# Facility Based Maternal Death Review And Study Of Delays In Maternal Mortality

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**Abstracts:** Objective**:** To evaluate various causes of maternal death and MMR at our institute and analysis of delays that contribute to maternal death. Methodology: This observational cross sectional study was conducted from January 2010 to December 2015 in Surat Municipal Institute of Medical Education and Research (SMIMER). All the maternal deaths of the institute during the study period were included in the study. A pre-structured coded Performa provided by National Rural Health Mission was used for present study. The factors associated with maternal deaths were classified by using the 'three delays' framework. Results: The overall MMR of the study was 244 per 100,000 live births. Direct obstetric causes were responsible in 68.04% cases of maternal death. Obstetric haemorrhage like antepartum haemorrhage (APH) and postpartum haemorrhage (PPH) were responsible in 24.74% of cases. Other important direct causes were septicaemia and eclampsia (10.30% and 9.27% cases respectively). Indirect causes were responsible in 31.95% cases of maternal death. Only 20.61% women had taken three or more ANC visits. 35.05% women had not taken any ANC care. 1st delay was found in 57.73% cases and 2nd delay in 34.02% cases. Conclusion: Maternal death review systems help to evaluate the trends of maternal deaths and help to develop subsequent policies and protocols to tackle life threatening obstetric emergencies. [Shah J K NJIRM 2016; 7(3):64 - 66]

**Key Words**: Maternal mortality ratio (MMR), facility based maternal death review.

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**Introduction:** Maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of duration and site of pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. Maternal mortality ratio (MMR) is calculated per 100000 live births. According to "three delays" model, there are three main inhibitors to health care service utilisation[1].

First is the delay in deciding to seek care for obstetric emergency, second is the delay in reaching an appropriate health care facility and third is the delay in receiving adequate care on reaching the facility. Maternal death review (MDR) is an important strategy to improve the quality of obstetric care and reduce the maternal mortality and morbidity [1,2].

Aims and objectives of this study were to evaluate various causes of maternal death and MMR at our institute and analysis of delays that contribute to maternal death.

**Material and Methods:** The The observational cross sectional study was conducted from January 2010 to December 2015 with an average of 6500 deliveries per year in Surat Municipal Institute of Medical Education and Research (SMIMER). All the maternal deaths of the institute during the study period were included in the study. A pre-structured coded Performa provided by National Rural Health Mission for facility based maternal death review (FBMDR) was used for present study. The factors associated with maternal deaths were classified by using the 'three delays' framework. Death which occurred in the department and those patients who were transferred to other departments and died there due to some pregnancy related or aggravated conditions were included in this study. Strict confidentiality of the data is maintained. Ethical Approval was taken from the Institutional Ethics Sub-Committee.

**Results:** Table 1 show that total number of deliveries per year in our institute was 39784 in 2010-15. Total maternal deaths were 97. There was an increasing pattern in the number of deaths per year from MMR 148 in 2010 to 393 in 2015. This may be explained by the fact that this institute is expanding as a referral institute and our documentation had improved throughout these years. The overall MMR of the study was 244 per 100,000 live births as compared to national figure of 178. As shown in table 2, direct obstetric causes were responsible in 68.04% cases of maternal death. Obstetric haemorrhage like antepartum haemorrhage (APH) and postpartum haemorrhage (PPH) were responsible in 24.74% of cases.

Other important direct causes were septicaemia and eclampsia (10.30% and 9.27% cases respectively). Indirect causes were responsible in 31.95% cases, of which anemia and jaundice were the chief

contributors. Antenatal care helps in detection of high risk cases. Proper management of high risk cases reduces maternal morbidity and mortality. As shown in table 3, only 20.61% women had taken three or more ANC visits. 35.05% women had not taken any ANC care. As shown in table 4, 1st delay was found in 57.73% cases and 2nd delay in 34.02% cases.

**Table 1: MMR per year**

| Year | Total No. of live births | No. of maternal death | MMR/ 1 lakh live birth |
|---|---|---|---|
| 2010 | 6764 | 10 | 147.84 |
| 2011 | 6396 | 08 | 125.07 |
| 2012 | 6264 | 09 | 143.67 |
| 2013 | 6659 | 15 | 225.25 |
| 2014 | 6581 | 27 | 410.27 |
| 2015 | 7120 | 28 | 393.26 |
| Total | 39784 | 97 | 243.82 |

**Table 2: Causes of maternal death**

| Cause | No. of maternal death (n=97) | Percentage |
|---|---|---|
| Direct causes | 66 | 68.04% |
| (a) Haemorrhage | 24 | 24.74% |
| -APH | 09 | 9.27% |
| -PPH | 15 | 15.46% |
| (b) Eclampsia | 09 | 9.27% |
| (c) Septicemia | 10 | 10.30% |
| (d) Others | 13 | 13.40% |
| Indirect causes | 31 | 31.95% |
| (a) Anemia | 13 | 13.40% |
| (b) Jaundice | 07 | 7.21% |
| (c) Others | 11 | 11.34% |

**Table 3: Distribution of maternal deaths according to ANC visits**

| ANC visits | No. of cases (n=97) | Percentage |
|---|---|---|
| No ANC visits | 34 | 35.05% |
| <3 ANC visits | 43 | 44.32% |
| ≥3 ANC visits | 20 | 20.61% |

**Table 4: Study of delays in maternal death**

| Delay | No. of cases (n=97) | Percentage |
|---|---|---|
| 1st delay | 56 | 57.73% |
| 2nd delay | 32 | 34.02% |
| 3rd delay | 9 | 9.25% |

**Discussion:** MMR is an indicator of the quality of obstetric care in the community. It varies from place to place. It is higher in developing countries than in developed countries. Every year more than half a million women die from pregnancy related complications, 99% of maternal deaths occur in developing countries. Majority of these deaths are preventable [3,4,5,6].

Government of India has taken up community based maternal death review (CBMDR) and Facility based maternal death review (FBMDR). FBMDR is conducted in all govt. teaching hospitals, referral hospitals (district, sub district, CHCs) where more than 500 deliveries are conducted in a year. Facility-based maternal death review is defined as in-depth investigation of the causes and associated factors in maternal deaths that occur in health facilities. It entails interviews of health personnel who attended to the deceased. It can also be extended to interviews of family members who accompanied the deceased. The review is non-judgemental to encourage the cooperation of the health workers involved. It provides information for improving obstetric care[2].

Current MMR of India is 178[7]. MMR in our study was 244 as our institute is a tertiary care centre. Similar high rates were found in Murthy BK et al, Bedi et al and Roy S et al studies [4,5,6]. Direct obstetric causes like haemorrhage, eclampsia, septicaemia, rupture uterus, amniotic fluid embolism etc were responsible in 68.04% of cases and indirect causes like anemia, jaundice, heart disease etc were responsible in 31.95% cases which were similar to other studies[3,5,9,10,11]. Antenatal care is an essential component to reduce complications and to achieve a healthy mother and a healthy neonate. WHO recommends at least four antenatal visit. In our study, 35.05% women had not taken antenatal care, 44.32% women had less than three visits. So majority of women had not received proper antenatal care. In the study by Roy S et al 89% cases of women were unbooked.

Table 4 shows that 1st delay was responsible in 57.73% cases. Old customs and beliefs, failure to recognize warning signs of pregnancy, gender inequality, lack of antenatal care, poor nutrition, delay in decision making, home delivery etc factors are associated in 1st delay. This can be prevented by education, expanding health services and proper training of Aanganwadi workers. 2nd delay was responsible in 34.04% cases.

Problem of transportation is still present in remote areas. Transportation was not a major concern in this study as the study was conducted in urban area and 108 ambulance services are freely available. In our study majority of women had reached the tertiary centre in moribund state. 3rd delay was found in 9.25% cases. Unavailability of ventilator, lack of blood and blood components are contributory factors.

**Conclusion:** Maternal death review systems help to evaluate the trends of maternal deaths and help to develop subsequent policies and protocols to tackle life threatening obstetric emergencies.

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