

# A five year study of Maternal Mortality in Bagalkot district, Karnataka, India

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## Abstract

**Background:** Maternal mortality is an important health indicator. This study aimed to determine the causes of maternal mortality in Bagalkot district, Karnataka, India after the introduction of the National Rural Health Mission in 2005.

**Methods:** This study is a retrospective analysis of case records. All records of maternal mortality from April 2011 to March 2016 were included from district health office Bagalkot.

**Results:** The maternal mortality ratio from April 2011 to March 2016 was 53.39/100,000 livebirths, compared to 146.08 in 2001-05 and 94.63 2006-10. Most deaths were of women between 20 -29 years and most died within 24 hours of admission. Postpartum hemorrhage, eclampsia and amniotic embolism were the leading causes of death. Anaemia also played a major role, directly or indirectly, in many of the maternal deaths.

**Conclusion:** Introduction of National Rural Health Mission seems to have helped reduce the maternal mortality ratio in Bagalkot district. MMR by Anaemia, PPH and eclampsia are largely preventable on early recognition and aggressive treatment by skilled birth attendants and promotion of hospital deliveries by creating awareness among peoples and establishing proper transport facilities for above purposes.

**Keywords:** Maternal mortality; Skilled birth attendants; Anaemia

## Introduction

Maternal mortality is an important indicator of health. It is defined as "The death of a woman while pregnant or within 42 days of termination of pregnancy irrespective of the duration and site of pregnancy from any cause related to or aggravated by pregnancy or its management but not from accidental or incidental causes". Improving maternal health and reducing maternal mortality have been the key goal all over globe, particularly in India. Two countries account for one third of all global maternal deaths, India at 17% and Nigeria at 14%<sup>1</sup>. The Office of the Registrar General, India under the Ministry of Home Affairs in 2013 declared maternal mortality in India as 178 per 100,000 live births<sup>2</sup>. Maternal mortality study in Madhya Pradesh, India showed 81% of all maternal deaths can be prevented through proper understanding diagnosis and management of labour complications<sup>3</sup>. The reasons for Women death in pregnancy and child birth are multifaceted. Apart from medical causes, there are

logistic causes, failures in the health care system, and lack of transport. Social, cultural and political factors influence the status of women, their health, fertility and health seeking behavior<sup>4</sup>. Keeping this in mind this study is planned to identify the causes of maternal mortality in Bagalkot district, India.

National rural health mission was introduced in April 2005 by the prime minister. One of the primary goals of this scheme was to reduce the maternal mortality by training the rural health attendants in necessary skills required to reduce the maternal deaths.

## Materials and Methods

This is a retrospective study, done by studying maternal mortality case records in Bagalkot district health office from April 2011 to March 2016. Case records from the District health office, Bagalkot, which includes maternal deaths occurring in the entire district, were analyzed by year in relation to distribution of deliveries and maternal deaths, age and parity, when death occurred-antenatal, intra ,post

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natal period, place of delivery, place of death, delivery conducted by whom, and cause of death for the period of five years.

**Inclusion Criteria**

1. Death of a woman during pregnancy.
2. Death of a woman during childbirth.
3. Death a woman within 42 days after termination of pregnancy.

**Exclusion Criteria**

Death of a woman during pregnancy or within 42 days of termination due to accidental/ incidental causes

**Results**

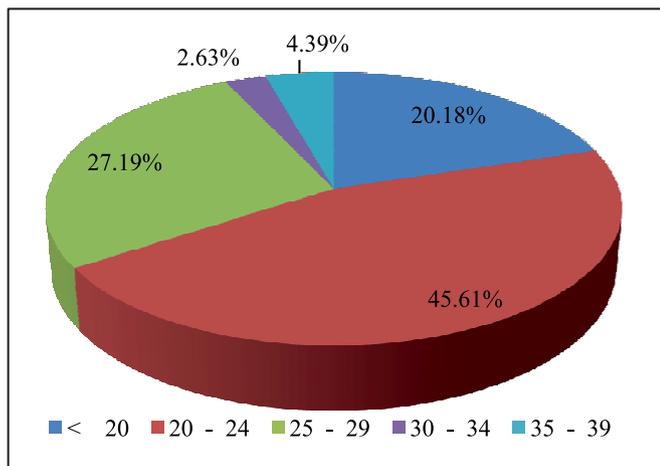
There were a total of 114 maternal deaths in a span of five years out of 213,524 deliveries in entire Bagalkot district, this resulted in a maternal mortality ratio (MMR) of 53.38/100,000 livebirths (Figure 1). Twenty to twenty four years is the most common age group with 45.61% followed by 25-29 years (27.19%) had maternal mortality in the study (Figure 1).

Most of the maternal mortality 52/114 occurred within 24 hours (45.61%) (Graph 1).

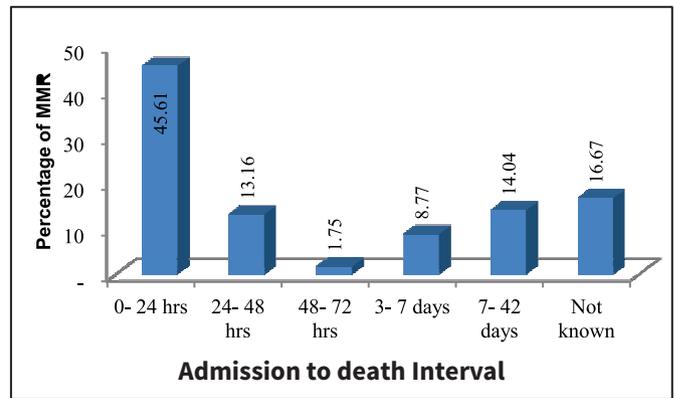
All had ANC registration at sub centre, Primary Health Center, Community Health Center or in a private hospital. 72.80% are booked cases and 27.19% are unbooked cases had irregular ANC (Table 1).

**Table 1: Distribution of maternal deaths according to regular/irregular ANC visits.**

ANC registration	No. of maternal death (n=114)	Percentage
Regular ANC	83	72.80
Irregular ANC/ unbooked cases	31	27.20



**Figure 1: Maternal deaths according to age group**



**Graph 1: Distribution of Maternal death according admission to death interval**

**Table 2: Distribution of maternal deaths and gravidity**

Gravidity	No. of maternal deaths (n=114)	Percentage
Primigravida	48	42.11
Multigravida	53	46.49
Grand multi (History of 4 births or more) <sup>9</sup>	13	11.40

Maternal mortality is more in hospital (77.19%) than home (13.15%) 11 cases were died on the way hospital (Table 3).

**Table 3: Distribution of place of maternal deaths**

Place of death	No. of maternal deaths (n= 114)	Percentage
Home	15	13.15
Hospital	88	77.19
On the way to hospital	11	09.60

Postpartum hemorrhage was the most common cause for maternal mortality in this study, it was responsible 34.21% (n=39) of deaths followed by pulmonary embolism (11.4%, n=13) and puerperal sepsis (11.4%, n=13), and pre-eclampsia with eclampsia (10.52%, n=12). Anemia was a contributing cause for most of deaths directly or indirectly.in most of cases like PPH, sepsis, eclampsia, APH, etc. (Table 4).

**Table 4: Causes of maternal mortality**

Causes of maternal mortality	No. of maternal deaths (n=114)	%
Post Partum Hemorrhage	39	34.21
Ante Partum Hemorrhage	06	5.26
Ruptured uterus	06	5.26
Pulmonary embolism	13	11.40
Pre-eclampsia and eclampsia	12	10.53
Puerperal sepsis	13	11.40
Cardiovascular System Cases	12	10.53
Cerebrovascular Thrombosis	04	3.51
Disseminated Intravascular Coagulation	02	1.75
Respiratory cases (ARDS)	03	2.63
Acute Renal Failure	01	0.88
Infection (TB Viral hepatitis, HIV)	03	2.63

### Discussion

A study on maternal mortality in India: a review of trends and patterns by IEG (Institute of economic growth) in 2015, indicate that MMR in India in the 1940s was around 2000, around 1000 in the 1950s, around 800 in the 1970s, over 400 in the 1980's, and currently 178 per 100,000 live births [RGI 2013]. At the completion of phase 1 of the NRHM (2012), MMR across high focus states is estimated to be 257 per 100,000 live births. Obstetric haemorrhage is the main cause for maternal deaths<sup>2</sup>, Yadav K et al reviews in his retrospective and prospective study of MMR in a rural tertiary care hospital India and results with MMR of 555.5/100,00 live births and PPH is leading cause [31.9%] followed by pre-eclampsia [24.4%], anemia [14.94%], sepsis [9.27%] for maternal deaths<sup>3</sup>. There as, on that women die in pregnancy and child birth are multifaceted. Behind the medical causes are logistic causes, failure in health care system, and lack of transport. Behind these, there are social, cultural and political factors which together determine the status of women, their health, fertility and health seeking behavior<sup>4</sup>. Common conditions like anemia, eclampsia and postpartum hemorrhage are the

leading causes of maternal mortality reflecting lack of antenatal care and timely referral as observed in Naik S et al<sup>5</sup> and Jadhav et al<sup>6</sup>. Sureka Tayade et al reviews in their study of MMR in district hospital of central India with MMR of 242.27/100,000 live births. According to one study, Pulmonary embolism is leading cause for maternal deaths followed by eclampsia. There is a need for proper audit of MMR for finding both specific cause and local solutions is recommended<sup>7</sup>. Pradeep M Ramachandra et al reviews in their retrospective study in Mandya district Karnataka and results with MMR of 38.25/100,000 live births [2011-15], same was 106.9[2001-05] and 95.89 [2006-10]. PPH is leading cause [32.5%] followed by eclampsia [15%], amniotic fluid embolism [12.5%] anemia [10%]<sup>8</sup>.

MMR in Bagalkot district was 146.08/100,000 live births in 2001-2005 and it was 94.63/100,000 live births in 2006-10. With effective implementation of NRHM programme, training skilled birth attendants and promoting hospital deliveries by creating awareness in people has reduced MMR to 53.39/100,000 live births in 2011-2015. In these five years in our district, post-partum hemorrhage is the leading cause of MMR of 34.21%. This is associated with co-morbidities like anemia, placenta previa, previous two caesarean both atonic and traumatic PPH, Twin pregnancy. In majority of cases there was a delay in recognition of PPH and treatment/referral. Pulmonary embolism, puerperal sepsis, pre-eclampsia and its complications is the followed leading causes of maternal mortality in our study. Anemia is present in almost all the cases of maternal mortality. Case records showed thirteen cases of sudden deaths attributed to amniotic embolism; none of them had postmortem report. Eleven cases were died on the way to hospital (Table 3) indicating that the district is lacking a well-organized referral system and transport for emergency cases. MMR by anemia, PPH, and eclampsia, are largely preventable on early recognition and aggressive treatment by skilled birth attendant<sup>8</sup>.

### Conclusion

With effective implementation of NRHM (National rural health mission) in Bagalkot district, maternal mortality decreased from 94.63 to 53.39/100,000 live births in five years. Postpartum hemorrhage, eclampsia and anaemia are still the leading causes of maternal mortality. Anemia is a direct or indirect cause in cases of PPH, and sepsis. All leading causes like PPH, eclampsia and anemia are largely preventable. Training SBA (skilled birth attendants) for early recognition/referral and aggressive treatment on

these co-morbidities may help in further reducing the MMR. Proper auditing and recording of each maternal death must be strengthened by maintaining maternal death register for systematic analyses to find specific cause and suitable local solutions in the prevention of maternal deaths.

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