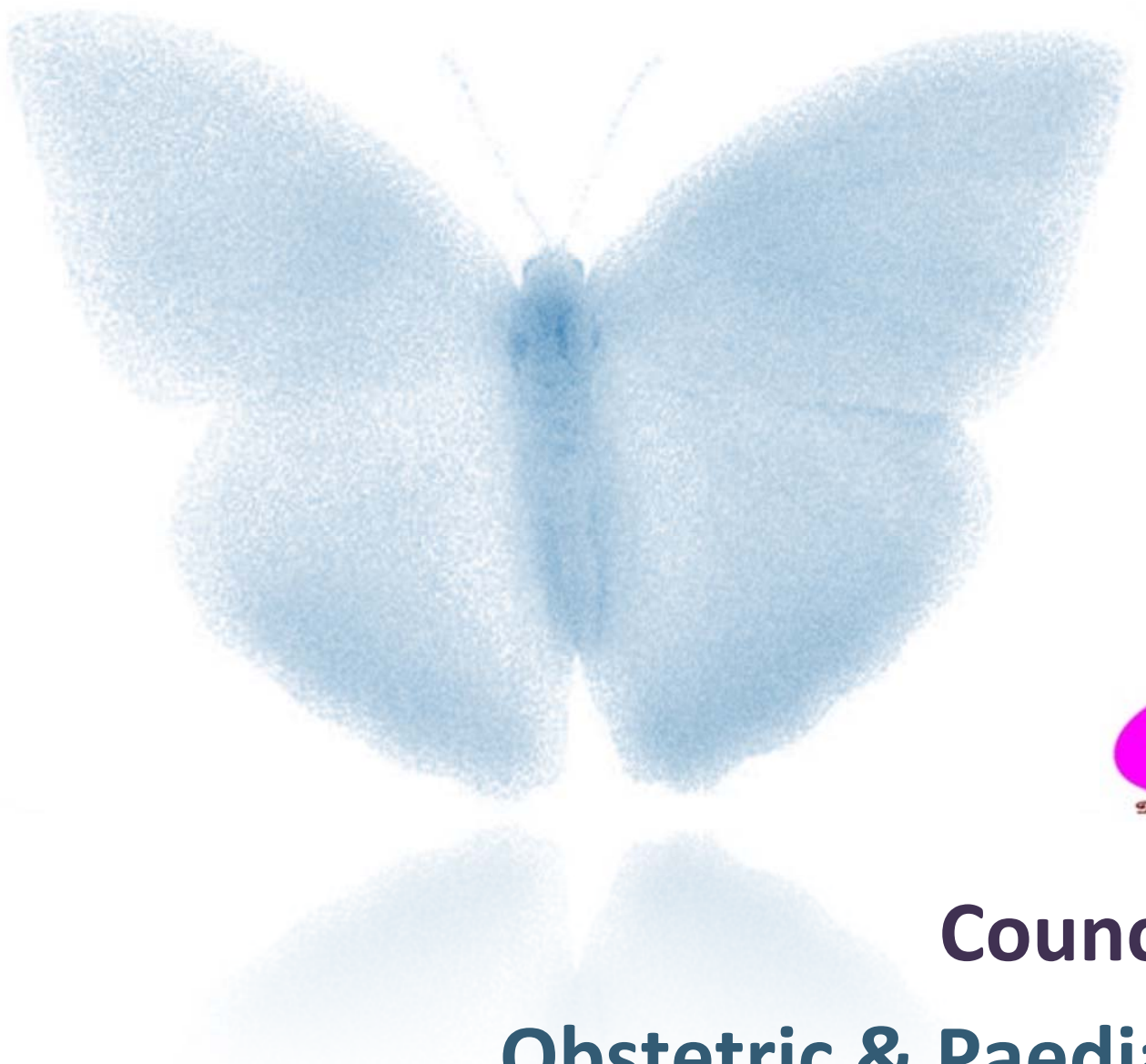




Council of Obstetric & Paediatric Mortality & Morbidity

Annual Report 2019

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COPMM Key Recommendations

A list of key *Council of Obstetric and Paediatric Mortality and Morbidity* (COPMM) recommendations based on the data arising from the review of perinatal, paediatric and maternal death cases reported in 2019 is tabulated below. These recommendations highlight the issues considered by Council to be important and that need to be addressed and actioned by relevant organisations statewide. To this end, Council values the Department's efforts to action and report against Council's recommendations where possible.

PAEDIATRIC	Youth suicide 1. The <i>Paediatric Mortality & Morbidity Committee</i> strongly supports the Coroner's recommendations with regards to youth suicide. To young persons whose friends have told them they are thinking about suicide, the Coroner recommended the following: (1) Take the statement seriously; (2) Do not keep it a secret, even if your friend has asked you to; (3) Tell a teacher or counsellor as soon as possible about what your friend has told you; and (4) Encourage your friend to seek help from a trusted adult such as a counsellor or to contact a helpline such as listed below: • Emergency services 000 • Lifeline 131 114 • Suicide Call Back Service 1300 659 467 • Beyond Blue support service 1300 224 636 • Kids Helpline 1800 551 800 • http://suicideprevention.com.au/ 2. Youth Beyond Blue have also developed the check in app (https://www.beyondblue.org.au/about-us/about-our-work/young-people/the-check-in-app), to assist young people who are concerned about a friend but worried about saying the wrong thing. 3. That all health professionals should be advised to inform relevant family members, carers or guardians of a child who may be at risk of suicide of that risk. 4. COPMM supports the Coroner's recommendation that the Media, in publishing articles and editorial on suicide, ensure complete compliance with Mindframe Guidelines. 5. That the Media clearly outline appropriate and available support helplines at the time of reporting on paediatric deaths that have been related to suicidal behaviour. 6. That appropriate support is available to all young people engaged in the use of social media networks such as Facebook where the issue of youth suicide may be discussed. This is particularly important where a young person may have committed suicide. 7. That age-appropriate and accessible mental health services and facilities be established, enhanced and adequately resourced for adolescents as part of an improved Mental Health Service.
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8. That all jurisdictions consider using a consistent national classification system for review of paediatric deaths.

Safe sleeping for infants

1. That a clear consistent message is used as part of the universal distribution of educational material concerning safe sleeping practices to all new parents. It is also recommended that further education packages are provided to parents highlighting the risks associated with parental use of illegal and prescribed drugs and co-sleeping. As highlighted in previous reports, it is also recommended that more effective forensic death scene examinations be undertaken to establish whether the cause of death is due to overlying¹.

Children and motor vehicles: travelling as passengers or external to vehicles

1. That the community continue to be alerted to risks associated with unsatisfactory restraint of children as passengers in moving vehicles and encouraged to ensure that all children are safely restrained with seatbelts when travelling in motor vehicles and preferably seated in the rear of the car.
2. That age, height and weight restrictions for children sitting in the front of a motor vehicle should be better defined and that children should not ride in motor vehicles as front seat passengers based on height/weight guidelines as well as age restrictions.
3. That recommendations from the Royal Children's Hospital (Melbourne)² be supported, stating that children should sit in the back seat of the car until they reach the age of 13 years and that a child should be taller than 145cm before transitioning out of a booster seat where they will need to pass a five-step test before they are big enough to use an adult seatbelt. The five-step test includes:
 - 3.1 Sit with their backs firmly against the seat back
 - 3.2 Bend knees comfortably over the front of the seat cushion
 - 3.3 Sit the sash belt across their mid-shoulder
 - 3.4 Sit with the lap belt across the top of their thighs
 - 3.5 Stay in this position for the whole car trip.
4. That children should not wear lap belts whilst travelling as passengers in a motor vehicle. As reported in previous years, the benefits of young children wearing harnesses with and without booster seats have been highlighted.
5. That drivers of vehicles must pay special attention to surroundings where there may be small children present when reversing vehicles especially on farms when farming equipment is being operated.

¹ Li, L., Zhang, Y., Zielke, R.R., Ping, Y., and Fowler, D.R. 2009. Observations on Increased Accidental Asphyxia Deaths in Infancy while Co-sleeping in the State of Maryland. *American Journal of Forensic Medical Pathology*. Vol.30, No.4, pp. 318-321.

² The Royal Children's Hospital Melbourne 2019. Car Seat safety: are Australian children safe? Viewed 15 May 2019, <https://www.rchpoll.org.au/polls/car-seat-safety-are-australian-children-safe/>.

	Children suffering from asthma 1. That a statewide protocol for children and young people with acute severe asthma be developed for Tasmania. 2. That Council supports the Coroner's recommendation that when administering salbutamol to children, it is important to ensure that the drug is administered correctly using a spacer. Guidance in this regard is available from chemists and Asthma Australia's website.
PERINATAL	NEONATAL DEATHS 1. As in previous years, smoking and other substance abuse remains an adverse risk factor in several neonatal deaths following extremely preterm birth. As always pregnant women should be encouraged to stop smoking cigarettes and taking other substances of abuse at all opportunities. 2. Evidence based endeavours to reduce the rate of preterm birth (e.g. the Australian Preterm Birth Prevention Alliance) and thus reduce perinatal morbidity and mortality, should be supported and funded. 3. Obstetric and Paediatric staff at all Tasmanian hospitals should complete the National Perinatal Death Clinical Audit Tool (NPDCAT), either electronically (now also possible via Obstetrix) or in hard copy, at the time of the hospital Mortality and Morbidity meetings. STILLBIRTHS 1. That all women be informed about options of aneuploidy screening by their primary health physicians and maternity providers and have access to early aneuploidy screening. 2. That fetal DNA screening is made affordable and supported by public funded health services in appropriate clinical settings. 3. That molecular karyotyping is offered routinely following the diagnosis of a morphologically abnormal pregnancy to aid in appropriate counselling of the parents. 4. That ongoing education be provided to all maternity care providers with regard to prenatal testing for fetal conditions. This should include the efficacy and latest recommendations for utilisation of pre-pregnancy screening for inherited conditions, combined first trimester aneuploidy screening, Non-Invasive Prenatal testing (NIPT), early ultrasound and invasive testing as well as the limitations of each test. Education should also include guidelines for referral to specialty services and/or genetic counselling. 5. That general practitioners be updated on the benefits of early referral for all pregnant women to antenatal services for triage, ideally by the end of the first trimester (14 weeks) to allow for appropriate time to start aspirin or institute cervical length screening in women who are at risk.

6. That women deemed at risk of premature labour are managed by a dedicated team using evidence-based strategies.
7. That all women are assessed for risk of preterm delivery at the time of morphology scanning with an appropriate measurement of cervical length.
8. That sonographers and radiologists are familiar with the guidelines for measuring cervical length appropriately.
9. That hospital funded NIPT should be offered to women who have a prior increased likelihood of Trisomy 21 based on maternal age (>40years) or past history.
10. That hospital funded NIPT should be offered as a second line screen for women who have a combined first trimester screen risk result for Trisomy between 1:50 and 1:250, or greater than background risk based on age. Women who have combined first trimester screen risk higher than 1:250 should be given the option of a diagnostic test (chorionic villous sampling or amniocentesis) rather than NIPT.
11. That patients considering NIPT as a second line screen should be appropriately counselled on the limitations of NIPT by a medical practitioner experienced in the management of high-risk pregnancies or a genetic counsellor.
12. Hospital funded NIPT should not be offered to women who have a fetus with a structural abnormality on ultrasound, Combined First Trimester Screening (cFTS) risk >1:50, nuchal translucency $\geq 3.5\text{mm}$, or extremes of biochemistry (PAPP-A < 0.2MoM, BHCG < 0.2MoM or >5MoM). For these women, diagnostic testing with chorionic villous sampling or amniocentesis should be recommended due to the increased likelihood of genetic anomalies not detectable by NIPT.
13. That women who test high risk for Trisomy 13 or 18 on cFTS should be referred to a medical practitioner experienced in the management of high-risk pregnancies or a genetic counsellor. Hospital funded NIPT may be offered on a case by case basis
14. That education is routinely made available to women and all maternity care providers regarding risks of stillbirths, and that caregivers discuss these risks with the women in their care.
15. That the optimal timing of delivery be individualised for women by their carers taking into account risk factors and the wishes of the individual woman.
16. That all providers are supported in provision of appropriate investigations for reduced fetal movements.
17. That all women who smoke during pregnancy are actively encouraged and supported to stop.
18. That there is ongoing research and funding to address maternal obesity and the risks it presents in pregnancy.
19. That COVID vaccination be administered to women during pregnancy and to women contemplating pregnancy since pregnant women have an increased risk of serious disease and deaths with COVID-19 infection and their babies are at increased risk of stillbirth and premature delivery.

	20. That every maternity hospital, public and private, should have a designated perinatal mortality and morbidity committee to review all perinatal deaths and provide information to COPMM as gazetted under Council's legislation. 21. That Obstetric and Paediatric staff at all Tasmanian hospitals should complete the NPDCAT, either electronically (now also possible via Obstetrix) or in hard copy, at the time of the hospital Mortality and Morbidity meetings.
MATERNAL	1. That engagement with appropriate antenatal care is undertaken soon after the diagnosis of pregnancy. 2. That perinatal mental health services in Tasmania be funded and supported adequately to ensure effective delivery to all women who require support. 3. That there is adequate investment and support for women with complex drug and alcohol presentations during pregnancy. 4. That all clinicians writing a Tasmanian death certificate determine whether the decedent had been pregnant in the preceding 12 months.

Executive Summary

The members of the *Council of Obstetric & Paediatric Mortality & Morbidity* (COPMM) are pleased to present the Annual Report for the calendar year 2019.

A key aim of the Council's Annual Report is to provide epidemiological information on the women who gave birth to liveborn or stillborn babies in 2019, and on their children. Data are derived from the Perinatal Data System with the source of data being the *ObstetrixTas* database that is supplemented where necessary by the Perinatal Data Collection Form that is completed by all maternity service providers in Tasmania.

The Annual Report includes the reports submitted by each committee of COPMM detailing relevant key trends arising during this year and recommendations based upon committee investigations and findings. Trends in reported perinatal and maternal statistics have been reported in Tasmania and compared with latest available national findings.

Key findings in the Annual Report for 2019 include:

Babies

- The number of live births recorded on the Perinatal Data System in 2019 was **5 704**, an increase of 224 (4.0 per cent) since 2018 (5 480). The total number of births including stillbirths was **5 736**.
- Males accounted for 52.1 per cent of livebirths and females 47.9 per cent.
- 54.3 per cent of babies were delivered by unassisted vaginal birth and 10.9 per cent delivered by instrumental birth.
- 34.8 per cent of babies were delivered via caesarean section (compared to 27.3 per cent in 2006).
- There were 83 episodes of multiple births, including 81 sets of twins and 2 sets of triplets.
- The proportion of low birth weight babies (less than 2 500 grams) in Tasmania was 7.5 per cent, which is higher than national figures reported in 2019 (i.e., 7.2 per cent).
- 8.9 per cent of deliveries were preterm (less than 37 weeks gestation) compared to national figures reported in 2019 of 8.6 per cent.

Mothers

- 71.3 per cent of mothers were public patients, 27.8 per cent were private patients and 0.9 per cent were home births.
- 52.7 per cent of mothers were aged over 30 years; 3.0 per cent of mothers were under the age of 20 years, a higher proportion than the national average of 1.9 per cent in 2019.
- 42.3 per cent of mothers had their first baby and 34.5 per cent had their second baby.
- 5.7 per cent of mothers were identified as Indigenous in Tasmania compared to 4.8 per cent nationally in 2019.
- Of all women who gave birth and had a caesarean section, 50.3 per cent were elective and 49.7 per cent were emergencies.
- 86.3 per cent of mothers were breastfeeding (including partially) at maternal discharge.

Antenatal factors

Smoking during pregnancy

- Smoking while pregnant was reported by 16.7 per cent of all mothers and 40.7 per cent of teenage mothers.
- The smoking rate was lower in the first 20 weeks of pregnancy (13.7 per cent) than after 20 weeks of pregnancy (15.5 per cent).
- 8.9 per cent of women who reported smoking during the first 20 weeks of pregnancy did not report smoking during the last 20 weeks.
- The proportion of Tasmanian women who reported that they had smoked tobacco during pregnancy has fallen significantly since 2010 (2010: 23.0%; 2019: 16.7%; $p<0.001$).
- In 2019, 16.7 per cent of Tasmanian women reported smoking whilst pregnant, which was similar to the 2018 figure of 17.2 per cent ($p=0.491$), with 13.9 per cent reporting to have smoked 10 cigarettes or fewer per day, 2.5 per cent reporting to have smoked more than 10 cigarettes daily and 0.3 per cent reporting to have smoked an unknown number of cigarettes daily.
- Maternal smoking continues to be more prevalent amongst younger women in Tasmania, particularly those aged less than 20 years. However, the proportion of maternal smokers in this age group has declined significantly ($p=0.041$) since 2015 from 50.8 per cent to 40.7 per cent in 2019, with the 2019 rate being statistically similar ($p=0.293$) to that reported for 2018 (46.3 per cent). The latter was also the case for each of the other age-groups, with the respective smoking rates for mothers remaining statistically similar to the previous year.
- The maternal smoking rate for public patients has remained unchanged since 2018 at 22.0 per cent, whilst the rate for private patients was similar to that for 2018 (2018: 1.9%; 2019: 2.1%; $p=0.716$).
- As reported in previous years, the significantly higher smoking rates amongst public patients when compared to private patients reflects the higher prevalence of smoking amongst lower socio-economic groups.
- In 2019, a total of 13.3 per cent of all women who had smoked in pregnancy had an LBW baby compared to 3.9 per cent of women who reported not to have smoked, a difference which is statistically significant ($p<0.001$). This figure representing the proportion of low birth weight babies in mothers who smoked remains a finding that continues to highlight the potential deleterious effects of smoking on birth weight. The relative risk of having an LBW baby in 2019 was 3.38 (95 per cent CI: 2.71, 4.22) in women who smoked in pregnancy compared with those who reported not to smoke.

Alcohol consumption

- 2.5 per cent of mothers reported that they had consumed alcohol during pregnancy, statistically significantly higher ($p=0.035$) than the 2018 figure of 1.9 per cent, but similar to the 2017 rate of 2.3 per cent ($p>0.05$), with the rate being the greatest for mothers aged over 35-39 years (4.4 per cent).
- The proportion of women aged 40 years and over who reported to have consumed alcohol during pregnancy has decreased from 3.6 per cent in 2018 to 0.6 per cent in 2019; however, the difference fell just short of being statistically significant ($p=0.051$). It is important to note that the decrease from 2018 to 2019 reversed the significant increase observed from 2017 to 2018, with the 2019 figure being similar to that for 2017 (1.0 per cent).

- For 2019, the proportion of mothers electing to be private patients who reported consumption of alcohol during pregnancy was, in contrast to previous years, similar to public patients (2.4 per cent vs. 2.5 per cent), and significantly higher than in the previous 4 years.
- From the data available in 2019, overall 2.5 per cent of Tasmanian women indicated that they had consumed alcohol during their pregnancy with 2.3 per cent reporting to have consumed one or fewer standard alcoholic drinks per day and 0.2 per cent reporting to have consumed more than one alcoholic drink per day.
- Maternal alcohol consumption remains generally higher for women aged 30-39 years, but no longer for mothers aged 40 years and over.
- For women aged under 20 years, 2.3 per cent reported consuming alcohol whilst pregnant in 2019, similar to the 2018 figure of 2.9 per cent.
- In 2019, a total of 13.6 per cent of all women who had consumed alcohol during pregnancy had a LBW baby compared to 5.3 per cent of women who reported not to have consumed alcohol, a difference which was statistically significant ($p < 0.001$). The relative risk of having an associated LBW baby in 2019 was 2.57 (95 per cent CI: 1.65, 4.01) in women who consumed alcohol in pregnancy compared to those who reported not having consumed alcohol. In this year, it was therefore clearly found that a strong association exists between maternal alcohol consumption and delivery of a LBW baby.

Antenatal visits

- 86.4 per cent of women attended at least one antenatal visit before 14 weeks gestation, although 4.0 per cent of women did not receive antenatal care until after 20 weeks.

Body Mass Index

- Based on self-reported height and weight at the first antenatal visit, over half (53.3 per cent) of the 5 651 women who gave birth in a Tasmanian facility in 2019 had a body mass index (BMI) in the overweight or obese range (25 and above) and one-quarter (27.0 per cent) had a BMI in the obese range (30 and over). It is noted however that these figures are lower than recorded in 2017-18 (based on measured height and weight) for Tasmanian women aged 18 years and over.

Vitamins

- Women who gave birth in a public hospital were the least likely to have taken an iodine supplement whilst pregnant (4.8 per cent). This proportion was significantly lower ($p < 0.001$) than for women who gave birth in a private hospital (11.9 per cent) or outside of hospital (28.0 per cent).
- It should be noted that multivitamins which potentially contain iodine, iron, folic acid and Vitamin D might not be reported by mothers, resulting in an under-estimate of the intake for each type of supplement.
- Higher numbers of women who gave birth in Tasmania in 2019 reported to have taken an iron supplement when pregnant compared to an iodine supplement, with 13.4 per cent overall reporting to have taken supplemental iron whilst pregnant, and the highest proportions reported amongst women who gave birth outside of hospital (88.0 per cent) or in a private facility (14.8 per cent).
- In 2019, 17.8 per cent of women reported to have taken Vitamin D supplements whilst pregnant, with the highest level of maternal Vitamin D supplementation reported amongst women giving birth outside

of hospital (24.0 per cent), compared with 19.9 per cent for women giving birth in a private facility and 16.5 per cent of women who gave birth in a public facility.

- A significant number of mothers (65.5 per cent) in 2019 reported not taking folic acid supplements at some point during pregnancy or pre-conceptually, with mothers who gave birth in a public facility or outside of hospital found to be less likely to take folic acid, while mothers giving birth in a private facility were the most likely.
- Of mothers who did take a folic acid supplement at some point during pregnancy, a significantly lower ($p < 0.001$) proportion of those who gave birth in a public setting reported taking folic acid both pre- and post-conceptually (7.9 per cent), compared to 39.7 per cent of mothers who gave birth in a private facility.

Perinatal and paediatric deaths at a glance

Table 1: Perinatal and paediatric deaths at a glance

Classification	Total number for 2019 (5 736)	Tasmanian rate per 1 000 ^(a) in 2019
Perinatal mortality	42	7.3
Stillbirths	32	5.6
Neonatal deaths	10	1.8
Total infant mortality (from birth to 1 year)	17	3.0
Non-neonatal infant mortality (>28 days post-delivery to 1 year)	7	1.2
Paediatric mortality	16	0.14 per 1 000 children ^(b)

(a) Stillbirths and perinatal mortality rates were calculated using all births. Neonatal death rate and infant mortality rates were calculated using all live births.

(b) Australian Bureau of Statistics estimates no. of children <18 years in Tasmania to be 112 482 in June 2019 (Australian Bureau of Statistics 2011–2020, Australian Demographic Statistics, 'Table 56 Estimated Resident Population by Single Year of Age, Tasmania', time series spreadsheet, cat. no. 3101.0, viewed 31 May 2021, [<https://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/3101.0Main+Features1Jun%2020?OpenDocument>]). Thus, Paediatric Mortality is calculated by total deaths (>28 days and <18 years) divided by estimated total no. of children in Tasmania under 18 years of age and multiplied by 1 000.

Perinatal deaths

The *Perinatal Mortality and Morbidity Committee* reviewed 42 deaths in 2019. Ten of these deaths were neonatal deaths (liveborn infants who did not live beyond 28 days of age) and thirty-two were stillbirths. The overall perinatal mortality rate was 7.3 per 1 000 births. The neonatal mortality rate was 1.8 per 1 000 live births, with a stillbirth rate of 5.6 per 1 000 births.

In Tasmania, the perinatal mortality rate in 2019 was lower than the previous year and the reported national rate for 2019. In 2019, the national stillbirth rate was 7.2 per 1 000 births; the neonatal death rate was 2.2 per 1 000 live births; and the perinatal death rate was 9.4 per 1 000 births.

The neonatal mortality rate of 1.8 per 1 000 live births reported in Tasmania in 2019 was the lowest rate reported for Tasmania since 2010, and lower than the reported national rate for 2019.

The stillbirth rate of 5.6 per 1 000 births reported in Tasmania in 2019 was lower than the rate reported for Tasmania in 2018 (6.5 per 1 000 births), and also lower than the 2019 national rate.

Full recommendations arising from the review of perinatal deaths from this year are outlined within the *COPMM Key Recommendations*.

Paediatric deaths

The *Paediatric Mortality and Morbidity Committee* noted that the number of paediatric deaths in Tasmania in 2019 was 16 (with an estimated paediatric mortality rate of 0.14 per 1 000 persons aged 0-17 years). This rate was significantly lower ($p < 0.001$) than the 2019 national paediatric mortality rate (estimated to be 0.31 per 1 000 persons aged 0-17 years).

The number of paediatric deaths in Tasmania reported in 2019 was significantly lower than reported over the last decade despite evidence of a slight (non-significant) rise in rate since 2018 (from 8.9 to 14.2 per 1 000 population).

It is concerning that one of the paediatric death cases was associated with injuries arising from self-harm. The recommendations outlined previously in relation to youth suicide continue to be supported and are again reiterated in this report.

The cases of unexplained infant deaths associated with risk factors in this year highlights the need to continue to ensure that all parents and the community receive a consistent message about safe sleeping. The dangers of co-sleeping and bed-sharing with adults must be highlighted in education and messaging.

Council recommendations based on the reported paediatric death cases in 2019 are highlighted within the *COPMM Key Recommendations*.

Maternal deaths

There was one **late maternal death-indirect** reported in Tasmania in 2019.

Council recommendations from previous years remain relevant and are reiterated within the *COPMM Key Recommendations*.

Data collection and reporting

ObstetrixTas continues to provide users from all public maternity hospitals throughout Tasmania with an electronic system for perinatal data entry and extraction. Council continues to encourage the refinement of this system to better assist its data extraction for review and classification processes.

The public and public contracted private hospitals advised that the smoking status and pattern collected at the time of labour onset/admission or after the birth occurs was inaccurate in some records from 2011. Statewide agreement has been sought from those hospitals to use the smoking information collected from antenatal visits for reporting. Therefore, the smoking figures have been updated retrospectively and differ from the figures published in the previous reports.

The NPDCAT continues to be the preferred form to use to collect detailed information on reported stillbirths and neonatal deaths. Council has discovered that the forms that have been integrated into *ObstetrixTas* system are unfortunately out-of-date and not consistent with the NPDCAT forms currently used. All Tasmanian hospitals (including all public and North West Private Hospital) are now familiar in the use of this tool to complete details around reported perinatal deaths where Council urges that only the attending medical practitioner/specialist completes the NPDCAT in respect to their reported perinatal mortality case. Council also urges participating hospitals to undertake data corrections in a timely manner in order to allow auditing of data to proceed efficiently to enable COPMM reporting to be achieved in a

timely manner. This form and other relevant forms can be accessed via COPMM's website (https://www.health.tas.gov.au/about_the_department/partnerships/registration_boards/copmm).

The Committee also continues to discuss key issues regarding the preparation and structure of this and future Annual Reports. Membership on this committee includes representatives from the areas of obstetrics, paediatrics, midwifery, Chair of COPMM and representatives from Health Information Team and Epidemiology Unit, DoH.

Dr Michelle Williams

Chairperson – Council of Obstetric and Paediatric Mortality and Morbidity

Disclaimer:

During the production of this report data anomalies may have arisen, however processes such as the undertaking of regular data audits have been established to minimise these anomalies.

Feedback:

A Feedback Form is provided at the end of this report inviting comments from readers on information presented. Please forward to the Executive, Clinical Quality, Regulation and Accreditation, Level 2, 22 Elizabeth Street, Hobart 7000. (Phone: 6166 1052).

Acknowledgments

The production of this Report relies on the assistance, willing co-operation and on-going support of numerous individuals and professional groups, which include:

- Members of the *Council of Obstetric and Paediatric Mortality and Morbidity*, and its committees (*Paediatric Mortality and Morbidity*, *Maternal Mortality and Morbidity*, *Perinatal Mortality and Morbidity* and *Data Management*);
- The Department of Health Tasmania (DoH) for its commitment to, and funding of, COPMM and its activities;
- Clinical Governance, Clinical Quality, Regulation and Accreditation, DoH;
- Obstetricians, Paediatricians and Midwives working in all parts of Tasmania;
- The State Coroner's Office and Staff;
- Statewide Forensic Medical Services;
- Office of Commissioner for Children and Young People (CCYP) Tasmania;
- The Australian Bureau of Statistics;
- Births, Deaths and Marriages;
- Health Information, Policy, Purchasing, Performance and Reform Group, DoH;
- Epidemiology Unit, Policy, Purchasing, Performance and Reform Group, DoH;
- Legal Services, DoH;
- Communications Unit, DoH;
- Neonatal Services;
- Medical Record Departments and staff in all Tasmanian hospitals;
- Royal Hobart Hospital;
- Launceston General Hospital;
- North West Private Hospital;
- Mersey Community Hospital;
- North Eastern Soldiers Memorial Hospital (Scottsdale);
- Smithton District Hospital;
- Hobart Private Hospital;
- Calvary Healthcare - Lenah Valley Campus;
- Australian and New Zealand Child Death Review and Prevention Group (ANZCDR&PG);
- Royal Automobile Club of Tasmania (RACT); and
- Tasmanian Health Service.

Obstetric and Paediatric Mortality and Morbidity Act 1994

The *Obstetric and Paediatric Mortality and Morbidity Act 1994* (the Act) establishes the Council of Obstetric & Paediatric Mortality & Morbidity (the Council). The functions of the Council include the maintenance of a perinatal data collection system, investigating the circumstances surrounding maternal deaths, perinatal deaths and the deaths of children up to 17 years; and investigating and reporting on matters relating to obstetric and paediatric mortality and morbidity referred to it by the Minister or Secretary.

The Act contains very strict confidentiality provisions such that the Council and its members are precluded from providing information to other persons except in very limited circumstances. Following its recent Amendment, the Act also enables the Council to:

- communicate to a coroner information relevant to a coronial inquiry or possible coronial inquiry into the death of a child or woman, of its own motion or at the request of the coroner;
- investigate and report to the Secretary or Minister (or any other relevant Minister) on any matter relating to obstetric and paediatric mortality and morbidity of its own motion without a reference from the Secretary or Minister;
- communicate information regarding identified deaths or morbidities to the Secretary, a relevant Minister or a prescribed body;
- have the power to place a restriction upon the subsequent use of any information or reports provided by the Council to a coroner, the Secretary, a Minister or a prescribed body;
- communicate information that comes into its possession to the Secretary where there is a belief or suspicion, on reasonable grounds, that a child has been or is being abused or neglected or is at risk of being abused or neglected;
- allow the Council to report information about possible criminal offences to the Commissioner of Police; and
- clarify the annual reporting requirements of the Council.

Definitions used by the Council

Abortion / Miscarriage: Spontaneous or medically induced termination of pregnancy before the fetus is viable (before 20 weeks gestation)

Birthweight:

Low birthweight: An infant born weighing less than 2 500 grams

Very low birthweight: An infant born weighing less than 1 500 grams

Extremely low birthweight: An infant born weighing less than 1 000 grams

Infant death: A death, occurring within 1 year of birth in a liveborn infant of at least 20 weeks gestation, or birthweight at least 400 grams.

Late maternal death: means the death of a woman more than 42 days but less than one year after the cessation of pregnancy:

- (a) resulting from an obstetric cause or another cause aggravated by an obstetric cause; and
- (b) irrespective of the duration of the pregnancy and the location of the fetus within the woman's body.

Maternal death: Death of a woman while pregnant or within 42 days after the cessation of pregnancy:

- (a) from any cause related to, or aggravated by, the pregnancy or its management; and
- (b) irrespective of the duration of the pregnancy and the location of the fetus within the woman's body.

Neonatal death: A death occurring within 28 days of birth in an infant born after at least 20 weeks of gestation, or birthweight at least 400 grams.

Paediatric death: A death, occurring in the age group from 29 days to 17 years (inclusive).

Perinatal death: A death fulfilling the definition of either a stillbirth or neonatal death.

Preterm: An infant with a gestational age of less than 37 completed weeks.

Stillbirth: A fetal death prior to the complete expulsion or extraction from its mother of a product of conception of 20 or more completed weeks of gestation or 400 grams or more birthweight; the death is indicated by the fact that after such separation the fetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles.³

Sudden Infant Death Syndrome (SIDS): Sudden death of an infant under 1 year of age, which remains unexplained after a thorough case investigation including performance of a complete autopsy, examination of the death scene, and a review of the clinical history.⁴

³ Australian Institute of Health and Welfare 2020. Stillbirth (fetal death), Canberra. Viewed 28 June 2021, <https://meteor.aihw.gov.au/content/index.phtml/itemId/733271>.

⁴ Willinger, M., James, L.S. & Catz, C 1991. Defining the Sudden Infant Death Syndrome (SIDS): Deliberations of an Expert Panel convened by the National Institute of Child Health & Human Development. Paediatric Pathology 11:667-684, 1991.

Sudden Unexpected Death in Infancy (SUDI): The death of an infant less than 12 months of age where the cause was not immediately apparent at the time of death. This definition excludes infants who die unexpectedly in misadventures due to external injury (such as transport incidents) and accidental drowning⁵.

Supplementary definition⁶

Maternal death:

Direct maternal death: This includes death of the mother resulting from obstetrical complications of pregnancy, labour, or the puerperium, and from interventions, omissions, incorrect treatment, or a chain of events resulting from any of these factors. An example is maternal death from exsanguination resulting from rupture of the uterus.

Indirect maternal death: This includes a maternal death not directly due to obstetrical causes, but resulting from previously existing disease, or a disease that developed during pregnancy, labour, or the puerperium, but which was aggravated by maternal physiological adaptation to pregnancy. An example is maternal death from complications of mitral stenosis.

Non-maternal (incidental) death: Death of the mother resulting from accidental or incidental causes in no way related to the pregnancy may be classified as a non-maternal death. An example is death from an automobile accident.

Maternal hypertension: Maternal blood pressure of > 140/90 mmHg.

Antepartum haemorrhage (APH): Refers to uterine bleeding after 20 weeks of gestation unrelated to labour and delivery.

Postpartum haemorrhage (PPH): Estimated blood loss of ≥ 500 ml after vaginal birth or $\geq 1\,000$ ml after caesarean delivery.

⁵ NSW Government Health 2019. Policy Directive #PD2019_035: *Death-Management of Sudden Unexpected Death in Infancy*. Viewed 2 July 2021, https://www1.health.nsw.gov.au/pds/ActivePDSDocuments/PD2019_035.pdf.

⁶ Definitions derived from 'Williams Obstetrics – 20th edition' by Cunningham MacDonald Gant Leveno Gilstrap Hankins Clark; Copyright 1997 & www.uptodate.com, viewed August 2008.

Members of the Council of Obstetric & Paediatric Mortality & Morbidity

Organisation	Membership as of June 2019	Current Membership as of June 2021 ^(a)
Person nominated by the Secretary employed in delivery of Neonatal Services	Prof Peter Dargaville	Prof Peter Dargaville
Nominee of the Paediatrics and Child Health Division of the Royal Australasian College of Physicians nominated by the Tasmanian State Committee of that College	Dr Michelle Williams (Chair)	Dr Michelle Williams (Chair)
Nominees of the University of Tasmania (2)	Assoc. Prof Amanda Dennis Dr Anagha Jayakar	Assoc. Prof Amanda Dennis Dr Anagha Jayakar
Nominee of the Tasmanian Regional Committee of the Royal Australian and NZ College of Obstetricians and Gynaecologists	Dr Tania Hingston	Dr Tania Hingston
Person nominated by the Secretary employed in the Department of Health	Dr Scott McKeown	Dr Scott McKeown
Nominee of the Tasmanian Branch of the Royal Australian College of General Practitioners	Dr Jillian Camier	Dr Jillian Camier
Nominee of the Tasmanian Branch of the Australian College of Midwives Inc.	Ms Sue McBeath	Ms Sue McBeath
Additional member nominated by Council to represent community interests	Ms Kate Cuthbertson Vacant - Commissioner for Children	Ms Kate Cuthbertson Ms Leanne McLean - Commissioner for Children & Young People (CCYP)

(a) Please note that the 3-year term (2019-2022) commenced in May 2019 with new membership reflected under "current membership".

Members of Committees and Support Services

Name of Committee	Membership as of June 2019	Current Membership as of June 2021
Maternal Mortality & Morbidity Committee	Assoc. Prof Amanda Dennis (Chair) Dr Tania Hingston Ms Sue McBeath Dr Kristine Barnden Dr Jill Camier Dr Jo Jordan (Manager, COPMM)	Assoc. Prof Amanda Dennis (Chair) Dr Tania Hingston Ms Sue McBeath Dr Kristine Barnden Dr Jill Camier Dr Jo Jordan (Manager, COPMM)
Paediatric Mortality & Morbidity Committee	Dr Michelle Williams (Chair) Dr Anagha Jayakar Dr Chris Lawrence Dr Jillian Camier Dr Chris Williams CCYP - Vacant Dr Jo Jordan (Manager, COPMM)	Dr Michelle Williams (Chair) Dr Anagha Jayakar Dr Don Ritchey Dr Jillian Camier Dr Chris Williams CCYP – Ms Leanne McLean Dr Andrew Reid Dr Jo Jordan (Manager, COPMM)
Perinatal Mortality & Morbidity Committee	Prof Peter Dargaville (Chair) Dr Tony De Paoli Dr Tania Hingston Assoc. Prof Amanda Dennis Ms Sue McBeath Dr Kristine Barnden Dr Jillian Camier Dr Jo Jordan (Manager, COPMM)	Prof Peter Dargaville (Chair) Dr Tony De Paoli Dr Tania Hingston Assoc. Prof Amanda Dennis Ms Sue McBeath Dr Kristine Barnden Dr Jillian Camier Dr Jo Jordan (Manager, COPMM)
Data Management Committee	Prof Peter Dargaville (Chair) Dr Tania Hingston (RANZCOG rep) Dr Michelle Williams (RACP-Paediatric Rep) Mr Michael Long (Epidemiology Unit) Dr Scott McKeown (DoH rep) Mr Peter Mansfield (Health Information) Ms Peggy Tsang (Health Information) Dr Jo Jordan (Manager, COPMM)	Prof Peter Dargaville (Chair) Dr Tania Hingston (RANZCOG rep) Dr Michelle Williams (RACP-Paediatric Rep) Dr Scott McKeown (DoH rep) Mr Michael Long (Epidemiology Unit) Mr Peter Mansfield (Health Information) Ms Peggy Tsang (Health Information) Dr Jo Jordan (Manager, COPMM)
National Perinatal Data Development Committee	Mr Peter Mansfield	Mr Peter Mansfield
Executive	Dr Jo Jordan	Dr Jo Jordan
Support staff	Ms Peggy Tsang (Health Information) Mr Michael Long (Epidemiology Unit) Mr Peter Mansfield (Health Information) Ms Cynthia Rogers (Health Information)	Ms Peggy Tsang (Health Information) Mr Michael Long (Epidemiology Unit) Mr Peter Mansfield (Health Information) Ms Cynthia Rogers (Health Information)

Compilation of this 2019 Annual Report by:

Executive support staff:

Dr Jo Jordan (Clinical Quality, Regulation & Accreditation, Clinical Governance, DoH)

Ms Peggy Tsang, Mr Peter Mansfield and Ms Cynthia Rogers (Health Information Team, PPR-Monitoring, Reporting & Analysis, DoH)

Mr Michael Long (Epidemiology Unit, PPR-Monitoring, Reporting & Analysis, DoH)

Committee reports

Perinatal Mortality & Morbidity Committee

The Australian Bureau of Statistics definition of perinatal deaths includes all infants (both live and stillborn) who had a gestational age of at least 20 weeks, or birth weight of at least 400 grams.

There were **42** perinatal deaths reported in Tasmania in 2019. Ten of these deaths were neonatal deaths (liveborn infants who did not live beyond 28 days of age) and thirty-two were stillbirths. The overall perinatal mortality rate was 7.3 per 1 000 births. The neonatal mortality rate was 1.8 per 1 000 live births, with a stillbirth rate of 5.6 per 1 000 births.

The Perinatal Society of Australia and New Zealand (PSANZ) Perinatal Mortality Classification System has been updated from version 2.2⁷ to version 3.4⁸ in 2019. Table 2 shows the classification of perinatal deaths from 2015-2018 using version 2.2 and the classification perinatal deaths in 2019 using version 3.4.

⁷ Flenady V, King J, Charles A, Gardener G, Ellwood D, Day K, McCowan L, Kent A, Tudehope D, Richardson R, Conway L, Chan A, Haslam R, Khong Y for the Perinatal Society of Australia and New Zealand (PSANZ) Perinatal Mortality Group 2009. PSANZ Clinical Practice Guideline for Perinatal Mortality. Version 2.2 April 2009. Viewed 30 June 2021, <https://sanda.psanz.com.au/assets/Uploads/Section-7-Version-2.2-April-2009.pdf>.

⁸ Flenady V, Oats J, Gardener G, Masson Vicki, McCowan Lesley, Kent A, Tudehope David, Middleton P, Donnelly N, Boyle F, Horey D, Ellwood D, Gordon A, Sinclair L, Humphrey M, Zuccollo J, Dahlstrom J, Mahomed K, Henry S, Khong Y for the PSANZ Care around the time of stillbirth and neonatal death guidelines group 2020. Clinical Practice Guideline for Care Around Stillbirth and Neonatal Death. Version 3.4, NHMRC Centre of Research Excellence in Stillbirth. Brisbane, Australia, January 2020. Viewed 30 June 2021, <https://stillbirthcre.org.au/wp-content/uploads/2021/03/Clinical-Practice-Guidelines-for-Care-Around-Stillbirth-and-Neonatal-Death2-2.pdf>.

Table 2: Number of perinatal deaths by PSANZ perinatal mortality classification 2015-2019^(a)

Perinatal mortality classification (V2.2)	2015	2016	2017	2018	Perinatal mortality classification (V3.4)	2019
1 Congenital anomaly	10+9	20+6	5+9	14+5	1 Congenital anomaly	5+2
2 Perinatal infection	3+0	2+1	1+0	1+1	2 Perinatal infection	0+0
3 Hypertension	1+1	1+1	0+1	1+1	3 Hypertension	3+0
4 Antepartum haemorrhage (APH)	2+3	0+1	3+0	3+3	4 Antepartum haemorrhage (APH)	1+0
5 Maternal conditions	1+0	2+1	0+0	0+0	5 Maternal conditions	2+0
6 Specific perinatal conditions	5+0	2+1	0+1	4+3	6 Complications of multiple pregnancy	1+1
					7 Specific perinatal conditions	2+0
7 Hypoxic peripartum death	0+3	2+0	0+0	0+0	8 Hypoxic peripartum death	1+2
8 Fetal Growth Restriction (FGR)	4+0	4+0	6+1	2+0	9 Placental dysfunction or causative placental pathology	2+1
9 Spontaneous preterm	0+7	3+8	7+4	8+4	10 Spontaneous preterm labour or rupture of membranes	8+4
10 Unexplained antepartum deaths	7+0	7+0	7+0	3+0	11 Unexplained antepartum fetal death	3+0
11 No obstetric antecedent	0+0	0+0	0+0	0+0	12 Neonatal death without obstetric antecedent	0+0
Not classified due to insufficient information	1+0	-	2+0	-	Not classified due to insufficient information	4+0
Total	57	62	47	53		42

(a) The + symbol indicates stillbirths plus neonatal deaths

Basic information on stillbirths for 2019

There were **32** stillbirths for 2019 which was slightly lower than 36 stillbirths reported in the previous year. Over half of these occur in the 20-24-week gestational period. Many of these at 20 to 24 weeks gestation are associated with significant or lethal fetal malformations. The tables below show the breakdown by 1) gestation, 2) the PSANZ Perinatal Mortality Classification used nationally, and 3) by gestation and PSANZ Perinatal Mortality Classification together.

Table 3: Gestation of stillbirth 2011-2019

Gestation (weeks)	2011 %	2012 %	2013 %	2014 %	2015 %	2016 %	2017 %	2018 %	2019	
									%	Number
20-27	61.8	64.4	71.4	55.1	61.8	65.1	67.7	72.2	59.4	19
28-31	14.7	13.3	4.8	4.1	26.5	16.3	6.5	8.3	12.5	4
32-36	5.9	13.3	7.1	22.4	8.8	7.0	3.2	11.1	18.8	6
37-41	17.6	8.9	14.3	18.4	2.9	4.7	16.1	8.3	9.4	3
42 and over	0.0	0.0	2.4	0.0	0.0	7.0	6.5	0.0	0.0	0

Table 4: Stillbirths reported by gestation period and PSANZ perinatal mortality classification 2019

Perinatal mortality classification V3.4	20-27 weeks	28-31 weeks	32-36 weeks	37-41 weeks	42 weeks and over
	Number (rates per 1 000 births in the reference category)				
1 Congenital anomaly	4 (83.3)	0 (0)	1 (2.4)	0 (0)	0 (0)
2 Perinatal infection	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
3 Hypertension	0 (0)	2 (43.5)	1 (2.4)	0 (0)	0 (0)
4 Antepartum haemorrhage (APH)	1 (20.8)	0 (0)	0 (0)	0 (0)	0 (0)
5 Maternal conditions	0 (0)	0 (0)	1 (2.4)	1 (0.2)	0 (0)
6 Complications of multiple pregnancy	0 (0)	1 (21.7)	0 (0)	0 (0)	0 (0)
7 Specific perinatal conditions	1 (20.8)	0 (0)	1 (2.4)	0 (0)	0 (0)
8 Hypoxic peripartum death	0 (0)	0 (0)	0 (0)	1 (0.2)	0 (0)
9 Placental dysfunction or causative placental pathology	2 (41.7)	0 (0)	0 (0)	0 (0)	0 (0)
10 Spontaneous preterm labour or rupture of membranes	8 (166.7)	0 (0)	0 (0)	0 (0)	0 (0)
11 Unexplained antepartum fetal death	0 (0)	0 (0)	2 (4.8)	1 (0.2)	0 (0)
12 Neonatal death without obstetric antecedent	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Not classified due to insufficient information	4 (83.3)	0 (0)	1 (2.4)	0 (0)	0 (0)
Total number of stillbirths	19 (395.8)	4 (87)	6 (14.4)	3 (0.6)	0 (0)
Total number of babies	48	46	418	5 209	15

The data in Table 4 indicate that congenital abnormalities are more likely to contribute to stillbirth in the 20-27-week gestational period than at later gestations. With morphology scans performed at 18-20-week gestation, this is to be expected as diagnosis of fetal anomaly such as spina bifida and hydrocephalus may not be made until this time. Such congenital anomalies require expert review by fetal maternal specialists or other specialists (neonatologists, paediatric cardiologists and neurosurgeons) for adequate assessment and prognosis. Some of these cases are associated with stillbirth at later gestations. Where possible, investigations for congenital abnormalities should be offered to all pregnant women in first and early second trimester pregnancy followed by timely morphology scan in attempt to reduce the rate of late diagnosis of lethal anomalies (e.g., trisomy 18) at late gestations of pregnancy.

Table 4 shows that during the early stages of pregnancy, particularly 20-27 weeks gestation, there is also a high rate of stillbirths attributed to spontaneous preterm labour and unexplained antepartum deaths. As such, it is important to determine how many of these cases have been investigated further.

Table 5: Stillbirths by PSANZ perinatal mortality classification 2011-2019

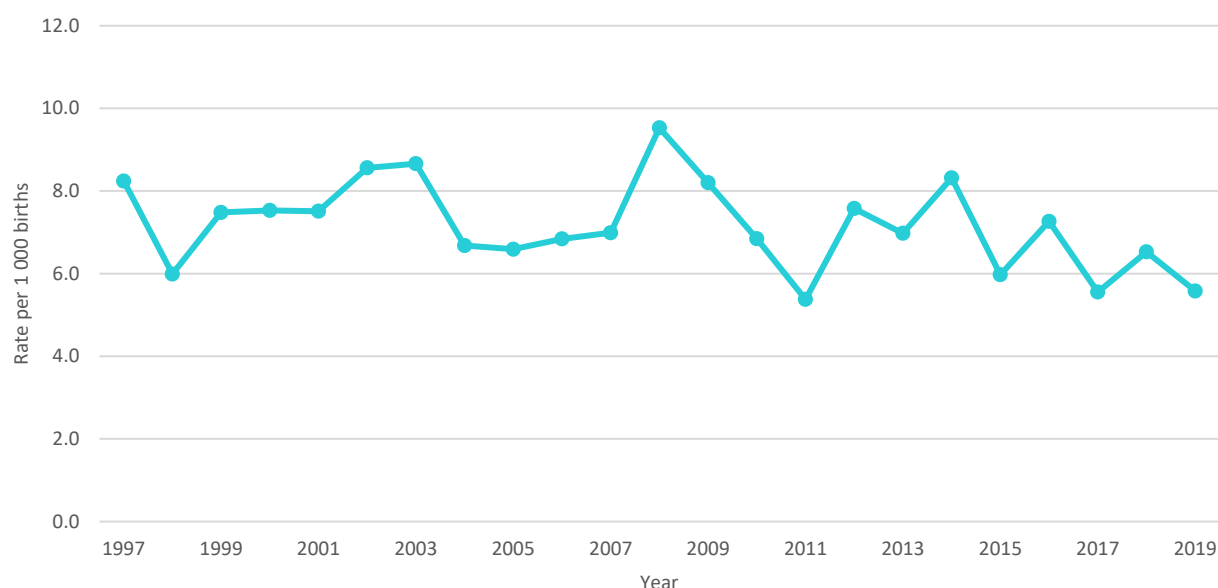
Perinatal mortality classification (V2.2)	2015 %	2016 %	2017 %	2018 %	Perinatal mortality classification (V3.4)	2019	
						%	Number
1 Congenital anomaly	29.4	46.5	16.1	38.9	1 Congenital anomaly	15.6	5
2 Perinatal infection	8.8	4.7	3.2	2.8	2 Perinatal infection	0.0	0
3 Hypertension	2.9	2.3	0.0	2.8	3 Hypertension	9.4	3
4 Antepartum haemorrhage	5.9	0.0	9.7	8.3	4 Antepartum haemorrhage (APH)	3.1	1
5 Maternal conditions	2.9	4.7	0.0	0.0	5 Maternal conditions	6.3	2
6 Specific perinatal conditions	14.7	4.7	0.0	11.1	6 Complications of multiple pregnancy	3.1	1
					7 Specific perinatal conditions	6.3	2
7 Hypoxic peripartum death	0.0	4.7	0.0	0.0	8 Hypoxic peripartum death	3.1	1
8 Fetal growth restriction (FGR)	11.8	9.3	19.4	5.6	9 Placental dysfunction or causative placental pathology	6.3	2
9 Spontaneous preterm labour	0.0	7.0	22.6	22.2	10 Spontaneous preterm labour or rupture of membranes	25.0	8
10 Unexplained antepartum deaths	20.6	16.3	22.6	8.3	11 Unexplained antepartum fetal death	9.4	3
11 No obstetric antecedent	0.0	0.0	0.0	0.0	12 Neonatal death without obstetric antecedent	0.0	0
Not classified due to insufficient information	2.9	0.0	6.5	0.0	Not classified due to insufficient information	12.5*	4

*COPMM seeks to encourage primary carers to submit completed NPDCATs to improve the case classification process

Over the period of 1997 to 2019 the stillbirth rate has dropped from 8.2 to 5.6 per 1 000 births, corresponding to a non-statistically significant average annual decrease of 0.86 per cent ($p=0.074$).

Table 6: Number of stillbirths and stillbirth rate per 1 000 births 1997-2019

Year	Number	Births	Rate per 1 000 births
1997	52	6 309	8.2
1998	37	6 171	6.0
1999	46	6 145	7.5
2000	45	5 975	7.5
2001	43	5 726	7.5
2002	49	5 714	8.6
2003	48	5 545	8.7
2004	37	5 540	6.7
2005	42	5 965	6.6
2006	45	6 184	6.8
2007	46	6 337	7.0
2008	60	6 461	9.5
2009	56	6 381	8.2
2010	42	6 137	6.8
2011	34	6 323	5.4
2012	45	5 940	7.6
2013	42	6 021	7.0
2014	49	5 892	8.3
2015	34	5 693	6.0
2016	43	5 920	7.3
2017	31	5 581	5.6
2018	36	5 516	6.5
2019	32	5 736	5.6

Figure 1: Stillbirth rate per 1 000 births for Tasmania 1997-2019

Recommendations

1. That all women be informed about options of aneuploidy screening by their primary health physicians and maternity providers and have access to early aneuploidy screening.
2. That fetal DNA screening is made affordable and supported by public funded health services in appropriate clinical settings.
3. That molecular karyotyping is offered routinely following the diagnosis of a morphologically abnormal pregnancy to aid in appropriate counselling of the parents.
4. That ongoing education be provided to all maternity care providers with regard to prenatal testing for fetal conditions. (This should include the efficacy and latest recommendations for utilisation of pre-pregnancy screening for inherited conditions, combined first trimester aneuploidy screening, Non-Invasive Prenatal testing (NIPT), early ultrasound and invasive testing as well as the limitations of each test. Education should also include guidelines for referral to specialty services and/or genetic counselling).
5. That general practitioners be updated on the benefits of early referral for all pregnant women to antenatal services for triage, ideally by the end of the first trimester (14 weeks) to allow for appropriate time to start aspirin or institute cervical length screening in women who are at risk.
6. That women deemed at risk of premature labour are managed by a dedicated team using evidence-based strategies.
7. That all women are assessed for risk of preterm delivery at the time of morphology scanning with an appropriate measurement of cervical length.
8. That sonographers and radiologists are familiar with the guidelines for measuring cervical length appropriately.
9. That hospital funded NIPT should be offered to women who have a prior increased likelihood of Trisomy 21 based on maternal age (>40years) or past history.

10. That hospital funded NIPT should be offered as a second line screen for women who have a combined first trimester screen risk result for Trisomy between 1:50 and 1:250, or greater than background risk based on age. Women who have combined first trimester screen risk higher than 1:250 should be given the option of a diagnostic test (chorionic villous sampling or amniocentesis) rather than NIPT.
11. That patients considering NIPT as a second line screen should be appropriately counselled on the limitations of NIPT by a medical practitioner experienced in the management of high-risk pregnancies or a genetic counsellor.
12. Hospital funded NIPT should not be offered to women who have a fetus with a structural abnormality on ultrasound, Combined First Trimester Screening (cFTS) risk $>1:50$, nuchal translucency $\geq 3.5\text{mm}$, or extremes of biochemistry (PAPP-A $< 0.2\text{MoM}$, BHCG $< 0.2\text{MoM}$ or $>5\text{MoM}$). For these women, diagnostic testing with chorionic villous sampling or amniocentesis should be recommended due to the increased likelihood of genetic anomalies not detectable by NIPT.
13. That women who test high risk for Trisomy 13 or 18 on cFTS should be referred to a medical practitioner experienced in the management of high-risk pregnancies or a genetic counsellor. Hospital funded NIPT may be offered on a case by case basis.
14. That education is routinely made available to women and all maternity care providers regarding risks of stillbirths, and that caregivers discuss these risks with the women in their care.
15. That the optimal timing of delivery be individualised for women by their carers taking into account risk factors and the wishes of the individual woman.
16. That all providers are supported in provision of appropriate investigations for reduced fetal movements.
17. That all women who smoke during pregnancy are actively encouraged and supported to stop.
18. That there is ongoing research and funding to address maternal obesity and the risks it presents in pregnancy.
19. That COVID vaccination be administered to women during pregnancy and to women contemplating pregnancy since pregnant women have an increased risk of serious disease and deaths with COVID-19 infection and their babies are at increased risk of stillbirth and premature delivery.
20. That every maternity hospital, public and private, should have a designated perinatal mortality and morbidity committee to review all perinatal deaths and provide information to COPMM as gazetted under Council's legislation.
21. That Obstetric and Paediatric staff at all Tasmanian hospitals should complete the NPDCAT, either electronically (now also possible via Obstetrix) or in hard copy, at the time of the hospital Mortality and Morbidity meetings.

Basic information on neonatal deaths for 2019

There was a total of **10** neonatal deaths.

Table 7: Neonatal deaths by PSANZ perinatal mortality classification 2015-2019

Perinatal mortality classification (V2.2)	2015 %	2016 %	2017 %	2018 %	Perinatal mortality classification (V3.4)	2019	
						%	Number
1 Congenital anomaly	39.1	31.6	56.3	29.4	1 Congenital anomaly	20.0	2
2 Perinatal infection	0.0	5.3	0.0	5.9	2 Perinatal infection	0.0	0
3 Hypertension	4.3	5.3	6.3	5.9	3 Hypertension	0.0	0
4 Antepartum haemorrhage	13.0	5.3	0.0	17.6	4 Antepartum haemorrhage (APH)	0.0	0
5 Maternal conditions	0.0	5.3	0.0	0.0	5 Maternal conditions	0.0	0
6 Specific perinatal conditions	0.0	5.3	6.3	17.6	6 Complications of multiple pregnancy	10.0	1
					7 Specific perinatal conditions	0.0	0
7 Hypoxic peripartum death	13.0	0.0	0.0	0.0	8 Hypoxic peripartum death	20.0	2
8 Fetal growth restriction (FGR)	0.0	0.0	6.3	0.0	9 Placental dysfunction or causative placental pathology	10.0	1
9 Spontaneous preterm labour	30.4	42.1	25.0	23.5	10 Spontaneous preterm labour or rupture of membranes	40.0	4
10 Unexplained antepartum deaths	0.0	0.0	0.0	0.0	11 Unexplained antepartum fetal death	0.0	0
11 No obstetric antecedent	0.0	0.0	0.0	0.0	12 Neonatal death without obstetric antecedent	0.0	0
Not classified due to insufficient information	13.0	0.0	0.0	0.0	Not classified due to insufficient information	0.0	0

Table 8: Neonatal deaths by PSANZ neonatal mortality classification 2015-2019

Neonatal death classification (V2.2)	2015 %	2016 %	2017 %	2018 %	Neonatal death classification (V3.4)	2019	
						%	Number
1 Congenital anomaly	43.5	31.6	56.3	29.4	1 Congenital anomaly	20.0	2
2 Extreme prematurity	30.4	42.1	37.5	47.1	2 Periviable infants	0.0	0
3 Cardio-respiratory disorders	0.0	0.0	0.0	17.6	3 Cardio-respiratory disorders	10.0	1
4 Infection	4.3	10.5	0.0	0.0	4 Infection	20.0	2
5 Neurological	13.0	10.5	0.0	5.9	5 Neurological	20.0	2
6 Gastrointestinal	8.7	0.0	6.3	0.0	6 Gastrointestinal	20.0	2
7 Other	0.0	5.3	0.0	0.0	7 Other	10.0	1

CONGENITAL ABNORMALITIES

In 2019 the two congenital abnormalities were comprised of congenital diaphragmatic hernia and genetic condition (achondrogenesis type II - autosomal dominant lethal condition).

EXTREME PREMATURITY

Extreme prematurity was classified as the neonatal cause of death in no cases in 2019.

ISSUES

The review of neonatal mortality identified the following issues:

- Tasmania's neonatal mortality rate in 2019 was 1.8 per 1 000 live births (2018 Tasmanian rate, 3.1 per 1 000 live births). The 2019 national neonatal mortality rate was 2.2 per 1 000 live births with a range across states and territories from 1.4 per 1 000 live births to 3.9 per 1 000 live births⁹.
- In 2020 additional junior medical staff and nursing staff have been employed via funding to Ambulance Tasmania to improve the quality of care and the time to retrieval for the Newborn Emergency Transport Service. This will reduce the risks to infants requiring retrieval to neonatal tertiary care centres, mostly the RHH Neonatal and Paediatric ICU.
- Ongoing efforts are underway to improve communication pathways between Obstetric and Paediatric staff statewide in the management of difficult perinatal cases in order to optimise care and facilitate the delivery of very preterm and other high-risk babies in a tertiary centre whenever feasible and safe.
- There remains a high rate of smoking amongst pregnant women, including mothers of preterm infants.

⁹ Australian Institute of Health and Welfare 2021. Australia's mothers and babies. Cat. no. PER 101. Canberra: AIHW. Viewed 28 June 2021, <https://www.aihw.gov.au/reports/mothers-babies/australias-mothers-babies>.

Recommendations

1. As in previous years, smoking and other substance abuse remains an adverse risk factor in several neonatal deaths following extremely preterm birth. As always pregnant women should be encouraged to stop smoking cigarettes and taking other substances of abuse at all opportunities.
2. Evidence based endeavours to reduce the rate of preterm birth (e.g., the Australian Preterm Birth Prevention Alliance), and thus reduce perinatal morbidity and mortality, should be supported and funded.
3. Obstetric and Paediatric staff at all Tasmanian hospitals should complete the NPDCAT, either electronically or in hard copy, at the time of the hospital Mortality and Morbidity meetings.

Paediatric Mortality & Morbidity Committee

Paediatric deaths for 2019

The Council's Terms of Reference in relation to paediatric mortality and as specified under the updated *Obstetric and Paediatric Mortality and Morbidity Act, 1994* are:

To investigate the circumstances surrounding, and the conditions that may have caused deaths of children in Tasmania in the age group from 29 days to 17 years.

The total number of paediatric deaths in Tasmania during 2019 was **16**, with an estimated paediatric mortality rate of 0.14 per 1 000 persons aged 0-17 years. Due to the relatively small number of paediatric deaths, paediatric mortality is classified using a broad four category classification system. Deaths are classified as being due to a condition determined at birth, an acquired condition, a sudden unexplained infant death (SUDI) or due to an injury.

The total number of deaths due to sudden unexplained infant deaths continued to remain stable with the previous year's number of reported cases. Child protection status reflects the following factors: whether a notification to child protection services had been made; whether the notification had been substantiated in the last 3 years and/or whether the case had been placed on orders prior to death. This more comprehensive information is now tracked for paediatric death cases reported for Tasmania. The total number of children who had been notified to child protection services prior to the death of the reported child in 2019 was **five** (noting that one case had been a subject of a Child Protection Order made by a court in Victoria). Noting the child protection status in this report does not necessarily imply that protective concerns were implicated in the cause of death. Paediatric deaths for the years 2010 to 2019 have been classified below.

Table 9: Paediatric deaths 2010-2019

Cause of death	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 ^(b)
Conditions determined at birth	7	5	5	4	5	1	1	4	1	4
Acquired conditions	10	4	9	8	6	4	8	2	4	7
Unexplained Infant Deaths	7	5	2	6	3	2	2 ^(a)	2 ^(a)	3 ^(a)	2
Injuries	12	3	5	7	10	5	9	14	2	3 ^(c)
Unknown/Indeterminate	0	1	0	1	0	0	0	0	0	0
Still under investigation	1	0	0	0	0	0	0	0	0	0
TOTAL	37	18	21	26	24	12	20	22	10	16

(a) All cases having been identified as being associated with risk factors such as unsafe sleeping.

(b) Includes one child not resident of Tasmania, dying in Tasmania.

(c) Note that an extra case not recorded in the Tasmanian death list was that of a 13 years old male adolescent who died as a result of severe abdominal injuries following a motorcycle accident in Tasmania where this adolescent had been transferred to Launceston General Hospital for surgery but later transferred to Royal Children's Hospital in Melbourne, Victoria where he died.

Table 10: Origin of injury leading to paediatric death 2019

Origin of injury	Number
Motor Vehicle Accident	2
Suspected suicide	1

In 2018, infants (children under one year) had the highest rates of child deaths in all jurisdictions accounting for 60 per cent of all child deaths nationally. While the child mortality rates were found to decrease substantially after infancy, mortality rates increased during adolescent years with the second highest mortality rates recorded for young people aged 15 to 17 years. The Northern Territory recorded the highest child mortality rate (67.1 deaths per 100 000 children aged 0-17 years), followed by the Australian Capital Territory (43.9 per 100 000). Tasmania had the lowest child mortality rate (24.1 per 100 000) in this year¹⁰.

Deaths from diseases and morbid conditions accounted for 70.7 per cent of all child deaths in 2018 (excluding New Zealand), with infants (children aged less than one year) exhibiting the highest mortality rate from diseases and morbid conditions in all jurisdictions. In 2018, suicide was the leading external cause of death in Queensland, Victoria, and New Zealand. Suicide and transport-related incidents were the equal leading external causes of death in South Australia and transport-related incidents was the leading external cause of death in New South Wales and Western Australia. In 2018, New Zealand had the highest rate of external-cause deaths (9.7 per 100 000), followed by Northern Territory (8.0 per 100 000). In 2018, it was also found that Northern Territory had the highest rate of infant deaths from Sudden Infant Death Syndrome (SIDS) and undetermined causes (1.0 per 1000 livebirths), followed by New Zealand (0.5 per 1000 livebirths)¹⁰.

Overall, the number of infant (less than 1 year old) deaths in Australia in 2019 where the cause of death was ill-defined and unknown, including deaths due to SIDS, was 112 or a rate of 0.4 deaths per 1 000 livebirths¹¹.

CONDITIONS DETERMINED AT BIRTH

In 2019 there were 3 deaths reported in children ranging from 1 month to 14 years. These include:

- One case due to an identified congenital abnormality of the brain and subsequent respiratory failure (age 1 month).
- One case of an infant who suffered from trisomy 18 (age 9 months).
- One case due to myoclonic epilepsy with ragged red fibres in an adolescent (age 14 years).

¹⁰ The State of Queensland (Queensland Family and Child Commission), 2020, Australian and New Zealand Child Death Statistics, 2018. Supplementary Chapter, Annual Report: Deaths of Children and Young People, Queensland, 2019-20. Viewed 3 August 2021, <https://www.qfcc.qld.gov.au/sites/default/files/2021-03/AustraliaandNewZealandchilddeathstatistics2018.PDF>.

¹¹ Australian Bureau of Statistics, 2020, *Causes of Death, Australia, 2019*, cat.no. 3303.0 Canberra: ABS. Viewed 28 June 2021, <https://www.abs.gov.au/statistics/health/causes-death/causes-death-australia/2019>.

ACQUIRED CONDITIONS

In 2019 there were 8 deaths in children ranging from 2 months to 13 years. These included:

- One case due to a septic shock, bone marrow suppression, CMV infection, past necrotising enterocolitis and extreme prematurity (GA 26 weeks) (age 2 months).
- One case due to relapse of acute lymphoblastic leukaemia, febrile neutropenia (age 6 years).
- One case due to hypoxic brain injury, cardiorespiratory arrest and presumed sepsis (E. coli) in a child who had multiple congenital abnormalities (VACTERL sequence) (age 3 years).
- One case due to effects of three different viruses including parainfluenza, rhinovirus and viral pneumonia where myocarditis had also been identified (age 5 months).
- One case due to metastatic bone tumour (age 13 years).
- One case due to infantile glioblastoma (GBM-brain tumour) (age 2 years).
- One case known to have had a congenital abnormality condition with splenic stricture and subsequent bowel obstruction and septic shock but whose death culminated from complications following surgery (1 month).
- One case of a child visiting from Victoria who had died as a result of acute exacerbation of chronic asthma (age 8 years).

UNEXPLAINED INFANT DEATH

In 2019, the number of reported 'unexplained infant deaths' remained steady with recent years with a total of two infants reported in this category aged between 1 month to 4 months. Both cases were found to have been associated with clear risk factors including an unsafe sleeping environment where the infants had been found to have co-slept in bed with an adult. In particular, one infant had also been identified as possibly suffering from probable asphyxia due to overlaying by a co-sleeping adult following bed-sharing.

INJURY

The number of children dying in 2019 as a result of injury remained low with a total of three paediatric death cases having been reviewed in this year.

The first case involved a 9-year-old who died as a result of suffering from mechanical asphyxia after having been trapped beneath an all-terrain vehicle (ATV) quad bike following a rollover crash. Similarly, a 17-year-old adolescent died from severe injuries sustained following a fatal motorcycle accident.

It continues to remain a concern to find a paediatric death associated with suspected suicide. The Committee wishes to support the Coroners recommendations in relation to youth suicide and reiterates the importance of addressing youth suicide and encouraging appropriate measures to be in place within the Community to help young individuals considered to be at risk.

CASES STILL UNDER INVESTIGATION

Nil.

UNKNOWN/INDETERMINATE

Nil.

SUMMARY

The number of paediatric deaths in Tasmania reported in 2019, although higher than the previous year, was still at a lower level than previously reported in the past decade. The report of a case associated with injuries arising from self-harm remains a concern and the recommendations outlined previously in relation to youth suicide continue to be supported reiterated in this report.

Furthermore, the finding of two additional cases of unexplained infant death associated with risk factors in this year highlights the need to continue to ensure that parents and the community receive a consistent message about safe sleeping practices particularly with regards to the dangers of co-sleeping and bed-sharing with adults.

Recommendations

Youth suicide

1. The *Paediatric Mortality & Morbidity Committee* strongly supports the Coroner's recommendations with regards to youth suicide. To young persons whose friends have told them they are thinking about suicide, the Coroner recommended the following: (1) Take the statement seriously; (2) Do not keep it a secret, even if your friend has asked you to; (3) Tell a teacher or counsellor as soon as possible about what your friend has told you; and (4) Encourage your friend to seek help from a trusted adult such as a counsellor or to contact a helpline such as listed below:
 - Emergency services 000
 - Lifeline 131 114
 - Suicide Call Back Service 1300 659 467
 - Beyond Blue support service 1300 224 636
 - Kids Helpline 1800 551 800
 - <http://suicideprevention.com.au/>
2. Youth Beyond Blue have also developed the check in app (<https://www.beyondblue.org.au/about-us/about-our-work/young-people/the-check-in-app>), to assist young people who are concerned about a friend but worried about saying the wrong thing.
3. That all health professionals should be advised to inform relevant family members, carers or guardians of a child who may be at risk of suicide of that risk.
4. COPMM supports the Coroner's recommendation that the Media, in publishing articles and editorial on suicide, ensure complete compliance with Mindframe Guidelines.
5. That the Media clearly outline appropriate and available support helplines at the time of reporting on paediatric deaths that have been related to suicidal behaviour.
6. That appropriate support is available to all young people engaged in the use of social media networks such as Facebook where the issue of youth suicide may be discussed. This is particularly important where a young person may have committed suicide.

7. That age-appropriate and accessible mental health services and facilities be established and resourced for adolescents as part of an improved Mental Health Service.
8. That all jurisdictions consider using a consistent national classification system for review of paediatric deaths.

Safe sleeping for infants

1. That a clear consistent message is used as part of the universal distribution of educational material concerning safe sleeping practices to all new parents. It is also recommended that further education packages are provided to parents highlighting the risks associated with parental use of illegal and prescribed drugs and co-sleeping. As highlighted in previous reports, it is also recommended that more effective forensic death scene examinations be undertaken to establish whether the cause of death is due to overlying¹².

Children and Motor Vehicles: travelling as passengers or external to vehicles

1. That the community continue to be alerted to risks associated with unsatisfactory restraint of children as passengers in moving vehicles and encouraged to ensure that all children are safely restrained with seatbelts when travelling in motor vehicles and preferably seated in the rear of the car.
2. That age, height and weight restrictions for children sitting in the front of a motor vehicle should be better defined and that children should not ride in motor vehicles as front seat passengers based on height/weight guidelines as well as age restrictions.
3. That recommendations from the Royal Children's Hospital (Melbourne)¹³ be supported where it is suggested that children be encouraged to sit in the back seat of the car until they reach the age of 13 years and that a child should be taller than 145cm before transitioning out of a booster seat where they will need to pass a five-step test before they are big enough to use an adult seatbelt. The five-step test includes:
 - 3.1 Sit with their backs firmly against the seat back
 - 3.2 Bend knees comfortably over the front of the seat cushion
 - 3.3 Sit the sash belt across their mid-shoulder
 - 3.4 Sit with the lap belt across the top of their thighs
 - 3.5 Stay in this position for the whole car trip.
4. That children should not wear lap belts whilst travelling as passengers in a motor vehicle. As reported in previous years, the benefits of young children wearing harnesses with and without booster seats have been highlighted.

¹² Li, L., Zhang, Y., Zielke, R.R., Ping, Y., and Fowler, D.R. (2009). Observations on Increased Accidental Asphyxia Deaths in Infancy while Co-sleeping in the State of Maryland. *American Journal of Forensic Medical Pathology*. Vol.30, No.4, pp. 318-321.

¹³ The Royal Children's Hospital Melbourne (15 May 2019), Car Seat safety: are Australian children safe? <https://www.rchpoll.org.au/polls/car-seat-safety-are-australian-children-safe/>

5. That drivers of vehicles must pay special attention to surroundings where there may be small children present when reversing vehicles especially on farms when farming equipment is being operated.
6. That COPMM support the Royal Australasian College of Surgeons view that quad bikes/ATVs and kids are a deadly mix, and all Australian children need to be banned from using these “death traps” with the support and action by all Australian jurisdictions.

Children and Asthma:

1. That a statewide protocol for children and young people with acute severe asthma be developed for Tasmania.
2. That Council supports the Coroner’s recommendation that when administering salbutamol to children, it is important to ensure that the drug is administered correctly using a spacer. Guidance in this regard is available from chemists and Asthma Australia’s website.

Maternal Mortality & Morbidity Committee

Maternal deaths for 2019

In terms of classification of maternal deaths there are three distinct classifications utilised and recognised by the World Health Organisation (WHO). These include **direct**, **indirect** and **non-maternal (incidental) death**. These classifications have been specified earlier in the Report.

There was one case of a 30-year-old **late maternal death-Indirect** (as it was not puerperal psychosis) reported in Tasmania in 2019. This death was in a patient with a history of pre-pregnancy depression, suicide attempt/self-harm and illicit drug use. Cause of death was hanging, an action sadly taken by this woman alone with the intention of ending her life 8 months after delivery of her baby.

Council reiterates that potential risks and near misses are still important to be made aware of and as such clinicians should be alerted to these to ensure that morbidity remains at a minimum thus reducing maternal mortality. Appropriate management of significant maternal morbidity issues is important and the establishment of the *Australian Maternity Outcomes Surveillance System (AMOSS): Improving the Safety and Quality of Maternity Care in Australia* has provided a significant step in initiating a comprehensive study of serious maternal morbidity events considered to contribute significantly to maternal morbidity in Australia. The System has undertaken active surveillance and epidemiological research of selected obstetric conditions with the aim of improving the knowledge of rare obstetric disorders and their management in Australia, providing evidence-based data for clinical guideline development, educational resources and ongoing national perinatal research.

In 2019, all six main providers of birthing services in Tasmania (i.e., Royal Hobart Hospital (RHH), Hobart Private Hospital (HPH), Calvary Health, Launceston General Hospital (LGH), and North West Private Hospital (NWPH)) have participated in AMOSS with data collection being initially based on six morbid events. Additional maternal morbid events as determined by an advisory group have been included as part of future data collections. The AMOSS website (<https://www.amoss.com.au/index.html>) became operational at the end of July 2009.

It is hoped that hospitals/states will, in the future, continue to support this system as part of their normal risk management framework.

Recommendations

1. That engagement with appropriate antenatal care is undertaken soon after the diagnosis of pregnancy.
2. That perinatal mental health services in Tasmania be funded and supported adequately to ensure effective delivery to all women who require support.
3. That there is adequate investment and support for women with complex drug and alcohol presentations during pregnancy.
4. That all clinicians writing a Tasmanian death certificate determine whether the decedent had been pregnant in the preceding 12 months.

Data Management Committee

Membership of the Data Management Committee continues to include representatives derived from obstetric, paediatric, midwifery, Health Information Team and Epidemiology Unit with Professor Peter Dargaville Chairing this committee. The committee continues to meet as required to progress discussions around formatting and preparation of future Annual Reports as well as the Electronic Perinatal Database (*ObstetrixTas System*) and development of a more comprehensive Congenital Abnormality Register for Tasmania.

The following activities have continued to be progressed in 2019 and beyond.

Data collection form

The NPDCAT continues to be the preferred form to use to collect detailed information on reported stillbirths and neonatal deaths in view of the current deficiencies in stillbirth and neonatal death forms on the *ObstetrixTas* system. Council has been advised that the old 2012 version of the NPDCAT form that had been recently integrated into the *ObstetrixTas* system, unfortunately does not include some of the key questions in Section 2 that are required for national reporting. As such, clinicians have opted to continue to use the hard copy of the later version of the NPDCAT and not the *ObstetrixTas* electronic version. Unfortunately, this matter remains unresolved.

All Tasmanian hospitals (including all public and NWPH) are now familiar in the use of this tool to complete details around reported perinatal deaths where Council urges that only the attending medical practitioner/specialist completes the NPDCAT in respect to their reported perinatal mortality case. Council also urges participating hospitals to undertake data corrections in a timely manner in order to allow auditing of data to proceed efficiently to enable COPMM reporting to be achieved in a timely manner.

National interest in the development of a national database for congenital anomalies has previously been reported. In recent times, this Committee has agreed that this area is complex and as such has supported the move to seek national developments in this area with a view to incorporate a national model for a Congenital Abnormality Register into the Tasmanian *ObstetrixTas* system in the future.

The new Tasmanian Perinatal Data Collection Form that was implemented in January 2019 continued to be completed by all services that do not have access to the *ObstetrixTas* system (i.e., private hospitals and birth centres where the birth occurs or private midwifery and medical practitioners who deliver babies outside of hospital). Completion of this form is a mandatory requirement for data collection under the *OPMM 1994 Act*. A copy of this form and associated guidelines can be accessed via COPMM's website (http://www.health.tas.gov.au/about_the_department/partnerships/registration_boards/copmm).

The Maternal Mortality and Morbidity Committee of Council continues to utilise the COPMM Maternal Death Notification Form to review and classify the maternal death cases reported in 2019. This tool has also been used to supply data at the request of the AIHW National Perinatal Epidemiology and Statistics Unit for reported maternal deaths as required.

Progress in database

The statewide Electronic Perinatal Database known as *ObstetrixTas* was implemented in all Tasmanian public maternity hospitals and public contracted maternity private hospitals in 2010 to provide obstetric units with access to clinical information for management, planning, teaching and research purposes. The database is the repository of information for the perinatal data system with the aim to eliminate the need for a hand-written perinatal data form and improving the timeliness, completeness and accuracy of information reported from the system. Council supports the proposal to incorporate a Congenital Abnormality Register for Tasmania into *ObstetrixTas* as a future priority.

Review the structure of the Annual Report

The 2019 report format continues to be refined as required to ensure a more effective format for clearer presentation of data. The role of the Data Management Committee through its Working Group is to provide an opportunity to discuss and revise formatting issues as required.

Perinatal statistics

Births, birth rates and pregnancies

Table 11: Live births and birth rates in Tasmania 2015-2019

Year ^(a)	Number of live births	Birth rate per 1 000 population ^(b)	Number of total births	Number of total pregnancies
2015	5 659	10.9	5 693	5 610
2016	5 877	11.3	5 920	5 818
2017	5 550	10.6	5 581	5 496
2018	5 480	10.4	5 516	5 436
2019	5 704	10.7	5 736	5 651

(a) Live births - Births as per ObstetrixTas system and available Perinatal Data Forms provided by maternity units and maternity service providers.

(b) Australian Bureau of Statistics estimates Tasmania's population at 534 575 in June 2019 (Australian Bureau of Statistics, 2020, Australian Demographic Statistics, 'Table 56 Estimated Resident Population by Single Year of Age, Tasmania, cat. no. 3101.0, viewed 28 April 2021, <https://www.abs.gov.au/statistics/people/population/national-state-and-territory-population/latest-release#data-download>).

From 2006 to 2008, the birth rate gradually increased from 12.5 to 12.9 per 1 000 population, which equates to a statistically significant ($p=0.002$) increase of 1.8 per cent per annum. From 2008 to 2019, this trend reversed, with a statistically significant ($p<0.001$) annual decline of 1.8 per cent per annum from 12.9 to 10.7 per 1 000 population. The 2019 birth rate was similar ($p=0.138$) to the 2018 figure of 10.4 per 1 000 population, following a statistically significant decline ($p=0.002$) from 2015 to 2018.

Figure 2: Birth rate for Tasmania per 1 000 head of population 2005-2019

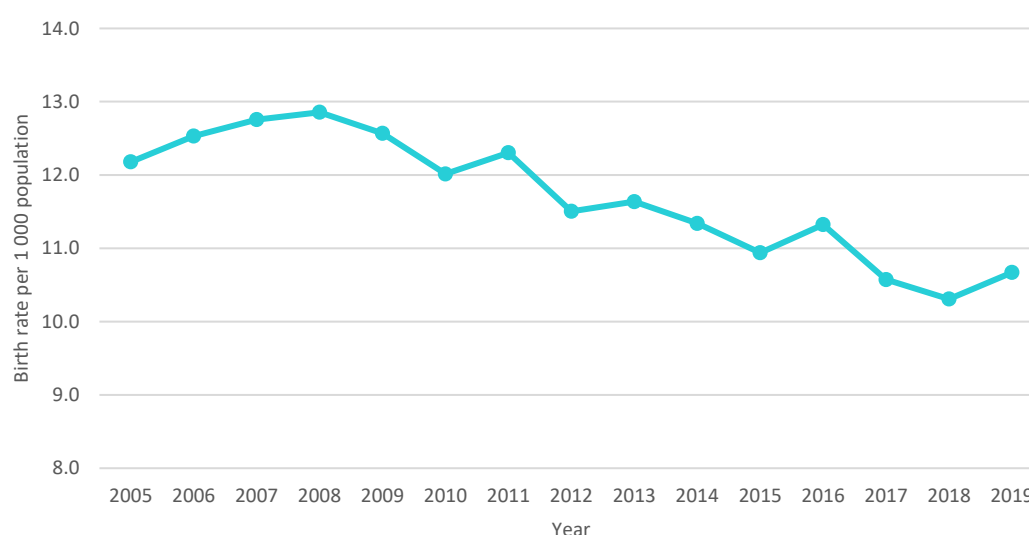


Table 12: Live births by region 2015-2019

Year	South		North		Northwest		Interstate		Total live births
	n	%	n	%	n	%	n	%	
2015	2 984	52.7	1 510	26.7	1 161	20.5	4	0.1	5 659
2016	3 055	52.0	1 635	27.8	1 178	20.0	9	0.2	5 877
2017	2 895	52.2	1 496	27.0	1 154	20.8	5	0.1	5 550
2018	2 878	52.5	1 495	27.3	1 101	20.1	6	0.1	5 480
2019	3 068	53.8	1 499	26.3	1 129	19.8	8	0.1	5 704

An increase in the number of births was reported in all three Tasmanian regions in 2019, with the Southern region reporting the greatest increase (6.6 per cent) since 2018, followed by the North West region at 2.5 per cent. The number of births in the Northern region was essentially the same as last year.

Table 13: Live births by birth setting 2015-2019

Year	Royal Hobart (QAH)	Launceston General (QVH)	District hospitals	Mersey Community	Private hospitals ^(a)	Others (including homebirths)	Total live births
Number							
2015	1 939	1 480	10	386	1 798	46	5 659
2016	1 950	1 643	8	316	1 921	39	5 877
2017	1 880	1 572	4	0	2 042	52	5 550
2018	1 891	1 589	2	0	1 951	47	5 480
2019	1 984	1 585	5	0	2 080	50	5 704
Percentage							
2015	34.3	26.2	0.2	6.8	31.8	0.8	100.0
2016	33.2	28.0	0.1	5.4	32.7	0.7	100.0
2017	33.9	28.3	0.1	0.0	36.8	0.9	100.0
2018	34.5	29.0	0.0	0.0	35.6	0.9	100.0
2019	34.8	27.8	0.1	0.0	36.5	0.9	100.0

(a) Includes public patients at the North West Private Hospital.

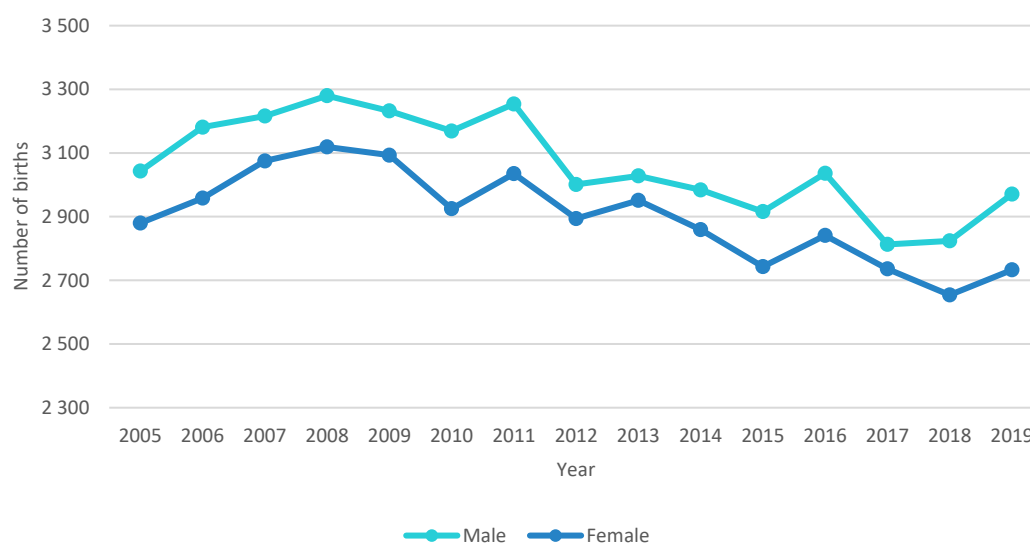
Sex of livebirths

Table 14: Live births by sex 2015-2019

Year	Male		Female		Indeterminate		Total live births
	n	%	n	%	n	%	
2015	2 916	51.5	2 743	48.5	0	0.0	5 659
2016	3 036	51.7	2 841	48.3	0	0.0	5 877
2017	2 813	50.7	2 736	49.3	1	^	5 550
2018	2 824	51.5	2 654	48.4	2	^	5 480
2019	2 971	52.1	2 733	47.9	0	0.0	5 704

^ Less than 0.1 per cent.

Figure 3: Live births by sex 2005-2019



Male births continue to exceed female births, accounting for 52.1 per cent of all Tasmanian livebirths in 2019 compared to 47.9 per cent (sex ratio: 108.7). This finding is comparable to national trends reported in 2019 with the national sex ratio for live births being 105.9 male liveborn babies for every 100 female liveborn babies.

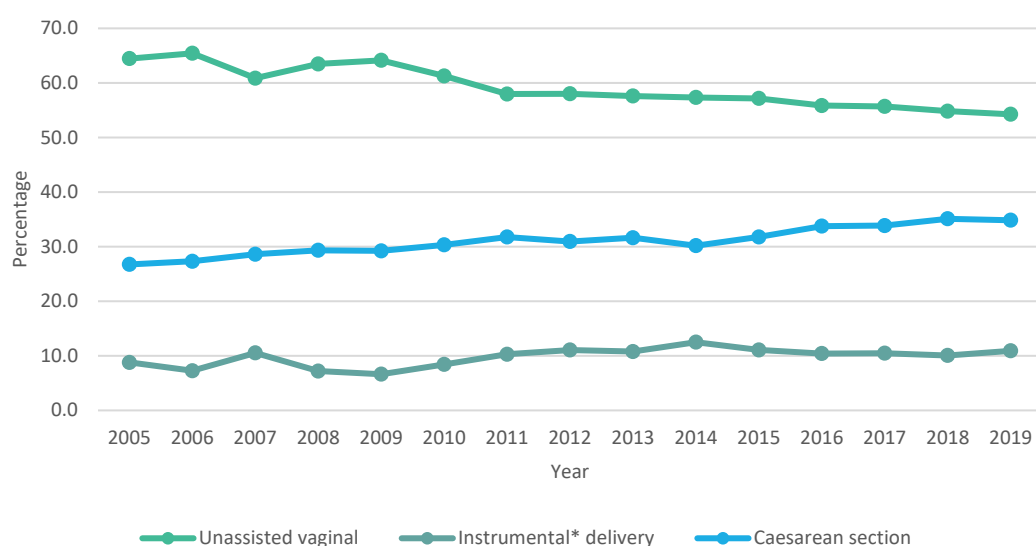
Mode of delivery

Table 15: Births by mode of delivery 2015-2019

Year	Unassisted vaginal		Instrumental ^(a) delivery		Caesarean section		Total births
	n	%	n	%	n	%	
2015	3 254	57.2	630	11.1	1 809	31.8	5 693
2016	3 306	55.8	616	10.4	1 998	33.8	5 920
2017	3 108	55.7	584	10.5	1 889	33.8	5 581
2018	3 024	54.8	555	10.1	1 937	35.1	5 516
2019	3 112	54.3	626	10.9	1 998	34.8	5 736

(a) Instrumental delivery includes forceps, forceps rotation, vacuum extraction and vaginal breech with forceps to the after coming head.

Figure 4: Births by mode of delivery 2005-2019



* Instrumental delivery includes forceps, forceps rotation, vacuum extraction and vaginal breech with forceps to the after coming head.

Table 16: Births by mode of delivery and gestation 2015-2019^(a)

Gestation in weeks	Year	Vaginal delivery		Caesarean section		Total
		n	%	n	%	n
20 – 27	2015	38	67.9	18	32.1	56
	2016	56	77.8	16	22.2	72
	2017	37	68.5	17	31.5	54
	2018	47	81.0	11	19.0	58
	2019	26	55.3	21	44.7	47
28 – 31	2015	32	45.7	38	54.3	70
	2016	18	28.6	45	71.4	63
	2017	12	30.8	27	69.2	39
	2018	14	25.0	42	75.0	56
	2019	25	53.2	22	46.8	47
32 – 36	2015	245	48.4	261	51.6	506
	2016	249	46.8	283	53.2	532
	2017	250	48.0	271	52.0	521
	2018	191	42.8	255	57.2	446
	2019	200	47.8	218	52.2	418
37 – 41	2015	3 547	70.4	1 488	29.6	5 035
	2016	3 588	68.5	1 652	31.5	5 240
	2017	3 384	68.3	1 570	31.7	4 954
	2018	3 314	67.1	1 625	32.9	4 939
	2019	3 478	66.8	1 731	33.2	5 209
42 and over	2015	21	84.0	4	16.0	25
	2016	11	84.6	2	15.4	13
	2017	9	69.2	4	30.8	13
	2018	13	76.5	4	23.5	17
	2019	9	60.0	6	40.0	15

(a) A vaginal birth had unknown gestation in 2015.

Table 17: Births by caesarean section following induction of labour 2015-2019

Year	Births by caesarean section	Induction of labour with caesarean section delivery	
		n	%
2015	1 809	343	19.0
2016	1 998	429	21.5
2017	1 889	404	21.4
2018	1 937	402	20.8
2019	1 998	409	20.5

The percentage of CS deliveries that followed induction of labour has remained relatively steady over the years from 19.0 per cent in 2015 to 20.5 per cent in 2019 (see Table 17).

Table 18: Births by caesarean section following augmentation of labour 2015-2019

Type of augmentation	Year	Primary	Repeat	Proportion of all augmentations
ARM ^(a) only	2015	34	26	8.8
	2016	38	22	9.4
	2017	48	21	12.7
	2018	41	25	12.4
	2019	42	27	11.9
Oxytocin only	2015	6	1	17.5
	2016	36	2	27.0
	2017	29	0	21.2
	2018	23	1	18.9
	2019	21	0	22.3
Oxytocin and ARM ^(a)	2015	63	3	20.4
	2016	62	2	19.3
	2017	51	0	16.0
	2018	57	1	20.6
	2019	85	7	24.5

(a) ARM = Artificial Rupture of Membranes

Presentation at birth

Table 19 below shows that the number of vaginal breech presentations in 2019 was similar to that reported in the previous years.

Table 19: Births by presentation at vaginal delivery only 2015-2019

Year	Vertex		Face and brow		Breech		Other		Total vaginal births
	n	%	n	%	n	%	n	%	n
2015	3 823	98.4	8	0.2	35	0.9	18	0.5	3 884
2016	3 866	98.6	6	0.2	29	0.7	21	0.5	3 922
2017	3 637	98.5	1	^	27	0.7	27	0.7	3 692
2018	3 529	98.6	6	0.2	32	0.9	12	0.3	3 579
2019	3 682	98.5	4	0.1	27	0.7	25	0.7	3 738

^ Less than 0.1 per cent

Table 20: Births by presentation via caesarean section delivery 2015-2019

Year	Vertex		Face and brow		Breech		Other		Total CS births
	n	%	n	%	n	%	n	%	n
2015	1 601	88.5	9	0.5	175	9.7	24	1.3	1 809
2016	1 757	87.9	5	0.3	202	10.1	34	1.7	1 998
2017	1 671	88.5	11	0.6	181	9.6	26	1.4	1 889
2018	1 704	88.0	5	0.3	190	9.8	38	2.0	1 937
2019	1 762	88.2	11	0.6	207	10.4	18	0.9	1 998

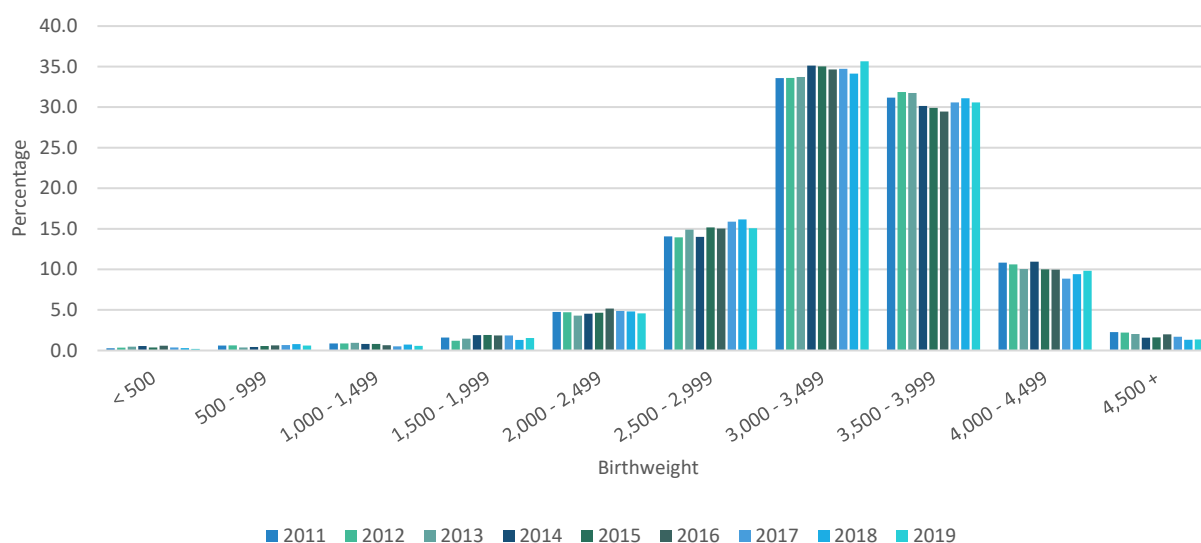
The percentage of caesareans in 2019 at which the presenting part was breech was 10.4 percent, which is the highest in the most recent 5 years but remains generally similar to previous years.

Birthweight

Table 21: Births by birthweight groups 2015-2019

Birthweight groups	2015		2016		2017		2018		2019	
	n	%	n	%	n	%	n	%	n	%
< 500	21	0.4	35	0.6	21	0.4	16	0.3	11	0.2
500 - 999	31	0.5	37	0.6	37	0.7	43	0.8	35	0.6
1,000 - 1,499	46	0.8	39	0.7	29	0.5	40	0.7	33	0.6
1,500 - 1,999	109	1.9	110	1.9	103	1.8	72	1.3	88	1.5
2,000 - 2,499	265	4.7	306	5.2	272	4.9	265	4.8	263	4.6
2,500 - 2,999	864	15.2	890	15.0	886	15.9	891	16.2	865	15.1
3,000 - 3,499	1 993	35.0	2 051	34.6	1 938	34.7	1 882	34.1	2 045	35.7
3,500 - 3,999	1 703	29.9	1 744	29.5	1 706	30.6	1 715	31.1	1 754	30.6
4,000 - 4,499	569	10.0	590	10.0	494	8.9	519	9.4	564	9.8
4,500 +	92	1.6	118	2.0	95	1.7	73	1.3	78	1.4
Total	5 693	100.0	5 920	100.0	5 581	100.0	5 516	100.0	5 736	100.0

Figure 5: Births by birthweight groups 2011-2019



Low birthweight

Low birthweight is defined as weight less than 2 500 grams and includes babies that are small for gestational age as well as those who are premature. Very low birthweight is defined as weight less than 1 500 grams.

Table 22: Incidence of low and very low birthweight 2015-2019

Year	Very low birthweight (< 1 500 grams)		Low birthweight ^(a) (< 2 500 grams)		Total births
	n	%	n	%	
2015	98	1.7	472	8.3	5 693
2016	111	1.9	527	8.9	5 920
2017	87	1.6	462	8.3	5 581
2018	99	1.8	436	7.9	5 516
2019	79	1.4	430	7.5	5 736

(a) Note low birthweight (< 2 500 grams) figures also include very low birthweight babies; total births include stillbirths.

The proportions of very low birthweight infants and low birthweight infants reported in Tasmania for 2019 has decreased slightly since 2015. In 2019, the Tasmanian incidence of very low birthweight infants was 1.4 per cent of all births (including stillbirths) and the incidence of low birthweight infants was 7.5 per cent of all births.

Table 23: Survival to hospital discharge by gestation 1996-2019^(a)

Year	% Survival (total number admitted)								
	23 weeks	24 weeks	25 weeks	26 weeks	27 weeks	24-27 weeks	28 weeks	29 weeks	30 weeks
1996-2003	25	44	46	70	90	70	94	94	98
2004-2008	20	46	72	86	91	79	93	100	98
2009-2013	0	54	58	87	83	73	92	98	98
2014-2018	30	100	81	91	95	91	94	98	97
ANZNN 2019^{(b) (c)}	63	70	83	92	95	87	96	97	98

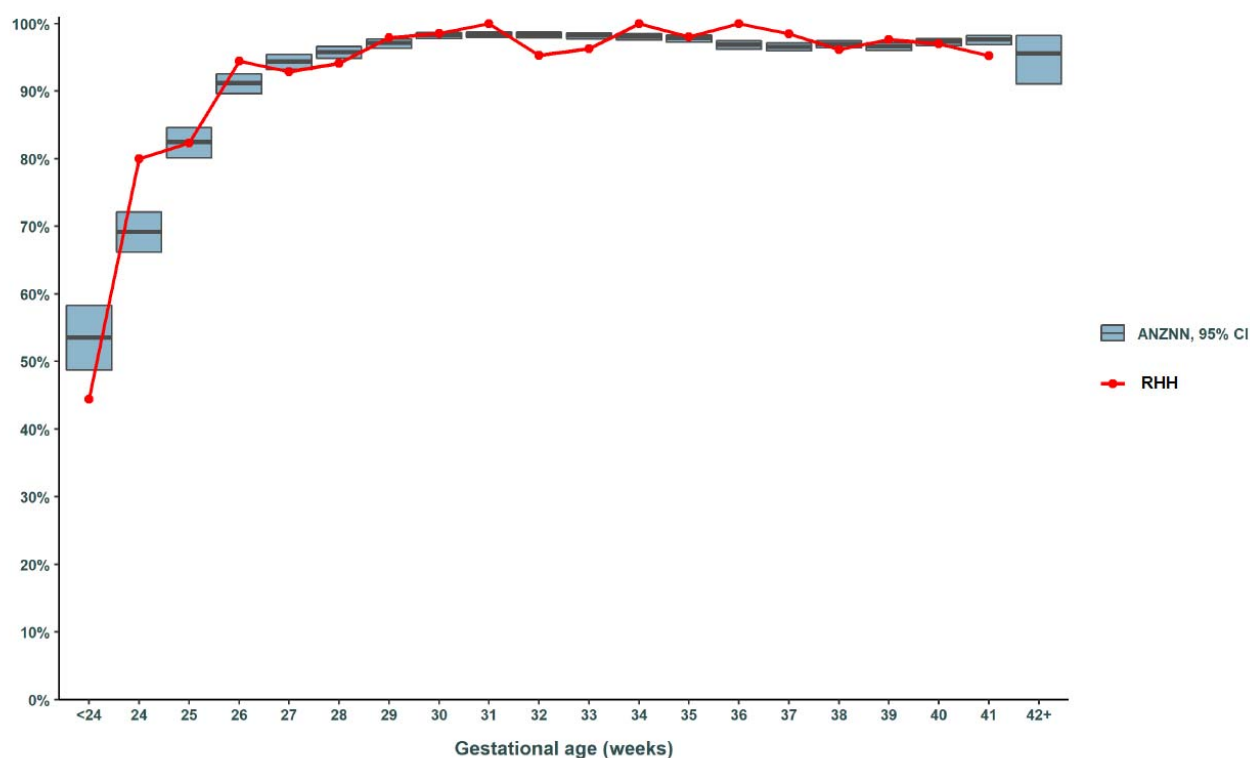
(a) Percent survival for infants admitted to the Tasmanian Neonatal and Paediatric Intensive Care Unit at the Royal Hobart Hospital. Lethal congenital anomalies are included.

(b) Chow, S.S.W. et al 2021. Report of the Australian and New Zealand Neonatal Network 2019. Sydney: ANZNN.

(c) Survival to discharge home (%) from the Australian and New Zealand Neonatal Network registry for the calendar year 2019. This registry receives data from all Neonatal Intensive Care Units in Australia and New Zealand (including Royal Hobart Hospital). Lethal congenital anomalies are not excluded.

As reported by the ANZNN in 2021 (Chow et al, 2021), survival for very preterm infants admitted to the RHH NPICU in the epoch 2015-2019 approximates that of the ANZNN as a whole (see Figure 6), with an adjusted standardized mortality ratio for infants born at 23-28 weeks gestation of just under 1.

Figure 6: Survival by gestational age 2012-2019^(a)



(a) Chow, S.S.W. et al 2021. Report of the Australian and New Zealand Neonatal Network 2019. Sydney: ANZNN.

Apgar scores

The Apgar score is routinely recorded shortly after birth (usually at one minute and again at five minutes after birth) for all infants. It is a general measure of an infant's well-being immediately after birth based on assessment of heart rate, breathing, colour, muscle tone, and reflex irritability. An Apgar score at five minutes is a good indication of the infant's overall health and well-being. An Apgar score of less than 6 at five minutes is indicative of an unwell infant.

Table 24: Live births by Apgar score at five minutes 2015-2019

Apgar score	2015		2016		2017		2018		2019	
	n	%	n	%	n	%	n	%	n	%
0	2	^	3	^	3	^	5	^	2	^
1	6	0.1	6	0.1	2	^	5	^	2	^
2	4	^	7	0.1	6	0.1	5	^	4	^
3	3	^	11	0.2	10	0.2	6	0.1	7	0.1
4	6	0.1	15	0.3	13	0.2	16	0.3	11	0.2
5	44	0.8	24	0.4	33	0.6	34	0.6	36	0.6
6	66	1.2	75	1.3	83	1.5	94	1.7	67	1.2
7	117	2.1	139	2.4	111	2.0	133	2.4	156	2.7
8	249	4.4	290	4.9	289	5.2	242	4.4	277	4.9
9	4 058	71.7	4 052	68.9	4 049	73.0	4 083	74.5	4 307	75.5
10	1 078	19.0	1 233	21.0	939	16.9	835	15.2	817	14.3
Not observed	26	0.5	22	0.4	12	0.2	22	0.4	18	0.3
Total livebirths	5 659	100.0	5 877	100.0	5 550	100.0	5 480	100.0	5 704	100.0

^ Less than 0.1 per cent

Figure 7: Live births with Apgar score less than 6 at five minutes 2005-2019

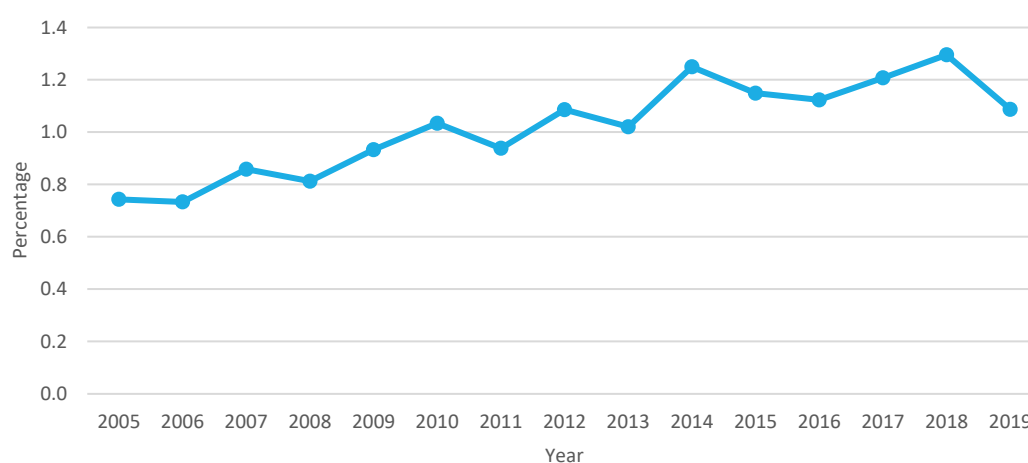


Figure 7 reflects that there has been a steady increase in the number of births associated with low Apgar scores at five minutes since 2005.

Resuscitation

The following table shows all intubations in the delivery room, including those undertaken in conjunction with other methods of resuscitation as specified in the electronic perinatal data database system or on the paper-based form. The percentage of live births requiring intubation reported in 2019 was essentially unchanged from that reported for the previous year, having decreased steadily from 0.9 per cent in 2010.

Table 25: Live births by active intubation and resuscitation at birth 2015-2019

Year	Intubation		Resuscitation		Total live births
	n	%	n	%	
2015	17	0.3	894	15.8	5 659
2016	20	0.3	915	15.6	5 877
2017	18	0.3	879	15.8	5 550
2018	17	0.3	810	14.8	5 480
2019	15	0.3	861	15.1	5 704

Perinatal mortality

The Tasmanian perinatal mortality rate per 1 000 births in 2019 (7.3 deaths per 1 000 births) was the lowest since 2005 (8.9 deaths per 1 000 births) and also less than the 2019 national perinatal mortality rate of 9.4 deaths per 1 000 births. Causes of perinatal mortality are outlined previously in Table 2.

Table 26: Perinatal outcome 2015-2019

Year	Stillbirth		Liveborn and survived ^(a)		Neonatal death		Other (post-neonatal death)		Total births
	n	%	n	%	n ^(b)	% ^(c)	n	%	
2015	34	0.6	5 642	99.1	17 (+6 ^(d))	0.3	0	0.0	5 693
2016	43	0.7	5 858	99.0	19 (+0)	0.3	0	0.0	5 920
2017	31	0.6	5 533	99.1	15 (+1)	0.3	2	^	5 581
2018	36	0.7	5 464	99.1	15 (+2)	0.3	1	^	5 516
2019	32	0.6	5 697	99.3	7 (+3)	0.1	0	0.0	5 736

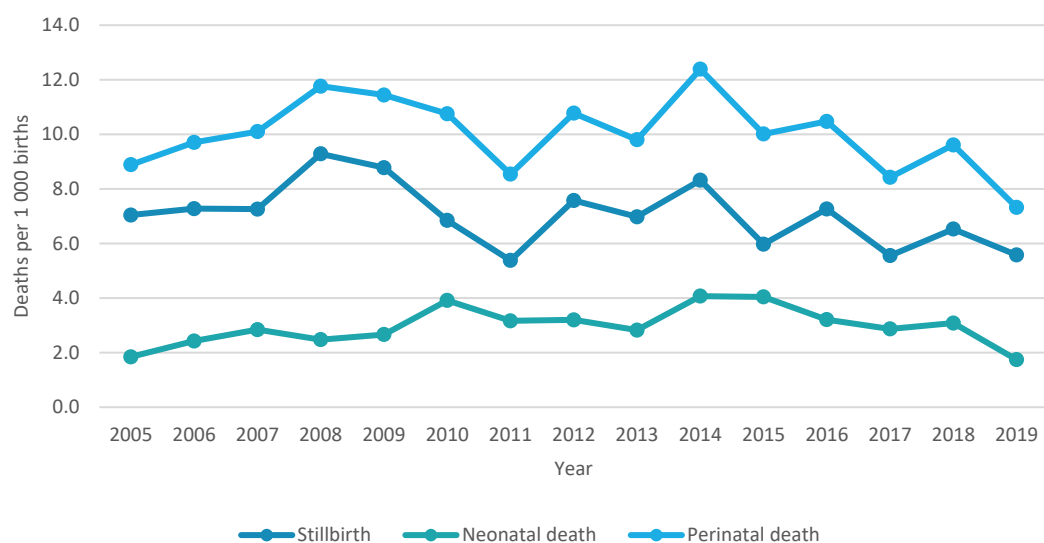
^ Less than 0.1 per cent

(a) Survived to first hospital discharge.

(b) Number in bracket means that neonatal deaths occurred after first hospital discharge.

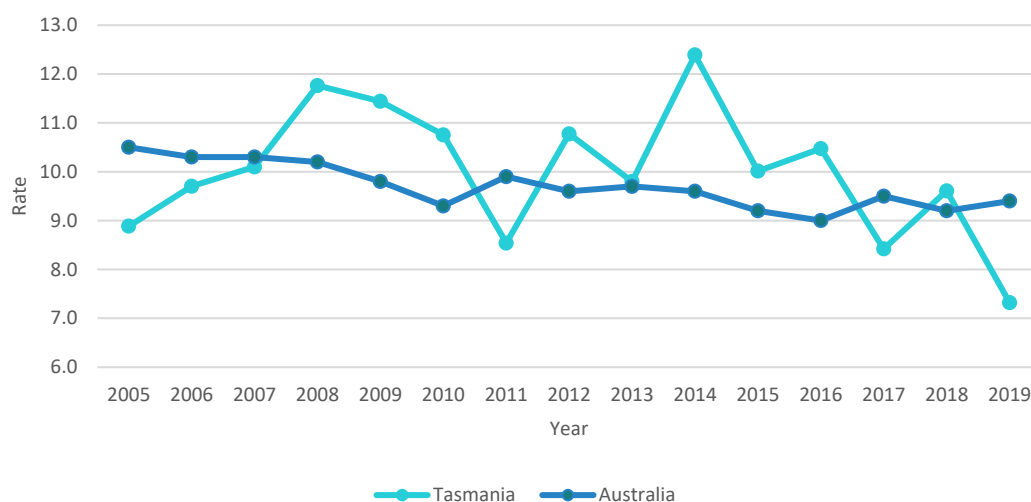
(c) Percentage calculated after excluding the numbers in parentheses.

(d) Five babies were born and died in Tasmania and one baby was not born in Tasmania but died in Tasmania.

Figure 8: Stillbirths and neonatal deaths per 1 000 births 2005-2019**Table 27: Perinatal mortality rates 2015-2019**

Year	Number of perinatal deaths	Percentage of perinatal deaths	Number of total births	Rate of perinatal mortality per 1 000 births
2015	57	1.0	5 693	10.0
2016	62	1.0	5 920	10.5
2017	47	0.8	5 581	8.4
2018	53	1.0	5 516	9.6
2019	42	0.7	5 736	7.3

The Tasmanian annual perinatal mortality rates have fluctuated over the period 2005 to 2019 without displaying any clear trend, with the 2019 rate being the lowest since 2005. In 2019, the national stillbirth rate was 7.2 per 1 000 births; the neonatal death rate was 2.2 per 1 000 live births; and the perinatal death rate was 9.4 per 1 000 births.

Figure 9: Perinatal mortality rate per 1 000 births in Tasmania and Australia 2005-2019

Source of Australian Perinatal Mortality Rate: Australia's mothers and babies, published annually by the Australian Institute of Health and Welfare.

Table 28: Perinatal mortality in multiple pregnancies 2015-2019

Year	Twin deaths		Births born from a twin pregnancy	Triplet deaths		Births born from a triplet pregnancy
	n	%	n	n	%	n
2015	6	3.6	166	0	0.0	0
2016	5	2.5	200	0	0.0	3
2017	1	0.6	170	0	0.0	0
2018	7	4.7	148	0	0.0	9
2019	3	2.3	128	0	0.0	6

Twin pregnancies encompass monochorionic and dichorionic twins. It is recognised that monochorionic twins pose special risks in the form of (a) diamniotic – twin to twin transfusion syndrome, and (b) monoamniotic – cord entanglement. These pregnancies are often interrupted prematurely so the risks attached are not the same as for singleton pregnancies. The extra risk to second twins has been noted in the literature¹⁴, hence consultant associated management is necessary. There is a widespread trend towards delivering term twins by caesarean section.

¹⁴ Smith, G., Pell, J. & Dobbie, R. (2002), 'Birth order, gestational age, and risk of delivery related perinatal death in twins: retrospective cohort study', British Medical Journal, vol. 325, 2 November, pp. 1004-1006.

Table 29: Perinatal mortality in multiple pregnancies by birth order 2015-2019

Year	Twin 1		Twin 2		Triplet Stillbirth		
	Stillbirth	Neonatal death	Stillbirth	Neonatal death	Triplet 1	Triplet 2	Triplet 3
2015	1	2	1	2	0	0	0
2016	1	1	2	1	0	0	0
2017	0	0	1	0	0	0	0
2018	3	0	2	2	0	0	0
2019	1	1	0	1	0	0	0

Perinatal mortality in Tasmania over the period 2010-2018, a regional analysis

Over the period 2011-2019 there were 576 perinatal deaths in Tasmania, which equates to a perinatal mortality rate of 9.8 per 1 000 births. As shown in Table 30, about half of these deaths were of babies born to mothers' resident in the Southern region of Tasmania, with slightly more deaths in the Northern region (140) than the North West region (130).

The perinatal mortality rates over this period were similar for each of the regions and the state as a whole. Further, there were no statistically significant trends in perinatal mortality rates over this period at either the state or regional level.

Table 30: Perinatal^(a) mortality by region, Tasmania 2011-2019

Region	2011-2019		
	n	rate ^(b)	95% CI
South	299	9.8	[8.7,10.9]
North	140	8.8	[7.4,10.4]
North West	130	10.6	[8.9,12.6]
Tasmania	576	9.8	[9,10.6]

(a) Includes neonatal deaths and stillbirths

(b) Rate per 1 000 births

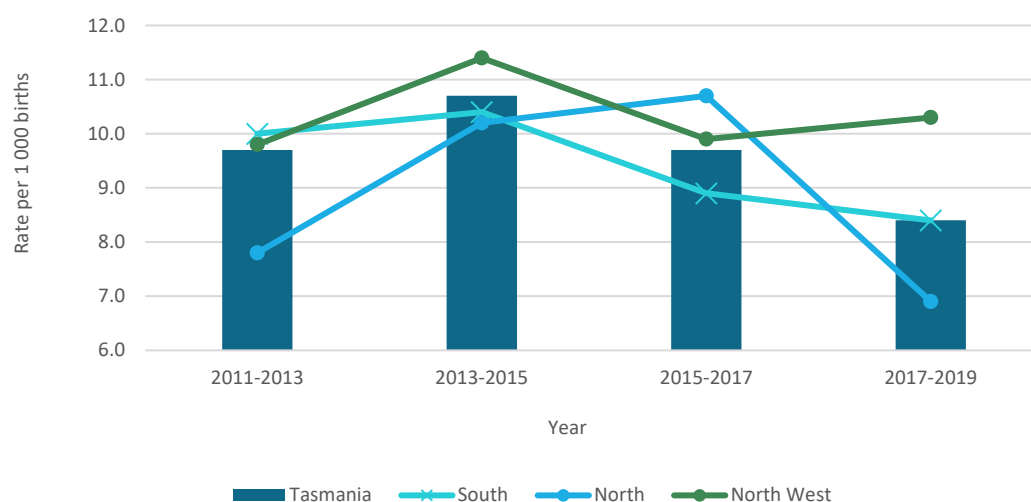
The lack of any significant trends becomes quite clear when considering perinatal mortality rates at the state and regional level calculated using a three-year rolling average (Table 31 and Figure 10). As expected, in accordance with the overall lack of significant variation in rates between regions, there were no significant regional differences within each of the three-year time periods between 2011 and 2019.

Table 31: Perinatal^(a) mortality by region and year, Tasmania 2011-2019

Region		South	North	North West	Tasmania
2011-2013	n	94	39	38	177
	rate ^(b)	10	7.8	9.8	9.7
	95% CI	[8.1,12.2]	[5.6,10.7]	[6.9,13.4]	[8.3,11.2]
2013-2015	N	96	48	42	188
	rate ^(b)	10.4	10.2	11.4	10.7
	95% CI	[8.5,12.8]	[7.5,13.5]	[8.2,15.4]	[9.2,12.3]
2015-2017	N	80	50	35	166
	rate ^(b)	8.9	10.7	9.9	9.7
	95% CI	[7.1,11.1]	[7.9,14.1]	[6.9,13.8]	[8.2,11.2]
2017-2019	N	75	31	35	142
	rate ^(b)	8.4	6.9	10.3	8.4
	95% CI	[6.6,10.6]	[4.7,9.8]	[7.1,14.3]	[7.1,9.9]

(a) Includes neonatal deaths and stillbirths

(b) Rate per 1 000 births

Figure 10: Perinatal mortality rate per 1 000 births by region, Tasmania 2011-2019

Neonatal mortality

Neonatal mortality includes all deaths of liveborn babies born after 20 weeks gestation or with a birthweight greater than 400 grams within the first 28 days of life, and the rate is expressed as deaths per 1 000 births.

The neonatal mortality rate of 1.8 per 1 000 births reported in Tasmania in 2019 was lower than last year (3.1 per 1 000 births) (see Table 34), and also lower than the rate reported nationally in 2019 (i.e., 2.2 per 1 000 births).

Table 32: Neonatal mortality per 1 000 births in infants over 28 weeks gestation 2015-2019

Year	Number of neonatal deaths	Rate of neonatal mortality per 1 000 births ^(a)
2015	10	1.8
2016	5	0.8
2017	4	0.7
2018	3	0.5
2019	5	0.9

(a) Showing neonatal mortality that is not related to extreme prematurity

Table 33: Neonatal mortality per 1 000 births in infants over 1 000 grams birthweight 2015-2019

Year	Number of neonatal deaths	Rate of neonatal mortality per 1 000 births ^(a)
2015	11	1.9
2016	5	0.8
2017	4	0.7
2018	3	0.5
2019	5	0.9

(a) Showing neonatal mortality that is not related to extremely low birth weight

Table 34: Fetal, neonatal and perinatal death rate per 1 000 births by state and territory 2015-2019

Year	NSW	VIC	QLD	WA	SA	TAS	ACT	NT	AUS
Fetal									
2015	6.2	8.3	6.6	6.4	7.6	6.0	7.3	9.7	7.0
2016	5.5	8.3	6.4	6.5	6.8	7.3	7.6	8.5	6.7
2017	6.1	8.5	6.8	6.9	6.6	5.6	10.3	9.4	7.1
2018	6.2	8.6	6.0	6.7	6.9	6.5	7.8	11.9	7.0
2019	5.9	9.0	7.7	6.6	5.8	5.6	6.7	11.1	7.2
Neonatal									
2015	1.9	2.4	2.8	1.5	1.7	3.9	2.8	4.0	2.2
2016	2.0	2.7	2.7	2.0	2.0	3.2	3.2	4.3	2.4
2017	2.2	2.5	3.0	1.5	2.4	2.7	2.6	5.5	2.4
2018	1.8	2.6	2.4	1.6	2.2	3.1	3.2	4.6	2.2
2019	2.0	2.3	3.1	1.4	1.4	1.8	1.8	3.9	2.2
Perinatal									
2015	8.1	10.7	9.4	7.9	9.3	9.8	10.0	13.7	9.2
2016	7.4	10.9	9.1	8.5	8.7	10.5	10.8	12.7	9.0
2017	8.3	11.0	9.8	8.4	9.0	8.2	12.8	14.8	9.5
2018	8.0	11.1	8.4	8.3	9.2	9.6	10.9	16.4	9.2
2019	7.9	11.2	10.7	7.9	7.2	7.3	8.4	15.0	9.4

Source: Australian Institute of Health and Welfare 2021. Australia's mothers and babies. Cat. no. PER 101. Canberra: AIHW. Viewed 28 June 2021, <https://www.aihw.gov.au/reports/mothers-babies/australias-mothers-babies>.

Autopsy rates

Autopsy rate provides important information that can change recorded cause of death in 22 to 76 per cent of cases¹⁵. In view of the repeated recommendation from the *Council of Obstetric & Paediatric Mortality & Morbidity* on the value of autopsy as an investigative tool in cases of perinatal death, especially in cases of unexplained intrauterine death, it is disappointing to find that the autopsy rate was significantly lower in 2019 than reported in more recent years.

It is important to note that the Australia and New Zealand Stillbirth Alliance is seeking to improve and conduct research into stillbirth in the Australia and New Zealand region. In particular, it aims to identify factors contributing to low autopsy consent rate for stillbirths and will provide robust information to develop information and educational materials that address the needs of parents and clinicians and improve overall autopsy rates in the future.

Table 35: Rate of autopsies on perinatal deaths 2015-2019

Year	Autopsy rate (%)
2015	33.3
2016	30.6
2017	31.9
2018	41.5
2019	26.2

In 2019, 11/42 had autopsy; 17 had no autopsy; 5 had external examination of the body and growth parameters; 9 had no autopsy stated.

¹⁵ Gordijn, S.J., Erwich, J.J., Khong, T.Y. Value of the perinatal autopsy: critique. *Pediatric Developmental Pathology*. 2002; 5(5): 480-8.

Mothers' statistics

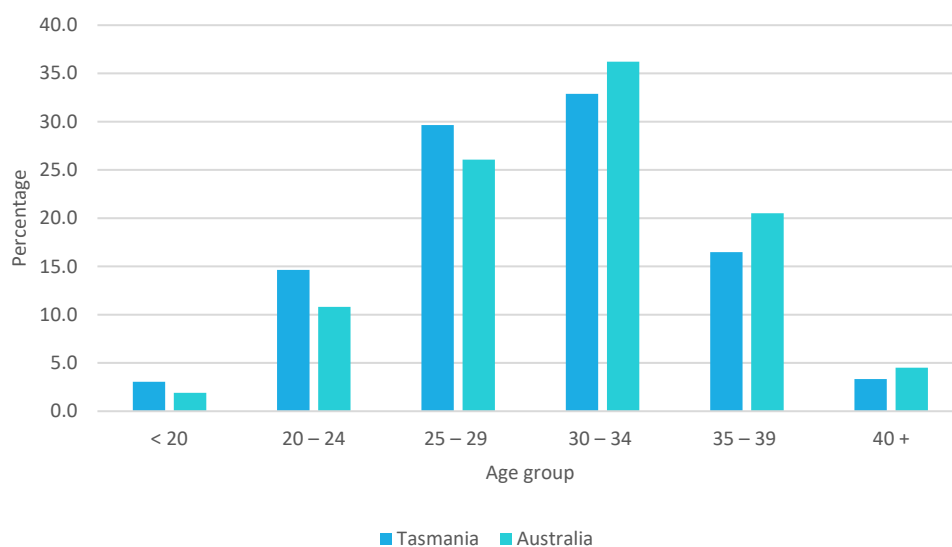
Maternal age

Table 36: Women who gave births by maternal age groups 2015-2019

Year	Under 20 years of age	20 – 24 years of age	25 – 29 years of age	30 – 34 years of age	35 – 39 years of age	40 and over years of age
Number						
2015	247	1 017	1 573	1 759	827	187
2016	248	1 053	1 610	1 784	908	215
2017	205	913	1 557	1 740	863	218
2018	177	917	1 572	1 725	868	177
2019	172	827	1 675	1 858	931	188
Percentage						
2015	4.4	18.1	28.0	31.4	14.7	3.3
2016	4.3	18.1	27.7	30.7	15.6	3.7
2017	3.7	16.6	28.3	31.7	15.7	4.0
2018	3.3	16.9	28.9	31.7	16.0	3.3
2019	3.0	14.6	29.6	32.9	16.5	3.3

In Tasmania, the ages of mothers in the various groups reported in 2019 are consistent with those reported in 2018. In general, the proportions of mothers in the 25-29-year-old and the 30-34-year-old age groups continue to remain higher than for the other age groups included in the assessment in 2019, a trend consistent with national reports from 2016. Overall, the proportion of mothers in Tasmania aged 35 years or more has increased, on average, annually since 2005 ($p < 0.001$), whilst nationally the proportion has remained relatively stable. Nationally, the mean age in 2019 was 30.8 years, compared with 29.7 years in 2004. Mothers aged 40 years and over constituted 4.5 per cent of women giving birth nationally in 2019 compared with 3.2 per cent in 2003. Furthermore, national figures have shown the proportion of mothers aged 35 and over has increased from 18.8 per cent in 2003 to about 25.0 per cent in 2019, while the proportion of mothers 24 years and under has decreased from 19.0 per cent to about 12.7 per cent¹⁶ over the same period.

¹⁶ Australian Institute of Health and Welfare 2021. Australia's mothers and babies. Cat. no. PER 101. Canberra: AIHW. Viewed 28 June 2021, <https://www.aihw.gov.au/reports/mothers-babies/australias-mothers-babies>.

Figure 11: Proportion of women who gave birth, by maternal age in Tasmania and Australia 2019**Table 37: Rates of birth per 1 000 female population by maternal age 2015-2019**

Maternal age in years	Year	Estimated Tasmanian female population ^(a)	Rate of births per 1 000 female population	Total births ^(b)
15 – 19	2015	16 135	15.3	247
	2016	15 504	16.3	252
	2017	15 241	13.3	202
	2018	15 203	11.6	176
	2019	15 004	11.6	174
20 – 24	2015	15 026	67.9	1 021
	2016	15 329	70.0	1 073
	2017	15 162	60.7	921
	2018	15 170	61.0	925
	2019	15 341	54.5	836
25 – 29	2015	14 437	110.4	1 594
	2016	15 363	106.2	1 632
	2017	15 546	101.4	1 577
	2018	16 020	99.8	1 599
	2019	16 494	102.9	1 698
30 – 34	2015	15 083	118.6	1 789
	2016	15 394	118.2	1 820
	2017	15 559	114.1	1 775
	2018	15 994	109.8	1 756
	2019	16 361	115.2	1 884

Maternal age in years	Year	Estimated Tasmanian female population ^(a)	Rate of births per 1 000 female population	Total births ^(b)
35 – 39	2015	14 527	58.6	852
	2016	14 783	62.4	922
	2017	15 222	57.8	880
	2018	15 476	56.9	881
	2019	15 945	59.6	950
40 – 44	2015	17 121	10.2	174
	2016	16 445	12.5	206
	2017	15 720	13.4	210
	2018	15 474	11.2	173
	2019	15 411	11.7	180
45 – 49	2015	17 314	0.6	11
	2016	17 770	0.7	12
	2017	18 006	0.4	8
	2018	18 120	0.3	5
	2019	17 849	0.7	12

(a) Australian Bureau of Statistics 2011-2020, Australian Demographic Statistics, 'Table 56 Estimated Resident Population by Single Year of Age, Tasmania', time series spreadsheet, cat. no. 3101.0, viewed 20 May 2021, <https://www.abs.gov.au/statistics/people/population/national-state-and-territory-population/sep-2020#data-download>.

(b) A number of mothers who were under 15 or over 49 are excluded from the table.

It is positive to note that there is a downward trend in the number of pregnancies amongst young women aged 15-19 years, but the 2019 rate of births per 1 000 female population in this age group was the same as the previous year.

Indigenous status

Reporting of Indigenous status is by self-identification and mothers are asked if they are of Aboriginal and/or Torres Strait Island origin when commencing antenatal care. Low community acceptance of the need to ask the question, and a lack of confidence in how an affirmative response will be treated has possibly resulted in some under-reporting of indigenous status. As a result of a targeted project to improve the quality of indigenous status data, the number of mothers identifying as Indigenous has increased markedly since 2005.

Nationally in 2019, 14 241 women identified as being Indigenous gave birth in Australia, representing 4.8 per cent of all women who gave birth.

Table 38: Women who gave birth, by Indigenous status 2015-2019

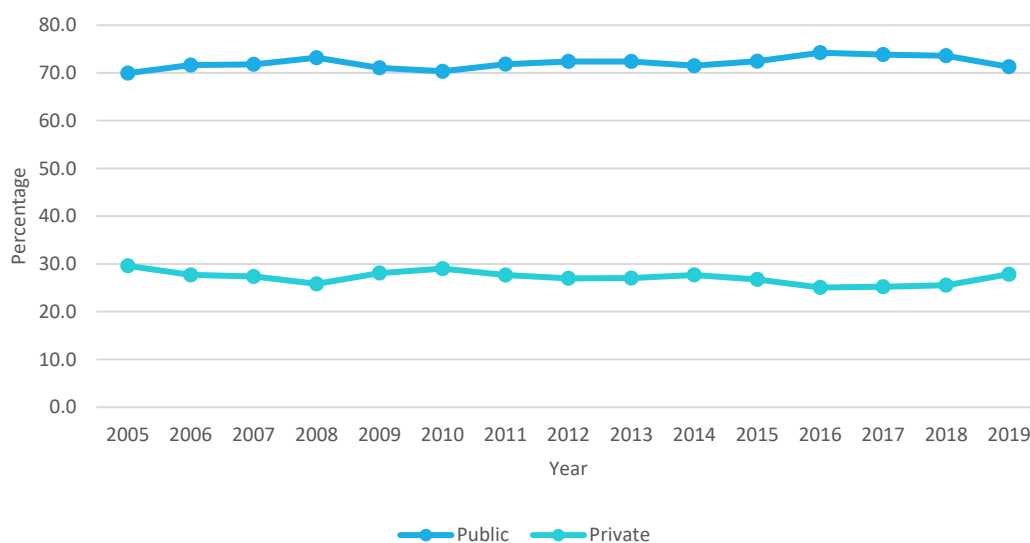
Year	Aboriginal		Torres Strait Islander		Aboriginal and Torres Strait Islander		Non-indigenous		Not stated		Total
	n	%	n	%	n	%	n	%	n	%	n
2015	271	4.8	13	0.2	27	0.5	5 188	92.5	111	2.0	5 610
2016	271	4.7	16	0.3	22	0.4	5 397	92.8	112	1.9	5 818
2017	283	5.1	9	0.2	28	0.5	5 057	92.0	119	2.2	5 496
2018	271	5.0	8	0.1	25	0.5	5 015	92.3	117	2.2	5 436
2019	289	5.1	14	0.2	20	0.4	5 205	92.1	123	2.2	5 651

In-patient election status

In Tasmania, the proportion of private patients in 2019 (27.8 per cent) was the highest in the most recent 5 years; conversely, the proportion of public patients (71.3 per cent) in Tasmania in 2019 was the lowest in the most recent 5 years.

Table 39: Women who gave birth, by admitted patient election status 2015-2019

Year	Public		Private		Not stated		Total
	n	%	n	%	n	%	
2015	4 064	72.4	1 500	26.7	46	0.8	5 610
2016	4 320	74.3	1 459	25.1	39	0.7	5 818
2017	4 058	73.8	1 386	25.2	52	0.9	5 496
2018	4 001	73.6	1 388	25.5	47	0.9	5 436
2019	4 028	71.3	1 573	27.8	50	0.9	5 651

Figure 12: Women who gave birth, by admitted patient election status 2005-2019

Note: "Public" and "Private" is classified by the mother's elected accommodation chargeable status upon admission to hospital - thus a patient in a public hospital can elect to be treated as a private patient.

Parity status

Parity refers to the condition of having given birth to an infant or infants, alive or deceased, at a gestation 20 weeks or beyond. A multiple birth (giving birth to >1 infant in a delivery) contributes one to parity. A woman is considered nulliparous (i.e., parity = zero) prior to the first delivery ≥20 weeks gestation.

Table 40: Women who gave birth, by parity 2015-2019

Year	Zero		One		Two		Three		Four and over		Total
	n	%	n	%	n	%	n	%	n	%	
2015	2 241	39.9	1 945	34.7	880	15.7	333	5.9	211	3.8	5 610
2016	2 366	40.7	1 998	34.3	862	14.8	358	6.2	234	4.0	5 818
2017	2 231	40.6	1 812	33.0	924	16.8	319	5.8	210	3.8	5 496
2018	2 232	41.1	1 891	34.8	812	14.9	303	5.6	198	3.6	5 436
2019	2 391	42.3	1 950	34.5	804	14.2	295	5.2	211	3.7	5 651

For Tasmania in 2019, 42.3 per cent of mothers gave birth for the first time and 34.5 per cent had their second baby. This trend is similar to that reported nationally in 2019, where 42.7 per cent of mothers gave birth for the first time and 35.1 per cent had their second baby.

Antenatal visits

Table 41: Women who gave birth, by gestational age at first antenatal visit 2015-2019

Year	Less than 14 weeks	14-19 weeks	20 weeks and over	No antenatal care or unknown gestation at first antenatal visit
Number				
2015	4 947	449	194	20
2016	5 119	474	195	30
2017	4 903	393	185	15
2018	4 750	451	213	22
2019	4 881	527	225	18
Percentage				
2015	88.2	8.0	3.5	0.4
2016	88.0	8.1	3.4	0.5
2017	89.2	7.2	3.4	0.3
2018	87.4	8.3	3.9	0.4
2019	86.4	9.3	4.0	0.3
Australia 2019¹⁷	76.6	14.6	8.6	0.1

Table 42: Women who gave birth, by number of antenatal visits 2015-2019

Year	One	Two to four	Five or more	No antenatal care
Number				
2015	196	261	4 976	177
2016	182	246	5 249	141
2017	193	209	5 077	17
2018	179	204	5 033	20
2019	191	215	5 224	21
Percentage				
2015	3.5	4.7	88.7	3.2
2016	3.1	4.2	90.2	2.4
2017	3.5	3.8	92.4	0.3
2018	3.3	3.8	92.6	0.4
2019	3.4	3.8	92.4	0.4
Australia 2019¹⁷	1.2	4.5	94.2	0.1

¹⁷ Australian Institute of Health and Welfare 2021. Australia's mothers and babies. Cat. no. PER 101. Canberra: AIHW. Viewed 28 June 2021, <https://www.aihw.gov.au/reports/mothers-babies/australias-mothers-babies>.

Almost all mothers (99.6 per cent) who gave birth in Tasmanian in 2019 had at least one antenatal visit – 86.4 per cent of women attended at least one antenatal visit in the first trimester (less than 14 weeks) and 4.0 per cent did not begin antenatal care until 20 weeks' gestation or beyond.

Maternal body mass index by birth setting

In view of its significant contribution to morbidity and mortality for both mother and baby, the inclusion of maternal body mass index (BMI) at first antenatal visit as a measure on the perinatal data collection form allows assessment of obesity during pregnancy based on the ratio of weight and height. It has been reported that pregnant women who are obese have an increased risk of thromboembolism, gestational diabetes, pre-eclampsia, post-partum haemorrhage, wound infections and caesarean section, and their babies have higher rates of congenital anomaly, pre-term birth, stillbirth and neonatal death compared with pregnant women who are not obese¹⁸. The normal range of BMI for non-pregnant women is 18.5 to 24.9 while a BMI of 30.0 kg/m² or more at the first antenatal consultation has been defined as obesity in pregnancy. Table 43 shows findings for maternal BMI by birth setting in Tasmania from 2015 to 2019.

Table 43: Women who gave birth, by maternal body mass index and birth setting 2015-2019

BMI (kg/m ²)	2015		2016		2017		2018		2019	
	n	% ^(a)	n	% ^(a)	n	% ^(a)	n	% ^(a)	n	% ^(a)
Public										
Less than 18.5	138	3.9	155	4.3	108	3.4	146	4.4	112	3.3
18.5–24.9	1 621	45.9	1 611	45.1	1 388	43.9	1 457	44.4	1 459	42.9
25.0–29.9	880	24.9	840	23.5	793	25.1	772	23.5	868	25.6
30.0–39.9	727	20.6	759	21.2	702	22.2	709	21.6	759	22.3
40.0–49.9	145	4.1	185	5.2	150	4.7	171	5.2	170	5.0
50 and over	19	0.5	26	0.7	21	0.7	29	0.9	29	0.9
Not stated	252	-	306	-	254	-	162	-	139	-
Total	3 782	100.0	3 882	100.0	3 416	100.0	3 446	100.0	3 536	100.0
Private										
Less than 18.5	52	3.1	47	2.6	51	2.6	43	2.2	46	2.2
18.5–24.9	857	50.5	869	48.7	909	45.5	854	44.2	921	44.8
25.0–29.9	446	26.3	463	25.9	561	28.1	558	28.9	566	27.5
30.0–39.9	292	17.2	337	18.9	402	20.1	401	20.8	441	21.4
40.0–49.9	46	2.7	63	3.5	68	3.4	73	3.8	80	3.9
50 and over	5	0.3	6	0.3	8	0.4	2	0.1	2	0.1
Not stated	84	-	112	-	29	-	12	-	9	-
Total	1 782	100.0	1 897	100.0	2 028	100.0	1 943	100.0	2 065	100.0

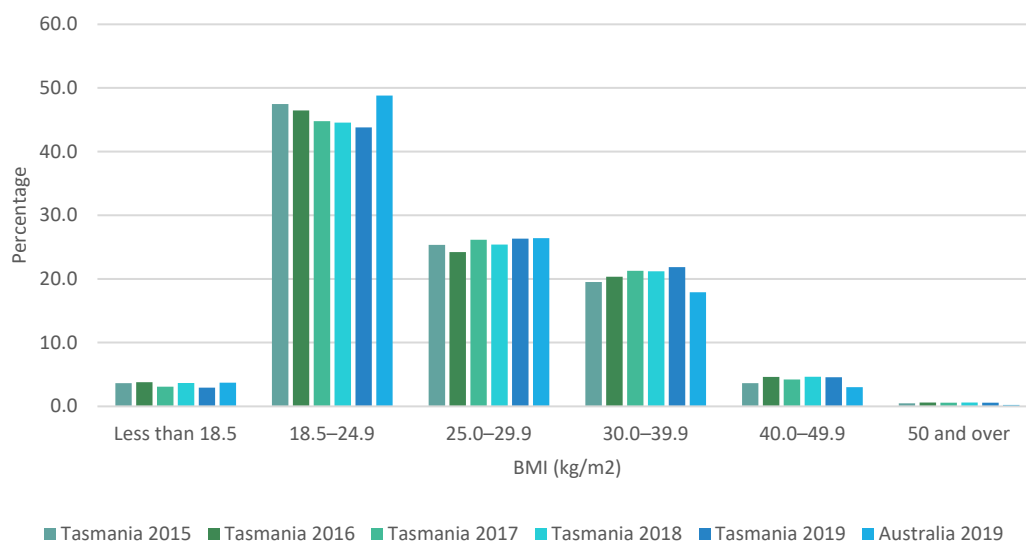
(a) Percentages calculated after excluding records with missing values.

¹⁸Royal College of Obstetricians and Gynaecologists (RCOG) 2018. Care of women with obesity in pregnancy. Green-top Guideline no. 72. London: RCOG. Viewed 5 July 2021, <https://obgyn.onlinelibrary.wiley.com/doi/full/10.1111/1471-0528.15386>.

BMI (kg/m ²)	2015		2016		2017		2018		2019	
	n	% ^(a)	n	% ^(a)	n	% ^(a)	n	% ^(a)	n	% ^(a)
Homebirths / Birth Centre										
Less than 18.5	1	2.4	2	5.7	1	2.5	3	6.4	3	6.4
18.5–24.9	23	54.8	27	77.1	31	77.5	33	70.2	29	61.7
25.0–29.9	9	21.4	4	11.4	6	15.0	6	12.8	13	27.7
30.0–39.9	9	21.4	2	5.7	2	5.0	5	10.6	2	4.3
40.0–49.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
50 and over	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Not stated	4	-	4	-	12	-	0	-	3	-
Total	46	100.0	39	100.0	52	100.0	47	100.0	50	100.0
Total										
Less than 18.5	191	3.6	204	3.8	160	3.1	192	3.6	161	2.9
18.5–24.9	2 501	47.5	2 507	46.5	2 328	44.8	2 344	44.5	2 409	43.8
25.0–29.9	1 335	25.3	1 307	24.2	1 360	26.1	1 336	25.4	1 447	26.3
30.0–39.9	1 028	19.5	1 098	20.3	1 106	21.3	1 115	21.2	1 202	21.9
40.0–49.9	191	3.6	248	4.6	218	4.2	244	4.6	250	4.5
50 and over	24	0.5	32	0.6	29	0.6	31	0.6	31	0.6
Not stated	340	-	422	-	295	-	174	-	151	-
Total	5 610	100.0	5 818	100.0	5 496	100.0	5 436	100.0	5 651	100.0

(a) Percentages calculated after excluding records with missing values.

Figure 13: Proportion of women who gave birth, by body mass index in Tasmania 2015-2019 and Australia 2019



Based on self-reported height and weight at the first antenatal visit, over half (53.3 per cent) of the 5 651 women who gave birth in a Tasmanian facility in 2019 had a BMI in the overweight or obese range (25.0 and above), and more than one-quarter (27.0 per cent) had a BMI in the obese range (30.0 and over). However, it is somewhat reassuring to note that these figures are lower than recorded in 2017-2018 for Tasmanian women aged 18 years and over, when 65.3 per cent were estimated to be overweight or obese, and 36.3 per cent estimated to be obese¹⁹, with the one caution that the 2017-2018 figures were based on *measured* height and weight; this tends to result in a higher BMI than when calculated using self-reported height and weight.

The proportion of overweight/obese (BMI $\geq$ 25.0) women giving birth in public facilities (53.8 per cent) was significantly higher ($p < 0.001$) than for those giving birth at home or in a birth centre (31.9 per cent), or when compared to Australia as a whole for 2019 (47.5 per cent), but similar to women giving birth in private facilities (53.0 per cent). The proportion of women giving birth in private facilities who were overweight/obese was also significantly higher ($p < 0.001$) than for women who gave birth at home or in a birth centre.

The proportion of women giving birth in a public setting in Tasmania in 2019 who reported to be obese (BMI $\geq$ 30.0) (28.2 per cent) was statistically significantly higher ($p = 0.024$) than for those giving birth in a private facility (25.4 per cent). Both the public and private facility obesity proportions were significantly higher ($p < 0.001$) than for women who gave birth outside of hospital (4.3 per cent). Also, both the public and private facility obesity (BMI $\geq$ 30.0) levels were statistically significantly higher ($p < 0.001$) than reported for Australian mothers overall in 2019 (21.1 per cent).

Maternal iodine/iron/vitamin D intake by birth setting

Iodine

The World Health Organisation recommends that women who are pregnant take a daily iodine supplement, as the amount of dietary iodine is not enough to meet the additional needs of pregnancy²⁰. However, very few women (7.6 per cent) giving birth in a Tasmanian facility in 2019 reported to have taken an iodine supplement whilst pregnant, similar ($p = 0.734$) to 2018 at 7.8 per cent, and significantly lower ($p < 0.001$) than in both 2017 (9.9 per cent) and 2016 (9.6 per cent), but statistically significantly higher ($p < 0.001$) than for 2015 (5.5 per cent).

As shown in Table 44, women who gave birth in a public hospital were the least likely to have taken an iodine supplement whilst pregnant (4.8 per cent). This proportion was statistically significantly lower ($p < 0.001$) than for women who gave birth in a private hospital (11.9 per cent) or outside of hospital (28.0 per cent). This might reflect a higher level of health awareness amongst women who choose to give birth in a private facility or outside of hospital.

Women who gave birth in a private facility in 2019 were significantly less likely ($p < 0.003$) to have taken an iodine supplement whilst pregnant (11.9 per cent) than in either 2018 (15.2 per cent), 2017 (21.7 per cent) or 2016 (19.7 per cent) but were significantly more likely ($p = 0.044$) to do so than in 2015 (9.9 per cent).

¹⁹ Australian Bureau of Statistics, 2018, National Health Survey: First results 2017-18, cat. no. 4364.0.55.001, viewed 24 April 2019. [<http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4364.0.55.001Main+Features100012017-18?OpenDocument>].

²⁰ National Health and Medical Research Council (NHMRC) public statement: Iodine supplementation for pregnant and breastfeeding women, January 2010.

The proportion of women who gave birth in a public facility in 2019 and took supplemental iodine (4.8 per cent) was significantly higher than for both 2018 (3.4 per cent, $p=0.003$) and 2017 (2.7 per cent, $p<0.001$), but similar ($p=0.472$) to 2016 at 4.5 per cent. It should again be noted here that multivitamins which potentially contain iodine might not be reported by mothers, resulting in an under-estimate of the number who took supplemental iodine.

The proportion of women giving birth outside of hospital in 2019 who took supplemental iodine whilst pregnant (28.0 per cent) was statistically similar to previous years ($p>0.05$).

Iron

Higher numbers of women who gave birth in Tasmania in 2019 reported to have taken an iron supplement when pregnant compared to an iodine supplement. This might be at least partially attributable to greater publicity over the importance of iron to health. For women who gave birth in a private facility, 305 reported taking an iron supplement, higher than the number who reported taking supplemental iodine (246).

Overall, in 2019, 13.4 per cent of women reported to have taken supplemental iron whilst pregnant, with the highest proportions being amongst women who gave birth outside of hospital (88.0 per cent) or in a private facility (14.8 per cent); both of which were significantly higher ($p<0.001$) than for women who gave birth in a public facility (11.5 per cent). Additionally, the difference in iron supplementation between private hospital patients (14.8 per cent) and those who gave birth outside of hospital (88.0 per cent) was statistically significant ($p<0.001$). Compared to 2018, a significantly ($p<0.001$) lower proportion of women who gave birth in a private facility reported having taken supplemental iron whilst pregnant (14.8 vs. 20.2 per cent). By contrast, the proportion of women giving birth outside of hospital and who reported taking supplemental iron whilst pregnant was significantly ($p<0.001$) higher in 2019 than in 2018 (88.0 vs. 57.4 per cent). For women who gave birth in a public facility, the 2019 maternal supplemental iron proportion was similar to 2018 (11.5 vs. 10.3 per cent, $p=0.114$). Again, it should be noted that there is a potential to underestimate the number of mothers who took supplemental iron in view of multivitamin consumption that may contain iron not being specifically reported by mothers.

Vitamin D

In 2019, about one in six (17.8 per cent) women reported to have taken a Vitamin D supplement whilst pregnant, statistically similar ($p>0.05$) to the level reported in 2018 (18.9 per cent).

The highest level of maternal Vitamin D supplementation was amongst women giving birth outside of hospital (24.0 per cent), statistically similar to women who gave birth in a private hospital (19.9 per cent, $p>0.05$), but significantly higher than for those women who gave birth in a public facility (16.5 per cent, $p=0.002$).

Compared to 2018, significantly fewer mothers who gave birth in a private hospital reported to have taken a Vitamin D supplement whilst pregnant (19.9 vs. 23.5 percent, $p=0.006$), whilst for women giving birth in a public hospital or outside of hospital the 2019 figures were statistically similar ($p>0.05$) to 2018 (16.5 vs. 16.3 per cent and 24.0 vs. 17.0 per cent, respectively). Again, it should be noted that there is a potential to underestimate the number of mothers who took Vitamin D in view of multivitamin consumption that may contain Vitamin D not being specifically reported by mothers.

Table 44: Women who gave birth and had iodine / iron / vitamin D intake, by birth setting 2015-2019

Vitamin	2015		2016		2017		2018		2019	
	n	%	n	%	n	%	n	%	n	%
Iodine										
Public	120	3.2	173	4.5	92	2.7	117	3.4	170	4.8
Private	176	9.9	374	19.8	440	21.7	296	15.2	246	11.9
Homebirths / Birth Centre	14	30.4	10	26.3	11	21.2	10	21.3	14	28.0
Total	310	5.5	557	9.6	543	9.9	423	7.8	430	7.6
Iron										
Public	339	9.0	410	10.6	358	10.5	356	10.3	407	11.5
Private	288	16.2	398	21.1	437	21.5	392	20.2	305	14.8
Homebirths / Birth Centre	24	52.2	22	57.9	38	73.1	27	57.4	44	88.0
Total	651	11.6	830	14.3	833	15.2	775	14.3	756	13.4
Vitamin D										
Public	504	13.3	471	12.1	479	14	561	16.3	585	16.5
Private	391	21.9	399	21.1	489	24.1	457	23.5	411	19.9
Homebirths / Birth Centre	10	21.7	10	26.3	6.0	11.5	8	17.0	12	24.0
Total	905	16.1	880	15.2	974	17.7	1 026	18.9	1 008	17.8

Maternal folic acid intake by birth setting

Folic acid deficiency has been strongly associated with an increased risk of neural tube defects in babies. As shown in Table 45, it is therefore of some concern to note that a significant number of mothers (65.5 per cent) in 2019 reported not taking supplemental folic acid either pre-conceptually or whilst pregnant. Mothers who gave birth outside of hospital were less likely to take folic acid, with mothers giving birth in a public or private facility the most likely.

Of mothers who did take a folic acid supplement at some point during pregnancy, a significantly lower ($p < 0.001$) proportion of those who gave birth in a public setting reported taking folic acid both pre- and post-conceptually (7.9 per cent), compared to 39.7 per cent of mothers who gave birth in a private facility. Both of these figures were statistically similar ($p > 0.05$) to the proportion of mothers who gave birth outside of hospital and who reported taking supplemental folic acid both pre-and-post-conceptually (22.2 per cent).

Over one-third (38.0 per cent) of women who gave birth in a private facility and took a folic acid supplement whilst pregnant did so only post-conceptually. This figure was significantly lower than for public facility mothers (57.8 per cent, $p < 0.001$), but statistically similar ($p > 0.05$) to women who gave birth outside of hospital (66.7 per cent).

A significantly higher ($p < 0.001$) proportion of women who gave birth in a public facility reported taking supplemental folate only pre-conceptually (34.3 per cent) compared to mothers who gave birth in a private facility (22.3 per cent). The proportion of women who gave birth outside of hospital reporting to take supplemental folate only pre-conceptually (11.1 per cent) was statistically similar ($p > 0.05$) to those who gave birth in either a public or private hospital.

Table 45: Women who gave birth and had folic acid consumption, by birth setting 2015-2019

Folic acid consumption	2015		2016		2017		2018		2019	
	n	%(a)	n	%(a)	n	%(a)	n	%(a)	n	%(a)
Pre-conceptually only										
Public	296	24.9	413	31.1	464	36.4	394	32.9	410	34.3
Private	126	15.8	126	14.5	127	13.9	111	15.7	166	22.3
Homebirths / Birth Centre	1	7.7	4	36.4	0	0.0	2	25.0	1	11.1
Total	423	21.1	543	24.6	591	26.9	507	26.5	577	29.6
Post-conceptually only										
Public	808	67.8	824	62.1	734	57.6	714	59.5	692	57.8
Private	282	35.3	318	36.7	330	36.2	270	38.2	282	38.0
Homebirths / Birth Centre	5	38.5	3	27.3	7	77.8	6	75.0	6	66.7
Total	1 095	54.6	1 145	52.0	1 071	48.8	990	51.8	980	50.3
Pre- and post-conceptually										
Public	87	7.3	90	6.8	77	6.0	91	7.6	95	7.9
Private	392	49.0	422	48.7	454	49.8	325	46.0	295	39.7
Homebirths / Birth Centre	7	53.8	4	36.4	2	22.2	0	0.0	2	22.2
Total	486	24.3	516	23.4	533	24.3	416	21.7	392	20.1
Not taken										
Public	2 591	-	2 555	-	2 141	-	2 247	-	2 339	-
Private	982	-	1 031	-	1 117	-	1 237	-	1 322	-
Homebirths / Birth Centre	33	-	28	-	43	-	39	-	41	-
Total	3 606	-	3 614	-	3 301	-	3 523	-	3 702	-
Total										
Public	3 782	100.0	3 882	100.0	3 416	100.0	3 446	100.0	3 536	100.0
Private	1 782	100.0	1 897	100.0	2 028	100.0	1 943	100.0	2 065	100.0
Homebirths / Birth Centre	46	100.0	39	100.0	52	100.0	47	100.0	50	100.0
Total	5 610	100.0	5 818	100.0	5 496	100.0	5 436	100.0	5 651	100.0

(a) Percentages calculated after excluding records with missing values.

Multiple pregnancies

The proportion of multiple pregnancies in Tasmania was very similar to the national average, with 14.7 multiple pregnancies per 1 000 mothers recorded in Tasmania in 2019 and 14.8 multiple pregnancies per 1 000 mothers in 2019 nationally. Multiple pregnancy in 2019 accounted for 1.5 per cent of pregnancies.

Table 46: Women who gave birth, by plurality 2015-2019

Year	Singleton pregnancy		Twin ^(a) pregnancy		Triplet ^(a) pregnancy		Total pregnancies
	n	%	n	%	n	%	
2015	5 527	98.5	83	1.5	0	0.0	5 610
2016	5 717	98.3	100	1.7	1	^	5 817
2017	5 411	98.5	85	1.5	0	0.0	5 496
2018	5 359	98.6	74	1.4	3	^	5 436
2019	5 568	98.5	81	1.4	2	^	5 651

^ Less than 0.1 per cent

(a) All birth orders >1 are multiple.

Onset of labour

Table 47: Women who gave birth, by onset of labour 2015-2019

Year	Spontaneous		Spontaneous and augmentation		Induced		No labour		Total pregnancies
	n	%	n	%	n	%	n	%	n
2015	1 826	32.5	1 033	18.4	1 651	29.4	1 100	19.6	5 610
2016	1 851	31.8	964	16.6	1 841	31.6	1 162	20.0	5 818
2017	1 653	30.1	870	15.8	1 852	33.7	1 121	20.4	5 496
2018	1 560	28.7	801	14.7	1 908	35.1	1 167	21.5	5 436
2019	1 755	31.1	840	14.9	1 862	32.9	1 194	21.1	5 651

Just under half (45.9 per cent) of women who gave birth in 2019 had a spontaneous labour (including those that were augmented), more than one-quarter had induced labour (32.9 per cent) and 21.1 per cent had no labour onset.

There have been small changes over the past five years in the type of labour onset – a decrease of 5.0 per cent in spontaneous labour (including those that were augmented) and corresponding increases for the induction of labour (3.5 per cent) and no labour onset (1.5 per cent).

Higher maternal age is strongly linked to an increased likelihood of complex maternal obstetric conditions such as hypertension, diabetes mellitus, renal disease etc. As these medical conditions are known to potentially impact on the pregnancy and the well-being of the baby it is not surprising that rates of induction of labour have increased.

Nationally in 2019, of all women who gave birth, 42.5 per cent had a spontaneous onset of labour; 22.7 per cent of mothers had no labour; and 34.7 per cent of mothers had induced labour. Out of all women who had spontaneous onset of labour (with WA excluded as the data were not provided), 67.7 per cent did not have augmentation. Of all women who gave birth nationally in 2019, 51.3 per cent had a non-instrumental vaginal birth; forceps delivery accounted for 5.1 per cent of mothers; while vacuum extraction accounted for 7.5 per cent of women who gave birth.

Induction of labour

Table 48: Women who gave birth after induction of labour, by method of birth and hospital sector 2015-2019

Year	Vaginal delivery				Caesarean section				Induction rate	
	Public		Private		Public		Private		Public	Private
	n	%	n	%	n	%	n	%	%	%
2015	841	79.6	473	79.5	215	20.4	122	20.5	27.9	33.4
2016	908	75.7	510	79.4	291	24.3	132	20.6	30.9	33.8
2017	880	77.1	574	80.7	261	22.9	137	19.3	33.4	35.1
2018	937	77.2	571	82.2	276	22.8	124	17.8	35.2	35.8
2019	873	77.3	580	79.2	257	22.7	152	20.8	32.0	35.4

Induced labour rates have risen for both the public and private sectors since 2015, with the public sector induction rate (32.0 per cent) being significantly lower ($p=0.007$) than for the private sector at 35.4 per cent, in keeping with 2016 and previous years. For 2017 and 2018 the private and public sector induction rates were statistically similar.

There has been a continued increase in the caesarean section rate reported nationally over the last decade with 36.0 per cent of mothers undergoing caesarean section deliveries in 2019 compared to 27.0 per cent reported in year 2002. In contrast, the proportion of instrumental deliveries has remained stable at about 12.6 per cent throughout this period²¹. Again in 2019, national data have shown that caesarean section rates increase with advancing maternal age and continue to be higher among older mothers (e.g., 44.2 per cent for mothers aged between 35 to 39 years old; 54.8 per cent for mothers aged 40 years and over) and those who gave birth in private hospitals (48.4 per cent) compared to the public sector (33.6 per cent).

²¹ Australian Institute of Health and Welfare 2021. Australia's mothers and babies. Cat. no. PER 101. Canberra: AIHW. Viewed 28 June 2021, <https://www.aihw.gov.au/reports/mothers-babies/australias-mothers-babies>.

Augmentation of labour

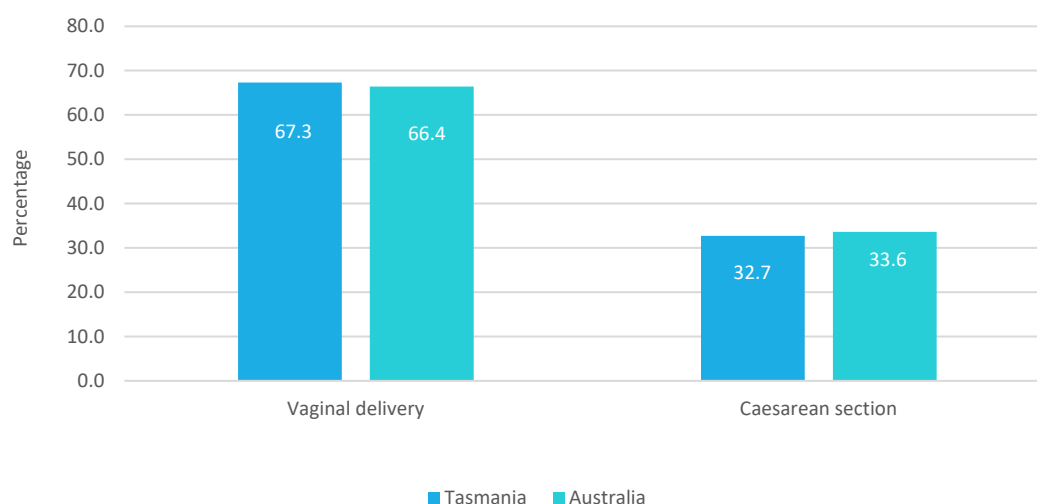
Table 49: Women who gave birth and had augmentation of labour, by type of augmentation 2015-2019

Year	Artificial Rupture of Membranes		Oxytocin		Other		Total augmentation	Augmentation rate	Total pregnancies
	n	%	n	%	n	%	n	%	n
2015	674	65.2	39	3.8	320	31.0	1 033	18.4	5 610
2016	617	64.0	36	3.7	311	32.3	964	16.6	5 818
2017	524	60.2	51	5.9	295	33.9	870	15.8	5 496
2018	499	62.3	37	4.6	265	33.1	801	14.7	5 436
2019	501	59.6	35	4.2	304	36.2	840	14.9	5 651

In Tasmania, 14.9 per cent of mothers were reported in 2019 to have had augmentation of spontaneous labour, similar to 2017 and 2018, but statistically significantly lower ($p < 0.013$) than for 2015 and 2016. Nationally in 2019, 32.3 per cent of all mothers who had spontaneous onset of labour (with WA excluded as the data were not provided) were reported to have had their labour augmented. Furthermore, in 2019 nationally, the onset of labour was spontaneous for 42.5 per cent of all mothers giving birth and 34.7 per cent of mothers had their labour induced.

Mode of delivery

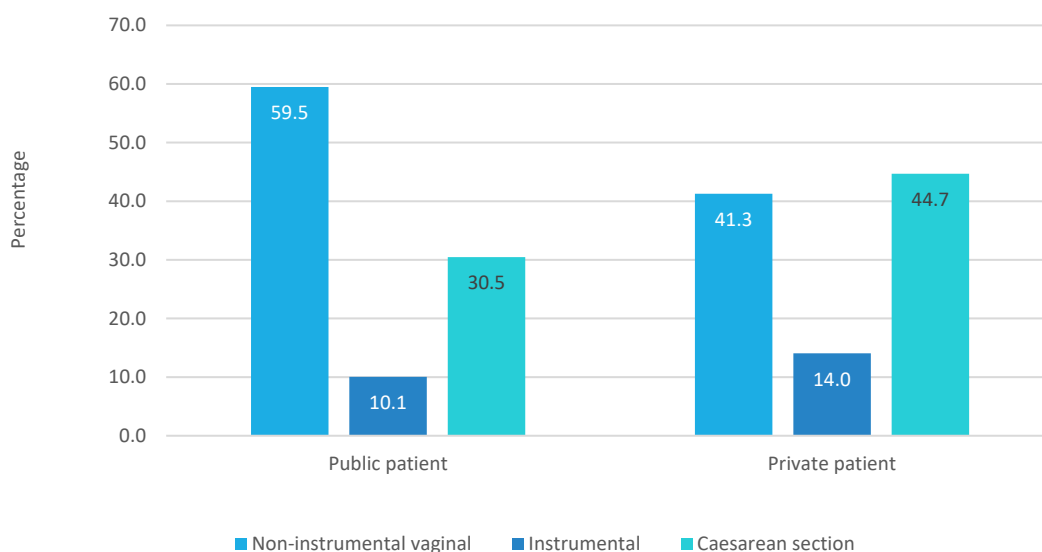
Figure 14: Proportion of women who gave birth in public hospitals, by mode of delivery in Tasmania and Australia 2019



Note: It should be highlighted that Tasmanian public hospital rates reported here may be skewed since all babies that are born at the Launceston General Hospital are recorded as public, regardless of patient election status, thus inflating the public hospital rate via the private patient contribution. Moreover, the North West Private Hospital at Burnie is a private hospital contracted to accommodate public patients.

Mode of delivery in public hospitals has remained relatively unchanged over recent years, with Tasmania recording 67.3 per cent in 2019, and Australia recording a similar rate of 66.4 per cent, for vaginal deliveries in 2019 compared to 66.7 per cent for Tasmania in 2018. Furthermore, caesarean sections (CS) were reported at 32.7 per cent for Tasmania in 2019 and 33.6 per cent nationally in 2019 compared with 33.3 per cent for Tasmania in 2018.

Figure 15: Proportion of women who gave births, by mode of delivery and admitted patient election status in Tasmania 2019



Again, private patients in Tasmania in 2019 continued to undergo more caesarean sections and instrumental vaginal deliveries than public patients (see Figure 15), a trend that was consistent with last year's figures. Conversely, more non-instrumental deliveries continued to be performed for public patients compared to private patients during 2019. For each mode of delivery, the difference between public and private patients was statistically significant ($p < 0.001$). Overall, in Tasmania in 2019, the total CS rate was 34.2 per cent; the total unassisted vaginal delivery rate was 54.8 per cent and the total instrumental delivery rate was 11.1 per cent.

In further detail:

- The higher caesarean section rates reported in 2019 in Tasmanian *private* hospitals is a trend consistent with national findings reported in 2019. National figures derived from 2019 have shown caesarean section rates to be higher in *private* hospitals (48.4 per cent) compared with *public* hospitals (33.6 per cent) across all age groups;
- Of the vaginal deliveries nationally reported in *public* hospitals in 2019, 54.0 per cent were spontaneous, 5.6 per cent were forceps deliveries and 6.8 per cent were vacuum extraction; and
- Of the vaginal deliveries nationally reported in *private* hospitals in 2019, 37.0 per cent were spontaneous, 4.2 per cent were forceps deliveries and 10.3 per cent were vacuum extraction.

Caesarean section

Table 50: Women who gave birth, by emergency / elective caesarean section 2015-2019

Year	Emergency		Elective		Total CS
	n	%	n	%	n
2015	891	50.6	871	49.4	1 762
2016	1 016	52.8	909	47.2	1 925
2017	961	52.7	861	47.3	1 822
2018	963	51.3	916	48.7	1 879
2019	960	49.7	970	50.3	1 930

Table 51: Women who gave birth, by emergency / elective caesarean section and hospital sector 2015-2019

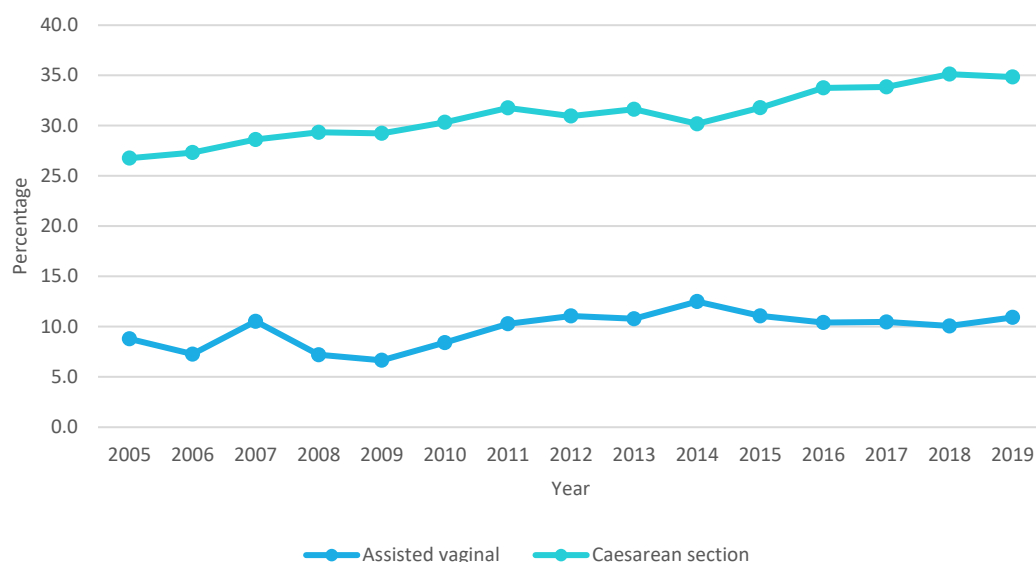
Year	Emergency				Elective				Total	
	Public		Private		Public		Private		Public	Private
	n	%	n	%	n	%	n	%	n	n
2015	604	55.5	287	42.6	485	44.5	386	57.4	1 089	673
2016	685	56.6	331	46.3	525	43.4	384	53.7	1 210	715
2017	626	57.1	335	46.2	471	42.9	390	53.8	1 097	725
2018	655	57.2	308	42.0	491	42.8	425	58.0	1 146	733
2019	643	56.0	317	40.6	506	44.0	464	59.4	1 149	781

Table 52: Women who gave birth, by primary / repeat caesarean section 2015-2019

Year	Primary		Repeat		Total CS
	n	%	n	%	n
2015	977	55.4	785	44.6	1 762
2016	1 115	57.9	810	42.1	1 925
2017	1 102	60.5	720	39.5	1 822
2018	1 103	58.7	776	41.3	1 879
2019	1 148	59.5	782	40.5	1 930

Table 53: Women who gave birth, by primary / repeat caesarean section and hospital sector 2015-2019

Year	Primary				Repeat				Total	
	Public		Private		Public		Private		Public	Private
	n	%	n	%	n	%	n	%	n	n
2015	601	55.2	376	55.9	488	44.8	297	44.1	1 089	673
2016	718	65.9	397	59.0	492	45.2	318	44.5	1 210	715
2017	670	61.1	432	59.6	427	38.9	293	40.4	1 097	725
2018	694	60.6	409	55.8	452	39.4	324	44.2	1 146	733
2019	673	58.6	475	60.8	476	41.4	306	39.2	1 149	781

Figure 16: Proportion of babies born by caesarean section and assisted vaginal 2005-2019

The incidence of caesarean section (CS) has risen progressively since the 1970s. This has been a trend in all countries, although the degree of rise has varied. In Tasmania, the proportion of babies born by CS was 34.8 per cent in 2019, and was slightly lower than for the previous year in Tasmania (35.1 per cent in 2018), and also lower than the nationally reported figure for 2019 (36.6 per cent).

As outlined in recent reports, multiple factors that are likely to contribute to this trend include the following:

1. **Maternal age.** This has been known to be an independent variable ever since perinatal outcomes were recorded by the late Professor Joe Correy when he started the first data collection in a state population in Australia in the 1970s. In general, there has been a steady trend for a reduction in births in women in the 20-29 age group, with an equally steady trend for an increase in the 30-39-year age group and over. The CS rate for the 40+ group is approximately double the rate reported for the 20-29 age group and as a demographic change alone it would be expected that the CS rate should rise without any change in background rates changing.

2. **Obstetric medical disorders.** One of the consequences of an increasing maternal age in the obstetric population is that providers are now experiencing a significant increase in the incidence of medical disorders in pregnancy. Hypertension, diabetes mellitus, renal disease, connective tissue and autoimmune diseases, and so on, all have significant potential implications for the well-being of mother and fetus. In their own right, these are associated with increased CS rates, and when coupled with a shift to an older obstetric population will inevitably lead to a rise in CS rates.
3. **Change in parity.** Whereas in the 1970s and before it was not unusual for women to have more than 3 babies, the average rate per woman is now less than 2 babies. As has been well documented, the CS rate for primigravidae is much higher than for multipara. This concentration of primigravidae, who are also older, concentrate the numbers likely to have CS delivery as a demographic change alone, without any actual increase in rates in each age group.
4. **Maternal weight.** The problems of obesity in pregnancy and the issues in relation to pregnancy have been highlighted in recent times, particularly with obesity becoming a modern health epidemic. Maternal obesity can present challenges for pregnant women and is associated with multiple complications in pregnancy such as congenital anomalies (including spina bifida), pre-existing and gestational hypertension, diabetes, preterm birth, fetal death and an increased rate of caesarean section with a resulting risk of complications. In developed countries this has reached proportions that have a significant consequence for health services. In recent years much attention has rested on smoking and its effects on health. There is emerging evidence of a similar effect and magnitude related to obesity. Even being overweight has been shown to increase morbidity and health costs. In the last decade attention has been directed to maternal body weight and its effects on pregnancy outcome. Although no obstetric weight data from Tasmania are available, it has been shown that the rate of obesity in the general population in Tasmania has increased significantly – as in other states in Australia. A research study²² investigating BMI and obstetric outcome in more than thirty thousand women in Belfast showed the effect of BMI on rates of breastfeeding compared to normal of 18.5-24.99. Table 54 has extracted significant findings from this study in relation to the impact of various levels of obesity on maternal outcomes shows that as obesity severity increases the likelihood of breastfeeding decreases.

²² Scott-Pillai, Spence, D., Cardwell, C.R., Hunter, A & Holmes, V.A. (2013). The impact of body mass index on maternal and neonatal outcomes: a retrospective study in a UK obstetric population, 2004-2011. *British Journal of Obstetrics & Gynaecology*, July, Vol 120 (no. 8), pp. 932-939.

Table 54: Relative risk of adverse maternal outcomes in overweight and obese women by BMI category (kg/m²)

	Overweight BMI 25.00-29.99	Obese Class 1 BMI 30.00-34.99	Obese Class 2 BMI 35.00-39.99	Obese Class 3 BMI ≥40
Gestational diabetes	1.7 (1.3 - 2.3)	3.7 (2.8 - 5.0)	6.0 (4.2 - 8.5)	8.5 (5.7 - 12.9)
Hypertensive disorders of pregnancy	1.9 (1.7 - 2.3)	3.5 (2.9 - 4.2)	5.0 (4.0 - 6.4)	6.6 (4.9 - 8.9)
Induction of labour	1.2 (1.1 - 1.3)	1.3 (1.2 - 1.5)	1.4 (1.2 - 1.7)	1.6 (1.3 - 2.0)
Emergency CS	1.4 (1.2 - 1.5)	1.6 (1.4 - 1.8)	1.8 (1.5 - 2.2)	1.9 (1.4 - 2.5)
PPH	1.4 (1.3 - 1.5)	1.8 (1.6 - 2.0)	2.4 (2.0 - 2.8)	2.7 (2.2 - 3.4)
Wound problems	1.2 (0.7 - 2.1)	1.6 (0.9 - 3.0)	3.5 (1.8 - 6.7)	6.0 (3.0 - 12.1)
C-section	1.4 (1.3 - 1.5)	1.8 (1.6 - 2.0)	2.5 (2.1 - 2.9)	2.8 (2.4 - 3.5)
Breastfeeding at discharge	0.8 (0.7 - 0.8)	0.6 (0.6 - 0.7)	0.5 (0.4 - 0.6)	0.4 (0.3 - 0.5)

*Note: Risk is relative to that for women of normal weight. All variables are adjusted for age, parity, social deprivation, smoking and year of birth. Values presented as OR (99% CI), with $p < 0.01$ considered to be significant. All p values < 0.001 were considered to be significant for all listed maternal outcomes by BMI Category except for **wound problems** in **overweight** and **obese class 1** categories. Note that the findings are taken from research study previously referenced.²³*

5. **A change in method of delivery from the early 1980s.** Instrumental delivery rates have fallen from above 20 per cent to under 10 per cent. This is in recognition that traumatic instrumental delivery, particularly from high in the birth canal, is attended by significant morbidity both for the baby and the mother. Few breech babies are born vaginally now Australia-wide, and an increasing number of twins undergo CS delivery especially in view of the associated complications of twin pregnancy including malpresentation and discrepancy in fetal growth and condition.
6. **Altered delivery of pre-term babies.** Table 16 shows data from year 2015 until current. There has been an increasing trend overall to deliver babies by CS involving gestation ranges 28 weeks and above.

Babies born very preterm from conditions such as IUGR, pre-eclampsia etc., who were in the past managed longer in utero, are now born earlier and in better condition by CS. Those delivered by CS at very early gestations are now expected to have very high survival rates in NICU.
7. **The use of cardiotocography (CTG).** Although it is known that the introduction and widespread use of CTG in the 1970s to monitor fetuses in labour has been associated with a significant rise in CS rates, it is questionable whether CTG use is still responsible for ongoing rising rates. The institution of the RANZCOG CTG guidelines has yet to be evaluated with regard to its impact on the rate of CS since the widespread Australian use of the guidelines began.

²³ Scott-Pillai, Spence, D., Cardwell, C.R., Hunter, A & Holmes, V.A. (2013). The impact of body mass index on maternal and neonatal outcomes: a retrospective study in a UK obstetric population, 2004-2011. *British Journal of Obstetrics & Gynaecology*, July, Vol 120 (no. 8), pp. 932-939.

8. **Concern regarding pelvic floor function.** The colorectal and urological literature has focused on the burden of both faecal and urinary incontinence in the female population highlighting the effects of childbirth. In practice this has led to a more liberal offer of CS to women perceived to be at higher risk of subsequent bowel or urinary incontinence e.g., those who experienced anal sphincter damage (a third- or fourth-degree tear with a prior delivery) or who have undergone surgery for prolapse or urinary incontinence.
9. **Debate in obstetric academic circles** and literature with regard to the safety of vaginal birth after caesarean section (VBAC) and the low acceptance of any fetal risk within the pregnant population and their families.
10. **Empowerment of women** as the consumer of maternity care and a preference among some groups of women to request CS. Women are much less accepting of risk and much more aware of the increased risks attributable to emergency over elective CS. Once risk factors are added – VBAC, multiple pregnancy, difficult previous vaginal delivery, IVF pregnancy, predicted larger than average baby- the practitioner has limited grounds for refusal of a request for CS.
11. **Induction of labour.** Induction from the thirty-ninth week has not been shown to increase caesarean section rates and women and their maternity care providers should be assessing the proposed length of all pregnancies according to risk factors and the desires of the woman. The practice of delaying induction of labour to term plus 10 days, in the absence of contra-indications to waiting, means labour is more likely to occur spontaneously.

Maternal hypertension

Table 55: Women who gave birth and had pregnancy-induced hypertension 2015-2019

Year	Pre-existing		Pregnancy-induced hypertension ^(a)		Total
	n	%	n	%	
2015	439	7.8	305	5.4	5 610
2016	449	7.7	368	6.3	5 818
2017	418	7.6	349	6.4	5 496
2018	389	7.2	355	6.5	5 436
2019	438	7.8	392	6.9	5 651

(a) These figures include pregnancy induced hypertension and pre-eclampsia.

The proportion of mothers in Tasmania reported to have pregnancy-induced hypertension in 2019 (6.9 per cent) was statistically significantly higher ($p < 0.001$) than in 2015 (5.4 per cent), but statistically similar ($p > 0.05$) to every other year from 2016 to 2018. Also, whilst the proportion of mothers in 2019 with pre-existing hypertension was similar to the previous year ($p = 0.231$), overall, there has been a significant increase in both the number and percentage of mothers presenting with pre-existing hypertension over the eleven-year period since 2006 ($p < 0.001$).

The increasing rate of obesity in the general population, which is reflected in higher maternal obesity rates, in association with increasing maternal ages in the obstetric population, have been found to impact on the state of pregnancy-induced hypertension and have significant potential implications for the well-being of mother and fetus.

Antepartum haemorrhage

Table 56: Women who gave birth and had antepartum haemorrhage 2015-2019

Year	Placenta praevia		Abruptio placenta		APH undetermined		Total
	n	%	n	%	n	%	
2015	19	0.3	19	0.3	126	2.2	5 610
2016	12	0.2	19	0.3	88	1.5	5 818
2017	18	0.3	26	0.5	91	1.7	5 496
2018	14	0.3	23	0.4	114	2.1	5 436
2019	25	0.4	19	0.3	128	2.3	5 651

Postpartum haemorrhage

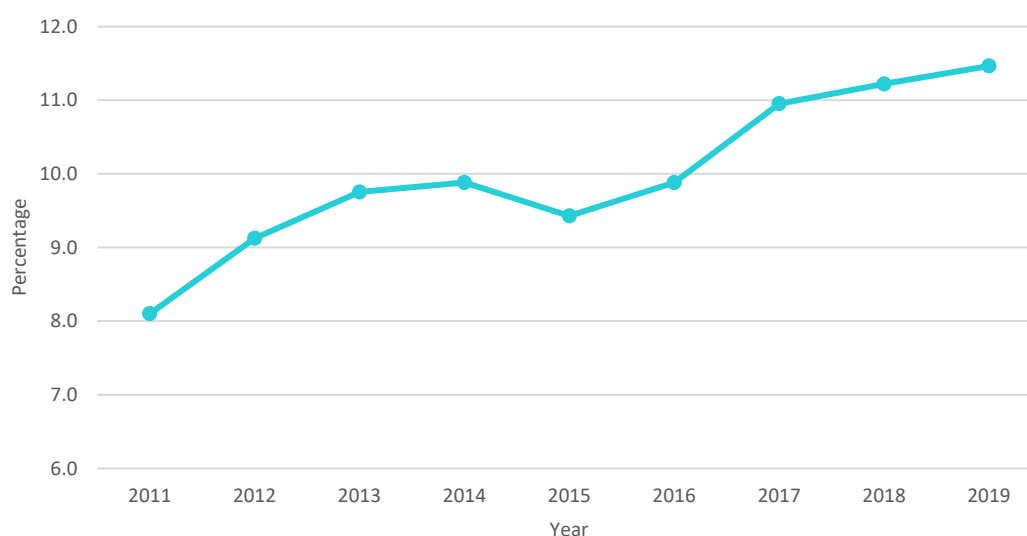
Table 57: Women who gave birth and had postpartum haemorrhage 2015-2019

Year	Number	Incidence %	Total
2015	529	9.4	5 610
2016	575	9.9	5 818
2017	602	11.0	5 496
2018	610	11.2	5 436
2019	648	11.5	5 651

Postpartum haemorrhage (PPH) continues to be a leading cause of both maternal mortality and morbidity. A blood loss of 500 ml or more from the genital tract after childbirth, occurring within 24 hours of birth or 1 000 ml or more after caesarean delivery, is considered to be PPH. The incidence of PPH rose from 9.4 per cent in 2015 to 11.5 per cent in 2019.

Factors contributing to this rise may include increased maternal obesity; increased induction of labour rates; increased CS rate (if there is no distinction made between maximum normal blood loss for vaginal births and CS where anything 500mls and over is recorded as PPH regardless of mode of delivery), increased awareness and reporting; and increased proportion of birth occurring in primiparous women. Other factors may include increased incidence of prolonged second stage (following the publication of new *American College of Obstetricians and Gynecologists* (ACOG) guidelines²⁴ suggesting 2 hours in a multi and 3 hours in a primiparous woman is normal). Also, no distinction between “mild” (500-1 000 ml) PPH, that may have less clinical significance and greater degrees of blood loss, and no data on blood transfusion or iron infusion requirements postnatally.

Figure 17: Proportion of women who gave birth and had postpartum haemorrhage 2011-2019



Breastfeeding

Trends reported in Tasmania (see tables below) indicate that the percentage of women who gave birth and were breastfeeding at maternal discharge has increased gradually. In December 2012, the National Health and Medical Research Council released revised *Infant Feeding Guidelines* which provide convincing evidence that breastfeeding provides major public health benefits to both the infant and mother²⁵. The percentage of public hospital patients breastfeeding at discharge in 2019 was the highest in the most recent 5 reporting years, and also significantly lower ($p < 0.001$) than the percentage reported for private hospital patients. This is likely to reflect lower rates of breastfeeding that have been observed among women of lower socio-economic status²⁶. It is encouraged to prepare women for breastfeeding during the antenatal and perinatal periods with support to be provided in the early stages, particularly in the public hospital system.

²⁴ Safe prevention of the primary cesarean delivery. Obstetric Care Consensus No. 1. American College of Obstetricians and Gynaecologists, Society for Materno-Fetal Medicine. *Obstet Gynecol* 2014;123:693–711. Reaffirmed 2016 and 2019.

²⁵ National Health and Medical Research Council (2012) *Infant Feeding Guidelines*. Canberra: National Health and Medical Research Council.

²⁶ Australian Health Ministers Conference (2009) *Australian National Breastfeeding Strategy 2010-2015* Canberra: Commonwealth of Australia.

Table 58: Women who gave birth, by breastfeeding status (including partially) at maternal discharge 2015-2019

Year	Yes		No		Total women delivered live births
	n	%	n	%	
2015	4 719	84.6	858	15.4	5 577
2016	4 870	84.3	907	15.7	5 777
2017	4 681	85.6	785	14.4	5 466
2018	4 593	85.0	809	15.0	5 402
2019	4 850	86.3	769	13.7	5 619

Table 59: Women who gave birth and were breastfeeding (including partially) at maternal discharge, by parity 2015-2019

Year	Primiparae		Multiparae		Total women breastfeeding
	n	%	n	%	
2015	1 935	86.8	2 784	83.1	4 719
2016	2 054	87.4	2 816	82.2	4 870
2017	1 944	87.7	2 737	84.2	4 681
2018	1 931	87.2	2 662	83.5	4 593
2019	2 129	89.6	2 721	83.9	4 850

Table 60: Women who gave birth and were breastfeeding (including partially) at maternal discharge, by hospital sector 2015-2019

Year	Public		Private		Total women breastfeeding in hospital
	n	%	n	%	
2015	3 090	82.3	1 584	89.2	4 674
2016	3 135	81.3	1 696	90.1	4 831
2017	2 796	82.3	1 833	90.8	4 629
2018	2 822	82.3	1 724	89.5	4 546
2019	2 943	83.7	1 857	90.4	4 800

Smoking and pregnancy

Data exploring the smoking status of Tasmanian women during pregnancy continue to be available for review in 2019, supplementing previous work conducted in the 1980's by the late Professor Joe Correy (Obstetric and Neonatal Report, Tasmania 1982) and Dr Neville Newman.

Please note that

- the smoking status has been updated (apart from the figures in Table 62) for mothers who gave birth at the public and public contracted private hospitals from 2011. Those hospitals advised that the smoking status and pattern collected at the time of labour onset/admission or after the birth occurs was inaccurate in some records. Statewide agreement has been sought from those hospitals to use the smoking information collected from antenatal visits for reporting.**

Therefore, the smoking figures in this report are not comparable to the figures published in the previous reports.

- the percentages in this section are calculated after excluding records with missing values (i.e. unknown smoking status or no antenatal visit). Care must therefore be taken when interpreting these percentages.**

Table 61: Proportion of women who gave birth, by tobacco smoking status during pregnancy, maternal age and election status; 1982 and 2015-2019

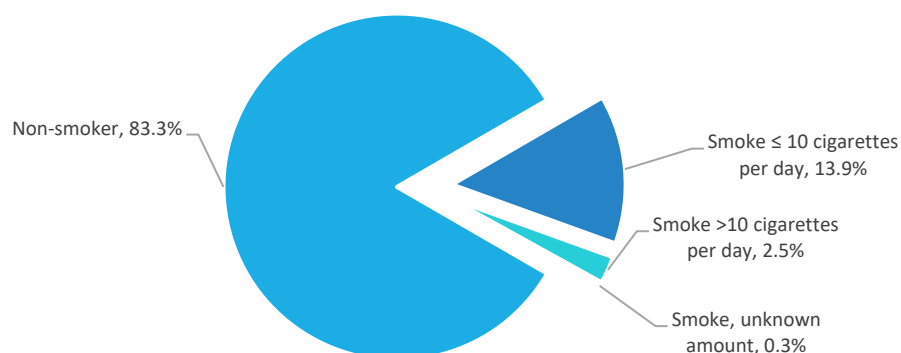
Year	Age (Years)							Election status	
	Overall	Less than 20	21-25	26-30	30 and over				
1982 ^(a)	35.3	55.2	46.0	30.2	21.2				
	Overall	Less than 20	20-24	25-29	30-34	35-39	40 and over	Public	Private
2015	20.5	50.8	31.2	20.4	13.4	14.5	11.4	26.4	3.3
2016	19.4	48.0	35.1	18.1	11.3	12.4	10.3	24.7	2.0
2017	18.4	48.8	34.0	16.8	12.1	11.9	5.5	23.3	2.3
2018	17.2	46.3	31.2	17.3	9.9	11.3	9.0	22.0	2.1
2019	16.7	40.7	31.8	17.9	10.0	10.6	9.6	22.0	1.9

(a) Obstetric and Neonatal Report – Tasmania 1982

The data on smoking prevalence during pregnancy are derived from self-reported information obtained by clinicians from the mother and reported to the Perinatal Data Collection.

Smoking during pregnancy is regarded as one of the key preventable causes of low birthweight and pre-term birth. Low birthweight (LBW) babies (less than 2 500 grams) are more likely to die in the first year of life and are more susceptible to chronic illness later in life, such as heart and kidney disease and diabetes.

The proportion of Tasmanian women who reported that they had smoked tobacco during pregnancy has fallen significantly since 2010 ($p < 0.001$). In 2019, 16.7 per cent of Tasmanian women reported smoking whilst pregnant, which was similar to the 2018 figure of 17.2 per cent ($p = 0.491$), with 13.9 per cent reporting to have smoked 10 cigarettes or fewer per day, 2.5 per cent reporting to have smoked more than 10 cigarettes daily and 0.3 per cent reporting to have smoked an unknown number of cigarettes daily.

Figure 18: Women who gave birth, by tobacco smoking status during pregnancy in Tasmania 2019

Number of mothers who reported smoking during pregnancy = 5 441 out of 5 651

As shown in the table below, 16.7 per cent of Tasmanian women who reported their smoking status stated that they had smoked during pregnancy in 2019^(a). This was the second highest maternal smoking proportion of all the jurisdictions following the Northern Territory (see Table 62). Overall, nationally, 10.2 per cent of women in these states and territories who reported their smoking status had smoked during pregnancy²⁷.

Table 62: Proportion of women who gave birth, by tobacco smoking status during pregnancy and state and territory 2010-2019²⁷

Jurisdiction	NSW	VIC	QLD	WA	SA	TAS	ACT	NT	AUS
2010	11.2	11.8	17.2	12.0	17.4	23.0	11.2	25.5	13.5
2011	11.2	12.2	16.1	12.1	17.0	18.4	10.0	26.0	13.2
2012	10.5	11.8	15.2	11.6	15.6	18.2	7.8	24.4	12.5
2013	9.7	11.2	14.2	10.8	14.5	16.7	6.1	23.4	11.7
2014	9.3	10.6	13.1	10.3	13.0	16.3	7.2	21.2	11.0
2015	8.9	10.0	12.4	9.7	12.5	15.2	7.4	21.6	10.4
2016	8.4	9.3	12.0	9.1	12.0	14.2	5.8	21.1	9.9
2017	8.9	9.0	11.9	8.9	11.3	14.5	6.2	20.6	9.9
2018 ^(a)	9.2	8.3	11.3	8.0	10.9	17.2	5.7	24.9	9.6
2019^(a)	8.9	11.3	11.6	7.9	9.0	16.7	5.6	20.7	10.2

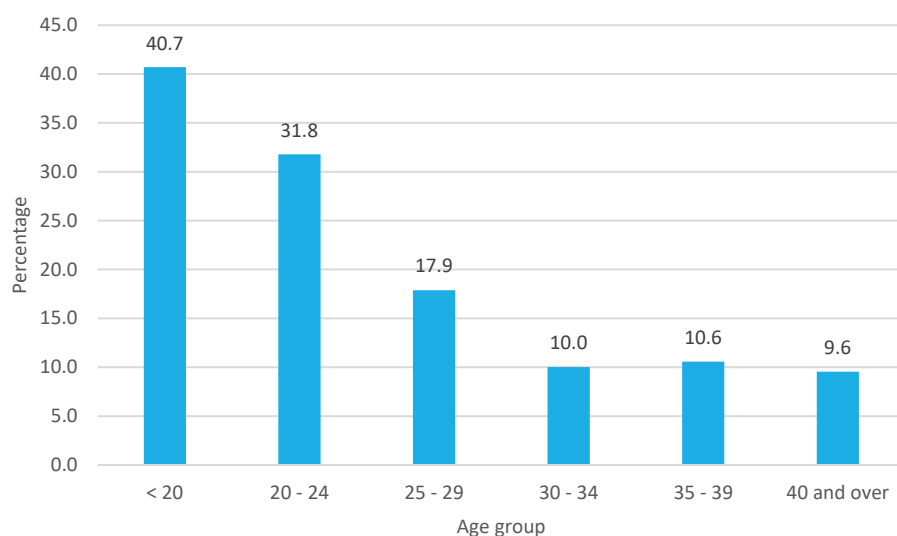
(a) The Tasmanian smoking data for 2018 and 2019 are not comparable to the previous years as a different collection method was used from 2018.

²⁷ Australian Institute of Health and Welfare 2021. Australia's mothers and babies. Cat. no. PER 101. Canberra: AIHW. Viewed 28 June 2021, <https://www.aihw.gov.au/reports/mothers-babies/australias-mothers-babies>.

Table 63 and Figure 19 show that maternal smoking continues to be more prevalent amongst younger women in Tasmania, particularly those aged less than 20 years. However, the proportion of maternal smokers in this age group has declined significantly ($p=0.041$) since 2015 from 50.8 per cent to 40.7 per cent in 2019, with the 2019 rate being statistically similar ($p=0.293$) to that reported for 2018 (46.3 per cent). The latter was also the case for each of the other age-groups, with the respective smoking rates for mothers remaining statistically similar to the previous year.

Table 63: Women who gave birth, by tobacco smoking status during pregnancy and maternal age 2015-2019

Maternal age in year	Year	Did not smoke during pregnancy		Smoked during pregnancy		Total reported smoking status		Not stated	Total
		n	%	n	%	n	%	n	n
Under 20	2015	121	49.2	125	50.8	246	100.0	1	247
	2016	127	52.0	117	48.0	244	100.0	4	248
	2017	105	51.2	100	48.8	205	100.0	0	205
	2018	94	53.7	81	46.3	175	100.0	2	177
	2019	102	59.3	70	40.7	172	100.0	0	172
20 - 24	2015	690	68.8	313	31.2	1 003	100.0	14	1 017
	2016	677	64.9	366	35.1	1 043	100.0	10	1 053
	2017	600	66.0	309	34.0	909	100.0	4	913
	2018	625	68.8	283	31.2	908	100.0	9	917
	2019	558	68.2	260	31.8	818	100.0	9	827
25 - 29	2015	1 216	79.6	312	20.4	1 528	100.0	45	1 573
	2016	1 285	81.9	284	18.1	1 569	100.0	41	1 610
	2017	1 262	83.2	255	16.8	1 517	100.0	40	1 557
	2018	1 269	82.7	265	17.3	1 534	100.0	38	1 572
	2019	1 336	82.1	291	17.9	1 627	100.0	48	1 675
30 - 34	2015	1 442	86.6	224	13.4	1 666	100.0	93	1 759
	2016	1 500	88.7	192	11.3	1 692	100.0	92	1 784
	2017	1 451	87.9	200	12.1	1 651	100.0	89	1 740
	2018	1 473	90.1	162	9.9	1 635	100.0	90	1 725
	2019	1 589	90.0	177	10.0	1 766	100.0	92	1 858
35 - 39	2015	666	85.5	113	14.5	779	100.0	48	827
	2016	749	87.6	106	12.4	855	100.0	53	908
	2017	713	88.1	96	11.9	809	100.0	54	863
	2018	729	88.7	93	11.3	822	100.0	46	868
	2019	787	89.4	93	10.6	880	100.0	51	931
40 and over	2015	156	88.6	20	11.4	176	100.0	11	187
	2016	182	89.7	21	10.3	203	100.0	12	215
	2017	188	94.5	11	5.5	199	100.0	19	218
	2018	151	91.0	15	9.0	166	100.0	11	177
	2019	161	90.4	17	9.6	178	100.0	10	188

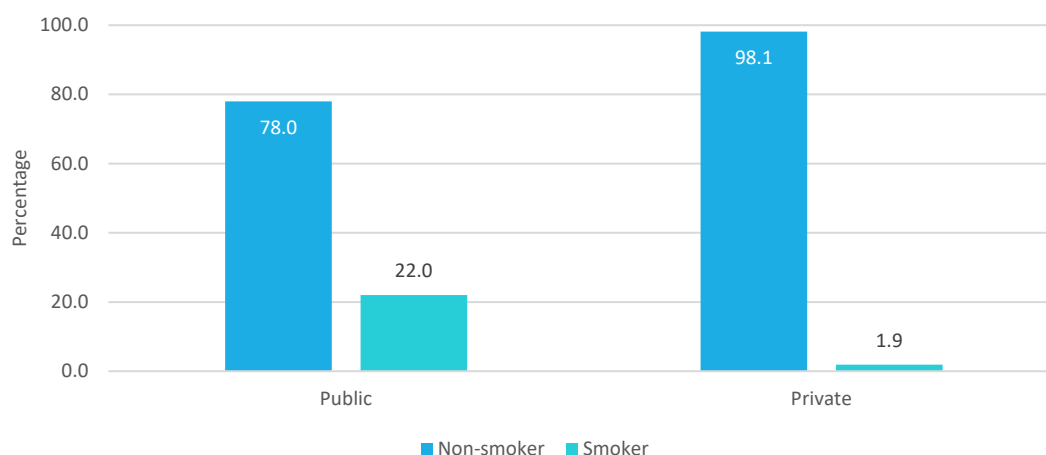
Figure 19: Women who gave birth, by tobacco smoking status during pregnancy and age in Tasmania 2019

The maternal smoking rate for public patients has remained unchanged since 2018 at 22.0 per cent, whilst the rate for private patients was similar to that for 2018 (1.9 per cent vs. 2.1 per cent in 2018, $p=0.716$). Smoking during pregnancy continues to be significantly more prevalent for public patients (22.0 per cent) compared to private patients (1.9 per cent) (Table 64 and Figure 20). As reported in previous years, this trend continues to reflect the higher prevalence of smoking amongst lower socio-economic groups.

Table 64: Women who gave birth, by tobacco smoking status during pregnancy and admitted patient election status 2015-2019

Admitted patient election status	Year	Did not smoke during pregnancy		Smoked during pregnancy		Total reported smoking status		Not stated	Total
		n	%	n	%	n	%	n	n
Public	2015	2 971	73.6	1 063	26.4	4 034	100.0	30	4 064
	2016	3 222	75.3	1 059	24.7	4 281	100.0	39	4 320
	2017	3 101	76.7	943	23.3	4 044	100.0	14	4 058
	2018	3 105	78.0	874	22.0	3 979	100.0	22	4 001
	2019	3 123	78.0	882	22.0	4 005	100.0	23	4 028
Private	2015	1 274	96.7	44	3.3	1 318	100.0	182	1 500
	2016	1 260	98.0	26	2.0	1 286	100.0	173	1 459
	2017	1 167	97.7	27	2.3	1 194	100.0	192	1 386
	2018	1 189	97.9	25	2.1	1 214	100.0	174	1 388
	2019	1 360	98.1	26	1.9	1 386	100.0	187	1 573

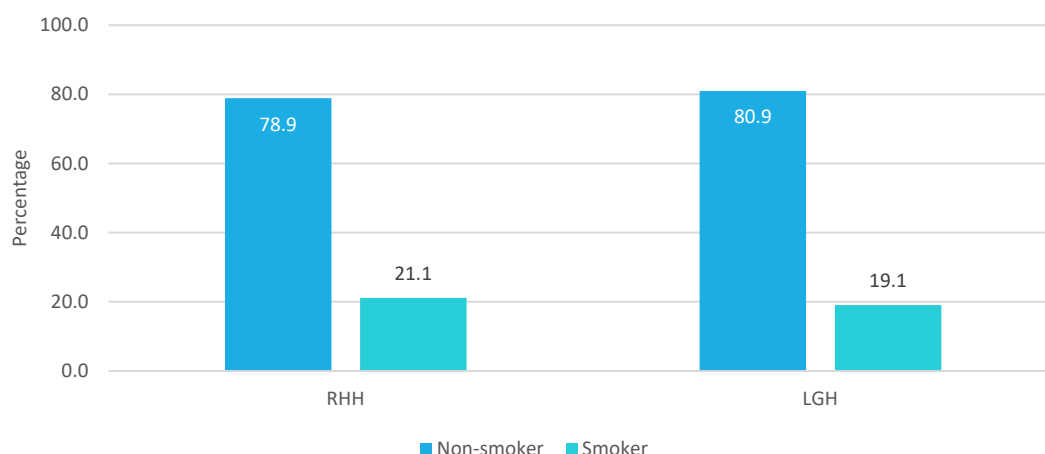
Figure 20: Women who gave birth, by tobacco smoking status during pregnancy and admitted patient election status in Tasmania 2019



For patients delivering in public hospitals, as shown in Table 65 and Figure 21, smoking during pregnancy was reported in 2019 most frequently by patients at the Royal Hobart Hospital (21.1 per cent) - continuing the decrease observed since 2012 - compared with 19.1 per cent of patients at the Launceston General Hospital, which was slightly higher than the reported level for the previous year (18.4 per cent). However, neither of these changes were statistically significant ($p > 0.05$). It is important to remember that a key factor in the variations reported between public hospitals relates to the differences in the patient mix at these two hospitals.

Table 65: Women who gave birth, by tobacco smoking status during pregnancy and public hospital 2015-2019

Public hospital	Year	Did not smoke during pregnancy		Smoked during pregnancy		Total reported smoking status		Not stated	Total
		n	%	n	%	n	%	n	n
RHH	2015	1 384	73.0	512	27.0	1 896	100.0	24	1 920
	2016	1 408	74.1	492	25.9	1 900	100.0	24	1 924
	2017	1 394	75.8	445	24.2	1 839	100.0	21	1 860
	2018	1 435	77.8	410	22.2	1 845	100.0	23	1 868
	2019	1 518	78.9	407	21.1	1 925	100.0	35	1 960
LGH	2015	982	76.6	300	23.4	1 282	100.0	180	1 462
	2016	1 142	78.5	313	21.5	1 455	100.0	181	1 636
	2017	1 096	79.1	289	20.9	1 385	100.0	168	1 553
	2018	1 181	81.6	267	18.4	1 448	100.0	128	1 576
	2019	1 194	80.9	281	19.1	1 475	100.0	97	1 572

Figure 21: Women who gave birth, by tobacco smoking status during pregnancy and public hospital in Tasmania 2019

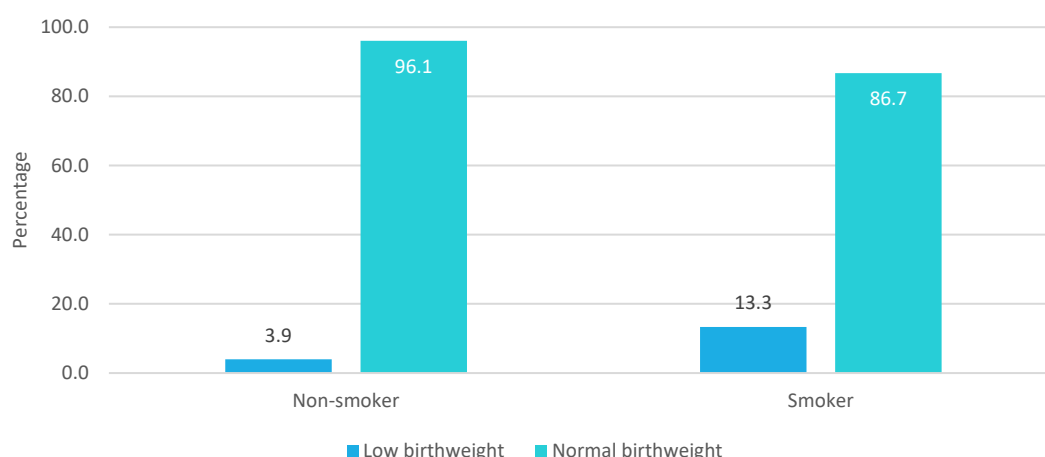
Low birthweight (LBW) is defined as a weight of less than 2 500 grams and includes babies that are small for gestational age as well as premature.

Based on the number of births (excluding multiple births, as multiparous births often result in low birthweight babies regardless of the mother's smoking status) whose mothers answered **Yes** to the smoking questions, a total of 118 babies in 2019 had a birthweight of less than 2 500 grams. Of these, 12.7 per cent had a birthweight of less than 1 500 grams (very LBW). In 2019, a total of 13.3 per cent of all women who had smoked in pregnancy had an LBW baby compared to 3.9 per cent of women who reported not to have smoked (see Table 66 and Figure 22), a difference which is statistically significant ($p < 0.001$). This figure representing the proportion of low birthweight babies in mothers who smoked remains a finding that continues to highlight the potential deleterious effects of smoking on birth weight. The relative risk of having an LBW baby in 2019 was 3.38 (95 per cent CI: 2.71, 4.22) in women who smoked in pregnancy compared with those who reported not to have smoked.

Table 66: Women who gave birth, by tobacco smoking status during pregnancy and birthweight category 2015-2019

Birthweight category	Year	Did not smoke during pregnancy		Smoked during pregnancy		Total reported smoking status		Not stated	Total
		n	%	n	%	n	%	n	n
Low birthweight	2015	207	4.9	150	13.7	357	100.0	25	382
	2016	221	5.0	145	13.6	366	100.0	26	392
	2017	212	5.0	137	14.3	349	100.0	21	370
	2018	208	4.9	120	13.5	328	100.0	22	350
	2019	176	3.9	118	13.3	294	100.0	37	331
Normal birthweight	2015	4 018	95.1	947	86.3	4 965	100.0	179	5 144
	2016	4 223	95.0	921	86.4	5 144	100.0	181	5 325
	2017	4 038	95.0	823	85.7	4 861	100.0	180	5 041
	2018	4 073	95.1	768	86.5	4 841	100.0	168	5 009
	2019	4 299	96.1	769	86.7	5 068	100.0	169	5 237

Figure 22: Women who gave birth, by tobacco smoking status during pregnancy and birthweight category in Tasmania 2019



Note: Multiple births have been omitted.

It continues to be important to note that a number of sources of error and confounding factors may influence the strength of this association. For example, since some women may be uncomfortable in disclosing their smoking status during their pregnancy, the reported data may not therefore provide an accurate measure of trends. Furthermore, maternal smokers may have other risk factors associated with LBW babies including younger maternal age, poorer prenatal care, inadequate maternal weight gain or other substance abuse. Such factors were not adjusted for in the analyses. If one or more of these factors is positively associated with LBW, they may be responsible for some of the excess risk that is attributed to maternal smoking. That is, the relative risk (RR) estimate of 3.38 may be an overestimate due to confounding (Epidemiology Unit, 2021).

Smoking status during the first 20 weeks and after 20 weeks of pregnancy

In 2019, 16.7 per cent of women who gave birth smoked at some time during their pregnancy, with the smoking rate being lower in the first 20 weeks of pregnancy (13.7 per cent) than after 20 weeks of pregnancy (15.5 per cent); this was also observed in 2018.

The smoking during pregnancy trend in women in Tasmania remains a concern. The higher smoking rate in the last 20 weeks than the first 20 weeks could be explained by the following:

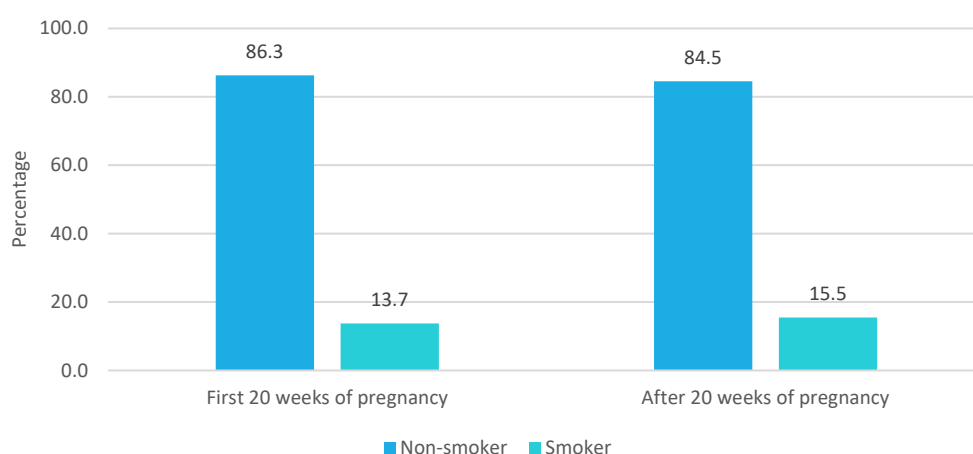
- Smoking status was assessed at each antenatal visit, 1-2 antenatal visits in the first 20 weeks and at least 8 visits in the last 20 weeks. The increased frequency of visits in the last 20 weeks of pregnancy may have provided a greater opportunity to capture smoking status in women who may have been more comfortable to disclose this information to their health care provider over time.
- Some women may not be booked until after 20 weeks when smoking status would be recorded. If women elect to attend a general practice setting in their early stages of pregnancy, smoking data is not recorded and therefore would be missed from the collection.

- While women are more likely to be motivated to quit/reduce smoking in the early stages of their pregnancy, these efforts may subside without effective smoking cessation support to help alleviate addiction/life stressors etc. As with any addiction, relapse is common despite being motivated to quit when pregnant.
- With the commencement of a 12-month Midwifery Group Practice Antenatal Routine Carbon Monoxide Monitoring project from July 2018 at the RHH, there was evidence to suggest that this routine monitoring led to better disclosure and identification of smoking status in pregnant women.

Table 67: Women who gave birth, by tobacco smoking status during first and last 20 weeks of pregnancy 2015-2019

Gestational weeks	Year	Did not smoke during pregnancy		Smoked during pregnancy		Total reported smoking status		Not stated	Total
		n	%	n	%	n	%	n	n
First 20 weeks of pregnancy	2015	4 402	84.5	806	15.5	5 208	100.0	402	5 610
	2016	4 642	85.1	814	14.9	5 456	100.0	362	5 818
	2017	4 382	84.9	781	15.1	5 163	100.0	333	5 496
	2018	4 414	86.0	721	14.0	5 135	100.0	301	5 436
	2019	4 601	86.3	733	13.7	5 334	100.0	317	5 651
Last 20 weeks of pregnancy	2015	4 367	81.0	1 024	19.0	5 391	100.0	219	5 610
	2016	4 612	82.3	989	17.7	5 601	100.0	217	5 818
	2017	4 392	83.1	893	16.9	5 285	100.0	211	5 496
	2018	4 417	84.3	821	15.7	5 238	100.0	198	5 436
	2019	4 598	84.5	842	15.5	5 440	100.0	211	5 651

Figure 23: Women who gave birth, by tobacco smoking status during first and last 20 weeks of pregnancy in Tasmania 2019

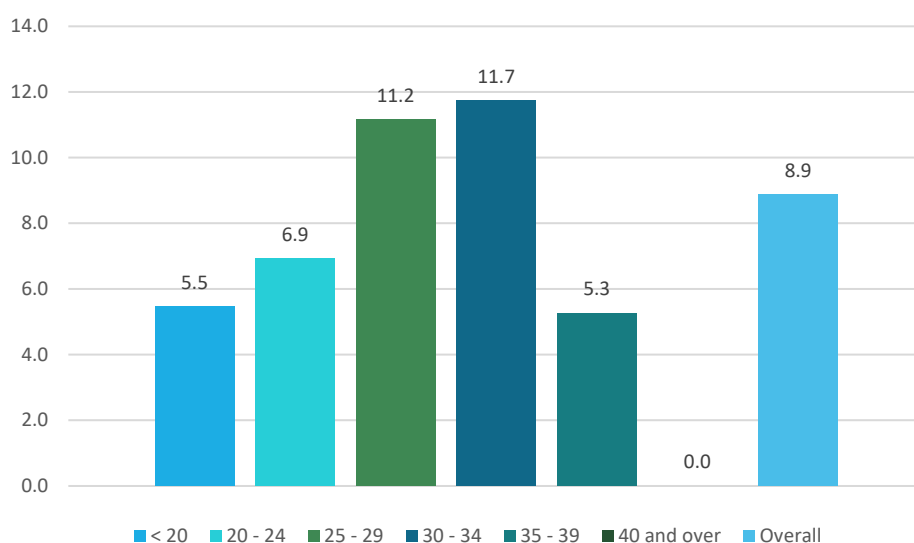


In 2019, nearly one in 10 women (8.9 per cent) smoked during the first 20 weeks but later quit. Mothers aged between 25 and 34 were the most likely to quit after 20 weeks, with more than 11 per cent doing so in 2019.

Table 68: Percentage of women who gave birth, by tobacco smoking status during the first 20 weeks and did not continue to smoke after 20 weeks 2015-2019

Year	Overall	Less than 20	20-24	25-29	30-34	35-39	40 and over
2015	9.4	10.3	11.8	6.4	9.1	10.7	11.1
2016	11.2	7.8	11.6	12.9	8.1	14.6	7.1
2017	9.3	5.6	7.5	10.2	12.3	10.5	9.1
2018	10.5	12.7	10.4	11.7	7.1	11.7	8.3
2019	8.9	5.5	6.9	11.2	11.7	5.3	0.0

Figure 24: Percentage of women who gave birth, by tobacco smoking status during the first 20 weeks and did not continue to smoke after 20 weeks 2019



Smoking in pregnancy: comments from the Council

As cited previously, evidence suggests that smoking cessation strategies do result in a reduction in the frequency of smoking, where low cost/low intensity strategies, utilising maternity care providers at antenatal visits (i.e., brief interventions) have been found to be as effective as high intensity strategies. Such interventions to reduce smoking in pregnancy continue to be important especially in view of evidence suggesting that where intrauterine growth restriction continues to be a significant contributor to perinatal mortality, any strategy that reduces the incidence of growth restriction may correspondingly reduce the stillbirth rate.

In view of this evidence, the Tasmanian Health Service (THS) Smoking Cessation Program continues to train doctors and midwives on how to provide brief interventions on smoking cessation during pregnancy. From 2009 onwards, the Tasmanian Health Service Smoking Cessation Program has provided ABC brief intervention training to midwifery and obstetric staff in all hospitals. In addition, the e-learning module was developed to ensure all THS staff members have access to brief intervention education. The Program has also facilitated the inclusion of a mandatory smoking field in the *ObstetrixTas* system which ensures that all antenatal clients receive an ABC brief intervention at every antenatal visit, which includes personalised brief advice and an offer of a Quit referral or referral to the Consultation Liaison Service. Recurrent education sessions have resulted in a team of midwives highly skilled in providing interventions on a regular basis to pregnant women. QUIT Tasmania have also trained staff that can provide counselling support specifically for pregnant women on the Quitline.

Positive outcomes have particularly demonstrated that such smoking cessation programmes as undertaken by the THS and Quit Tasmania are providing beneficial effects for younger women especially those aged between 20 to 24 years. Positive outcomes from these smoking cessation programmes have also been welcomed at both public and private hospitals.

Recommendations

As reported in previous years, interventions to reduce smoking in pregnancy are important particularly in view of reducing the incidence of growth restriction and potentially stillbirth rate. Standard antenatal care should therefore continue to incorporate smoking cessation advice and support by maternity staff for all women who smoke, in line with the education provided by the THS Smoking Cessation Program.

Alcohol consumption and pregnancy

The effects of alcohol consumption during pregnancy have been extensively reported in medical literature. Alcohol is a teratogen that has been found to have deleterious effects on fetal development and birth outcomes. In particular, exposure of the fetus to alcohol may result in a spectrum of adverse effects known as *Fetal Alcohol Spectrum Disorders* (FASD)²⁸. *Fetal Alcohol Syndrome* (FAS) has been described in children exposed to high levels of alcohol in utero as a result of either chronic or intermittent maternal alcohol use.

Alcohol has been found to cross the placental barrier causing such problems as reduced fetal growth or weight, characteristic facial abnormalities, damaged neurons and brain structures as well as other physical, mental or behavioural problems²⁹. In particular, the primary effect of FAS is permanent central nervous system damage, especially to the brain. Furthermore, developing brain cells and structures are underdeveloped or malformed by prenatal alcohol exposure and as such are often associated with an array of primary cognitive and functional disabilities (e.g., attention and memory deficits) and secondary disabilities (e.g., mental health problems and drug addiction)³⁰. In fact, fetal alcohol exposure has been found to be a primary cause of neurological problems and mental retardation³¹.

While the risk of birth defects is greatest with high, frequent maternal alcohol intake during the first trimester, it is concerning to note that alcohol exposure throughout pregnancy, and even before a pregnancy is confirmed, can have negative consequences on the development of the fetal brain since the fetal brain continues to develop throughout the whole pregnancy³².

High level and/or frequent intake of alcohol in pregnancy has also been associated with increased risk of miscarriage, stillbirth and premature birth³³. In addition, there is new evidence to suggest that prenatal alcohol exposure may increase the risk of alcohol dependence in adolescence³⁴.

It is also necessary to highlight that timing is important and not all “heavy” drinkers will have an affected child.

²⁸ National Health and Medical Research Council (NHMRC) (2009), *Australian Guidelines to Reduce Health Risks from Drinking Alcohol*, Canberra.

²⁹ Ulleland, C.N. (1972). The offspring of alcoholic mothers. *Annals New York Academy of Sciences*, 197, 167-169. PMID 4504588.

Streissguth, A. (1997). *Fetal Alcohol Syndrome: A Guide for Families and Communities*. Baltimore: Brookes Publishing. ISBN 1-55766-283-5.

³⁰ Streissguth, A.P., Barr H.M., Kogan, J. & Bookstein, F.L. (1996). Understanding the occurrence of secondary disabilities in clients with fetal alcohol syndrome (FAS) and fetal alcohol effects (FAE): Final report to the Centers for Disease Control and Prevention on Grant No. RO4/CCR008515 (Tech. Report No. 96-06). Seattle: University of Washington, Fetal Alcohol and Drug Unit.

³¹ Abel, E.L., & Sokol, R.J. (1987). Incidence of fetal alcohol syndrome and economic impact of FAS-related anomalies: Drug alcohol syndrome and economic impact of FAS-related anomalies. *Drug and Alcohol Dependency*, 19(1), 51-70. PMID 3545731.

³² Guerri, C. (2002). Mechanisms involved in central nervous system dysfunctions induced by prenatal ethanol exposure. *Neurotoxicity Research*, 4(4), 327-335. PMID 12829422.

³³ O'Leary C.M., (2004). Fetal alcohol syndrome: diagnosis, epidemiology and developmental outcomes. *Journal of Paediatric Child Health*, 40: 2-7.

³⁴ Alanti R., Mamun, A.A., Williams, G. et.al., (2006). In utero alcohol exposure and prediction of alcohol disorders in early adulthood: A birth cohort study. *Arch. Gen. Psychiatry*, 63: 1009-1016.

In view of the potential problems associated with alcohol consumption during pregnancy, data exploring the alcohol consumption status of Tasmanian women during pregnancy have been available for review since 2008 and continue to be collected for review. Available data on alcohol consumption during pregnancy is derived from self-reported information obtained by clinicians from the mother and reported to the Perinatal Data Collection.

As with the data available for smoking during pregnancy, it is important to note that some women may be similarly uncomfortable in disclosing their alcohol consumption status during the course of their pregnancy and as such the data provided may not be entirely accurate.

Please note that

- 1. the alcohol consumption status has been updated for mothers who gave birth at the public and public contracted private hospitals from 2011. Statewide agreement has been sought from those hospitals to use the alcohol consumption information collected from antenatal visits for reporting, same as smoking during pregnancy reporting methodology.***

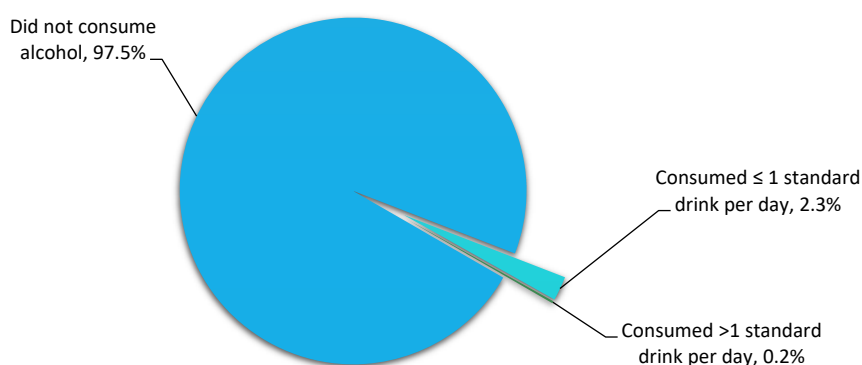
Therefore, the alcohol consumption figures in this report are not comparable to the figures published in the previous reports.

- 2. the percentages in this section are calculated after excluding records with missing values (i.e. unknown alcohol consumption status). Care must therefore be taken when interpreting these percentages.***

Table 69 and Figure 25 below show that overall, 2.5 per cent of Tasmanian women indicated that they had consumed alcohol during their pregnancy with 2.3 per cent reporting to have consumed one or fewer standard alcoholic drinks per day and 0.2 per cent reporting to have consumed more than one alcoholic drink per day. The overall proportion of women who reported to have consumed alcohol in 2019 was statistically significantly higher ($p=0.035$) than the 2018 figure of 1.9 per cent. The proportion of women aged 40 years and over who reported to have consumed alcohol during pregnancy has decreased from 3.6 per cent in 2018 to 0.6 per cent in 2019; however, the difference fell just short of being statistically significant ($p=0.051$). It is important to note that the decrease from 2018 to 2019 reversed the significant increase observed from 2017 to 2018, with the 2019 figure being similar to that for 2017 (1.0 per cent).

Table 69: Proportion of women who gave birth, by alcohol consumption status during pregnancy, maternal age and election status 2015-2019

Year	Age (Years)							Election status	
	Overall	Less than 20	20-24	25-29	30-34	35-39	40 and over	Public	Private
2015	3.6	2.8	3.1	2.7	4.0	5.2	3.4	4.5	0.7
2016	2.5	2.0	1.3	2.2	2.6	4.0	4.0	3.0	0.6
2017	2.3	2.9	2.1	1.3	2.8	3.2	1.0	2.8	0.3
2018	1.9	2.9	1.3	1.1	2.2	2.9	3.6	2.3	0.7
2019	2.5	2.3	1.0	2.2	2.7	4.4	0.6	2.5	2.4

Figure 25: Women who gave birth, by alcohol consumption status during pregnancy in Tasmania 2019

Number of mothers who reported alcohol consumption during pregnancy = 5 415 out of 5 651

NHMRC 2009 definition³⁵: 1 standard drink is 10 grams of alcohol which is equivalent to 1 can/stubbie of mid-strength beer OR 100ml of wine (13.5 per cent alcohol) OR 30ml of spirits (1 nip)

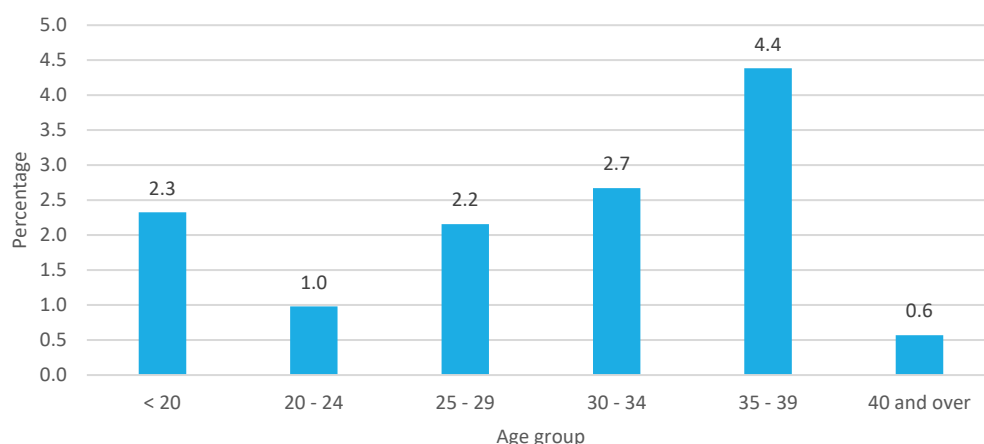
Maternal alcohol consumption remains generally higher for women aged 30-39 years, but no longer for mothers aged 40 years and over. For mothers aged 25-29 years, maternal alcohol consumption has doubled from 1.1 per cent in 2018 to 2.2 per cent in 2019, a difference which was statistically significant ($p=0.016$). For each of the remaining age groups, the proportion of mothers who reported consuming alcohol whilst pregnant was statistically similar to 2018 (Table 70 and Figure 26).

³⁵ National Health and Medical Research Council (NHMRC) (2009), *Australian Guidelines to Reduce Health Risks from Drinking Alcohol*, Canberra.

Table 70: Women who gave birth, by alcohol consumption status during pregnancy and maternal age 2015-2019

Maternal age in year	Year	Did not consume alcohol during pregnancy		Consumed alcohol during pregnancy		Total reported alcohol consumption status		Not stated	Total
		n	%	n	%	n	%	n	n
Under 20	2015	239	97.2	7	2.8	246	100.0	1	247
	2016	239	98.0	5	2.0	244	100.0	4	248
	2017	199	97.1	6	2.9	205	100.0	0	205
	2018	170	97.1	5	2.9	175	100.0	2	177
	2019	168	97.7	4	2.3	172	100.0	0	172
20 - 24	2015	972	96.9	31	3.1	1 003	100.0	14	1 017
	2016	1 027	98.7	14	1.3	1 041	100.0	12	1 053
	2017	889	97.9	19	2.1	908	100.0	5	913
	2018	896	98.7	12	1.3	908	100.0	9	917
	2019	809	99.0	8	1.0	817	100.0	10	827
25 - 29	2015	1 482	97.3	41	2.7	1 523	100.0	50	1 573
	2016	1 525	97.8	34	2.2	1 559	100.0	51	1 610
	2017	1 494	98.7	20	1.3	1 514	100.0	43	1 557
	2018	1 513	98.9	17	1.1	1 530	100.0	42	1 572
	2019	1 588	97.8	35	2.2	1 623	100.0	52	1 675
30 - 34	2015	1 591	96.0	66	4.0	1 657	100.0	102	1 759
	2016	1 638	97.4	43	2.6	1 681	100.0	103	1 784
	2017	1 596	97.2	46	2.8	1 642	100.0	98	1 740
	2018	1 595	97.8	36	2.2	1 631	100.0	14	1 645
	2019	1 713	97.3	47	2.7	1 760	100.0	98	1 858
35 - 39	2015	733	94.8	40	5.2	773	100.0	54	827
	2016	810	96.0	34	4.0	844	100.0	64	908
	2017	777	96.8	26	3.2	803	100.0	60	863
	2018	795	97.1	24	2.9	819	100.0	49	868
	2019	829	95.6	38	4.4	867	100.0	64	931
40 and over	2015	169	96.6	6	3.4	175	100.0	12	187
	2016	191	96.0	8	4.0	199	100.0	16	215
	2017	195	99.0	2	1.0	197	100.0	21	218
	2018	160	96.4	6	3.6	166	100.0	11	177
	2019	175	99.4	1	0.6	176	100.0	12	188

Figure 26: Women who gave birth, by alcohol consumption status during pregnancy and maternal age in Tasmania 2019



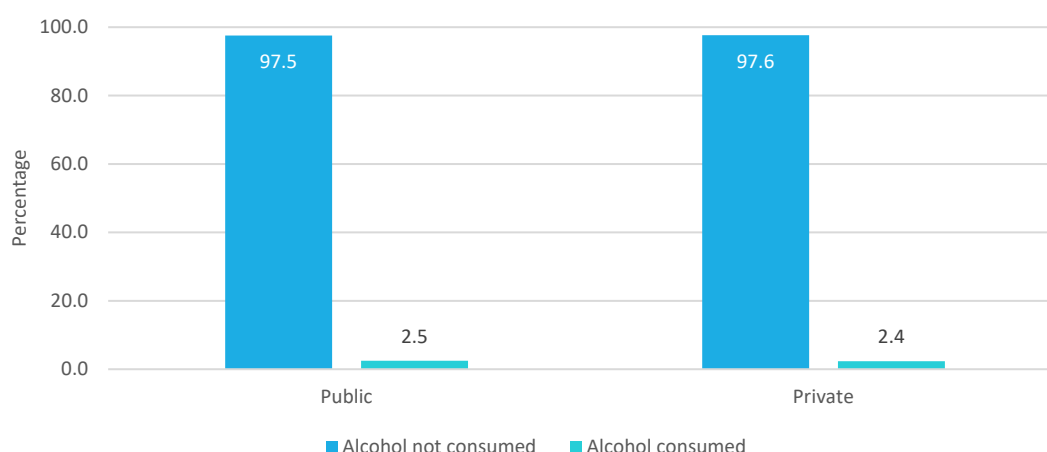
Alcohol consumption during pregnancy by private patients (2.4 per cent) was statistically significantly higher ($p < 0.001$) than in the previous four years (2015-2018), and, in contrast to previous years, now similar to that for public patients (2.5 per cent), as shown in Table 71 and Figure 27.

Amongst mothers in 2019 who reported whether they had consumed alcohol whilst pregnant, 0.3 per cent of public patients reported consuming more than one alcoholic drink per day, compared to zero per cent of private patients.

Table 71: Women who gave birth, by alcohol consumption status during pregnancy and admitted patient election status 2015-2019

Admitted patient election status	Year	Did not consume alcohol during pregnancy		Consumed alcohol during pregnancy		Total reported alcohol consumption status		Not stated	Total
		n	%	n	%	n	%	n	n
Public	2015	3 849	95.5	182	4.5	4 031	100.0	33	4 064
	2016	4 144	97.0	130	3.0	4 274	100.0	46	4 320
	2017	3 929	97.2	115	2.8	4 044	100.0	14	4 058
	2018	3 886	97.7	92	2.3	3 978	100.0	23	4 001
	2019	3 908	97.5	99	2.5	4 007	100.0	21	4 028
Private	2015	1 292	99.3	9	0.7	1 301	100.0	199	1 500
	2016	1 247	99.4	8	0.6	1 255	100.0	204	1 459
	2017	1 169	99.7	4	0.3	1 173	100.0	213	1 386
	2018	1 196	99.3	8	0.7	1 204	100.0	184	1 388
	2019	1 325	97.6	32	2.4	1 357	100.0	215	1 572

Figure 27: Women who gave birth, by alcohol consumption status during pregnancy and admitted patient election status in Tasmania 2019



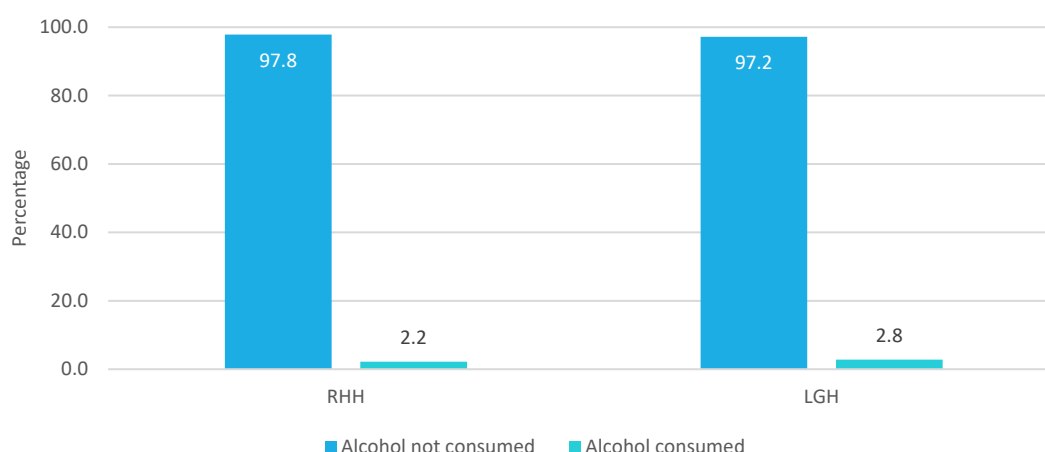
With regard to the proportion of Tasmanian mothers from public hospitals reporting to have consumed alcohol during pregnancy, Table 72 and Figure 28 show that in 2019, alcohol consumption during pregnancy was reported most frequently by patients at the Launceston General Hospital (2.8 per cent), followed by 2.2 per cent of patients at the Royal Hobart Hospital. Compared to 2018, a significantly higher proportion of mothers at the Launceston General Hospital reported that they had consumed alcohol whilst pregnant (2.8 per cent vs. 1.7 per cent, $p=0.046$), whilst for mothers at the Royal Hobart Hospital the maternal alcohol consumption figure was similar to the previous year (2.2 per cent vs. 2.8 per cent, $p=0.238$).

Similar to the smoking during pregnancy data, a key factor in these variations may relate to difference in the patient mix at these two hospitals.

Table 72: Women who gave birth, by alcohol consumption status during pregnancy and public hospital in Tasmania 2015-2019

Public hospital	Year	Did not consume alcohol during pregnancy		Consumed alcohol during pregnancy		Total reported alcohol consumption status		Not stated	Total
		n	%	n	%	n	%	n	n
RHH	2015	1 800	94.9	96	5.1	1 896	100.0	7	1 903
	2016	1 838	96.8	60	3.2	1 898	100.0	19	1 917
	2017	1 785	97.1	54	2.9	1 839	100.0	11	1 850
	2018	1 793	97.2	52	2.8	1 845	100.0	9	1 854
	2019	1 883	97.8	42	2.2	1 925	100.0	12	1 937
LGH	2015	1 216	95.4	59	4.6	1 275	100.0	6	1 281
	2016	1 392	96.9	45	3.1	1 437	100.0	7	1 444
	2017	1 327	96.9	42	3.1	1 369	100.0	2	1 371
	2018	1 414	98.3	25	1.7	1 439	100.0	7	1 446
	2019	1 408	97.2	41	2.8	1 449	100.0	4	1 453

Figure 28: Women who gave birth, by alcohol consumption status during pregnancy and public hospital in Tasmania 2019



As indicated previously, low birthweight (LBW) is defined as a weight of less than 2 500 grams and includes babies that are small for gestational age as well as premature.

Based on the number of births (excluding multiple births, as multiparous births often result in low birthweight babies regardless of the mother's smoking status) whose mothers answered **Yes** to the alcohol consumption questions, a total of 18 babies had a birthweight of less than 2 500 grams. Of these, 16.7 per cent (3) had a birthweight of less than 1 500 grams (very LBW).

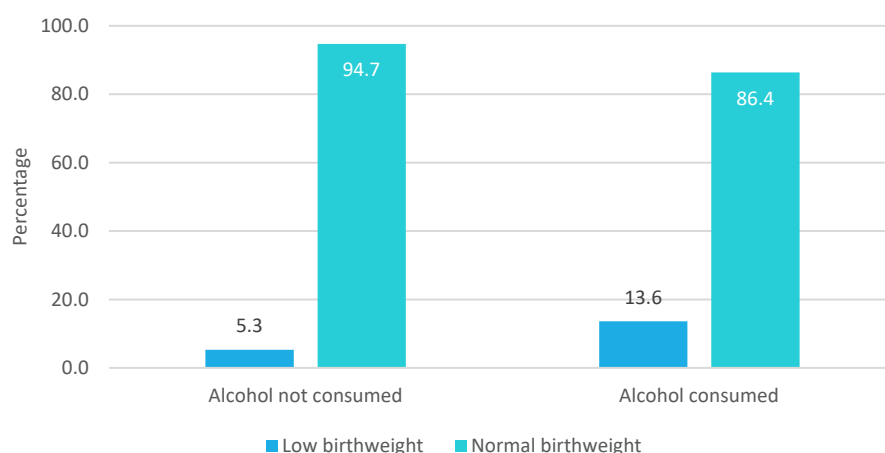
In 2019, a total of 13.6 per cent of all women who had consumed alcohol during pregnancy had an LBW baby compared to 5.3 per cent of women who reported not to have consumed alcohol (Table 73 and Figure 29), a difference which is statistically significant ($p < 0.001$).

The relative risk of having an associated LBW baby in 2019 was 2.57 (95 per cent CI: 1.65, 4.01) in women who consumed alcohol in pregnancy compared to those who reported not having consumed alcohol, a ratio which is statistically significant ($p < 0.001$). As such, this finding suggests that there is a proper association between maternal alcohol consumption and LBW babies.

It is important to note that several sources of error may influence findings of this analysis. Since some women may be uncomfortable in disclosing alcohol consumption during their pregnancy, the reported data may not provide an accurate measure of alcohol consumption during pregnancy. Furthermore, other risk factors associated with LBW babies may be involved, including smoking, younger maternal age, poorer prenatal care, inadequate maternal weight gain, or other substance abuse. Such factors were not adjusted for in the analyses. If one or more of these factors is positively associated with LBW, they may be responsible for some of the excess risk that is attributed to maternal alcohol consumption. That is, the relative risk (RR) estimate of 2.57 may be an overestimate due to confounding (Epidemiology Unit, 2021).

Table 73: Women who gave birth, by alcohol consumption status during pregnancy and birthweight category 2015-2019

Birthweight category	Year	Did not consume alcohol during pregnancy		Consumed alcohol during pregnancy		Total reported alcohol consumption status		Not stated	Total
		n	%	n	%	n	%	n	n
Low birthweight	2015	342	6.7	12	6.3	354	100.0	28	382
	2016	354	6.6	9	6.7	363	100.0	29	392
	2017	338	6.7	9	7.6	347	100.0	23	370
	2018	323	6.4	4	4.0	327	100.0	23	350
	2019	276	5.3	18	13.6	294	100.0	37	331
Normal birthweight	2015	4 771	93.3	178	93.7	4 949	100.0	59	5 008
	2016	4 985	93.4	126	93.3	5 111	100.0	60	5 171
	2017	4 734	93.3	109	92.4	4 843	100.0	39	4 882
	2018	4 735	93.6	96	96.0	4 831	100.0	57	4 888
	2019	4 928	94.7	114	86.4	5 042	100.0	64	5 106

Figure 29: Women who gave birth, by alcohol consumption status during pregnancy and birthweight category in Tasmania 2019

Note: Multiple births have been omitted

Recommendations

In relation to recommendations around alcohol consumption during pregnancy from the *NHMRC Australian Guidelines to Reduce Health Risks from Drinking Alcohol*, Australian Government, 2009 (*Guideline 4: Pregnancy and breastfeeding*) Council agrees that:

- For women who are pregnant or planning pregnancy, not drinking is the safest option.
- For women who are breastfeeding, not drinking is the safest option.

Attachment A: Guideline for Investigation of 'Unexplained' Stillbirths

Introduction

For stillbirths where the cause is obvious, investigations should be targeted towards the cause. In all other cases where no cause is determined, the following guideline should be used.

A thorough and systematic approach will result in the likelihood of a cause being found and would help in counselling patients and may help prevent recurrences. While the list below is not meant to be comprehensive, it should serve as a guideline for investigation of stillbirths. All hospitals within the state are encouraged to implement the guideline.

Guideline

Detailed medical and social history of the mother

A possible cause for the stillbirth like intercurrent infection, cholestasis of pregnancy or drug use may be elicited by careful history taking and examination of the antenatal record.

Histopathology of placenta

Whether or not an autopsy is performed, all placentas should be sent for examination. The placenta should be placed in a dry sterile container (no formalin or saline) and sent for histopathological examination.

External examination of the baby

In cases where parental consent for autopsy cannot be obtained, external examination of the baby should be performed preferably by a perinatal pathologist or an experienced neonatologist. In addition, **clinical photographs, X-rays** and if possible, **MRI** scans should be done.

Autopsy of the baby

After informed parental consent, an autopsy should be conducted by an experienced perinatal pathologist. One of the senior clinicians involved with the care of the patient should counsel the couple and explain the need for autopsy. Where consent for a full autopsy cannot be obtained from the parents, efforts should be made to at least obtain consent for limited autopsy including needle biopsies of appropriate organs.

Karyotype

Ideally obtained by amniocentesis prior to delivery, but if consent not obtained then placental biopsy and/or cord blood (if obtainable) or fetal skin should be sent for chromosomal analysis. Chromosomal analysis is still possible in macerated fetuses.

Maternal Investigations

Where there is no obvious cause for death, the following investigations should also be performed:

- a) Full Blood Count
- b) Maternal antibody screen
- c) Kleihauer Test (blood should be obtained prior to delivery)
- d) HbA1c (GTT if indicated)
- e) Liver function tests including serum bile acids
- f) Renal function tests including uric acid
- g) Thrombophilia screen including Anticardiolipin antibodies, Lupus anticoagulant and Activated protein C resistance
- h) Maternal serology – CMV, Toxoplasmosis and Parvovirus (Rubella and syphilis if not already done antenatally)
- i) Microbiology – fetal ear and throat swab, placental swab
- j) Drug history and urine drug screen if indicated

Attachment B: Perinatal Data Collection Form



TASMANIAN PERINATAL DATA COLLECTION FORM

Effective 1 January 2019

Reset Form

CONFIDENTIAL Obstetric and Paediatric Mortality and Morbidity Act 1994

Data submission timeline: within 7 days of the birth of a baby.

This form is to be completed for all babies (both liveborn & stillborn) who have a gestational age of at least 20 weeks and/or weighing at least 400 grams at birth. In the case of multiple births, a separate form must be completed in full for each baby.

** tick one or more

Note: This form must be completed in the hospital where the birth occurs or where the mother is first admitted if the baby is born before arrival.

MOTHER'S DETAILS		Hospital code	URN
Surname	First name	Date of birth	
Country of birth	Suburb	Postcode	
Indigenous status	☐ Aboriginal ☐ Torres Strait Islander ☐ Aboriginal and Torres Strait Islander ☐ Neither		
Marital status	☐ Never married ☐ Widowed ☐ Divorced ☐ Separated ☐ Married (including de facto)		

PREVIOUS PREGNANCIES	PRE PREGNANCY CONDITIONS **	ANTENATAL SCREENING
☐ Livebirths ☐ Stillbirths ☐ Ectopic pregnancy ☐ Miscarriage ☐ Terminated pregnancy Parity ^ (excluding this pregnancy) Number of neonatal deaths Number of previous caesareans Mode of last delivery ☐ Vaginal ☐ Caesarean section ☐ N/A ^ No. of previous pregnancies resulting in births ≥ 20 wks or ≥ 400 g	☐ None ☐ Cardiovascular ☐ Thyroid ☐ Diabetes mellitus ☐ Pre-existing Type 1 diabetes ☐ Pre-existing Type 2 diabetes ☐ Other type of diabetes mellitus Diabetes mellitus treatment ** ☐ Insulin ☐ Oral hypoglycaemic ☐ Diet and exercise ☐ Mental health ☐ Renal disease ☐ Epilepsy ☐ Chronic hypertension ☐ Other	Yes Not offered Declined Mental health cond? ☐ ☐ ☐ Domestic violence? ☐ ☐ ☐ VITAMIN SUPPLEMENTS ** Did the mother take vitamin supplements during the pregnancy? ☐ None ☐ Vitamin D ☐ Iron ☐ Folate, pre-conceptually ☐ Iodine ☐ Folate, post-conceptually ☐ Multi vitamins (pregnancy) ☐ Multi vitamins (other)
THIS PREGNANCY Estimated date of confinement Determined by (select most accurate option only) ☐ Known conception ☐ Known date LMP ☐ Ultrasound <12 wks ☐ Ultrasound >12 wks Is this pregnancy the result of assisted reproductive technology (ART)? ☐ No ☐ Yes Intended place of birth ☐ Hospital ☐ Birth centre ☐ Home/other Intending to breastfeed ☐ No ☐ Yes ☐ Unsure Plurality ☐ Single ☐ Multiple, no.: Est. gestation at 1st antenatal visit Total number of antenatal visits Height (whole cm) Weight (whole kg) Self reported at conception	SMOKING / ALCOHOL / DRUG Did the mother smoke at all during the first half (<20 weeks) of pregnancy? ☐ No ☐ Yes, avg cigarettes/day? Did the mother smoke at all during the second half (≥ 20 weeks) of pregnancy? ☐ No ☐ Yes, avg cigarettes/day? Did the mother consume alcohol at all during the first half (<20 weeks) of pregnancy? Frequency of drinking: ☐ Never ☐ Monthly or less ☐ 2-4 times a month ☐ 2-3 times a week ☐ ≥ 4 times a week No. of standard drinks on a typical day: Did the mother consume alcohol at all during the second half (≥ 20 weeks) of pregnancy? Frequency of drinking: ☐ Never ☐ Monthly or less ☐ 2-4 times a month ☐ 2-3 times a week ☐ ≥ 4 times a week No. of standard drinks on a typical day: Did the mother smoke marijuana during the pregnancy? ☐ No ☐ Yes ☐ Not stated Did the mother use other recreational drugs during the pregnancy? ☐ No ☐ Yes ☐ Not stated	ADMISSION Date of admission (in which birth occurs) Admitted patient election status ☐ Public ☐ Private ☐ N/A Transfer of patient prior to delivery ☐ No transfer ☐ Hospital to hospital ☐ Birth centre to hospital ☐ Home to hospital (intended homebirth only) OBSTETRIC COMPLICATIONS ** ☐ None ☐ Bleed <20 weeks (threatened miscarriage) ☐ Placenta praevia ☐ APH undetermined origin ☐ Placental abruption ☐ Threatened premature labour ☐ Hypertension ☐ Pregnancy induced hypertension ☐ Pre-eclampsia ☐ Eclampsia ☐ Prolonged rupture of membranes (>18 hours) ☐ Pre-labour rupture of membranes ☐ Gestational diabetes, treatment ** ☐ Insulin ☐ Oral hypoglycaemic ☐ Diet and exercise ☐ Other
ANTENATAL TESTING ** ☐ None ☐ 1 st trimester Downs screening ☐ 2 nd trimester Downs screening ☐ Amniocentesis ☐ Chorionic villus sampling ☐ Screening for gestational diabetes ☐ GBS screen ☐ Level 2 ultrasound ☐ Non-invasive prenatal testing		



COUNCIL OF OBSTETRIC & PAEDIATRIC MORTALITY & MORBIDITY

TASMANIAN PERINATAL DATA COLLECTION FORM

The Tasmanian Perinatal Data Collection Form is a mandatory requirement for data collection under the *Obstetric and Paediatric Mortality and Morbidity Act 1994* (previously known as *Perinatal Registry Act 1994*).

The Tasmanian Perinatal Data Collection Form is required to be **completed by all private hospitals and birth centres where the birth occurs, or by private midwifery and medical practitioners who deliver babies outside hospitals**. Please use the electronic perinatal database system (i.e. ObstetrixTas) for all births reported in public and public contracted maternity hospitals.

If the mother and/or baby are transferred from the hospital of confinement, the form should be **completed by the hospital of birth**. In cases where the mother is transferred to another hospital for operational birth and transferred back to the hospital of confinement immediately after the operation, the form should be **completed by the hospital of confinement**. If the mother and/or baby are admitted to hospital after the birth has occurred, a form should be **completed by the hospital where the mother is first admitted**.

NOTE: A multiple birth requires a separate Perinatal Data Collection Form to be completed for each baby with the same identifying maternal demographic information. Please ensure that the second twin's Perinatal Data Collection Form is also submitted.

Data submission timeline: within 7 days of the birth of a baby.

General instructions

- Please print clearly using a ballpoint pen and all writing and figures must be legible (paper submission only).
- Use ticks on the form to indicate the appropriate options.
- **ANSWER ALL QUESTIONS.** If a particular item of information is not available or unknown, please fill all numeric fields with '9' or record 'Unknown' in a text field.
- If any data items are not complete, the hospital of birth will be asked to supply the missing information.
- In the case of multiple births, a separate form should be completed for each baby. For example, in the case of twins, two forms are to be completed, identifying each twin as Twin 1 and Twin 2 in the Birth order question of the Baby's Details section.
- Where boxes are present, place a tick or write the appropriate number(s) in the relevant box(es).
- Where there are more boxes provided than necessary, please 'right adjust' your response.

e.g. Weight - 58 kgs

0	5	8
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Queries relating to completion of this Form, please refer to the **Guidelines for the completion of the Perinatal Data Collection Form** available from the website or contact:

Tasmanian Perinatal Data Collection Services
 Health Information - Monitoring Reporting and Analysis Unit
 Planning Purchasing and Performance Group
 Department of Health
 GPO Box 125
 Hobart TAS 7001
 Phone : (03) 6166 1012
 Email : ppp.perinataldata@health.tas.gov.au
 Web : http://www.dhhs.tas.gov.au/about_the_department/partnerships/registration_boards/copmm

Completing the Form

If you have not yet completed the Form and want to work on it later, please click:

Save to my computer

The 'Save to my computer' button allows you to save a draft copy of the Form to your local computer so you can access the Form without being connected to the Internet.

When you are ready to submit this Form, please click:

Submit by email

The 'Submit by email' button will allow you to submit the Form to Tasmanian Perinatal Data Collection Services for processing via email.

Print form

The 'Print form' button will print the Form and you will need to post it using a confidential envelope to:

Tasmanian Perinatal Data Collection Services
 Health Information - Monitoring Reporting and Analysis Unit
 Planning Purchasing and Performance Group
 Department of Health
 GPO Box 125, Hobart TAS 7001

Attachment C: National Perinatal Death Clinical Audit Tool (NPDCAT)

National Perinatal Death Clinical Audit Tool



Type of Perinatal Death

- ☐ **STILLBIRTH (Fetal death):** Death prior to the complete expulsion or extraction from its mother of a product of conception of 20 or more completed weeks of gestation or of 400 g or more birthweight where gestation is not known. The death is indicated by the fact that after such separation the fetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles.

Please select type:

- ☐ Antepartum fetal death
☐ Intrapartum fetal death
☐ Time of fetal death not known
☐ Termination of pregnancy

OR

- ☐ **NEONATAL DEATH:** Death of a liveborn infant occurring before 28 completed days after birth.

Please select type:

- ☐ Non-admitted neonatal death
☐ Neonatal death in hospital
☐ Termination of pregnancy

Please follow the instructions and answer all questions as directed. You may not know the answer to some of the questions but please provide as much detail as possible. Personally identifiable information collected on this form will be kept confidential. Information included in reports will be grouped and non identifiable.

Section 1: CLINICAL DATA RELEVANT TO PERINATAL DEATH

PLEASE COMPLETE THIS SECTION WITHIN 48 HOURS OF THE STILLBIRTH OR NEONATAL DEATH.

- How many perinatal deaths are associated with this pregnancy?
- Mother: Surname: _____
 Given name(s): _____
 Other name(s): _____
- Mother's Unit Record No: _____
- Mother's date of birth: _____ (DD/MM/YYYY)
- Usual residential address of mother at time of birth:
 Town/City/Locality _____
 State _____
 Post Code
- Date and time of baby's birth: Date: _____ (DD/MM/YYYY)
 Time: _____ hrs (hh:mm, 24 hour clock)
- Date and time of baby's death (neonatal deaths): Date: _____ (DD/MM/YYYY)
 Time: _____ hrs (hh:mm, 24 hour clock)
- Calculated gestation of pregnancy at birth: completed weeks
- Birth weight: grams

10. Gender: Male ☐ Female ☐ Undetermined ☐

11. Name of facility reporting: _____

12. Marital status: Never Married ☐ Married ☐ De facto ☐ Widowed ☐ Divorced ☐ Separated ☐

13. Education: <High school ☐ High school ☐ Tertiary ☐

14. Mother's occupation: _____

15. Mother's country of birth: _____

16. Mother's ethnicity: ☐ Aboriginal
☐ Torres Strait Islander
☐ Aboriginal & Torres Strait Islander
☐ Maori / Pacific Islander
☐ Papua New Guinean/Timorese
☐ Caucasian
☐ Mediterranean
☐ Indian, Pakistani, Bangladeshi, Sri Lankan
☐ Cambodian, Laos, Vietnamese, Thai
☐ Malay, Philippino, Indonesian
☐ Chinese, Korean, Japanese
☐ Middle Eastern, Nth African
☐ African
☐ Central / Sth American
☐ Other, please state: _____

17. Mother's understanding of spoken English:

- ☐ None or ☐ Unknown
☐ Poor
☐ Average
☐ Good

18. Mother's height:

--	--	--

 cms
weight:

--	--	--

 kg (earliest measured in pregnancy)

If not available please measure height and weight.

19. Maternal BMI at booking:

--	--

 .

--

or Unknown ☐

20. Was this a multiple pregnancy?

Yes ☐ No ☐ Unknown ☐

If yes, what was birth order of this stillborn or deceased baby?

- ☐ First
☐ Second
☐ Other

a. Number of fetuses/babies alive at 20 weeks gestation:

--

b. Chorionicity (if known) _____

21. Mother's previous obstetric history:a) total number of previous pregnancies: *or* Unknown ☐b) details of previous pregnancies (*list in order from first pregnancy - more space page 11*)

	Date of birth	Place of birth	Gestation (weeks)	Pregnancy Outcome (codes below)	Type of birth (codes below)	Birth weight	Complications (eg. IUGR) (codes below)
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							

Pregnancy Outcome: LB = live birth; SM = spontaneous miscarriage; TOP = termination of pregnancy; E = ectopic pregnancy; SB = stillbirth; NNDE = early neonatal death (<7 days age); NNDL = late neonatal death (7 days - 28 days); NNDI = death 28 days - 2 years; U = unknown.

Type of Birth: NVB = normal vaginal birth; OVD = operative vaginal delivery; VB = vaginal breech; CS = caesarean section; U = unknown.

Complications: NIL = no complications; HE = hyperemesis; APH = ante partum haemorrhage/abruption; CxS = cervical stitch; IUGR = intrauterine growth retardation; GDM = gestational diabetes mellitus; GH = gestational hypertension; U = unknown; Other = please comment in summary section, page 11.

22. Mother's medical history (before this pregnancy):

	Yes	No	Unknown
a Any pre-existing medical condition	☐	☐	☐
<i>(If no or unknown, go to question 23)</i>			
b. Asthma	☐	☐	☐
c. Diabetes pre pregnancy (type 1 or 2)	☐	☐	☐
d. Epilepsy	☐	☐	☐
e. Heart condition (congenital or acquired)	☐	☐	☐
f. Hypertension	☐	☐	☐
g. Endocrine disorder (eg. hyper/hypothyroid)	☐	☐	☐
h. Inflammatory bowel disease	☐	☐	☐
i. Systemic lupus erythematosus	☐	☐	☐
j. Other autoimmune disorder	☐	☐	☐
k. Mental health disorder	☐	☐	☐
l. Renal disease	☐	☐	☐
m. Venous thromboembolism	☐	☐	☐
n. Haematological disorders	☐	☐	☐
o. Cervical/uterine surgery	☐	☐	☐
p. Urinary tract infection	☐	☐	☐
q. Uterine abnormality	☐	☐	☐
r. Other, please state:			

All remaining questions relate only to the pregnancy associated with this perinatal death.

23. Fertility treatment or assisted conception in this pregnancy?

Yes ☐ No ☐ Unknown ☐

If yes, method/s and dates:

24. Is mother a smoker? Yes ☐ If yes: per day No ☐

If no:

Never smoked ☐

Stopped before this pregnancy ☐

Stopped during this pregnancy ☐ at gestation: wks

Unknown ☐

25. Mother's use of alcohol and other drugs: Yes ☐ No ☐ Unknown ☐

If yes specify drug and alcohol use during this pregnancy:

a. First trimester:

b. Month prior to birth:

26. Antenatal check ups:

a. Total number of antenatal visits recorded Unknown ☐

b. Gestation at first antenatal visit Unknown ☐

27. Model of antenatal maternity care:

(Select one in each column)

	At booking	At birth
No booked care	☐	☐
Obstetric hospital	☐	☐
Maternal/Fetal Medicine	☐	☐
Hospital midwifery (eg birth centre)	☐	☐
Private obstetrician	☐	☐
Private midwife	☐	☐
General Practitioner/Shared	☐	☐
Unknown	☐	☐

28. Intended place of birth before labour:

- ☐ Home
☐ Birth Centre
☐ Public Hospital
☐ Private Hospital
☐ Other
☐ Unknown

Please state name of intended place:

29. Actual place of birth:

- ☐ Home
☐ Birth Centre
☐ Public Hospital
☐ Private Hospital
☐ Other
☐ Unknown

Please state name of actual place:

30. Obstetric conditions during this pregnancy:*Indicate all conditions known to be present during this pregnancy.***Yes****a.** Hypertension ☐*If yes indicate type of hypertension*

- ☐ Gestational hypertension
☐ Pre-eclampsia
☐ Pre-eclampsia with chronic hypertension
☐ Eclampsia
☐ Unspecified

b. Preterm labour ☐**c.** Prolonged rupture of membranes ☐*If yes indicate gestation*

- ☐ Preterm - rupture <37 weeks gestation
☐ Term - rupture ≥37 weeks gestation

d. Cholestasis of pregnancy ☐**e.** Confirmed maternal infection ☐*If yes indicate kind of infection*

- ☐ Pyelonephritis
☐ Lower urinary tract infection
☐ Other infection, please specify: _____

f. Trauma ☐*If yes indicate kind of trauma*

- ☐ Vehicular
☐ Fall
☐ Violent personal injury
☐ Other, please specify: _____

g. Vaginal bleeding ☐*If yes indicate gestation*

- ☐ Before 20 weeks
☐ After 20 weeks

h. Gestational diabetes ☐*If yes indicate intervention*

- ☐ Oral hypoglycaemic therapy
☐ Insulin treated
☐ Other, please specify: _____

i. Other obstetric condition ☐

please specify: _____

☐ None of the above☐ Unknown**31. Suspected fetal growth restriction during pregnancy:***(Select one)*

- ☐ No
☐ Yes and confirmed by scan
☐ Yes but normal growth on scan
☐ Yes but no scan performed
☐ Unknown

32. Antenatal procedures: *(Please indicate all procedures undertaken in pregnancy before perinatal death)*

	Yes	
First trimester screening scan	☐	Total number of scans =
Anomaly scan at <=20 gestation	☐	
Chorion villus sampling	☐	
Cervical suture	☐	
Amniocentesis	☐	
Doppler studies	☐	
External cephalic version	☐	
Fetocide	☐	
Amnioreduction	☐	
Laser treatment	☐	
Other, please state: _____		
None of the above	☐	
Unknown	☐	

33. Please indicate if obstetric consultation occurred for these reasons: *(All that apply)*

No obstetric consultations	☐
Prolonged pregnancy (>41 weeks)	☐
Poor obstetric history	☐
Breech presentation	☐
Mother's request	☐
Previous perinatal death	☐
Antepartum haemorrhage	☐
Unstable lie	☐
Fetal abnormality	☐
Prolonged rupture of membranes	☐
Decreased fetal movements	☐
Non-reassuring CTG	☐
Polyhydramnios/Oligohydramnios	☐
Surgery, specify: _____	
Other reason, specify: _____	

34. Was the mother referred to other healthcare services during pregnancy?

Yes ☐ No ☐ Unknown ☐

If yes, select all applicable:

Medical	☐
Mental health	☐
Drug and alcohol	☐
Social worker	☐
Other service	☐
If other, specify: _____	

35. Were maternal corticosteroids given in pregnancy?

Yes ☐ No ☐ Unknown ☐

36. Medication taken in this pregnancy? Yes ☐ No ☐*(Include all over the counter and traditional medicines)*

If yes, list:

NB. If fetal death confirmed before labour, please go to question 42.

Labour and Birth:**37. Onset of labour:**

Spontaneous ☐ Induced ☐ No labour ☐ Unknown ☐

(If no labour, go to question 42)

a) If labour induced, state methods used to induce labour

- ☐ Drugs used, please specify: _____
- ☐ Artificial rupture of membranes, date & time: _____
- ☐ Other, please specify: _____

b) Reason for induction: _____**38. Labour augmentation:**

Yes ☐ No ☐ Unknown ☐

(If yes, please select all that apply)

- ☐ Artificial rupture of membranes, date & time: _____
- ☐ Oxytocin infusion
- ☐ Other, please specify: _____

39. Analgesia during labour:

Yes ☐ No ☐ Unknown ☐

(If yes, select all relevant)

- Opiate ☐
- Nitrous oxide ☐
- Epidural ☐
- Non-pharmacological - please specify: _____
- Other - please state: _____

40. Water immersion during labour:

Did part of labour occur in bath/pool?

Yes ☐ No ☐ Unknown ☐

(If yes)

Was the baby born in bath/pool?

Yes ☐ No ☐ Unknown ☐

41. Fetal monitoring during labour:

Yes ☐ No ☐ Unknown ☐

(If yes select all relevant)

- Intermittent auscultation ☐
- CTG on admission ☐
- Intermittent CTG ☐
- Continuous CTG external ☐
- Continuous CTG - FSE ☐
- Fetal scalp ph/lactate ☐
- Other, please state: _____

42. Method of birth of this baby

- Vaginal non-instrumental ☐
- Forceps ☐
- Vacuum extractor ☐
- LSCS ☐ *(see below)*
- Classical caesarean ☐ *(see below)*
- Other, please state ☐
- Unknown/not stated ☐

Details: _____

If caesarean, please answer a) and b) over:

a) Main reason for caesarean: (select one)

- ☐ No medical indication
☐ Previous caesarean
☐ Breech presentation
☐ Pre-eclampsia
☐ Antepartum haemorrhage
☐ Maternal request
☐ Intra uterine fetal death (Go to Question 48)
☐ Intra uterine growth restriction
☐ Fetal abnormality
☐ Fetal distress
☐ Cord presentation/prolapse
☐ Failure to progress
☐ Other, please specify: _____

b) Anaesthetic for operative delivery:

- General ☐
 Spinal ☐
 Epidural ☐

43. Complications in labour:

Yes ☐ No ☐ Unknown ☐

(If yes, select **all** relevant)

- APH ☐
 Meconium liquor ☐
 Fetal bradycardia ☐
 Non-reassuring CTG ☐
 Cord entanglement/prolapse ☐
 Shoulder dystocia ☐
 Failure to progress/dystocia ☐
 Other, please specify: _____

44. Length of labour:

- a) First stage hours minutes or Unknown ☐
 b) Second stage hours minutes or Unknown ☐
 c) If birth occurred in hospital, state time in hospital before birth:
 days hours minutes or Unknown ☐

45. Apgar scores:

☐ 1 min ☐ 5 mins ☐ 10 mins ☐ 15 mins ☐ Unknown

46. a) Resuscitation at birth:

Yes ☐ No ☐ Unknown ☐

If yes answer the rest of this question:

- Baby resuscitated and transferred to another clinical area ☐
 Baby not able to be resuscitated ☐

b) Details of resuscitation at birth:

If resuscitation commenced indicate methods:

- ☐ Suction
☐ Oxygen
☐ IPPV - bag and mask
☐ External cardiac massage
☐ Medications, specify: _____
☐ Other resuscitation, specify: _____

State category of senior staff present: _____

47. Cord gases at birth:

	Yes ☐	No ☐	Unknown ☐
	Arterial		Venous
pH	.	.	.
Base deficit	+ -	+ -	+ -
CO ₂	.	.	.
Lactate	.	.	.

48. Baby's examination after birth (live and stillborn babies):

a) Length . cm **and** Head circumference . cm

b) External abnormalities noted on examination of baby: Yes ☐ No ☐

*If yes, specify
(including birth
trauma)*

c) If stillborn, degree of maceration: None ☐ Slight ☐ Moderate ☐ Marked ☐

NB. If fetal death confirmed before labour, go to question 53.

49. Was baby transferred from place of birth (eg via NETS) prior to death?

Yes ☐ No ☐ Unknown ☐

If yes, where was the baby transferred to? (Select one)

- NICU/SCU* ☐
 Post natal ward ☐
 Home ☐
 Died in transfer ☐
 Tertiary Services ☐
 Other ☐

* Neonatal Intensive Care Unit/Special Care Unit

If other, please state _____

50. If baby admitted to hospital, provide details of further treatments.

- a) Diagnoses made: _____
 b) Investigations/procedures: _____
 c) IV therapy and drugs: _____
 d) Mechanical ventilation details: _____
 e) Were active life supporting measures withdrawn? Yes ☐ No ☐

f) Summary of significant neonatal events:

Date	Time	Baby's age	Event

51. Place of death if baby was born alive:

Home ☐
 Hospital ☐ Specify location in hospital: _____
 Other ☐ Give details: _____

52. Baby examination after neonatal death:

External abnormalities noted on examination of the baby? Yes ☐ No ☐

If yes, specify
(including birth
trauma)

53. Placental examination:

a) Placenta weight: gm or Unknown ☐

b) Placental examination

- ☐ Not examined
☐ Normal
☐ Abnormalities, please state: _____

c) Placenta sent to pathology: Yes ☐ No ☐ Unknown ☐

54. Umbilical cord notable features: Yes ☐ No ☐ Unknown ☐

If yes, indicate **all** features noted:

True knot	☐	tight	☐	loose	☐	
Cord round neck	☐	tight	☐	loose	☐	
Cord round limbs or body	☐	tight	☐	loose	☐	
Hyper-coiled appearance	☐					
Marginal/velamentous insertion	☐					
Abnormal cord length	☐	short	☐	long	☐	cms
Unusual thickness	☐	thin	☐	thick	☐	cms
Meconium stained	☐					
2 vessels	☐					
Other abnormality, please state:	_____					

55. Maternal outcome:

- ☐ Alive and generally well
☐ Alive but with serious morbidity (e.g. admitted to ICU, hysterectomy, stroke).
☐ Dead

Please add further details in the summary (page 11) if serious maternal morbidity or mortality.

56. Post mortem examination:

a) Parents offered a post mortem examination? Yes ☐ No ☐ Unknown ☐

Parental consent to full post mortem? Yes ☐ No ☐

Parental consent to limited post mortem? Yes ☐ No ☐

Parental consent to external examination? Yes ☐ No ☐

b) Death referred to the Coroner? Yes ☐ No ☐

57. Were there any other factors which contributed to the perinatal death? Yes ☐ No ☐

If yes, please specify and complete Section 2.

58. Bereavement support program commenced with family?

Yes ☐

No ☐

59. Summary: Please provide any relevant information not covered in the previous questions, which you consider may have contributed to the perinatal death.

Section 1 of this form completed by:-

Name:-

Designation:-

Contact details: - Phone

Email

Date:-

_____ (DD/MM/YYYY)

Please email/mail completed original Section 1 marked 'Confidential' to:

**Manager, Council of Obstetric & Paediatric Mortality & Morbidity
Department of Health and Human Services
GPO Box 125
HOBART TAS 7001
ppp.perinataldata@dhhs.tas.gov.au**

Section 2: CAUSE OF DEATH AND ASSOCIATED FACTORS

COMPLETE THIS SECTION AT PERINATAL MORTALITY COMMITTEE REVIEW

Mother's Surname _____

(If multiple birth, indicate birth number of this baby)

Date of perinatal death _____

Gestation _____

Facility reporting _____

1. Classification of cause of death**A) Cause of death recorded on Medical Certificate**

i. Main disease or condition in fetus or infant: _____

ii. Other diseases or conditions in fetus or infant: _____

iii. Main maternal disease or condition affecting fetus or infant: _____

iv. Other maternal diseases or conditions affecting fetus or infant: _____

v. Other relevant circumstances: _____

B) PSANZ Perinatal Mortality Classification of Cause of Death(I) Perinatal Death Classification (PSANZ-PDC) Category

Category description _____

(II) Neonatal Death Classification (PSANZ-NDC) Category

Category description _____

C) PSANZ Perinatal Mortality Classification of associated conditions**Associated condition 1:**(a) Perinatal Death Classification (PSANZ-PDC) Category

Category description _____

OR(b) Neonatal Death Classification (PSANZ-NDC) Category

Category description _____

Associated condition 2:(a) Perinatal Death Classification (PSANZ-PDC) Category

Category description _____

OR(b) Neonatal Death Classification (PSANZ-NDC) Category

Category description _____

2. Post mortem investigations and results

a) Autopsy conducted

Yes - Full ☐Yes - Limited ☐No ☐

If yes, state limits (if applicable) and findings (or attach copy of report)

b) Placental histopathology Yes ☐ No ☐

If yes, state limits (if applicable) and findings (or attach copy of report)

c) Maternal investigations

d) State other tests and available results

3. Factors relating to care

Were any potentially contributing factors relating to provision of (or access to) care present?

Yes ☐ No ☐ If no, go to question 4.

If yes, complete table and state whether each event was **antenatal**, **intrapartum** or **postnatal**:

A. Factors related to the woman/her family/social situation	Sub-optimal factor code	Relevance to outcome code
B. Factors related to access to care		
C. Factors related to professional care		
D. Other factors		

Suboptimal factors - coding	Relevance of sub-optimal factor to outcome - coding
R - Failure to <u>recognise</u> problem	I - Insignificant. Sub-optimal factor(s) identified but <u>unlikely</u> to have contributed to outcome.
A - Failure to <u>act</u> appropriately	P - Possible. Sub-optimal factor(s) identified <u>might</u> have contributed to outcome.
C - <u>Communication</u> failure	S - Significant. Sub-optimal factor(s) identified <u>likely</u> to have contributed to outcome.
S - Failure to <u>supervise</u>	U - Undetermined. Insufficient information available.
H - Inadequate <u>human</u> resources	
O - <u>Other</u>	

4. Recommendations for practice improvements: **Yes** ☐ **No** ☐

<u>Recommendation 1:</u>	
Action required:	
Review date:	
<u>Recommendation 2:</u>	
Action required:	
Review date:	
<u>Recommendation 3:</u>	
Action required:	
Review date:	

5. Other recommendations (eg. education or research): **Yes** ☐ **No** ☐

Recommendation 1:	
Recommendation 2:	
Recommendation 3:	

6. Perinatal mortality review administrative details

Location of perinatal mortality review: _____

Date of review: _____ (DD/MM/YYYY)

 Review finalized? **Yes** ☐ **No** ☐

If yes, date finalized: _____ (DD/MM/YYYY)

If no, please specify outstanding areas for review

Section 2 of this form completed by:-

Name:- _____

Designation:- _____

Contact details: - Phone _____

Email _____

Date:- _____ (DD/MM/YYYY)

Please copy Section 2 for perinatal mortality committee records and email/mail completed original marked 'Confidential' to:

Manager, Council of Obstetric & Paediatric Mortality & Morbidity
Department of Health and Human Services
GPO Box 125
HOBART TAS 7001
ppp.perinataldata@dhhs.tas.gov.au

Section 3: PERINATAL DEATH FOLLOW-UP**(OPTIONAL)****COMPLETE THIS SECTION WHEN MOTHER DISCHARGED FROM MEDICAL CARE
(FILE IN CASE NOTES)****1. Follow-up visits for family**

Obstetrician: _____ Yes ☐ Date/time: _____ (DD/MM/YYYY HHMM)

Neonatologist: _____ Yes ☐ Date/time: _____ (DD/MM/YYYY HHMM)

Midwife: _____ Yes ☐ Date/time: _____ (DD/MM/YYYY HHMM)

General Practitioner: _____ Yes ☐ Date/time: _____ (DD/MM/YYYY HHMM)

Bereavement support: _____ Yes ☐ Date/time: _____ (DD/MM/YYYY HHMM)

Other, specify _____ Yes ☐ Date/time: _____ (DD/MM/YYYY HHMM)

G.P. notified of the perinatal death _____ Yes ☐ Date notified: _____ (DD/MM/YYYY)

Genetic counselling required? Yes ☐ No ☐

If yes, please specify _____

Further investigations required? Yes ☐ No ☐

If yes, please specify _____

Specific religious or cultural considerations? Yes ☐ No ☐

If yes, please specify _____

Other relevant information: _____

2. Other investigations proceeding:

Coroner's case Yes ☐ No ☐

Please provide details: _____

Sentinel event report Yes ☐ No ☐

Please provide details: _____

Root Cause Analysis report Yes ☐ No ☐

Please provide details: _____

Perinatal Mortality Review Committee? Yes ☐ No ☐

Please provide details: _____

Section 3 of this form completed by:-

Name:- _____

Designation:- _____

Contact details: - Phone _____

Email _____

Date:- _____ (DD/MM/YYYY)

Feedback Form

The *Council of Obstetric & Paediatric Mortality & Morbidity* is committed to ensuring that the Annual Report is a useful tool for Obstetricians, Paediatricians and Midwives in monitoring the care and outcomes for mothers and babies. To this end we would welcome your feedback. Please complete the following form and return it to:

Executive
Clinical Quality, Regulation and Accreditation
Level 2, 22 Elizabeth Street
HOBART TAS 7000

Please circle
one option

1. Did you find the information contained within this Report useful?

Yes No

If no, please specify what was lacking:

2. Is there additional information you would like to see routinely included in the Report?

Yes No

If yes, please specify:

3. Are there any other suggestions you would make to assist in improving the usefulness of this Report?

Yes No

If yes, please specify:

If you require further information please contact the Executive, Clinical Quality, Regulation and Accreditation on 6166 1052.

Notes



**COUNCIL OF
OBSTETRIC & PAEDIATRIC
MORTALITY & MORBIDITY
(TASMANIA)**

Clinical Quality, Regulation and Accreditation
Department of Health

GPO Box 125, Hobart 7001

Phone: 6166 1052

Email: jo.jordan@health.tas.gov.au

Visit: www.health.tas.gov.au