

## Maternal mortality in Bijapur district

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**Abstract:** *Objectives:* The objectives of this study is to evaluate the incidence of maternal deaths, causes responsible for maternal mortality, direct and indirect factors, and various preventable methods to reduce maternal mortality rate. *Background:* 95% of maternal deaths occur in Asia and Africa. The need for undertaking this study is to know the maternal mortality rate, analyze the causes and preventable factors of death occurring in the district of Bijapur, Karnataka, India. *Methodology:* It is a study of 2years from the Records of District Health Office and Institutions on maternal mortality from June 2011 to May 2013 in Bijapur. *Results:* In two years there were fifty eight maternal deaths and seventy nine thousand five hundred and sixty six live births, hence maternal mortality ratio was seventy three per lakh live births. Eighty two percent of maternal deaths occurred in families who belonged to Below Poverty Line. Prevalence of anemia in pregnancy was 79.3%. Severe anemia (Hemoglobin <7g%) seen in 5.1% was the most common indirect cause of death. Forty three percent of the deaths occurred at private setups. Hemorrhage, Septicemia and Preeclampsia & Eclampsia were responsible for 44.82%, 15.51% and 6.89% respectively. *Conclusion:* Majority of the maternal deaths are preventable if these four delays are avoided: a) Delay in identifying the problem. b) Delay in seeking care. c) Delay in reaching the referral institute. d) Delay in getting treatment on reaching the referral institute.

**Keywords:** Maternal mortality, direct causes, indirect causes, preventable factors.

### Introduction

Maternal mortality rate has been an indicator of maternal health services. A woman in her role is the central nucleus and forms backbone of the family, yet 212 women per 100000 live births die during their pregnancy in India. The early age of marriage of women, high birth rate, less spacing between the birth of two children, lack of knowledge regarding danger signs of pregnancy, high rate of home delivery and delivery by unskilled birth attendant-all can lead to high maternal mortality ratio (MMR). The condition is more dangerous in mothers living in hard to reach area [1].

In India, approximately 28 million women experience pregnancy and 26 million have live births. An estimated 67,000 maternal deaths and one million newborn deaths occur each year. Averting maternal deaths remains a challenge to health care system in India as to the developing world. Millennium development goal 5 aims at reducing maternal mortality ratio by 75% over a period of 1990-2015. However, India has observed appreciable decline in MMR from 677

in 1980 to 254 in 2004-06 and 212 in 2007-09. National Rural Health Mission (NRHM) and MDG5 target to reduce MMR to less than 100 by 2015 [2].

The reasons that women die in pregnancy and childbirth are many layered. Behind the medical causes are logistic causes, failure in health care system, lack of transport etc. and behind these are social, cultural and political factors which together determine the status of women, their health, fertility and health seeking behavior [2]. Maternal Mortality has been called "The most neglected tragedy of our times". The causes are multifactorial in origin, involving interrelated factors and it has to be looked beyond the medical complications like society attitudes towards women during infancy, adolescence and childhood, the socioeconomic and cultural environment and education of the women [3].

India has made significant progress in reducing in reducing its maternal mortality rate (MMR) from 254 (SRS 2004-06) to 212

(SRS 2007-09) per hundred thousand live births. Maternal mortality is frequently described as “The Tip of Iceberg”. This explains that there is vast base to the iceberg in the form of maternal mortality near miss which described as maternal morbidity. It has remained largely undescribed. In 2009, Roost et al reported MMR as 187/100000 live births and Maternal near miss as 50/100000 live births, with a relatively low mortality index of 3.6% [4]. Maternal mortality prevention can be targeted at 3 levels: primary prevention (prevention of pregnancy); secondary prevention (prevention of obstetric complications); and tertiary prevention (prevention of maternal death once complications have arisen) [5].

The current Maternal Mortality Rate (MMR) of India is 212 per one lakh live births, whereas the country’s MDG in this respect is 109 per one lakh live births by 2015. The maternal mortality rate of Karnataka is 176 per one lakh live births and of Bijapur district is 110 per one lakh live births (2010). Maternal mortality prevention can be targeted at 3 levels: primary prevention (prevention of pregnancy); secondary prevention (prevention of obstetric complications); and tertiary prevention (prevention of maternal death once complications have arisen) [6].

In India, the proportion of institutional deliveries is low (less than 41 percent as per the National Family Health Survey III [NFHS-III]). Most maternal deaths can be prevented if deliveries are attended by Skilled Birth Attended (SBA) and proper Antenatal Care (ANC) and Post-natal Care (PNC) is received. Furthermore, institutional deliveries are encouraged, since home deliveries lack the time of emergency obstetric care (EmOC) that trained health professional in an institution can provide [7].

**Material and Methods**

*Source of data:* It is a study of 2 years from the Records of District Health Office and institutions on maternal mortality from June 2011 to May 2013 in Bijapur.

*Inclusion criteria:* Maternal death during pregnancy or within 42days of delivery, irrespective of duration and site of pregnancy, from any cause related to or aggravated by the pregnancy, or its management.

*Ex clusion criteria:*

1. Death from accidental or incidental causes not related to pregnancy.
2. Non obstetric deaths (causes not related to pregnancy, complications r management).

*Sample size:* It is a two-year study of maternal deaths in Bijapur District from June 2011 to May 2013 from the records of District Health Office and the institutions.

*Method of collection of data:* Details of the patient and other particulars are collected from the records of District Health Office and the institutions from June 2011 to May 2013 in Bijapur.

**Results**

In the present study, there were 79566 live births and 58 maternal in Bijapur, Karnataka. Thus maternal mortality rate is 73 per 1, 00,000 live births.

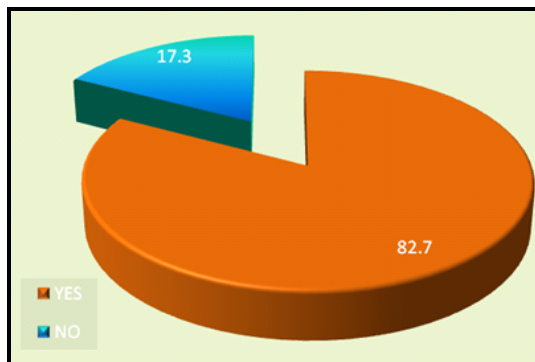
**Table-1: Maternal Mortality Rate in Bijapur from June 2011 to May 2013**

Total number of maternal deaths	58
Total number of live births	79566
Maternal Mortality Rate	73

**Table-2: Frequency and percentage distribution of patients according to BPL**

BPL	Frequency	Percentage
Yes	48	82.7
No	10	17.3
<b>Total</b>	<b>58</b>	<b>100</b>

**Graph-1:** Percentage distribution of patients according to BPL



Most of the deaths occurred belonged to Below Poverty Line: 48 out of 58 cases belonged to Below Poverty Line (82.7% were BPL cases)

Obstetrical score	Frequency	Percentage
Primi Gravida	30	51.7
Multi Gravida	25	43.1
Grand MultiPatra	03	5.2
<b>Total</b>	<b>58</b>	<b>100</b>

Most of the deaths occurred in primigravida-51.7% compared to multipara-43.1% and grand multipara-5.2%.

Anemia	Frequency	Percent
Moderate	28	47.5
Mild	13	22.0
No	12	20.3
Severe	03	5.1
Very severe	01	1.7
Not done	01	1.7
<b>Total</b>	<b>58</b>	<b>100</b>

Anemia was prevalent in 79.7% of the maternal deaths of various grades. Moderate anemia was found in majority of the cases of 47.5%. Severe anemia was found in 5.1% of the cases and very severe anemia in 1.7% of the cases.

Among 58 maternal deaths, 25(43.1%) died at private institute, 10(17.3%) died at government setups, 18 (31%) died on transit and 5 (8.6%) died at home.

*Maternal mortality rate reported by different authors:*

Author	Year	Country	MMR/100000 Live Births
Tapasvi et al [8]	2007-08	India	47.2
Amowitz et al [9]	2002	Afghanistan	593
Lau G [10]	2002	Singapore	40-180
A O Fawole et al [11]	2012	Nigeria	927
A Kalaichandran [12]	2007	Cambodia	956
L T T Trinh et al [13]	2006	Vietnam	165
<b>Present Study</b>	<b>2013</b>	<b>India</b>	<b>73</b>

Place of death	Frequency	Percentage
Transit	18	31.0
PVT institute	25	43.1
Govt. Hospital	10	17.3
Home	05	8.6
<b>Total</b>	<b>58</b>	<b>100.0</b>

Level of delay	Frequency	Percent
Delay in identifying problem	24	41.3
Delay in deciding to seek care	14	24.2
Delay in reaching the health care facility	07	12.1
Delay in receiving adequate treatment on reaching health facility	13	12.1
<b>Total</b>	<b>58</b>	<b>100</b>

In 41.3% of the cases there was a delay in identifying the problem. There was a delay in deciding to seek care in 24.2% of the cases and delay in reaching the health facility in 12.1% of the cases. In 22.4% of the cases there was a delay in receiving adequate treatment on reaching health facility.

**Discussion**

This study was done in order to analyze in detail about the factors responsible for maternal deaths. During this period, there were 79566 live births and 58 maternal deaths. Thus maternal mortality in Bijapur, Karnataka from June 2011to May 2013 is 73 per 1, 00, 000 live births.

*Influence of age on maternal mortality:* Majority of the deaths occurred in the age group of 21-30years which was 58.6%, comparable to age related deaths to AH Khosla et al [21] 62.5% and Arvind Pandey et al [15] 61.66%. Slightly higher rates of maternal deaths in 21-30yrs of age was found with Nishu Priya et al [4] 74.22% and PN

Anandalakshmy et al [14] 67.85%. The mortality in below 20years of age is less in our study group, may be due to less child marriages and teenage pregnancies in Bijapur. Maternal deaths after 35years were less because of lesser chances of pregnancies after 35 years.

Author	Year	< 20Yrs	21-30Yrs	31-35Yrs	>35Yrs
A H Khosla et al [21]	2006		62.5%	25%	12.5%
Nishu Priya et al [4]	2010	8.24%	74.22%	17.52%	
P N Anandalakshmy et al [14]	1993	6.34%	67.85%	13.09%	12.69%
Arvind Pandey et al [15]	2003	15.9%	61.66%	8.51%	13.83%
<b>Present study</b>	<b>2013</b>	<b>34.5%</b>	<b>58.6%</b>	<b>6.9%</b>	<b>Nil</b>

*Influence of below poverty line (BPL) on maternal mortality:* As compared to Sunil Saksena Raj et al [16] the rate of maternal deaths in Below Poverty Line women was 47.4% which was less than the rate of our study of 82.7%. According to Planning Commission 2013

July, percentage of people below poverty line in Karnataka is 20.9%. In the lower socio-economic strata, nutrition is poor in girl child due to poverty, ignorance and anemia. They are unaware of available medical help, contraception and abortion facilities.

Author	Year	Yes	No
Sunil Saksena Raj et al [16]	2013	47.4%	49.1%
<b>Present study</b>	<b>2013</b>	<b>82.7%</b>	<b>17.3%</b>

*Influence of parity on maternal mortality:* As shown in the table below, maternal mortality rate in our study in primigravida (51.7%) was comparable to Arpita N et al [17] 48.29%. A slightly increased rate was seen in our studies compared to Nishu Priya et al [4] 42.36% and P N Anandalakshmy et al [14] 32.93%. Maternal deaths in grandmultipara 5.2% were comparable

to Nishu Priya et al [4] 8.24%. Preeclampsia and Eclampsia are commonly seen in primigravida and higher incidence of anemia, hemorrhage and chronic hypertension are seen in multigravida. Thus equal importance has to be given to all the pregnant women irrespective of their parity.

Author	Year	Primigravida	Multigravida	Grandmultipara
Nishu Priya et al [4]	2010	42.26%	49.48%	8.24%
P N Ananda lakshmy et al [14]	1993	32.93%	52.38%	9.52%
Arpita N et al [17]	2013	51.7%	43.1%	5.2%
<b>Present study</b>	<b>2013</b>	<b>48.29%</b>	<b>46.89%</b>	<b>9.7%</b>

*Influence and prevalence of anemia in maternal deaths:* Anemia was prevalent in 79.7% of the pregnant women which is comparable to Umesh Kapil et al [19]. Moderate anemia was seen in 47.5% which is comparable to Umesh Kapil et al [19], however slightly higher incidence (25.2%)

was seen in the study of Nadeem Ahmed et al [18]. Severe anemia was seen in 5.1% of the cases which was less than Nadeem Ahmed et al [18] 14.2% which may be due to better compliance of pregnant women to IFA tablets in Bijapur.

Author	Year	No Anemia	Mild	Moderate	Severe	Very Severe	Not done
Nadeem Ahmed et al [18]	2010	25.2%	22.6%	38.1%	14.2%		
Umesh kapil et al [19]	1999	21.2%	29.4%	47.8%	1.6%		
<b>Present study</b>	<b>2013</b>	<b>20.3%</b>	<b>22%</b>	<b>47.5%</b>	<b>5.1%</b>	<b>1.7%</b>	<b>1.7%</b>

*Influence of place of death on maternal mortality:* According to our study 31.03% of the maternal deaths occurred in transit comparable to Sunil Saksena Raj et al [16] of 30%. Only 8.6% of the deaths occurred at home which indicates that a better coordination with the ASHA workers and ANM's can help reduce MMR. It is far less than

B R Ganatra et al [20] of 26.4% and Bhatia J C [22] of 40.9%. Deaths at government setups (17.1%) and private setups (35.5%) in our study is comparable to B R Ganatra et al [20] of 19.6% and 35.5% respectively.

Author	Year	Transit	Private Setups	Government Setups	Home
Sunil Saksena Raj et al [16]	2013	30%	16%	31%	23%
Bhatia Jagdish C [22]	1993	8.5%	7%	43.6%	40.9%
B R Ganatra et al [20]	1998	18.1%	35.5%	19.6%	26.4%
<b>Present study</b>	<b>2013</b>	<b>31.03%</b>	<b>43.1%</b>	<b>17.1%</b>	<b>8.6%</b>

*Causes of maternal mortality:* Three deadly causes of Maternal deaths are Haemorrhage, Preeclampsia & Eclampsia and Septicemia. Most common indirect cause of death is anemia. Haemorrhage usually postpartum hemorrhage is the most common cause of maternal death in our study (44.82%) which is slightly higher than WHO estimates of 30.8% and SRS (1997-03) of 38%. Septicemia was responsible for 15.5% of maternal death in our study which was slightly higher than WHO and SRS estimates of 11.6% and 11% respectively.

There were no deaths related to abortions in our study. Preeclampsia and Eclampsia was responsible for 6.89% of the deaths comparable to SRS of 5%.

	WHO (ASIA)	SRS (1997-2003)	Present Study
Hemorrhage	30.8%	38%	44.82%
Sepsis	11.6%	11%	15.51%
Hypertensive disorders	9.1%	5%	6.89%
Obstructed Labour	9.4%	5%	
Abortions	5.7%	8%	
Embolism-Pulmonary	0.4%		6.89%
Embolism-Amniotic			1.72%
Anemia	12.8%		3.44%
Other		34	
CVT			5.17%
Rupture Uterus			5.17%
APH			5.17%
Cardiac Failure			5.17%

**References**

1. Datta D, Datta PP. Maternal Mortality in India: Problems and Challenges. *Asian J Med Res* 2013; 2(1):33-35.
2. Asamoah BO et al. Distribution of causes of maternal mortality among different socio-demographic groups in Ghana; a descriptive study. *BMC Public Health* 2011; 11:159.

3. Konar H, Baran CA. Maternal Mortality: A FOGSI Study (Based on Institutional Data). *The Journal of Obstetrics and Gynaecology of India* 2013; 63(2):88-95.
4. Nishu P, Verma A, Verma S. Maternal Mortality: Ten years retrospective study. *JK Science* 2010; 12:3.
5. Purandare CN. Maternal Near Miss Review: A way forward. *The Journal of Obstetrics and Gynaecology of India* 2013; 63(4):213-215.
6. Burchett HE, Mayhew SH. Maternal Mortality in low income countries: What interventions have been evaluated and how should the evidence base be developed further? *International Journal of Gynecology and Obstetrics* 2009; 105:78-81.
7. Vora KS et al. Maternal health situation in India: A case study. *J Health Popul Nutr.* 2009; 27(2):184-201.
8. Puwar TI, Parvathy SR, Mavalankar DV. Situational Analysis of Reporting and Recording of Maternal Deaths in Gandhinagar District, Gujarat State. *Indian Institute of management, Ahmedabad, India.* 2009.
9. Amowitz LL, Reis C, Iacopino V. Maternal mortality in Herat Province, Afghanistan, in 2002: an indicator of women's human rights. *JAMA.* 2002; 288(10):1284-91.
10. Lau G. Are maternal deaths on the ascent in Singapore? A review of maternal mortality as reflected by coronial casework from 1990 to 1999. *Ann Acad Med Singapore.* 2002; 31(3):261-75.
11. Fawole AO et al. Predictors of maternal mortality in institutional deliveries in Nigeria. *Afr Health Sci.* 2012; 12(1):32-40.
12. Kalaichandran A et al. The obstetric pathology of poverty: maternal mortality in Kep province, Cambodia. *World Health Popul.* 2007; 9(2):38-47.
13. LTT Trinh et al. Antenatal Care Adequacy in Three Provinces of Vietnam: Long An, Ben Tre, And Quang Ngai. *Public Health Rep.* 2006; 121(4): 468-475.
14. Anandalakshmy PN et al. Demographic, socioeconomic and medical factors affecting maternal mortality- An Indian experience. *Journal of Family Welfare Sept* 1993; 39(3):1-4.
15. Pandey A et al. Estimates of Maternal Mortality ratios in India and its states-A Pilot Study. *ICMR* July 2003.
16. Saksena Raj S et al. Meeting the community halfway to reduce maternal deaths? Evidence from a community-based maternal death review in UttarPradesh, India. *Global Health; Science and Practice.* 2013; 1:84-96.
17. Arpita N et al. A retrospective study of maternal mortality in rural tertiary care hospital of Central India. *Indian Journal of Community Health* 2013; 25:1.
18. Nadeem Ahmed et al. The prevalence of anemia associated factors in pregnant women in a rural Indian community. *Australasian Medical Journal* 2010;3(5):276-280.
19. Umesh Kapil et al. Micronutrient deficiency disorders amongst pregnant women in three urban slum communities of Delhi. *Indian Pediatrics* 1999; 36:991-998.
20. Ganatra BR et al. *WHO Bulletin OMS* 1998;76.
21. Khosla AH, Dhaiya k, Sangwan K. Maternal mortality and near-miss in rural north india. *Int J Gynecol Obstet* 2000. Feb; 68(2):163-164
22. Bhatia JC, Cleland J. Obstetric morbidity in south india; results from a community survey. *Soc Sci Med* 1996; 43(10):1507-1516.

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