisis in Queensland (annual percent change: -0.8 per cent (95 per cent CI: -4.3 per cent -2.8).
- Between 2008 and 2017, 45 babies (approximately 12.5 per cent) born with gastroschisis died during the perinatal period. There has not been any significant reduction in the mortality rate for babies born with gastroschisis when compared with the rate for the previous decade (13.3 per cent between 1988 and 2007).
- Between 2008 and 2017, approximately 88.6 per cent of babies born with gastroschisis were born at one of the tertiary perinatal centres in Queensland. When limited to livebirths, 92.9 per cent were born in a tertiary centre. These rates have slightly increased since the period 1988 to 2007 (85.0 per cent overall; 89.0 per cent livebirths only) and suggest a high rate of antenatal detection and referral for planned tertiary delivery and optimal neonatal management.
- Babies with gastroschisis are highly likely to be born preterm (‹37 weeks gestation; 64.5 per cent) and with a low birthweight (‹2,500g; 56.7 per cent).

### Good practice point

Isolated gastroschisis continues to have a significant perinatal mortality in Queensland and elsewhere. There is an elevated risk of late stillbirth, hence careful fetal growth monitoring of affected pregnancies with planned birth no later than 37 weeks gestation remains in current recommendations.

45 Statbite#80 Fraser M, Utz M, Johnston T. Gastroschisis in Queensland, 2008 to 2017. Statistical Services Branch, Queensland Health. *https://www.health.qld.gov.au/__data/assets/pdf_file/0030/929541/statbite80.pdf*

Delivery prior to 37 weeks largely reflects obstetric management to improve outcome. Between 2008 and 2017, half of induced labours and 73.7 per cent of caesarean sections without labour were preterm. This is a large increase in the preterm rate of caesarean sections, compared with 48.8 per cent prior to 2008.

- These data suggest that Queensland has tended toward earlier birth in pregnancies complicated by gastroschisis.
- Maternal characteristics found to be associated with an increased risk of giving birth to a baby with gastroschisis were: young maternal age, not being married or in a de-facto relationship (an indicator of poor social support) and being a first-time mother. Being underweight, a smoker or Indigenous were also associated with higher risk at the univariate level but these factors were not significant when adjusted for other variables.

## Critical congenital heart defects – 2007 to 2015

Congenital heart defects (CHD) constitute the most common group of congenital anomalies with an incidence between four and 10 per 1000 livebirths. CHD cases in Queensland account for more perinatal deaths than any other congenital anomaly. Infants born with critical CHD (cCHD) are a higher risk subgroup where initial neonatal care is often urgent and complex[46, 47]. In this study, we report four 'duct dependent' cCHD types, Transposition of the Great Arteries (TGA), Pulmonary Atresia (PA), Hypoplastic Left Heart Syndrome (HLHS) and Tetralogy of Fallot (ToF). In these conditions early interventions are frequently time-critical and include maintaining ductal patency, early postnatal echocardiogram and other tertiary cardiac interventions.

This report examines all fetal and neonatal cases of these four cCHD lesions born between 2007 -2015 in Queensland, excluding cases with other known lethal anomalies; those with >1 cCHD lesion and those known to be a termination of pregnancy (ToP) or planned palliation. Cases were ascertained using CALF which includes the QPDC, QHAPDC, Queensland death registration data and by individual health record enquiry.

### Hospital of Birth

Birth in a tertiary hospital maternity unit with a paediatric cardiac service has been recommended to improve short term outcomes and lower mortality overall in cCHD infants. In this cohort, non-cardiac hospital (NCH) birth occurred in 41.7 per cent of cCHD cases. The cCHD lesion with the highest rates of NCH birth were ToF and TGA (Table 7).

**Table 7: Hospital of Birth cCHD Cases, Queensland 2007 to 2015**

| | Hospital with paediatric cardiac service | Hospital without paediatric cardiac service | % Births in hospital without paediatric cardiac service |
|---|---|---|---|
| ToF | 73 | 83 | 53.2 |
| TGA | 91 | 60 | 39.7 |
| PA | 41 | 17 | 29.3 |
| HLHS | 30 | 8 | 21.1 |
| **Total** | **235** | **168** | **41.7** |

46 Antenatal Detection of Treatable Critical Congenital Heart Disease Is Associated with Lower Morbidity and Mortality. Elza Cloete, Frank Bloomfield, Lynn Sadler, Monique de Laat, Kirsten Finucane, Thomas Gentles. J Pediatrics 2019;204:66-70).

47 Outcome of infants with prenatally diagnosed congenital heart disease delivered outside specialist paediatric cardiac centres. Anagnostou K, Messenger L, Yates R, Kelsall WArch Dis Child Fetal Neonatal Ed 2012:F1-F4, doi:10.1136/archdischild-2011-300488

### Critical congenital heart defects mortality

During the eight years of review, there were 403 infants born with these four types of isolated cCHD and of these there were 65 deaths (16 per cent mortality). It is important to note that planned palliation and ToP have been excluded as these comprised a significant proportion for some of these cardiac anomalies. For example, in HLHS, ToP or palliation comprised 69.6 per cent of all cases.

The four cCHD anomalies had a higher mortality when infants were born outside a hospital with cardiac services. This was statistically significant only in the PA infants in whom mortality was halved for those born in the tertiary cardiac centre (Table 8).

**Table 8: cCHD mortality, Queensland 2007 to 2015**

| | Births in hospital without a paediatric cardiac service | Births in hospital with a paediatric cardiac service | p value |
|---|---|---|---|
| PA | 50% | 24.4% | 0.037 |
| HLHS | 37.5% | 26.1% | 0.27 |
| TGA | 20% | 12.5% | 0.134 |
| ToF | 12.8% | 9.6% | 0.268 |

*ToP and palliative care cases excluded*

### Screening for cCHD

Screening for cCHD in Queensland currently includes fetal detection on antenatal ultrasound scan at 12 to 20 weeks gestation; routine neonatal examination and the evolving use of pulse oximetry screening during the birth admission. For this cCHD cohort, the uptake of at least one antenatal ultrasound scan prior to 20 weeks was high. Missed cCHD cases on fetal scan were lowest for the anomalies with 'univentricular anatomy', both HLHS and PA. Only one in eight fetal cases of TGA were detected on antenatal scan. (Table 9). For the eight-year period of this review, there were 148 cases of these defined cCHD cases missed on antenatal screening.

**Table 9: cCHD Births Queensland 2007 to 2015**

| | Screening Antenatal Scan Rate | Missed Cases on AN Scan | |
|---|---|---|---|
| | | n | % |
| TGA | 98% | 53 | 88.3% |
| ToF | 100% | 69 | 80.2% |
| PA | 100% | 13 | 44.8% |
| HLHS | 97% | 13 | 8.7% |
| **Total** | | **148** | |

In the QMPQC 2015 Report[48], a recommendation was made that fetal ultrasound views of both cardiac outflow tracts, as stated by the International Society for Ultrasound in Obstetrics and Gynecology Guidelines 2013, be performed and documented. Analysis of two epochs, 2007-2011 and 2011-2015 were both before this previous recommendation, but showed a significant reduction in the missed fetal case rate in ToF and HLHS. The missed fetal cCHD rates remained unchanged for TGA and PA cases (Table 10). There has been no further assessment since 2015.

48 QMPQC 2015 Report. Maternal and Perinatal Mortality and Morbidity in Queensland. QMPQC webpage – Resources and Reports *https://www.health.qld.gov.au/__data/assets/pdf_file/0037/437986/qmpqc-report-2015-full.pdf*

**Table 10: Missed cCHD rates on Fetal Ultrasound Screening, Queensland 2007 to 2011 and 2011 to 2015**

| | 2007-2011 | 2011-2015 | p value |
|---|---|---|---|
| ToF | 95.2% | 65.9% | 0.0003 |
| TGA | 86.7% | 90.0% | 0.34 |
| PA | 50.0% | 69.2% | 0.17 |
| HLHS | 21.6 | 8.8% | 0.039 |

To improve detection of fetal cCHD in Queensland, the QMPQC Congenital Anomaly Sub-Committee recommends that further support be made available to antenatal ultrasound providers, including focussed fetal cardiac training. This should be specifically aimed at detection of TGA and ToF as the current detection rates for these are extremely low, despite some evidence of recent improvement.

### Good practice point

Fetal detection for Transposition of the Great Arteries and Tetralogy of Fallot remains low in Queensland. Important improvements in fetal detection and in neonatal outcome for these infants can be achieved with focussed fetal cardiac views at the second trimester fetal ultrasound screen.

### Recommendation

That all fetal ultrasound screen providers receive training around, and utilise, published guidelines for standard fetal cardiac views, particularly of ventricular outflow tracts, as noted in the International Society of Ultrasound in Obstetrics and Gynaecology Fetal Cardiology Guidelines [49].

### Recommendation

That consideration be given by each birth hospital for all newborn infants to have pulse oximetry screening prior to discharge, as stated in the Queensland Maternity and Neonatal Clinical Guidelines 2019 [51].

#### Pulse oximetry screening during birth admission

A Cochrane Review published in 2018 on pulse oximetry screening for critical CHD, included 21 studies with 457,202 participants [50]. That review found an overall sensitivity of pulse oximetry for detection of cCHD of 76.3 per cent (95 per cent CI: 69.5-82.0) with a specificity of 99.9 per cent (95 per cent CI: 99.7-99.9). It derived that out of 10,000 apparently healthy newborn infants, six will have cCHD by the median prevalence. Screening by pulse oximetry will detect five of these infants as having cCHD and would miss one case. In addition, such screening would falsely identify another 14 infants out of the 10,000 as having suspected cCHD. However, many of these false positive cases will have other important superimposed illness, for example, sepsis.

In a recent survey of practice across 40 neonatal nurseries throughout Queensland, pulse oximetry screening of newborn infants was occurring in 21 of the 33 (63.6 per cent) neonatal nurseries that responded. The QMPQC will convene a working group in 2020, to define best practice in birth admission pulse oximetry screening provision to all infants born in Queensland. Given the high 'false positive' rate of routine pulse oximetry screening, the working group will consider how to address the added anxiety and expense for families, particularly those living in rural and remote areas.

49 International Society of Ultrasound in Obstetrics and Gynaecology – Fetal Cardiology Guidelines. *https://www.isuog.org/uploads/assets/uploaded/46292fe8-e6e7-445a-b7005f8d7bc398fb.pdf*

50 Pulse oximetry screening for critical congenital heart defects. Maria Plana, Javier Zamora, Gautham Suresh, Luis Fernandez-Pineda, Shakila Thangaratinam, Andrew K Ewer. Cochrane Library. *https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD011912.pub2/epdf/full*

51 Maternity and Neonatal Clinical Guidelines. Assessment – Routine Newborn. *https://www.health.qld.gov.au/qcg/publications*

## Perinatal and fetal autopsy consent

Obtaining consent for autopsy in infants who are stillborn or die postnatally, requires careful explanation to ensure parents fully understand what is being requested of them and why[52]. It is important that senior medical staff are involved in these discussions. At the same time, clinicians need to be aware of the importance of providing detailed clinical information to inform the autopsy examination. Multiple versions of perinatal autopsy consent forms have been identified as currently in use in Queensland. The QMPQC Congenital Anomaly Sub-Committee has thought carefully about a best practice alternative. Consequently, a 'single pack' perinatal and fetal autopsy consent form has been developed that includes:

- instructions for pathologists conducting the examination e.g. type of autopsy
- parent information
- a clinical summary form to be completed by requesting clinicians.

The perinatal and fetal autopsy consent form is due for publication in 2020 and will be available at *https://www.health.qld.gov.au/consent*

Clinical information is vital for efficient and accurate placental examination and fetal autopsy. Pathologists should not have to conduct searches for information not provided in detail by those medical officers responsible for completing the consent and associated forms. All forms require documentation of the name and contact details of the requesting medical officer. This will assist the Pathologist to clarify any gaps in the information provided. Furthermore, it is of benefit to grieving parents to have an accurate and detailed consent form completed with all relevant clinical information, as it supports timely and optimal reporting of the outcome of investigations.

**Recommendation**

That all Queensland Hospital and Health Services use the 'single pack' perinatal and fetal autopsy consent form.

**Good practice point**

Clinicians must complete in detail, the perinatal and fetal autopsy consent and placental histology request forms and provide details of the requesting medical officer.

## Reproductive genetic carrier screening

Preconception carrier testing targets autosomal recessive and X-linked genetic conditions. It does not test for autosomal dominant conditions, for adult onset or mild, treatable conditions where effective interventions are available in Australia. Most of the population is thought to have several recessive gene variants. Carrying a recessive gene variant typically does not cause any harm because every person usually carries a second working version of the same gene to make a functional pair. Any couple planning a pregnancy has a two or three per cent chance of having a child with a congenital abnormality. Most genetic conditions are quite rare and there is no general test that can be done to clarify all risks for future pregnancies. However currently there are several options for genetic carrier testing:

- A panel of three genes which test for variants responsible for three common genetic disorders: cystic fibrosis, spinal muscular atrophy and Fragile X syndrome. Approximately six per cent of people in Australia will be identified as carriers for one or more of these disorders, and one in 160 couples will be identified as having a 25 per cent chance of having an affected child.

**Any couple planning a pregnancy has a two or three per cent chance of having a child with a congenital abnormality.**

52 PSANZ Clinical Practice Guideline for Care Around Stillbirth and Neonatal Death. Ch 4 – Perinatal autopsy including placental assessment. *https://sanda.psanz.com.au/clinical-practice/clinical-guidelines/*

- There is also an option for an expanded screening test that looks for variants in many hundreds of autosomal recessive genes and X-linked genes which cause debilitating disorders affecting babies and children. Approximately 70 per cent of people in Australia will be identified as carriers for one or more of these disorders, and one in 30 couples will be identified as having a 25 per cent chance of having an affected child.

Genetic carrier screening generally incurs an out of pocket expense to couples who have no family history of genetic conditions.

### Mackenzie's Mission

Mackenzie's Mission is an Australian Reproductive Carrier Screening Project in which 10,000 couples will be offered screening before they conceive or in early pregnancy, to identify those with an increased chance of having children with significant genetic conditions [53]. Couples will also be tested for conditions where early treatment can improve health outcomes. These couples will be offered information and support to help them make informed decisions about whether to have the test, which will involve a simple mouth swab or blood test. If they are found to have an increased chance of having a child with one of the genetic conditions, they will be provided information about their reproductive options. The project is planning to test for more than 1,000 recessive and X-linked genetic conditions. Outcomes of screening will be evaluated, including the psychosocial impacts, the ethical issues raised by screening, and the health economic impacts. There is also a plan to investigate how reproductive carrier screening should be provided as a national program, with the long-term aim of making screening free for every Australian couple who requests it. The project is expected to commence in early 2020 in Victoria, Western Australia and New South Wales. The study will then open in all other States and Territories, through participating health professionals in late 2020. It is scheduled for completion at the end of 2021.

Further information on prenatal screening and diagnostic testing for fetal chromosomal and genetic conditions can be found on the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) website [54].

## Congenital syphilis

Infectious syphilis and the re-emergence of congenital syphilis affecting babies in Queensland was identified as an important issue by the QMPQC in 2017 [55].

During 2018, the QMPQC convened a Congenital Syphilis Working Group (CSWG) tasked with the review of all cases of congenital syphilis that occurred in Queensland after 2010 (15 cases). The aim was to identify recurrent factors, common themes and modifiable risk factors considered to have contributed to the cases. Factors for improvement at both clinical and systems level were to be highlighted. The CSWG met several times during 2018 and reviewed all available information relating to the 15 cases that were notified between 1 January 2010 and 1 April 2018.

Several good practice points were identified and recommendations were made. These will be provided in a report to the Queensland Health Director-General and the Minister for Health, together with an action plan that will include referral to the Communicable Diseases Branch (CDB) for consideration. In the meantime, several initiatives have commenced:

53 Mackenzie's Mission. *https://www.australiangenomics.org.au/our-research/disease-flagships/mackenzies-mission/*

54 RANZCOG. Statements and Guidelines. *https://ranzcog.edu.au/statements-guidelines?searchtext=preconception+genetic+testing&searchmode=anyword&sortby=#SCORE*

55 QMPQC 2017 Report. Queensland Mothers and Babies 2014-2015. QMPQC webpage – Resources and Reports. *https://clinicalexcellence.qld.gov.au/sites/default/files/docs/qmpqc-report-2017.pdf*

### Health promotion project for women at high risk

CDB has funded True Relationships and Reproductive Health (True) to implement a statewide health promotion project focusing on women of reproductive age and pregnant women, who are at high risk of syphilis and other STIs. A needs assessment conducted by True, identified particularly vulnerable women as being those who are released from incarceration or who have an incarcerated partner; injecting or other drug users, and the homeless or those at risk of homelessness. This project is being driven by a steering group of representatives from organisations that support these highly vulnerable women, together with other sexual health professionals. The project commenced 1 July 2019 and will be completed by 30 June 2020.

### Syphilis health promotion project for men who have sex with men (MSM)

CDB also funded the Queensland AIDS Council and Queensland Positive People to undertake a 12-month health promotion project to raise awareness of syphilis transmission and prevention, and to encourage three monthly testing in gay men and other men who have sex with men. This joint project resulted in a campaign called 'Let's Treat Syphilis' which ran from January to June 2019. It included messaging about the risk of syphilis in pregnancy. An evaluation report for this project was due for completion by 20 December 2019.

### Syphilis in pregnancy guideline implementation project

Following the publication of the Syphilis in Pregnancy Guideline [56] in December 2018, CDB has provided funding to two Hospital and Health Services (HHSs) (Townsville and Metro South) for two dedicated project officer positions (Nurse Grade 7) to formally implement the Guideline into HHSs across the state. This work is to complement the work already being undertaken across North Queensland under the North Queensland Aboriginal and Torres Strait Islander STI Action Plan. The recruitment for these positions commenced in November 2019 and the project is likely to run until approximately July/August 2020.

### Sexual health training project

True Relationships and Reproductive Health has recently accepted an Agreement with the Department to deliver specialised sexual health training to maternity staff in Hospital and Health Services across Queensland. The project will ensure that health professionals who deliver maternity services are well versed in taking thorough sexual health histories and know how to initiate and access support for partner notification, particularly for syphilis. This 12-month project commenced in January 2020. The aim is for multiple training sessions to be provided on-site in hospitals across the state, particularly targeting midwives but also inviting general practitioners and any other health professionals who provide maternity care.

Further information on these initiatives is available via the Sexually Transmissible Infections Team, Communicable Diseases Branch, Prevention Division, Queensland Health email: *bbvcdu@health.qld.gov.au* telephone: (07) 3328 9728 (Reception)

The QMPQC will continue to provide a surveillance role through in-depth review by the CSWG, of any further congenital syphilis cases occurring in Queensland.

56 Maternity and Neonatal Clinical Guideline. Syphilis in pregnancy. 2018 *https://www.health.qld.gov.au/__data/assets/pdf_file/0035/736883/g-sip.pdf*

# Maternal mortality

The QMPQC is initially notified of maternal deaths by the Queensland Department of Health. This information provides the QMPQC Maternal Mortality Sub-Committee (MMSC) with the ability in most cases, to seek detailed information about each woman's antenatal, intrapartum and postnatal care and the circumstances surrounding her death. Health professionals who had primary responsibility for the care or treatment of a woman while she was pregnant or within 365 days after the end of her pregnancy, and who are aware of the maternal death of a woman, are required by legislation [57], to provide the QMPQC with a completed maternal death reporting form [58]. Information is also sought from the State Coroner when a maternal death is subject to a coronial investigation. In-depth case review by the MMSC enables appropriate classification of each maternal death and any contributing factors to be determined. Recommendations and good practice points are then developed and data provided to the Australian Institute of Health and Welfare for national reporting. All maternal mortality information is deidentified for the purpose of case review and reporting.

## Maternal death definition

According to the World Health Organisation [59] (WHO), a maternal death is the death of a woman while pregnant or within 42 days of the end of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management. This definition excludes deaths from accidental or incidental causes.

The definitions used by the QMPQC in this report include, in addition to the WHO definition, incidental deaths and deaths occurring more than 42 days after termination of pregnancy, that is, 43 days up to 365 days.

57 *Public Health Act 2005*, s 228F Maternal Deaths Statistics

58 National Maternal Death Reporting Form *https://clinicalexcellence.qld.gov.au/priority-areas/safety-and-quality/queensland-maternal-and-perinatal-quality-council*

59 World Health Organization, Maternal Mortality Ratio (per 100 000 live births), WHO 2017 *http://www.who.int/healthinfo/statistics/indmaternalmortality/en/*

## Classification of maternal deaths

Deaths in pregnancy and for the first 365 days after the end of pregnancy are uncommon and are classified in several ways.

**Direct deaths** are those that result from obstetric complications of the pregnant state (pregnancy, labour and puerperium), including deaths from interventions, omissions, inappropriate treatment or from a chain of events resulting from any of the above. They are complications of the pregnancy itself.

**Indirect deaths** are those which result from pre-existing disease or disease that developed during pregnancy and was not due to direct obstetric causes, but which may have been aggravated by physiological effects of pregnancy.

**Incidental deaths** are those due to conditions occurring during pregnancy, where the pregnancy is unlikely to have contributed significantly to the death, although it is sometimes possible to postulate a distant association. These deaths are not included in the calculation of the Maternal Mortality Ratio (MMR).

**Late maternal death** is the death of a woman later than 42 days but within one year of giving birth or otherwise ending a pregnancy. These deaths are not included in the calculation of the MMR (see below).

## Classification of maternal suicide

While the World Health Organisation has reclassified maternal suicide as a direct cause of maternal death, the QMPQC has endorsed the continuation of its classification of 'direct', only for those maternal suicide deaths where no pre-existing mental health condition was noted. For all other maternal suicide deaths, the classification given is either 'indirect' or 'incidental'. This ensures consistency with all other Australian States and Territories which classify maternal suicide in this way, to align with national reporting.

**Maternal mortality ratio (MMR)**

$$\text{The MMR is defined as } \frac{\text{Number of maternal deaths}}{\text{Number of women who gave birth}} \times 100{,}000$$

In 2016 to 2017, 37 deaths occurred during pregnancy or within 365 days of the end of a pregnancy. For the purpose of calculating the MMR, the WHO definition [60] for maternal death is applied. There were 10 maternal deaths (two direct and eight indirect deaths) which fit with this definition, giving an MMR of 8.2 per 100,000 births, which is slightly higher than the national rate of 7.2 per cent per 100,000 births for the same period [61] (Note - this is not due to obstetric causes, but other causes such as worsening perinatal mental health and pregnancies complicated by various malignancies). A further two maternal deaths were classified as incidental. There were 25 late maternal deaths, one of which could not be classified.

The MMR in Queensland in the most recent four triennia are shown in Table 11 and have been explained in more detail in previous QMPQC reports [62].

### In Queensland

37 maternal deaths occurred during pregnancy or within 365 days of the end of a pregnancy in 2016 and 2017.

The maternal mortality ratio for this period was 8.2 per 100,000 births. This ratio includes only the two direct and eight indirect deaths that occurred during pregnancy or within 42 days of a birth.

60 Ibid.

61 Australian Institute of Health and Welfare 2019. Maternal deaths in Australia. Cat. No. PER 99. Canberra: AIHW. Viewed 14 January 2020, *https://www.aihw.gov.au/reports/mothers-babies/maternal-deaths-in-australia/data*

62 Previous QMPQC reports are available for download at: *https://clinicalexcellence.qld.gov.au/priority-areas/safety-and-quality/queensland-maternal-and-perinatal-quality-council/resources-and*

**Table 11: Maternal mortality ratios (MMR), Queensland and Australia, 2006 to 2008 to 2015 to 2017**

| Triennia | Direct | Indirect | Number of women who gave birth in Queensland | MMR Queensland | MMR Australia [63] |
|---|---|---|---|---|---|
| 2006-2008 | 6 | 7 | 175,274 | 7.4 | 6.9 |
| 2009-2011 | 4 | 11 | 183,175 | 8.2 | 7.4 |
| 2012-2014 | 10 | 2 | 187,660 | 6.4 | 6.8 |
| 2015-2017 | 5 | 10 | 182,310 | 8.2 | 6.6^ |

*Includes direct and indirect deaths within 42 days of the end of pregnancy.*
*^Excludes data for all data from Western Australia for 2016 and 2017.*

## Classification of cause of maternal deaths

In this section, the broader definition of maternal death is used, including incidental and late maternal deaths.

Table 12 shows the classification of the 37 deaths that occurred during pregnancy or within 365 days of the end of a pregnancy in the period 2016 to 2017. Two deaths were a direct result of the pregnancy and 15 were indirect deaths (resulting from a pre-existing condition aggravated by the physiological effects of pregnancy). Eighteen women died of incidental causes. One maternal death could not be classified because the cause of death was unable to be determined and another could only be partially classified because information required to determine avoidable factors was not available for inclusion in this report.

**Table 12: Classification of maternal deaths in Queensland 2016 and 2017 (includes incidental and late deaths)**

| Maternal death timing | Classification | Total |
|---|---|---|
| Deaths during pregnancy | Indirect | 2 |
| Deaths within 42 days of end of pregnancy | Direct<br>Indirect<br>Incidental | 2<br>6<br>2 |
| Deaths between 43 days and 365 days of end of pregnancy (i.e. late maternal deaths) | Indirect<br>Incidental<br>Unclassifiable<br>Awaiting further information to allow review for classification | 7<br>16<br>1<br>1 |
| **Total** | | **37** |

*Includes all maternal deaths.*


63 Australian Institute of Health and Welfare 2019. Maternal deaths in Australia. Cat. No. PER 99. Canberra: AIHW. Viewed 14 January 2020, *https://www.aihw.gov.au/reports/mothers-babies/maternal-deaths-in-australia/data*

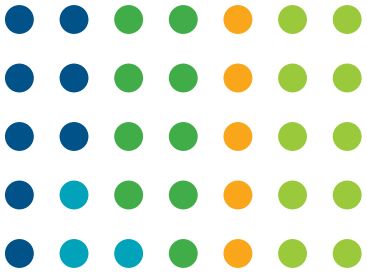
## Cause of maternal death

Table 13 shows the cause of the 37 deaths that occurred during pregnancy or within 365 days of the end of a pregnancy. Suicide (9), Malignancy (8), and cardiac (5) were the most prominent causes of death. As the numbers are small on a population basis, care should be taken with interpretation.

**Table 13: Cause of maternal deaths in Queensland 2016 and 2017**

| Cause of death | During Pregnancy/ 0-42 days postpartum Number | 43-365 days Postpartum Number |
|---|---|---|
| **Suicide** | 2 | 7 |
| **Malignancy** | | |
| Metastatic Melanoma | | 1 |
| Metastatic cervical cancer | | 1 |
| Metastatic breast cancer | | 1 |
| Metastatic pancreatic cancer | 1 | |
| Metastatic lung cancer | | 1 |
| Glioblastoma | | 1 |
| Lymphoma | 1 | |
| Carcinoma (oesophagus) | | 1 |
| **Cardiac** | | |
| Coronary artery thrombosis | 1 | |
| Mitral valve prolapse | | 1 |
| Cardiac arrest | | 2 |
| Cardiomyopathy | 2 | |
| Sudden unexplained death | | 1 |
| **Trauma** | | |
| Head, neck and trunk trauma (fall from height) | | 1 |
| Motor vehicle trauma | | 2 |
| **Substance use disorder** | | 2 |
| **Other causes** | | |
| **Amniotic Fluid Embolism** | 1 | |
| **Intra-cerebral cyst** | 1 | 1 |
| **Bacterial meningitis** | 1 | |
| **Intra-cerebral haemorrhage** | 1 | |
| **Primary postpartum haemorrhage** | 1 | |
| **Anaphylaxis (food)** | | 1 |
| **Yet to be determined** | | 1 |
| **Total** | **11** | **46** |

*Includes all maternal deaths.*



In 2016 and 2017

- **8 maternal deaths due to malignancy**
- **9 due to suicide**
- **5 due to cardiac**
- **3 due to trauma**
- **10 due to other causes**

as described in Table 13.

## Perinatal mental health

### Postpartum suicide

It is distressing to review the deaths of mothers due to suicide, who had infants of less than 12 months of age. Women continue to fall through the gaps of mental health care provision, including appropriate identification of their mental health needs during and immediately post pregnancy. This is a public health issue which is of concern to the MMSC and requires considered attention.

While there have been improvements in screening, there are gaps between screening and access by women to specialised perinatal mental health services. Engagement of women with these services is problematic in relation to the delivery of services and in making sure that all health workers involved with pregnant women and mothers, are appropriately skilled. As perinatal mental health disorders are common and often poorly diagnosed, managed and followed up, this is a matter that must be prioritised. Timely access to specialist perinatal mental health services and/or advice is a matter of serious concern.

The introduction of Medicare-funded antenatal and postnatal mental health screening services for pregnant women needs to be promoted, to ensure screening occurs as a routine within the private health sector. Education and information regarding access to local referral pathways also needs to occur. Screening should not occur if clinicians are not aware of referral pathways and this also needs to be promoted. The Centre for Perinatal Excellence (COPE) is working to address this through the development of online training programs for health professionals and a directory of resources [64]. It is important that all private sector healthcare providers are familiar with available resources.

In some maternal deaths, delays in access to public mental health professionals have also been identified.

Three deaths occurred following termination of pregnancy (ToP). The newly released guidelines for ToP [65] place a strong emphasis on psychosocial screening and the importance of referral for counselling and mental health assessment as required. These guidelines should be easily accessible for all providers of ToP, including private providers

The QMPQC noted in its earlier reports that active follow-up of the women known to be at risk of depression from prenatal and postnatal screening, needs to be universal and effective. The Edinburgh Postnatal Depression Scale (EPDS) continues to be the preferred antenatal screening tool for symptoms of depression and/or anxiety. A score of 13 or more may be indicative of symptoms of major depression and is a priority for follow-up with positive answers for Questions 3, 4 and 5 also followed up for anxiety disorder. A positive answer to Question 10 regarding thoughts of self-harm/ suicide should always be explored and pathways for further mental health review put in place.

**Recommendation**

That consideration be given to the promotion of education regarding the new Medicare numbers for screening for perinatal mental health in the private sector, including increasing awareness of local referral pathways.

**Recommendation**

That consideration be given to prioritising the development of a Queensland clinical guideline on perinatal mental health.

64 Centre of Perinatal Excellence (COPE). National Perinatal Mental Health Guideline. Online training program. *https://www.cope.org.au/health-professionals/health-professionals-3/review-of-new-perinatal-mental-health-guidelines*

65 Queensland Maternity and Neonatal Clinical Guidelines. Termination of pregnancy. *https://www.health.qld.gov.au/qcg/publications*

In 2017, COPE produced an Australian Clinical Practice Guideline, *Effective Mental Health Care in the Perinatal Period* [66], to support health professionals in providing evidence-based care. Guidance on screening and psychosocial assessment and care of women with depressive and anxiety disorders, severe mental illness, including schizophrenia, bipolar disorder and borderline personality disorder, was also included.


### Mental health follow-up

Antenatal and postnatal screening has led to better identification of women at risk of mental health disorders during pregnancy. However, the challenge lies in managing new and ongoing mental health and psychosocial difficulties beyond the first six weeks postpartum.

Women who have pre-existing mental health disorders or are diagnosed during pregnancy need careful postpartum follow-up. There continues to be a gap in care between maternity providers, child health nurses, mental health providers and general practitioners. A clear discharge plan for mental health follow-up needs to be provided by hospital maternity care providers. Midwives and child health nurses involved in postpartum care need to ensure appropriate mental health care follow up occurs. Communication between maternity care providers, mental health care providers, general practitioners and family support services must be a priority.

There are many resources available for both women and clinicians, designed to reduce the impacts of emotional and mental health problems in the antenatal and postpartum period. These should be accessed to support follow-up management of new and ongoing mental health or psychosocial difficulties [67, 68, 69].

## Good practice points

Private obstetric services need to be aware of local referral pathways to refer women for further perinatal mental health assessment and management.

All health professionals working with pregnant and postpartum women need to be skilled in psychosocial and mental health assessment.

As a routine, the Queensland Termination of Pregnancy Guideline must be easily accessible for all providers of termination of pregnancy, including private providers.

Women with a history of serious mental illness (for example, schizophrenia, bipolar affective disorder, schizoaffective disorder) must always be offered mental health follow-up for at least the first twelve months postpartum.

## Good practice points

Women who have pre-existing mental health disorders or are diagnosed during pregnancy require a specific discharge plan provided by hospital maternity care providers, for mental health follow-up.

Transparent communication between all stakeholders involved in the woman's care must be a priority and led by the primary maternity care provider.

66 Centre of Perinatal Excellence (COPE). Effective Mental Health Care in the Perinatal Period - Australian Clinical Practice Guideline. *https://www.cope.org.au/health-professionals/health-professionals-3/review-of-new-perinatal-mental-health-guidelines*

### Psychosocial issues/missed clinical appointments/management of complex pregnancies

Traditionally, when women miss three appointments within the public antenatal care system, a letter and where possible an SMS message, is sent to the woman referring them back to their general practitioner (GP). A letter is also sent to the woman's GP advising them that the woman has been referred back to them for ongoing care. However, in very high-risk women with complex medical disorders of pregnancy, this approach results in substandard care. Highly vulnerable women with complex psychosocial backgrounds, are less likely to obtain the care they require. Each of these cases should be reviewed by a senior clinician within the hospital's antenatal clinic, to decide on an appropriate course of action, including whether it is possible to determine and address the woman's reason for disengagement.

A letter discharging these women from the antenatal clinic for reasons of missed appointments and leaving follow up to a general practitioner, is inappropriate. Such practice does not fulfil the responsibility and commitment of health services to provide quality and safe healthcare. The woman in most need of antenatal care may often be the woman most likely to not attend appointments. Review of current processes is required for managing women who do not attend antenatal appointments, especially those who may have complex mental health/psychosocial issues.

Women who fail to attend antenatal appointments need to be supported to re-engage with healthcare providers. This may include being linked to sensitive and intensive continuity of care models. For example, these women may benefit from oversight by midwife navigators, who as primary caregivers, conduct home visits, accompany the women to their visits with various clinicians and who understand the barriers for attendance at antenatal clinic.

Women with increasingly complex health needs are embarking on pregnancy. Supporting these women requires multidisciplinary team care which may include input from obstetricians; midwives; physicians; cardiologists; other medical sub-specialists; surgeons; psychiatrists; allied health professionals; neonatologists; anaesthetists and others healthcare providers as required. The importance of excellent multidisciplinary communication and collaborative decision-making cannot be over emphasised. When this process breaks down, the lives of women and babies are at risk. It is essential that one clinician is designated as the overall co-ordinator of the woman's care and accepts the responsibility of providing clear and transparent communication between the team and the woman. Consideration should be given to convening a formal multidisciplinary team meeting to develop an agreed pregnancy management plan.

#### Recommendation

That consideration be given to the development of a systematic, holistic approach to appropriate high intensity intervention, including case management with a continuity of care midwifery model, for women who are at risk of disengaging from antenatal care and who may have complex mental health/psychosocial issues.

#### Good practice point

Within each facility, in-depth review by a senior clinician needs to be undertaken for any woman who misses two consecutive antenatal appointments, to determine why this has occurred and how it can be addressed.

Engagement by women, with regular antenatal care, needs to be emphasised at each point of care occasion.

#### Good practice point

Maternity units need to have a process for women with complex needs where their cases are appropriately discussed and an agreed management plan put in place between all relevant parties and which is reviewed regularly.

67 Australian Institute of Health and Welfare. Resources for supporting psychosocial health in pregnancy – Mental health. *https://www.aihw.gov.au/reports-data/population-groups/mothers-babies/resources-for-psychosocial-health-in-pregnancy/mental-health*

68 Queensland Centre for Perinatal and Infant Mental Health. *https://www.childrens.health.qld.gov.au/chq/our-services/mental-health-services/qcpimh/infant-perinatal-mental-health*

69 Centre of Perinatal Excellence (COPE). *https://www.cope.org.au/about/*

### Hypothetical case

A 22-year-old woman presents to the emergency department in early pregnancy with suicidal ideation. This is an unplanned pregnancy and her relationship with the father of the baby has recently broken down. She describes this relationship as marked by violence. She is struggling to cope with financial stressors and being unable to work due to hyperemesis. She has reduced her cannabis intake which has led to heightened anxiety and depressive symptoms. She is estranged from her family having left home at the age of 15 to escape family violence. After acute mental health review, she is referred to perinatal mental health services. Linkages are made with the caseload midwife, maternity social worker, alcohol and other drugs services, Headspace and a family support service. She proceeds with the pregnancy and is referred after birth to child health continuing care program.

### Contraception

There is good evidence that a short inter-pregnancy and birth interval is associated with several adverse features, including a negative impact on perinatal outcomes for babies and maternal mental health. The MMSC is strongly of the view that all pregnant women should be able to make an informed decision about postnatal contraception, following discussion during the antenatal period. An agreed contraceptive plan can subsequently be documented in each woman's pregnancy record.[70]

The number of maternal suicides occurring after a ToP is of great concern to the MMSC. As stated previously, psychosocial screening, mental health assessment and referral for counselling as required, should be instituted by all providers of TOP. Appropriate follow-up should also be arranged for these women.

It is imperative that state and federal jurisdictions improve education and rapid access to safe, reliable contraception for women. Ideally, this should be done through provision of suitable education for early secondary school students and a suitably targeted advertising campaign through public health channels. Access to safe contraception is a priority, especially long acting reversible contraception (LARC) devices, available through medical practitioners, nurses, midwives and pharmacies. Culturally safe programs targeting education and provision of suitable contraception in Indigenous women need to be developed as a matter of priority.

It is essential that hospitals are flexible in the provision of these services, given the increasingly short length of postnatal stay for many women. Hospitals should ensure they have enough staff trained in the safe insertion of various LARCs to meet each woman's need, often in a short time frame. Hospital pharmacies should ensure sufficiency of LARC resources on wards to meet any out of hours requirements, and barriers preventing dispensing of oral contraceptives by public hospitals should also be removed.

#### Good practice point

Women with a history of complex trauma benefit from sensitive trauma informed care with support from multidisciplinary services through collaboration with maternity services, alcohol and other drugs services, mental health services, domestic violence services, continuity of midwifery care, general practice and other services as required.

#### Recommendation

That State and Federal jurisdictions improve education and rapid access to safe reliable contraception for women. This should preferably occur through education for early secondary school students and a suitably targeted public health campaign.

#### Good practice point

Psychosocial assessment should be an integral part of the care of women requesting termination of pregnancy and instituted by all providers of this procedure. Appropriate follow-up should be arranged as required.

#### Recommendation

That culturally safe programs targeting education and provision of suitable contraception in Indigenous women be developed as a priority.

#### Good practice point

Hospital pharmacies need to ensure adequate resources are available to meet patient demand and need to review current policies to remove any barriers in the prescription of common contraceptives, such as the various types of oral contraceptive pills.

70 Association of Short Inter-Pregnancy Interval with Pregnancy Outcomes According to maternal age Schummers L et al; JAMA Intern Med. 2018;178(12):1661-1670. doi:10.1001/jamainternmed.2018.4696

### Underweight women

While there has been a public health focus on overweight and obesity, women with a low BMI are at risk of higher rates of fetal adverse events. There is also the risk of an undiagnosed or untreated eating disorder, impaired fetal development and antenatal complications. Women with undiagnosed or untreated eating disorders are at risk of sudden death due to electrolyte abnormalities and cardiac arrhythmias. Midwives, obstetricians and general practitioners need to be diligent in considering the underpinning causes of low BMI in pregnant women [71]. There needs to be a low threshold for referrals to mental health professional and physicians, to ensure that appropriate investigation and management of underweight women occurs.

**Good practice point**

Focussed education and training for all maternity care staff is recommended, to assist with identification of eating disorders in pregnancy; early intervention and referral.

## Hypertension in pregnancy

Unlike in previous reporting years, in the period 2016 to 2017, there were no maternal deaths relating to failure in the diagnosis and management of hypertension in pregnancy. However, this condition remains a common cause of maternal deaths throughout the world. The QMPQC urges vigilance in ensuring that any rise in blood pressure during pregnancy is carefully assessed.

**Good practice point**

Any rise in blood pressure during pregnancy needs to be carefully assessed, and decisions made by senior clinical staff about appropriate management, including the frequency of ongoing monitoring.

## Cancer

### Preconception counselling for women with a previous history of cancer

There are an increasing number of young women who have a background history of cancer prior to pregnancy. Some of these cancers may be influenced by a subsequent pregnancy. In most cases there is some guidance regarding appropriate disease-free intervals prior to embarking on pregnancy. It was noted by the MMSC that in some situations, pre-conception care may have been important. Women who are undertaking cancer treatment need appropriate contraception. Once appropriate disease-free periods have been completed and a pregnancy is being considered, the MMSC strongly recommends that women be referred for an appropriate pre-conception consultation with maternity care providers. A pregnancy during acute cancer treatment demonstrates a failure to provide appropriate contraceptive advice.

**Good practice point**

Women with a recent history of cancer who are considering a pregnancy, require suitable inter-professional preconception counselling and those women undertaking cancer treatment require appropriate contraception advice.

### Spotting and cervical screening

Current Australian clinical practice guidelines developed by RANZCOG and Cancer Council Australia, recommend that cervical cancer should be excluded in all women with persistent abnormal vaginal bleeding. [72] While cancer is an uncommon cause of abnormal vaginal bleeding in women of any age, postcoital bleeding and irregular per vaginal (PV) spotting and bleeding during pregnancy warrant investigation because either may be a symptom of cervical cancer.

In line with National Cervical Cancer Screening Guidelines, pregnant women at any age who have signs or symptoms suggestive of cervical cancer need to have a Co-test (cervical cancer screening test). Referral for appropriate investigation to exclude genital tract malignancy should be considered if there are any suspicious features detected during clinical examination.

**Good practice point**

Appropriate investigation must be recommended to any pregnant woman who presents with PV spotting or bleeding. This needs to be performed at the time of presentation to exclude a significant lower genital tract cause of the bleeding +/- a Co-test, if one has not been performed within a suitable time frame.

71 Pregnancy and Eating Disorders: A professionals guide to assessment and referral *https://www.nedc.com.au* (member access only)

72 National Cervical cancer screening Guidelines available at *https://wiki.cancer.org.au/australia/Guidelines:Cervical_cancer/Screening/Introduction*

Pregnancy and/or the presence of bleeding should not be regarded as a contraindication to the performance of a Co-test.

## Obstetric haemorrhage

One maternal death was due to primary postpartum haemorrhage and one from amniotic fluid embolism associated with subsequent coagulopathy and massive haemorrhage. Several contributing factors were determined during case review regarding a lack of local policies and protocols to manage severe haemorrhage, or a failure to follow clinical practice guidelines[73]. Failure to offer or follow recommended best practice, that is, upskilling maternity care staff about massive transfusion protocol, and failure to recognise and act on clinical deterioration, was noted. It was also noted that there was often a failure to appreciate the significance of cumulative maternal blood loss.

Centres which provide for birth by caesarean section must be prepared to treat massive obstetric haemorrhage and the consumptive coagulopathy that frequently accompanies it. Formal Massive Transfusion Protocols (MTP) must be developed/followed in all centres providing intra-partum care, to aid in co-ordination of the clinical and laboratory response to massive haemorrhage. Consideration needs to be given to the use of whole blood Point of Care Coagulation Testing (POCCT), for example TEG or ROTEM to guide blood product administration.

### Good practice points

Improved training and diligence in estimation of maternal blood loss is needed, including measures such as weighing of blood-stained bedding, in both birthing areas and in the operating theatres, to improve quantitation of maternal blood loss.

Maternity care team training needs to occur in all maternity care units to ensure protocols are followed for the effective management of massive obstetric haemorrhage.

Consideration needs to be given to making appropriate Point of Care Coagulation Testing (POCCT) (including training) available in all facilities with a maternity service.

**Hypothetical case**

A woman of 38 years in her third pregnancy; under hospital-based antenatal care with two uncomplicated vaginal births prior, attended antenatal clinic appointments regularly. Ultrasound indicated a fundal placenta. She presented via ambulance at 36 weeks gestation with antepartum haemorrhage of 100ml and abdominal pain. Spontaneous vaginal birth occurred within two hours of presentation. She passed 650ml blood PV soon after giving birth and was actively managed with uterotonics. Six hours after giving birth, the woman was reassessed because of mild blood loss and 200ml of clots were removed from the uterus. All observations were stable.

The woman was admitted for a few hours to the maternity inpatient unit as the bleeding was minimal and a haemoglobin test was to be repeated. The patient insisted on going home 16 hours after giving birth. She was reviewed by a junior medical officer who determined that as the woman was stable, she was able to be discharged home. The results of repeat haemoglobin were not checked prior to her discharge.

There was no senior medical officer input or documentation in relation to the risk of early discharge or the review of the haemoglobin test results. The patient was readmitted soon after with massive postpartum haemorrhage and required resuscitation. Examination under anaesthesia revealed retained placental cotyledons with clots which were removed. In this hypothetical case, the woman was transfused, the bleeding settled and her haemoglobin returned to normal. The woman was discharged home eight days later.

### Good practice point

Senior medical officers should be consulted regarding early postpartum discharge, if there are any risk factors, clinical concerns or new issues that have arisen during labour or the early postpartum. Care needs to be taken to ensure that length of stay targets and bed pressure within maternity units do not inadvertently compromise patient safety.

73 *Queensland Maternity and Neonatal Clinical Guidelines, Primary postpartum haemorrhage*

Seventeen of 18 maternal deaths reported nationally between 2006 and 2016, were direct deaths that occurred following obstetric haemorrhage. In the case above, the woman was discharged by a junior medical officer within 16 hours of postpartum haemorrhage, without the haemoglobin test results being checked. The woman then re-presented soon after and was appropriately managed, but this case is clearly a 'near miss'. It demonstrates the importance of having a protocol in place where senior medical officers need to be responsible for the discharge of women following an obstetric complication. If a patient insists on being discharged, having a senior medical officer involved in explaining the risks of early discharge may change the decision to leave the hospital, or encourage them to re-present should concerns arise, reducing the risk of further complications or even death.

## Timing of discharge and postnatal debriefing

Women who have had a complex peripartum course may need additional inpatient care prior to discharge from hospital. While hospitals are very focused on length of stay, there is a risk that some women are inappropriately discharged early, placing them at serious risk of adverse events. Women who have had pre-eclampsia; postpartum haemorrhage; infection and other adverse events peripartum, may benefit from longer periods of observation. These women must not be discharged without senior consultant review.

It is important that all women who have had a complex peripartum course are offered a formal birth review with senior obstetric, midwifery and other clinicians who provided them with significant care, to enable their case to be examined, their questions answered, and an agreed plan for their next pregnancy to be formulated. As noted in the Consumer Guidance section of this report (see page 29), women may not feel ready to participate in a birth review during their postpartum hospital stay, or for some time after. In managing their concerns, women need to know and feel that they can seek this conversation with their maternity service at a time when they feel more able to discuss their experience.

### Good practice point

Consultant review is required prior to discharge for any woman who has suffered a significant adverse event during labour, birth or early postpartum period. Patient care and timing of discharge needs to be individualised and not driven by hospital protocols.

## Inter-professional team training in obstetric emergency management

There is increasing evidence that inter-professional team training in the management of obstetric emergencies can lead to a variety of better maternal and perinatal outcomes, including reduced rates of blood transfusions, fewer unplanned admissions to intensive care for mothers and fewer fetal injuries secondary to shoulder dystocia. Team training has several benefits, including identification of knowledge and skill gaps for key staff; identification of unforeseen workplace risks; testing of new hospital policies and protocols in real time, and improvement in workplace culture and team harmony. [74]

### Good practice point

That each hospital providing maternity care engage in inter-professional team training to improve the management of maternity emergencies, and to identify systemic problems in their hospitals which may predispose towards delay in provision of required care.

74 Shoustarian M et al Impact of introducing Practical Obstetric Multi-Professional Training (PROMPT) into maternity units in Victoria, Australia *https://obgyn.onlinelibrary.wiley.com/doi/full/10.1111/1471-0528.12767*

## Investigations in pregnancy

During case review, a five-month delay in obtaining an echocardiogram was noted as a contributing factor to one of the maternal deaths. This highlights the issue of timely access to investigations for pregnant women and the importance of inter-professional collaborative care. These women need timely access to echocardiograms; endoscopy; cerebral imaging; abdominal imaging and other investigations as required. Long waiting lists for some investigations may result in clinicians needing to be very determined to ensure timely access to investigation for their patients. Echocardiogram waiting times for pregnant women need to be scrutinised by each Hospital and Health Service and improved where necessary. There is sometimes a reluctance to engage in appropriate and thorough investigation of symptoms that occur during pregnancy. It is unacceptable to delay any investigations simply because of pregnancy.

**Good practice point**

Waiting times for any investigations require monitoring by each Hospital and Health Service and improved where necessary.

While most headaches in pregnancy have a benign cause, women die of cerebral tumours, intracerebral haemorrhage and other intracerebral pathologies. The differential diagnosis of raised intracranial hypertension in pregnancy needs attention. As with all symptoms in pregnancy, a detailed and thorough clinical history, clinical examination and appropriate investigations are required. A complete examination of women with headaches includes visualisation of the optic fundi. If the staff responsible for a pregnant woman with headaches do not have these skills, the woman requires a thorough ophthalmological assessment. Imaging with non-contrasted MRI or CT scanning during pregnancy must be undertaken if it is indicated.

**Good practice point**

Imaging with non-contrasted MRI or CT scanning during pregnancy must be undertaken if it is indicated.

## Record keeping

In some instances, reviewing confidential case records was hampered by insufficient medical, nursing and midwifery notes. Further, with the introduction of integrated electronic Medical Records (ieMR), a clear chronological history is frequently difficult to ascertain. This certainly made it difficult for the MMSC to fully review the confidential case record in some instances.

The MMSC noted that since the introduction of ieMR within different Hospital and Health Services, and departure from the paper-based Pregnancy Health Record, there is no reliable way for pregnancy health records of women engaged in shared models of care to be noted in the ieMR. This is also an issue in other situations, for example, hampering effective communication with an external provider. This has led to gaps in care, the potential for missed diagnoses such as pre-eclampsia and intrauterine growth restriction, and increased risk of less safe care. It has also limited women's access to and input into their own clinical information. As the ieMR is introduced more widely, these risks need to be managed. Clinician and consumer concern around these matters also needs to be considered by decision-makers. Furthermore, the fact that the ieMR does not take the mother/baby dyad into consideration, contributes to risk in managing the care of both.

**Recommendation**

That priority be given to developing an ieMR solution that allows linking of mother and infant medical records.

**Recommendation**

That an appropriate electronic solution to replace the functionality of a patient hand-held record, which can be shared between hospitals, midwives, general practitioners and women, be urgently prioritised.

## Referral guidelines and inter-professional collaboration

It is essential that women participating in maternity care receive the right care by the right person in the right place, at the right time. Maternity care is delivered in many different models of care, by different health professionals, across both the public and private sectors. It is important that all care givers collaborate regularly and that women have their care escalated if their clinical condition deteriorates and risks for a successful pregnancy outcome emerge. The Australian College of Midwives (ACM) and RANZCOG have developed agreed referral guidelines[75]. These are meant to be a 'single, nationally consistent and evidence-based tool to assist midwives in making decisions about when to discuss care and/or consult with other midwives or to refer a woman's care to a suitably qualified health practitioner'.
It is important that practitioners providing maternity care adhere to these guidelines to an auditable safety standard. This would allow a pregnant woman to move seamlessly between models of care, enabling her to obtain the correct care and assist her in achieving the best possible pregnancy outcome.

### Good practice point

Compliance with the Australian College of Midwives (ACM) Referral Guidelines should occur to an auditable standard.

## Autopsies following maternal death

The MMSC reiterates the comment included in the QMPQC 2017 Report[76] regarding the importance of establishing an accurate diagnosis in cases of unexpected and/or sudden death, in women who are pregnant or in the first 12 months postpartum. An autopsy is strongly recommended in cases where a cause of death is unclear. A molecular autopsy is required if a cause of death is not identified through conventional autopsy. Additionally, clinicians need to be aware of referral pathways for first degree relatives of the deceased for clinical family screening and where appropriate, genetic testing of unexplained sudden cardiac death. The aim of these further steps is to identify causes of sudden unexplained cardiac death, most importantly inherited arrhythmias, in which there may be life-saving treatments available for other affected family members. This information needs to be provided to families for the purpose of informed decision-making about their own health. In a recent study, led by Australian and New Zealand investigators, genetic testing revealed a likely cause of death in 27 per cent of otherwise unexplained sudden cardiac deaths in the young (aged ‹35 years), and relevant clinical diagnoses in 13 per cent of families referred for screening[77]. Queensland Health offers a publicly funded cardiac genetic clinic service at the Royal Brisbane and Women's Hospital. The clinic offers family screening, genetic counselling and where appropriate genetic testing.

### Recommendation

That an autopsy, and where appropriate and available, molecular investigations, be performed in all cases of maternal mortality. Consideration should be given to amending the *Queensland Coroners Act 2003* to include investigation of all maternal deaths (including late deaths), except where there is a clear and unequivocally diagnosed cause of death, for example, a known metastatic malignancy.

### Good practice point

It is important to emphasise that unexpected and/or sudden death in women of child bearing age has a broad differential diagnosis which should be considered in all cases. Clinical diagnosis does not override the importance of an autopsy.

75 ACM National Midwifery Guidelines for Consultation and Referral available at: *https://www.midwives.org.au/resources/national-midwifery-guidelines-consultation-and-referral-3rd-edition-issue-2-2014*

76 QMPQC Report 2017, Page 42. QMPQC Webpage – Resources and Reports. *https://clinicalexcellence.qld.gov.au/priority-areas/safety-and-quality/queensland-maternal-and-perinatal-quality-council*

77 Bagnall RD et al N Engl J Med 2016;374:2441-52

## Psychologically safe workplace environments

In conducting in-depth case review, the MMSC noticed episodes of workplace bullying, harassment and intimidation hinted at, or noted in the medical record. Failure to provide a psychologically safe work environment contributes to adverse events and in one case, may have contributed to a patient's death. It is critical that workplace culture is clearly recognised as a risk factor for adverse patient outcomes. Patient safety and quality of care is dependent upon a psychologically safe working environment, free of intimidation, harassment or bullying. A respectful, caring team environment is critical in the delivery of world class healthcare. Maternity environments are high stress, making workplace culture particularly pertinent not only for health care providers, but also for healthcare consumers and their families, who are very likely to witness and/or be impacted by workplace culture. Where there is poor workplace culture, priority needs to be given to identifying and promptly addressing causal factors. Systems need to be in place for vulnerable staff to report intimidation, bullying and harassment. This tends to occur in power gradients and so reporting systems need to take this into account. Reporting systems need to be anonymous and sensitive to the power gradients, conflicts of interest and vulnerability of those who need to report, including consumers who witness or who are exposed to these incidents personally during their care. Sustainable approaches to this issue that have worked in other large-scale healthcare settings, such as the Vanderbilt or Ethos system, need to be implemented across Queensland hospitals[78]. Similarly, opportunity for consumers to formally report perceived bullying and intimidation by health care providers, needs to be openly available and any reports responded to promptly.

**Recommendation**

That a systematic approach to reporting and reducing workplace intimidation, bullying, harassment and poor culture be developed for statewide implementation within all Queensland hospitals.

## Avoidability

The QMPQC considers the national reporting preference in relation to contributing factors when classifying maternal death cases (see Appendix E).

## Characteristics of women who died in the period 2004 to 2017

**Table 14: Clinical characteristics of direct and indirect maternal deaths, Queensland 2004 to 2017 (death during pregnancy or within 42 days of giving birth)**

| Characteristic | | 2004 to 2017 | % |
|---|---|---|---|
| **Death classification** | Direct | 35 | 47.9 |
| | Indirect | 37 | 50.7 |
| | Classification uncertain | 1 | 1.4 |
| **Timing of death** | Death occurred after a termination of pregnancy | 8 | 11.0 |
| | Death occurred after miscarriage | 3 | 4.1 |
| | Death occurred after the woman gave birth | 44 | 60.3 |
| | Death occurred in trimester 1 of pregnancy | 7 | 9.6 |
| | Death occurred in trimester 2 of pregnancy | 6 | 8.2 |
| | Death occurred in trimester 3 of pregnancy | 5 | 6.8 |
| **Autopsy** | Autopsy performed | 58 | 79.5 |
| | Autopsy not performed | 15 | 20.5 |
| **Avoidability** | No avoidable factors | 46 | 63.0 |

*Includes direct and indirect deaths within 42 days of the end of pregnancy.*

78 *Endemic unprofessional behaviour in health care: the mandate for a change in approach*. Westbrook J, Sunderland N, Atkinson V, Jones C, Braithwaite J. Med J Aust. 2018 Nov 5;209(9):380-381

Indigenous women comprised 14.3 per cent of maternal deaths from 2012 to 2017, but just 6.5 per cent of all births in Queensland over the same epoch. Similar results are seen from 2006 to 2011 (Table 15). This indicates an ongoing elevated rate of Indigenous maternal deaths. There is still a long way to go in closing the gap for Indigenous women in social deprivation and maternal and perinatal health. The QMPQC encourages clinicians to continue to work to improve these outcomes.

**Table 15: Characteristics of women who died (direct and indirect deaths), and percentages of all women giving birth, Queensland, 2006 to 2017**

| | 2006-2011 | | | | 2012-2017 | | | |
|---|---|---|---|---|---|---|---|---|
| | Maternal Deaths | | Queensland | | Maternal Deaths | | Queensland | |
| | n | % | n | % | n | % | n | % |
| Indigenous | 6 | 15.0 | 19,967 | 5.6 | 7 | 14.3 | 23,765 | 6.4 |
| Non-Indigenous | 34 | 85.0 | 338,481 | 94.4 | 42 | 85.7 | 346,205 | 93.6 |
| | | | | | | | | |
| First time mother | 4 | 15.4 | 144,747 | 40.4 | 6 | 17.6 | 152,108 | 41.1 |
| One/more previous birth | 22 | 84.6 | 213,701 | 59.6 | 28 | 82.4 | 217,859 | 58.9 |
| | | | | | | | | |
| Less than 20 years | 4 | 10.0 | 19,595 | 5.5 | 3 | 6.3 | 15,321 | 4.1 |
| 20-34 years | 28 | 70.0 | 268,689 | 75.0 | 30 | 62.5 | 282,244 | 76.3 |
| 35+ years | 8 | 20.0 | 70,164 | 19.6 | 15 | 31.3 | 72,405 | 19.6 |
| | | | | | | | | |
| Underweight | 0 | 0.0 | 11,916 | 4.6 | 3 | 9.7 | 20,892 | 5.7 |
| Normal | 9 | 50.0 | 130,116 | 49.7 | 12 | 38.7 | 188,501 | 51.7 |
| Overweight | 5 | 27.8 | 66,434 | 25.4 | 6 | 19.4 | 83,766 | 23.0 |
| Obese | 4 | 22.2 | 53,116 | 20.3 | 10 | 32.3 | 71,265 | 19.6 |
| | | | | | | | | |
| Major cities | 17 | 43.6 | 211,890 | 59.7 | 31 | 64.6 | 229,402 | 62.6 |
| Inner regional | 15 | 38.5 | 73,551 | 20.7 | 15 | 31.3 | 69,522 | 19.0 |
| Outer regional | 4 | 10.3 | 57,869 | 16.3 | 1 | 2.1 | 56,538 | 15.4 |
| Remote/Very remote | 3 | 7.7 | 11,695 | 3.3 | 1 | 2.1 | 10,854 | 3.0 |

*Includes all direct and indirect deaths.*
*Percentages are calculated as proportion of women with available data for that characteristic.*
*Totals for each characteristic vary depending on data completeness.*
*BMI only available from July 2007.*

## Reporting of maternal deaths

Since the amendment in 2013 to the *Queensland Public Health Act 2005* (the Act), which mandates the reporting of maternal deaths by public and private health professionals, there has been vast improvement in the QMPQC's capacity to review and appropriately classify maternal deaths. This demonstrates the value of pursuing appropriate legislative amendment. Specifically, Division 3, Section 228F and 228 G of the Act outlines who is responsible for providing the notification about a maternal death and in what format. The National Maternal Death Report Form [79] is the designated format for the reporting of all maternal deaths that occur in Queensland.

### Good practice point

All health professionals who had primary responsibility for the care or treatment of a woman while she was pregnant or within 365 days after the end of her pregnancy, and who are aware of the maternal death of a woman, are required by legislation [80] to provide the QMPQC with a maternal death reporting form completed with as much information as possible.

79 National Maternal Death Report Form *https://clinicalexcellence.qld.gov.au/priority-areas/safety-and-quality/queensland-maternal-and-perinatal-quality-council*
80 *Public Health Act 2005*, s 228F

## Maternal suicide in Queensland, 2004-2017

Suicide is now a leading cause of maternal death, but remarkably little is known about the circumstances in which these deaths occur. In order to better understand this tragedy, the QMPQC in its 2017 Report, gave an undertaking to conduct a case review of maternal suicides that occurred in Queensland between 2004 to 2017. There were 59 deaths by suicide during this fourteen-year period. More than half (53 per cent) of the suicides occurred following a birth. Twenty-one of the deaths occurred following a termination of pregnancy (ToP), which amounted to 36 per cent of the cases. The remainder either occurred during pregnancy or following a miscarriage or ectopic pregnancy. Of the women who had terminations of pregnancy, all but one of these took place in the setting of a private clinic. Two out of the three women who died whilst pregnant also had a ToP less than a year before their death.

**Table 16: Maternal suicide in Queensland, 2004 to 2017**

| | During pregnancy or 0-42 days after (n=12) | 43-365 days (n=47) | Total | |
|---|---|---|---|---|
| | | | n | (n=59) |
| **Age** | | | | |
| ‹20 years | 1 | 8 | 9 | 15% |
| 20-35 years | 9 | 34 | 43 | 73% |
| ›35 years | 2 | 5 | 7 | 12% |
| **Pregnancy Outcome** | | | | |
| Birth | 5 | 23 | 31 | 53% |
| ToP | 4 | 17 | 21 | 36% |
| Miscarriage/Ectopic | 0 | 4 | 4 | 7% |
| Death during pregnancy | 3 | 0 | 3 | 5% |
| **Indigenous Status** | | | | |
| Aboriginal or Torres Strait Islander | 1 | 10 | 11 | 19% |
| Non-Indigenous | 11 | 37 | 48 | 81% |
| **Country of Birth** | | | | |
| Australia | 11 | 39 | 50 | 85% |
| Other | 1 | 8 | 9 | 15% |
| **Community Size*** | | | | |
| Major city | 8 | 25 | 33 | 56% |
| Inner regional | 4 | 12 | 16 | 27% |
| Outer regional | 0 | 9 | 9 | 15% |
| Very remote | 0 | 1 | 1 | 2% |
| **Socio-economic index for area (SEIFA) Decile¶** | | | | |
| ≤ 3 | 4 | 24 | 28 | 47% |
| 4-6 | 1 | 8 | 9 | 15% |
| ≥ 7 | 7 | 15 | 22 | 37% |
| **Psychiatric Diagnoses** | | | | |
| Depression | 8 | 26 | 34 | 58% |
| Anxiety | 3 | 6 | 9 | 15% |
| Postnatal depression | 1 | 3 | 4 | 7% |
| Other | 2 | 4 | 6 | 10% |
| Nil known | 2 | 18 | 20 | 34% |
| **Other clinical characteristics** | | | | |
| Previous suicide attempt | 0 | 10 | 10 | 17% |
| Suicidal ideation | 2 | 11 | 13 | 20% |
| Self-harm | 3 | 8 | 11 | 19% |
| Prior psychiatric admission | 1 | 9 | 10 | 17% |
| Known prior contact with mental health services | 2 | 15 | 17 | 29% |
| Alcohol/Substance misuse | 3 | 21 | 24 | 41% |
| Documented domestic violence | 1 | 5 | 6 | 10% |
| Recent relationship breakdown | 3 | 5 | 8 | 14% |

**Using 2016 Remoteness Areas, Australian Bureau of Statistics (ABS).¶ABS SEIFA 2016 by State Suburb Code (SSC) – Queensland.*

### Timing of death

Forty-seven (80 per cent) of these deaths occurred between 43-365 days after the end of pregnancy. Three deaths occurred during pregnancy and nine occurred within 42 days after the end of pregnancy. There was a higher proportion of early maternal deaths in women who had a termination of pregnancy when compared to women who gave birth.

### Demographics

The mean age of the women at the time of death was 26, with a range of 16 to 40 years old. Eleven women (19 per cent) identified as Aboriginal or Torres Strait Islander. In comparison, Indigenous women represented six per cent of all women giving birth in Queensland for this time frame. Nine (15 per cent) were born outside Australia. Thirty-three women (56 per cent) lived in a major city, with the rest either occupying inner regional (27 per cent), outer regional (15 per cent) or very remote (2 per cent) areas. The median socio-economic index for area (SEIFA) was four, with 47 per cent of women living in a suburb with a SEIFA index of three or less. These areas, by definition, are the most disadvantaged 30 per cent of neighbourhoods in Queensland.

### Clinical characteristics

Most of the women who died by suicide had a prior psychiatric diagnosis (66 per cent). The most common diagnosis was depression (58 per cent), followed by anxiety (15 per cent) (some women had more than one diagnosis). Nine of these women had previously received more than one psychiatric diagnosis, and 10 had a previous psychiatric admission. Many had a history of presentation with suicidal ideation (20 per cent), previous self-harm (19 per cent), and a prior suicide attempt (17 per cent). There was documented contact with mental health services in the three months before death in 29 per cent of cases. Alcohol or substance misuse was identified in 24 (41 per cent) of women. Domestic violence was documented in six (10 per cent). A recent relationship breakdown occurred prior to death in eight women (13 per cent).

### Method of suicide

The most common method of suicide was hanging, strangulation and suffocation, a method used in 80 per cent of cases. Poisoning by drugs or motor vehicle exhaust was used in 10 per cent of cases. Overall, 88 per cent of women died using violent methods. This rate is much higher than that seen in whole population data for females in Queensland [81], a finding consistent with previous research [82, 83].

81 Leske, S., Crompton, D., & Kõlves, K (2019). Suicide in Queensland: Annual Report 2019.Brisbane, Queensland, Australia: Australian Institute for Suicide Research and Prevention, Griffith University.

82 Khalifeh H, Hunt IM, Appleby L, Howard LM. Suicide in perinatal and non-perinatal women in contact with psychiatric services: 15 year findings from a UK national inquiry. Lancet Psychiatry 2016; 3(3):233-42. doi: 10.1016/S2215-0366(16)00003-1.

83 Esscher A, Essen B, Innala E, Papadopoulos F, Skalkidou A, Sundstrom-Poromaa I, Hogberg U. Suicides during pregnancy and 1 year postpartum in Sweden, 1980–2007. The British Journal of Psychiatry 2016; 208:462–469. doi: 10.1192/bjp.bp.114.161711

**Summary**

This case review offers some insight into this unique group of women and reveals several important trends that may be useful in informing suicide prevention. Most deaths occurred after a birth, although more than one third of suicides followed a ToP and this may be a group of women requiring an increased level of care. Following the introduction of the *Queensland Termination of Pregnancy Act 2018*, new clinical guidelines have been developed which emphasise the need for psychosocial support, screening for mental illness and further referral as required. While most deaths by suicide occurred late and well after pregnancy was complete, those in whom suicide followed a ToP, occurred earlier and generally within 42 days. Engagement and collaboration with private providers will be necessary in order to ensure widespread implantation of these procedures. Marginalised population groups such Aboriginal and Torres Strait Islander women, and women with a migrant background, were found to be over-represented in this cohort. Women who died by suicide tended to be younger than the average Australian mother, and the majority had a prior mental illness, with depression the most common psychiatric diagnosis present in more than half of the women. Violent methods of suicide were used in most deaths. Many women had a history of suicidal ideation, self-harm, or a previous suicide attempt.

The QMPQC feels strongly that maternal suicide requires further investigation. It has endorsed the establishment of an expert working group to review peripartum mental illness, including a focus on vulnerable population groups and access to specialised perinatal mental health services, to address the risk of maternal suicide.

**Good practice point**

When considering suicide risk, clinicians should be aware of the population groups more vulnerable to peripartum mental illness and should consider all available suicide prevention strategies.

# Perinatal mortality

## Definitions

**Fetal death (stillbirth):** defined by the *Queensland Public Health Act 2005* (the Act) as a baby who has shown no sign of respiration or heartbeat, or other sign of life after completely leaving the child's mother and who has been gestated for 20 weeks or more, or weighs 400g or more.

**Live birth:** defined by the Act as a 'baby whose heart has beaten after delivery of the baby is completed'.

**Perinatal mortality** is defined in this report as all fetal deaths (stillbirths) of at least 20 weeks gestation or at least 400 grams birthweight and neonatal deaths (deaths of live-born babies of any weight or gestation within the first 28 days of life). In 2016 and 2017 the perinatal mortality rate in Queensland was 9.7 per 1,000 births. This included:

- 811 stillbirths (6.6 per 1,000 births)
- 385 neonatal deaths (3.1 per 1,000 live births)
- The national perinatal mortality rate for the same period was 9.4 per 1,000 births (stillbirth rate 7.0 per 1,000 births and neonatal mortality rate 2.6 per 1,000 live births) [84]. The perinatal mortality rate in Queensland is similar to the national rate, with the stillbirth rate being slightly lower and the neonatal death rate being higher.
- The rate of stillbirths has not changed significantly in Queensland over the decade 2008 to 2017 (annual percent change: -0.1; 95 per cent CI: -1.1, 1.0) while neonatal death rate has declined modestly (annual percent change: -1.9; 95 per cent CI: -3.4, -0.4). When data are stratified by gestational age however, stillbirth and neonatal death rates among babies born at later gestational ages have declined (*Statbite#81*) [85].

84 Australian Institute of Health and Welfare 2019. Australia's mothers and babies data visualisations. Cat. No. PER 101. Canberra: AIHW. Viewed 31 January 2020, *https://www.aihw.gov.au/reports/mothers-babies/australias-mothers-babies-data-visualisations/data*

85 Gregory, K., Utz M., Johnston, T., 2020, Trends in stillbirths and neonatal deaths among babies born to Indigenous and non-Indigenous women in Queensland, 1988-1992 to 2013-2017, Statbite#81, Statistical Services Branch, Queensland Health. *https://www.health.qld.gov.au/__data/assets/pdf_file/0031/948325/statbite81.pdf*

- Higher perinatal mortality rates occur in hospitals where women with higher risk pregnancies give birth. Table 17 shows that the highest rates occur in hospitals where the rate of preterm birth and other associated risk factors is highest. While these risk factors and medical conditions in the mother and/or baby account for a large proportion of deaths, quality of care can also be a factor (see contributing factors section page 70).
- The data in Table 17 must be carefully interpreted as no adjustments are made for the different populations using hospitals of different levels. For example, almost all of the excess in perinatal deaths in Level 6 hospitals can be accounted for by the higher neonatal death rate. This is directly related to their role in caring for babies who are born extremely preterm due to the neonatal intensive care facilities located in Level 6 hospitals.

**Table 17: Rate of perinatal mortality and selected perinatal/maternal risk factors, excluding terminations of pregnancy and babies with selected major congenital anomalies, by hospital peer group, 2016 and 2017**

| Peer Group | stillbirth (a) | neonatal death (b) | perinatal death (a) | preterm (c) | lbw (d) | < 5 antenatal visits (e) | smoking after 20 weeks (f) | obesity (g) |
|---|---|---|---|---|---|---|---|---|
| Level 2/3 | 4.0 | 1.7 | 5.6 | 4.7 | 3.2 | 4.8 | 18.6 | 20.7 |
| Level 4/5 | 4.8 | 1.7 | 6.4 | 8.4 | 6.4 | 4.9 | 16.6 | 27.8 |
| Level 6 | 4.7 | 3.4 | 8.1 | 10.4 | 8.7 | 5.4 | 6.9 | 16.7 |
| Private | 2.7 | 0.9 | 3.6 | 9.1 | 5.5 | 0.8 | 0.5 | 14.7 |
| **Total** (h) | **4.3** | **2.1** | **6.4** | **9.0** | **6.7** | **4.1** | **9.7** | **20.3** |

*Peer group determined based on Clinical Services Capability Framework. For further details see https://www.health.qld.gov.au/__data/assets/pdf_file/0024/444273/cscf-maternity.pdf*

*Birthing centres categorised as peer group of parent facility.*

*(a) Rate per 1,000 births.*

*(b) Rate per 1,000 livebirths; mortality within 28 days of birth.*

*(c) Rate of babies born prior to 37 weeks gestation per 100 births. Excludes records of unknown gestation.*

*(d) Low birthweight (lbw). Rate of babies <2500g per 100 livebirths. Excludes records of unknown birthweight.*

*(e) Rate per 100 births. Excludes babies born to mothers with unknown number of antenatal visits and births at less than 32 weeks gestation.*

*(f) Rate per 100 births. Excludes babies born to mothers of unknown smoking status after 20 weeks.*

*(g) Rate per 100 births. Excludes babies born to mothers of unknown BMI.*

*(h) Includes babies born at level 1 facilities, born before arrival, home birthed and born at not stated facility.*

## In Queensland

There were 6.6 stillbirths per 1,000 births and 3.1 neonatal deaths per 1,000 live births.


## Deaths of Aboriginal and Torres Strait Islander babies

In Queensland and nationally, stillbirths and neonatal deaths occur at a higher rate among babies born to Indigenous women than among babies born to non-Indigenous women. In Queensland in 2016 and 2017, stillbirths occurred at 1.7 times the rate and neonatal deaths occurred at 1.8 times the rate. There has been little change in this figure over the past decade (*Statbite#81*).

When death rates were explored within gestational age categories (*Statbite#81*), a significant disparity in stillbirths between babies born to Indigenous women and babies born to non-Indigenous women was evident among babies born at term. The neonatal death rate was also higher among babies who were born at term of Indigenous mothers, though the difference was not significant in the most recent period examined. The stillbirth and neonatal mortality rates for babies born at earlier gestations were not higher in babies born to Indigenous mothers.

**Stillbirths and neonatal deaths occur at a higher rate among babies born to Indigenous women than among babies born to non-Indigenous women.**

A previous study examining stillbirths in Queensland attributed the higher rate of stillbirths at term for babies of Indigenous women to higher rates of maternal diabetes, perinatal infection, fetal growth restriction and unexplained antepartum fetal death [86].

Over time, there has been a slight decrease in differences in neonatal mortality rates for babies born at term, but the higher rate for babies of Indigenous women remains (*Statbite#81*). There has been little change in the proportion of Indigenous babies born preterm and the overall excess in neonatal mortality for babies of Indigenous women, is unlikely to reduce until the excess in preterm births is addressed. The Queensland Government provided funding of $3.0 million over the 2016 – 2018 period, through the Making Tracks towards closing the gap in health outcomes for Indigenous Queenslanders by 2033: Investment Strategy 2015-2018. The Institute for Urban Indigenous Health was tasked with the expansion of the Birthing in Our Communities workforce, increasing the number of midwives and Indigenous worker positions; and the establishment of Birthing in Our Communities program through the Mums and Bubs Hub based in Salisbury, Brisbane, which opened in October 2016.

## Causes of perinatal deaths

The Perinatal Society of Australia and New Zealand (PSANZ) perinatal mortality classification system was developed for use in Australia and New Zealand as part of the process of clinical audit of perinatal deaths [87].

The classification system includes a Perinatal Death Classification (PSANZ-PDC) for classifying the main obstetric antecedent factor that led to the chain of events resulting in the stillbirth or neonatal death, and a Neonatal Death Classification (NDC) for classifying the main condition in the neonatal period that caused the death. For approximately half of all perinatal deaths, the PSANZ classifications are assigned by the QMPQC's Perinatal Mortality Sub-Committee following consideration of all available clinical information for each perinatal death. Maternity services with experienced perinatal and maternal mortality review committees, submit classified perinatal deaths to the QMPQC and therefore, these are not classified by the PMSC.

Figures 12 and 13 show the PSANZ-PDC causes of death for stillbirths and neonatal deaths. In 2016 and 2017, the leading cause of stillbirths was congenital abnormality, accounting for 32 per cent of all stillbirths (including termination of pregnancy for major anomalies). This proportion is much higher than many international reports[88]. However, international comparisons are problematic due to differing definitions (including gestation age cut-off and whether terminations are excluded) [89]. There are also major international differences in the laws governing late termination of pregnancy (e.g. different gestational age limits) which also impact on reported stillbirth rates.

Approximately one quarter (27 per cent) of stillbirths were classified as unexplained (Figure 12), and up to 55 per cent of stillbirths that occurred at term gestations were unexplained [90]. However, the proportion of stillbirths classified as unexplained is likely to be overestimated due to poor data quality. A possible contributor to the high rate of unexplained causes of stillbirths is the low autopsy rate. In more than 10 per cent of these stillbirths, potentially causal placental pathology was present. The PSANZ classification system was recently revised to improve placental pathology and unexplained stillbirth classification.

The leading PSANZ-PDC cause of neonatal deaths was spontaneous preterm birth, which led to complications in the neonatal period causing the death. Figure 14 shows the neonatal deaths by PSANZ-NDC classification as a proportion of all neonatal deaths.

86 Ibiebele I, Coory M, Boyle F, Humphrey M, Vlack S, Flenady V. Stillbirth rates among indigenous and nonindigenous women in Queensland, Australia: is the gap closing? BJOG 2014;DOI: 10.1111/14 DOI: 10.1111/14 DOI: 10.1111/1471- 0528.13047.

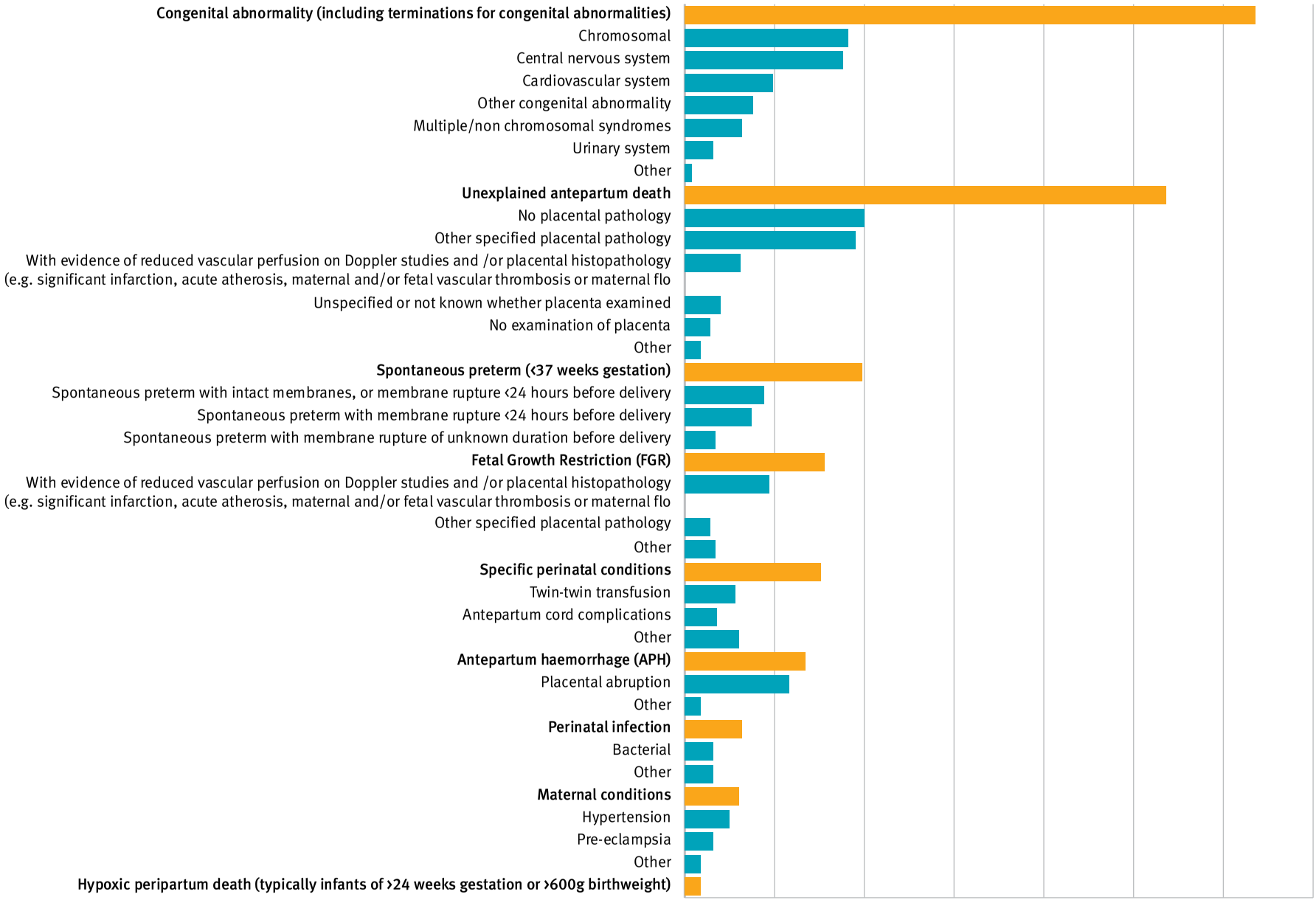
87 PSANZ Perinatal Mortality Classification System. Quick Reference Sheet. Appendix J. *https://www.stillbirthcre.org.au/assets/Uploads/Appendix-J-Perinatal-Mortality-Classifications-Quick-Reference-Sheet2.pdf*

88 Flenady V, Wojcieszek AM, Middleton P, Ellwood D, Erwich J, Coory M, Khong TY, Silver RM, Smith G, Boyle FM, et al. Stillbirths: Recall to action in high-income countries. Lancet 2016; 387: 691–702 Published Online January 18, 2016 *http://dx.doi.org/10.1016/S0140-6736(15)01020-X*

89 Ibid

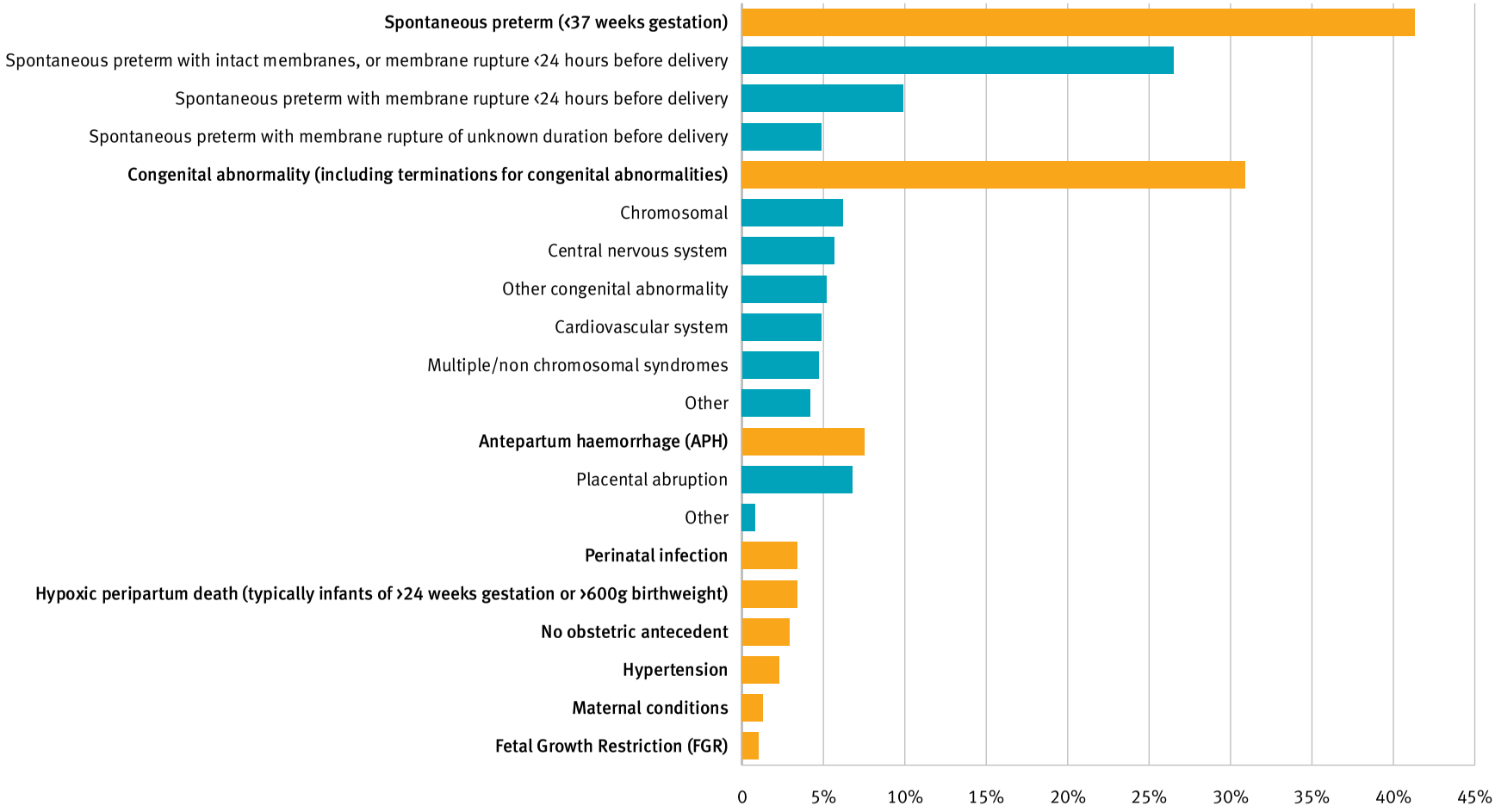
90 Queensland Health, Statistical Services Branch (2020). Causes of Perinatal Deaths, Queensland [Data file]. Available from *www.health.qld.gov.au/hsu/dashboards/psanz.xlsm*

**Figure 12: Stillbirths by PSANZ-PDC classification as proportion of all stillbirths, Queensland, 2016 and 2017**



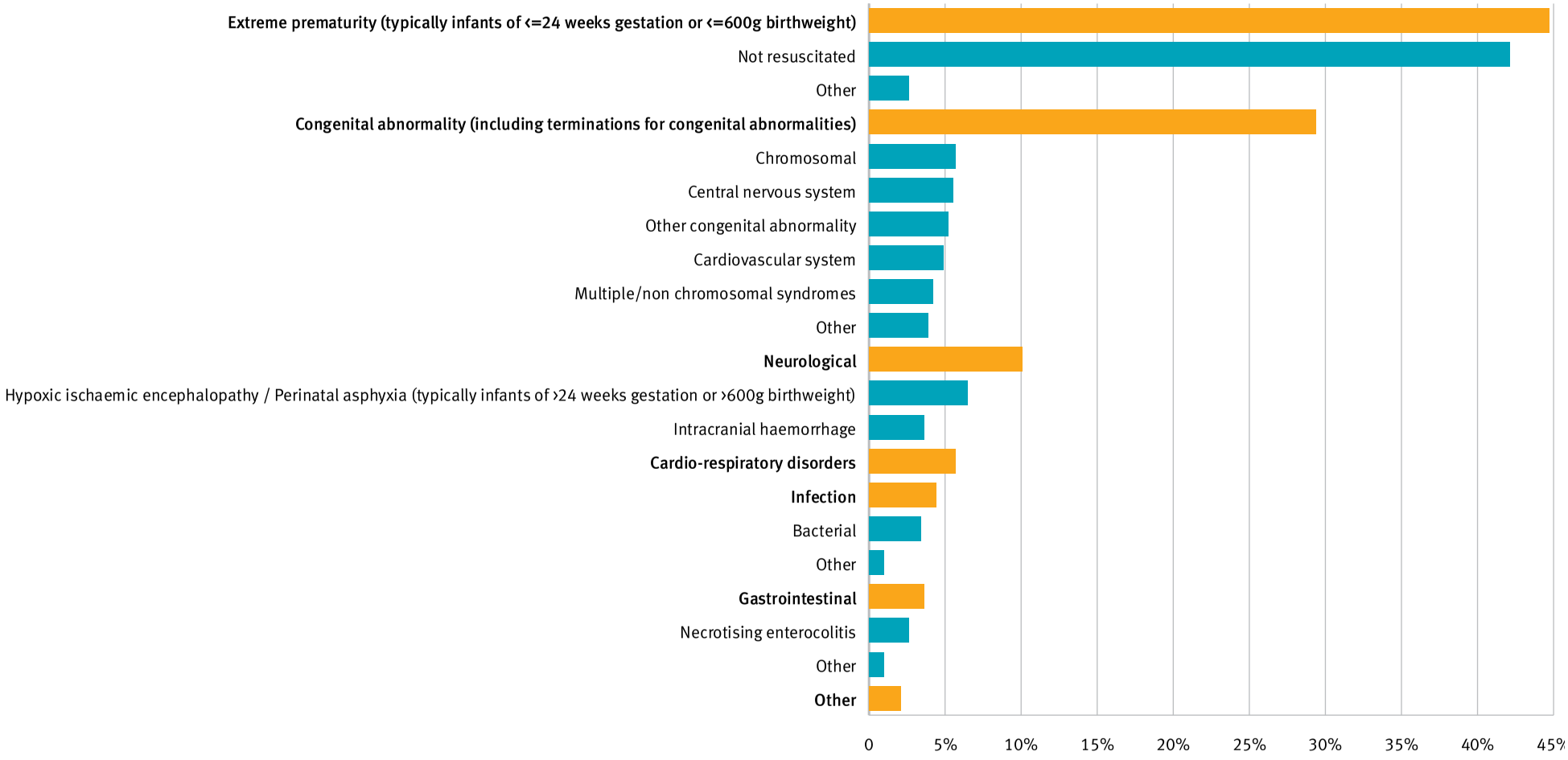

*Only sub-categories with frequency of at least 10 tabulated individually.*

**Figure 13: Neonatal deaths by PSANZ-PDC classification as proportion of all neonatal deaths, Queensland, 2016 and 2017**




*Only sub-categories with frequency of at least 10 tabulated individuall.*

**Figure 14: Neonatal deaths by PSANZ-NDC classification as a proportion of all neonatal deaths, Queensland, 2016 and 2017**




*Only sub-categories with frequency of at least 10 tabulated individually*

Causes of death vary by factors such as gestational age, maternal age, plurality and Indigenous status. An interactive list of PSANZ causes of death by these factors is available at (DASHBOARD link).

While most stillbirths are due to antepartum fetal death, attention to intrapartum deaths is important due to the potential for prevention, particularly in late gestation. Trends in intrapartum deaths (excluding ToPs and congenital anomalies) over the period 1997 - 2017 (by triennia) show a steady decline from 0.8/1000 to 0.5/1000 births with the largest reduction seen for stillbirths 29-36 weeks with a reduction from 1.2/1000 in the period 1997-1999 to 0.2/1000 births in 2015-2017 (Table 18). The rate of intrapartum stillbirths at term is extremely low at 0.1/1000 births.

**Table 18: Rates of intrapartum death (excluding congenital abnormalities and terminations of pregnancy), by triennia and gestational age, babies whose births were recorded in Queensland facilities, 1997 to 2017**

| Gestation weeks | Years | Intrapartum deaths | Births | Rate (per 1,000 births) |
|---|---|---|---|---|
| 20-24 | 1997-1999 | 75 | 392 | 191.3 |
| | 2000-2002 | 84 | 399 | 210.5 |
| | 2003-2005 | 90 | 422 | 213.3 |
| | 2006-2008 | 94 | 469 | 200.4 |
| | 2009-2011 | 77 | 504 | 152.8 |
| | 2012-2014 | 76 | 457 | 166.3 |
| | 2015-2017 | 65 | 452 | 143.8 |
| 25-28 | 1997-1999 | 6 | 634 | 9.5 |
| | 2000-2002 | 10 | 657 | 15.2 |
| | 2003-2005 | 5 | 663 | 7.5 |
| | 2006-2008 | 3 | 768 | 3.9 |
| | 2009-2011 | 7 | 767 | 9.1 |
| | 2012-2014 | 4 | 710 | 5.6 |
| | 2015-2017 | 3 | 697 | 4.3 |
| 29-36 | 1997-1999 | 12 | 9,773 | 1.2 |
| | 2000-2002 | 9 | 10,654 | 0.8 |
| | 2003-2005 | 10 | 11,760 | 0.9 |
| | 2006-2008 | 6 | 13,508 | 0.4 |
| | 2009-2011 | 4 | 14,003 | 0.3 |
| | 2012-2014 | 6 | 15,072 | 0.4 |
| | 2015-2017 | 3 | 14,963 | 0.2 |
| 37+ | 1997-1999 | 21 | 133,122 | 0.2 |
| | 2000-2002 | 22 | 135,485 | 0.2 |
| | 2003-2005 | 20 | 142,718 | 0.1 |
| | 2006-2008 | 21 | 162,421 | 0.1 |
| | 2009-2011 | 18 | 169,681 | 0.1 |
| | 2012-2014 | 14 | 173,125 | 0.1 |
| | 2015-2017 | 14 | 167,586 | 0.1 |

*Excludes babies born at less than 20 gestation weeks, babies with unknown gestation weeks, and babies who died prior to commencement of birth.*

*Intrapartum deaths are deaths of babies whose heart beat ceased during labour but before birth, as recorded in the heartbeat field in the Perinatal Data Collection.*

*Terminations of pregnancy/congenital abnormalities are defined by at least one of the following:*

- *A PSANZ Perinatal Death Classification (PSANZ-PDC) category 1 (Congenital anomalies, including terminations for congenital anomalies) recorded for the baby.*
- *An ICD-10-AM code of P96.4 (termination of pregnancy, affecting fetus and newborn) recorded as a cause of death for the baby.*
- *An ICD-9-CM code of 779.6 (termination of pregnancy (fetus)) recorded as a cause of death for the baby.*
- *Where the baby was a singleton, an ICD-10-AM code of 004 (medical abortion) recorded for the mother.*
- *Where the baby was a singleton, an ICD-9-CM code of 635 (legally induced abortion) recorded for the mother.*

*The coding of terminations of pregnancy has not been individually checked prior to 2005. Terminations of pregnancy prior to 2005 should be interpreted with caution.*

## Perinatal mortality review

### Investigating the causes of stillbirth and neonatal deaths

A full and detailed perinatal autopsy, including all ancillary investigations performed by an appropriately trained and experienced perinatal pathologist, is the gold standard for investigation of stillbirths and neonatal deaths. The autopsy investigations include microbiology, radiology, and appropriate molecular genetics, as well as the detailed and careful macroscopic dissection and histology.

Perinatal autopsy is important. To ensure high quality perinatal autopsies are performed by experienced perinatal pathologists, most other States in Australia have established specific centres to undertake these autopsies. Queensland has a partially centralised autopsy service at the Royal Brisbane and Women's Hospital, Mater Hospital, Sunshine Coast University Hospital and Gold Coast University Hospital, which has evolved in an ad hoc manner. However, there is nothing to prevent any pathologist in Queensland, regardless of experience and training in this specialised field, from undertaking a perinatal autopsy of variable quality. It is recommended that Queensland Health follow the example of other health jurisdictions and establish recognised and appropriately staffed tertiary centres, where perinatal and neonatal autopsies are performed by recognised and experienced perinatal pathologists.

There is no legal requirement in Queensland to perform an autopsy in all cases of stillbirth and neonatal death. Just over one third of stillborn babies had an autopsy in 2016 and 2017 (37.3 per cent). The autopsy rate for stillbirths has remained relatively constant over the past decade. The rate of neonatal death autopsy in 2016 and 2017 was much lower at only 22.3 per cent, however the rate has increased in the last two years after consistently declining over previous years (Figure 15). Higher autopsy rates are achieved in some of the other States and Territories, for example, the neonatal death autopsy rates have been reported as 66 per cent in Western Australia and 56 per cent in the Australian Capital Territory[91].

Low perinatal autopsy rates are also of concern internationally and have been attributed to a range of reasons including, lack of appropriately skilled pathologists; poor staff knowledge and confidence; negative attitudes about the value of autopsy; parents' difficulty in making the decision at a time of intense grief [92]; controversy over past practices of organ retention, and complex consent requirements. Parents need clear and consistent information delivered in a timely and sensitive manner to enable informed decision-making. Where stillbirth or neonatal death is anticipated, these discussions can be had sensitively during antenatal care. Counselling parents about the option of an autopsy should be carried out by a senior health care professional who has a detailed understanding about the procedure. This should also occur in collaboration with a clinician who has an established relationship with the family[93].

#### Recommendation

That Queensland Health consider designating appropriately resourced tertiary perinatal pathology centres, for the performing of perinatal and neonatal autopsy investigation by perinatal pathologists. This, together with appropriate staffing, to ensure timely high-quality investigation of stillbirths and neonatal deaths, is vital.

#### Good practice points

The option of a high-quality autopsy examination should be offered to all parents following, or who are anticipating a perinatal death, with counselling on the procedure provided by a senior clinician working in collaboration with a clinician with whom the family has an established relationship.

In addition to the offer of autopsy, as a minimum for all stillbirths, a comprehensive maternal and pregnancy history plus placental histopathology; testing for feto-maternal haemorrhage; cytogenetics, molecular and other investigations, as indicated according to the PSANZ Guidelines, should be performed.

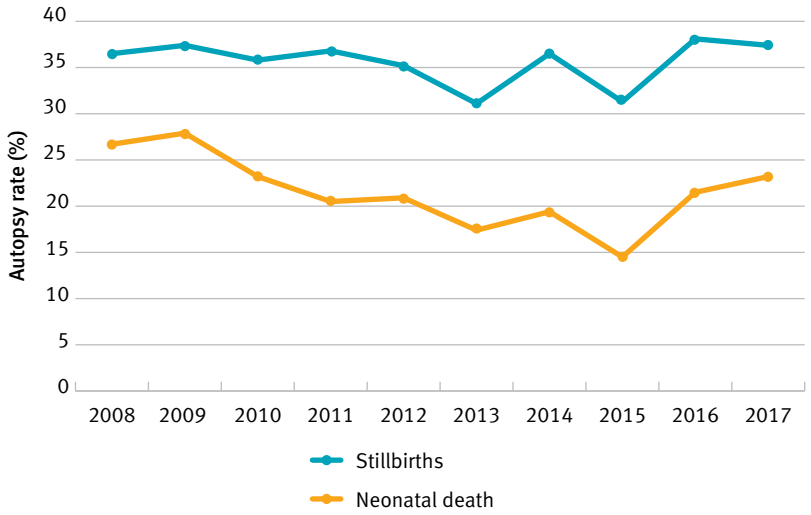
Parents need to be given the opportunity to discuss the results of all investigations with someone skilled and experienced in the relevant specialised field, recognising that in some cases this may mean referral to a tertiary perinatal centre.

91 AIHW: Hilder L, Li Z, Zeki R & Sullivan EA 2014. Stillbirths in Australia, 1991–2009. Perinatal statistics series no. 29. Cat. no. PER 63. Canberra: AIHW National Perinatal Epidemiology and Statistics Unit.

92 Flenady V, Wojcieszek AM, Middleton P, Ellwood D, Erwich J, Coory M, Khong TY, Silver RM, Smith G, Boyle FM, et al. Stillbirths: Recall to action in high-income countries. Lancet 2016; 387: 691–702 Published Online January 18, 2016 http://dx.doi.org/10.1016/S0140-6736(15)01020-X

93 PSANZ Clinical Guidelines. Section 4 – Perinatal Autopsy including placental assessment *https://sanda.psanz.com.au/assets/Uploads/Section-4-PerintalPostMortemExamination-V3.2-121219.pdf*

**Figure 15: Stillbirth and neonatal deaths autopsy rates, Queensland, 2008 to 2017**




The PSANZ bi-national guidelines on perinatal mortality recommend core investigations for both stillbirths and neonatal deaths [94]. The Queensland Clinical Guidelines has adopted the guideline for stillbirth investigation [95]. The IMPROVE (IMproving Perinatal Review and Outcomes via Education) program is an interactive, skills-based educational program for doctors and midwives, aimed at increasing the uptake of best practice in investigating and reporting of causes and contributing factors of perinatal deaths, including autopsy consent. IMPROVE is available to all maternity hospitals [96] and has recently been developed into an e-Learning program (see Appendix D).

The PSANZ Guideline recommendations align with the recent WHO Guidelines, which recommend that all maternity services implement high quality perinatal mortality audit, including classification and consideration of contributing (substandard care) factors for every stillbirth and neonatal death [97, 98].

Stillbirths and neonatal deaths are rare events in smaller centres. This can result in a lack of experience in perinatal mortality audit and substandard processes at the local facility level. The PMSC has discussed how best to address this issue and a 'hub and spoke' model has been suggested (i.e. where smaller hospitals link to their larger regional counterpart for support in the management of perinatal mortality audit).

It is acknowledged that healthcare providers prefer to evaluate their own care and can do so effectively through perinatal and maternal mortality review committees (PMMRCs) and comprehensive clinical incident analysis. Perinatal mortality audit undertaken at the local level is recommended by the QMPQC. After changes prompted by the QMPQC in 2016, to Section 29(1) of the Hospital and Health Boards Regulation 2012, where stillbirths were included as a reportable event, the QMPQC developed a guidance paper to assist HHSs in determining which stillbirths required in-depth analysis [99].

94 PSANZ Clinical Practice Guidelines for Care Around Stillbirth and Neonatal Death *https://sanda.psanz.com.au/clinical-practice/clinical-guidelines/*

95 Queensland Maternity and Neonatal Clinical Guidelines. *https://www.health.qld.gov.au/qcg/publications*

96 Gardiner P, Kent A, Flenady V et al. IMproving Perinatal Mortality Review and Outcomes Via Education; An educational program for health care professionals on best practice around the time of a perinatal death. BMC Pregnancy Childbirth. 2016 Nov 25;16(1):376.

97 PSANZ Clinical Practice Guidelines for Care Around Stillbirth and Neonatal Death *https://sanda.psanz.com.au/clinical-practice/clinical-guidelines/*

98 World Health Organisation. Making every baby count: audit and review of stillbirths and neonatal deaths. *http://www.who.int/maternal_child_adolescent/documents/stillbirth-neonatal-death-review/en/*

99 Comprehensive clinical incident analysis following stillbirth – Criteria for stillbirth analysis. QMPQC webpage – Resources and Reports. *https://clinicalexcellence.qld.gov.au/priority-areas/safety-and-quality/queensland-maternal-and-perinatal-quality-council/resources-and*

The clinical governance necessary to support implementation of a 'hub and spoke' model is an essential factor and requires commitment from Hospital and Health Service clinical administrators. Co-operation between the larger facility perinatal audit team and/or PMMRCs (the hub) and the local audit group (spoke), as well as feedback to care providers, must be embedded in the implementation strategy. The PMSC is working to progress a pilot 'hub and spoke' model in 2020, with the aim of demonstrating the benefits of establishing it as a statewide model.

**Suggested 'hub and spoke' model**

There are 16 HHSs from which eight hubs – four primary and four secondary, could operate. This has the potential to fulfil the requirements for timely perinatal mortality audit, including classification of perinatal deaths, local and national and reporting.

- **Cairns** – a hub serving the Torres and Cape HHS, North West HHS and Cairns Hinterland HHS
- **Townsville** – a hub serving Townsville HHS, Central West HHS and Mackay HHS
- **Rockhampton** – a hub serving Central Queensland HHS and Wide Bay HHS
- **Ipswich** – a hub serving West Moreton HHS, Darling Downs HHS and South West HHS
- **Sunshine Coast**
- **Metro North**
- **Metro South**
- **Gold Coast**

## Recommendation

That all maternity hospitals have effective processes (e.g. via Perinatal and Maternal Mortality Review Committees (PMMRCs) in place to ensure all perinatal deaths are appropriately investigated and classified according to the PSANZ national guidelines, for cause of death and contributing factors relating to care.

## Good practice points

Hospital and Health Services should conduct multidisciplinary review of all perinatal deaths to identify contributing factors across all levels of the service. To achieve this, multidisciplinary mortality and morbidity review committees (e.g. PMMRCs) led by a senior clinician, need to be established and convened on a regular basis, for example, quarterly. According to the PSANZ Guidelines, these committees need to have a clearly defined process for case review, which includes identification of contributing factors from which recommendations are developed and documented. An action schedule should be generated and reviewed at the next meeting to ensure completion. Any findings should be shared with appropriate staff to facilitate learnings and improvements in healthcare provision.

Hospital and Health Services should prepare and provide quarterly mortality and morbidity review committee reports to the QMPQC for monitoring and to enable support of the review process as necessary.

Classification of all perinatal deaths by health service providers needs to be carried out in an efficient manner and provided to the Department of Health, Queensland Perinatal Data Collection to allow for validation and timely national reporting.

## Contributing factors relating to care (substandard care)

The PMSC undertook a review of selected perinatal deaths to identify contributing factors relating to care (substandard care factors). This work has not been possible in previous years due to the non-allocation of appropriate resourcing. As well as being key to improving the quality of care and perinatal outcomes, it is a national reporting requirement to provide contributing factor data from in-depth clinical case review.

### Methods

#### Inclusion criteria

All stillbirths and neonatal deaths of 34 weeks gestation or more, excluding major congenital anomalies occurring over the period 1 January 2018 to 31 December 2018.

#### Case selection and data sources

All perinatal deaths fulfilling the inclusion criteria were identified through the Queensland Perinatal Data Collection (QPDC). The QPDC also provided maternal demographic information for each included perinatal death.

Clinical information for each included perinatal death review was sought by the QMPQC secretariat from the Directors of Obstetrics (or equivalent) and/or Patient Safety and Quality Officer at each of the services where the perinatal death occurred. The requested information included the following:

- Pregnancy hand-held records
- Queensland Health Hospital and Health Service (HHS) records
- Integrated electronic Medical Records (ieMR)
- Completion of the Australian Perinatal Mortality Clinical Audit Tool (APMCAT) [100]

In addition, the QMPQC secretariat sourced further information from:

- General Practitioners
- Private obstetric specialists
- Internal and external pathology providers' records
- Medical Imaging service providers' records
- Coroner's reports

#### Assessment of contributing factors

A multidisciplinary panel conducted a review of each perinatal death to determine the presence of contributing factors and if present, the degree to which the relevant factor contributed to the death. The APMCAT recommended by PSANZ in the guidelines on care after stillbirth and neonatal deaths, was used to allocate contributing factors to one of three major groups [101]:

- Organisation/management (e.g. inadequate supervision of staff, lack of appropriate clinical management protocols, lack of communication between services)
- Personnel (e.g. staff factors relating to professional care and service provision)

100 PSANZ Clinical Practice Guideline for Care Around Stillbirth and Neonatal Death. Appendix E. *https://sanda.psanz.com.au/assets/Uploads/Appendix-E-Australian-Perinatal-Mortality-Clinical-Audit-Tool.pdf*

101 Flenady V, Oats J, Gardener G, Masson Vicki, McCowan Lesley, Kent A, Tudehope David, Middleton P, Donnolley N et al for the PSANZ Care around the time of stillbirth and neonatal death guidelines group. Clinical Practice Guideline for Care Around Stillbirth and Neonatal Death. Version 3, NHMRC Centre of Research Excellence in Stillbirth. Brisbane, Australia, March 2018.

- Accessing/engaging with care (e.g. no antenatal care; infrequent or late booking for antenatal care; women decline treatment/advice)
- The contribution of each factor to the death was then specified as:
- Insignificant (sub-optimal factors identified but unlikely to have contributed to the outcome)
- Possible (sub-optimal factors identified–might have contributed to the outcome)
- Significant (sub-optimal factors identified–were likely to have contributed to the outcome)

The panel consisted of 13 rotational members which included the following: a perinatal pathologist, maternal fetal medicine specialists, midwives, a clinical epidemiologist with experience in audit process, an obstetrician, a neonatologist and a consumer representative. Two co-chairs ensured there was consistency and uniformity in each session and that the objectives of the reviews were met.

Substandard care was determined as being present if antenatal care was not managed according to accepted evidence-based best practice[102]. The Queensland Maternity and Neonatal Clinical Guidelines were the primary point of reference used by the panel. Others included the National Clinical Practice Guidelines: Pregnancy Care[103], RANZCOG and reputable peak international sources such as the Royal College of Obstetricians and Gynaecologists[104] and the National Institute for Health and Care Excellence[105].

**Substandard care was determined as being present if antenatal care was not managed according to accepted evidence-based best practice[102].**

### Results

Eighty-two cases were identified from the routinely collected perinatal data as meeting the inclusion criteria (63 stillbirth and 19 neonatal deaths). Eight cases were excluded upon further screening due to the presence of a major congenital abnormality. Of the remaining 74 cases (60 stillbirths and 14 neonatal deaths), nine cases were unable to be reviewed due to insufficient information being provided, that is, one in a public maternity service; two in the private sector; two homebirths and four Coroner cases (ongoing investigations of neonatal deaths).

The remaining 65 cases were reviewed by the panel; 56 (86 per cent) stillbirths and nine (14 per cent) neonatal deaths. Most stillbirths occurred in the antepartum period; 53 (95 per cent). In relation to neonatal deaths, the majority occurred in the early neonatal period; six (67 per cent). The gestational age for the included stillbirths were evenly split across the late preterm period (34-36 weeks) 26, (46 per cent) and at term (37-41 weeks) 30 (54 per cent). For neonates, the majority occurred at term gestations, seven (78 per cent). (Figure 16).

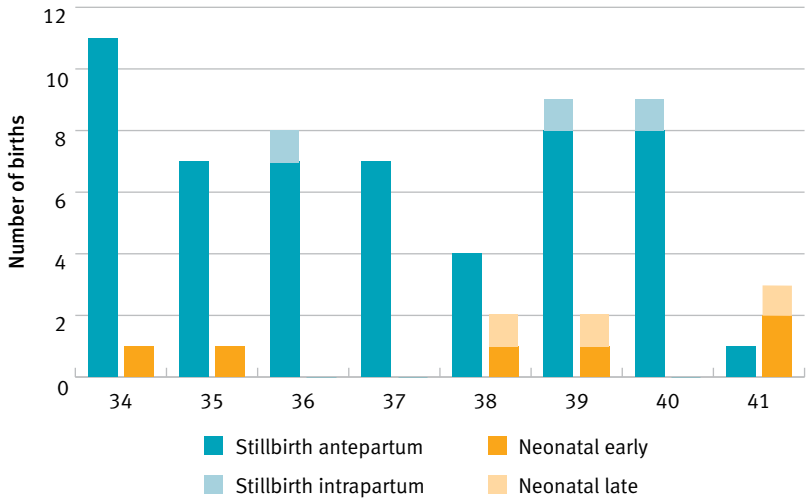
102 Queensland Maternity and Neonatal Clinical Guidelines. *https://www.health.qld.gov.au/qcg/publications*

103 Department of Health (2019). Clinical Practice Guidelines: Pregnancy Care. Canberra: Australian Government Department of Health.

104 Royal College of Obstetricians and Gynaecologists (RCOG). Guidelines and research services. *https://www.rcog.org.uk/en/guidelines-research-services/*

105 National Institute for Health and Care Excellence (NICE). *https://www.nice.org.uk/*

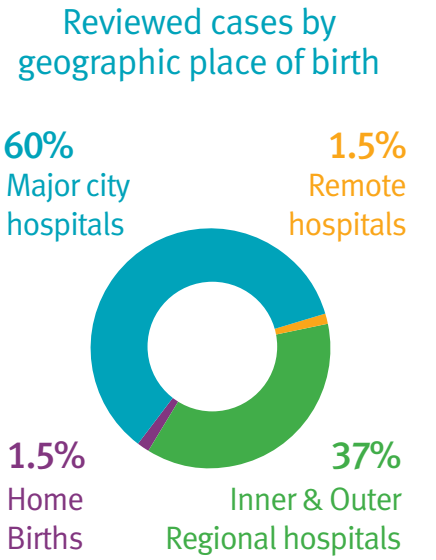
**Figure 16: Perinatal deaths by timing and gestational age**




*Early neonatal mortality refers to the death of a live-born baby within the first seven days of life*
*Late neonatal mortality refers to death after 7 days until 28 days.*

Characteristics of the included cases were compared with all similar births that did not result in a perinatal death (Table 19). While numbers are small, the perinatal deaths included in this review appeared to be a higher risk population, with higher proportions of births to Indigenous mothers; women who smoked during pregnancy and those who had hypertension and/or diabetes.

Reflecting on the distribution of places of birth in Queensland, the included deaths occurred across the following settings: hospitals in major cities 39 (60 per cent); inner and outer regional 24 (37 per cent), remote one (1.0 per cent); and one home birth (1.5 per cent). In terms of facility sector, 11 (17 per cent) occurred in private hospitals 53 (81.5 per cent) in public hospitals. Fifty out of 65 deaths occurred in public hospitals with a clinical service capability from Level 4 to Level 6 [106]. This is likely to reflect the higher risk profiles of women attending these services.





106 Queensland Health Clinical Services Capability Framework. *https://www.health.qld.gov.au/clinical-practice/guidelines-procedures/service-delivery/cscf*

**Table 19: Maternal demographics and place of birth of included perinatal deaths compared with all births, 34 weeks or more gestation excluding babies with major congenital abnormality, Queensland, 2018**

| Characteristic | Perinatal deaths | All Births (p) |
|---|---|---|
| | N (%) | N (%) |
| Indigenous | 9 (13.8%) | 3,973 (6.9%) |
| Nulliparous | 26 (40%) | 23,665 (40.9%) |
| | | |
| Maternal BMI | | |
| Underweight | 5 (7.6%) | 2,899 (5.1%) |
| Normal | 28 (42.4%) | 28,489 (49.8%) |
| Overweight | 15 (22.7%) | 13,725 (24.0%) |
| Obese | 15 (24.2%) | 12,150 (21.2%) |
| | | |
| Maternal Age | | |
| Less than 20 | 2 (3.0%) | 1,700 (2.9%) |
| 20-34 | 51 (78.8%) | 43,827 (75.8%) |
| 35-39 | 9 (13.6%) | 10,123 (17.5%) |
| 40 + | 3 (4.5%) | 2,187 (3.8%) |
| | | |
| Pre-existing and/or arising in pregnancy conditions | | |
| Hypertension | 8 (12.3%) | 4,327 (7.5%) |
| Diabetes | 24 (36.9%) | 9,228 (16.0%) |
| Smoking at first visit | 12 (18.5%) | 6,335 (11.0%)~ |
| | | |
| Remoteness of facility^ | | |
| Major Cities | 39 (60.0%) | 40,023 (69.2%) |
| Inner Regional | 12 (18.5%) | 9,779 (16.9%) |
| Outer Regional | 12 (18.5%) | 7,146 (12.4%) |
| Remote | 1 (1.5%) | 748 (1.3%) |
| Home/Free births | 1 (1.5%) | 141 (0.2%) |
| | | |
| Clinical service capability level* | | |
| Level 1 | 1 (1.5%) | 53 (0.1%) |
| Level 2/3 | 6 (9.3%) | 4,085 (7.1%) |
| Level 4 | 25 (38.5%) | 14,158 (24.5%) |
| Level 5 | 4 (6.1%) | 5,548 (9.6%) |
| Level 6 | 21 (32.3%) | 23,886 (41.3%) |
| Private unranked | 8 (12.3%) | 10,107 (17.5%) |
| | | |
| Facility type | | |
| Public | 53 (81.8%) | 44,119 (76.3%) |
| Private | 11 (16.7%) | 13,577 (23.5%) |
| Home/Free births | 1 (1.5%) | 141 (0.2%) |

(p) data preliminary and subject to change

~ Smoking before 20 weeks gestation

^ ABS Accessibility/Remoteness Index of Australia

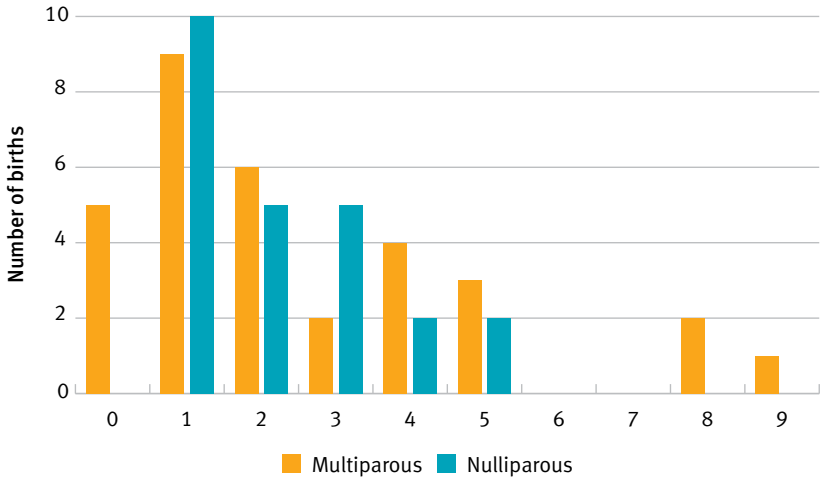
* Mater Women's & Children's Private included with Level 6 hospitals; home birth included with Private unranked

### Risk factors for stillbirth

Well known risk factors [107] for stillbirth were present in most included stillbirths, 51 (91.1 per cent). More than 57 per cent had more than one risk factor - nulliparity was the most frequent single risk factor (Figure 17). Other frequent risk factors included diabetes 24 (36.9 per cent) and hypertension eight (12.3 per cent). Furthermore, 12 (18.5 per cent) of women identified as smokers at the booking-in visit.

**Well known risk factors for stillbirth were present in most stillbirths included in the review.**

**Figure 17: Count of stillbirth risk factors per case – by parity status**




### Causes of perinatal deaths included in the review

The most commonly classified causes of all perinatal deaths in this cohort were unexplained antepartum death 31 (47.7 per cent), fetal growth restriction eight (12.3 per cent), specific prenatal conditions (largely antepartum cord complications) seven (10.8 per cent), antepartum haemorrhage six (9.2 per cent), and hypoxic peripartum death six (9.2 per cent) (Table 20).

**Table 20: Primary causes of included perinatal deaths by the PSANZ perinatal death classification (PSANZ PDC)**

| Perinatal death classification | Stillbirth | Neonatal death | Perinatal deaths |
|---|---|---|---|
| Unexplained Antepartum Death | 31 | 0 | 31 |
| Fetal Growth restriction | 8 | 0 | 8 |
| Antepartum Haemorrhage | 6 | 0 | 6 |
| Specific Perinatal Conditions | 5 | 2 | 7 |
| Hypoxic Peripartum Death | 3 | 3 | 6 |
| Hypertension | 2 | 1 | 3 |
| No Obstetric antecedent | 0 | 1 | 1 |
| Perinatal Infection | 0 | 2 | 2 |
| Spontaneous preterm | 1 | 0 | 1 |
| **Total** | **56** | **9** | **65** |

For neonatal deaths, the most frequent primary PSANZ NDC category was neurological causes (seven cases; six neonatal deaths were from hypoxic ischaemic encephalopathy (HIE).

107 Queensland Maternity and Neonatal Clinical Guidelines. Stillbirth Care. *https://www.health.qld.gov.au/qcg/publications*

### Contributing factors

Contributing factors were identified in 46 (71 per cent) of perinatal deaths reviewed; 39 (69.6 per cent) of stillbirths and seven (77.8 per cent) of neonatal deaths (Table 21).

In 20 cases (30.8 per cent) factors were considered to have significantly contributed to the outcome, the majority were stillbirths (80 per cent).

**Table 21: Contributing factors in perinatal deaths 34 weeks or more gestation excluding congenital abnormalities, Queensland, January 2018 to December 2018**

| | Stillbirths | Neonatal deaths | Perinatal deaths |
|---|---|---|---|
| Number of deaths reviewed | 56 (86.1%) | 9 (13.8%) | 65 |
| Deaths with contributing factor(s) identified | 39 (69.6%) | 7 (77.8%) | 46 (70.8%) |
| **Significant** – contributing factors identified that were likely to have contributed to the outcome | 16 | 4 | 20 (30.8%) |
| **Possible** contributing factors that might have contributed to the outcome | 17 | 3 | 20 (30.8%) |
| **Insignificant** – contributing factors identified that were unlikely to have contributed to the outcome | 6 | 0 | 6 (9.2%) |

There were 147 contributing factors identified from the review of selected perinatal deaths. Fifty-seven were significant (38.8 per cent) and seventy-eight were possible (53.1 per cent). In most instances, more than one contributing factor was found for each perinatal death reviewed (Table 22).

**Table 22: Contributing factors by type and link to outcome in perinatal deaths 34 weeks or more gestation excluding congenital abnormalities, Queensland, January 2018 to December 2018**

| | Stillbirths | Neonatal deaths | Perinatal deaths |
|---|---|---|---|
| Number of contributing factors | 128 | 19 | 147 |
| **Contributing care factor(s) identified but unlikely to have contributed to outcome (insignificant)** | **12** | **0** | **12** |
| Relating to organisation and or management | 0 | 0 | 0 |
| Relating to personnel (care and service provision) | 8 | 0 | 8 |
| Relating to the mother access/engaging with care | 4 | 0 | 4 |
| **Contributing care factor(s) identified might have contributed to outcome (possible)** | **72** | **6** | **78** |
| Relating to organisation and or management | 5 | 2 | 7 |
| Relating to personnel (care and service provision) | 37 | 3 | 40 |
| Relating to the mother access/engaging with care | 30 | 1 | 31 |
| **Contributing care factor(s) identified likely to have contributed to outcome (significant)** | **44** | **13** | **57** |
| Relating to organisation and or management | 8 | 2 | 10 |
| Relating to personnel (care and service provision) | 19 | 10 | 29 |
| Relating to the mother access/engaging with care | 17 | 1 | 18 |

There were **147** contributing factors identified from the review of selected perinatal deaths.

**57** of the 147 contributing factors identified were classified as significant.

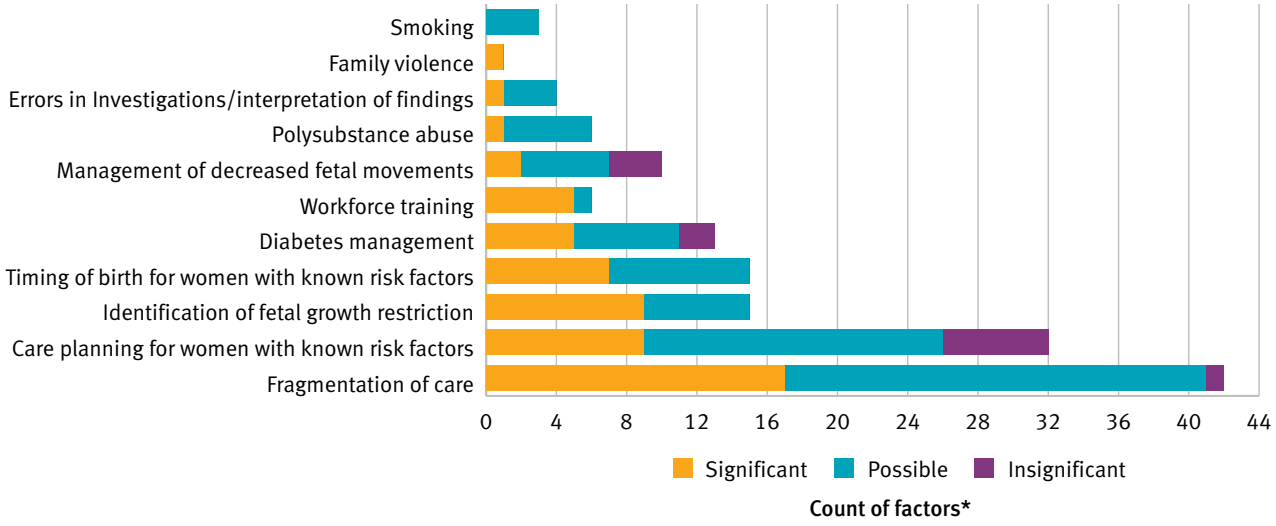
Of the 147 contributing factors grouped by clinical practice improvement areas (Figure 18), the top five **significant** factors were as follows:

1. Fragmentation of maternity care, accounting for 18 (29.8 per cent) of significant factors.
2. Care planning for women with known risk factors, accounting for nine (15.8 per cent) of significant factors; and identification of fetal growth restriction (FGR), accounting for nine (15.8 per cent) of significant factors.
3. The timing of birth for women with known risk factors accounting for seven (12.2 per cent) of significant factors.
4. Managing women with pre-existing and gestational diabetes accounting for five (8.7 per cent) of significant factors.
5. Workforce training (for example, inadequate neonatal resuscitation; inaccurate interpretation of CTG findings; lack of appreciation of the seriousness of pregnancy complications) accounting for five (8.7 per cent) of significant factors.

And the top five **possible** factors were as follows:

1. Fragmentation of maternity care, accounting for 24 (30.8 per cent) of possible factors.
2. Care planning for women with known risk factors, accounting for 17 (21.8 per cent) of possible factors.
3. The timing of birth for women with known risk factors accounting for eight (21.8 per cent) of possible factors.
4. Managing women with pre-existing and gestational diabetes accounting six (7.7 per cent) of possible factors; and identification of fetal growth restriction (FGR), accounting for six (7.7 per cent) of possible factors.
5. Management of DFM accounting for five (6.4 per cent); and polysubstance abuse accounting for five (6.4 per cent) of possible factors.

**Figure 18: Identified areas for clinical practice improvement**

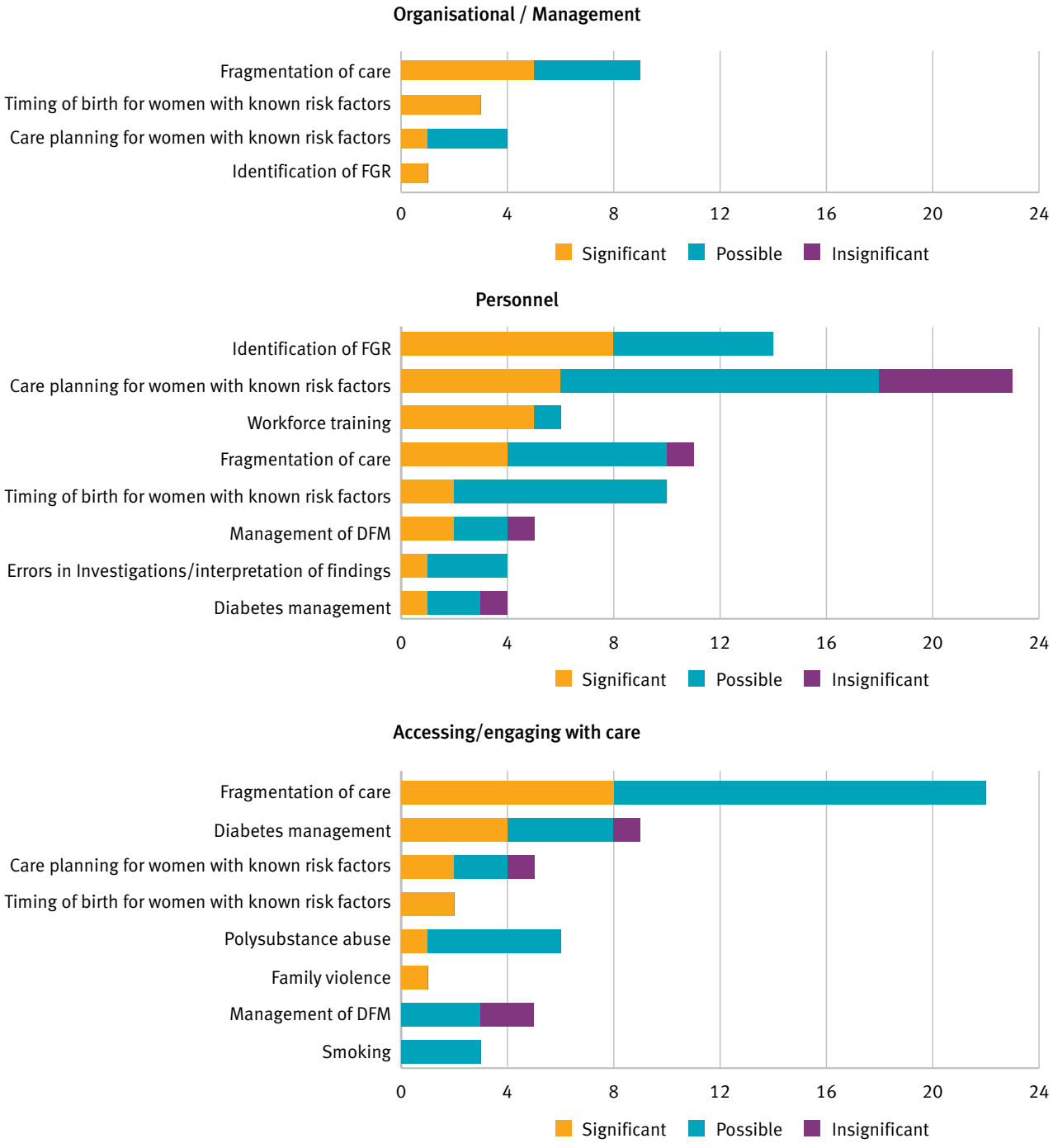



**Note: cases might have more than one factor present, so totals do not represent total cases*

Of the 65 perinatal deaths reviewed, nine were babies of Indigenous women (13.8 per cent) with seven (77.7 per cent) cases identified with contributing factors. Of concern, six perinatal deaths had significant contributing factors. The most common factor was fragmented care, with sporadic antenatal attendance and a lack of communication and processes between rural maternity services and regional facilities contributing to the outcomes. Two Indigenous women were not cared for in culturally safe models. Other factors associated with these stillbirths included inadequate management of diabetes and missed detection of fetal growth restriction (FGR).

When examined by the PSANZ categories, the most frequent category of contributing factors was under the group: personnel 77 (52.4 per cent) (e.g. staff factors relating to professional care and service provision) followed by women accessing and engaging with care 53 (36.1 per cent) (Figure 19).

**Figure 19: Clinical practice improvement areas by PSANZ contributing factors categories**



## Good practice points


All women should be screened for risk factors at the booking-in visit and care planned accordingly, including individualised informed shared decision-making about the timing of birth.

Care for women with risk factors should include careful antenatal monitoring and consideration of referral for serial growth and wellbeing ultrasound scans to inform appropriate timing of birth.

Models of antenatal care that enable continuity by the same provider should be promoted; especially for higher risk groups of women—for example, Indigenous mothers, Pacific Islanders and young women aged less than 20 years.

Health professionals working with pregnant women need to be skilled in the assessment of symphysis fundal height measurement and plotting and when to refer women with suspected fetal growth restriction (FGR).

Women with diabetes in pregnancy require a multi-disciplinary approach and appropriate management and referral to minimise maternal and fetal/neonatal complications.

Pregnant women should be reminded at every antenatal visit after 28 weeks gestation to know their baby's movements and to contact their health care provider if they have any concerns.

Women who are smokers (or recent quitters) should be provided with individualised smoking cessation support at every antenatal care visit.

## Recommendations

That all maternity services implement best practice care according to the Safer Baby Bundle [108].

That the Queensland Department of Health review the temporary perinatal mortality Clinical Midwife Consultant Project Officer position, with a view to establishing it as a permanent resource allocated to the QMPQC.

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## Centre of Research Excellence in Stillbirth (Stillbirth CRE)

The QMPQC will collaborate with the Stillbirth CRE in promoting best practice and raising community awareness around the prevention of stillbirth and care for families whose child is stillborn. In doing so, the QMPQC has provided below, an introduction to the Safer Baby Bundle (the Bundle) scheduled for statewide implementation in enrolled sites by Clinical Excellence Queensland (CEQ) throughout 2020 and 2021. Safer Baby Bundle – preventing stillbirth across Australia – is an initiative developed by the NHMRC Centre of Research Excellence in Stillbirth (Stillbirth CRE), in collaboration with maternity professionals, state health bodies and bereaved parents. The aim is to reduce the rate of stillbirth after 28 weeks gestation by 20 per cent by the year 2023.

Safer Baby Bundle
WORKING TOGETHER TO REDUCE STILLBIRTH

108 Safer Baby Bundle. *https://www.stillbirthcre.org.au/safer-baby-bundle/*

The Bundle is a collection of interventions designed to reduce late pregnancy stillbirth. Its development has drawn from the expertise of the UK Saving Babies Lives Bundle of Care, which saw a 20 per cent reduction in stillbirth rates following implementation in the United Kingdom and individually, Scotland. Resources include e-Learning modules for clinicians and information for pregnant women and their families, aimed at bridging the gap between best practice clinical evidence and maternity service provision across Australia.

e-Learning resources for the Bundle were launched nationally on 15 October 2019, by the Federal Minister for Health at Parliament House in Canberra. These resources have been endorsed by 18 organisations including RANZCOG, the Australian College of Midwives, PSANZ and CEQ. They have been designed to improve and reduce variations in practice across five priority areas, each with accompanying evidence syntheses in the PSANZ/Stillbirth CRE position statements and guidelines:

- supporting women to stop smoking in pregnancy [109]
- improving detection and management of fetal growth restriction [110]
- raising awareness and improving care for women with decreased fetal movements [111]
- improving awareness of maternal safe going-to-sleep position in late pregnancy [112]
- improving shared decision-making about the timing of birth for women with risk factors for stillbirth. [113]

These resources include best practice recommendations, clinical care pathways, case study-based learnings and resources for women. Clinicians who successfully complete the Bundle e-Learning modules can attain accredited CPD points. Implementation of the resources will be managed by the appropriate quality improvement agency within state jurisdictions.

Emphasis is also placed on the importance of other overarching aspects of best practice care, including supporting women to access continuity of midwifery care and conducting audits on every stillbirth, to reduce future risks.

The Bundle content will also be available as a face-to-face workshop for clinicians in early 2020. Partnership funding via the National Health and Medical Research Council has made it possible to implement the Bundle across New South Wales, Victoria and Queensland. On 2 December 2019, the Federal Minister for Health announced that additional funding from the Medical Research Future Fund will be made available to support a national roll out of the Bundle.

For further information about the Safer Baby Bundle in Queensland, please contact SaferBabyBundle@health.qld.gov.au

For further information about the Stillbirth CRE, please contact Stillbirthcre@mater.uq.edu.au

## Ministerial Rural Maternity Taskforce

The Rural Maternity Taskforce was established in August 2018 to advise the Minister for Health and Ambulance Services on the status of rural maternity services in Queensland, with a focus on safety and access. The Taskforce included rural consumers, front-line clinicians, Aboriginal and Torres Strait Islander organisations, professional organisations and unions, researchers, policy makers and health service leaders. For information on the Taskforce findings and recommendations, please refer to *https://clinicalexcellence.qld.gov.au/sites/default/files/docs/maternity/rural-maternity-taskforce-report.pdf*

109 Safer Baby Bundle. Supporting women to quite smoking during pregnancy. *https://www.stillbirthcre.org.au/safer-baby-bundle/quit-smoking/*

110 Safer Baby Bundle. Improving detection and management of fetal growth restriction. *https://www.stillbirthcre.org.au/safer-baby-bundle/improving-detection-and-management-of-fetal-growth-restriction/*

111 Safer Baby Bundle. Raising awareness and improving care for women with decreased fetal movements. *https://www.stillbirthcre.org.au/safer-baby-bundle/raising-awareness-and-improving-care-for-women-with-decreased-fetal-movements/*

112 Safer Baby Bundle. Improving awareness of maternal safe going-to-sleep position in late pregnancy. *https://www.stillbirthcre.org.au/safer-baby-bundle/improving-awareness-of-maternal-safe-going-to-sleep-position-in-late-pregnancy/*

113 Safer Baby Bundle. Improving decision-making about the timing of birth for women with risk factors for stillbirth. *https://www.stillbirthcre.org.au/safer-baby-bundle/improving-decision-making-about-the-timing-of-birth-for-women-with-risk-factors-for-stillbirth/*

# Appendix A

## Abbreviations

| | |
|---|---|
| ABS | Australian Bureau of Statistics |
| ACM | Australian College of Midwives |
| AIHW | Australian Institute of Health and Welfare |
| Apgar | appearance, pulse, grimace response to foot stimulation, activity and respiration |
| APMCAT | Australian Perinatal Mortality Clinical Audit Tool |
| ART | assisted reproductive technology |
| BMI | body mass index |
| CALF | Congenital Anomaly Linked File |
| CAPS | Communication and Patient Safety Program |
| CASC | Congenital Anomalies Sub-Committee |
| CDB | Communicable Diseases Branch |
| cCHD | critical Congenital Heart Defect |
| CHD | Congenital Heart Defect |
| cfDNA | cell-free DNA |
| CFTS | combined first trimester screening |
| COPE | Centre of Perinatal Excellence |
| CPD | Continuing Professional Development |
| CRE | Centre of Research Excellence (Stillbirth) |
| CSCF | Clinical Services Capability Framework |
| CSWG | Congenital Syphilis Working Group |
| CT | computed tomography |
| CTG | cardiotocography |
| DFM | decreased fetal movements |
| EPDS | Edinburgh Post-natal Depression Score |
| FGR | fetal growth restriction |
| g | gram |
| GP | General Practitioner |
| HIE | Hypoxic ischaemic encephalopathy |
| HHS | Hospital and Health Service |
| ICD-9-CM | The International Classification of Diseases, Ninth Revision, Clinical Modification |
| ICD-10-AM | International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification |
| ieMR | integrated electronic Medical Record |
| IMPROVE | IMproving Perinatal Review and Outcomes Via Education |
| LARC | long acting reversible contraception |
| LOS | length of stay |
| MMR | maternal mortality ratio |
| MMSC | Maternal Mortality Sub-Committee |
| MRI | Magnetic resonance imaging |
| MTP | massive transfusion protocol |
| NDC | Neonatal Death Classification |
| NHMRC | National Health and Medical Research Council |
| NIPT | non-invasive prenatal test |
| NTD | neural tube defects |
| OECD | Organisation for Economic Co-operation and Development |
| PDC | Perinatal Death Classification |
| PMMRC | Perinatal and Maternal Mortality Review Committee |
| PMSC | Perinatal Mortality Sub-Committee |
| POCCT | Point of Care Coagulation Testing |
| PSANZ | Perinatal Society of Australia and New Zealand |
| PSANZ-NDC | Perinatal Society of Australia and New Zealand Neonatal Death Classification |
| PSANZ-PDC | Perinatal Society of Australia and New Zealand Perinatal Death Classification |
| PV | per vaginal |
| QPDC | Queensland Perinatal Data Collection |
| QHAPDC | Queensland Hospital Admitted Patient Data Collection |
| QMPQC | Queensland Maternal and Perinatal Quality Council |
| RANZCOG | Royal Australian and New Zealand College of Obstetricians and Gynaecologists |
| SEIFA | Socio-economic Indexes for Areas |
| SES | socioeconomic status |
| SGA | small for gestational age |
| SMNCN | Statewide Maternity and Neonatal Clinical Network |
| STI | Sexually Transmissable Infections |
| TEG | thromboelastogram |
| TGA | Transposition of the great arteries |
| ToP | Termination of Pregnancy |
| ToF | Tetralogy of Fallot |
| ROTEM | rotational thromboelastometry |
| WHO | World Health Organization |

# Appendix B

## Data sources used in this report

This report is based on the:

- Queensland Perinatal Data Collection
- Queensland Hospital Admitted Patient Data Collection
- Queensland Death Registrations and Master Linkage File data.

It relates primarily to the two calendar years 2016 and 2017. Trend analysis is based on data for a 10-year period (from 2008), unless otherwise noted. Data are accurate at time of publication, although subsequent changes to the perinatal data collection may occur.

Other data sources include:

- Australian Institute of Health and Welfare
- Office of the Queensland State Coroner.

# Appendix C

## Membership of the Queensland Maternal and Perinatal Quality Council, 2018-19

| Membership | Position |
|---|---|
| Professor David Ellwood (Chair) | Dean of Medicine and Professor of Obstetrics and Gynaecology, Griffith University School of Medicine, Director of Maternal Fetal Medicine, Gold Coast University Hospital; Co-Director, Stillbirth Centre of Research Excellence |
| Dr Anthony Brown | Director, Medical Services, Thursday Island, Torres and Cape Hospital and Health Service |
| Professor Vicki Flenady | Director, Centre of Research Excellence in Stillbirth, Mater Research Institute – The University of Queensland |
| Associate Professor Tim Donovan | Neonatal Medicine and Consultant Neonatology, Royal Brisbane and Women's Hospital, Metro North Hospital and Health Service |
| Ms Joanne Ellerington | Manager, Data Collections – QHAPDC and QPDC, Statistical Collections and Integration Unit, Statistical Services Branch, Queensland Health |
| Dr Trisha Johnston | Director, Statistical Analysis and Linkage Unit, Statistical Services Branch, Queensland Health |
| Professor Leonie Callaway | Director of Research, Women's and Newborn Services; Royal Brisbane and Women's Hospital and Executive Director of the Women's and Children's Stream, Metro North Hospital and Health Service |
| Associate Professor Ted Weaver (Deputy Chair) | Senior Medical Officer, Obstetrics and Gynaecology, Sunshine Coast Hospital and Health Service; Clinical sub-Dean, Griffith University School of Medicine |
| Dr Nikki Whelan | Consultant Obstetrician and Gynaecologist |
| Dr Diane Payton | Anatomical Pathologist, Pathology Queensland |
| Dr Simon Maffey | Deputy Director, Obstetric Anaesthesia, Department of Anaesthesia, Mater Health Services, Brisbane |
| Dr Helen Barrett | Director of Endocrinology, Mater Health Services, Brisbane |
| Dr Paul Bretz | Director, Obstetrics and Gynaecology, Mater Health Services, Brisbane |
| Ms Anne Bousfield | Clinical Midwifery Consultant, Roma Hospital, South West Hospital and Health Service |
| Ms Pauline McGrath | Senior Genetic Counsellor, Genetic Health Queensland |
| Ms Libby Morton | Program Manager, Queensland Centre for Perinatal and Infant Mental Health, Child and Youth Mental Health Service, Children's Health Queensland |
| Ms Julie Eaton | Nurse Unit Manager, Antenatal/Gynaecology Clinic/Midwifery Group Practice/Early Pregnancy Service, Ambulatory Services, West Moreton Hospital and Health Service |
| Dr Ellen Whittaker (until December 2018) | Private Hospitals Association of Queensland representative, Director of Clinical Services, North West Private Hospital, Brisbane |
| Mr Christopher Junge (from February 2019) | Private Hospitals Association of Queensland representative, Director of Clinical Services, St Andrew's Private Hospital, Ipswich |
| Dr Samantha Scherman | Director of Obstetrics and Gynaecology, Cairns Hospital, Cairns and Hinterland Hospital and Health Service |
| Ms Marce Green | Consumer Representative |
| Dr Rebecca Jenkinson (PhD) | Consumer Representative |
| Dr Thangeswaran Rudra | Senior Consultant, Obstetrics and Gynaecology, Royal Brisbane and Women's Hospital, Metro North Hospital and Health Service |
| Dr Yogesh Chadha | Senior Staff Specialist, Obstetrics and Gynaecology, Royal Brisbane and Women's Hospital, Metro North Hospital and Health Service |
| tba | Aboriginal and Torres Strait Islander Health Worker |
| Associate Professor Rebecca Kimble | ex-officio as Chair, Statewide Maternity and Neonatal Clinical Network |
| Associate Professor Julie McEniery | ex-officio as Chair, Queensland Paediatric Quality Council |
| Dr Jocelyn Toohill | Director of Midwifery, Office of the Chief Nursing and Midwifery Officer, Clinical Excellence Queensland |
| Ms Andrea Chitakis | QMPQC Co-ordinator and Secretariat |

## Perinatal Mortality Sub-Committee

| Membership | Position |
|---|---|
| Professor Vicki Flenady (Co-Chair) | Director, Centre of Research Excellence in Stillbirth, Mater Research Institute – The University of Queensland |
| Dr Nikki Whelan | Consultant Obstetrician and Gynaecologist |
| Ms Joanne Ellerington | Manager, Data Collections – QHAPDC and QPDC, Statistical Collections and Integration Unit, Statistical Services Branch, Queensland Health |
| Ms Anne Bousfield | Clinical Midwifery Consultant, Roma Hospital, South West Hospital and Health Service |
| Ms Deborah Birthisel | Clinical Midwife, Birth Suite, Royal Brisbane and Women's Hospital, Metro North Hospital and Health Service |
| Dr Paul Conaghan | P/T Senior Staff Specialist, Obstetrics, Mater Health Services, Brisbane |
| Dr Diane Payton | Staff Anatomical Pathologist, Pathology Queensland, Health Support Queensland |
| Ms Teresa Walsh | Director and Midwife, New Life Midwifery Pty Ltd |
| Associate Professor Helen Liley | Senior Staff Specialist, Neonatology, Mater Health Services, Brisbane |
| Professor David Ellwood (Co-Chair) | Dean of Medicine and Professor of Obstetrics and Gynaecology, Griffith University School of Medicine, Director of Maternal Fetal Medicine, Gold Coast University Hospital, Gold Coast Hospital and Health Service; Co-Director, Stillbirth Centre of Research Excellence |
| Ms Leah Hardiman | Consumer Representative |
| Dr Admire Matsika | Specialist Consultant Anatomical Pathologist, Mater Pathology |
| Dr Johanna Laporte (Deputy Chair) | Maternal Fetal Medicine Specialist, Royal Brisbane and Women's Hospital, Metro North Hospital and Health Service |
| Professor Sailesh Kumar | Maternal Fetal Medicine Specialist, Mater Health Services, Brisbane |
| Ms Bree Lowing | Clinical Midwife, Maternal Fetal Medicine, Gold Coast University Hospital |
| Ms Catherine Kilgour | Lecturer (Teaching and Research) School of Nursing, Midwifery and Social Work, The University of Queensland, Midwife/Registered Nurse Royal Brisbane and Women's Hospital, Metro North Hospital and Health Service |
| Dr Christoph Lehner | Consultant Obstetrician, Fellow in Maternal Fetal Medicine, Royal Brisbane and Women's Hospital, Metro North Hospital and Health Service |
| Ms Andrea Chitakis | Secretariat |
| Ms Imogen Kettle | Clinical Midwife Consultant – QMPQC Projects |

## Maternal Mortality Sub-Committee

| Membership | Position |
|---|---|
| Dr Nikki Whelan (Chair) | Private Consultant Obstetrician and Gynaecologist |
| Professor Leonie Callaway | Director of Research, Women's and Newborn Services; Royal Brisbane and Women's Hospital and Executive Director of the Women's and Children's Stream, Metro North Hospital and Health Service |
| Ms Libby Morton | Program Manager, Queensland Centre for Perinatal and Infant Mental Health, Children's Health Queensland |
| Associate Professor Ted Weaver | Senior Medical Officer, Obstetrics and Gynaecology, Sunshine Coast Hospital and Health Service; Clinical sub-Dean, Griffith University School of Medicine |
| Dr Simon Maffey | Deputy Director, Obstetric Anaesthesia, Department of Anaesthesia, Mater Health Services, Brisbane |
| Dr William Parsonage | Staff Specialist, Cardiology, Royal Brisbane and Women's Hospital, Metro North Hospital and Health Service |
| Ms Anne Bousfield | Clinical Midwifery Consultant, Roma Hospital, South West Hospital and Health Service |
| Dr Rebecca Williams | Forensic Pathologist, Forensic and Scientific Services, Health Support Queensland |
| Dr Susan Roberts | Clinical Lead, Lavender Mother and Baby Unit, Perinatal Psychiatrist, Gold Coast University Hospital, Gold Coast Hospital and Health Service |
| Ms Julie Eaton | Nurse Unit Manager, Antenatal/Gynaecology Clinic/Midwifery Group Practice/Early Pregnancy Service, Ambulatory Services, West Moreton Hospital and Health Service |
| Dr Thangeswaran Rudra | Senior Consultant, Obstetrics and Gynaecology, Royal Brisbane and Women's Hospital, Metro North Hospital and Health Service |
| Dr Helen Barrett | Director of Endocrinology, Mater Health Services, Brisbane |
| Dr Yogesh Chadha | Senior Staff Specialist, Obstetrics and Gynaecology, Royal Brisbane and Women's Hospital, Metro North Hospital and Health Service |
| Ms Caitlin Modini | Medical student |
| Ms Andrea Chitakis | Secretariat |

## Congenital Anomaly Sub-Committee

| Membership | Position |
|---|---|
| Dr Paul Bretz | Director, Obstetrics and Gynaecology, Mater Health Services |
| Dr Diane Payton | Staff Anatomical Pathologist, Pathology Queensland, Health Support Queensland |
| Associate Professor Timothy Donovan (Chair) | Neonatal Medicine and Consultant Neonatology, Royal Brisbane and Women's Hospital, Metro North Hospital and Health Service |
| Associate Professor Julie McGaughran | Director, Genetic Health Queensland |
| Ms Joanne Ellerington | Principal Data Collections Officer, Statistical Services Branch, Queensland Health |
| Dr Renuka Sekar | Clinical Lead, Maternal and Fetal Medicine, Royal Brisbane and Women's Hospital, Metro North Hospital and Health Service |
| Dr Trisha Johnston | Director, Statistical Analysis and Linkage Unit, Statistical Services Branch, Queensland Health |
| Ms Melanie McKenzie | Consumer representative, Director and Founder of Harrison's Little Wings |
| Ms Pauline McGrath | Senior Genetic Counsellor, Genetic Health Queensland |
| Ms Andrea Chitakis | Secretariat |

## Congenital Syphilis Working Group

| Membership | Position |
|---|---|
| Professor Paul Colditz (Co-Chair) | Neonatologist; Director, Perinatal Research Centre and Head of School of Clinical Medicine, The University of Queensland, |
| Dr Mandy Seel (Co-Chair) | Public Health Physician – Sexual Health, Public Health Unit, Metro North Hospital and Health Service. |
| Dr Diane Payton | Staff Anatomical Pathologist, Pathology Queensland, Health Support Queensland |
| Dr Renuka Sekar | Clinical Lead, Maternal and Fetal Medicine, Royal Brisbane and Women's Hospital, Metro North Hospital and Health Service |
| Dr Annie Preston-Thomas | Public Health Medical Officer – Sexual Health, Tropical Public Health Services, Cairns and Hinterland Hospital and Health Service |
| Professor Vicki Flenady | Director, Centre of Research Excellence in Stillbirth, Mater Research Institute – The University of Queensland |
| Ms Andrea Chitakis and Ms Allison Mackie (CDB) | Secretariat |

## Perinatal Mortality Contributing Factors Case Review Panel

| Membership | Position |
|---|---|
| Professor Vicki Flenady (Co-Chair) | Director, Centre of Research Excellence in Stillbirth, Mater Research Institute – The University of Queensland |
| Professor David Ellwood | Dean of Medicine and Professor of Obstetrics and Gynaecology, Griffith University School of Medicine, Director of Maternal Fetal Medicine, Gold Coast University Hospital; Co-Director, Stillbirth Centre of Research Excellence |
| Dr Diane Payton | Staff Anatomical Pathologist, Pathology Queensland, Health Support Queensland |
| Deborah Birthisel | Clinical Midwife, Birth Suite, Royal Brisbane and Women's Hospital, Metro North Hospital and Health Service |
| Associate Professor Timothy Donovan | Neonatal Medicine and Consultant Neonatology, Royal Brisbane and Women's Hospital, Metro North Hospital and Health Service |
| Dr Johanna Laporte (Co-Chair) | Maternal Fetal Medicine Specialist, Royal Brisbane and Women's Hospital, Metro North Hospital and Health Service |
| Dr Christoph Lehner | Registrar, Maternal Fetal Medicine, Royal Brisbane and Women's Hospital, Metro North Hospital and Health Service |
| Ms Bree Lowing | Clinical Midwife, Maternal Fetal Medicine, Gold Coast University Hospital |
| Dr Admire Matsika | Specialist Consultant Anatomical Pathologist, Mater Pathology |
| Ms Teresa Walsh | Director and Midwife, New Life Midwifery Pty Ltd |
| Ms Leah Hardiman | Consumer representative |
| Ms Andrea Chitakis | Secretariat |
| Ms Imogen Kettle | Clinical Midwife Consultant – perinatal mortality case review information management |

# Appendix D

## IMPROVE program

The Perinatal Society of Australia and New Zealand (PSANZ) has developed Clinical Practice Guidelines for Perinatal Mortality to improve standards in clinical practice around the time of a perinatal death and partners with the Stillbirth CRE to maintain and disseminate the guidelines. The IMPROVE (**IM**proving **P**erinatal **R**eview and **O**utcomes via **E**ducation) program has been developed for maternity health care professionals to enhance the uptake of these guidelines. IMPROVE utilises the Structured, Clinical, Objective, Referenced, Problem-orientated, Integrated and Organised (SCORPIO) educational model designed for skills training[114] which involves small groups of learners rotating around six interactive learning stations that are each facilitated by an experienced educator.

IMPROVE involves: 1) a short introductory lecture; 2) six learning stations; and 3) formative assessment. Workshops are five hours in duration and are delivered by trained educators.

**The learning stations:**

1. Communicating with parents about perinatal autopsy
2. Autopsy and placental examination
3. Investigation of perinatal deaths
4. Examination of babies who die in the perinatal period
5. Audit and classification of perinatal deaths
6. Psychological and social aspects of perinatal bereavement

**Who should attend?**

The workshops are designed for health care professionals including obstetricians, midwives, neonatal nurses, neonatologists, pathologists, bereavement specialists, social workers, or those interested from a policy or public health perspective. IMPROVE workshops provide an opportunity for participants to understand the PSANZ Perinatal Mortality Guidelines in an interactive way.

**IMPROVE program materials**

A booklet of program materials is provided for each participant covering key aspects of the PSANZ Guidelines and other relevant documentation specific to that region. A certificate of completion is provided at the end of the IMPROVE program. This activity is endorsed with four MidPlus points from the Australian College of Midwives. Eligible fellows of RANZCOG can claim five CPD points in the Clinical Expertise domain.

To date, IMPROVE has trained more than 1400 health care professionals across Australia and New Zealand, In Queensland, the IMPROVE Program is overseen by the QMPQC Perinatal Mortality Sub-Committee. Non-recurrent funding has been made available through the Queensland Department of Health, Patient Safety and Quality Improvement Service to assist in the ongoing delivery of this program across Queensland and the development of an accompanying e-Learning program.

**IMPROVE e-Learning**

The IMPROVE eLearning module has been developed and will be formally launched in 2020. The eLearning module covers similar content to the face to face workshop, in an interactive way that users can complete at their own pace.

The workshop has been accredited by Australian College of Midwives, RANZCOG and Australian College of Rural and Remote Medicine, with CPD points available upon successful completion.

The eLearning module can be accessed here: *https://learn.stillbirthcre.org.au/*

For further information contact Vicki Flenady, *vicki.flenady@mater.uq.edu.au*.

**To arrange an IMPROVE workshop please contact the IMPROVE Co-ordinator:**

Megan Weller, MRI-UQ, Telephone: 07 3163 7667 Email: *megan.weller@mater.uq.edu.au*

114 Gardiner P, Kent A, Flenady V et al. IMproving Perinatal Mortality Review and Outcomes Via Education; An educational program for health care professionals on best practice around the time of a perinatal death. *BMC Pregnancy Childbirth*. 2016 Nov 25;16(1):376.

# Appendix E

## Classification of mortality contributing factors

Maternal and perinatal mortality case review findings are classified against the AIHW required options to enable standardised national reporting, as recommended in the PSANZ Clinical Guidelines[115] on Care around Stillbirth and Neonatal Death:

- Substandard factor(s) identified but unlikely to have contributed to outcome (insignificant)
- Substandard factor(s) identified but might have contributed to outcome (possible)
- Substandard factor(s) identified likely to have contributed to outcome (significant)
- No substandard care factors identified
- Contributing factor assessment not undertaken.

Furthermore, the PSANZ Guidelines recommend categorisation of substandard factors for perinatal deaths by type of factor, using the Australian Perinatal Mortality Clinical Audit Tool[116].

| **Were factors relating to organisational and/or management identified? (for example, inadequate supervision of staff, lack of appropriate clinical management protocols, lack of communication between services. If yes, please specify each question based on the following rates:**<br>*1.- Insignificant. Sub-standard factors identified but unlikely to have contributed to the outcome*<br>*2.- Possible- Sub-standard factors identified might have contributed to the outcome*<br>*3.- Significant. Sub-standard factors identified were likely to have contributed to the outcome*<br>*4.- Undetermined. Insufficient information available*<br>*5.- Unknown*<br>Please state the specific factors and include any relevant comments. |
|---|
| Poor organisational arrangements of staff |
| Inadequate education and training |
| Lack of policies, protocols or guidelines |
| Inadequate numbers of staff |
| Poor access to senior clinical staff |
| Failure or delay in emergency response |
| Delay in procedure (for example, caesarean section) |
| Inadequate systems/process for sharing of clinical information between services |
| Delayed access to test results or inaccurate results |
| Equipment (for example, faulty equipment, inadequate maintenance or lack of equipment) |
| Building and design functionality (for example, space, privacy, ease of access, lighting, noise, power failure, operating theatre in distant location) |
| Other reason/Unknown |

| **Were factors relating to personnel identified? (staff factors relating to professional care and service provision). If yes, please specify as per options 1 – 5 above.** |
|---|
| Knowledge and skills of staff were lacking |
| Delayed emergency response by staff |
| Failure to maintain competence |
| Communication between staff was inadequate |
| Failure to seek help/supervision |
| Failure to follow recommended best practice |
| Lack of recognition of complexity or seriousness or condition by care giver |
| Other reason/Unknown |
| **Were barriers to accessing/engaging with care identified? (for example, no; infrequent or late booking for antenatal care; woman declined treatment/advice)** |
| No antenatal care |
| Infrequent or late booking |
| Declined treatment or advice |
| Obesity impacted on delivery of optimal care (for example, USS) |
| Substance use |
| Family violence |
| Lack of recognition by the woman or family of complexity of seriousness of condition |
| Maternal mental illness |
| Cultural barriers |
| Language barriers |
| Not eligible to access free care |
| Environmental (for example, isolated, long transfer, weather prevented transport) |
| Other reason/Unknown |

115 PSANZ Clinical Practice Guidelines 2018. Care around Stillbirth and Neonatal Death. *https://sanda.psanz.com.au/clinical-practice/clinical-guidelines/*

116 Australian Perinatal Mortality Clinical Audit Tool. Page 31 *https://sanda.psanz.com.au/assets/Uploads/Appendix-E-Australian-Perinatal-Mortality-Clinical-Audit-Tool.pdf*

# Appendix F

## Statewide Maternity and Neonatal Clinical Network and Queensland Clinical Guidelines

The QMPQC consults with the Statewide Maternity and Neonatal Clinical Network (SMNCN) and views that body as the peak clinical body in Queensland for maternity and newborn care. The primary objective of the Queensland Clinical Guidelines (QCG), established by Queensland clinicians and working also in close partnership with both the SMNCN and the QMPQC, is to provide clinical guidance informed by contemporary evidence. In late 2019, QCG was formally incorporated into Health Care Improvement Unit of Clinical Excellence Queensland with recurrent funding and permanent positions established.

Now in its 11th year, QCG has an effective program of developing maternal and neonatal clinical guidelines with further work progressing on implementation and evaluation of health outcomes and healthcare research. Currently there are 40 maternity and neonatal guidelines, and two operational frameworks. Additionally, in 2018, QCG established a neonatal medicine formulary (NeoMedQ) with the aim of standardising neonatal medicine preparation and administration in Queensland. There are currently 32 medicines available on the QCG website - with more in progress.

Each guideline is accompanied by implementation resources, including a guideline supplement, education presentation, knowledge assessment and consumer information. The guidelines and resources are a valuable support to the QMPQC in improving the safety and quality of maternity and neonatal care in Queensland.

QCG is now the second most visited clinical webpage in Queensland Health with resources accessed from more than 60 countries world-wide. On average, a resource is downloaded every four minutes with almost 10,000 knowledge assessments completed last financial year.

Guidelines, the NeoMedQ and operational frameworks and resources can be accessed at *https://www.health.qld.gov.au/qcg*

# Appendix G

## Table of outcomes from QMPQC 2017 Report

| Queensland Maternal and Perinatal Quality Council – 2017 Report – Action Plan | | | |
|---|---|---|---|
| **Recommendation** | **Suggested Action/ Area Responsible** | **Action** | **Response** |
| That the Therapeutic Goods Administration consider reviewing the conditions for authorising medical practitioners to prescribe ovulation induction agents, particularly for techniques designed to minimise the incidence of multiple pregnancy, and that the Royal Australian and New Zealand College of Obstetricians and Gynaecologists consider promoting education programs for its Fellows and Diplomates regarding the safe and appropriate use of ovulation induction agents. (repeated from 2015 QMPQC Report) | Correspondence to be forwarded to the Commonwealth Therapeutic Goods Administration recommending that the CTGA progress implementation of the recommendation.<br><br>Correspondence to be forwarded to the Royal Australia and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) recommending that consideration be given to the recommendation. | Letter sent<br><br>Letter sent | Nil response<br><br>Nil response |
| That the Queensland Department of Health develop and implement a public health campaign to encourage women to attend antenatal care in the first trimester (prior to 14 weeks gestation) to enable pre-existing and potential pregnancy-related conditions to be detected early and managed throughout the pregnancy. | Correspondence to be forwarded to the Deputy Director-General, Clinical Excellence Division seeking support and action in relation to this recommendation. | Letter sent | Chief Health Officer supported. Referred to Queensland Department of Health Strategic Communications Branch for action. |
| That all cases of congenital syphilis are to be consistently identified and reported and then investigated to identify factors for improvement at both clinical and system levels and mechanisms are made available to implement recommended changes to practice. | Correspondence to be forwarded to the Deputy Director-General, Clinical Excellence Division seeking support and action in relation to this recommendation. | Letter sent | Response received. Queensland Clinical Guideline – "Syphilis in Pregnancy" developed. QMPQC Congenital Syphilis Working Group formed to conduct a retrospective case review. Findings have assisted in the planning and implementation of four projects to date, to address gaps in public health awareness. |
| That Queensland Health consider placing within current healthy lifestyle initiatives, a stronger emphasis on the link between good pregnancy outcomes and preconception care/healthy pregnancy, including a reduction in congenital anomalies. | Correspondence to be forwarded to the Chief Health Officer and Deputy Director-General, Prevention Division seeking consideration of and action in relation to this recommendation. | Letter sent | To be referred to recently established statutory authority Health and Wellbeing Queensland. |
| That the Queensland Department of Health, Mental Health Alcohol and Other Drugs Branch explore how communication between mental health services, primary health practitioners and termination of pregnancy providers could be enhanced to ensure women are appropriately supported after a termination of pregnancy. | Correspondence to be forwarded to the Executive Director, Mental Health Alcohol and Other Drugs Branch seeking consideration of and action in relation to this recommendation. | Letter sent | Meetings held with Director, MHAODB and presentation to the Suicide Prevention Taskforce |

| Queensland Maternal and Perinatal Quality Council – 2017 Report – Action Plan | | | |
|---|---|---|---|
| **Recommendation** | **Suggested Action/ Area Responsible** | **Action** | **Response** |
| That an autopsy, and where appropriate and available, molecular investigations, be performed in all cases of maternal mortality; and consideration given to amending the Queensland Coroners Act 2003 to include investigation of all maternal deaths, that is, women who die in pregnancy and within the first twelve months postpartum, except where there is a known metastatic malignancy. | Correspondence to be forwarded to Pathology Queensland seeking consideration and advice in relation to this recommendation.<br>Correspondence to be forwarded to the Queensland Attorney-General seeking support to amend the *Queensland Coroners Act*. | Letter sent<br>Letter sent | Nil response<br>Response received. Queensland Attorney-General is seeking advice from the Department of Justice and Attorney-General. |
| That the Queensland Department of Health participate in a national public awareness campaign initiated by the Stillbirth Centre for Research Excellence on the importance of timely reporting of decreased fetal movements. | Correspondence to be forwarded to the Deputy Director-General, Clinical Excellence Division seeking consideration of, and action in relation to this recommendation. | Letter sent | Response received. Queensland Department of Health implementing the Safer Baby Bundle in early 2020. |
| That the PSANZ/Stillbirth Centre for Research Excellence Guidelines on:<br>• detection and management of women with fetal growth restriction (FGR) and<br>• detection and management of women with decreased fetal movements (DFM)<br>Should be implemented by all maternity services and all staff encouraged to complete the FGR and DFM e-Learning programs. | Correspondence to be forwarded to all HHS Chief Executives seeking support and action in relation to this recommendation. | Letter sent | RResponse received from Townsville Hospital and Health Service only (Appendix H) |
| That all maternity hospitals have effective systems in place to ensure all stillbirths and neonatal deaths are appropriately investigated, reviewed, classified and reported to the health department according to the PSANZ national guidelines | Correspondence to be forwarded to all HHS Chief Executives seeking support and action in relation to this recommendation. | Letter sent | Response received from Townsville Hospital and Health Service only (Appendix H) |
| That the option of a high-quality autopsy examination be offered to all parents following a perinatal death, with counselling on the procedure provided by a senior clinician. | Correspondence to be forwarded to all HHS Chief Executives asking that they note this recommendation and consider promoting it to Hospital and Health Service clinicians. | Letter sent | Response received from Townsville Hospital and Health service only (Appendix H) |
| That in addition to the offer of autopsy, as a minimum for all stillbirths, a comprehensive maternal and pregnancy history plus placental histopathology; testing for feto-maternal haemorrhage; cytogenetics, molecular and other investigations as indicated according to the PSANZ Guidelines, be performed. | Correspondence to be forwarded to all HHS Chief Executives and Pathology Queensland asking that they consider this recommendation. | Letters sent | Nil response |

# Appendix H Letter from Townsville Hospital and Health Service

The QMPQC was reassured by this response to recommendations from the 2017 Report.

Queensland Government
Townsville Hospital and Health Service

Professor David Ellwood
Chair
Queensland Maternal and Perinatal Quality Council
GPO Box 48
BRISBANE QLD 4001

Dear Professor Ellwood

I refer to your letter dated 31 June 2018 regarding *Queensland Mothers and Babies 2014-15*, the 2017 Report of the Queensland Maternal and Perinatal Quality Council, seeking our consideration of four recommendations included in the report. We have reviewed the report and recommendations and offer our comments below in response.

**Recommendation:**

That the Perinatal Society of Australia and New Zealand (PSANZ)/Stillbirth Centre of Research Excellence (CRE) Guidelines on detection and management of women with fetal growth restriction (FGR) and detection and management of women with decreased fetal movements (DFM) be implemented by all maternity services and all staff encouraged to complete the FGR and DFM eLearning programs.

**Response:**

- The Townsville Hospital and Health Service (THHS) endorses and utilises the State Clinical Guidelines which were updated February 2018 and March 2018 (Stillbirth Care and Therapeutic Termination). THHS is adopting the recommendations and Maternal Fetal Medicine (MFM) Clinical Midwifery Consultant, Cherie Boniface will action education sessions and ensure completion of eLearning package by relevant staff.

**Recommendation:**

That all maternity hospitals have effective systems in place to ensure all stillbirths and neonatal deaths are appropriately investigated, reviewed, classified and reported to the health department according to the PSANZ national guidelines.

**Response:**

- The THHS Obstetrics and Gynaecology and Neonatal Units conduct regular perinatal mortality meetings (eight meetings were held in 2017). All neonatal deaths and registered stillbirths are reviewed and classified in a multidisciplinary meeting inclusive of MFM, specialists, obstetricians, neonatologists, pathologist, radiologist, midwives, neonatal nurses, ultrasonography staff and the social work department. The THHS aims for monthly meetings but is dependent upon availability of chairs Dr David Watson, MFM Specialist and Dr Yoga Kandasamy, Neonatologist.
- All cases are classified using the PSANZ classification system and the THHS has recently adopted the new classification system as per the new guidelines dated March 2018. The Maternity Service Report is completed and forwarded for review by QMPQC in Brisbane.

Townsville Hospital and Health Service
Queensland Government
health.qld.gov.au/townsville
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E tsv-ceo@health.qld.gov.au
100 Angus Smith Drive
Douglas QLD 4814

**Recommendation:**

That the option of a high-quality autopsy examination be offered to all parents following a perinatal death, with counselling on the procedure provided by a senior clinician.

**Response:**

- Perinatal autopsy is offered to parents for all stillbirths by obstetric staff and neonatal deaths by neonatologists at The Townsville Hospital (TTH). Autopsies are performed at Royal Brisbane & Women's Hospital, Metro North, by perinatal pathologists. Services provided include written information pamphlets for parents regarding perinatal autopsy which are in recent guidelines and endorsed by the Stillbirth Centre of Research Excellence, PSANZ and SANDA.

**Recommendation:**

That in addition to the offer of autopsy, as a minimum for all stillbirths, a comprehensive maternal and pregnancy history plus placental histopathology; testing for feto-maternal haemorrhage; cytogenetics, molecular and other investigations as indicated according to the PSANZ Guidelines, be performed.

**Response:**

- Comprehensive maternal and antenatal care history is performed on all pregnancy loss at TTH. Placental histopathology is routine at TTH, along with the appropriate investigations as per guidelines "stillbirth Care" . If the mother consents, amniocentesis is performed at time of diagnosis of IUFD, if possible, otherwise placental sample is collected and sent to cytogenetics.

We trust our response and support of the four recommendations above highlights our support in ensuring that key staff are aware of the recommendations and good practice points, ultimately benefiting women and babies in the care of THHS.

Yours sincerely,

Kieran Keyes
**Health Service Chief Executive**
**Townsville Hospital and Health Service**

# Queensland Mothers and Babies, 2016 and 2017

Report of the Queensland Maternal and Perinatal Quality Council 2019