

# Maternal deaths from suicide in Singapore

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## ABSTRACT

**Introduction:** Maternal mortality in Singapore, as in other developed countries, has remained low in the past decade. In the United Kingdom and Australia, maternal deaths from suicide and psychiatric causes have been the leading cause of maternal mortality, and there have therefore been comprehensive healthcare programmes to address the mental health needs of mothers.

**Methods:** In this study, we looked at maternal deaths from 2000 to 2004, by linking coronial cases of female suicide in the reproductive age group 15–45 years, with the birth registration database, to identify both early and late maternal deaths.

**Results:** There was only one identified maternal death among 589 female suicides aged 15–45 years, occurring in a teenager within the first month postpartum. There was likely also another case that was unconfirmed and unreported.

**Conclusion:** From this preliminary study, suicide and psychiatric causes are not significant causes of maternal mortality in Singapore. However, given that the epidemiology of postnatal depression statistics mirror that of the other countries, it is possible that maternal suicides have been under-reported, and the load may well be higher. There is a need for a similar confidential enquiry into maternal deaths to be set up here, as is already in place in various countries, notably the United Kingdom and Australia, for the past decade.

**Keywords:** female suicide, maternal deaths, maternal mortality, severe maternal mental illness, suicide

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## INTRODUCTION

Suicide is one of the determinants measuring the effectiveness of mental healthcare interventions and measures of a country. It is also the one and only complication in psychiatry that is irreversible and tragic, and one that has been the main focus of strategies and policies to improve mental healthcare of any nation.

When suicide occurs in a woman who is pregnant or has recently delivered, the tragedy is even greater, for not only is there a loss of life, there are significant negative effects to the family, in particular, the infant, who is thence at a risk for psychological problems. Mothers who commit suicide invariably suffer from some form of severe mental illness. The epidemiology of psychiatric disorders related to childbirth has been well-established, with the majority of severe mental illness occurring in the first three months after delivery.<sup>(1,2)</sup> Furthermore, it is more likely that deaths from suicide or from psychiatric causes tend to occur some weeks after the onset of the illness, when the illness has worn the afflicted woman down to a state of hopelessness and desperation. Thus, by using the usual limit of 42 days postpartum to classify maternal mortality as is currently practiced locally, it is possible to miss out the deaths from suicide and psychiatric causes occurring in the subsequent weeks. In other words, the late maternal deaths (from after 42 days to one year postpartum), may have been missed out as maternal deaths, and therefore resulting in an untrue reflection of the actual load of the most critical complication of maternal mental illness in Singapore.

In the United Kingdom (UK), where maternal deaths have been comprehensively examined in the past decade, with a psychiatrist being included as a central assessor, it has been consistently found that suicide has been the leading cause of maternal deaths from 1997 to 2002.<sup>(3)</sup> This finding was established after case ascertainment was completed through linkage with birth and death registration at the Office of National Statistics linkage (ONS), which revealed more cases than that reported to the Confidential Enquiry into Maternal Deaths.<sup>(4,5)</sup> The ONS linkage was critical in the comprehensive examination of all maternal deaths, as the majority of women who committed suicide within the first year following childbirth was not reported to the Enquiry, as they were no longer in contact with maternity services by the time they died and their deaths were not coded as due to maternal causes on the death certificate.<sup>(3)</sup> Without the ONS linkage, suicide was the second leading cause of maternal death, and the leading cause of indirect maternal death. Interestingly, maternal deaths due to psychiatric causes have also been found to be the leading cause of maternal mortality in Australia in the recent years.<sup>(6)</sup>

Locally, maternal deaths within the 42 days

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postpartum period in the last decade of the last century have been studied by Lau,<sup>(7)</sup> and there was an upward trend in the maternal mortality rate, as reflected by coronial casework. In that coronial casework series of 51 maternal deaths over ten years, there were three antenatal suicides identified, with no postnatal suicides. The need for the establishment of a comprehensive database of maternal deaths, that is continually and contemporaneously updated, was recommended.<sup>(7)</sup> Maternal suicide has not been dramatically noticeable in Singapore, in part because the cases have been few and far between, and we hypothesise, because maternal suicide has been under-reported, given the immense stigma of mental illness in our society, resulting in difficulties with establishing facts, as well as gathering information from the family of the deceased mother. However, suicide rates in the Singaporean general population are not dissimilar to those of developed nations. In the years 2000 and 2002, local female suicide rates were 6.4 and 7.6 per 100,000, respectively,<sup>(8)</sup> as compared to about 5.8 per 100,000 in the UK,<sup>(9)</sup> and about 5.0 per 100,000 in Australia<sup>(10)</sup> in the corresponding years. Also, the rates of psychiatric disorders in Singapore are similar to those in other countries,<sup>(11)</sup> with antenatal and postnatal depression affecting about 10% of women locally.<sup>(12)</sup> As such, it is not unimaginable that maternal suicide in Singapore should be as important an issue as it is in the UK and Australia. There has so far been no previous study examining maternal suicides in Singapore, and the aim of this study was to examine the reported maternal deaths due to suicide in Singapore, and to test our hypothesis that maternal suicide may be a leading cause of all maternal deaths (early and late) here in Singapore as well.

## METHODS

This study was conducted in joint collaboration with the Centre of Forensic Medicine (CFM), Health Sciences Authority, and the Coroner's Court. Data was also obtained and processed by the Registry of Births and Deaths, Immigration and Checkpoints Authority. Firstly, all the female suicides, whether confirmed or suspected, from a forensic or investigative perspective, were extracted from the CFM database, including cases which have received a verdict of suicide in the course of the respective coronial inquiries. The cases of interest were those of females in the childbearing age 15–45 years, and in the years from 2000 to 2004.

This list was then run through the database at the Registry of Births and Deaths, to identify those who had delivered in the preceding 365 days before their demise, that is, those in their first year postpartum. This would then identify maternal suicides that were not otherwise picked up due to missing information regarding obstetrical

**Table I. Number of suicides during the period 2000–2004.**

Year	No. suicides
2000	112
2001	120
2002	119
2003	108
2004	130
Total	589

history, and late maternal deaths that were not otherwise reflected in the local statistics, but would actually be of significance in reflecting the load of severe maternal mental illness. The coronial records of the identified maternal deaths were then reviewed. The coronial list of recorded maternal deaths for the corresponding years 2000 to 2004 was also examined.

## RESULTS

There were a total of 589 female suicides in the age range of 15–45 years from 2000 to 2004 (Table I). Interestingly, there was only one maternal death, occurring in a 17-year-old, about two weeks after premature delivery. The deceased had come from a socially-disadvantaged background, and was a single mother, who had systemic lupus erythematosus, with renal and cerebral involvement. She had committed suicide by jumping from a height. Unfortunately, although she had communicated her suicidal intentions prior to her demise, the risk was not deemed high as she was mentally obtunded and had been bedridden in the preceding days. Of the other 588 female suicides, the linkage with the database at the Registry of Births and Deaths did not reveal that any of them had delivered in the preceding one year.

From the coronial list of maternal deaths, there were in total 40 maternal deaths from 2000 to 2004, with the majority of deaths from amniotic fluid embolism, cardiovascular disorders and pulmonary thromboembolism (Table II). Thus suicide accounted for one out of 40 maternal deaths, and was the least common cause of maternal death. Apart from this identified and confirmed maternal death, there was at least one other unreported case, related by a senior consultant at the local maternity hospital, KK Women's and Children's Hospital, of a mother who committed suicide some two months after delivery, in year 2004, as informed by her husband. Unfortunately, no further details were presently available.

## DISCUSSION

Given that our suicide rates are comparable, and indeed slightly higher, than that of the UK and Australia, and that

**Table II. Causes and number of maternal deaths during the period 2000–2004.**

Cause	No. maternal deaths
Amniotic fluid embolism	9
Cardiovascular disorders	8
Pulmonary thromboembolism	6
Pulmonary disorders	5
Others*	11
Suicide	1
Total	40

\* Include PPH, ectopic, RTA, sepsis, CNS causes

our load of perinatal depression is similar, this finding is indeed surprising, and refutes our hypothesis that maternal suicide is the leading cause of maternal death locally, as it is in the UK and Australia. Another possible explanation is that some of the female suicides may have been preceded by an abortion, and thus there is no reflection in the linkage with the Registry of Births. Indeed, the risk of suicide following an abortion has been found to be three times the general suicide rate and six times of that associated with birth: the rate for women following a live birth was 5.9 per 100,000; following a miscarriage 18.1; following an abortion 34.7.<sup>(13)</sup> Reported local statistics show that there have been as many as about 12,700 abortions in the year 2002, compared with over 40,000 live births and stillbirths, i.e. 25% of pregnancies were terminated.<sup>(14)</sup> It would be interesting to know how many of the local female suicides had been preceded by an abortion, and if this therefore accounts for the lower rates of maternal suicides locally, as none of these would be reported as a maternal death although they were associated with pregnancy. However, such information would be difficult to establish, given that many women do not want to disclose this, and their surviving families may not be aware of the abortion.

The limitations of the study are that it was assumed that the suicide data from the coronial case records were exhaustive and comprehensive, although it is highly likely that suicide has been under-reported here, much as it has been in other countries. One possible way of circumventing this would have been to consider all the females who had died within a year of delivery (from the data at the Registry of Births and Deaths), and then study the deaths of these women in detail to identify which cases had committed suicide, or had suffered a death as a result of psychiatric illness interfering with diagnosis and early intervention of a physical illness. Such a study design, though ideal, would have been difficult to conduct, as it would entail much resources, in particular requiring interagency collaboration with proper legislative backing, and it would possibly also raise ethical concerns regarding

the confidentiality of each deceased mother. A possible solution would be to conduct a confidential enquiry, as has been done in the UK and Australia.

Although examining the role of psychiatric factors and mental illness in maternal mortality was not in the scope of this paper, this is an issue that needs to be addressed. In the 2000–2002 UK enquiry, a grave concern which surfaced was that 32% of the psychiatric deaths were due to physical illness, and in half of these, either physical or behavioural disturbance was mistakenly attributed to a functional psychiatric disorder rather than to a serious and ultimately fatal physical illness.<sup>(3)</sup> Thus, the presumed psychiatric diagnosis led to a delay in making the correct diagnosis, and hence a delay in the onset of effective treatment. Locally, a possibility could be that some of the mothers who died from physical causes had indeed suffered from a psychiatric illness, and this could have led to a delay in diagnosis and intervention. Hence, a psychiatric evaluation of each maternal death, which can be conducted in a confidential enquiry, may uncover more deaths associated with a mental illness than reflected in the local data, and therefore the significance of mental illness as a risk factor in maternal mortality locally.

If the findings are indeed reflective of the actual state, it is possible that mothers in Singapore are not significantly afflicted with severe peripartum mental illness that predispose to suicide and mortality. One possible explanation could be a stronger family support and a more cohesive social structure locally, or that the rates of substance abuse among women are lower in Singapore as compared to that seen in western countries. It is then prudent to collaborate with our local primary healthcare, obstetric and mental health services to contain maternal mental illness at its current level, before it escalates further to the level seen in other developed countries. Certainly, more research into the area of motherhood and mental illness is necessary for a better understanding of the scope of the problem here in Singapore. The authors recommend that a similar Confidential Enquiry into Maternal Deaths be set up here, as is already in place in various countries, notably the UK and Australia, for the past decade.

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