



June, 2011

# SPECIAL BULLETIN ON MATERNAL MORTALITY IN INDIA 2007-09

## SAMPLE REGISTRATION SYSTEM

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Reduction of mortality of women is an area of concern for the Governments across the globe. The International Conference on Population and Development in 1994 had recommended reduction in maternal mortality by at least 50 percent of the 1990 levels by the year 2000 and further one half by the year 2015. The Millennium Development Goals (MDG) of the United Nations has set the target of achieving 200 maternal deaths per lakh of live births by 2007 and 109 per lakh of live births by 2015.

2. The Office of the Registrar General, India under the Ministry of Home Affairs, apart from conducting Population Census and monitoring the implementation of Registration of Births and Deaths Act in the country, has been giving estimates on fertility and mortality using the Sample Registration System (SRS). SRS is the largest demographic sample survey in the country that among other indicators provide direct estimates of maternal mortality through a nationally representative sample. Verbal Autopsy instruments are administered for the deaths reported under the SRS on a regular basis to yield cause-specific mortality profile in the country. The First Report on maternal mortality in India (1997-2003) – Trends, Causes and Risk Factors was released in October, 2006. The present Bulletin, which provides only the levels of maternal mortality for the period 2007-09, is being brought out as a sequel to the previous Bulletin (2004-06). With this, the maternal mortality data from SRS is available for a period of 13 years. It is worth noting that the number of States that have realized MDG target in 2007-2009 has gone up to 3 against 1, Kerala which was the sole State with this distinction in 2004-2006. Tamil Nadu and Maharashtra are the new entrants. Andhra Pradesh, West Bengal, Gujarat and Haryana are in closer proximity to the MDG target.

3. In order to understand the maternal mortality situation in the country better and to map the changes that have taken place, specially, at the regional levels, States have been categorized into three groups namely, "Empowered Action Group" (EAG) States comprising Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, Orissa, Rajasthan, Uttar Pradesh & Uttarakhand and Assam; "Southern" States which include Andhra Pradesh, Karnataka, Kerala and Tamil Nadu; and "Other" States covering the remaining States/UTs as was done in respect of Maternal Mortality Report (1997-2003) and also in the Maternal Mortality Bulletin (2004-2006). It is heartening that the Maternal Mortality Ratio of India has declined from 254 in 2004-2006 to 212 in 2007-2009. The decline has been most significant in EAG States & Assam from 375 to 308. Among the Southern States, the decline has been from 149 to 127 and in the Other States from 174 to 149.

4. The key statistics presented in the Bulletin is the Maternal Mortality Ratio (MMR). This is derived as the proportion of maternal deaths per 1,00,000 live births reported under the SRS. Besides, the 95% Confidence Intervals (95% CI) of the estimates based on the calculated Standard Error (SE) have also been presented. In addition, estimates of Maternal Mortality Rate viz. maternal deaths to women in the ages 15-49 per lakh of women in that age group, and the life time risk have been presented. The life time risk is defined as the probability that at least one women of reproductive age(15-49) will die due to child birth or puerperium assuming that chance of death is uniformly distributed across the entire reproductive span and has been worked out using the following formula:

$$LifeTimeRisk = 1 - \left( 1 - \frac{MaternalMortalityRate}{100000} \right)^{35}$$

5. The maternal deaths being a rare event require prohibitively large sample size to provide robust estimates. In order to enhance the SRS sample size, the results have been derived by following the practice of pooling the three years data to yield reliable estimates of maternal mortality. Further, in order to take care of the undercount mainly on account of out-migration as VA forms during the period was administered after the conduct of the Half Yearly Surveys, the actual number of maternal deaths for each state has been multiplied by a 'Correction Factor'. This correction factor, which is the ratio of total female deaths in a particular age group in SRS to the counts for the corresponding age group as yielded from VA forms, has been applied separately for different reproductive age groups as was done in the past.

**Table 1: Maternal Mortality Ratio (MMR), Maternal Mortality Rate and Life Time Risk; India, EAG & Assam, South and Other states, 2007-09**

India & Major States	Sample Female Population	Live Births	Maternal Deaths	MMR	95% CI	Maternal Mortality Rate	Lifetime risk
<b>INDIA TOTAL</b>	<b>5678691</b>	<b>436411</b>	<b>926</b>	<b>212</b>	<b>(198-226)</b>	<b>16.3</b>	<b>0.6%</b>
Assam	174250	12303	48	<b>390</b>	(280-500)	27.5	1.0%
Bihar/Jharkhand	331294	38096	100	<b>261</b>	(210-313)	30.1	1.0%
Madhya Pradesh/Chhattisgarh	323937	33041	89	<b>269</b>	(213-325)	27.4	1.0%
Orissa	272797	20616	53	<b>258</b>	(189-327)	19.5	0.7%
Rajasthan	241249	27277	87	<b>318</b>	(251-384)	35.9	1.2%
Uttar Pradesh/Uttarakhand	484847	54039	194	<b>359</b>	(308-409)	40.0	1.4%
<b>EAG AND ASSAM SUBTOTAL</b>	<b>1828374</b>	<b>185372</b>	<b>570</b>	<b>308</b>	<b>(282-333)</b>	<b>31.2</b>	<b>1.1%</b>
Andhra Pradesh	340520	23003	31	<b>134</b>	(87-182)	9.1	0.3%
Karnataka	376272	22889	41	<b>178</b>	(124-233)	10.8	0.4%
Kerala	287854	14624	12	<b>81</b>	(35-127)	4.1	0.1%
Tamil Nadu	388462	22262	22	<b>97</b>	(56-138)	5.6	0.2%
<b>SOUTH SUBTOTAL</b>	<b>1393108</b>	<b>82778</b>	<b>105</b>	<b>127</b>	<b>(103-151)</b>	<b>7.5</b>	<b>0.3%</b>
Gujarat	280969	24435	36	<b>148</b>	(100-196)	12.8	0.4%
Haryana	165619	14594	22	<b>153</b>	(90-217)	13.5	0.5%
Maharashtra	323812	21715	23	<b>104</b>	(61-146)	6.9	0.2%
Punjab	193705	12691	22	<b>172</b>	(100-244)	11.3	0.4%
West Bengal	476579	30291	44	<b>145</b>	(102-188)	9.2	0.3%
Other	1016525	64535	104	<b>160</b>	(130-191)	10.2	0.4%
<b>OTHER SUBTOTAL</b>	<b>2457209</b>	<b>168261</b>	<b>250</b>	<b>149</b>	<b>(130-167)</b>	<b>10.2</b>	<b>0.4%</b>

**Table 2: Age Distribution of Maternal and Non-Maternal deaths, India, 2007-09**

Age Groups	Maternal Deaths		Non-maternal Deaths	
	Proportion	95 % CI	Proportion	95 % CI
15-19	9%	(7-11)	12%	(11-13)
20-24	36%	(33-39)	16%	(15-17)
25-29	27%	(24-29)	13%	(13-14)
30-34	14%	(12-17)	13%	(12-14)
35-39	9%	(7-11)	14%	(13-15)
40-44	5%	(3-6)	16%	(15-17)
45-49	1%	(0-1)	16%	(15-16)
<b>15-49</b>	<b>100%</b>		<b>100%</b>	

## MATERNAL MORTALITY RATIO (MMR) ALONG WITH 95% CONFIDENCE INTERVAL, INDIA AND STATES, 2007-2009

