



An Examination of the Maternal Health Quality of Care Landscape in India

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ABBREVIATIONS

ANM	auxiliary nurse-midwife
ARTH	Action Research and Training for Health
ASHA	accredited social health activist
AWW	Anganwadi worker
CHC	community health center
CHSJ	Center for Health and Social Justice
CY	Chiranjeevi Yojana
DFID	United Kingdom Department for International Development
FLW	frontline worker
FOGSI	Federation of Obstetric and Gynecological Societies of India
FRU	first referral unit
GOI	Government of India
IUD	Intrauterine device
JSY	Janani Suraksha Yojana
MMR	maternal mortality ratio
NRHM	National Rural Health Mission
OB/GYN	obstetrician/gynecologist
PFI	Population Foundation of India
PHC	primary health center
RCH-I	Reproductive and Child Health I
RCH-II	Reproductive and Child Health II
RMNCH+A	Reproductive, Maternal, Newborn, Child Health Plus Adolescent Health Program
SAHAJ	Society for Health Alternatives
SIDA	Swedish International Development Agency
SLIC	Socio-Legal Information Center
UN	United Nations
UNFPA	UN Population Fund
UNICEF	UN Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization
WRAI	White Ribbon Alliance for Health in India

EXECUTIVE SUMMARY

India has made significant strides in maternal health over the past several decades, reducing its maternal mortality ratio (MMR) from 556 to 174 maternal deaths per 100,000 live births from 1990 to 2015 (World Bank 2016a). Policies and initiatives to increase access to maternal health services largely account for this progress. However, the rate of improvement has slowed, and the country continues to contribute almost one-quarter of maternal deaths globally (Nair 2011). In addition, India is home to a high but difficult to measure rate of so-called near-miss maternal deaths that often lead to maternal morbidity. Although the incidence of maternal morbidity in India is largely unknown due to the country's lack of diagnoses and under-reporting, it is estimated that millions of Indian women experience pregnancy-related morbidity; the Global Burden of Disease estimates that India contributes one-fifth of the disability-adjusted life years lost globally due to maternal health conditions (World Health Organization 2008). These patterns suggest there is still progress to be made in maternal health in India.

The John D. and Catherine T. MacArthur Foundation seeks to continue its more than 20-year history supporting population and reproductive health in India and accelerate the country's advancement in maternal health. It has chosen to fund a three-and-a-half-year grantmaking strategy to improve maternal health quality of care, which has emerged as a key means to further reduce MMR and related outcomes. This review is intended to describe current issues and interventions in the delivery of maternal health care and provide a backdrop for the Foundation's grantmaking effort.

Key issues in delivery of maternal health care in India

Evidence suggests that although the quality of maternal health care varies across India, on average, it is low. The limitations of maternal health quality of care can be summarized as follows:

- Poor delivery of clinical care. Studies have found that fewer than one-third of providers in India adhere to clinical guidelines; fewer than half of clinical interactions result in correct diagnoses and treatment; and fewer than one-third of rural health subcenters have regular supplies of water, electricity, blood, medicines, and other treatments (Das et al. 2015, 2012; Muldoon et al. 2011).
- Lack of patient-centered care. Patient-centeredness is not a concept commonly practiced by providers or understood by patients. Surveyed patients in India reported general satisfaction with their care; however, they also indicated barriers to explanations about medications and treatment options. Patients also reported a lack of respect, empathy, and compassion (or cultural competence) from their health care providers and lack of privacy when seeking care (Ardey and Ardey 2015; Narichiti 2013).
- Inequitable delivery of care and inefficient health system. A disproportionate share of facilities and providers in urban settings hinders access to care among the approximately 67 percent of India's population that lives in rural settings (World Bank 2017a; Ministry of Health and Family Welfare 2014). Data also show disparities in delivery of care: mothers with lower income and literacy, and from tribal groups, scheduled casts, and rural areas are less likely than their counterparts at other

socioeconomic levels to receive and use maternal health care (Vora et al. 2009). Provider absenteeism, mismanaged facilities, fiscal irresponsibility, poor regulation, and corruption have also been cited as obstacles to the efficient delivery of care.

Select interventions to address maternal health quality of care

To address some of these deficiencies, donor investments, government prioritization, and an active civil society have intensified the focus on maternal health quality of care in recent years. These interventions are aimed at delivering health services effectively and efficiently (supply); increasing awareness about maternal health, including women's rights and entitlements, available resources, and accountability of providers; and incentivizing women to use maternal health services (demand); and generating or using evidence on trends, needs, and outcomes to influence decision makers and affect changes in policies and programs at national or local levels (advocacy). A short description of these three areas is provided below:

- **Supply.** Most supply interventions implemented to date focus on training providers to improve their skills, competencies, and adherence to guidelines and evidence-based practices, and to increase facility resources and coordination. Studies of these initiatives suggest that health care capacity can be expanded by training midlevel providers to deliver services usually offered through doctors; this shift of responsibilities between health care workers has been found to have no effect on the quality of care, and was actually found to increase supply of emergency maternal health services, decrease costs and other barriers, and improve the management of pregnancy complications (Iyengar and Iyengar 2009; Jejeebhoy et al. 2011; Iyengar 2014).
- **Demand.** Studies of demand-side initiatives indicate that community-based education campaigns and cash incentive programs can improve women's demand for health care. However, cash incentives were not found to be associated with reduced maternal mortality (Achyut et al. 2016; Amudhan et al. 2013; Banerjee et al. 2013; Bloom et al. 2001; Kumar et al. 2011; Gupta et al. 2012; Leon et al. 2014; Lim et al. 2010; More et al. 2012; Ng et al. 2014; Powell-Jackson et al. 2016; Tripathy et al. 2010; Randive et al. 2013).
- **Advocacy.** Many activists and policymakers across India have used evidence to advocate for funding to enact or scale-up programs that improve the quality of maternal health services, such as training for accredited social health activists (ASHAs). To support the dissemination of evidence and mobilize the community, several networks dedicated to maternal health have formed across India, including the White Ribbon Alliance for Health India (WRAI 2016). However, information is limited on the success of advocacy initiatives and their effect on maternal health services and outcomes.

Research on these interventions has helped identify promising approaches to improving maternal health outcomes in India. However, the evidence is only emerging. As poor outcomes and inequities persist across India, opportunities remain to explore the way forward for maternal health quality of care and to generate further data on the best policies and practices for improving maternal health outcomes. Such efforts may represent the critical means through which India can significantly contribute to the United Nations Sustainable Development Goal of reducing the global MMR to 70 maternal deaths per 100,000 live births by 2030 (United Nations 2016b).

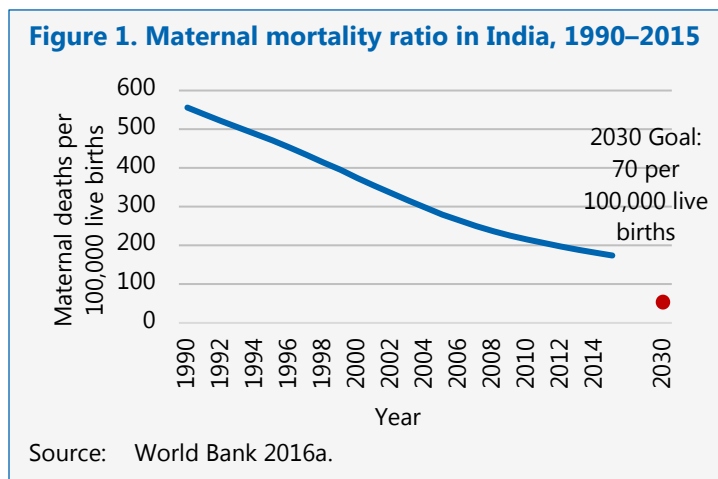
ABOUT THE REVIEW OF THE MATERNAL HEALTH QUALITY OF CARE LANDSCAPE IN INDIA

This landscape review, funded by the John D. and Catherine T. MacArthur Foundation (MacArthur Foundation), identifies the social, political, and environmental conditions that influence the delivery of quality maternal health care in India. It is intended to provide context for the implementation and evaluation of a three-and-a-half-year maternal health quality of care grantmaking strategy included under the MacArthur Foundation’s Population and Reproductive Health Program. This grantmaking effort aims to catalyze improvements in maternal health quality of care by supporting individuals’ and organizations’ work in maternal health in India. To provide a backdrop for this work, the review discusses the progress in maternal health to date (Chapter I), a framework for understanding maternal health quality of care (Chapter II), related ongoing programs and initiatives (Chapter III), and opportunities for continued improvements (Chapter IV). It draws on select maternal health literature, including peer-reviewed publications, in addition to public reports and data on maternal health in India. It also includes information from interviews with 11 stakeholders, including national government officials, maternal health experts, donors, and nongovernmental organizations.

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I. ARRIVING AT MATERNAL HEALTH QUALITY OF CARE IN INDIA

India has made large strides in maternal health over the past several decades, reducing its maternal mortality ratio (MMR) from 556 to 174 maternal deaths per 100,000 live births between 1990 and 2015 (Figure 1; World Bank 2016a). With this progress, India came closer to achieving United Nations (UN) Millennium Development Target 5.A, reducing its MMR by 75 percent by 2015 (World Bank 2016a; World Health Organization 2015).



A. Policy, programs, and players influencing maternal health

Much of the progress in reducing MMR to date has been due to the Government of India (GOI), multiple donors, and civil society and other nongovernmental organizations' focus over the past several decades on improving access to maternal health care (Figure 2). Maternal health efforts emerged from policies aimed at slowing population growth in the 1950s. During that time and through the late 1980s, most of these efforts concentrated on family planning services, which protect a mother's health by delaying pregnancy and facilitating birth spacing. Reflecting this longstanding emphasis, contraceptive use in India has tripled over the past 40 years; as of 2010, more than half of all women in India were using contraceptives (Appendix A, Exhibit A.1; UN Population Division, World Contraceptive Use 2016).

The 1990s brought a paradigm shift in India that linked issues surrounding population growth and economic development to women's empowerment, gender equality, and reproductive rights. High rates of maternal mortality also emerged as a key concern in India. As a result, the GOI launched several initiatives, including the Child Survival and Safe Motherhood program and the Reproductive and Child Health Phase I (RCH-I) program to improve women's ability to obtain maternal health services. These programs were developed with the recognition that improving maternal health outcomes requires access to comprehensive primary care and a continuum of care through pre-conception, antenatal, postnatal, and interconception periods. Bilateral organizations and donors entered the field with similar objectives, funding civil society and other nongovernmental organizations to raise awareness of and increase programs that provide maternal health care. Between 1993 and 2006, antenatal care coverage increased nearly 20 percent; nearly three-quarters of pregnant mothers now receive at least one antenatal care visit during their pregnancy, and nearly 40 percent receive at least four visits (Appendix A, Exhibit A.2; Family Welfare Statistics in India 2011).

Figure 2. Maternal health programs, policies, and stakeholders in India, 1950–present

1950–1969:	The Government of India (GOI) incorporated maternal health into the country’s five-year plan with a focus on slowing population growth through family planning. Ford Foundation funding increased access to modern contraceptives.
1970–1989:	The United Nations Population Fund (UNFPA) invested in family planning services in 1974. Expansion in the 1980s supported the procurement and production of contraceptives nationally, strengthened management information systems, provided training, and promoted education and communication programs to increase awareness of and improve maternal health.
1990–1999:	GOI shifted its focus from family planning to reproductive and child health strategy in the Family Welfare Program. The Child Survival and Safe Motherhood Program (1992–1995) focused on maternal health and mortality, and the Reproductive and Child Health (I (RCH-I) program (1997–2004) expanded the scope of the Family Welfare Program to incorporate additional dimensions of women’s health care. Bilateral and philanthropic organizations entered the field. The United Kingdom Department for International Development (DFID) supported state-level reforms to reduce vacancy rates for doctors in underserved districts, increase deliveries at public institutions, and improve access to family planning and safe abortions. The United States Agency for International Development (USAID) invested in maternal health services through partnerships with GOI and private sector and civil society organizations. Swedish International Development Agency (SIDA) funding promoted sexual and reproductive health and rights. The MacArthur Foundation supported local civil society organizations and individuals to improve reproductive health.
2000–2009:	The United Nations Millennium Declaration called for governments to reduce maternal mortality and increase the proportion of births attended by skilled health personnel. Philanthropic institutions and bilateral and multilateral agencies continued investments in maternal health service delivery, advocacy, and accountability. Investments from the Bill and Melinda Gates Foundation increased the use of evidence-based tools among health workers; provided training for auxiliary nurse-midwives (ANMs), accredited social health activists (ASHAs), and other community health workers for antenatal and postnatal care; and promoted institutional delivery and other maternal health practices. The Packard Foundation funded family planning, sexual education, and reproductive health services for young people; other programs improved access to safe abortions; and advocacy increased government support for quality sexual and reproductive health programs. The MacArthur Foundation invested in community-based models for reducing maternal mortality and morbidity, with a focus on strengthening birth preparedness; improving management of pregnancy-related complications; creating community financing programs; enhancing health professionals’ (nurses’ and doctors’) skills; and supporting advocacy, accountability, and research. GOI launched Reproductive and Child Health II (RCH-II) within the National Rural Health Mission (NRHM) in 2005. With joint financing from a range of multilateral and bilateral agencies, the program aimed to increase the provision of both essential and emergency obstetrical care, improve the referral system for pregnancy complications, strengthen infrastructure, build the capacity of providers and facilities, and create incentives for the use of maternal health services, such as Janani Suraksha Yojana, which provided payments to mothers for institutional delivery. UNFPA’s reproductive and child health program merged with the NRHM. National foundations, and civil society and other nongovernmental organizations funded and implemented gap-filling programs with support from both international and domestic funders, such as those listed above and IKEA, the NIKE Foundation, and the Children’s Investment Fund Foundation. Community-based organizations and grassroots nongovernmental organizations strengthened women’s access to essential maternal care.
2010–present:	Bilateral funders SIDA and DFID exited; government launched Reproductive, Maternal, Newborn, Child Health Plus Adolescent Health (RMNCH+A) in 2011, shifting focus to quality, adding an adolescent health component, re-emphasizing family planning, and addressing disparities across states. GOI launched the National Urban Health Mission under the National Health Mission in 2013, to focus on providing essential primary health care services and reducing of out-of-pocket expenses for the urban poor.

Sources: Gates Foundation n.d.; MacArthur Foundation 2015; Packard Foundation n.d.; SIDA 2014; Staples 1992; Townsend 2010; UNFPA 2007; USAID 2016.

The 2000s ushered in the next generation of government programs, such as the Reproductive and Child Health Phase II (RCH-II) program within the National Rural Health Mission (NRHM). This program focused on strengthening infrastructure and building the capacity of providers and facilities. It also created incentives for the use of maternal health services, such as Janani Suraksha Yojana (JSY), which provides payments to mothers for institutional delivery. Today, almost 80 percent of live births in India take place at a health facility, compared with about 25 percent 25 years ago (Appendix, Exhibit A.3; UNICEF, Division of Data, Research and Policy 2016).

Since 2010, the GOI continued to expand services throughout the reproductive life course, including adolescence, through the Reproductive, Maternal, Newborn, Child Health Plus Adolescent Health (RMNCH+A) program. It also added the National Urban Health Mission to the National Health Mission, recognizing the struggles in accessing care among the urban poor.

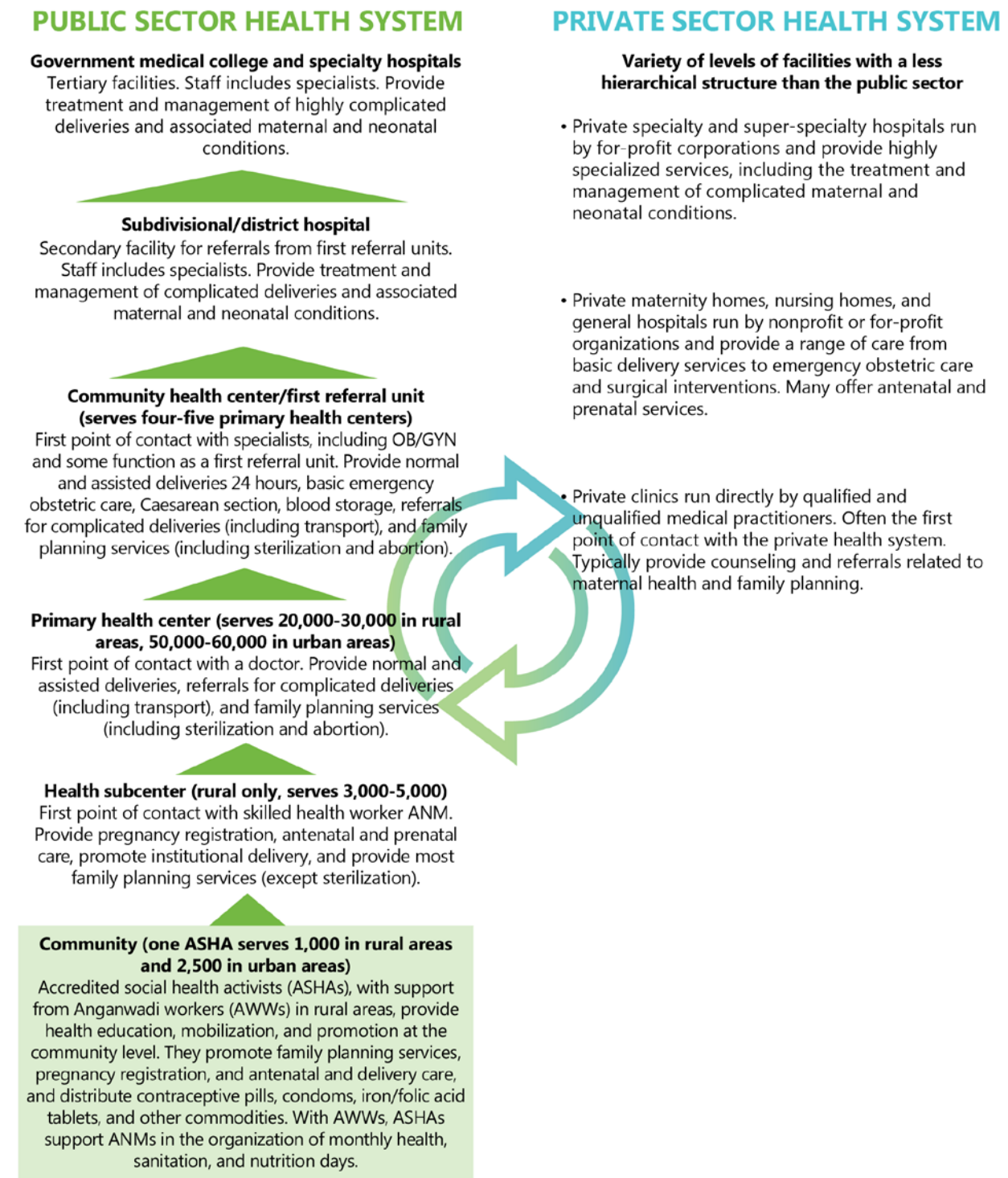
B. Point of entry to maternal health services in India

Coverage in India has improved substantially, and women can now obtain maternal health services at multiple points throughout the health system—from the community level to highest level of specialty care at a facility (Figure 3). The public and private health sectors have their own structures and systems for the provision of this care. The public health system consists of state-owned health care facilities funded by the government and subject to the rules and regulations of the states in which they operate and/or the GOI; many of the services in these institutions are either fully or partially subsidized. In contrast, private facilities operate as businesses, generating their own revenue with minimal government regulations. The growth of the private health sector throughout India means it delivers a large proportion of the country's maternal health services, accounting for around two-fifths of institutional deliveries (International Institute for Population Sciences 2014). Below, we discuss the points of entry for maternal health services within public and private health sectors.

Public health system

At the community level, women's point of contact within the public health system occurs with frontline workers (FLWs). Under the National Health Mission, FLWs, including accredited social health activists (ASHAs), provide health education, mobilization, and promotion through home visits and community meetings. ASHAs receive performance-based compensation for promoting key maternal health services, including family planning, early registration of pregnancies, and antenatal and delivery care. ASHAs can also distribute pills, condoms, and iron/folic acid tablets, and can assist women with developing a birth preparedness plan. In rural areas, ASHAs work closely with Anganwadi workers (AWWs), FLWs from the Integrated Child Development Services program who offer basic health and nutrition services to women and children. ASHAs and AWWs support the organization of monthly health, sanitation, and nutrition days in their communities with auxiliary nurse-midwives (ANMs) from the nearest health subcenter in attendance.

Figure 3. Overview of India’s public and private sector health systems



Sources: Bhawan 2012; Health Department, Government of Bihar, India n.d.; International Institute for Population Sciences 2014; Ministry of Health and Family Welfare 2013c.

OB/GYN = obstetrician/gynecologist.

ANM = Auxiliary Nurse Midwife

Subcenters represent the lowest level of static public health facility that women can visit for basic maternal health services. The ANM who runs the subcenter is the first level of service provider within the formal health system and undertakes outreach services for pregnancy registration, antenatal and postnatal care, and family planning. The ANM can also provide most family planning services, including intrauterine device (IUD) insertion, but not sterilization. ANMs are not typically expected to conduct deliveries at subcenters. However, in remote areas with limited access to higher level facilities, ANMs may also conduct home deliveries or deliveries at the subcenters. They encourage and promote institutional delivery at primary health centers (PHCs) or higher level facilities.

PHCs are typically women's first point of contact with a physician. In urban areas and other cases where women live closer to a PHC than a subcenter, PHCs may be women's first point of contact with the formal health system. Doctors and nurses at PHCs offer the same services found at subcenters. In addition, they provide 24-hour delivery services, including normal and assisted deliveries; however, not all PHCs operate around the clock. Clinicians at PHCs are trained in danger signs and complications during pregnancy and are authorized to make referrals to higher level facilities. They also can perform other reproductive health procedures, including sterilization and abortion.

At the next level, community health centers (CHCs) serve four to five PHCs each, and are staffed with generalist medical officers and specialists, including an obstetrician/gynecologist (OB/GYN). In addition to providing all of the services available at PHCs and subcenters, CHCs that are designated as first referral units (FRUs) can provide basic emergency obstetric care and medical and surgical interventions for complicated deliveries, including Caesarean sections; FRUs have blood storage units or blood banks. In non-FRU CHCs, providers are trained to recognize danger signs and complications during delivery that require a higher level of intervention and refer these cases to the nearest subdivisional or district hospital. Subdivisional and district hospitals are secondary facilities equipped to treat and manage complicated deliveries that CHCs cannot perform, as well as manage associated maternal and neonatal morbidities.

At the highest level of the public health system are government medical colleges and specialty hospitals, tertiary facilities that include specialty and subspecialty services. These facilities treat and manage the most complicated maternal and neonatal health conditions.

Private health system

Private health facilities offer a range of maternal health services with little standardization in the provision of services at any given type of facility. The most basic level of private facilities comprises clinics that are run directly by practitioners. These facilities are often women's first point of contact with the private health system, and they typically provide basic check-ups, counseling, and referrals related to maternal health. Private maternity homes, nursing homes, and general hospitals also offer basic delivery services, antenatal care, and postnatal care as well as high levels of care, including emergency obstetric care and surgical interventions. Private specialty and super-specialty hospitals offer highly specialized services, including the treatment and management of complicated maternal and neonatal conditions.

Unlike for public facilities, regulations do not require private facilities to staff physicians or nurses with specific educational backgrounds. As a result, private providers have a range of education and expertise, from no formal training or degree to highly specialized medical training. In addition, there are rarely standardized protocols for referring women with maternal complications. Thus, the private health system has a less structured hierarchy than the public health system and produces great variation in quality and costs. Nonetheless, private providers and facilities play a significant role in expanding women's access to care, particularly in urban areas.

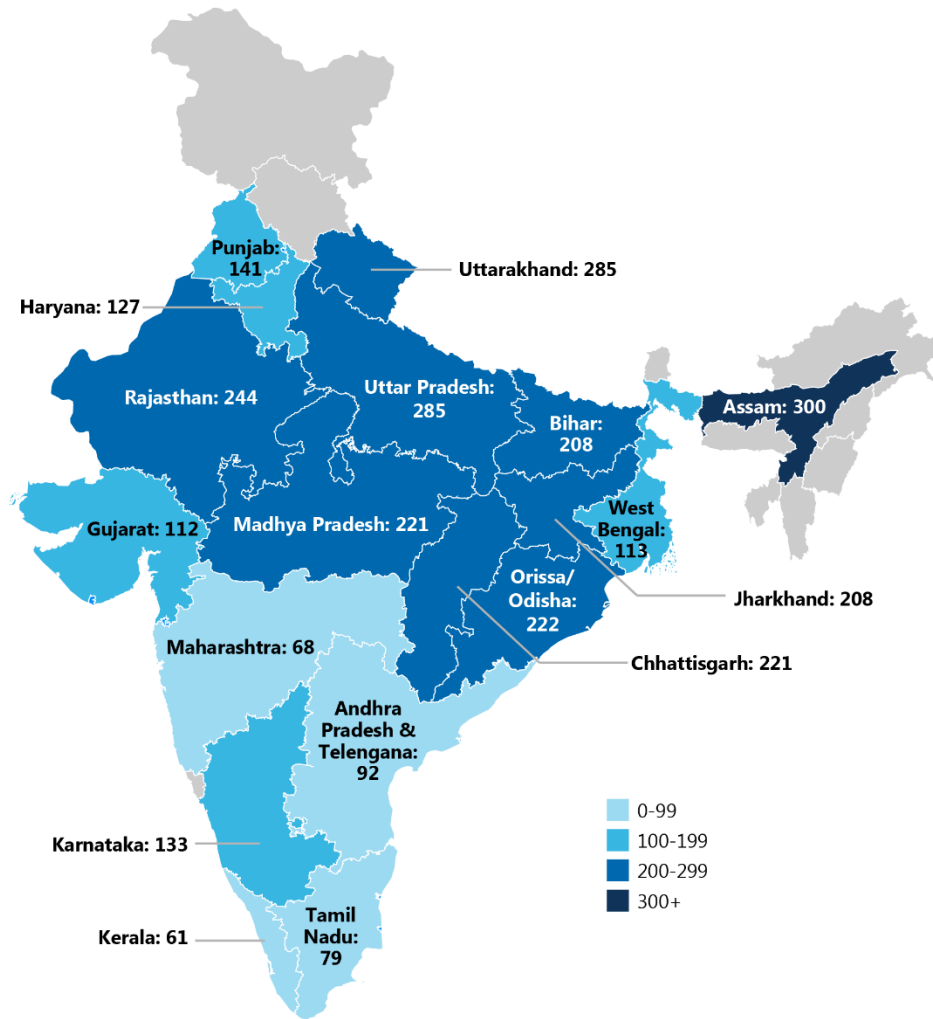
C. Quality as a strategy to catalyze further improvements in maternal health

Despite the notable increases in policies and programs to incentivize the use of maternal health services and the multiple points of entry to maternal health services, reductions in MMR have slowed in recent years, and large disparities persist across various states and populations (Iyengar et al. 2014; Powell-Jackson et al. 2015). Rates are particularly high in India's northern states, where its poorest and most marginalized populations reside (Figure 4). At the same time, MMR in many wealthier states, where access to care is better, also remain above the country's goals; only Maharashtra and Kerala have an MMR below 70 (United Nations 2016).

These patterns suggest that policies and programs to promote access to health care alone are not sufficient to improve maternal health and that low quality of care has played a role in hindering further progress in maternal health. In fact, studies have cited lack of medical staff competency, cleanliness and safety of facilities, effectiveness and responsiveness of the care provided, and health system transparency and accountability as major barriers to improving maternal health outcomes (Randive et al. 2013; Srivastava et al. 2014). GOI and other stakeholders have recently demonstrated that they understand the critical role of health care quality by enacting policies and programming such as RMNCH+A, which includes provisions to implement and monitor delivery of maternal health services, incentives to promote accreditation of private facilities operating outside of public sector regulations, and campaigns to promote reproductive health and rights. Thus, efforts to address quality of care are recognized as key strategies for India to contribute to the UN Sustainable Development Goal of reducing global MMR to 70 deaths per 100,000 by 2030.

Building on this brief introduction to India's progress in maternal health, the remainder of this document presents a framework for understanding the current status of quality in maternal health services in India (Chapter II), current evidence on select maternal health quality of care interventions to date (Chapter III), and implications of this evidence for further opportunities to improve maternal health quality of care (Chapter IV). This review is not intended to provide a comprehensive study of the history and evolution of maternal health in India. Rather, it draws on select literature to give context to current maternal health priorities and ongoing activities in the field.

Figure 4. Maternal mortality ratio by state, 2013



Source: Ministry of Health and Family Welfare 2015c.

Note: Gray states indicate that data were not available.

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II. A FRAMEWORK FOR UNDERSTANDING THE STATUS OF MATERNAL HEALTH QUALITY OF CARE IN INDIA

The concept of quality in maternal health services has broadened over time in India. During the early 1970s, the notion of quality in maternal health began with a focus on improving capacity and capabilities in human resources. Consequently, health committees made recommendations about medical education and support for clinical manpower (Srivastava et al. 2014). In the next decade, the emphasis on quality tied to clinical delivery of care continued, and policies and programs addressed the need for adequate supplies, better medical training, and efficient clinical operations. As advocacy and dialogue on patient rights in reproductive health increased their influence in the 1990s, perspectives on quality extended to include implementation and outcomes, such as effectiveness, equitability, and accessibility. The focus on quality outcomes is consistent with the growing visibility in this period of the Donabedian model for quality of medical care, which viewed health services in terms of its structure, process, and outcomes (Donabedian 1978, 1988).

Since the 2000s, viewpoints on quality expanded further to introduce patient-centered care, and mechanisms for quality assurance moved to the forefront. For family planning, the Bruce-Jain framework rose to prominence, highlighting the importance of provider–patient interactions and defining quality as “the way individuals and clients are treated by the system providing services” (Bruce 1990; Jain 1989). In addition, programs such as RCH-II included provisions to establish quality assurance committees at district and state levels and provided guidelines for maternal death reviews (Srivastava et al. 2014). The GOI also began funding patient welfare committees for communities to improve the accountability among facilities. That is not to say, however, that quality framed within the context of clinical care became less important; in fact, the GOI set up the National Health Systems Resource Center to provide technical assistance and capacity building for quality improvement in the health system.

As the evolution in the concept of quality demonstrates, quality is multidimensional and complex. Not surprisingly, there is no universally accepted framework for or definition of quality today (Nair and Panda 2011; Raven et al. 2012; Karvande et al. 2016). This review relies on the World Health Organization’s (WHO’s) commonly accepted paradigm for understanding and assessing quality of health care (WHO 2006). It also aligns with a framework developed by Hulton et al. (2007) for assessing quality of maternal health services in India. Both frameworks influenced the MacArthur Foundation in conceptualizing its maternal health quality of care grantmaking strategy. Therefore, this review examines quality of care across the WHO quality of care framework dimensions: effectiveness, efficiency, accessibility, patient-centeredness, equitability, and safety (Figure 5). Because many of these dimensions are related, this review further combines them into three key components: clinical (safe and effective), experiential (patient-centered), and contextual (accessible, efficient, and equitable). In the remainder of this chapter, we discuss maternal health quality of care in India within these three components.

Figure 5. World Health Organization components and dimensions of quality of care



Source: World Health Organization 2006.

A. Quality in provision of clinical care (safe and effective)

In clinical care, quality care is safe and effective enough to produce desired health outcomes. This component of quality hinges on two basic ingredients: (1) staff with the skills to deliver appropriate care and (2) facilities with the resources to support care delivery. To date, India has experienced challenges in these areas because clinical staff often lack necessary skills, and many facilities have inadequate resources (Das et al. 2012, 2015).

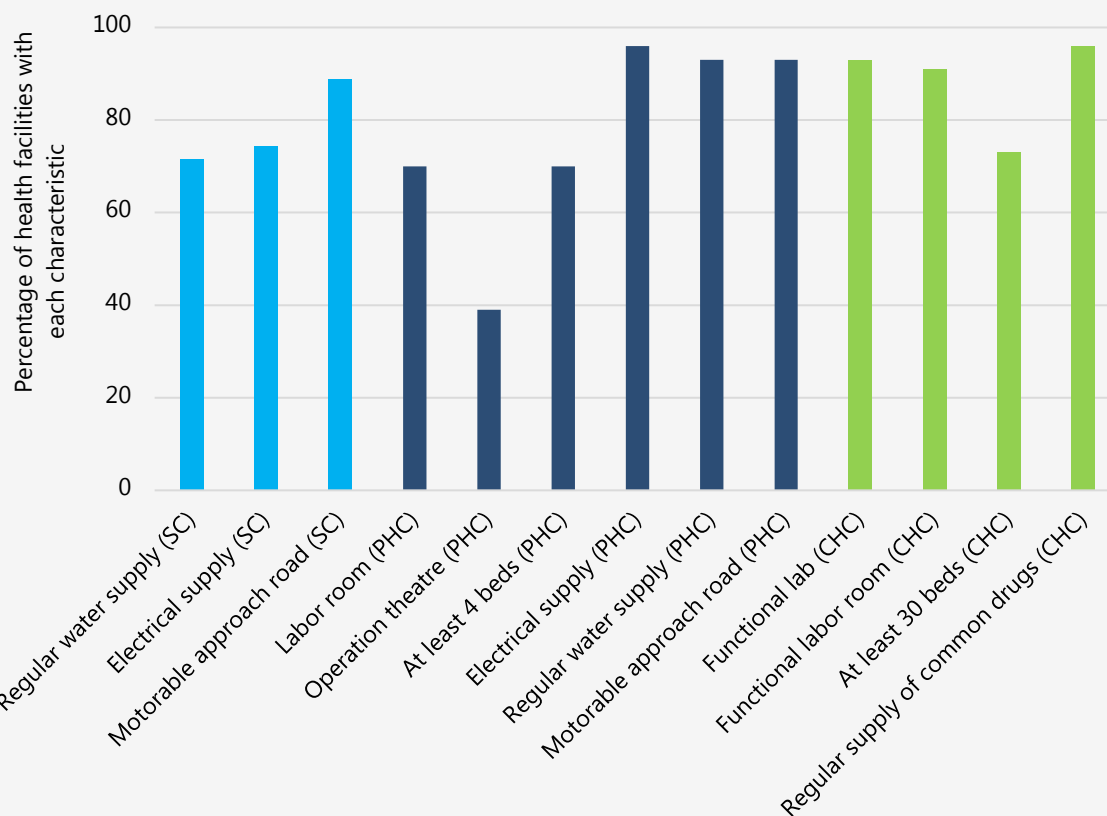
Clinical providers' skills and competencies. Although providers in urban areas are likely to have more medical qualifications than their counterparts in rural areas, one study comparing primary care center providers in rural and urban Delhi and Madhya Pradesh found little difference between the two groups in adherence to clinical guidelines; just over 30 percent of providers adhered to clinical guidelines in both settings (Das et al. 2012, 2015). The study also found that, regardless of setting, fewer than half of provider–client clinical interactions resulted in correct diagnoses and appropriate treatment, and providers frequently used harmful or unnecessary medications.

Facility resources. Many facilities are poorly equipped to provide maternal health services. Almost one-third of rural health subcenters lack a regular water and electrical supply—

elevating the risk of infection. Running water and electricity have been found as protective factors against maternal mortality among women with uncomplicated pregnancies, who often deliver at subcenters (Figure 6; Muldoon et al. 2011). In addition, one-third of PHCs lack labor rooms, and some hospitals perform surgical procedures such as Caesarean sections with no onsite blood banks or reliable anesthetics, further increasing the risk for unmanaged pregnancy complications (Hulton et al. 2007; Ghodki and Sardesai 2014; Jadon and Bagai 2014).

Suggested strategies to fill gaps in quality of clinical care focus on clinical provider placement and training. Experts recommend placing skilled teams at PHCs that have the capacity to provide 24-hour care for normal labor and childbirth and to manage or make referrals for patients experiencing complications during labor, childbirth, and the immediate postnatal period (Sharma et al. 2015). In addition, training and feedback were found to reduce unnecessary and potentially harmful interventions, such as non-medically-indicated Caesarean sections, labor augmentation, episiotomy, and intense manual fundal pressure, at CHCs and district-level hospitals (Iyengar et al. 2014). Experts also indicate that training providers in evidence-based clinical guidelines pre-service *and* in-service, and training programs linked to certification, registration, and career progression mechanisms establish and reinforce necessary knowledge and competencies of providers (Sharma et al. 2015).

Figure 6. Status of health facilities in rural India, 2015



Source: Ministry of Health and Family Welfare, 2009, 2010, 2011, 2012, 2013a, 2014a, 2014b, 2015b.
SC = subcenter; PHC=primary health center; CHC= community health center.

B. Quality of patient experience with care (patient-centered)

Care that considers the patient as the center of the health system has been shown to be associated with faster healing, improved psychological health, and reduced unnecessary health service utilization (Bauman et al. 2003; International Alliance of Patients' Organizations 2007; Dickson et al. 2007). In India, stakeholders have increasingly recognized that patient-centered care contributes to quality improvement. However, this component of quality has not yet been widely adopted at the provider, facility, and system levels of health care:

- **Provider level.** The few studies in India on patient–provider interactions have shown high satisfaction among patients. One study reported that more than 80 percent of patients reported that they were satisfied with their treatment and care (Ardey and Ardey 2015). However, these patients indicated barriers to obtaining explanations about medications and treatment options, and also described a lack of respect, empathy, and compassion (or cultural competence) from their health care providers. In extreme cases, women have recounted slapping and pinching by attending clinicians in response to their screaming during delivery (Khan 2010; Chattopadhyay 2015). Such stories have deterred some women from seeking care and delivering in health institutions.
- **Facility level.** At facilities, especially within the public sector, patients often experience a lack of privacy, overcrowded rooms, and inadequate amenities. These shortcomings in services further undermine patient-centeredness within the health system (Ardey and Ardey 2015; Narichiti 2013).
- **Systems level.** The health system of India has adopted the largely western didactic model of providing care, which focuses on the disease rather than the person, and has incorporated few of the cultural values and traditions of India (Bauman et al. 2003). As a result, health information and services often are not tailored to India's populations; in particular, minorities, marginalized groups, and youth are at the highest risk of poor outcomes (Greene 2013). In this system, patients may become unwilling to go to facilities for necessary care.

Several experts have indicated that barriers to patient-centered care include inadequate human resources, supplies, and infrastructure to address the growing demand for services and a fragmented health service delivery system (Ardey and Ardey 2015). For example, provider shortages in certain areas mean that clinicians spend less time with each patient, and equipment and supply shortages mean that providers often spend more time cobbling together solutions and less time working with patients to understand their needs. However, resource constraints likely do not completely explain barriers to practicing patient-centered care. Other obstacles cited include lack of cultural competency training among providers, provider absenteeism, and corruption. Providers regularly demand bribes and often fail to acknowledge women's priorities and values (Sahayog 2012; Gale and Gokhale 2014; Transparency International 2006; Thaddeus and Maine 1994; Green et al. 2013).

C. Influence of health system context on quality of care (accessible, efficient, and equitable)

The contextual components of quality include factors that influence clinical providers' behaviors in delivering care and patients' actions in utilizing care. For instance, facilities with

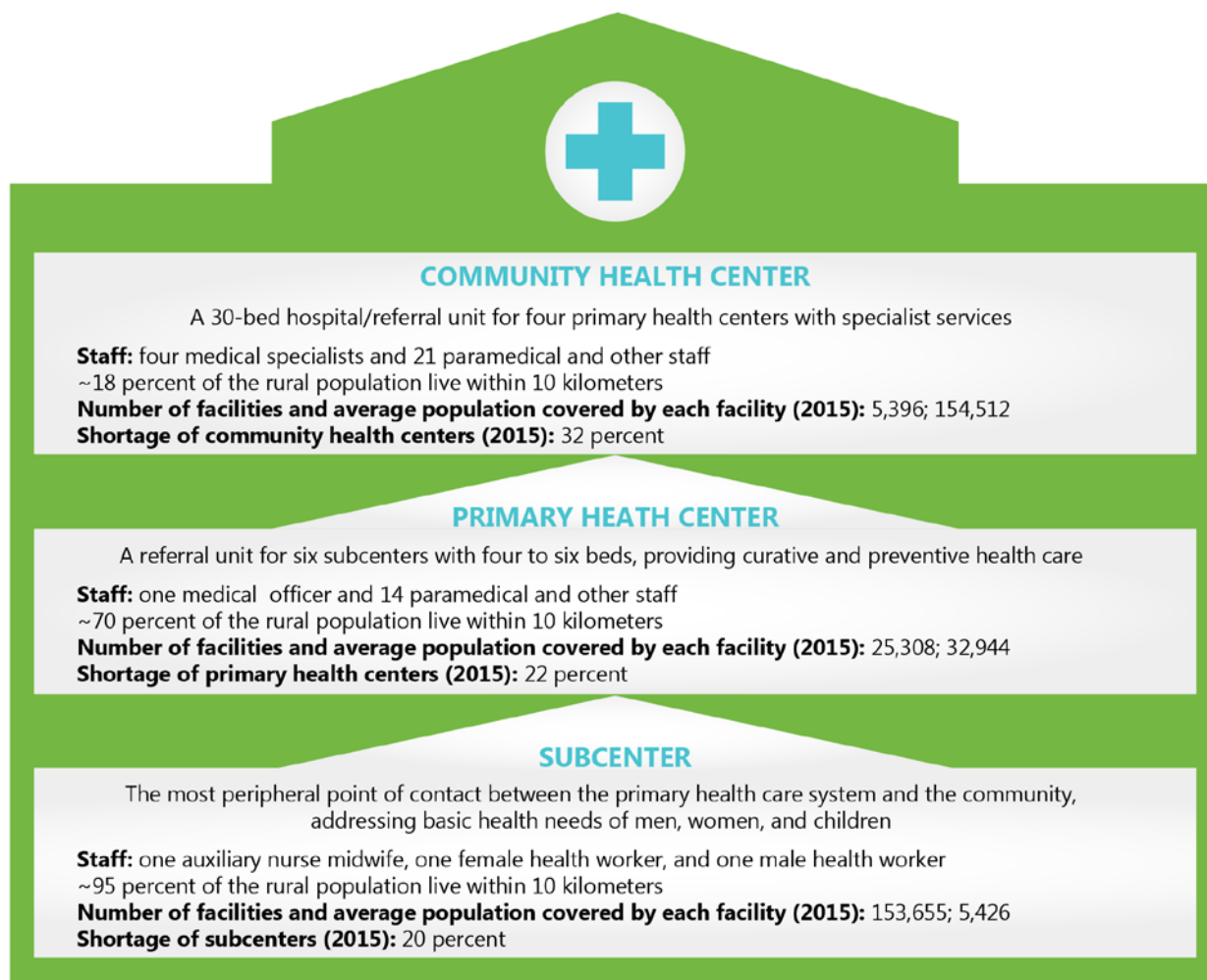
smooth and efficient operations enable clinical providers to deliver timely care. Location of staff and facilities in areas aligned with the needs of the population will facilitate patient use of services and appropriate management of health conditions. However, in India, the current distribution and supply of medical facilities and providers make quality health care services inaccessible to some populations. In addition, out-of-pocket expenses pose obstacles to poor and marginalized populations, many of whom live in rural areas or urban slums. Marginalized populations are also often treated poorly when they seek care due to India's hierarchical culture, which manifests itself through inequities in treatment by gender, family, caste, and class. Below, we further detail the inequities in distribution and supply of facilities and the clinical workforce as well as in utilization of services.

Distribution and supply of facilities. A key contextual or structural dimension of quality in health services includes geographical distribution of care in a manner aligned with population needs. In India, approximately 67 percent of the population live in rural areas (World Bank 2017a; Ministry of Health and Family Welfare 2014). However, only one-quarter of India's health infrastructure, including providers and facilities, is located in these areas. In contrast, urban areas, where only one-third of India's population live, account for 75 percent of the health infrastructure (Dasgupta 2013).

Not surprisingly, rural areas experience shortages of health care facilities in all three tiers of India's public sector rural health system (Figure 7). The largest shortages in rural areas occur at the CHC level, which provides the most advanced care, such as complicated delivery and emergency obstetric care. Still, shortages in facilities at the PHC and subcenter levels indicate that at least one-fifth of the rural population cannot have their most basic medical needs met through regulated public sector facilities; such basic health needs include antenatal, natal, and postnatal care; family planning services; treatment of common illnesses; prevention of malnutrition; and receipt of benefits from various national health programs, such as that for immunization and supplementary nutrition. To access public sector facilities, many rural residents must travel long distances and wait for treatment when they arrive (Thaddeus and Maine 1994; Green et al. 2013; George 2007). Access to facilities is further reduced during the monsoon season, when roads can be inaccessible, especially for the roughly 10 percent of subcenters and PHCs that can be accessed only on foot (Rural Health Statistics Reports 2009–2015).

As an alternative, many people opt to go to private sector facilities. In fact, private facilities serve approximately 70 percent of households in India and have experienced a steady increase in usage over the past 25 years (International Institute for Population Sciences 2007; Kannan 2013). These facilities also account for approximately 40 percent of all deliveries (International Institute for Population Sciences 2014). Much of the public in India perceives private facilities as higher in quality than public ones, even though public facilities are subject to more rigorous standards and regulations (Das et al. 2015). These perceptions are based on factors such as cleanliness, effort of and interactions with the medical provider, wait times, and facility supplies; however, research has shown that public and private sectors do not differ in terms of appropriate treatments and harmful practices.

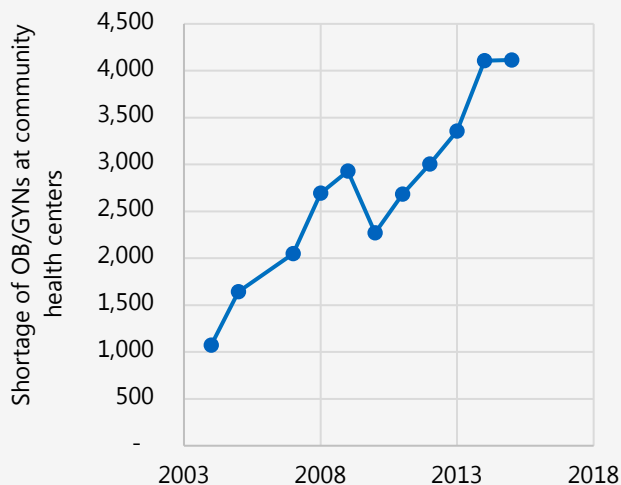
Figure 7. Distribution and supply of health care in India's three-tier rural public sector health system



Source: International Institute for Population Sciences 2015.

Distribution and supply of the health care workforce. Parallel to the distribution of facilities, only one-quarter of public-sector clinical providers reside in rural areas (Sundararaman and Gupta 2010). Many providers are unwilling to work in these areas. This shortage of trained health care professionals in rural areas exacerbates the challenges patients face in obtaining care aligned with their health needs. In the context of maternal health in particular, the WHO estimates that 2.5 health professionals per 1,000 patients are needed to ensure that skilled attendants are present at births (Paul et al. 2011). The Indian public health system falls short of this benchmark with 1.35 health professionals per 1,000 patients (UK House of Commons International Development Committee 2011). The current supply of OB/GYNs translates to 0.25 OB/GYNs per community health center with each center serving about 75,000 women (Ministry of Health and Family Welfare 2005–2015). Furthermore, the Indian Ministry of Health and Family Welfare recorded in recent years the highest level of OB/GYN shortages at the CHC level in the country's history, with 4,115 unfilled OB/GYN positions (Figure 8).

Figure 8. Shortage of OB/GYNs at community health centers in India, 2004–2015



Source: Ministry of Health and Family Welfare 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013a, 2014a, 2014b, 2015b.

OB/GYN = obstetrician/gynecologist.

To address some of the workforce shortage, the NRHM introduced ASHAs, who work with ANMs at the subcenter and serve as the interface between the community and health system.¹ ASHAs receive performance-based compensation for promoting preventive health services, referral and escort services, construction of household toilets, and other health care delivery programs. In relation to maternal health, ASHAs are required to (1) help mothers develop a birth preparedness plan and (2) be trained to identify obstetric complications. However, few studies have shown that these FLWs are equipped for these tasks; rather, the research implies that ASHAs would benefit from further training, support, and supervision (Kochukuttan 2013; Khan 2010).

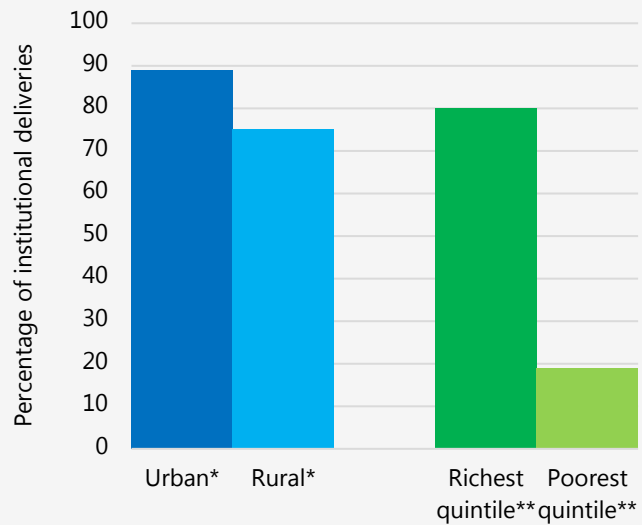
Disparities in service utilization. At the national level, access to and use of maternal health care have improved greatly across India, but barriers remain in certain populations. Most of the disparities correlate to socioeconomic status—poor mothers with lower levels of literacy, from scheduled castes, urban slums, and rural areas, are less likely than their counterparts at other socioeconomic levels to receive and use maternal health care, including antenatal and postpartum care; they are also less likely to receive advice from clinical providers on key maternal health issues (Appendix A, Exhibit A.4; Vora et al. 2009). These populations have fewer resources to access the same preventive and curative services than wealthier counterparts (Balarajan et al. 2011). (Appendix A, Exhibit A.4 presents receipt of select maternal health services by socioeconomic status.)

However, disparities in health care utilization are observed even in services, such as institutional deliveries, for which the GOI has provided incentives and coverage for out-of-pocket expenditures through programs such as JSY (Figure 9; UNICEF 2011; Balarajan 2011). These observations indicate that factors other than patients' out-of-pocket costs, such as knowledge and awareness of services, cultural acceptance of use of services, the physical accessibility of care, and patient mistreatment at facilities, play a role in these observed patterns.

¹ In some areas, the ASHAs receive guidance from Anganwadi workers, a position created through the Integrated Child Development Services program to provide supplementary nutrition, nonformal preschool education, nutrition and health education, immunization, health check-ups, and referral services.

Hence, having policies and programs that increase access and coverage of maternal health care is not sufficient to increase its utilization, meet the needs of all populations, and ultimately improve maternal health outcomes. For existing policies and initiatives to be effective and equitable, the health care system may require further investments to (1) expand the supply of health services; (2) address knowledge and cultural barriers for marginalized populations, and (3) increase measures to improve the quality of service provision across all types of facilities.

Figure 9. Institutional deliveries in India by socioeconomic Group



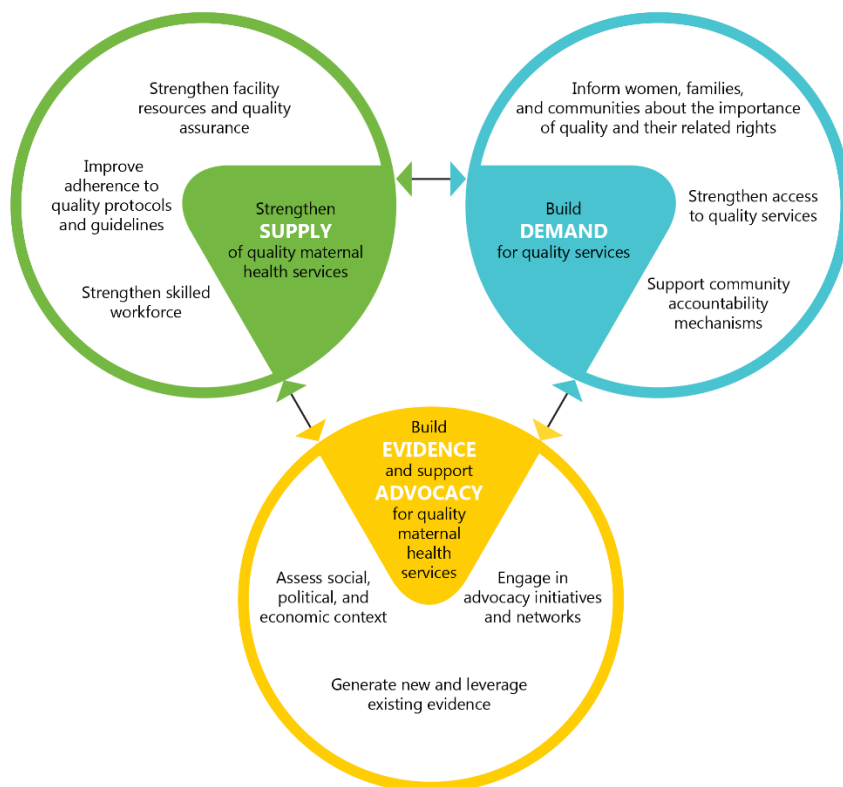
Source: UNICEF 2016.
 *2014
 **2008

III. EVIDENCE ON INTERVENTIONS TO IMPROVE MATERNAL HEALTH QUALITY OF CARE

Although quality of care has become more visible in the past few years as a key means of meeting the UN Millennium Development Goals for maternal health, interventions to support it have been ongoing for two decades. During this time, researchers have conducted a number of studies to assess their implementation and outcomes. This chapter highlights key findings from several of these studies; the full list is available in Appendix B, Exhibit B.1.

A review of 22 studies covering both governmental and nongovernmental initiatives in 15 states showed that interventions targeting maternal health quality of care usually address multiple quality dimensions (Figure 5). For instance, an intervention to train providers on cultural competence may also address patient-centeredness and equity in delivery of care. (See Appendix B provides for brief summaries of the studies included in this review.)² Given the crosscutting nature of these interventions and the key purpose of the review to provide context to the MacArthur Foundation’s maternal health quality of care grantmaking strategy, we organized the studies according to the strategy’s three main levers for achieving quality: (1) supply, (2) demand, and (3) advocacy. Figure 10 presents the conceptual framework for the strategy (MacArthur Foundation 2016). Supply interventions include those aimed at improving the delivery of health services to reproductive-age women. Demand interventions focus on increasing awareness about maternal health, including women’s rights and entitlements, available resources, increasing women’s use of services, and improving accountability for health services. Advocacy interventions generate evidence on trends, needs, and outcomes related to maternal health and bring this information to decision makers to effect changes in policies and programs at national or local levels. These levers are interrelated and reinforce each other. For instance, evidence and advocacy for maternal health quality of care can increase both supply of and demand for these services as communities and policymakers become aware of the need for them. Alternatively, increase in supply of quality services can spur advocacy and demand as stakeholders observe the benefits of quality services and seek more of them.

² The review does not encompass all studies of maternal health interventions in India but represents a sample of relevant, recent studies related to access to and quality of maternal and reproductive health care in India. We reviewed rigorous studies using experimental, quasi-experimental, and non-experimental designs to assess the outcomes or impacts of maternal and reproductive health programs and policies. The studies we reviewed assess interventions focused on the supply of (6 studies) and demand for (17 studies) quality maternal health care; one study addressed both demand- and supply-side interventions. No evaluations of advocacy interventions were found.

Figure 10. Levers for improving maternal health quality of care in India

Source: MacArthur Foundation 2016.

A. Supply-side interventions

Supply-side interventions can increase the availability and accessibility of high quality maternal health care. Specifically, training and supporting health care providers can expand the cadre of providers who can offer maternal health services and ensure that they offer high quality, evidence-based care. At the same time, strengthening resources and quality-assurance practices at facilities can ensure that providers have the institutional supports required to deliver high quality care. Through improved adherence to quality protocols and guidelines, providers and facilities receive the guidance they need to ensure that the care they deliver meets the highest standards.

What the evidence says about strengthening the supply of maternal health quality of care

- Nurses and midwives can be trained to provide abortion care with outcomes comparable to those of physicians.
- Increased supply of emergency maternal health services may increase appropriate use of medically indicated Caesarean sections.
- Training for clinicians and program managers combined with accountability measures can improve provider- and facility-level adherence to evidence-based practices.

Strengthen skilled workforce. Several studies show that training midlevel providers to deliver maternal health services, as opposed to relying on physicians, can increase the supply of care without compromising quality of care. One intervention, developed and implemented by Action Research and Training for Health (ARTH) and funded by the MacArthur Foundation provided training to nurse-midwives to detect and manage delivery-related complications and make referrals in Rajasthan (Iyengar and Iyengar 2009). These trained midwives significantly improved women's access to skilled maternal and neonatal care in rural areas, successfully managed maternal complications, and effectively referred patients for higher level care as needed. Another study assessed the potential for nurses to provide safe, effective abortion services. By law, these services can be conducted in India only by trained physicians and only if medically indicated (Jejeebhoy et al. 2014). Many women who are unable to travel to a facility with a trained physician, cannot afford the procedure, or have other personal reasons for doing so seek unsafe abortions performed by unskilled or unregistered practitioners, putting these women at higher risk for maternal mortality (Montgomery et al. 2014). Janani, a nongovernmental organization, provided training to nurses and physicians in Bihar and Jharkhand on abortion methods consistent with government guidelines (Jejeebhoy et al. 2011). For a sample of 897 women seeking abortions, the findings showed that the trained nurses had skills in assessing eligibility and performing the procedure comparable with those of trained physicians. Thus, appropriately trained nurses could provide a safe and effective alternative to physician-performed abortions to increase capacity for safe abortions.

Strengthen facility resource and quality assurance. Many of the interventions studied related to facility resources for improving quality of maternal health services focused on increasing emergency obstetrics and neonatal care and coordination. As part of the Tamil Nadu Health Systems Project (2005–2015), the government of the state of Tamil Nadu created 80 comprehensive emergency obstetrics and neonatal centers and purchased 385 ambulances to improve the effectiveness of the state's health system. The proportion of appropriate Caesarean sections and women receiving ambulatory services increased during the program period by 11 and 9 percentage points, respectively (World Bank 2011, 2015). Another study showed that setting aside resources to ensure the completion of referrals to existing resources was effective in improving use and timeliness of maternal health care (Iyengar and Iyengar 2009). The ARTH training program included a system whereby nurse-midwives offered comprehensive referral support and care coordination—explaining the reason for referral to patients, hiring transport, accompanying them to the hospital, and facilitating timely admission (Iyengar and Iyengar 2009). Of the 283 women who complied with their referral, 95 percent received treatment at the hospital (3 percent delivered in transit to the hospital, and 2 percent returned to the health center without treatment). This finding indicates a large increase; other studies have found that, on average, only about 10 percent of women referred completed the referral (Hitesh 1996).

Improve adherence to quality protocols and guidelines. Another ARTH study in Rajasthan, supported by the MacArthur Foundation's current maternal health quality of care grantmaking strategy, demonstrated that training clinicians and program managers improves adherence to evidence-based practices and significantly reduces harmful practices (Iyengar et al. 2014). Visits to the facilities, interviews with women and providers, use of assessment checklists, and delivery observations showed that all but one of the eight measured incorrect practices decreased significantly, and three of nine correct practices increased to a statistically significant degree. The study also found that overall scores (that is, aggregate scores for provider

practices, facility maintenance, and materials availability) for hospitals increased in all but 3 of the 44 facilities included in the study. Accreditation of facilities is another strategy for improving the quality of facilities. For example, the Federation of Obstetric and Gynecological Societies of India (FOGSI), a current MacArthur Foundation grantee, has developed Clinical Standards for Accreditation to Ensure Safe Delivery, which require facilities to meet a number of measures of quality (FOGSI n.d.). However, no studies were found assessing the effect of accreditation on continued quality at facilities.

B. Demand-side interventions

Demand-side interventions focus on reducing barriers to seeking maternal health care and empowering community members to request higher quality care. These interventions include efforts to inform women, families, and communities about their rights to high quality care. Complementing these education efforts are community-led strategies to hold the government and providers accountable for providing mandated, quality services. Such community accountability mechanisms serve to monitor the quality of care provided within the health system and offer a formal mechanism for ensuring that care meets official standards. Finally, financial incentive programs aim to increase demand for care by reducing financial barriers to institutional care.

What the evidence says about building demand for quality maternal health care

- Targeted community-based education campaigns can be effective in increasing women's knowledge of and demand for quality services, but the message may lose effectiveness when combined with large amounts of other information.
- Although cash incentive programs can increase institutional deliveries, institutional deliveries do not appear to reduce maternal mortality rates at this time; further opportunities may exist to improve quality of care within institutions.
- Although there is little rigorous evidence on the impact of community accountability mechanisms on maternal health quality of care in India, anecdotal evidence is positive, especially for the use of maternal death reviews to inform policymakers and providers.

Inform women, families, and communities about the importance of quality and their health entitlements and rights to increase demand for quality maternal care. Several studies provided mixed results on community-based information and mobilization campaigns' effect on increasing the knowledge and attitudes of women, their families, or their caregivers as a means for increasing demand for quality care and improving health outcomes. Results seemed to vary by mode of community education. Delivering targeted messages through media campaigns generally was more effective than peer education, and focused messages were more effective than initiatives that provided large amounts of information. Four studies in India, including one that reviewed an intervention implemented by Ipas, a current MacArthur Foundation grantee (Banerjee et al. 2013), showed that community-based information and mobilization campaigns resulted in changes in maternal and reproductive health knowledge, attitudes, and, in some cases, demand for quality health services (Kumar et al. 2011; Banerjee et al. 2013; Leon et al. 2014; Achyut et al. 2016). Participating women increased their knowledge about the warning signs during pregnancy and labor and the legality of abortion (Kumar et al. 2012; Banerjee et al. 2013). Women and their families also changed their attitudes, recognizing a woman's autonomy in family planning decisions and increasing their acceptance of abortion

(Leon et al. 2014; Banerjee et al. 2013). Some interventions also increased women's demand for qualified health care providers, birth preparedness and planning, modern methods of contraception, and discussions with health care providers and others about warning signs and symptoms (Kumar et al. 2012; Banerjee et al. 2013; Leon et al. 2014; Achyut et al. 2016). Some of these studies also showed that women receiving health education were less likely to experience pregnancy and labor-related issues.

Less promising, however, were studies of two other community information and mobilization campaigns: one in Jharkhand and Orissa that provided education and training to both pregnant women and birth attendants and one in Mumbai that consisted of group meetings of women who shared perinatal experiences, learned about the importance of maternal health care, and discussed maternal health services available in the community (Tripathy et al. 2010; More et al. 2012). An evaluation of the intervention in Jharkhand and Orissa showed no effect on women's health care-seeking behavior, though the authors did note positive impacts on neonatal mortality and on the birth attendants' adherence to evidence-based practices. Similarly, the intervention in Mumbai showed no impact on demand for antenatal care, institutional delivery, or other care-seeking behavior.

Strengthen access to quality services. Financial incentive programs have been widely used to increase demand for quality services. Among the best known is the JSY program—a national government conditional cash transfer initiative that provides a monetary incentive to women who give birth at health institutions, which are assumed to provide higher quality services than a home birth. Seven studies saw large increases in institutional deliveries with the implementation of JSY (Khan et al. 2010; Lim et al. 2010; Randive et al. 2013; Amudhan et al. 2013; Gupta et al. 2012; Ng et al. 2014; and Powell-Jackson et al. 2016). No studies, however, linked JSY to reductions in maternal mortality rates. One study did find that the program decreased maternal depression by as much as 36 percent, and another study found that institutional deliveries were associated with improved postpartum child and maternal care behaviors (Khan et al. 2010; Lim et al. 2010; Randive et al. 2013; Amudhan et al. 2013; Gupta et al. 2012; Ng et al. 2014; Powell-Jackson et al. 2016; and Mohanan et al. 2014). Furthermore, a study of the Chiranjeevi Yojana cash transfer program to cover the costs of deliveries in private sector hospitals for poor women in Gujarat found no increase in institutional deliveries and little to no decrease in household expenditure on deliveries (Mohanan et al. 2014). These studies suggest that financial incentives may increase demand for institutional deliveries but are not sufficient for improving maternal health outcomes; quality of services once women enter a facility may be the missing link in achieving desired outcomes.

Support community accountability mechanisms to demand high quality care. Although there is little rigorous evidence on the impact of accountability mechanisms on maternal health quality of care in India, numerous studies evaluating accountability mechanisms in other policy areas and in other contexts have shown that they are effective at spreading awareness among community members about their rights and entitlements, generating feedback on the quality of a public service, and holding service providers accountable (Banerjee and Duflo 2006; Bjorkman and Svensson 2009). Mechanisms for community accountability include community score cards, participation in feedback forums with government officials and providers, and call-in helplines where patients can report concerns. Anecdotal evidence from accountability interventions that focus on improving maternal care in India has been positive. For

example, data from a helpline created for patients to report bribery from health providers were used to inform patient welfare committees about the extent of the problem. Nongovernmental organizations have used maternal death reviews to hold providers accountable, identify areas for improving maternal health care, and demand improvements. To date, maternal death reviews by organizations funded through the MacArthur Foundation's current grantmaking strategy, such as the Center for Health and Social Justice (CHSJ) and the Society for Health Alternatives (SAHAJ), have uncovered systematic malpractice within health facilities. These organizations have also used the reviews as an advocacy tool to inform government officials and demand effective remedies.

What the evidence says about building evidence and supporting advocacy for quality maternal health services

- Evidence about the effect of maternal health interventions has led to large-scale adoption and funding by the government.
- Numerous local, state, and national policy advocacy initiatives have been and are currently being implemented in India. However, little evidence has been generated about their effect on maternal health access, quality of care, and outcomes.

C. Advocacy interventions

Advocacy interventions generate the information and/or attention needed to support supply- and demand-side efforts to improve quality. They require an understanding of the social, political, and economic contexts of maternal health quality of care. By generating new evidence and leveraging existing evidence on quality of care, researchers and advocates can help build the case for the importance of quality and ways to ensure it. This evidence can then be used to buoy advocacy initiatives and networks, including grassroots civil society organizations and national and regional advocacy efforts.³

Assess social, political, and economic context. Several organizations conduct research to fill important gaps in the evidence base of maternal health. Specifically, the Guttmacher Institute, with support from the MacArthur Foundation, conducted an in-depth analysis of the incidence of abortion in India and the maternal and social factors associated with it—information not previously collected in a systematic way—to illustrate the demand for quality abortion services and implications under current abortion policies and practices. The purpose of the evidence is to assist practitioners and policymakers in understanding the barriers to safe abortion (Stillman et al. 2014; Pallikadavath 2006).

Generate new and leverage existing evidence. Many of the studies highlighted in this chapter demonstrate the types of maternal health evidence generated. Such evidence has been used to influence policies and programs at the national and state levels. For example, the Population Foundation of India (PFI), in partnership with Community Action for Health, implemented a community accountability program in which communities used report cards to provide feedback on health care received (B. Roy, personal communication, September 21, 2016). The program's evidence of effectiveness, generated from the 2009 pilot, along with tools and guidance PFI created under a grant from the MacArthur Foundation, led to its scale-up to 22 states in 205 districts, fully funded by the NRHM and with technical assistance from PFI.

³ See Exhibit A.5 for more information on India's maternal health networks.

Engage in advocacy initiatives and networks. In the past decade, civil society organizations have begun forming coalitions and networks to undertake research and advocacy in several domains, including maternal health. These networks bring together multiple organizations to raise the profile of maternal health issues. For example, WRAI, which now comprises 1,800 organizations, organized the March to the Taj in 2001. Thousands of citizens, celebrities, health workers, and media staffers participating in the march brought much attention to maternal mortality in India. Following the march, WRAI began receiving MacArthur Foundation funding for population and reproductive activities. In addition, the GOI, through consultation with the WRAI affiliates, reformed policies to allow nurses to perform life-saving procedures that previously only physicians could perform and expand the reach of the services to rural women (WRAI 2016).

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IV. FURTHER OPPORTUNITIES IN MATERNAL HEALTH QUALITY OF CARE IN INDIA

The evidence presented in Chapter III on supply-side, demand-side, and advocacy interventions suggests promising approaches to improving maternal health quality of care in India. Still, evidence is only emerging about the best practices in implementation and their effect on maternal health outcomes. Consequently, these approaches are not yet widely used. Recognizing the need for further evidence, the MacArthur Foundation is supporting through its maternal health quality of care grantmaking strategy the testing and development of tools to implement and scale up several approaches. This section further characterizes key approaches within supply, demand, and advocacy that could help address the gaps in maternal health quality of care.

A. Increasing supply by expanding health care staff roles and access to facility care

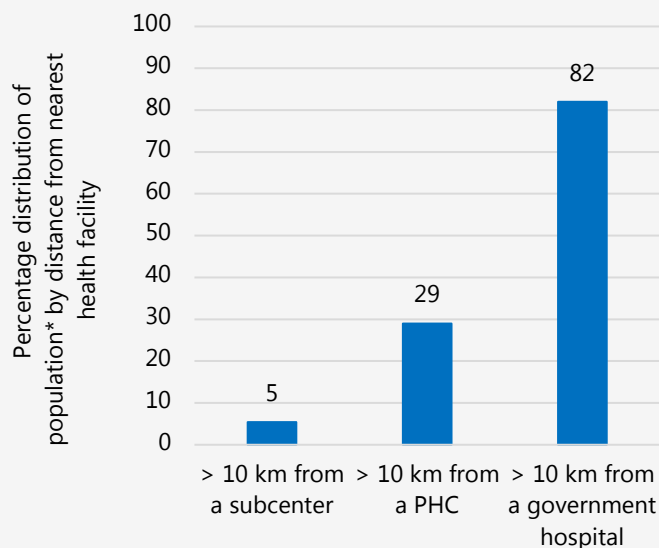
As discussed previously, the uneven distribution of quality maternal care prevents marginalized populations from receiving appropriate care. Based on the review of evidence in the literature, the following supply-side improvements could increase the availability and quality of maternal health services and improve patient outcomes.

Expanding staff roles and responsibilities. Given the structure of India's health system, women with pregnancy-related complications must seek care at a CHC, which is the first level of care to employ an OB/GYN. These centers are difficult to reach and require women to have a referral to receive services. In addition, some women referred from lower level centers arrive at higher level centers only to be told their medical issue should be treated at a lower level facility—causing confusion about where to go and leaving them unable to reach the provider most appropriate for their needs (George 2007). Furthermore, poor referral infrastructure and care coordination can prevent women from receiving continuity of care as they move from lower level to higher level centers.

Interventions for improving the referral and coordination process include training midwives at lower level health facilities on pregnancy danger signs and enabling them to make referrals to the appropriate facility, communicate referral recommendations to families, accompany women to referral facilities, and ensure the women receive care at the referral facility. Similarly, training nurses to counsel families on the use of contraceptives, as well as training nurses to provide abortion services, could reduce some of the barriers to meeting the family planning needs of women and their partners.

Equity in access to facility-level care. The distance a patient must travel has been shown to be a key barrier to seeking and receiving health care, especially for rural populations (Thaddeus and Maine 1994). Approximately 5 percent of Indian women live more than 10 kilometers from a health subcenter, where uncomplicated deliveries can be performed. Moreover, almost one-third of women live more than 10 kilometers from a PHC, which addresses more complicated deliveries (Figure 11). These long distances are mainly experienced by women living in rural areas. Some of these issues may be addressed as India's transportation infrastructure improves, but other helpful measures would include training more staff at mid-level and lower-level facilities to deliver care and improving incentives for skilled providers to work in rural areas.

Figure 11. Distance to health facilities, 2008



Source: International Institute for Population Sciences 2006.

* Based on a sample of villages

PHC = primary health center.

B. Improving demand through health empowerment and community accountability

Several initiatives, such as conditional cash transfer programs, over the past 15–20 years have been shown to increase women's demand for institutional deliveries. Although this finding represents an important step toward improving maternal access, women must understand what their rights are when accessing care, feel empowered to ask for care, and have a mechanism for ensuring the quality of their care. Studies have shown that women who interface with the health system and have positive experiences continue to use care (Bloom et al. 1999; Dhillon and Yadav 2013). They are also likely share their experiences with other women and drive overall community utilization of appropriate care.

Health empowerment. Within India's hierarchical society, women feel relatively low levels of empowerment; in this environment, a key constraint to a woman's demand for health services is her lack of knowledge about her rights to and need for these services, as well as their availability and usefulness to her. Two studies, one in a low MMR state (Maharashtra) and one in a high MMR state (Manipur), suggest that fewer than 60 percent of women have adequate knowledge about antenatal behaviors and appropriate care (Patel et al. 2016; Laishram et al. 2013). Health information and counseling provided at the community level or during care could help improve women's knowledge about services, avoid misconceptions about care, and help women make informed decisions about why, when, and how to request care and engage in self-advocacy for quality services. Studies suggest that women who are more empowered to make decisions about their reproductive health tend to use more reproductive and maternal health services and choose options aligned with their needs (Leon et al. 2014; Bloom 2001; Patra et al. 2014).

Community accountability. Accountability mechanisms can help ensure that funding reaches its destination and that well-meaning policies and programs are implemented as intended, counteracting some of the barriers cited to accessing quality care such as poor provider practices, lack of facility resources, and corruption in the health system. Though community accountability is featured as a key quality assurance strategy within the NRHM, it has faced several political and other barriers to implementation to date. Several donors fund activities that mobilize community members to provide policymakers with information and feedback about community experiences and needs in India. Accountability mechanisms, however, require the government and providers to be open to receiving and addressing feedback. Organizations such as SAHAJ continue to explore approaches to improving government, provider, and community communication, emphasizing accountability and a participatory approach among all stakeholders.

C. Supporting advocacy and evidence-generation by testing innovations, partnership networks, and legal action

A relatively large number of rigorous evaluations on maternal health interventions exist. However, given the diversity within the population, variation in maternal health status and needs across regions, and the myriad of potential policy and program opportunities, more research is necessary to develop a strong, comprehensive evidence base on maternal health quality of care in India. Advocates and policymakers can use this evidence base to inform the maternal health agenda.

Testing innovations. Creative organizations, with support from strategic donors, have been piloting and testing interventions that generate evidence on whether, how, and why maternal health interventions work, and have scaled these initiatives in partnership with state and national government programs. For example, the Population Foundation of India, in partnership with SEARCH, trained frontline community health workers to monitor maternal and child health outcomes through pregnancy. The project saw a 59 percent reduction in neonatal deaths in the 39 villages where it was piloted, and its success drove the National Health Resource Center to replicate and scale the model, training 800,000 ASHAs with support from the Population Foundation of India (Bang et al. 1999).

Partnership networks. Partnerships among maternal health organizations help to raise awareness of maternal health service quality issues among beneficiaries and policymakers. Existing networks of maternal health organizations and activists have led large campaigns that have successfully raised awareness about maternal deaths and abuse of women's human rights during labor or delivery (Human Rights Law Network n.d.). Awareness of the issues—and beneficiaries' and experts' support for them—can motivate policy change and increase funding and prioritization for maternal health. (Appendix A, Exhibit A.5 lists select maternal health networks operating in India.)

Legal action. Pursuing a legal approach could establish greater accountability from state and national governments for maternal health policies and programs. For example, the Socio-Legal Information Center (SLIC) has filed petitions and argued cases to improve quality of maternal health care in nearly every high court in India. This work has resulted in government investigations into harmful practices (for example, sterilization camps), improvements in government health policies and programs, and compensation for victims (SLIC 2015). Continued use of these advocacy tools could help ensure accountability and improvement in maternal health quality of care.

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V. CONCLUSION

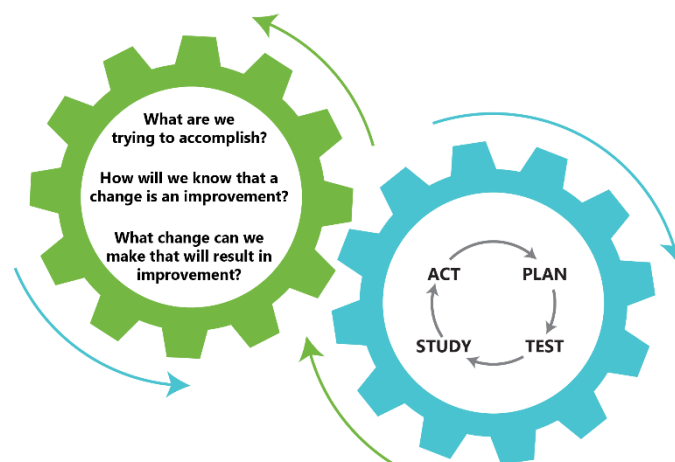
Reducing maternal mortality continues to be a part of the India's health agenda, and the NRHM maintains its prominence as a key government program. In addition, India's commitment to UN Sustainable Development Goals along with pressure from global and local civil society organizations are likely to keep the government focused on this area. Given this climate, the efforts to improve maternal health will also likely persist in India.

However, the government has provided little new funding for maternal health or even general health. Public health investments have stagnated in recent years, representing 1 to 2 percent of gross domestic product and placing India among the countries that provide the lowest amount of public health funding (World Bank 2017b, 2017c; Sharma 2016). Public health investments have focused on health protection programs that largely exclude maternal health, because they prioritize secondary and tertiary facilities, and most maternal health services are provided at the primary level. In addition, interviews with stakeholders by the authors indicate that in light of recent years' progress and the pressing burden of other preventable health conditions, such as noncommunicable diseases and trauma, prioritization for maternal health is declining.

Private foundations continue to fill the maternal health funding gaps and invest in innovation. But bilateral funders have reduced or ended development aid to India for maternal health, as they revise their funding priorities partly in response to India's notable maternal health achievements to date. The space for civil society organizations and nongovernmental organizations to bring in resources to catalyze and grow social movements and change has also shrunk in India due to these organizations' increasingly strained relationships with the government.

As fewer resources are available to sustain and fund improvements in maternal mortality, new and more cost-effective strategies are needed to meet India's goals. Previous donor investment, government prioritization, and an active civil society have positioned the maternal health quality of care agenda as a means of continuing the country's progress. Initial implementation of these interventions targeting quality in select regions shows potential. However, quality improvement will be an ongoing process that cannot end with discrete and time-limited interventions. Health care providers, facilities, and systems need to continuously assess their performance to identify areas for development (Langley et al. 2009; Varkey and Kollengode

Figure 12. Ongoing cycle for quality improvement



Source: Adapted from Langley et al. 2009.

2011; Sekar 2011). This process requires attention from people who can authorize and implement the change to (1) plan and identify clear and measurable aims, (2) test practices for improvement, (3) study the data to assess changes, and (4) continuously refine and scale up practices based on feedback (Figure 12). Without these requirements, progress and innovation will deteriorate. Thus, ongoing attention is critical to support the quality improvement cycle and drive the maternal health agenda forward.

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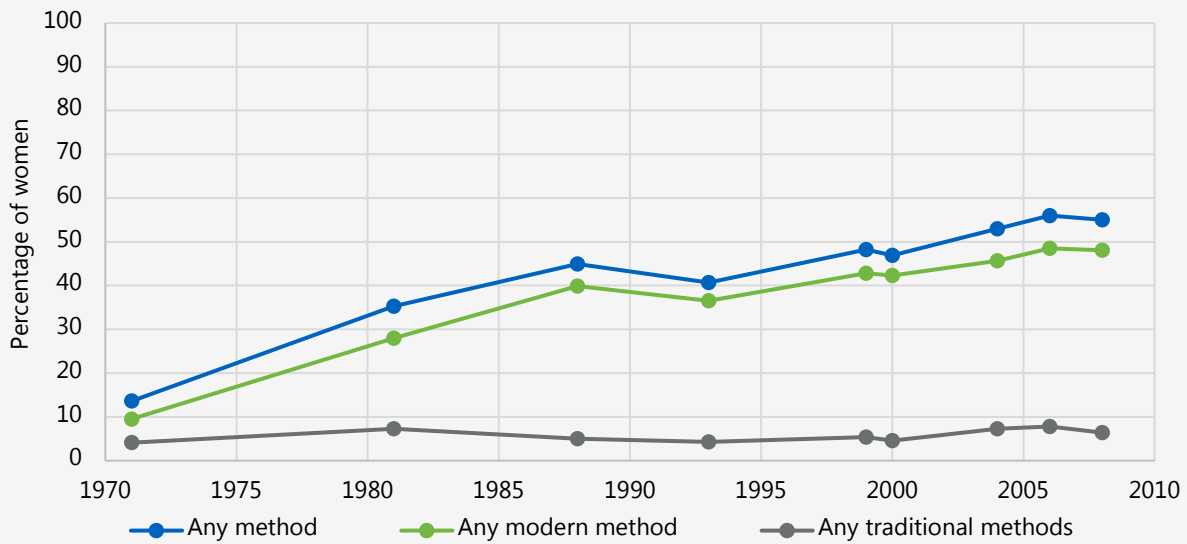
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APPENDIX A:
SUPPLEMENTAL EXHIBITS

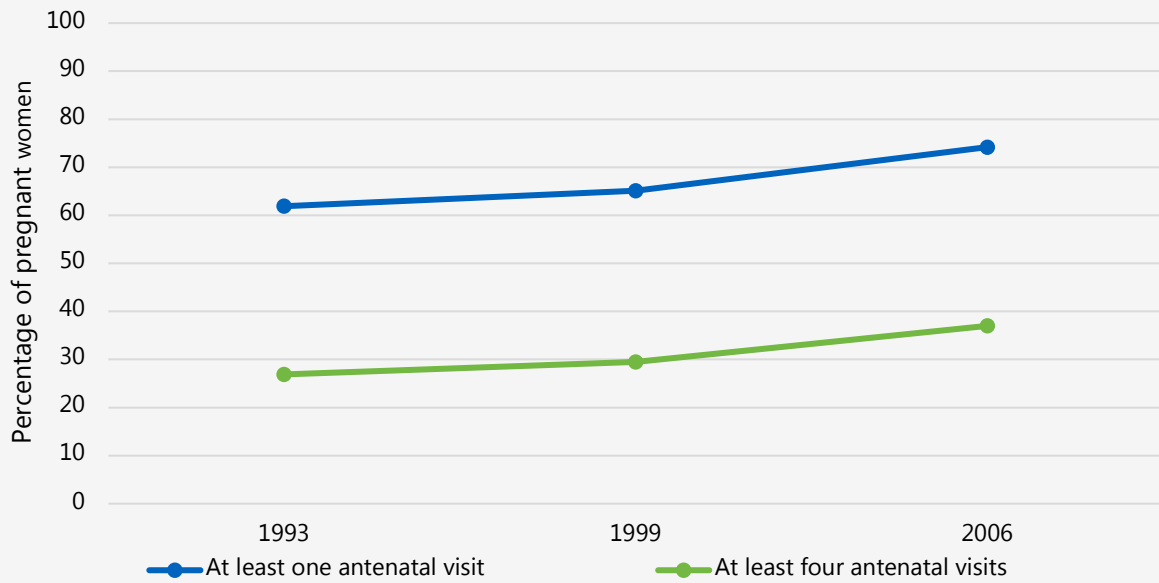
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Exhibit A.1. Increase in access: contraceptive prevalence in India, 1970–2010

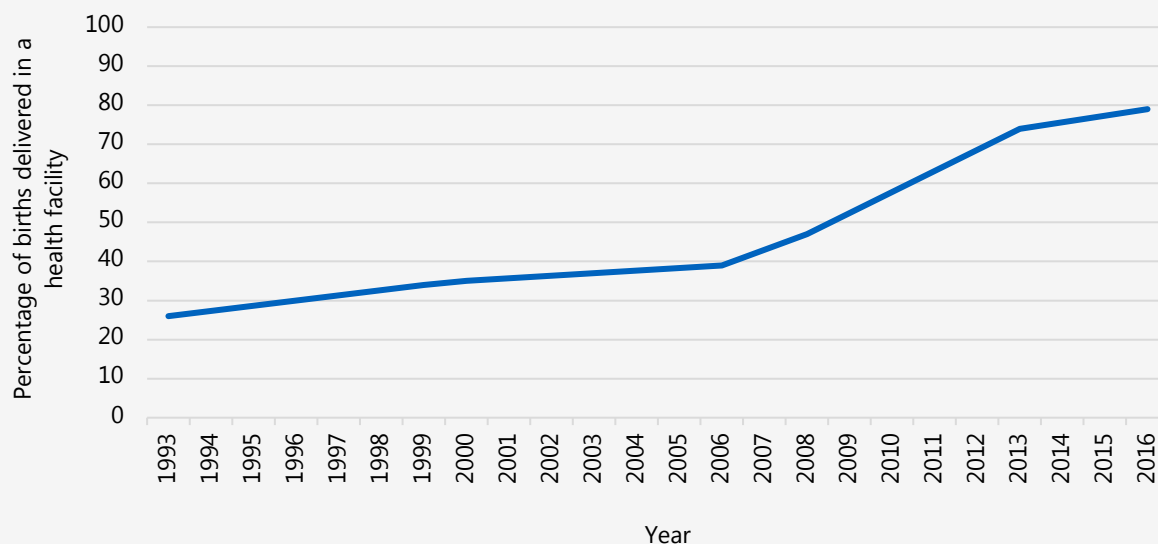


Source: United Nations Population Division, World Contraceptive Use 2016.

Exhibit A.2. Increase in access: antenatal care among pregnant women in India, 1993–2006



Source: Family Welfare Statistics in India 2011.

Exhibit A.3. Increase in access: institutional deliveries in India, 1993–2016

Source: UNICEF, Division of Data, Research and Policy 2016.

Exhibit A.4. Demographics of women receiving select maternal health services (2007 and 2008)

	Received antenatal care***	Received advice during antenatal care on:					
		Breastfeeding	Birth spacing	Limiting the number of births	Nutrition	Had an institutional delivery	Had a postnatal check-up
Geography							
Rural	NA	55%	37%	36%	52%	38%	NA
Urban	NA	69%	52%	48%	65%	70%	NA
Castes or tribes							
Scheduled castes	NA	58%	40%	39%	55%	NA	NA
Scheduled tribes	NA	60%	50%	38%	54%	NA	NA
Other backward classes	NA	58%	41%	39%	56%	NA	NA
Others	NA	63%	45%	42%	61%	NA	NA
Income							
Lowest income quintile	59%	43%	25%	25%	40%	19%	19%
Second income quintile	NA	48%	30%	30%	45%	29%	NA
Third income quintile	NA	57%	39%	38%	54%	42%	NA
Fourth income quintile	NA	63%	45%	43%	61%	58%	NA
Highest income quintile	97%	73%	56%	52%	70%	80%	79%
Education							
Nonliterate or literate but did not attend school	62%	45%	26%	26%	41%	NA	24%
Less than 5 years	NA	56%	37%	37%	54%	NA	NA
5–9 years	NA	63%	45%	43%	60%	NA	NA
10 or more years of education	98%**	74%	58%	54%	72%	NA	83%**

Sources: DLHS 2005; UNICEF, Division of Data, Research, and Policy 2016; Vora et al. 2009.

**12 or more years of education.

***Data for 2005–2006.

NA = not available.

Exhibit A.5. Select maternal health networks in India

Description of maternal health network
<p>Advisory Group on Community Action</p> <p>Established by the Government of India, the group supports a secretariat with an exclusive membership of civil society organizations, to monitor community health services delivery.</p>
<p>CommonHealth (the Coalition for Maternal–Neonatal Health and Safe Abortion)</p> <p>This network of 110 institutions and individuals includes health care providers, researchers, nongovernmental organizations, lawyers, activists, administrators, and advocates for better access to and quality of maternal and neonatal health and safe abortion services across 22 states in India.</p>
<p>Community of Practitioners on Accountability and Social Action on Health (COPASAH)</p> <p>These health practitioners focus on community monitoring for accountability in health work to strengthen the field by exchanging experiences and lessons learned; sharing resources, capacities, and methods; and networking and building capacity among member organizations.</p>
<p>Human Rights Law Network (HRLN)</p> <p>This network of 200 lawyers, paralegals, and social activists across 26 states in India aims to use the legal system to advance human rights and ensure access to justice for all. HRLN's Reproductive Rights Initiative combats violations of reproductive rights and demands accountability, including for maternal mortality and morbidity issues.</p>
<p>MerryGold Health Network (MGHN)</p> <p>This multitiered network of hospitals, clinics, and Ayush partners in 35 districts of Uttar Pradesh and Rajasthan aims to create access to low-cost, high quality maternal and child health services through private sector social franchising. MGHN targets low-income women and children and addresses antenatal, postnatal, safe delivery, contraceptive, family planning, and other reproductive health and family planning needs.</p>
<p>National Alliance for Maternal Health and Human Rights (NAMHHR)</p> <p>This national secretariat works in seven states, focusing on maternal health access, quality, and coverage.</p>
<p>Rajasthan White Ribbon Alliance for Safe Motherhood (SUMA)</p> <p>This alliance of civil society organizations, United Nations (UN) agencies, international nongovernmental organizations, government agencies, and individuals launched in 2002 advocates for a reduction of maternal and neonatal mortality in the state of Rajasthan.</p>
<p>Reproductive, Maternal, Newborn and Child Health Coalition (RMNCH+A)</p> <p>Created in 2012, this multistakeholder coalition composed of government agencies, academia, research and training institutes, health care professionals, local bodies, nongovernmental organizations, corporations, media agencies, donors, and UN agencies aims to provide advocacy and advisory support to improve RMNCH outcomes in India.</p>
<p>World Health Partners (WHP)—Uttar Pradesh</p> <p>This Sky Network of health care providers in three districts of Uttar Pradesh focuses on providing women with long-term contraceptive methods and providing prenatal care and birth preparedness information to ensure safe pregnancy and delivery.</p>
<p>White Ribbon Alliance for Health in India</p> <p>This international network of 1,800 organizations convenes advocates and campaigns to uphold the right of all women to be safe and healthy before, during, and after childbirth.</p>

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APPENDIX B:

STUDIES OF MATERNAL HEALTH INTERVENTIONS IN INDIA REVIEWED

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Exhibit B.1. Studies of maternal health interventions in India reviewed

Citation	Location	Study and intervention details	Evaluation methodology	Findings
Achyut et al. 2016 ^a	Uttar Pradesh	This study evaluated the impact of the Urban Health Initiative (UHI), which aims to increase the modern contraceptive prevalence rate, reduce maternal and infant mortality, and use evidence-based strategies aligned with the Government of India's programs for the urban community through postpartum and post-abortion family planning, provider training, expanding the role of the private sector, using media to promote demand, and using community health workers for outreach.	<ul style="list-style-type: none"> • Outcome evaluation 	<ul style="list-style-type: none"> • Women exposed to brochures, billboards, posters, wall hangings, and television content were significantly more likely to use a modern contraceptive method. • The study found borderline significance for exposure to a community health worker and living near an improved public and private supply environment where UHI was active.
Amudhan et al. 2013	Haryana and Punjab	This study examined the differential and sequential effects of Janani Suraksha Yojana (JSY), a government conditional cash transfer program for the socioeconomically disadvantaged, and of strengthening the primary health center (PHC) network to provide 24-hour obstetric care on promoting institutional deliveries. The intervention focused on two PHCs that adopted JSY and the 24-hour model and different points in time.	<ul style="list-style-type: none"> • Quasi-experimental design: difference-in-differences 	<ul style="list-style-type: none"> • Institutional deliveries nearly doubled among villages with access to 24-hour delivery services compared with villages with poor access. • Introduction of JSY in villages with poor access resulted in a 1.4-fold increase in institutional deliveries and a 1.1-fold increase in villages served by PHCs 24 hours a day. • The introduction of PHC 24-hour care to villages served by JSY doubled the rate of institutional deliveries. • Among the disadvantaged, institutional deliveries increased by 34.4 percent, compared with 24.8 percent among the advantaged. • Among the disadvantaged, introduction of PHC 24-hour care increased institutional deliveries fourfold compared with threefold for JSY alone.
Banerjee et al. 2013	Bihar and Jharkhand	This study evaluated the effectiveness of a community-level behavior change communication campaign aimed at increasing awareness about abortion legality and availability of services in India, as well as to change negative perceptions about abortion.	<ul style="list-style-type: none"> • Quasi-experimental design: pre-post, difference-in-differences 	<ul style="list-style-type: none"> • Changes in the odds of knowing that abortion is legal and where to obtain safe abortion services were larger in the intervention districts. • An increase in women's perception of greater support for abortion within their families and the increase in perceived self-efficacy with respect to family planning and abortion was greater in the intervention districts.

Citation	Location	Study and intervention details	Evaluation methodology	Findings
Bloom et al. 1999	Uttar Pradesh	This study examined the effect of antenatal care use on the likelihood of using safe delivery care among poor to middle-income women in an urban area of Uttar Pradesh. A new measure for antenatal care use assigned a weight to 20 input components based on their importance to positive maternal and child health outcomes.	•Outcome evaluation	<ul style="list-style-type: none"> •Women with a relatively high level of care (at the 75th percentile of the score) had estimated odds of using trained assistance at delivery almost four times higher than women with a low level of care (at the 25th percentile of the score). •Women delivering in a health facility achieved similar results.
Bloom et al. 2001	Uttar Pradesh	This study explored the influence of women's autonomy (control over finances, decision making power, and freedom of movement) on the use of care during pregnancy and birth.	•Observational study	<ul style="list-style-type: none"> •Women with greater freedom of movement obtained higher levels of antenatal care and were more likely to use safe delivery care than those experiencing limited freedom of movement.
Dhillon and Yadav 2013*	Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Rajasthan, Uttaranchal and Uttar Pradesh	This study investigated whether the continuum of maternal and child health service use increased contraceptive use in the eight socioeconomically lagging Empowered Action Group states with high levels of fertility and mortality.	•Quasi-experimental design: propensity-score matching	<ul style="list-style-type: none"> •Only 16 percent of women have received all three critical services (antenatal care, institutional delivery, and postnatal care); among these groups, only 27 percent of women are using modern contraceptives. •Using all of these maternal and child health services led to increased use of any modern contraceptive method by 4 percentage points, from 31 to 35 percent, and led to increased modern method use by 6 percentage points, from 21 to 27 percent. •The effect of any maternal and child health service use on contraceptive use was only 2 percent.
Gupta et al. 2012	Madhya Pradesh	This study observed outcomes two years before and two years after the implementation of the JSY. The study sought to determine the total number of institutional deliveries before and after the implementation of the JSY, determine the maternal mortality ratio, and compare factors associated with maternal mortality and morbidity.	•Outcome evaluation	<ul style="list-style-type: none"> •Institutional deliveries increased by 42.6 percent after implementation, including those among rural, illiterate, and primary literate people of lower socioeconomic strata. •Cases of eclampsia, pre-eclampsia, polyhydramnios, oligohydramnios, antepartum hemorrhage, postpartum hemorrhage, and malaria increased significantly among pregnant women attending the hospital for institutional delivery.

Citation	Location	Study and intervention details	Evaluation methodology	Findings
Iyengar and Iyengar 2009	Rajasthan	This nine-year study observed two Action Research Training in Health-initiated, midwife-led health centers in rural Rajasthan, where trained nurse-midwives provided 24-hour skilled maternal and newborn care. The nurse-midwives detected and managed complications; they also, in telephone consultation with doctors, advised referrals to the nearest hospital in cases of emergencies. The referral system included family counseling, arranging transportation and accompanying women to the hospital, and arranging a social worker at the hospital to facilitate admission and inpatient care.	<ul style="list-style-type: none"> • Process and outcome evaluation 	<ul style="list-style-type: none"> • Of women in labor, 21 percent had a life-threatening complication or its antecedent condition and 16 percent were advised referral, with which two-thirds complied. • Among the 202 women who came with antenatal, post-abortion, or postpartum complications, referral was advised for 70 percent, of whom 72 percent complied. • Compliance with referral was higher for maternal conditions than for fetal conditions. • Only one maternal death occurred in nine years. • Trained nurse-midwives can significantly improve access to skilled maternal and neonatal care in rural areas and manage maternal complications with and without the need for referral.
Iyengar et al. 2014	Rajasthan	This evaluation assessed the outcomes of an intervention, titled Parijaat, that aimed to improve the quality of delivery services in public health facilities. The main intervention included training doctors and program managers, and regular visits to facilities. This study measured adherence to evidence-based practices before, during, and after the intervention.	<ul style="list-style-type: none"> • Outcome evaluation: pre-post analysis 	<ul style="list-style-type: none"> • All incorrect practices except dorsal position for delivery decreased significantly. • There was an increase in only three beneficial practices. • Of the 17 practices, 10 saw significant improvement.
Jejeebhoy 2011	Bihar and Jharkhand	This study assessed the feasibility of expanding the manual vacuum aspiration provider base in India to include nurses. It explored whether efficacy and safety rates associated with manual vacuum aspiration provided by newly trained nurses were the same as those provided by physicians.	<ul style="list-style-type: none"> • Outcome evaluation: prospective two-sided equivalence study 	<ul style="list-style-type: none"> • Nurses were as skilled as physicians in assessing gestation age and completed abortion status, performing manual vacuum aspiration, and obtaining patients' compliance. • Failure and complication rates were low and equivalent between the two provider types. • Both provider types were equally acceptable to women who underwent the procedure (98 percent).
Khan et al. 2010	Uttar Pradesh	This study assessed the influence of JSY on eight targeted behaviors, including institutional or safe-at-home deliveries, uptake of postnatal care services and practices for newborns and mothers,	<ul style="list-style-type: none"> • Quantitative and qualitative outcome evaluation using 	<ul style="list-style-type: none"> • The proportion of women who received at least three antenatal check-ups increased from 19.2 in 1992 to 34.4 percent in 2009. • Education, class, geography, and caste are important predictors of a woman's receipt of antenatal care.

Citation	Location	Study and intervention details	Evaluation methodology	Findings
		and uptake of family planning services and immunizations for children.	large sample of survey data	<ul style="list-style-type: none"> • JYS increased the rate of institutional delivery from 23 percent in 2008 to 44 percent in 2009, and the share of institutional deliveries at public facilities. • Awareness of JYS, in addition to having contact with an accredited social health activist (ASHA), increased institutional delivery rates by 20 percent compared with women who were not in contact with an ASHA. • Most postpartum newborn and mother care practices were higher for women who delivered at an institution compared with those who delivered at home.
Kumar et al. 2012	Uttar Pradesh	This study assessed the effect of a community-based behavior change management intervention for newborn care on maternal health outcomes. High-risk domiciliary newborn care practices and behaviors, which also posed a risk to maternal health, were targeted through home visits and community meetings.	<ul style="list-style-type: none"> • Cluster randomized controlled trial 	<ul style="list-style-type: none"> • Significant improvements were observed in maternal health equity and outcomes, including knowledge of danger signs, care practices, self-reported complications, and timely care-seeking from trained providers. • The difference in the adjusted maternal mortality rate was not significant.
Leon et al. 2014	Jharkhand	This study tested an intervention designed to provide information addressing technical and gender concerns in family planning services and expand contraceptive choice to examine whether the intervention empowered literate and illiterate women. The study also evaluated the effects of women's decision making power on contraceptive use behavior.	<ul style="list-style-type: none"> • Quasi-experimental design 	<ul style="list-style-type: none"> • Women's power to decide to have a child increased among illiterate women but not among literate women. • The intervention did not improve unmet need for contraception among illiterate women with relatively less decision making power, but the change for illiterate women with relatively more power was greater in the intervention than in the control area.

Citation	Location	Study and intervention details	Evaluation methodology	Findings
Lim et al. 2010	India—National	This study assessed the effect of JSY on intervention coverage and various health outcomes. JSY was a national conditional cash transfer program in India intended to reduce maternal and neonatal deaths by promoting institutional births. JSY provided a cash incentive to all women to give birth in a health institution.	<ul style="list-style-type: none"> • Quasi-experimental design: matching and difference-in-differences 	<ul style="list-style-type: none"> • Implementation of JSY in 2007–2008 was highly variable by state—from less than 5 percent to 44 percent of women giving birth receiving cash payments from JSY. • The poorest and least educated women did not always have the highest odds of receiving JSY payments. • JSY had a significant effect on increasing access to antenatal care and in-facility births.
Mohanan et al. 2014	Gujarat	The Chiranjeevi Yojana (CY) program, a public-private partnership launched by the state government of Gujarat, aimed to improve maternal and neonatal health and increase institutional delivery rates. The program covered the costs of deliveries at designated private-sector hospitals for women below the poverty line. This study evaluated the effect of the CY program on the probability of institutional delivery, the use of maternal and neonatal services, birth-related maternal complications, and household spending for delivery.	<ul style="list-style-type: none"> • Quasi-experimental design: difference-in-differences 	<ul style="list-style-type: none"> • From 2005 to 2010, the CY program was not associated with a statistically significant change in the probability of institutional delivery or of birth-related complications. • Mean household expenditures for private-sector deliveries had either not fallen or fell very little under the program.
More et al. 2012	Mumbai	This study evaluated an intervention in which women’s groups in urban slums worked to improve local perinatal health. The group meetings, conducted by a facilitator, focused on sharing perinatal experiences, peer-learning, and encouraging action to negotiate optimal care with family and providers.	<ul style="list-style-type: none"> • Cluster randomized controlled trial 	<ul style="list-style-type: none"> • No differences were found between trial arms in the uptake of antenatal care, reported work, rest, and diet in later pregnancy; institutional delivery; early and exclusive breastfeeding; or care-seeking.
Ng et al. 2014	Madhya Pradesh	This study investigated the impact of JSY, a government-initiated cash incentive program aimed at reducing maternal mortality by encouraging women to deliver in an institution, on maternal mortality in Madhya Pradesh.	<ul style="list-style-type: none"> • Outcome evaluation using Bayesian spatio-temporal model to estimate 	<ul style="list-style-type: none"> • The proportion of all institutional deliveries increased from 23.9 percent in 2005 to 55.9 percent in 2010 provincewide. • The proportion of JSY-supported institutional deliveries rose from 14 percent in 2005 to 80 percent in 2010.

Citation	Location	Study and intervention details	Evaluation methodology	Findings
				<ul style="list-style-type: none"> •The study detected no significant association between maternal mortality reduction and JSY.
Powell-Jackson et al. 2016	Uttar Pradesh	This study explored whether JSY reduced maternal depression in Uttar Pradesh.	•Quasi-experimental design	<ul style="list-style-type: none"> •The receipt of the cash transfer was associated with an 8.5 percent reduction in the continuous measure of maternal depression and a 36 percent reduction in moderate depression. •No associations were detected between JSY and measures of emotional well-being, specifically happiness and worry.
Randive et al. 2013	Rajasthan, Uttarakhand, Bihar, Madhya Pradesh, Orissa, Assam, Chhattisgarh, Jharkhand, and Uttar Pradesh	This study examined trends in the proportion of institutional births before and during implementation of the JSY and demonstrated the relationship between the maternal mortality rate and institutional births.	•Observational study	<ul style="list-style-type: none"> •The proportion of institutional births increased from an average of 20 to 49 percent in five years •The study was unable to detect a significant association between the institutional birth proportion and maternal mortality rate.
Tripathy et al. 2010	Jharkhand and Orissa	This study tested the effect of community mobilization through participatory women's groups on child and maternal health outcomes in poor, rural, and tribal communities. A facilitator conducted groups every month to support participatory action and learning for women, and to develop and implement strategies to address maternal and newborn health problems.	•Cluster randomized controlled trial	<ul style="list-style-type: none"> •The study found no statistically significant decrease in maternal mortality. •No significant effect on maternal depression was found overall, but a reduction in moderate depression of 57 percent was observed in Year 3. •No significant differences in women's health care-seeking behaviors were observed between the control and treatment groups. •Birth attendants were more likely to wash their hands, use a safe delivery kit and plastic sheet, and boil the thread used to tie the cord than were those in the control group.
World Bank 2011, 2015	Tamil Nadu	These studies assessed the Tamil Nadu Health Systems Project (2005–2015), which extended secondary health services in rural areas by	•Outcome evaluation using	<ul style="list-style-type: none"> •From 2008 to 2015, the proportion of Caesarean section deliveries among scheduled caste or scheduled tribe mothers at the secondary level grew from 28.1 to 39.8 percent.

Citation	Location	Study and intervention details	Evaluation methodology	Findings
		establishing 80 comprehensive emergency obstetrics and neonatal centers and 385 ambulances. The objective of the project was to significantly improve the effectiveness of the health system in Tamil Nadu.	administrative data	<ul style="list-style-type: none"> • From 2010 to 2015, the percentage of calls made by pregnant women attended to by 108 (ambulance) services increased from 90.3 to 99.3 percent. • From 1999 to 2006, the state’s maternal mortality ratio decreased from 167 deaths per 100,000 live births to 111 deaths per 100,000 live births. • More than 99.5 percent of deliveries in the state now take place in medical institutions.
Yadav and Dhillon 2015	Uttar Pradesh	This study evaluated the impact of family planning advice provided as a part of maternal health services in increasing the use of contraceptives and reducing the unmet need for family planning among married women.	<ul style="list-style-type: none"> • Quasi-experimental design: propensity-score matching 	<ul style="list-style-type: none"> • The use of maternal health services (antenatal care, institutional delivery, and postnatal care) and family planning advice during antenatal and postnatal care led to an increase in current contraceptive use by 3.7, 7.3, and 6.8 percent, respectively. • Greater use of these services has not translated into a reduced unmet need for contraception.

Note: Green shading indicates demand-side interventions, and blue shading indicates supply-side interventions

^a The intervention in this study aims at increasing supply and demand for maternal health services.

*Information from meeting abstract. We were unable to locate the full study.

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