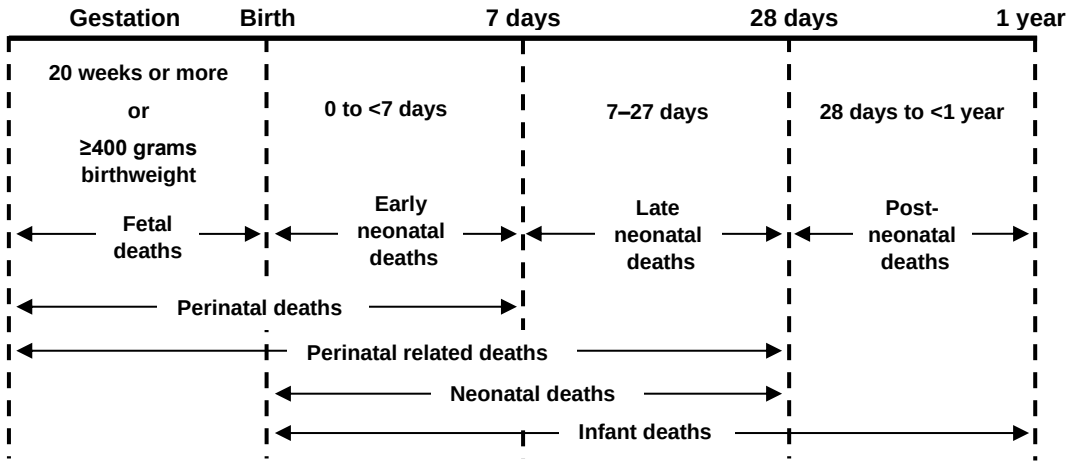
Executive summary | Whakarāpopototanga matua

This monitoring report outlines some of the trends in mortality in babies and mothers, and serious morbidity from neonatal encephalopathy. Deaths are usually multifactorial in nature – usually a death has more than one cause. The aim of this work is to monitor trends and look at systems issues that could be modified to prevent future deaths.

Definitions used by the PMMRC – perinatal related and infant deaths



Source: Adapted from New Zealand Health Information Service (2007) and Ministry of Health (2010).[4]

Perinatal mortality

Since 2007, when the Perinatal and Maternal Mortality Review Committee (PMMRC) began collecting data, deaths overall (perinatal related deaths) have reduced significantly. Perinatal mortalities (fetal and early neonatal deaths) decreased significantly among babies of New Zealand European mothers, but not for any other ethnic group.

The decrease in the rate of stillbirths was largely driven by a reduction in stillbirths in babies of New Zealand European women. There was also a statistically significant decrease in stillbirths for babies of Middle Eastern, Latin American, or African (MELAA) women, but no significant change occurred in any other ethnic group.

The rates of terminations of pregnancy and rates of neonatal mortality overall showed no statistically significant changes.

Deaths due to congenital anomalies remain the leading cause of death overall. The rates of perinatal-related mortality in the peripartum period due to hypoxia have decreased significantly since 2007.

Our results show that certain groups are at higher risk of serious adverse outcomes. These include babies of Māori, Pacific and Indian mothers; and babies of mothers aged less than 20 years. Mortality also increased somewhat for babies of mothers aged 40 years and over.

Mortality rates varied significantly by the level of socioeconomic deprivation in the areas where mothers lived, as measured by the New Zealand Index of Deprivation 2013 (NZDep2013). Those mothers living in the most deprived areas (quintile 5) were statistically significantly more likely to lose a baby from stillbirth, neonatal death and perinatal related death overall, compared with those living in any other quintile. This variation in mortality rates by deprivation was most marked for deaths due to spontaneous preterm labour or rupture of membranes.

[4] New Zealand Health Information Service. 2007. *Fetal and Infant Deaths 2003 & 2004*.Wellington: Ministry of Health.
Ministry of Health. 2010. *Fetal and Infant Deaths 2006*. Wellington: Ministry of Health.

Our data suggest that the National Maternity Collection (MAT) data set[5] underestimates maternal body mass index (BMI). However, regardless of whether we use MAT or PMMRC data, the mortality rates from stillbirth, neonatal death and perinatal related death overall increase with increasing maternal BMI.

Rates of mortality from stillbirth, neonatal death and perinatal related death overall were higher for babies of women who were smoking at the time of registration with a lead maternity carer (LMC) compared with those who were not. Smoking is a significant and modifiable risk factor of perinatal loss. When women are appropriately supported to quit, outcomes clearly improve in relation to some risk factors for mortality, such as spontaneous preterm birth and small for gestational age. Effective smoking cessation programmes do exist, and investment in appropriate programmes designed to reduce this modifiable risk factor should be supported.

Mortality rates were higher for small for gestational age babies than those who were appropriate or large for gestational age. In particular, babies with a birthweight in the 5th customised centile group or below have substantially higher mortality rates than the other centile groups.

Overall, around 41% of babies who died had optimal investigation into the cause(s) of their death, meaning that their death was investigated through post-mortem, karyotype confirming chromosomal abnormality or clinical examination or investigation confirming the diagnosis. Around half of terminations of pregnancy had 'optimal' investigation, whereas under 40% of stillbirths and neonatal deaths did. There were some variations between prioritised ethnic groups in both the rate of offering of post-mortem and the rate of uptake if offered.

Local review of cases showed that a number of deaths had potentially avoidable aspects. Review findings indicated contributory factors were present in just under one quarter of perinatal related deaths. Barriers to access and/or barriers to engagement with care were the most common type of contributory factor; others that the reviews considered were organisational and/or management factors, and personnel factors.

Neonatal encephalopathy

Neonatal encephalopathy (NE) is a clinically defined syndrome of disturbed neurological function within the first week after birth in an infant born from 35 weeks' gestation, manifested by difficulty in initiating and maintaining respiration, depression of tone and reflexes, subnormal level of consciousness and often seizures.[6]

The rate of NE cases per 1,000 term births fluctuated from year to year, with a high of 1.38 per 1,000 live births in 2012 and a low of 1.00 in 2014. Between the years 2010 and 2018, the rate has not shown a statistically significant trend up or down.

Babies of primiparous women had the highest rates of NE, and those rates were statistically significantly higher than for babies of multiparous women regardless of parity. The rates of NE varied by gestational age at birth, with higher rates for those at the extreme ends of term pregnancies. Babies with lower birthweight had higher rates of NE; those under 2,500g had the highest rate.

Overall, 77% of babies had cooling therapy, with the proportion slightly higher for babies with moderate NE. The rates of cooling were the same for babies of Māori mothers as for those with New Zealand European mothers.

Mortality was much higher in babies with severe NE, among whom 60% died, compared with 2% of babies with moderate NE.

[5] The MAT data set is the primary source of information for publicly funded maternity care in Aotearoa/New Zealand.

[6] Nelson KB, Leviton A. 1991. How much of neonatal encephalopathy is due to birth asphyxia? *American Journal of Diseases of Children* 145(11): 1325–31.

Maternal mortality

Maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy (miscarriage, termination[7] or birth), irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.

The PMMRC collected information on a total of 126 maternal deaths during pregnancy or within 42 days postpartum over the period 2006–2018, as well as on another 28 coincidental maternal deaths. The number of maternal deaths has fluctuated substantially over this time. Although the trend is not statistically significant, the total number of maternal deaths followed a general downward pattern over the study period.

The incidence of maternal death increased with age, with the highest rates among those aged 40 years and over (39.2 per 100,000 maternities). In our analysis of the incidence of maternal deaths by prioritised ethnic group, wāhine Māori had statistically significantly higher rates than New Zealand European women. There was a general pattern of increasing mortality with increasing deprivation, when measured by NZDep2013. However, this pattern was not statistically significant (p=0.11).

There were 68 direct[8] and 50 indirect[9] maternal deaths[10] over the study period 2006–2018 inclusive. The single largest cause of maternal death in Aotearoa/New Zealand was suicide, which accounted for 30 deaths during this time (44% of direct causes). The next leading cause was amniotic fluid embolism (AFE), which caused 14 deaths (11.1%).

Suicide continues to be the leading cause of maternal death in Aotearoa/New Zealand and particularly affects wāhine Māori. PMMRC strongly recommends making targeted investment in maternal mental health a key priority for funding by the Ministry of Health. Maternal wellbeing, the development of culturally appropriate maternal screening tools and treatment for women and their babies continue to be areas in urgent need of investment, alongside addressing the wider societal drivers of suicide. Investment should prioritise populations who would benefit the most, such as ngā māma Māori, and be informed by research findings about when women most need that support.

The COVID-19 outbreak in 2020 has impacted on maternity care in a number of ways. Supply of contraceptives has been and continues to be unreliable.[11] Whānau were not able to attend hospital births and the maternity sector was challenged with the need to care for people giving birth while following recommendations to stay out of hospital as much as possible. We will take these conditions into account when examining 2020 data and reporting on them in 2022.

[7] Termination of pregnancy is the interruption of an ongoing pregnancy (whether the baby was stillborn or live born). This report includes only termination of pregnancy from 20 weeks' gestation in the perinatal section. For maternal mortality, a maternal death following termination of pregnancy at any gestational age is included.

[8] Direct maternal deaths are those that result from obstetric complications of the pregnant state (pregnancy, labour or puerperium) from interventions, omissions or incorrect treatment or from a chain of events resulting from the above.

[9] Indirect maternal deaths are those that result from previous existing disease or disease that developed during pregnancy and was not due to direct obstetric causes but that was aggravated by the physiologic effects of pregnancy.

[10] For another eight maternal deaths, the cause is as yet unknown.

[11] PHARMAC. 2020. Oral contraceptives: Supply updates. Wellington: PHARMAC Te Pātaka Whaioranga. URL: https://www.pharmac.govt.nz/information-for/enquiries/oral-contraceptives-supply-updates/ (accessed 18 August 2020).