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Motherhood In The Margins: Improving Maternal Health Outcomes In India

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Abstract:

Despite significant progress in recent decades, India continues to face major challenges in improving maternal health outcomes, particularly among marginalized populations. This review examines the current state of maternal health in India, critical barriers to care, and evidence-based interventions to reduce maternal mortality and morbidity. A comprehensive literature search was conducted using PubMed, Google Scholar, and government databases to identify relevant studies published between 2000-2023. The review finds that while institutional delivery rates have increased substantially, quality of care remains inconsistent. Key barriers include lack of access in rural areas, cultural beliefs, low female literacy, and health system weaknesses. Community-based interventions, health worker training, cash transfer programs, and health system strengthening show promise for improving outcomes. However, a multisectoral approach addressing social determinants of health is needed to achieve equitable progress. Prioritizing marginalized women through targeted, culturally appropriate interventions is critical to reduce maternal deaths further and achieve universal health coverage in India.

Keywords: *Maternal Health, India, Healthcare Disparities, Community Interventions, Quality of Care*

1. Introduction

Maternal health pertains to the well-being of women during pregnancy, labor, and the postpartum period [1]. Enhancing maternal health has been identified as a crucial global health priority, as evidenced in the United Nations Sustainable Development Goals [2]. Despite significant advancements in recent years, maternal mortality rates remain unacceptably high, especially in low- and middle-income nations. India is responsible for around 12% of global maternal fatalities, with an estimated 35,000 women succumbing annually to causes related to pregnancy or childbirth [3].

The maternal mortality ratio (MMR) in India has declined from 556 per 100,000 live births in 1990 to 97 per 100,000 live births in 2018-20 [4]. However, this progress has been inequitable, with marginalized populations continuing to face disproportionately high risks. Rural women, those from lower socioeconomic backgrounds, and members of scheduled castes and tribes experience significantly worse maternal health outcomes compared to their more advantaged counterparts [5].

This review examines the current state of maternal health in India, focusing on marginalized populations, critical barriers to care, and evidence-based interventions to improve outcomes. By synthesizing the latest research and identifying gaps in knowledge, this review seeks to inform policy and practice to achieve more equitable progress in maternal health across India.

2. Methods

A comprehensive literature search was conducted using PubMed, Google Scholar, and government databases to identify relevant studies published between 2000-2023. Search terms included combinations of "maternal health," "maternal mortality," "India," "rural," "tribal," "scheduled caste," "intervention", and related keywords. Studies were included to determine whether they addressed maternal health outcomes, barriers to care, or interventions in India, focusing on marginalized populations. Government reports and data were also reviewed. A total of 153 articles were identified for full-text review, of which 37 were included in the final analysis.

3. Current State of Maternal Health in India

3.1 Maternal Mortality Ratio

The maternal mortality ratio (MMR) in India has declined from 556 per 100,000 live births in 1990 to 97 per 100,000 live births in 2018-20 [4]. However, this national average masks substantial regional and socioeconomic disparities. Table 1 shows the variation in MMR across different states in India.

Table 1: Maternal Mortality Ratio (MMR), Maternal Mortality Rate and Life Time Risk; India, EAG & Assam, South and Other states, 2018-20

India & Major States	MMR	95% CI	Maternal Mortality Rate	Lifetime risk
INDIA	**97**	**(88 - 106)**	**6.0**	**0.21%**

Assam	195	(117 - 272)	12.1	0.42%
Bihar	118	(78 - 157)	11.2	0.39%
Jharkhand	56	(10 - 101)	4.2	0.15%
Madhya Pradesh	173	(126 - 220)	15.3	0.53%
Chhattisgarh	137	(54 - 219)	9.9	0.35%
Odisha	119	(71 - 167)	7.3	0.25%
Rajasthan	113	(71 - 155)	9.6	0.33%
Uttar Pradesh	167	(126 - 207)	14.3	0.50%
Uttarakhand	103	(52 - 154)	6.3	0.22%
EAG AND ASSAM SUBTOTAL	**137**	**(121 - 154)**	**11**	**0.38%**
Andhra Pradesh	45	(13 - 78)	2.4	0.08%
Telangana	43	(4 - 83)	2.3	0.08%
Karnataka	69	(35 - 103)	3.5	0.12%
Kerala	19	(0 - 42)	0.9	0.03%
Tamil Nadu	54	(24 - 85)	2.7	0.09%
SOUTH SUBTOTAL	**49**	**(35 - 64)**	**2**	**0.09%**
Gujarat	57	(28 - 86)	3.9	0.14%
Haryana	110	(58 - 162)	8.0	0.28%
Maharashtra	33	(10 - 56)	1.8	0.06%
Punjab	105	(40 - 170)	5.4	0.19%
West Bengal	103	(64 - 143)	5.0	0.18%

Other states	77	(55 - 98)	3.9	0.14%
OTHER SUBTOTAL	**76**	**(63 - 89)**	**4**	**0.15%**

Source: Sample Registration System (SRS) 2018-2020 [4]

Table 1 shows wide variation in MMR across states, ranging from 43 in Kerala to 215 in Assam. States in southern India generally perform better, while states in the north and northeast continue to face challenges. Rural areas typically have higher MMRs within states than urban areas [6].

As per the Sample Registration System (SRS) Bulletin of Registrar General of India (RGI), the Infant Mortality Rate (IMR) has reduced from 37 per 1000 live births in 2015 to 30 per 1,000 live births in 2019 at National Level.

Table 2: The State/ UT wise details of Infant Mortality Rate (IMR) for the period from 2015 to 2019 are as follows:

S. No.	National/ State/ UT	Infant Mortality Rate (per 1000 live births)				
		2015	2016	2017	2018	2019
	ALL INDIA	**37**	**34**	**33**	**32**	**30**
1	Andhra Pradesh	37	34	32	29	25
2	A&N Islands	20	16	14	9	7
3	Arunachal Pradesh	30	36	42	37	29
4	Assam	47	44	44	41	40
5	Bihar	42	38	35	32	29
6	Chandigarh	21	14	14	13	13
7	Chhattisgarh	41	39	38	41	40
8	D&N Haveli	21	17	13	13	11
9	Daman & Diu	18	19	17	16	17

10	Delhi	18	18	16	13	11
11	Goa	9	8	9	7	8
12	Gujarat	33	30	30	28	25
13	Haryana	36	33	30	30	27
14	Himachal Pradesh	28	25	22	19	19
15	J & K including Ladakh	26	24	23	22	20
16	Jharkhand	32	29	29	30	27
17	Karnataka	28	24	25	23	21
18	Kerala	12	10	10	7	6
19	Lakshadweep	20	19	20	14	8
20	Madhya Pradesh	50	47	47	48	46
21	Maharashtra	21	19	19	19	17
22	Manipur	9	11	12	11	10
23	Meghalaya	42	39	39	33	33
24	Mizoram	32	27	15	5	3
25	Nagaland	12	12	7	4	3
26	Odisha	46	44	41	40	38
27	Puducherry	11	10	11	11	9

28	Punjab	23	21	21	20	19
29	Rajasthan	43	41	38	37	35
30	Sikkim	18	16	12	7	5
31	Tamil Nadu	19	17	16	15	15
32	Telangana	34	31	29	27	23
33	Tripura	20	24	29	27	21
34	Uttar Pradesh	46	43	41	43	41
35	Uttarakhand	34	38	32	31	27
36	West Bengal	26	25	24	22	20
Source: Sample Registration System of Registrar General of India						

Table 3: As per the Sample Registration System (SRS) Report of Registrar General of India (RGI), the Maternal Mortality Rate (MMR) has reduced from 8.1 in 2015-17 to 7.3 in 2016-18 at National Level. The Status of MMR at National level and State level as per SRS 2015-17 and 2016-18 are as follows:

Status of Maternal Mortality Rate (MMR)		
India/ States	**2015-17**	**2016-18**
ALL INDIA	**8.1**	**7.3**
Andhra Pradesh	3.6	3.6
Assam	15.2	14.0
Bihar	16.9	15.1

Jharkhand	6.1	5.6
Gujarat	6.0	5.1
Haryana	7.7	7.0
Karnataka	7.3	4.9
Kerala	1.9	2.1
Madhya Pradesh	17.5	15.9
Chhattisgarh	11.0	12.1
Maharashtra	3.3	2.6
Odisha	11.1	9.7
Punjab	6.8	7.0
Rajasthan	16.8	14.5
Tamil Nadu	4.8	3.2
Telangana	3.8	3.6
Uttar Pradesh	20.1	17.8
Uttarakhand	5.9	6.4
West Bengal	5.0	5.0
Other States	4.7	4.5
Source: Sample Registration System (SRS) of Registrar General of India (RGI)		

3.2 Maternal Health Indicators

Beyond mortality, several key indicators are used to assess maternal health status and quality of care. Table 4 presents data on some indicators from the National Family Health Survey (NFHS-5) conducted in 2019-21.

Table 4: Key Maternal Health Indicators in India, 2019-21

Indicator	Percentage
Mothers who had antenatal check-ups in the first trimester	70.0%
Mothers who had at least 4 antenatal care visits	58.1%
Institutional births	88.6%
Births assisted by a doctor/nurse/LHV/ANM/other health personnel	89.4%
Mothers who received postnatal care from a doctor/nurse/LHV/ANM/midwife/other health personnel within 2 days of delivery	78.0%
Women aged 15-49 years who are anaemic	57.0%

Source: National Family Health Survey (NFHS-5), 2019-21 [7]

While these national averages show improvements compared to previous surveys, they still fall short of universal coverage. Moreover, disaggregated data reveals persistent inequities based on socioeconomic status, education, caste, and geography [7].

3.3 Quality of Care

Despite increases in institutional deliveries, the quality of care remains a significant concern. Studies have documented inadequate infrastructure, shortages of skilled personnel, and inconsistent adherence to evidence-based practices in many facilities [8,9]. A study in Uttar Pradesh found that only 6% of facilities were fully equipped to provide primary emergency obstetric care [10]. Poor quality of care contributes to maternal deaths even when women do access health facilities.

4. Key Barriers to Maternal Health Care

4.1 Geographic Access

Physical distance to health facilities remains a significant barrier, particularly in rural and remote areas. A study in Jharkhand found that women living more than 5 km from a health facility were 80% less likely to deliver in a facility than those living within 5 km [11]. Lack of transportation and poor road conditions further exacerbate this challenge.

4.2 Financial Barriers

Although government schemes have reduced out-of-pocket expenditure, financial constraints continue to limit

access to care for many women. A study in rural Uttar Pradesh found that 39% of women cited cost as a reason for not delivering in a health facility [12]. Indirect costs such as transportation and lost wages also pose barriers.

4.3 Sociocultural Factors

Cultural beliefs and practices have a notable impact on maternal health-seeking behaviors. Within various societies, pregnancy and delivery are seen as natural events that may not necessitate medical assistance [13]. Additionally, gender norms constraining women's control over decision-making also influence their healthcare-seeking behaviors. Research conducted in rural Madhya Pradesh demonstrated that just 28% of women had the ultimate authority in determining their healthcare choices [14].

Socio-demographic factors play a crucial role in the utilization of maternal health care services in India. Paul and Chouhan (2020) found that factors such as women's education, wealth index, and exposure to mass media significantly influence the use of antenatal care, institutional delivery, and postnatal care services [15].

4.4 Low Female Literacy

Education level is strongly associated with maternal health outcomes. The NFHS-5 found that women without schooling were much less likely to receive antenatal care or deliver in a facility than those with secondary or higher education [7]. Low literacy limits women's access to health information and healthcare system navigation.

4.5 Health System Weaknesses

Shortages of skilled health workers, inadequate infrastructure, and inconsistent quality of care pose significant barriers. A study in rural Rajasthan found that 41% of primary health centers lacked 24/7 delivery services, and 35% lacked a female doctor [16]. Absenteeism and poor attitudes of health workers also deter women from seeking care.

Figure 1 summarizes the critical barriers to maternal healthcare in India.

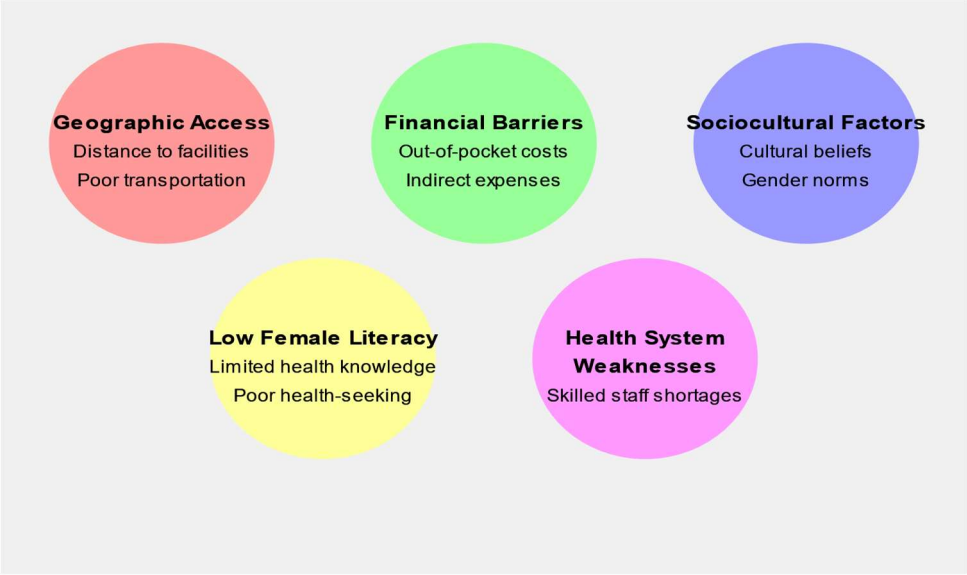

Figure 1: Key Barriers to Maternal Healthcare in India

5. Interventions to Improve Maternal Health Outcomes

5.1 Community-Based Interventions

Community-based interventions have shown promise in improving maternal health outcomes, particularly in rural and underserved areas. These interventions typically involve community health workers (CHWs) providing health education, facilitating access to care, and sometimes delivering essential services.

The Accredited Social Health Activist (ASHA) program, launched as part of the National Rural Health Mission in 2005, is a crucial example. ASHAs are community women trained as health educators and promoters in their villages. Studies have found that ASHA visits are associated with increased antenatal care visits, institutional deliveries, and postnatal check-ups [17,18].

Another successful model is the Janani Suraksha Yojana (JSY) scheme, which provides cash incentives to women for delivering in health facilities. A large-scale evaluation found that the JSY was associated with a 3.7 percentage point reduction in perinatal mortality and a 1.5 percentage point reduction in neonatal mortality [19].

Community mobilization approaches have also shown positive results. A cluster-randomized trial in Jharkhand and Odisha found that participatory women's groups led to a 32% reduction in neonatal mortality over 3 years [20]. These groups focused on identifying maternal and newborn health problems and collectively strategizing solutions.

Recent research has explored innovative approaches to improving maternal health outcomes. Singh et al. (2021) investigated the impact of financial inclusion on maternal health service utilization, finding that owning a bank account was associated with increased use of antenatal care services and institutional deliveries [21]. This suggests that interventions addressing broader socio-economic factors may have positive spillover effects on maternal health.

5.2 Health Worker Training and Support

Improving the skills and support of frontline health workers is critical for enhancing the quality of care. Several interventions have focused on training auxiliary nurse midwives (ANMs), staff nurses, and medical officers in evidence-based practices for maternal care.

A study in Bihar evaluated a nurse mentoring program that involved on-site clinical mentoring and skills labs. The intervention was associated with significant improvements in essential maternal and newborn care practices, including active management of the third stage of labor and newborn resuscitation [22].

Another approach is using mobile health (mHealth) technologies to support health workers. A randomized controlled trial in Uttar Pradesh found that providing ANMs with mobile phone-based job aid improved their adherence to antenatal care protocols and increased detection of pregnancy complications [23].

5.3 Health System Strengthening

Strengthening health systems is crucial for sustainable improvements in maternal health. This includes upgrading infrastructure, ensuring adequate staffing and supplies, and improving referral systems.

The Maternal and Newborn Health Toolkit, implemented in Uttar Pradesh, took a comprehensive approach to strengthening the health system. It included facility upgrades, supply chain management, data systems

improvements, and supportive supervision. An evaluation found significant improvements in the availability of essential medicines and equipment and increased institutional deliveries [24].

Another example is the Chiranjeevi Yojana scheme in Gujarat partnered with private obstetricians to provide free deliveries for poor women. The program was associated with a 3.8 percentage point increase in facility births and a 2.5 percentage point reduction in neonatal mortality [25].

5.4 Addressing Social Determinants of Health

Recognizing that broader social and economic factors influence maternal health, some interventions have taken a more comprehensive approach. The Gram Varta program in Bihar combined participatory learning, microplanning, and convergence with government schemes to address multiple maternal and child health determinants. An evaluation found improvements in antenatal care, institutional deliveries, and newborn care practices [26].

Conditional cash transfer programs that address poverty while incentivizing health behaviors have also shown promise. The Indira Gandhi Matritva Sahyog Yojana (IGMSY) provides cash transfers to pregnant and lactating women, conditional on fulfilling specific health and nutrition requirements. A study found that the program was associated with increased use of antenatal care services and improved infant feeding practices [27].

Table 5 summarizes critical interventions and their impact on maternal health outcomes.

Intervention	**Description**	**Key Findings**
ASHA Program	Community health workers providing health education and linkage to care	Increased antenatal care visits, institutional deliveries, and postnatal check-ups [17,18]
Janani Suraksha Yojana (JSY)	Cash incentives for comprehensive ANC and PNC care	3.7 percentage point reduction in perinatal mortality, 1.5 percentage point reduction in neonatal mortality [19]
Participatory Women's Groups	Community mobilization through facilitated group meetings	32% reduction in neonatal mortality over 3 years [20]
Nurse Mentoring Program	On-site clinical mentoring and skills labs for nurses	Improved adherence to evidence-based practices for maternal and newborn care [21]
mHealth Job Aid for ANMs	Mobile phone-based support tool for antenatal care	Improved adherence to antenatal care protocols increased detection of pregnancy complications [23]
Maternal and Newborn Health Toolkit	Comprehensive health system strengthening approach	Improved availability of essential medicines and equipment, increased institutional deliveries [24]
Chiranjeevi Yojana	Public-private partnership for free	3.8 percentage point increase in facility births,

Intervention	Description	Key Findings
	deliveries	2.5 percentage point reduction in neonatal mortality [25]
Gram Varta Program	Integrated approach addressing multiple health determinants	Improvements in antenatal care, institutional deliveries, and newborn care practices [26]
Indira Gandhi Matritva Sahyog Yojana (IGMSY)	Conditional cash transfers for pregnant and lactating women	Increased use of antenatal care services, improved infant feeding practices [27]

6. Challenges and Future Directions

While significant progress has been made, several challenges remain in improving maternal health outcomes in India, particularly for marginalized populations.

6.1 Persistent Inequities

Despite improvements, wide disparities persist based on geography, socioeconomic status, caste, and education level. A study using NFHS-4 data found that women from the poorest wealth quintile had 2.76 times higher odds of experiencing maternal complications compared to those from the wealthiest quintile [28]. Addressing these inequities requires targeted interventions and focusing on social determinants of health.

6.2 Quality of Care

While access to institutional delivery has improved, the quality of care remains inconsistent. A study in Uttar Pradesh found that only 39% of facilities could provide primary emergency obstetric care and adherence to evidence-based practices was low [29]. Improving quality requires ongoing training, supportive supervision, and strengthening of health systems.

6.3 Health Workforce Shortages

India faces a critical shortage of skilled health workers, particularly in rural areas. As of 2019, there was a shortfall of 22% for nurses and midwives at primary health centers [30]. Addressing these shortages through improved training, retention strategies, and task-shifting approaches is essential for expanding access to quality care.

6.4 Cultural Barriers

Deep-rooted cultural beliefs and practices continue to influence maternal health-seeking behaviors. A qualitative study in rural Rajasthan found that traditional birth attendants were often preferred over skilled birth attendants due to cultural familiarity and perceived respectful care [31]. Developing culturally sensitive interventions that engage with local beliefs while promoting evidence-based practices is crucial.

6.5 Data Quality and Monitoring

Reliable data is essential for tracking progress and targeting interventions. However, data quality and completeness issues persist, particularly in rural areas. A study assessing the quality of maternal death reporting in Madhya Pradesh found significant underreporting and misclassification of maternal deaths [32].

Strengthening health information systems and maternal death surveillance is critical for evidence-based policy-making.

Figure 2 illustrates the interconnected challenges in improving maternal health outcomes in India.

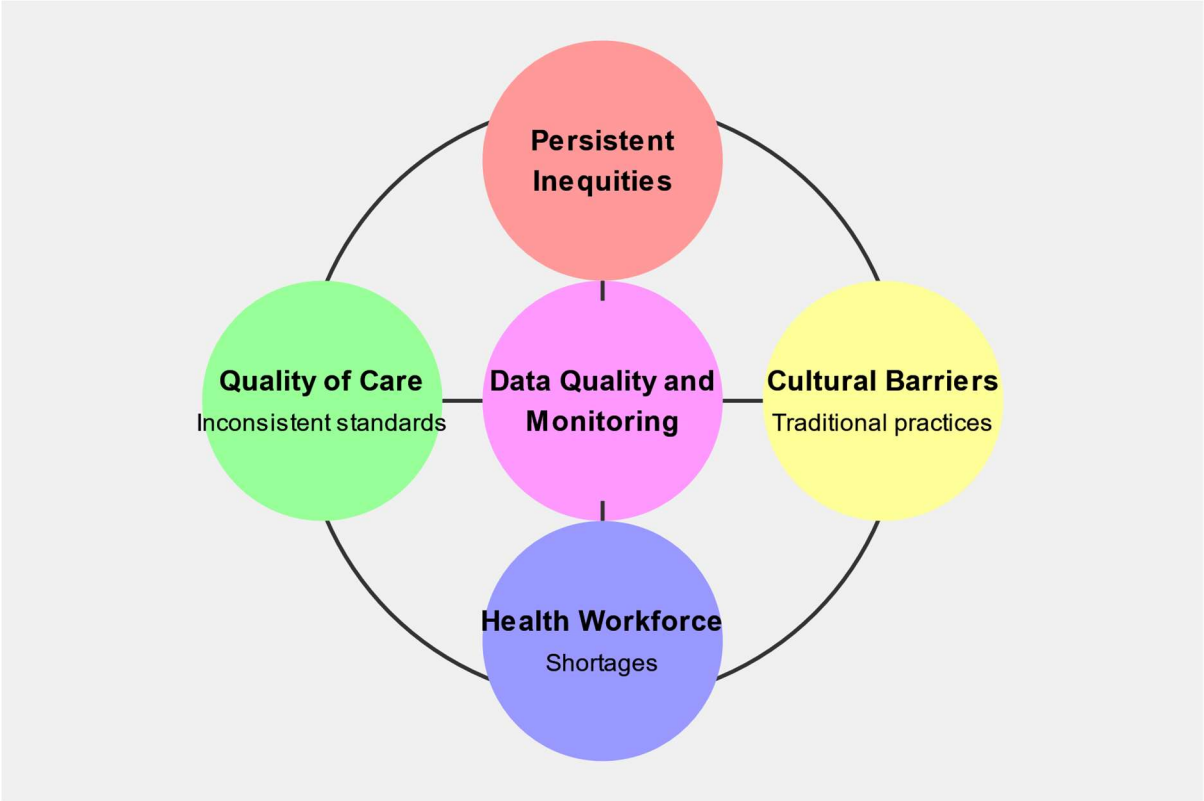

Figure 2: Interconnected Challenges in Improving Maternal Health Outcomes in India

7. Recommendations

Based on the evidence reviewed, the following recommendations are proposed to improve maternal health outcomes in India, with a focus on marginalized populations:

7.1 Strengthen Community-Based Interventions

1. Expand and strengthen the ASHA program, ensuring adequate training, support, and compensation for these critical frontline workers.
2. Scale up successful models of participatory women's groups, adapting them to local contexts.
3. Integrate community mobilization approaches with existing government health programs to enhance reach and sustainability.

7.2 Improve Quality of Care

1. Implement comprehensive quality improvement initiatives in health facilities, focusing on evidence-based practices and respectful maternity care.
2. Expand nurse mentoring programs and on-site training to build the capacity of frontline health workers.

3. Strengthen referral systems and emergency transport to ensure timely access to higher-level care when needed.

7.3 Address Social Determinants of Health

1. Expand conditional cash transfer programs that address poverty while incentivizing health-seeking behaviors.
2. Collaborate with other sectors (e.g., education, women's empowerment) to address underlying determinants of maternal health.
3. Implement targeted interventions for particularly vulnerable groups, such as adolescent mothers and tribal populations.

7.4 Enhance Data Systems and Accountability

1. Strengthen maternal death surveillance and response systems to track and address causes of maternal mortality accurately.
2. Improve health information systems to enable real-time monitoring and data-driven decision-making.
3. Implement community-based monitoring mechanisms to enhance accountability and responsiveness of health services.

7.5 Promote Cultural Competence and Respectful Care

1. Develop and implement culturally sensitive guidelines for maternal care that respect local beliefs while promoting evidence-based practices.
2. Train health workers in respectful maternity care and cultural competence.
3. Engage traditional birth attendants as partners in promoting facility-based delivery and linking women to formal health services.

Table 6 outlines potential strategies to address critical challenges in improving maternal health outcomes.

Table 6: Strategies to Address Challenges in Maternal Health Challenge, Potential Strategies

Challenge	Potential Strategies
Persistent Inequities	- Targeted interventions for vulnerable groups - Expansion of conditional cash transfer programs - Intersectoral collaboration to address social determinants
Quality of Care	- Comprehensive quality improvement initiatives - Nurse mentoring and on-site training programs - Strengthening of referral systems and emergency transport
Health Workforce Shortages	- Task-shifting approaches (e.g., training nurse-midwives) - Improved retention strategies for rural areas - Public-private partnerships to expand service coverage

Challenge	Potential Strategies
Cultural Barriers	- Development of culturally sensitive care guidelines - Training in respectful maternity care and cultural competence - Engagement of traditional birth attendants as partners
Data Quality and Monitoring	- Strengthening of maternal death surveillance systems - Improvement of health information systems - Implementation of community-based monitoring mechanisms

8. Conclusion

India has significantly improved maternal health outcomes over the past two decades. However, persistent inequities and challenges remain, particularly for marginalized populations. Addressing these issues requires a multifaceted approach that combines community-based interventions, health system strengthening, and efforts to address broader social determinants of health.

Key priorities include improving the quality of care in health facilities, strengthening the capacity of frontline health workers, expanding successful community mobilization approaches, and developing culturally sensitive interventions that respect local beliefs while promoting evidence-based practices. Enhancing data systems and accountability mechanisms is crucial for tracking progress and ensuring responsive health services.

As India works towards achieving the Sustainable Development Goal target of reducing maternal mortality to less than 70 per 100,000 live births by 2030, a renewed focus on equity and reaching the most vulnerable populations is essential. By prioritizing marginalized women and addressing the interconnected challenges that impact maternal health, India can make significant progress in ensuring safe motherhood for all.

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