Maternal mortality trends in Australia

Maternal death is low and decreasing in Australia, but continuing surveillance is important

The death of a mother or a baby has significant short and long term impacts for the surviving family members and for the community and health workers who cared for them. The World Health Organization estimates that 303 000 women died in pregnancy and childbirth in 2015, with 99% of these deaths occurring in low income countries.[1]

In Australia, a series of reports regarding maternal deaths has been published over the past five decades; the first in the series covered the 1964–1966 triennium.[2] These reports examine the deaths that occurred during pregnancy or within 42 days of the end of pregnancy. They are compilations of data sourced from multidisciplinary state maternal mortality review committees that undertake detailed reviews of each case.

The incidence of maternal death is expressed as a maternal mortality ratio (MMR). The MMR is the number of deaths due to complications of the pregnancy (direct deaths) or aggravation of existing disease processes by the pregnancy (indirect deaths) per 100 000 women giving birth. The calculation does not include deaths from unrelated causes that occur in pregnancy or the puerperium (incidental deaths) and deaths that occur more than 42 days after the end of a pregnancy.

The MMR in Australia is low; it has decreased from 41.2 in the 1964–1966 period to 7.1 in the years 2008–2012.[3] The comparable figures are 14.7 for the period 2010–2012 in New Zealand[4] and 9.0 for the period 2011–2013 in the United Kingdom.[5]

Until now, publications in the *Maternal deaths in Australia* series have been irregular. The Australian Institute of Health and Welfare (AIHW) established the National Maternity Data Development Project (NMDDP) in response to the recommendations in the 2008 Maternity Services Review from the Commonwealth and the subsequent 2010–2015 National Maternity Services Plan.[6] A recent report regarding the progress of the NMDDP notes that sustainable data collection on national maternal mortality will be established to facilitate "consistent and regular national reporting" of maternal mortality in the future.[6]

The genesis of the almost sixfold reduction in maternal death rates in Australia is multifactorial, including the improved general health of the population and the availability of better health care options, such as the availability of antibiotics, blood transfusion, safer anaesthesia and effective diagnostic ultrasound. Advanced maternal age, maternal obesity and caesarean deliveries[3,5] are all associated with an increase in the risk of maternal death, and any future growth in their incidence will threaten the efforts to further reduce the maternal mortality rate.

In the list of most common causes of death, infection, abortion and pre-eclampsia have been replaced by maternal cardiovascular disease and psychosocial health problems, while obstetric haemorrhage and thromboembolism remain prominent. The current method of classifying maternal deaths into direct, indirect and incidental deaths was first used in the report on the 1973–1975 triennium.[7] Between that first 1973–1975 report and the most recent one for 2008–2012, 944 direct and indirect maternal deaths have been reported in Australia. Over that 48-year period, cardiovascular disease (MMR, 1.5), sepsis (MMR, 1.3) and obstetric haemorrhage (MMR, 1.1) have been the most prominent causes of death.

Aboriginal and Torres Strait Islander women are twice as likely to die in association with pregnancy and childbirth as other Australian women. In 2008–2012, the Aboriginal and Torres Strait Islander MMR was 13.8 compared with 6.6 for non-Indigenous Australian women who gave birth.[3] The differential between the MMRs is decreasing and caution should be exercised in drawing conclusions due to the small numbers analysed. The leading causes of maternal deaths among Aboriginal and Torres Strait Islander women were cardiovascular conditions, sepsis and psychosocial conditions.

Women aged 35 years or over were more than twice as likely as their younger counterparts to die in association with pregnancy and childbirth, and those aged 40 years or more were over three times more likely to die in association with pregnancy and childbirth.[3]

Of the six most prominent causes of maternal death between 1973 and 2012, psychosocial death is the only group where the MMR is rising; the incidence of maternal death due to cardiovascular disease, obstetric haemorrhage, thromboembolism, hypertensive disorders and sepsis are all decreasing. Most of the deaths classified as psychosocial deaths are due to suicide, although some are related to fatal complications of substance misuse and homicide in domestic situations. While some of that apparent rise may be due to changes in the ascertainment of maternal deaths in general and to problems reporting both maternal suicide and deaths due to substance misuse in particular, it is clear that more needs to be done in this

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sphere. There is a growing belief that a significant portion of late maternal deaths are related to suicide; however, without a clear review of the cases by multidisciplinary committees, the relationship between pregnancy and suicide more than 42 days after the end of pregnancy remains speculative.

It is not clear whether the incidence of suicide in association with pregnancy is more or less common than in comparable non-pregnant women. This comparison is fraught, as the true denominator for pregnancy is not known due to lack of information regarding pregnancies lost as a result of miscarriage and termination. Given that caveat, the overall suicide rate in the 15- to 45-year-old Australian female population in 2006–2010 was 6.0 per 100 000 women,[8] while the maternal mortality rate due to psychosocial issues in the same period was 0.9 per 100 000 women giving birth. A similar finding has recently been noted in the United States.[9] Nevertheless, the apparently increasing incidence of psychosocial maternal death is a matter of concern, given that pregnant women are among the most medically supervised members of the population.

Screening during pregnancy for mental health, substance misuse and domestic violence problems is recommended,[10] but it is not universally undertaken. All maternity care providers should commit to making these items a standard part of their care delivery. The follow-up of identified concerns by the relevant specialist services must be a priority and should continue for a significant period after the end of pregnancy. Similar screening attention is needed for women who had miscarriages and pregnancy terminations.

In many cases, an autopsy is necessary to understand the true cause of a maternal death. A number of causes of maternal death, such as amniotic fluid embolism and pulmonary thromboembolism, may be easily confused clinically. In the case of amniotic fluid embolism, for example, the diagnosis can only be confirmed by autopsy. The question of an autopsy should be pursued with the family by a senior clinician, and the presumption of a diagnosis that has been made in an intensive care unit or similar setting should not be an excuse to not request this critical form of investigation.

Maternal death is one of the few defined core sentinel events in health care; however, it is disturbing to find that a significant portion of these deaths have not been subjected to a root cause analysis or similar review. The application of a systematic review to identify gaps in hospital systems and health care processes, which are not immediately apparent and may have contributed to the occurrence of an event, should be applied to all maternal deaths, whether occurring in the public or private health systems.

The question of the presence or absence of contributory factors is now being actively pursued by some state and territory maternal mortality review committees, and similar questions are also being raised internationally. A consolidation of such information is yet to be published in an Australia-wide context. Experience with such review in New Zealand[11] has shown that more than 50% of maternal deaths were associated with contributory factors, and 35% of the deaths were potentially avoidable.

The Victorian Consultative Council on Obstetric and Paediatric Mortality and Morbidity model[12] appears to be of value, and examines two questions:

- Were suboptimal care factors identified?
- What was the relevance of any suboptimal care factors identified?

Suboptimal care factors may be classified as factors related to the woman, her family and social situation, factors related to access to care and factors related to professional care. Moreover, these factors may be classified as identified but unlikely to have contributed to the outcome (insignificant), identified and might have contributed to the outcome (possible), or identified and likely to have contributed to the outcome (significant).

It is critical to maintain a continuing intensive surveillance of maternal death — with particular reference to recognised risk factors — and to examine the contributory factors. Health departments must require that all direct and indirect maternal deaths are subjected to a systematic review. At present, data on late maternal deaths — occurring more than 42 days after the end of pregnancy — are not collected in all states and territories and are not reported nationally. Reviews of late maternal deaths and of severe maternal morbidity are future necessities, but the resources and methodologies are not yet available at a national level.

Competing interests: I chair the National Maternal and Perinatal Mortality Advisory group and I am a contracted perinatal adviser to the Australian Institute of Health and Welfare (AIHW). I previously chaired the National Maternal Mortality Advisory Committee and was a contracted perinatal adviser to the National Perinatal Epidemiology and Statistics Unit (NPESU) of the University of New South Wales (UNSW). The views expressed in this article are mine and are not necessarily those of the AIHW or the NPESU or UNSW.

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