

Review Article

Maternal health situation in two states of central India: a comparative analysis

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ABSTRACT

The health of women during their pregnancies, deliveries, and postpartum periods is referred to as maternal health. Madhya Pradesh (MP) and Chhattisgarh (CG) are included in the National Rural Health Mission's "Empowered Action Group" states due to their poorer maternal health indicators. The main purpose of the study is to compare the "Maternal Health" indicators presented in the factsheets of the National Family Health Survey-4 and -5 for two major states of India: Chhattisgarh and Madhya Pradesh. The fact sheets of the National Family Health Survey for Madhya Pradesh and Chhattisgarh were obtained from reliable sources. The study compared the maternal health data extracted from the "NFHS-4" and "NFHS-5" fact sheets of these states to assess the state of maternal health. According to NFHS-5, it is evident that maternal health in the states of Chhattisgarh and Madhya Pradesh has not yet met the expected goals. However, when comparing NFHS-5 with NFHS-4, the maternal health indicators have shown improvement. The provision of antenatal care (ANC) is crucial for safe motherhood, and pregnant women are routinely given tetanus toxoid (TT) vaccinations and iron-folic acid (IFA) pills as part of comprehensive maternal care. Institutional care is essential to ensure that mothers remain healthy and survive childbirth. Despite these efforts, neither state has performed well in neonatal care during the first two days after birth. Compared to Madhya Pradesh's performance, Chhattisgarh's performance is relatively better. Action is needed to address the increasing number of caesarean section deliveries in private hospitals. The study presents the maternal health indicators for two major states of India. The data indicates that immediate improvements are necessary to enhance maternal health services in India.

Keywords: Maternal health, Chhattisgarh, Madhya Pradesh, NFHS

INTRODUCTION

Maternal health pertains to the health of women during their pregnancies, deliveries, and postpartum periods.¹ Among these aspects, the maternity cycle encompasses the periods of pregnancy, labor, birth, and the postnatal period. The five phases of the maternity cycle are (i) fertilization (ii) antenatal/prenatal (iii) intranatal (iv) postnatal and (v) interconceptional.² The maternal cycle plays a crucial role in a woman's life. Generally, motherhood is a positive and fulfilling experience, but this can vary between developed and developing

countries. In developing countries, maternal health often involves significant risks and can sometimes lead to death. Maternal injury and mortality are primarily caused by unsafe abortion, excessive blood loss, infection, high blood pressure, and obstructed labor. Mortality can also result from indirect causes such as cardiac diseases, malaria, and anemia. Major contributors to high mortality and morbidity include hemorrhage, eclampsia, obstructed labor, and sepsis. Figure 1 shows distribution of causes of maternal deaths.^{1,3}

In India, maternal health is a significant public health concern. Variations in maternal health indicators are

observed across the country. Factors affecting mortality rates include geographical differences (state-wise), socioeconomic status (rich and poor), urban and rural distribution, social status, literacy levels, and accessibility to health services.⁴

The maternal mortality ratio (MMR) is an indicator used to assess maternal health. In India, MMR is also utilized as a tool for developing various policies. The MMR is defined as the number of maternal deaths per 100,000 live births during a specified time period.³

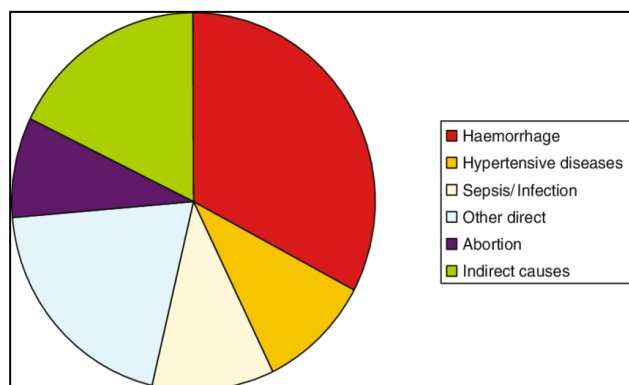


Figure 1: Main cause of maternal deaths for the complications.

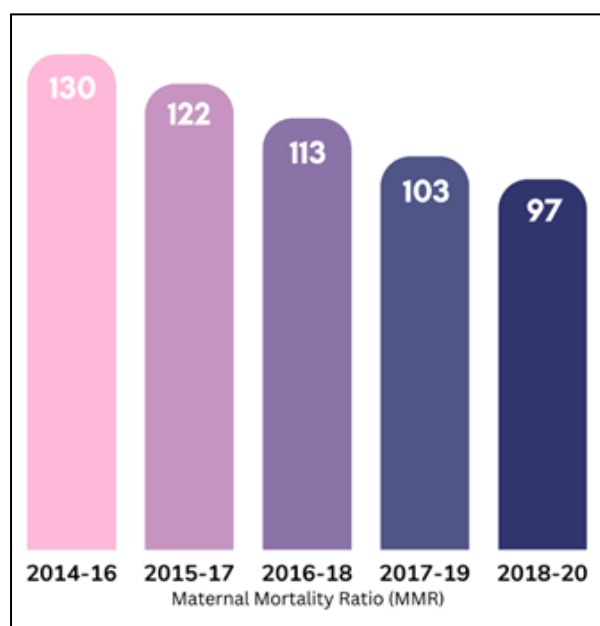


Figure 2: Maternal mortality ratio of India.³

According to the sample registration system (SRS) in India, the Maternal Mortality Ratio was 97 per 100,000 live births for the period 2018-2020(5). States have been divided into three groups: "Empowered Action Group" states (Jharkhand, Uttar Pradesh, Chhattisgarh, Madhya Pradesh, Rajasthan, Odisha, Bihar, Uttarakhand, and Assam); "Southern" states (Andhra Pradesh, Telangana, Karnataka, Kerala, and Tamil Nadu); and "Other" states

(covering the remaining states and Union Territories). This classification helps in assessing the mortality status and changes in maternal health across the nation, particularly at regional levels.⁶

It is encouraging to note that the Maternal Mortality Ratio (MMR) in India has decreased over the years, falling to 97 per 100,000 live births in 2018-2020, down from 103 in 2017-2019, 113 in 2016-2018, 122 in 2015-2017, and 130 in 2014-2016. It has been observed that the highest number of maternal deaths occurs among women aged 20 to 24 years.^{3,5} The relevant details are shown in the Figure 2 and Table 1.

The National Family Health Survey (NFHS) is a large-scale survey conducted in multiple rounds. In India, there have been three rounds of this survey. The first round of the NFHS was conducted during 1992-93.

The survey is carried out among a representative sample of Indian households. It provides comprehensive information on various aspects of health and family planning services, including maternal and child health, fertility, anemia, and newborn and child mortality, at both national and state levels.⁷

Each round of the survey has had two specific goals: 1) to provide crucial data on health and family welfare needed by the Ministry of Health and Family Welfare and other agencies for policy and program purposes, and 2) to offer data on emerging health and family welfare issues.

The International Institute for Population Sciences (IIPS) in Mumbai has been designated as the nodal agency by the Ministry of Health and Family Welfare (MoHFW) of the Government of India. IIPS is responsible for coordinating and providing technical guidance for the survey. For its implementation, IIPS collaborated with several Field Organizations (FOs), each tasked with conducting survey operations in one or more states.⁸

The evaluation aimed to assess the condition of maternal health in two major states, Chhattisgarh and Madhya Pradesh, using the fact sheets from NFHS-4 and NFHS-5.⁹⁻¹² The primary aim of the study is to assess the indicators of "Maternal Health" as presented in the fact sheets of the National Family Health Survey-4 (NFHS-4) and National Family Health Survey-5 (NFHS-5) for two major states in India Chhattisgarh and Madhya Pradesh.

The study involved analyzing the National Family Health Survey fact sheets for both Madhya Pradesh (MP) and Chhattisgarh (CG) obtained from reliable sources. Data on maternal health from the NFHS-4 and NFHS-5 fact sheets were plotted and compared.

The indicators compared in the study include antenatal care services, daily iron and folic acid supplementation, routine screening for anemia and neonatal tetanus, use of the Maternal and Child Protection (MCP) card, postnatal

care, Janani Suraksha Yojana (JSY) utilization, expenditure incurred, skilled birth attendance, and delivery services.⁹⁻¹²

For this study, the fact sheets of the National Family Health Survey-4 and NFHS-5 were analyzed, and a comparison table was prepared. The table plots the percentage-wise indicators for both states, Chhattisgarh and Madhya Pradesh, to evaluate and compare their maternal health situations. Antenatal Care (ANC) or prenatal care plays a crucial role in the maternal cycle, helping to reduce risk factors during pregnancy.

Ideally, four ANC visits are recommended for optimal maternal health. Attending ANC during the first trimester has a positive impact on the health of the mother. In Chhattisgarh, the percentage of women attending ANC during the first trimester decreased from 70.8% in NFHS-4 to 65.7% in NFHS-5.

In contrast, Madhya Pradesh saw a significant increase in this metric, with the percentage rising from 53% to 75.4%. This data indicates that over 75% of pregnant women in Madhya Pradesh attended their first trimester ANC visits, compared to only 65.7% in Chhattisgarh, which experienced a decrease of 5.1%. Regarding the total number of at least four ANC visits, both states showed minimal increases. In NFHS-5, Chhattisgarh's percentage increased slightly from 59.1% to 60.1%, while Madhya Pradesh saw a more substantial rise from 35.7% to 57.5%.^{10,12} The data are shown in Table 2.

Tetanus is an acute infectious disease caused by the spores of the bacterium *Clostridium tetani*, which can enter the body through cuts or wounds. Tetanus typically manifests within 14 days of infection.

During pregnancy, the Tetanus Toxoid (TT) vaccine is administered to prevent tetanus infections and protect both the mother and child. In Chhattisgarh, the percentage of mothers receiving tetanus toxoid vaccination decreased from 94.3% to 91.9%. In contrast, Madhya Pradesh saw a 5.2% increase in the percentage of mothers receiving protection against tetanus.^{10,12}

As part of prenatal care, the World Health Organization recommends daily iron-folic acid (IFA) supplements to reduce the risks of low birth weight, maternal anemia, and iron deficiency. In Chhattisgarh, IFA consumption was initially lower compared to Madhya Pradesh.

However, according to NFHS-5, IFA consumption in Chhattisgarh increased from 30.3% to 45%. Meanwhile, Madhya Pradesh also saw a significant rise in the percentage of mothers consuming IFA during pregnancy.^{10,12} The current data is shown in Table 2.

With support from UNICEF and the National Institute of Public Cooperation and Child Development (NIPCCD), the Ministry of Women and Child Development and the

Ministry of Health & Family Welfare of the Government of India introduced the mother and child protection (MCP) card in April 2010. The MCP Card was introduced to monitor maternal health nationwide.

Depending on the region, the MCP Card may have different names, such as 'Mamta Card' or 'Jaccha Baccha Card.' The evaluation of pregnancies where the mother received the MCP Card began with NFHS-4. In both Chhattisgarh and Madhya Pradesh, a significant increase of over 90% in the use of the MCP Card has been observed.^{10,12} The detailed trend is shown in Table 2.

Postnatal care (PNC) within 2 days after delivery is crucial for reducing the risk of illness and mortality for mothers. According to the data, both Chhattisgarh and Madhya Pradesh improved their provision of postnatal care from skilled health professionals between NFHS-4 and NFHS-5.

Madhya Pradesh showed a 29% higher performance in this area compared to Chhattisgarh. However, many women still do not receive adequate care immediately after delivery. The detailed PNC data is shown in Table 2.

NFHS-5 data reveals that both Chhattisgarh and Madhya Pradesh experienced significant out-of-pocket expenses for deliveries, with average expenditures of Rs. 1,833 and Rs. 1,619, respectively. Comparing NFHS-5 with NFHS-4, it is observed that the out-of-pocket expenditure increased by Rs. 353 in Chhattisgarh and by Rs. 138 in Madhya Pradesh. The detailed trend is shown in Table 2.

Maternal delivery at home without skilled care is a significant public health concern. In both states, very few children born at home receive regular check-ups by professionals within one day of birth. NFHS-4 and NFHS-5 data show only a marginal increase in such check-ups.

However, the care provided by health personnel within 48 hours of delivery has seen a substantial improvement in both Chhattisgarh and Madhya Pradesh. In Chhattisgarh, this percentage increased from 34.2% to 82%, while in Madhya Pradesh, it rose from 17.5% to 84%. The detailed trend is shown in Table 2. Institutional deliveries have seen a substantial increase in both states, as reported by NFHS-5 compared to NFHS-4.

This improvement is likely due to enhanced public facilities. Madhya Pradesh shows a 5% higher increase in institutional deliveries compared to Chhattisgarh, as noted in NFHS-5.

These institutions account for a significant portion of births in both states, with both achieving an increase of 15 to 20%. There has also been notable progress in the number of deliveries conducted by doctors in both Chhattisgarh and Madhya Pradesh between NFHS-4 and NFHS-5.

However, Madhya Pradesh is only 0.5% ahead of Chhattisgarh in this regard. The data indicates that approximately 80% of institutional deliveries are performed by professionals in both states. Both

Chhattisgarh and Madhya Pradesh have shown a slight increase in caesarean section deliveries, with a significant proportion of these procedures being performed in private-sector hospitals.

Table 1: Data of “maternal” and “non-maternal” deaths.

Age group (in years)	Maternal deaths		Non-maternal deaths	
	Proportion (%)	95% CI	Proportion (%)	95% CI
15-19	6	(4-8)	9	(8-9)
20-24	32	(28-36)	11	(11-12)
25-29	31	(27-35)	13	(12-14)
30-34	18	(15-22)	13	(12-14)
35-39	8	(5-10)	14	(13-15)
40-44	3	(2-5)	18	(17-19)
45-49	2	(1-3)	22	(21-23)
15-49	100		100	

Table 2: Comparative analysis of data of ‘NFHS-4’ and ‘NFHS-5’.

Indicator	Chhattisgarh (NFHS-4)	Chhattisgarh (NFHS-5)	Madhya Pradesh (NFHS-4)	Madhya Pradesh (NFHS-5)
% who had ANC in the first trimester	70.8	65.7	53.0	75.4
% who completed 4 ANC visits	59.1	60.1	35.7	57.5
% who protected last birth from neonatal tetanus	94.3	91.9	89.8	95.0
% who consumed IFA for 100 days or more	30.3	45.0	23.5	51.4
% of pregnancies registered under MCP card	91.4	97.5	92.2	96.7
% who availed PNC from health personnel within 2 days of delivery	63.6	84.0	54.9	83.5
Average expenditure incurred per case in public hospital (Rs.)	1480	1833	1481	1619
% of home deliveries with a check-up by health personnel within 24 hours	4.7	9.8	2.5	9.4
% who received a health check after birth from health personnel within 2 days	34.2	82.0	17.5	84.0
% of institutional deliveries	70.2	85.7	80.8	90.7
% of institutional births in public facilities	55.9	70.0	69.4	80.2
% of home deliveries conducted by skilled attendants	8.4	5.8	2.3	2.5
% of births assisted by health personnel	78.0	88.8	78.0	89.3
% of total caesarean section deliveries	9.9	15.2	8.6	12.1
% of caesarean sections in private facilities	46.6	57.0	40.8	52.3
% of caesarean sections in public health facilities	5.7	8.9	5.8	8.2

DISCUSSION

In NFHS-5, it is evident that the overall progress in maternal health has been only marginal. Both Chhattisgarh and Madhya Pradesh have not yet achieved

the desired goals. However, when comparing NFHS-5 with NFHS-4, there have been improvements in several maternal health indicators. Antenatal care (ANC) is a crucial component of the maternity cycle. ANC involves various steps such as routine check-ups and investigations

to ensure good maternal health. It helps in identifying any abnormalities at an early stage. The maternal cycle consists of four stages at different points in labor. In India, anemia remains a significant issue for women. To address this, tetanus toxoid (TT) vaccinations and iron-folic acid (IFA) tablets are regularly provided to pregnant women as part of comprehensive maternal care.¹³ Various organizations, including WHO and the National Health Mission (NHM), emphasize that Antenatal Care (ANC) should be universally mandated for all pregnant women. According to the NFHS-5 data, Madhya Pradesh shows positive growth in maternal health indicators, although it has not reached the expected standards. In contrast, Chhattisgarh's performance is more concerning, with only a marginal increase in the percentage of women receiving the recommended four ANC visits compared to Madhya Pradesh.

Several factors contribute to the disparities in maternal care, including socio-economic conditions, literacy levels, and other socio-cultural factors. Religion, income, age at marriage, and education significantly impact maternal health outcomes and access to care. These factors collectively influence the effectiveness of maternal health programs and the overall quality of care provided to pregnant women.¹⁴

During the antenatal period, regular ANC is crucial for ensuring the well-being of both mother and child throughout the childbirth process. The care provided during this period plays a significant role in supporting the mother and managing potential complications. It is noteworthy that home deliveries are decreasing over time, with institutional deliveries proving to be more successful and less problematic. However, in India, the lack of livelihood resources in rural areas continues to make home deliveries prevalent. Despite the advantages of institutional deliveries, economic and logistical challenges often lead many families in rural regions to opt for home births.¹⁵ Chhattisgarh and Madhya Pradesh are classified as Empowered Action Group (EAG) states, which include regions where many rural areas are particularly underserved and underdeveloped.

These states face significant challenges in improving healthcare infrastructure and access, particularly in remote and rural areas.⁶ According to the most recent NFHS-5 data, institutional deliveries are conducted under the supervision of medical and paramedical specialists, which significantly reduces the risk of complications and ensures better outcomes for both mother and child.¹⁵ According to the outlined data, it is observed that in both states, more than ninety percent of deliveries are registered under the mother and child protection (MCP) card program.⁸

Similarly, neonatal care is crucial for the survival and health of newborns. Immediate and effective care in the post-delivery period is vital for ensuring the well-being of the baby. Institutional care plays a key role in providing the necessary support for the baby's survival and overall health. In this regard, both Chhattisgarh and Madhya

Pradesh have shown suboptimal performance in providing care to newborns within the first two days after birth. However, Chhattisgarh has performed better compared to Madhya Pradesh in this aspect.¹⁶

According to the NFHS-4 and NFHS-5 data, Caesarean Section (CS) deliveries are notably higher in private hospitals compared to public hospitals, highlighting a significant public health issue in both states. The prevalence of CS deliveries in the private sector suggests that patients may be pressured by private institutions to undergo these procedures, often resulting in additional financial burdens on the patients. In public hospitals, the number of CS deliveries is relatively low, which could be attributed to a shortage of qualified healthcare professionals or other resource constraints. This discrepancy underscores the need for appropriate measures to address the rising trend of CS deliveries in private hospitals and ensure that all delivery options are provided based on medical necessity rather than financial incentives.¹⁷

Several indicators reveal areas of concern, highlighting the need for Madhya Pradesh and Chhattisgarh to collaborate more effectively to enhance maternal health. Both states have achieved success in certain areas and have shown improvement in some outcomes. Antenatal Care (ANC) is a critical component for ensuring the health of expectant mothers, and both Chhattisgarh and Madhya Pradesh should focus on expanding ANC services to both urban and rural areas. Emphasizing institutional deliveries is particularly important, especially in rural and underserved regions, to improve overall maternal and neonatal health outcomes.¹³ It is essential to ensure that, while promoting institutional deliveries, the number of deliveries attended by qualified professionals is increased to reduce maternal and neonatal mortality and morbidity.

Additionally, the distribution of essential maternal health services, such as iron-folic acid (IFA) tablets, multivitamins, and tetanus toxoid (TT) vaccinations by auxiliary nurse midwives (ANMs) and accredited social health activists (ASHAs), should be reinforced. These frontline workers can significantly contribute to improving maternal health by providing medical support before and after delivery. Furthermore, caesarean section (CS) deliveries should be carefully evaluated to minimize unnecessary procedures, as they impact both the financial burden on families and the health of women. Competent authorities should establish and enforce regulations to prevent unnecessary CS deliveries and ensure that such decisions are based on medical necessity rather than financial incentives or other pressures.

CONCLUSION

The sample registration system categorizes Chhattisgarh and Madhya Pradesh as EAG states, emphasizing the need for significant improvements in maternal health care within these regions. To advance maternal health in India,

it is crucial to enhance public health facilities and improve all aspects of pregnancy, childbirth, and postpartum care. Effective strategies are urgently needed, including strong political will, community mobilization, and well-informed policy decisions. Reports indicate that early or underage marriage often leads to early childbirth and associated complications. Addressing these issues requires exceptional leadership, determination, and increased community awareness. Such measures should be systematically implemented in both Chhattisgarh and Madhya Pradesh to drive meaningful improvements in maternal health outcomes.

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