

Are Maternal Deaths on the Ascent in Singapore? A Review of Maternal Mortality as Reflected by Coronial Casework from 1990 to 1999

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Abstract

Introduction: In Singapore, published maternal mortality rates (MMR) over the last decade (1990 to 1999) have been so low (0.0 to 1.0 per 1000 live births and still births) as to imply that maternal deaths are rare to the point of being non-existent in some years. This inference is counterintuitive, and earlier studies on maternal mortality, amniotic fluid embolism (AFE) and pulmonary thromboembolism (PTE) have also suggested otherwise. Accordingly, local trends in maternal mortality warrant further examination. **Materials and Methods:** A descriptive and comparative study, comprising a clinico-pathological review of maternal deaths, for which autopsies were conducted by the Centre for Forensic Medicine, during a 10-year period from 1990 to 1999. The annual necropsy-based, MMR (estimated MMR), as well as the prevalence of maternal deaths during this time, were estimated with the aid of the relevant, published demographic data on live births and still births. These were compared with the corresponding rates calculated (calculated MMR) from raw demographic data on maternal deaths classified as such in the published data. **Results:** Coronial autopsies were conducted on a total of 51 cases of maternal death, of which 33, 17 and 1 were direct, indirect and fortuitous deaths, respectively. The annual, estimated MMR ranged from 0.4 to 1.8 per 10,000 live births and still births. The estimated MMR was twice as high as the calculated MMR and a statistically significant upward linear trend was demonstrated for the former ($P = 0.046$). AFE (16/51) and PTE (10/51) were the two most common causes of maternal death; their corresponding cause-specific, 10-year prevalence being 0.33 and 0.21 per 10,000 live births and still births, respectively. There was apparent clustering of the cases of PTE during the earlier part of the last decade (1990 to 1995), corresponding to a statistically significant, upward trend in its overall necropsy incidence during that time ($P = 0.019$). Cardiovascular and pulmonary disorders constituted the bulk of indirect deaths (13/17), while antenatal suicides accounted for 3 of these deaths (0.06 per 10,000 live births and still births). **Conclusions:** This was an upward trend in MMR, as reflected in coronial casework, over the last decade. It would appear that the local, estimated (direct and indirect) maternal mortality prevalence compares favourably with the MMR reported in developed countries. The apparent rate of AFE was no less than 4 times higher than that reported in the United Kingdom, while the maternal mortality rate from PTE was at least as high. Allowing for the possibility that such deaths were under-reported, the actual annual MMR and 10-year prevalence could be appreciably higher than the estimates presented here. There may well be a case for the establishment of a comprehensive database of maternal deaths, that is updated continually and contemporaneously, in Singapore.

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Key words: Amniotic fluid embolism, Coronial autopsies, Direct and indirect deaths, Estimated maternal mortality rates, Prevalence, Pulmonary thromboembolism

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