

## **Maternal and infant mortality in the state of Odisha**

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### **ABSTRACT**

Health is an important determinant of well-being in the broadest sense of the term. Improved health is desirable not only in itself, but also because it leads to enhanced capability to work and to participate in economic development. Improved health and nutritional status contribute to increased life expectancy. India is in a race against time to achieve the Millennium Development Goals (MDGs) 4 and 5, to reduce Infant Mortality Rate (IMR) to '28' and Maternal Mortality Ratio (MMR) to '109', by 2015 (Nations, 2010). This study estimates the percent net contribution of the state of Odisha and the periods in shaping India's IMR/MMR, and predicts future levels. In the present study a standardized historical survey technique is used to estimate Odisha's decline in IMR / MMR values of the past two decades to predict IMR / MMR levels for 2015 for India and for one of the (*i.e.* Odisha) 15 most populous states.

**Key Words :** Millennium development goals, Pregnancy deaths, Childbirth deaths

### **INTRODUCTION**

In 1994, the International Conference on Population and Development recommended that maternal mortality be reduced by at least 50 per cent of the 1990 levels by 2000, and further one half by 2015.

Globally, maternal and child mortality are in decline, although the pace of decline is nonsufficient to attain Millennium Development Goals (MDGs) in developing countries (Lozano *et al.*, 2011). Due to slow progress in reducing infant and maternal mortality and the moral urgency of reinvigorating efforts to tackle slow progress; the United Nations (UN) launched the Global Strategy for Women's and Children's Health in 2010 (United Nations. Global strategy for women's and children's health. New York: UN, 2010., 2012).

As part of this strategy, India committed to strengthening maternal and child health services in 235 districts, which account for nearly 70% of infant and maternal deaths. In 2010, India recorded 56 per 1000 maternal (WHO, 2012) and 1.3 million infant deaths (UNICEF, 2011) the highest for any country.

India's MDG 4 target is to reduce IMR by two-thirds between 1990 and 2015, *i.e.*, from 80 infant deaths per 1000 live births in 1990 to '28' by 2015. Under MDG 4, another target is to improve the proportion of one-year-old children immunized against measles from 42%, 8 in 1992-1993 to 100% by 2015. India's main MDG 5 target is to reduce MMR by three-quarter between 1990 and 2015, *i.e.*, from 437 maternal deaths per 100 000 live births to '109' (GOI, 2010), while it has also committed to improve the 'proportion of births attended by skilled health personnel'. With only three months to achieve

MDGs 4 and 5 targets, there is a need to understand the progress made by India and as well one of its 15 most populous states *i.e.* Odisha.

The latest census shows that Kerala, Tamil Nadu and Maharashtra have not only achieved the target but have also brought down the ratio to less than 109 per one lakh live births. Andhra Pradesh, West Bengal, Gujarat and Haryana are close to the target. India's maternal mortality ratio is 212 while that of Orissa is 258.

### **A comparative statistical framework on overall infant and maternal related issues in Odisha and India:**

Sample Registration System (SRS) is designed for reliable estimates of fertility and mortality indicators at State and National level separately for rural and urban areas. It is the only source for fertility and mortality data since 1969-70 till 1990. Being the largest demographic survey in the country covering about 1.4 million households and 7.01 million population in 7597 sample units across 35 States/UTs. Since 2004, a system of collection of Causes of Death data through Verbal Autopsy has also been included under the domain of SRS. This system allows for tracking Millennium Development Goals (MDG) on Child Mortality and Maternal Health on a regular basis. MDGs are a set of numerical and time-bound targets to measure achievements in human and social development laid down by the UN. Of the 8 MDGs, IMR, U5MR and MMR are generated by SRS

<b>Table 1 : Millennium development goals (MDG)</b>			
Goal No.	Goals	Indicators	Targets by 2015
5	Improve maternal health	Maternal Mortality Ratio (MMR)	109
	Reduce infant mortality	Infant Mortality Rate (IMR)	28
4	Reduce child mortality	Under 5 Mortality Rate (U5MR)	42

Source: Sample Registration System (SRS) Office of Registrar General, India

<b>Table 2 : Maternal Mortality Ratio (MMR)</b>		
India and Odisha	MMR (2007-2009)	MMR (2010-12)
India	254	212
Odisha	303	258

Source: Sample Registration System (SRS) Office of Registrar General, India

\*MMR measures number of women aged 15-49 years dying due to maternal causes per 1,00,000 live births.

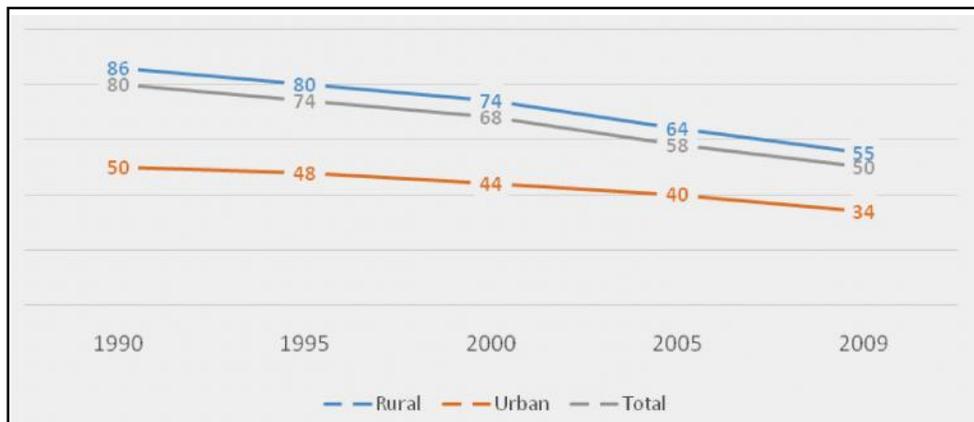
From the above table it can be drawn that there is a decline in MMR estimates in 2010-12 over 2007-09. For India: 212 from 254 (a fall of about 17%) so as in Odisha 258 from 303 (a fall of about 14%) which is comparatively less (NHM, 2014) than that of Overall achievement.

### **Infant Mortality Rate (IMR):**

IMR measures number of infant (less than 1 year) deaths per 1000 live births. Every 6<sup>th</sup> death in the country pertains to an infant. IMR in India has registered a 3 points decline to 50 from 53 in 2008. Maximum IMR in Madhya Pradesh (67) and minimum IMR in Kerala (12) (General, 2011). Neo-Natal Mortality Rate (less than 29 days) and Post Neo-Natal Mortality Rate (1 months to 11 months) has declined by 1 point and 2 points, respectively.

From the Fig. 1 shown below it is estimated that IMR for the country declined by 30 points (rural IMR by 31 points vis-à-vis urban IMR 16 points) in the last 20 years at an annual average decline of 1.5 points. Still, 1 in every 20 children - National level in every 18 children - rural area, and 1 in every 29 children - urban area die within one year of birth (against 1 in 37 under MDG).

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Source: Sample Registration System (SRS) Office of Registrar General, India

**Fig. 1 : Infant Mortality Rate (IMR) by residence, 1990-2009**

Form the above Table 3 it can be easily assessed that the overall performance of Odisha in comparison to India is below the target to be achieved in an entire perspective of decline in infant mortality. Therefore it is a high time to evaluate the district wise evaluation of statistics in order to have an in-depth knowledge on maternal and infant mortality.

	Rural	Urban	Total
<b>Crude Birth Rates</b>			
India	18.9	15.9	17.2
Odiaha	20	17.4	19.1
<b>Crude Death Rates</b>			
India	7.4	5.3	7
Odiaha	8.5	6.4	8.1
<b>Infant Mortality Rates</b>			
India	48	34	46
Odiaha	59	37	56
<b>Under five Mortality Rate (U5MR)</b>			
India	71	45	67
Odiaha	80	48	75

Source: Sample Registration System (SRS) Office of Registrar General, India

**Odisha :**

Decentralized district-based health planning is essential in India because of the large inter-district variations. In the absence of vital data at the district level, the State level estimates are being used for formulating district level plans as well as setting the milestones thereof. In the process, the hotspots (districts requiring special attention) very often get masked by the State average. This statistical fallacy compounds the problems of the districts acutely, more so in the health sector. The District Level Household Survey (DLHS) conducted with periodicity of five years mainly focuses on indicators pertaining to maternal health and child programmes. There has, therefore, been a surge in demand from various quarters, in recent years, to generate timely and reliable statistics at the district

level for informed decision making in the health sector.

Realizing the need for preparing a comprehensive district health profile on key parameters based on a community set up, the AHS has been designed to yield benchmarks of core vital and health indicators at the district level on fertility and mortality; prevalence of disabilities, injuries, acute and chronic illness and access to health care for these morbidities; and access to maternal, child health and family planning services. By virtue of being a panel survey, it has the unique ability to map the rate of change in these indicators on a yearly basis. In the year the body had a survey on total health issues pertaining in the state and took samples from all the 30 district representative sample of 20,694 statistically selected Primary Sample Units (PSUs - Census Enumeration Blocks in case of urban areas and villages or a segment thereof in case of larger villages in rural areas) based on 2001 Census.

District	Rural	Urban	Total
Bargarh	64	-	62
Jharsuguda	47	47	47
Sambalpur	63	33	52
Debagarh	66	21	62
Sundargarh	56	31	49
Kendujhar	58	55	57
Mayurbhanj	51	-	50
Baleshwar	48	38	47
Bhadrak	53	-	51
Kendrapara	63	-	61
Jagatsinghapur	54	-	51
Cuttack	72	33	61
Jajapur	51	33	50
Dhenkanal	70	-	69
Anugul	51	33	48
Nayagarh	65	63	65
Khordha	79	64	72
Puri	83	52	78
Ganjam	66	-	59
Gajapati	62	50	61
Kandhamal	89	-	86
Baudh	62	-	60
Sonapur	54	-	52
Balangir	100	-	98
Nuapada	52	-	52
Kalahandi	59	-	56
Rayagada	64	40	61
Nabarangapur	51	-	51
Koraput	55	41	53
Malkangiri	53	42	52
Odisha	62	41	59

Source: Annual Health Survey, 2011-12. Odish

District	Rural	Urban	Total
Bargarh	16	-	16
Jharsuguda	13	3.8	12
Sambalpur	14	1	12
Debagarh	16	1.6	15
Sundargarh	15	3	15
Kendujhar	15	1.6	14
Mayurbhanj	16	-	16
Baleshwar	15	2.2	14
Bhadrak	16	-	16
Kendrapara	17	-	17
Jagatsinghapur	16	-	16
Cuttack	18	1.3	17
Jajapur	16	1.1	15
Dhenkanal	17	-	17
Anugul	15	1.5	14
Nayagarh	17	3.5	16
Khordha	18	3.1	17
Puri	19	1.9	18
Ganjam	24	0.6	18
Gajapati	24	2.8	22
Kandhamal	26	-	26
Baudh	24	-	24
Sonapur	15	-	15
Balangir	20	1.8	19
Nuapada	23	-	23
Kalahandi	24	-	24
Rayagada	24	1.7	23
Nabarangapur	23	-	23
Koraput	23	1.4	22
Malkangiri	23	2.6	22
Odisha	18	2.2	16

\* Calculated per 1000 person

Source: Annual Health Survey, 2011-12. Odisha

In view of the large volume of data collected under AHS and dissemination of AHS results is done in different phases (Commissioner, 2012). The data in the form of State level bulletins contains the district level data on crude birth rate, crude death rate, natural growth rate, infant mortality rate, neo-natal and post neonatal mortality rates, under 5 mortality rate, sex ratio at birth, sex ratio (0-4 years), maternal mortality rate, maternal mortality ratio and overall sex ratio have been calculated. But for the current only two statistics have been taken into account *i.e.* IMR and MMR to draw a conclusion on prevailing status on infant and maternal mortality in the state. Despite several women and child welfare programmes in Orissa, the state continues to be plagued by the problem of high infant and maternal mortality.

#### **Infant mortality:**

Orissa's position as the poorest state in the country is reflected in its dismal healthcare record - 87 out of every 1,000 children die soon after they are born (Sethi, 2012). The infant mortality rate (IMR) in Orissa continues to be higher than in any other Indian state. Although the IMR has decreased marginally since 2001, Orissa has occupied this slot for the last two decades.

According to latest sample registration system data, Orissa's IMR has come down from 91 deaths in 2011 to 67 in 2012. Figures from the 1999 National Family Health Survey show that approximately 86,000 infants die here every year.

The recently released economic survey of the state for the year 2012-13 of the state claims that the infant mortality rate (IMR) has gone down considerably in last some years. IMR is the number of infant (0-1 year) die out of 1000 births. In the year 2011 it stands at 57 as against the national average of 44. The situation is grim. Odisha's IMR is second highest in the country, first being Madhya Pradesh. This is as per the Sample Registration Survey (SRS) bulletin, 2012. However the state has constantly made improvements in the IMR situation over last 20 years. In 1991 it was 124 and in 2011 it was 61, in 2010 it was 65 so on and so forth (Saikia *et al.*, 2010).

While boasting that the state has succeeded in reducing the IMR (Health Condition, 2011), over the past three years, Three of the four BIMARU (Bihar, Madhya Pradesh, Uttar Pradesh and Rajasthan) states follow close behind — Madhya Pradesh (85), Uttar Pradesh (80) and Rajasthan (78). Other states at the top of the high IMR list are Chhattisgarh with 73 deaths per 1,000, and Bihar with 70 per 1,000.

Further, Officials say that 68 highly vulnerable blocks (BPNI, 2011) were identified in Boudh, Deogarh, Gajapati, Kandhamal, Kalahandi, Nuapada, Keonjhar, Koraput, Nabarangpur, Malkangiri, Mayurbhanj, Rayagada, Sonepur and Sundergarh districts.

#### **Maternal mortality rate in Odisha:**

The reduction of women mortality — the number of maternal deaths per one lakh live births is still an area of concern for governments across the globe (Lozano *et al.*, 2011).

In 1994, the International Conference on Population and Development recommended that maternal mortality be reduced by at least 50 per cent of the 1990 levels by 2000, and further one half by 2015.

As part of its millennium development goals, the United Nations has set the target of 200 maternal deaths per one lakh of live births by 2007 and 109 by 2015.

Over 80 per cent of maternal deaths in India, as elsewhere in the world, are due to six causes: haemorrhage; Eclampsia (an acute and life-threatening complication of pregnancy); obstructed labour; sepsis (blood poisoning) (Sahoo, 2012); complications arising out of unsafe abortions; and pre-existing conditions such as anaemia and malaria. Most of these can be treated in hospital or a first referral unit endowed with emergency facilities and skilled personnel.

The underlying causes include the low quality of health systems and socio-economic and biological causes that obstruct and underplay the importance of women's healthcare.

10 to 15 per cent of all pregnancies result in emergency, which may happen to any woman, rich or poor, rural or urban. However, a woman's social status can make all the difference. Women may need the Caesarean section and blood transfusion, which require complex skills, facilities and logistical support that are found only in hospital. And for many in India, these services are not available.

#### **Reasons involved for infant and maternal mortality:**

Given such a weight of IMR and child mortality in overall mortality burden, and concentration of infant deaths, it is worthwhile analysing the available data on the causes of infant and child deaths. Prematurity, resulting in low birth weight of babies is the predominant cause of infant deaths, accounting for 38.5 per cent of such deaths. Nearly 30 per cent of infant deaths are due to adverse conditions of infections relating to the circulatory system. Broadly speaking, these causes of infant death reflect inadequate antenatal, natal, and post-natal care.

In particular, three factors may explain the high level of IMR in Orissa: 1st, the poor professional attendance at birth; 2nd, high percentage of low birth weight babies, and 3rd, lack of professional post-natal care. These three factors together have a bearing on neonatal mortality, which constituted about 64 per cent of infant deaths in Orissa. Maternal malnutrition and malaria are among the important causes for low birth weight babies. It has been estimated that 40 per cent of neonatal deaths occur in the case of low birth weight babies. The coverage of post-natal care seems to be quite poor: only 18 per cent of women were visited by the Auxiliary Nurse Midwife (ANM) within two weeks of delivery.

Lack of access to safe drinking water and adequate nutrition are the other underlying factors behind child deaths. For deaths of children under 5 years of age, diarrhoea accounts for 28 per cent, Acute Respiratory Infection (ARI)/pneumonia for 15 per cent, measles for 10 per cent, tetanus for 6 per cent, and tuberculosis infection, fevers like malaria, typhoid, and hepatitis (Reddy *et al.*, 2012) for the rest. The single most important factor for reducing the prevalence rate and case fatality rate of major infant and childhood diseases is improvement of nutritional status and antenatal and intra-natal care.

In case of maternal mortality, most of the deaths found happened at home experienced complications during delivery, about 63% of the maternal deaths (Project, 2014) occurred after child birth which denotes poor PNC care and after birth complications. Investigating socio-economic status of the women died maternal death is found to be living under BPL which is 85% and among them 95% belongs to tribal areas.

Lack of rest, lack of nutrition/ extra food and social stigmas in accessing care were the major bottlenecks that ended in a maternal death. Cause of death due to fatal illness like PHP, obstructed labour, eclampsia and convulsion was also assessed in maternal death. Transportation was found to be a big problem in remote areas.

#### **Action needed to be taken :**

The study on infant and maternal and complications faced can be taken into consideration in programme designing and planning for reduction of infant and maternal mortality. The recommendation that follows from the findings is as follows:

- There is still need for health education as rural and tribal areas are still influenced by social and cultural stigmas and practices contravening the healthy pregnancy, child birth child's health.
- Birth planning and complication readiness should be promoted with the active involvement of ANM, ASHA and other grass root service providers with regular follow up and constant counselling.
- Community participation and family support for a safe health before and after pregnancy and infant health should be promoted through more IEC measures.
- Sub centres should be upgraded and strengthened with positioning staff 24×7 for providing gynaecological and paediatric issues.
- The complication should be identified and appropriate action should be taken with timely

referral to the appropriate facility for better outcome.

– Public–Private partnership is sensitization of community and transportation during complication is required for timely action to address complication.

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