INCREASING THE AVAILABILITY OF SKILLED BIRTH ATTENDANCE IN RURAL INDIA

Prepared for the International Advisory Panel of the National Rural Health Mission, Ministry of Health & Family Welfare, Government of India

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EXECUTIVE SUMMARY

Key considerations in the availability of skilled birth attendance will be a critical component in national efforts towards ensuring universal health coverage in India. This paper aims to examine opportunities for strengthening skilled birth attendance at the primary level by (a) exploring relevant models of rural primary and community-level skilled attendance, both India and internationally, that have achieved positive health outcomes; (b) assessing the current skilled birth attendance coverage in India and means to achieving greater coverage of skilled attendance and enhanced linkages in the continuum of care; and (c) recommending opportunities and required investment for scaling-up skilled attendance within NRHM.

Five high-focus NRHM states were selected for regional sampling in data collection (Assam, Bihar, Uttar Pradesh, Madhya Pradesh, and Rajasthan) as they are among the poorest and most populated states in the country. Two districts in each state were selected for variability in geography and health indicator performance. Within each district, questionnaires were administered to a sample of health workers across blocks and at the health facility level, including nursing staff and medical officers. Semi-structured interviews were conducted with state and national-level progammatic staff and health officials.

Several key issues have emerged from our primary research about the availability of skilled birth attendance, many of which are widely recognized: (a) there are serious, persistent gaps in safe delivery capacity at the primary level, especially sub-centres and remote PHCs, despite efforts to decentralize care through NRHM; (b) SBA training targets are not being met across states; (c) SBA training quality is poor, particularly practical components; (d) there is a need for improving the rational distribution of SBA-trained staff into facilities with capacity, and to high-focus catchment areas, which limits skills development and/or maintenance, and also care outcomes; (e) quality of care post-training is not well monitored or supervised, so skills are not necessarily well applied or further developed; (f) health worker availability is largely insufficient at primary care levels, particularly nursing staff; (g) gaps in information between providers exist, particularly for use in point-of-care support, despite several means of data collection and tracking; (h) serious system gaps remain in equipment, supplies, and timely referral transport; (i) India's patriarchal society has considerable implications for the valuation and welfare of women providers in health services, particularly nursing cadre.

Our primary research highlights immediate requirements for more targeted systems strengthening, particularly for sub-centres that can provide intranatal care, and for PHCs depending on their delivery caseload and accessibility to other referral facilities. This requires significantly more strategic planning at the district level, and creating or reinforcing full-time support structures that can focus on quality assurance of care, including training and skills development, facility quality management, and linkages between care providers. In light of the secondary and primary research presented in this paper, we offer short, medium, and long-term recommendations for programmatic and policy consideration, focusing on:

1. Requirements for a full-time training and supportive supervision structure at district level
2. Prioritizing MCH sub-centres to meet immediate skilled attendance needs at community level
3. Prioritizing coordinated referral transport systems
4. Improving information linkages for point-of-care support
5. Diversifying skilled birth attendance cadre to address gaps in rural availability
6. Ensuring nurse-midwife welfare

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ABBREVIATIONS

ANM	Auxiliary nurse midwife
BEmOC	Basic emergency obstetric care
BPM	Block programme manager (NRHM)
CEmOC	Comprehensive emergency obstetric care
CHC	Community health centre
DPM	District project management (NRHM)
EDD	Estimated date of delivery
GNM	General nurse midwife
GoI	Government of India
Hb	Hemoglobin
IMCI	Integrated management of childhood illness
JSSK	Janani-Shishu Suraksha Karyakram
JSY	Janani Suraksha Yojana
LHV	Lady health visitors
MCTS	Mother-child tracking system
MO	Medical officer
MoHFW	Ministry of Health & Family Welfare
MP	Madhya Pradesh
NRHM	National Rural Health Mission, Ministry of Health & Family Welfare
PHC	Primary health centre
PPP	Public-private partnership
RHP	Rural health practitioner (Assam)
SBA	Skilled birth attendant
SC	Sub-centre
SIHFW	State institute of Health & Family Welfare, Government of India
TBA	Traditional birth attendant
TT	Tetanus toxoid vaccine
UP	Uttar Pradesh
WHO	World Health Organization

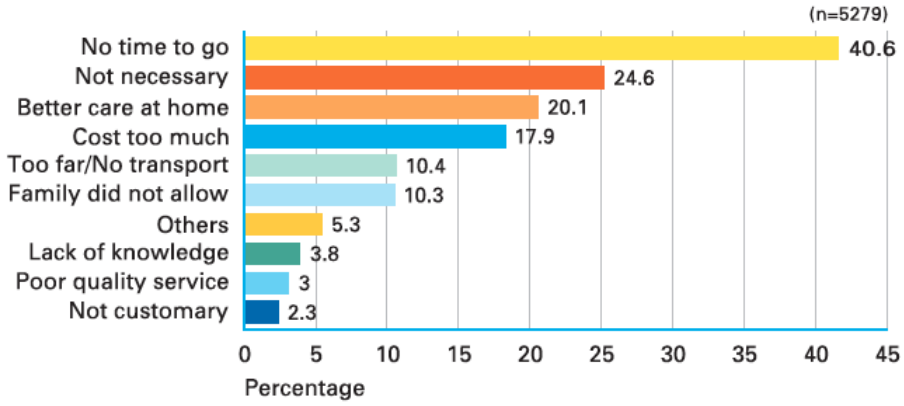
INTRODUCTION

Skilled attendance during pregnancy, childbirth, and the postpartum/natal period is among the most critical interventions for improving maternal and neonatal survival. All pregnant women are at the risk of developing complications at any point during pregnancy, delivery, and post-delivery. Thereby, high-quality antenatal and intranatal care is critical to identify and safely manage complications. The skilled attendant is critical to this continuum of care, as is a health system that is appropriately prepared, supplied, staffed, and supported by emergency referral transport.

In India, the continuum of skilled attendance has a number of providers—in the absence of a formal midwifery cadre—including auxiliary nurse midwives (ANM), lady health visitors (LHV), staff nurses, and doctors. The National Rural Health Mission (NRHM) envisions that safe delivery services should be available at the community level—which is not widely available to date—and at primary and referral facilities. India's safe delivery rates have been increasing, with a reported 71.8% of rural deliveries having a skilled birth attendant available, either as an institutional delivery or at home with a skilled attendant (CES 2009). Sixty-eight percent of rural deliveries occurred in institutions, and of these, 70% in public facilities; Figure 1 explores reported survey responses for not delivering in an institution (CES 2009).

FIGURE 1

Reasons for not Deliverying at Institution (Multiple Responses)



Source: CES 2009 (MoHFW, UNICEF)

With the increase in institutional deliveries during NRHM and the uptake of Janani Suraksha Yojana (JSY), referral facilities are often overwhelmed with the load of normal deliveries, which complicates the capacity for postnatal monitoring and providing emergency obstetric care (EmOC) or handling other complicated cases. Up to 75% of women reported to have stayed in facilities for post-delivery monitoring between 24 hours and four or more days; a quarter of women leave within 24 hours of delivering. Additionally, antenatal care uptake varies widely across the country; 22.8% of women reporting to have received full ANC[1] (CES 2009). Community-based postnatal care in the country requires strengthening (Paul *et al*. 2011); CES 2009 reports that 60.7% of newborns received at least one visit within ten days after birth, but only 24.8% received three or more visits. Continued strategies to strengthen primary-level skilled birth attendance is thereby essential to achieve equitable service

[1] Full ANC for a pregnant woman includes at least three antenatal checkups, one TT injection, and at least 100 IFA tablets (or syrup) consumed during the pregnancy

delivery (e.g. reducing opportunity costs for families that are poor and/or living in difficult-to-reach areas) and effective care systems (e.g. birth planning, referral transport, quality assurance and supervision, referral systems).

Objectives

This paper aims to examine opportunities for strengthening skilled birth attendance at the primary level[2] by (a) exploring relevant models of rural primary and community-level skilled attendance, both India and internationally, that have achieved positive health outcomes; (b) assessing the current skilled birth attendance coverage in India and means to achieving greater coverage of skilled attendance and enhanced linkages in the continuum of care; and (c) recommending opportunities and required investment for scaling-up skilled attendance within NRHM. Key considerations in the availability of skilled birth attendance will be a critical component in national efforts towards ensuring universal health coverage. When examining the availability of skilled attendance in rural areas, there are several key dimensions to ensure that the skilled attendants and the health system are strengthened at rural primary care levels:

- Health workforce adequacy, including the number, rational distribution, accessibility, and availability of skilled birth attendants.
- Readiness and quality assurance of both the skilled attendants and the health system, including education (e.g. skills mix, continuing education), essential tools (e.g. medicines, supplies, equipment, transport), and supervision towards regulation and accountability.
- Linkages between skilled attendants, particularly information sharing for point-of-care support and efficient referral mechanisms.
- Welfare of skilled attendants, including fair compensation and incentives, promotion and professional development, and protection.

Given these stated objectives, we hypothesized that improving the availability of skilled attendance in rural India would require a two-pronged approach: (a) increasing the availability and quality of skilled attendants through measures like training and incentivization for performance management, and (b) enhancing referral and linkage systems to ensure a continuum of skilled care from pregnancy and birth planning, to safe delivery, to immediate postnatal care.

This paper is one of a series of four research papers commissioned by UNICEF India. The first examines the performance of ASHA, and recommendations for enhancing ASHA recruitment and training, streamlining responsibilities, increasing supportive supervision and incentivization, and providing opportunities for career development. The second examines the current state of integration between health and nutrition programming in the country, and potential strategies for further convergence at levels of state policy, district management, facility care, and community outreach. The third explores increasing the availability of specialist services in India, including a number of policy changes, human resource management strategies, public-private partnership models, and innovative uses of technology. These four papers were intended to inform advocacy efforts on behalf of UNICEF India and The Earth

[2] Here we focus on the ANM, LHV, general nurse midwife (GNM), and staff nurse cadres that serve in sub-centres and primary health centres. The ASHA's mobilization and care provision at the community level is also a critical component of the skilled attendance continuum, but we do not focus on the ASHA cadre here. This paper will not focus on the skilled personnel required at referral facilities, which will be examined in our accompanying paper on increasing the coverage of specialist services in rural India, including gynaecologists.

Institute during policy and strategy development with the national Ministry of Health and Family Welfare (MoHFW) and state health departments.

BACKGROUND

Skilled birth attendance is central to the continuum of care in public health systems, serving as a critical link between the mother-baby unit, community, and health system. Skilled birth attendants are recognized as health professionals trained (and accredited) in skills to manage normal pregnancies, deliveries, and postnatal care, and to identify, manage, or refer presenting complications in pregnant or postpartum women and newborns (WHO 2005). Up to 40% of pregnancies can require some form of special care, and about 15% of all pregnant women develop complications during the intra-partum and immediate post-partum period and need access to emergency obstetric care (Fauveau 2004). Twenty-five percent of obstetric complications and maternal deaths occur during childbirth, while 60% occur immediately thereafter (WHO, ICM, FIGO 2004; UNFPA 2005). Skilled attendance during this period can help prevent, detect, and manage major complications,[3] reducing maternal deaths by 16-33% (Graham *et al.* 2001).

Skilled attendance in rural India

India's maternal mortality ratio currently stands at 212 (SRS 2007-09), and while performance indicators for maternal health services reflect small improvements, rural areas continue to fall short of both national and international targets (TABLE 1). Of particular significance to this paper, primary level delivery services are not serving the rural masses; only 1% of women reported to have delivered in a government sub-centre, and 9% in a primary health centre (PHC) (CES 2009). The continuum of care at the primary level also relies on comprehensive antenatal and postnatal care; however only 22.8% women in India receive three antenatal check-ups (CES 2009), and 49.7% of women report receiving postnatal care within two weeks of delivery (DLHS-3 2007-08). With current fertility rates, national births that are not attended by a skilled health worker are expected to reach 69 million between 2011 and 2015 (Crowe *et al.* 2012).

TABLE 1. Reproductive and child health indicators in rural India.

	INDIA	RURAL	SOURCE
Mothers who had full antenatal check-up (%)	**26.5**	**22.8**	*CES 2009*
Institutional delivery rate – public and private (%)	**72.9**	**68.0**	*CES 2009*
Skilled birth attendance (institutional and home deliveries) (%)	**76.2**	**71.7**	*CES 2009*
Maternal mortality ratio (per 100,000 live births)	**212**		*SRS (2007-09)*
Infant mortality ratio (per 1,000 live births)	**47**	**51**	*SRS (2010)*
Neonatal mortality ratio (per 1,000 live births)	**32**		*UNICEF et al. (2011)*
Newborns who received check up within 24 hours of birth	**65.6**	**60.7**	*CES 2009*

In India, medical officers (MO), general nurse midwives (GNM), and staff nurses (SN) receive in-service training in skilled birth attendance; there is no other standalone professional cadre of midwives in India. Facilities in India that are capable of conducting deliveries are designated Maternal and Child Health (MCH) Centres, and three levels of service delivery have been defined:

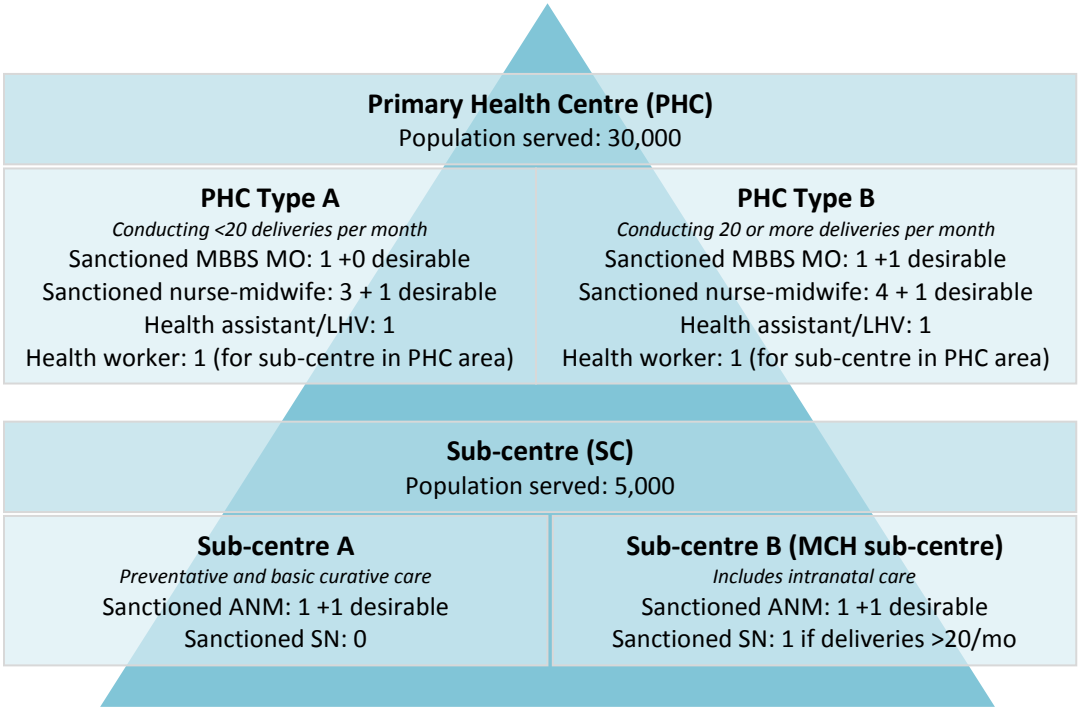
- **LEVEL 1 MCH centres:** sub-centres and primary health centres (PHC) providing safe care for non-complicated deliveries; these facilities are also largely responsible for antenatal care

[3] Complications include obstructed labor, eclampsia, puerperal sepsis, and obstetric haemorrhage.

- **LEVEL 2 MCH centres:** PHCs and community health centres (CHC) equipped to manage complicated deliveries not requiring surgery and other RCH services like safe abortion, sterilization, and sick newborn care
- **LEVEL 3 MCH centres:** including CHCs and (sub)district hospitals[4] providing critical emergency obstetric and newborn care (CEmONC) with fully functional operation theatres, and possibly blood banks or blood storage, sick new born care units (SNCU), and malnutrition treatment centres

Indian Public Health Standards (IPHS) sets detailed benchmarks for these levels of maternal and child care, including workforce recommendations, physical infrastructure, operational guidelines, and essential equipment, supplies, and drugs. The 2012 IPHS guidelines introduced disaggregation of facilities by intranatal care loads and catchment area, in an effort to provide more strategic facility upgrades, support, and manpower distribution (Figure 2).

FIGURE 2. 2012 IPHS manpower requirements for skilled attendance at primary level.



Filling these rural staffing requirements as outlined by IPHS remains a serious challenge for the system. Recent in-country research notes that nursing and medical students recruited from rural areas are more interested in working in rural areas, as are nursing students more largely; for in-service health workers, better salaries were an important driver for willingness to work in a rural area, while nursing/medical students indicated that a combination of better salaries, good facility infrastructure, and post-graduate study reservations would motivate rural work placements (Rao 2012). Chhattisgarh and Assam have introduced rural health practitioner cadres to provide additional curative and intranatal support in rural areas (Raha *et al.* 2010; Yadav *et al*. 2009).

[4] Facilities capable of providing CEmONC services are designated first referral units (FRUs) by NRHM.

For in-service health workers that are already in rural areas, there have been a number of recent interventions to strengthen the country's skilled attendance capacity. Given that midwifery is a short component of nursing training,[5] the government has introduced an additional skills-based training programme of two to three weeks duration for staff nurses. ANM and LHV cadres are not recognized as skilled birth attendants until they have completed the government's SBA course, which is usually a 21-day programme. In addition to introducing training scale-up in the past few years, the government also lifted previous policy barriers around nurses providing certain life-saving measures for women in obstetric emergency.[6]

While the Indian government is making efforts to scale-up the availability of skilled attendance in rural areas through systems strengthening, there are continued barriers to care seeking. This paper does not explore these barriers—or demand generation—for skilled attendance, but must recognize strong social and economic determinants of skilled birth attendance, particularly for women in rural areas, poorer households, with lower levels of education, and in some religious communities (Hazarika 2011). Women in India are also often pressured to marry and have children early; 42% of women in India give birth before 20 years of age (NFHS-3). Economically- and socially-motivated delays in deciding to seek skilled care, reaching appropriate points of care, and receiving adequate care significantly determine the outcome of a complication during pregnancy, delivery, and postpartum/postnatal periods (Thaddeus & Maine 1994). The national scale-up of the JSY scheme—and more recently, Janani-Shishu Suraksha Karyakram (JSSK) as an effort to guarantee care entitlements—have sought to minimize these barriers to seeking skilled attendance at delivery.

Best practice strategies

A number of best practices have been implemented across the world to mitigate the aforementioned delays and increase the availability of skilled birth attendance in rural areas. These broadly include: (a) enhanced in-service training on skilled attendance; (b) creating new cadres of midwives; (c) mechanisms to make skilled attendants available at the community level, including incentives, rational placement, adequate facilities and supply chains, and other support; (d) improving care linkages between pregnancy, delivery, immediate postnatal/postpartum care, and continued postpartum/postnatal care; (e) improving referral transport; and (f) community mobilization towards institutional delivery. Some best practice strategies are described below as country case studies, and examples of strategies are outlined in TABLE 2.

Diversifying training to create midwifery cadres

Neighbouring Bangladesh created two nationwide human resource development plans in an effort to reach large rural areas and tackle soaring rates of maternal mortality rates by 2015. The first initiative provided team-based competency training in emergency obstetric care (EmOC) at (sub) district hospitals. This included one-year training for medical officers in obstetrics and anaesthesia, a four-month training for nurses in midwifery, and a two-week training for laboratory technicians in safe blood transfusion. The second plan aims to train 17,000 community-level skilled birth attendants (CSBA) by 2015. A six month competency training in skilled birth attendance was provided to two community health worker cadres, family welfare assistants (FWA) and female health assistants (HA). Upon training completion they were certified as community SBAs (CSBA) by the national nursing council and began performing

[5] Midwifery is covered for a few months in the third year (http://www.kmcmedicare.org/course.html).

[6] RCH-II planning included permission to use uterotonic drugs for prevention of postpartum haemmorage, to use drugs in emergency situations prior to referral for stabilizing the patient, and to perform basic procedures at community level in emergency situations (RCH II 2008).

delivery services in their work area (WHO & GHWA 2008). The country is also trying to expand a cadre of 'registered midwives' by two means: (a) as a short-term solution in 2010 began providing six-month intensive course to in-service nurse-midwives, 60 graduated from the first batch in 2011; (b) beginning a two-year training programme in 2012 to license new registered midwives (Minca 2011).

Sri Lanka has achieved nearly universal skilled birth attendance, with practitioners attending to 98.5% of births (DHS 2006-07). The government created two categories of midwives in order to place a midwife in every locality: institutional midwives (IMs) who work at facility level and public health midwives (PHMs) that provide care at the community level. There are now around 3,000 IMs working in facilities and 5,000 PHMs deputed to rural communities across the country (Arulkumaran 2011).

Under the ACCESS project in the Dumka district of Jharkhand, development partners developed a 12-week competency-based training module in skilled attendance because the 3-week module prescribed by MoHFW was perceived to be insufficient for the ANMs employed. The project wanted to create a demand for skilled care in the community, train ANMs so that they were competent enough to provide care, and support the ANMs to deliver care at both community and facility level (USAID *et al.* 2010). With these interventions in skills development and supportive supervision, the proportion of deliveries conducted by ANMs increased from 5% to 13% in the intervention group, demonstrating a certain measure of success for the training.

Increasing intake of new recruits

In 2006, Ghana's Ministry of Health began increasing the annual intake of midwifery institute students by 20%, and at the end of five years had increased the country's midwifery numbers by 192% (n=5,440). Additional investments in expanding training infrastructure and tutors facilitated the steady increase of annual student intake. Midwifery training includes both pre-service and in-service training components.[7] All health practitioners are encouraged[8] to spend a proportion of their time teaching, and accredited private schools are also utilized for training scale-up (GHWA & WHO 2008).

Operationalizing rural services and referral transport

Tamil Nadu's MMR has dropped from 380 (1993) to 97 (SRS 2007-09), the result of combined development in infrastructure and welfare policies for health workers. The state upgraded PHCs and incentivized[9] nurses to provide 24*7 BEmOC and newborn care, and equipped CHCs for handling cases that required CEmOC (Padmanaban *et al.* 2009). Additionally, the state created a post-graduate reservation for medical officers as an incentive to attract health practitioners to rural areas.

The government of Madhya Pradesh, in partnership with UNICEF (UNICEF 2011), piloted a three-pronged strategy to address the state's low institutional delivery rates (28% in 2004) and high MMR (334 in 2004-06). The innovations included (a) instituting and strengthening a free referral transport system and 24X7 call centres in every district to dispatch, (b) operationalizing delivery services at selected sub-centres in remote areas, and (c) improving the quality of care at key peripheral facilities by upgrading infrastructure, human resources, and equipment. Between 2007 and 2009, institutional deliveries rose from 47% to 81% in the state, considerably exceeding the national average of 47% (DLHS-3 2007-08). The pilot districts have a reported MMR of 262, far below the state MMR of 310 (UNICEF 2011).

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[7] Details of training and infrastructure in Table 2 below

[8] Health practitioners are expected to devote some of their time teaching but are not being given any additional incentive to do so and there is dissatisfaction amongst the practitioners in this regard

[9] They were given Rs.25 per delivery in addition to their monthly salary

In rural Rajasthan, the non-governmental organization ARTH has trained nurse-midwives to staff two health centres deep in rural areas. These nurse-midwives provide 24*7 skilled care to mothers and newborns and are trained to detect, manage and refer cases. Their involvement in referral led to higher referral compliance rates and includes counselling, arranging transport, accompanying women, facilitating admission, and supporting inpatient care (Iyengar & Iyengar 2009). From 2000-2008, out of 2,771 women in labour, 16% were advised referral and two-thirds complied; out of 202 women who came with complications[10] 70% were advised referral and 72% complied. These two centres have seen only one maternal death in nine years, and the authors advocate that the method be replicated for a larger field trial in a low resource setting.

Increasing access to services through public-private partnerships (PPP)

There are growing international attempts to transcend financial barriers to accessing health facilities by using innovative health-finance mechanisms towards universal health coverage. In Kenya, three vouchers are being piloted in three phases starting in 2007, including a Safe Motherhood Voucher (SMV) that costs 200Ksh[11], a Family Planning Voucher (FPV) that costs 100Ksh, and a Gender Based Violence (GBV) voucher that is free of cost. The SMV is being piloted in three districts and entitles the client to antenatal care up to four visits, institutional delivery that includes treatment of complications and C-section, and postpartum care for up to six weeks.[12] Service providers range from public facilities, private nursing homes, and faith-based organisations. Since the voucher scheme was initiated in the intervention sites, deliveries attended by skilled professionals has increased by 57%, and as accredited service providers is increasing, issues of distance and accessibility problems for rural voucher clients are on the decline (Janisch *et al.* 2010).

Reproductive health voucher programmes are now running in more than ten countries[13] around the world and initial evidence suggests that they have increased reproductive health service utilization, enhanced quality of care, and improved population health outcomes (Bellows *et al.* 2011). A widely watched PPP initiative in India—the Chiranjeevi Yojana scheme rolled out in the state of Gujarat—has contracted in private providers for institutional deliveries. This scheme is discussed in our accompanying paper on increasing the availability of specialist services in rural India.

[10] These women were not in labor but came with complications during pregnancy, post-abortion or post-partum

[11] Approximately 1.80 Euros or Rs.128

[12] Voucher initiative is funded by KfW Entwicklungsbank: German Bank and managed by PricewaterhouseCoopers.

[13] Bangladesh, Cambodia, China, Kenya, Korea, India, Indonesia, Nicaragua, Taiwan, and Uganda (Bellows *et al.* 2011)

TABLE 2. BEST PRACTICE CASE STUDIES - INCREASING THE AVAILABILITY OF SKILLED ATTENDANCE

REGION	CONCEPT	STRATEGY DETAILS	IMPACT	KEY CONSIDERATIONS FOR SCALABILITY IN INDIA
Diversifying Training & Midwifery Cadre				
Bangladesh (2003) (Nasreen *et al.* 2010)	• Existing family welfare assistants (FWA) and female health assistants (FHA) retrained in midwifery as SBAs to provide safe home deliveries • Government goal: train 1760 new community SBA (CSBA) every year from 2009-15, and increase total SBA births to 86% by 2015 • 90 trained during 2003 pilot; 4000 trained by 2008	• **Core Training (6 months):** 74 essential skills, including ANC, childbirth, PNC, health services advocacy, and identifying complications for referral • **Reinforcement Training (3 months)**: management of a) bleeding during pregnancy and childbirth, b) difficult deliveries, and c) infections • **Supervision**: training of female paramedics as technical supervisors for this new cadre of SBAs initiated in 2008	• Initial success in the 2003 pilot of increasing access to safe home deliveries resulted in a nation-wide scale-up • Programme is able to train approximately 1,000 SBAs annually • Between 2006-2008, 65,000 home deliveries were conducted by an SBA, all for women who TBAs or relatives had previously attended	• No national strategies to provide community-based SBA (CSBA) at-scale; only an interim strategy as women choose institutional delivery and care from professional nurse-midwives • Overburdening of community-level health workers • Facility strengthening to keep up with increased referrals
Kenya (2005) (GoK 2005)	• Kenya's Community Midwifery Model increases access to skilled attendance for home deliveries through the recruitment and retraining of retired and unemployed registered nurse midwives to become community midwives (CM) • Upon completion of a pilot phase in 2005, the scale-up of this model began in 2007 in four districts (Mt. Elgon, Lugari, Bungoma, Butere, Mumia)	• **Theoretical Training** (1 week, classroom): ANC, childbirth, PNC, newborn care, referrals for complications, family planning, infection prevention • **Practical Training** (1 week, clinic): Provide ANC, assist ten births, use partogram, manual removal of placenta, perform episiotomy, manage complications, family planning referral • **Incorporation:** Receive MoH certification upon training; linked with a public health facility and supervised by public health nurses; receives business skills training (CM charges approximately 23USD per client)	• Skilled attendance rate in Mt. Elgon district over time increased from 3.7% in 2003 (n=15) to 10.4% in 2007 (n=221). • Number of home deliveries with a skilled attendant increased from 2005- 2006-2007: • All 889 babies delivered by a CM in 2007 received at least one postnatal assessment	• Brief, intensive retraining of midwives was viable for increasing availability at community level • CM model in Kenya charges service fee, which counters NRHM model; would require voucher or other incentive structure • Business skills training and income generation activities (e.g. selling commodities like sanitary napkins) could lead to community health worker empowerment
Nigeria (2009) (WHO & GHWA 2011; Taskier 2011)	• Midwives Service Scheme (MSS) recruits and deploys newly trained, retired, and unemployed midwives to rural primary care facilities • Cluster model deploys midwife to a primary care facility (ensuring 24*7 BEmOC care) clustered around an emergency facility. • Scheme is a collaboration between federal, state, and local governments	• **Capacity Building**: competency trainings in maternal and child care (lifesaving skills, IMCI) and refresher midwifery training at midwifery schools and clinics. • **ICT systems**: connects national headquarters, six regional offices, central health supplies store, and 40 clusters, including (a) a voice communication system to connect the midwives to other health workers for support; (b) online HMIS and report uploading. Intended to expand into point-of-care support and m-health data collection of key indicators by SMS.	• 2,622 unemployed and retired midwives recruited as of 2010 • Deployed to 652 frontline facilities clustered around 163 hospitals in rural areas • There is preliminary evidence to suggest an increase in utilization of services in some of the health facilities where the midwives are working. Larger impact assessment from World Bank forthcoming.	• Brief, intensive refreshers were viable for increasing availability at primary level facilities • Opportunities for expanding e-health and m-health tool use in data collection and point-of-care support, and especially connecting leadership and health workers at state, district, and block
Increasing intake of new recruits				
Ghana (2006) (WHO & GHWA 2008)		• **Pre-service training:** The majority of midwives received 7–12 months of formal didactic and clinical training • **In-service training (IST):** The most common IST training topics were breastfeeding, family planning, infection prevention, normal delivery, use of a partograph, and ANC • **Services provided by midwives:** ANC, routine Postpartum Care, routine reproductive and infant care	• There are more than 3,379 midwives in Ghana compared with fewer than 2,000 physicians • ANC coverage increased from 82% in 1988 to 92% in 2003 • Nurses or midwives assist 41% of births, compared with doctors who serve just 7% (GSS, 2003)	• Doctor dominance in policy and practice; hesitance about nursing care models and nursing practice independence • Poor monitoring and supervision systems in India and no assurance of quality of nursing education

Operationalizing rural services and referral transport				
Tamil Nadu (Padmanaban *et al.* 2009)	• Positioning 3 staff nurses at each PHC to provide 24x7 delivery care and providing SBA training to these nurses • This was operationalized under RCH I (1997-2004)	• **Well-equipped PHCs:** 229 of 1,532 PHCs were upgraded as 30-bedded PHCs, with five medical officers, three staff nurses, two ANMs, an ECG machine, laboratory **equipment, and other basic services** • **Well-trained staff:** Staff nurses in these facilities were trained to conduct normal deliveries independently and refer women in the case of complications • **Monetary incentive for 24X7 care**: These staff nurses receive a consolidated pay of Rs 2,500 (US$ 59.52) every month plus a payment of Rs 25 (US$ 0.59) as an incentive for each delivery conducted	• There has been 35% reduction in the Infant Mortality Rate (IMR) from 48 deaths per 1,000 in 1999 to 31 deaths per 1,000 live births in 2006 • The institutional delivery rate of 90.7% is very high compared to the national average of 40.7% • Skilled birth attendants (SBAs) assist most (93.2%) deliveries compared to 68.6% in Andhra Pradesh, a neighbouring state	• IPHS norms require Type A PHCs to be staffed with 3 SNs and Type B with 4 SNs • Supply of trained nurses will have to be increased in a phased manner (to combat shortage of nurses and nursing schools) • More PPPs with private nursing schools and strengthened accreditation and monitoring procedures
Madhya Pradesh Guna and Shivpuri districts (2007-2008) (UNICEF 2011)	3 pronged strategy: • referral transport • service delivery at sub-centres • quality control at peripheral health facilities	• **Outsourcing referral transport to private sector:** 75 vehicles for referral transport per block have been hired • **Call centre for monitoring and co-ordination**: A call-centre is set up per district to manage vehicles in the district hospital • **Equitable distribution of facilitates:** A facility mapping exercise was carried out and facilities were established keeping in mind population density and accessibility • **SC upgrades**: 125 out of 500 SCs chosen for upgrade; have been equipped for delivery and are manned by 3 ANMs	• MMR has fallen from 310 to 262 in a span of two years • Institutional deliveries have increased from 47% - 81% from 2007-2009 • 526,000 pregnant women transported free of charge across the state through call centres from September 2007 to July 2011 • More than 90% of the beneficiaries belonged to 'Scheduled Caste/Scheduled Tribe' and 'Other Backward Classes' which is higher than the population distribution of these categories	• Road conditions, issues around accessibility, and cell phone reception are crucial for scaling up this model (in MP, rolled out in conjunction with state-wide road development scheme, Pradhan Mantri Gram Sarak Yojna) • Centralized, 24X7 dispatch control for ambulances challenging to set-up • Monitoring referral transport and response time will need to be outsourced

METHODOLOGY

Five high-focus NRHM states were selected for regional sampling in data collection—Assam, Bihar, Uttar Pradesh, Madhya Pradesh, and Rajasthan—as they are among the poorest and most populated states[14] in the country. Two districts in each state were selected for variability in geography and health indicator performance. Within each district, a sample of health workers was selected across blocks and health facility level;[15] at any given facility, not more than one health worker of a given cadre was selected.[16]

Methods

Open-ended questionnaires were developed for cadres of health workers and district health officials. Questionnaires were administered individually and confidentially, and translated into Hindi by interviewers.[17] Responses were captured in the questionnaire format, including qualitative notes from discussions. Responses were entered into excel and analysed using descriptive statistics. State and national-level interviews were conducted with programming staff in NRHM and non-governmental organizations, trainers, and area experts. Semi-structured interviews were conducted by phone and coded by theme.

Sample

The selected sample spanned three levels of MCH care, but targeted levels 1 and 2 given the paper's focus on community and primary-level availability of skilled birth attendance.[18] Health workers sampled included auxiliary nurse midwives (ANM) and rural health practitioners [19] (RHP) at the sub-centres, ANMs and general nurse midwives (GNM) or staff nurses working at primary health centres (PHC) and community health centres (CHC), and medical officers working at PHCs (TABLE 3).

TABLE 3. Sample sizes for each respondent category.

	Assam		Bihar		Madhya Pradesh		Rajasthan		Uttar Pradesh		TOTAL
	Dhubri	Morigaon	Jehanabad	Samastipur	Dhar	Khandwa	Dausa	Dungarpur	Lalitpur	Unnao	
MO	8	8	5	7	7	5	6	6	5	7	**64**
GNM/SN (CHC)	3	0	2	3	5	4	3	1	1	2	**24**
GNM/SN (PHC)	5	7	5	4	1	0	5	10	0[20]	0	**37**
ANM/LHV (CHC)	0	0	0	0	1	0	1	0	2	2	**6**
ANM/LHV (PHC)	0	1	2	4	3	6	0	0	5	8	**35**
RHP (SC)	6	6	-	-	-	-	-	-	-	-	**12**
ANM (SC)	9	8	10	10	9	11	10	10	10	10	**97**
District	1	1	1	1	1	2	2	2	1	1	**13**
State interviews	4		3		2		4		2		**14**
TOTAL	**39**	**42**	**31**	**40**	**37**	**37**	**36**	**40**	**34**	**38**	

[14] Four out of five states in the sample (except A.P.) are part of NRHM's High Focus States

[15] District health officials in Dausa, Rajasthan and Dhubri, Assam notified health workers that researchers would be visiting health facilities, in an effort to organize efficient travel across the district, but did not accompany researchers.

[16] This is an exception in Assam, where more than one health worker was selected from the larger health facilities.

[17] In Assam, sub-centre questionnaires were translated into Assamese by the interviewer.

[18] MCH levels 2 and 3 are researched more extensively in our accompanying paper on improving the availability of specialist services in rural India.

[19] RHPs are a recently introduced health cadre in Assam. They received three years of primary healthcare training, including skilled attendance, and are placed in sub-centres.

[20] GNM posts do not exist at PHC level in UP.

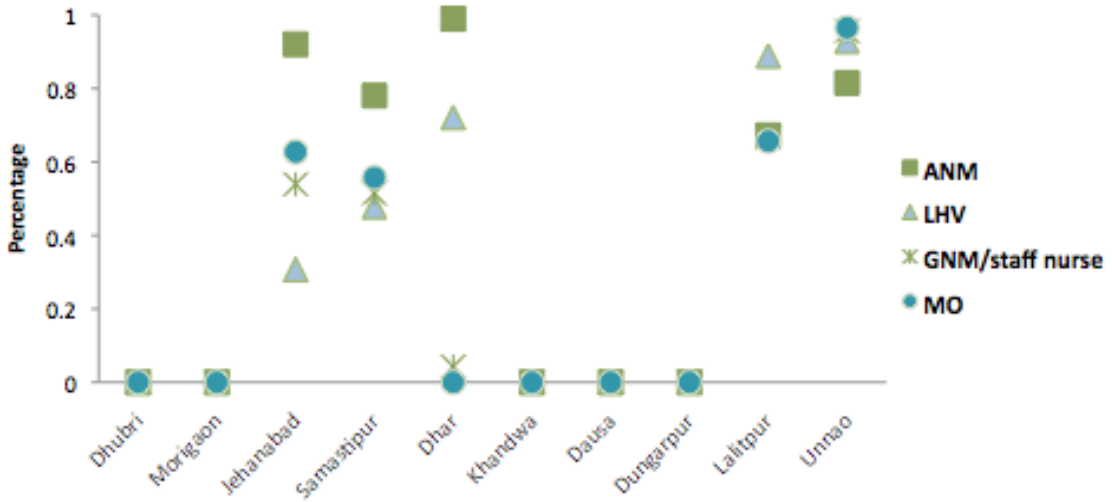
RESULTS

Examining the coverage of skilled birth attendance at India's primary level requires an assessment of (a) health worker availability as per requirements,[21] (b) measures to improve and ensure quality of care, (c) health system capacity to provide quality care in facilities and transport when required, and (d) care linkages between multiple service providers involved in care during pregnancy, delivery, and the postpartum period.

1. Health worker availability

There are many facets to examining health worker gaps in rural India; it is not only the absolute number of available staff, but also rational recruitment and placement, on-site staffing support, and targeted training. All districts reported significant gaps in health workers at the primary level (Figure 3). One key indicator of more recent staffing scale-up is the availability of the NRHM-administered second ANM. In sampled facilities, 63% of ANMs reported to be the only staff at their sub-centre; only 5% of sub-centres in UP reported a second ANM through NRHM, 15% in MP, and 40% in Rajasthan.

FIGURE 3. Proportion of sanctioned staff positions filled.



The sample characteristics also provide perspective on two important elements in health worker availability in rural areas: frequency of health worker production, and rural recruitment of trainees. First, the sample indicated a dearth in recently recruited nursing staff. Across our sample, 61% of ANMs received their qualification training over 20 years ago, 26% received their training between 10 to 20 years ago, and only 13% within the last 10 years. Second, local recruiting and placement appears to be quite strong in some states; of 77% of ANMs are working in their home district, the highest rates were 95% in Assam and MP, while the lowest was UP with 55%. Fifty percent of medical officers across states reported being from a rural area. In Rajasthan, Assam, and MP, about a third of MOs were working in their home district, but in Bihar only one MO was, and in UP none were. While the RHP concept in Assam targets local recruitment and placement, only 50% of RHPs reported to be working in their home district, and 75% reported to be from a rural area.

[21] The NRHM has sanctioned health worker posts under IPHS; 2012 guidelines further designate numbers of SBA required in intranatal facilities. The WHO recommends one SBA per every 175 pregnant women.

As states begin focusing scale-up based on the 2012 IPHS guidelines for priority sub-centres and PHCs, rational distribution will be critical for ensuring health worker availability in high-focus areas. State interviews particularly emphasized the need to prioritize SBA placement in higher-risk areas of the districts, including those areas that are difficult to reach by referral transport, or where sociocultural considerations require community-level delivery services.

MEETING PERSONNEL SHORTAGES IN ASSAM

Assam is implementing several measures to meet personnel shortages. First, the state has created the RHP cadre and positioned practitioners at community level. RHPs are intended to deliver at sub-centres, but there have been considerable challenges in stationing RHPs in areas that are high-focus and also equipped for delivery (e.g. space suitable for delivery, safety ensured for mother and staff, adequate water and power supply). Given that the position is still very young, it will be an important area for future research. The state is scaling up, and aims to open an additional 2 RHP schools.

Second, the state requires MBBS doctors to complete a one-year rural rotation; though some state experts contend that they are too early in their obstetrics and gynaecology training, having only completed 2 months at the time of rotation, to make a significant impact in meeting long-term skilled attendance needs.

Third, the state has recently initiated a six-month training course for ANMs to upgrade to a position similar to a GNM[1] to meet shortages, and then deployed to first referral units (FRU).[1] It goes without saying that comparable efforts should be made to ensure adequate ANM recruitment and training.

A critical component to availability of health workers is also the safety and welfare of these health workers. State-level qualitative data emphasized that gender is a serious policy consideration for nurse-midwife welfare, both in ensuring that female healthcare providers are in safe, non-discriminatory work environments today, and that nursing cadre are more valued in health system policy structures.

2. Health worker readiness as skilled birth attendants

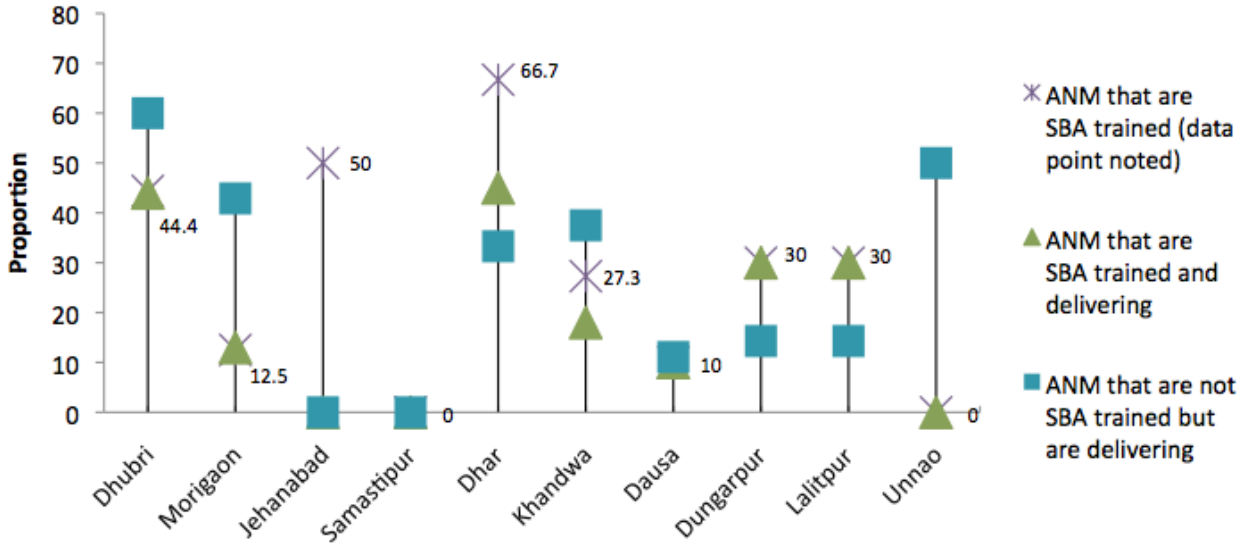
Across the states, only 27% of ANM participants had received the government's SBA training, and 51% of GNMs reported that they had been trained. District NRHM managers interviewed largely attributed SBA shortfalls to the state's inability to fill GNM and ANM vacancies in the district, poor district-level capacity to train SBA, and absenteeism among staff. We will examine in greater detail the readiness of health workers at both sub-centre and PHC facilities.

Deliveries at sub-centre level

The decentralization of institutional delivery capacity across India aims to make skilled attendance available down to the community level at sub-centres. All district NRHM officials reported that ANM are delivering in the district. First, we examine where ANM are delivering. Some states reported that ANM are delivering in equipped sub-centres; Rajasthan, for example, has tried to create 'Model Sub-Centres'[22] across the state to target infrastructure and capacity upgrades. In Bihar, officials reported that ANM deliver in PHCs or sub-centres not yet equipped for delivery; state officials report that essentially the lowest level of delivery points is the block PHC. In Dhubri (Assam), 55.6% of ANMs reported to only deliver in homes, as did 20% in Lalitpur (UP). District and state officials attributed poor infrastructure—including regular electricity, water supplies, and safe space—as a serious impediment to sub-centre deliveries.

Second districts show wide variance in the proportion of ANMs that are trained and also delivering; many untrained ANMs are also delivering (Figure 4). ANMs also reported that non-trained health workers besides themselves were conducting deliveries at their facility (e.g. second ANM), this was highest in Assam, where over 40% of ANM reported deliveries were conducted at the sub-centre by other untrained staff.

FIGURE 4. Proportion of sub-centre ANM that are SBA trained and/or delivering.



[22] Model Sub-Centres require an SBA-trained ANM, a full labor room with table and basic instruments, accessible by the population, and water and electricity sources. SIHFW reports that an average sub-centre's upgrades have required 25,000INR in civil works (3 walls for a labor room), and electricity, storage tank, and equipment an additional 10,000INR per facility.

Third, a critical component of skilled attendance for ANMs at sub-centres is identifying complications and referring women safely and in a timely manner. Fifty-four percent of all ANMs said that they would like more training in identifying complications. Nearly all ANMs reported that they refer when identifying a complication, and many record the complication in registers (Table 4). Very few take further actions like notifying the medical officer, or accompanying the woman to the referral facility. There is wide variation in reported numbers of deliveries and referrals at sub-centres.

TABLE 4. Coverage of skilled delivery attendance from ANMs at sampled sub-centres.[23]

		Assam		Bihar*		Madhya Pradesh		Rajasthan**		Uttar Pradesh	
		DH *n=9*	MO *n=8*	JE *n=10*	SA *n=10*	DH *n=9*	KH *n=11*	DA *n=10*	DU *n=10*	LA *n=10*	UN *n=10*
1	Average deliveries/month	6	3	N/A	N/A	7	5	9	5	5	21
2	Average number of referrals (last 3 mo)	2	2	N/A	N/A	3	4	2	10	0	4
3	Proportion of ANM reporting that the following actions are taken when pregnancy complication noted										
	Refer	66.7	100.0	100.0	100.0	100.0	90.0	90.0	90.0	70.0	90.0
	Accompany	0	0	0	0	11.1	27.3	10.0	40.0	20.0	40.0
	Record complication	0	0	30.0	10.0	88.8	72.7	60.0	80.0	40.0	30.0
	Notify MO	0	0	20.0	20.0	0	27.3	40.0	0	10.0	0

** No sampled sub-centres in Bihar were conducting deliveries; this is a state-wide reality. Indicated with N/A.*

We would anticipate wider variation in sub-centre intranatal outcomes and capacity if states aggressively designate MCH sub-centres for scale-up, and focus on preventative care and referral support for remaining sub-centres.

Deliveries at primary centre level

Despite the expectation for PHCs to serve as a first level referral facility and conduct a high load of deliveries each month, rates of SBA-trained staff were quite low in many districts, and a high proportion of facilities reported that non-SBA trained staff was delivering (Table 5). While medical officers are available at the PHC level, the nursing staff is likely to conduct most of the delivery caseload at the facility; this was not directly examined, but anecdotally sometimes women prefer female attendants, and nurses are often more avialable at the facilities for care, among other reasons.

PHC staff noted serious gaps in equipment, supplies, and skills for meeting the requirements for skilled attendance. Thirty to forty five percent of GNMs across sites reported that equipment required for delivery needed replacement; this was markedly lower in Bihar (10%). When GNMs were asked what they required to better fulfil their day-to-day duties, 77% reported training, and 70% more staffing at the facility.

[23] Tables in the results section abbreviate each district in sub-headings with the first two letters of the district name, for purposes of chart readability.

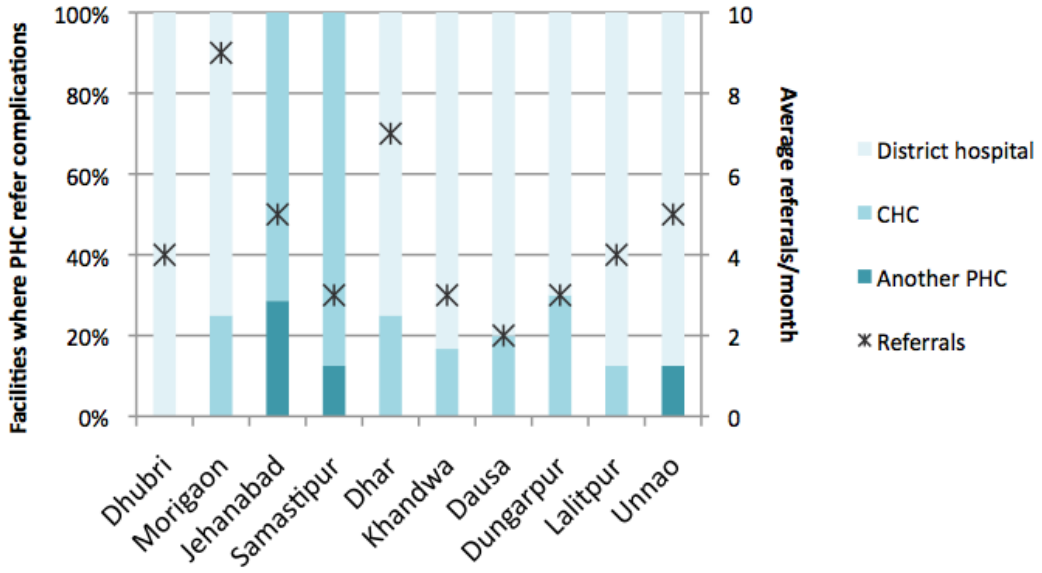
TABLE 5. Coverage of skilled attendance at primary health centres.

		Assam		Bihar		Madhya Pradesh		Rajasthan		Uttar Pradesh	
		DH	MO	JE	SA	DH	KH	DA	DU	LA	UN
1	Proportion of PHC ANM/LHV/GNM reporting that they are SBA trained	40.0	71.4	85.7	25.0	66.7	50.0	N/A	70.0	20.0*	25.0
2	Proportion PHC respondents reporting that non-SBA trained staff are delivering at facility	100.0	62.5	14.3	37.5	100.0	33.3	80.0	100.0	80.0	87.5
3	According to GNMs at PHC, the proportion of fellow staff cadre who are SBA trained										
	GNM	50.0	82.1	96.2	0	0	0	33.3	47.1	-	-
	LHV	50.0	0	0	0	0	66.7	27.0	0	0	11.1
	ANM	25.0	0	95.2	42.3	16.7	75.0	30.0	0	28.6	26.7

*GNM are not staffed at PHC in Uttar Pradesh, only ANM.

Timely referral transport is also a challenge for PHC referrals—most severely in UP, and to some extent Rajasthan. In MP, Assam, and Bihar, over 50% of medical officers reported available ambulances for facility-to-facility transport, and only 16% in Rajasthan and none in UP. Despite JSSK roll-out, only about half of MOs reported regularly available transport from home to facility in MP, Assam, and Bihar. PHCs reported largely to refer directly to district hospitals, and only facilities in Bihar reported substantial referrals to CHCs (Figure 5).

FIGURE 5. PHCs reporting on frequency and destination of intranatal referrals



PHC capacity for skilled attendance requires improvement across the board. Districts can more strategically equip PHCs for safe delivery (e.g. SBA-trained personnel, equipment, supplies, and infrastructure) based on local caseloads and proximity or accessibility of facility to a higher referral facility, which is not systematically done at present.

3. Training towards health worker readiness: an issue of numbers or quality?

State and national health and programmatic officials emphasize that skilled birth attendant readiness is not an issue of numbers[24], but quality. Respondent data would argue that both are very serious issues. First, only 27% of ANM reported to have received SBA training. Those that did had received it recently, in perhaps a clear push towards more training; of those trained, 77% reported to have received the training within the past two years. States have struggled to introduce training at-scale; Assam set goals in 2005-06 to train 10,000 ANM, but only 4,000 have been trained thus far. Respondents across districts reported that trainings covered largely the same skills sets in antenatal care, safe delivery, newborn resuscitation, postnatal care, and postpartum care. However, SBA-trained GNMs working in PHCs still reported training needs in skilled attendance (Table 6). The proportion identifying training needs was not markedly different between trained and untrained nursing staff, besides in Bihar.[25]

poor district-level capacity to train SBA, and absenteeism among staff. We will examine in greater detail the readiness of health workers at both sub-centre and PHC facilities.

TABLE 6. Self-reported training needs among nursing staff.

		Assam	Bihar	Madhya Pradesh	Rajasthan	Uttar Pradesh
1	Proportion of all GNM (CHC-PHC) that would like more training in:					
	Identifying complications	25.0	55.0	60.0	40.0	55.0
	Newborn resuscitation	6.3	25.0	40.0	45.0	40.0
2	Proportion of SBA-trained GNM (PHC) that would like more training in:					
	Identifying complications	28.5	28.5	75.0	42.8	100.0
	Newborn resuscitation	14.3	0	75.0	42.8	100.0

Serious training gaps not only concern skilled birth attendance training for nursing cadres, but also medical officers. Several programme managers report that MOs require training in recognizing and addressing complications during pregnancy. Issues as simple as hygiene and hand washing are systematically under-practiced across facilities, as reported by several state programming officials who regularly monitor facilities.

The issues that hinder quality training, continued skills development and supportive supervision are widely acknowledged, and persistent. These include:

- The reality that trainers and training leadership are identified by seniority, not necessarily interest, merit, or current clinical experience (in fact many have been promoted into administrative work for some time and are distanced from the field), which is often reflected in the effort and quality put into training.

[24] There are 1642 total public nursing schools in India, and numbers for sampled states include: Rajasthan (42), Assam (16), Bihar (64), UP (144), MP (120) (Indian Nursing Council 2012).

[25] Our questionnaire was not sophisticated enough to measure if the training needs requested by SBA-trained GNM could be higher (as they are in many cases) than non-trained nursing staff because of higher awareness (due to the SBA training) of skill sets needed, resulting lack of confidence from not understanding/lack of practice and use, etc.

- Training participants can also be selected by seniority or other means, and not strategically (e.g. skills mix or rational placement), nor by merit or interest. Poor tracking of human resources and training records further exacerbate this problem.
- The lack of a full-time training structure in many places means that district-level training responsibilities are added to already overburdened staff, e.g. DPMU or clinicians (e.g. district hospital-based trainings which call upon the same clinicians as trainers), which does not permit high quality training, introduction of innovative training means, adequate monitoring, and appropriate follow-up in the field to provide on-the-job skills support, ensure skills are applied in the home clinical setting, address problem areas, and continue training. The lack of a full-time structure in most states, especially at the district level, severely restricts institutional memory in the training structure, nor the ability to seriously review quality and reform trainings.
- Residential trainings are expensive to conduct, and facilities are not widely available or suitable for productive learning environments. The unavailability of sub-district training facilities requires participants to travel every day throughout the district, which is a financial and time burden.
- Overburdened health facilities suffer further when staff is pulled out for training, which is an issue particularly cited for the large numbers of health workers requiring SBA training.
- Practical training components are weak, and when they exist, usually occur in larger facilities that are unfamiliar to the health worker's clinical realities at their home facility.
- Post-training follow-up at facility level, particularly to ensure the safe and high-quality application of skills and continued skills development, does not exist in current training structures. Additionally, participants who return to home facilities may not have the infrastructure, equipment, or materials to apply their skills in their clinical setting.

INTRODUCING ON-SITE TRAINING: BIHAR & RAJASTHAN

The Integrated Family Health Initiative (IFHI) in Bihar is placing two full-time training coordinators in each district and one master's trainer for every two districts; all have advanced nursing qualifications (e.g. BSc or MSc). Trainers travel between block PHCs—currently the lowest level facilities delivering in the state—for on-site training on key reproductive and maternal health topics (e.g. stages of labor, management complications, family planning). Trainers use multimedia materials carried on laptops, and each facility is provided with a mini-skills laboratory, including mannequins, for training in skills that can be challenging to learn on site due to patient availability (e.g. newborn resuscitation). UNICEF is also using a skills laboratory model in the state, with a mobile laboratory that travels in the district and provides SBA training to nurses for 3-4 days.

ARTH in Rajasthan has designed similar on-the-spot training. Here, teams of both project staff and DPM/BPM officials trained in care practices visit facilities on a quarterly basis. During visits they administer quality checklists during observation, provide on-the-spot and relevant training using multimedia aids based on needs identified, and jointly plan quality improvement interventions required at the facility that will be followed-up on during the next visit.

Programme officials from Bihar and Rajasthan recognize that while these models of on-site training add significant value in developing skills, improving quality of care, and continuing education, they do not necessarily replace existing training structures (e.g. nursing qualification training), which require serious reforms towards quality assurance. Officials also report that there has been great interest in the trainings; programming is ongoing so evaluations are not yet available.

Some states have implemented measures to address these issues. Assam recently initiated a PPP with private nursing colleges for SBA training space, in an effort to meet training targets. Three training batches have been completed. Some, however criticize this PPP approach to training, arguing that it is political compromise to commit to training and then not providing substantial investment to build the public system capacity to trains and support its staff. In Rajasthan, the SIHFW has assumed training responsibility for SBA, and report that ARTH and UNICEF in Rajasthan are engaging retired medical doctors to conduct mentoring rounds at local health facilities and provide on-the-job training.

Larger structural issues permit poor training quality and uptake. First, health expertise in the country emphasizes that a persistent lack of political will in many states is a significant issue in prioritizing training and training reform, and providing the serious investments required to build capacity in maternal health. Second, many state-level trainers emphasize that while training continues to focus heavily on skills building, it does not emphasize many of the soft skills and sensitization needed to foster the appropriate attitudes and behaviours required for high-quality, comprehensive health care that is focused on serving the rural poor.

4. Skilled birth attendant connectedness: linkages between community and primary level care

In many cases, and especially in higher risk pregnancies, skilled attendance is dependent on linkages of information and care across multiple care providers and locations. Here we examine two types of linkages: information and transport.

Information linkages

Information linkages are critical in skilled attendance, particularly when identifying, addressing, and monitoring complications in pregnancy, delivery, and post-delivery. While there are a number of information streams available in the Indian health system, our results demonstrate that they are not well used in practice—and across multiple care providers—for the efficient and safe care of a mother and child.

One key linkage is making accurate information about a woman's pregnancy available at the time of delivery. Across states, 45% of medical officers and 68% of GNM report that when a woman arrives at the facility for delivery, they are able to ascertain if she had complications during her pregnancy (Table 7). Over 80% of MOs and GNMs report that they receive information about a woman's blood pressure or her haemoglobin (Hb) levels during her antenatal care. This might indicate that current information streams do not adequately capture complications, or, in other likely scenario, complications are not adequately assessed for and identified during the antenatal periods.

Eighty-three percent of GNMs and 77% of MOs report that they acquire this information from mother-carried cards; other significant sources of information are the ASHA and the woman herself. After the delivery, 91% of GNM report that information about the delivery is recorded in the delivery register, and 23% in MCTS formats. A small minority record information on formats that will be available for the ANM or ASHA in postnatal/partum care, including the mother-carried cards (11%) or a discharge slip (13%). However, about 75% of GNMs and MOs are confident that the information will be passed along to the necessary health workers, and most likely verbally from the mother.

TABLE 7. Health worker access to recorded information during delivery and post-delivery.

	Assam		Bihar		Madhya Pradesh		Rajasthan		Uttar Pradesh	
	DH	MO	JE	SA	DH	KH	DA	DU	LA	UN
1 At the moment a woman arrives at a facility, what will the medical officer know about her pregnancy?										
Hb	87.5	100.0	60.0	71.4	100.0	80.0	100.0	83.3	60.0	85.7
Blood pressure	87.5	100.0	80.0	71.4	85.7	80.0	50.0	66.7	80.0	85.7
Tetanus toxoid (TT) schedule	0	0	80.0	71.4	57.1	80.0	100.0	100.0	80.0	100.0
Estimated date of delivery (EDD)	37.5	37.5	80.0	28.6	28.6	60.0	50.0	66.7	80.0	57.1
If complications during pregnancy were identified	0	37.5	60.0	28.6	57.1	20.0	66.7	83.3	40.0	71.4
Number of pregnancies	12.5	37.5	80.0	42.9	57.1	20.0	50.0	100.0	80.0	100.0
2 After the delivery, what information does the medical officer record about a woman's delivery?										
Hb	0	25.0	42.9	42.9	57.1	60.0	50.0	66.7	40.0	14.3
LBW	0	25.0	80.0	85.7	100.0	80.0	100.0	100.0	80.0	100.0
Feeding	0	12.5	80.0	71.4	100.0	40.0	66.7	50.0	80.0	100.0
Complications	0	25.0	80.0	57.1	71.4	60.0	83.3	83.3	80.0	100.0

A second important linkage is for support from other health workers, particularly for questions about care or notifications about referral. GNM and ANM both report across states that they are most likely to call a medical officer if they encounter a problem in the clinic, and most use mobile phones. Rajasthan has issued GNMs official mobiles, and Rajasthan and Assam provide ANMs mobile phones.

INFORMATION LINKAGES FOR CARE DECISIONS: BIHAR

Integrated Family Health Initiative (IFHI) in Bihar is introducing 'case papers' to be used at intake and discharge to both record information and use it in care decision-making. This was determined a priority need because women arrive for delivery late, and usually without information about their care. If MAMTA cards are available, they are not used systematically in decision-making, nor are protocols displayed in the facility. The case paper provides an algorithm to identify and manage complications, or at least stabilize before referral. Key care information from the case should be available to community-level care outreach and follow-up.

Referral capacity

A second critical linkage in skilled attendance is a physical one: the availability of safe, timely referral linkages between facilities in the case of emergency. As reported earlier in this section, respondents acknowledged serious gaps in referral transport, though efforts to centralize dispatch and coordination (e.g. through contracting out ambulance services to GVK EMRI 108) and to ensure transport entitlements in JSSK are expanding in most states (Table 8).

TABLE 8. Geographical coverage of facilities providing safe delivery.

		Assam		Bihar*		Madhya Pradesh		Rajasthan		Uttar Pradesh	
		DH	MO	JE	SA	DH	KH	DA	DU	LA	UN
1	Average (*range)* reported distance (km) from PHC to nearest government facility providing safe delivery	23.2 *(15-36)*	15 (*7-30)*	11.5 *(3-30)*	11.5 *(6-15)*	28 (*8-80)*	18 *(3-39)*	12.3 *(5-18)*	8.25 *(3-15)*	21 (*5-40)*	15.6 *(1-30)*
2	Average (*range)* reported distance (km) from PHC to nearest private facility providing safe delivery	24 *(18-30)*	16.7 *(1-40)*	17.3 *(8-30)*	12.5 *(10-15)*	25.5 *(12-45)*	10 *(0-22)*	12.3 *(5-18)*	40.75 *(15-90)*	27 *(20-40)*	18.4 *(0-35)*
3	Average (*range)* reported distance (km) from sub-centre to nearest government facility providing safe delivery	14.7 (3-70)	6.4 (1.5-12)	6.2 *(2-12)*	4.6 *(0-7)*	4.2 *(1.5-8)*	10.2 *(1.5-40)*	6.7 *(2-20)*	5.5 *(1-12)*	7.4 *(0-16)*	8.9 *(2-20)*
4	Proportion of medical officers reporting that PHC has available service to transport from home to facility (mothers & children)	100.0	62.5	75.0	50.0	25.0	50.0	20.0	0	0	0
5	Proportion of medical officers reporting that PHC has available service to transport facility-facility (mothers & children)	0	87.5	75.0	50.0	25.0	50.0	20.0	0	0	0

The geographic distribution of skilled attendance is also critical for the strategic placement and scale-up of attendants in high-focus areas. Of interest from our sample, medical officers at PHC reported very comparable referral distances between the closest public and private facilities with intranatal care. This documents the robust private sector spread in rural areas. While GNMs report that JSY incentives are still the largest draw to public sector delivery services, significant numbers of women are delivering in

private facilities, at an average of 5100INR per normal delivery and 16,000INR for caesarean section. The majority of GNMs said that women who choose to deliver in private facilities do so because the quality of care is better, and they know health workers are readily available.

Conclusion

Several key issues have emerged from our primary research about the availability of skilled birth attendance, many of which are widely recognized: (a) there are serious, persistent gaps in safe delivery capacity at the primary level, especially sub-centres and remote PHCs, despite efforts to decentralize care through NRHM; (b) SBA training targets are not being met across states; (c) SBA training quality is poor, particularly practical components; (d) there is a need for improving the rational distribution of SBA-trained staff into facilities with capacity, and to high-focus catchment areas, which limits skills development and/or maintenance, and also care outcomes; (e) quality of care post-training is not well monitored or supervised, so skills are not necessarily well applied or further developed; (f) health worker availability is largely insufficient at primary care levels, particularly nursing staff; (g) gaps in information between providers exist, particularly for use in point-of-care support, despite several means of data collection and tracking; (h) serious system gaps remain in equipment, supplies, and timely referral transport; (i) India's patriarchal society has considerable implications for the valuation and welfare of women providers in health services, particularly nursing cadre.

Our primary research highlights immediate requirements for more targeted systems strengthening, particularly for sub-centres that can provide intranatal care, and for PHCs depending on their delivery caseload and accessibility to other referral facilities. This requires significantly more strategic planning at the district level, and creating or reinforcing full-time support structures that can focus on quality assurance of care, including training and skills development, facility quality management, and linkages between care providers.

DISCUSSION & RECOMMENDATIONS

This paper seeks to examine what mechanisms can improve the availability of skilled attendance in delivery and immediate postnatal care in rural India. In light of the secondary and primary research presented in this paper, we offer the following recommendations and justifications for policy and programmatic consideration:

1. Requirements for a full-time training and supportive supervision structure at district level

SHORT TERM

The training and supportive supervision requirements for a quality workforce of skilled birth attendants in rural India is staggering, and can no longer be met without a commitment to a full-time, innovative training structure. We have outlined the persistent issues in current training structures that hinder quality, maintenance of skills, on-the-job support, and performance management. District-level, full-time training structures are immediately required to (a) provide regular training requirements at scale (e.g. SBA), and (b) provide significant support in ensuring that skills are used, and quality care provided, in home facilities. On-the-job skills support is a critical gap in the system, and heavy investments in training will not provide the desired results until this gap is closed. On-site training can provide more relevant, interactive training and mentorship to health workers, and enables regular monitoring of quality and skills utilization.

Reference*:* The Integrated Family Health Initiative (IFHI)[26] and UNICEF are introducing innovative on-site training models in Bihar, as is ARTH in Rajasthan. Please see Results section for further details.

2. Prioritizing MCH sub-centres to meet immediate skilled attendance needs at community level

SHORT TERM

Safe delivery is not reaching the community level as NRHM envisioned, and as rural communities require. States now have the time-sensitive task of strategically and systematically designating select sub-centres as MCH sub-centres and strengthening them to provide safe delivery. These designations must be data-driven about catchment areas that should be high-focus, including data from health information systems, mapping exercises, and district/block experiences in catchment areas. State experiences point to the necessity for a coordinated 'package' of quality upgrades to sub-centres to: (1) ensure facility capacity, including infrastructure, staffing, and equipment/supplies, (2) ensure adequate skills are available, and (3) ensure that performance is audited.

Measures should include, but are not limited to: (a) rational placement of skilled birth attendants in MCH centres, including incentives for expected higher workloads and 'isolated' postings, (b) serious commitment to ANM on-site training, supportive supervision, and peer mentoring arrangements, (c) immediate water and power (solar) access, (d) fast-tracked construction to ensure labour space, and (e) systematic MCH sub-centre monitoring of outcomes, quality assurance, and incentives for strong performance. Districts' and states' ability to meet MCH sub-centre sanctions should be a serious accountability measurement. Building out MCH sub-centres also requires the full coverage of emergency services, and accessibility of sub-centres should be considered when designating them for

[26] Project team led by CARE India and includes partners

intranatal services. Referral transport systems must be effectively managed and available within reasonable transport times from MCH sub-centres.

Reference*:* Model Sub-Centre initiative in Rajasthan, where certain sub-centres were targeted for quality improvement. Please see Results section for more detail on interventions and basic costing. Our experience in the state, however, indicates that not all Model Sub-Centres are fully functioning, and there is much to be learned from the state's scale-up experiences.

3. Prioritizing coordinated referral transport systems

SHORT TERM

Coordinated referral transport systems are a critical intervention for ensuring emergency obstetric care, and also provide an important systems linkage in strengthening capacity at primary care level to handle normal deliveries, and higher level facilities to focus on cases with complications. UP particularly requires an immediate scale-up to provide referral transport; this remains a significant gap in providing safe delivery across the state. As JSSK is strengthened across the country, entitling women and children to free transport services—it is necessary to streamline referral transport systems into emergency and non-emergency, drop-back vehicles. As was qualitatively reported in several sites, districts are using enabled ambulances to provide non-emergency transport (e.g. drop-offs at home after delivery), and these services should be re-directed so that emergency care services are not compromised. Additionally, as referral transport systems scale-up, considerable efforts must be placed in: (a) centralizing dispatch and management of ambulances to ensure adequate response times and around-the-clock operations, and (b) diversifying vehicles to reach isolated areas (e.g. four-wheel transport where required).

Reference*:* Guna and Shivpuri district pilots in Madhya Pradesh, a collaboration between UNICEF and the state government, as detailed in our Background section.

4. Diversifying skilled birth attendance cadre to address gaps in rural availability

MEDIUM-LONG TERM

Persistent gaps in rural health worker availability require a number of serious reforms, including strong rural recruitment, improved work incentive packages, and higher quality education, especially among nursing cadres. Strengthening and diversifying health worker cadres to fill key gaps in preventative, curative, intranatal, and immediate postnatal care could include:

1. National commitment to the creation of a **nurse-midwife cadre**
2. Serious national consideration of advancing a nursing model in the country, strengthening rural coverage of **advance practice nurses** (APN). Current nursing cadres can be strengthened and developed professionally as nurse practitioners.
3. Possibilities for further recruitment of retired or non-practicing nurses for additional midwifery support.
4. Targeted scale-up of **rural health practitioners**, which should gain momentum with the recent endorsement of the BSc Community Health, in high-focus areas of the country. This is a secondary recommendation at this stage because there is more data required on RHP

performance in Assam to determine how they are helping in performing skilled birth attendant functions.

5. Wider scale-up of **in-facility health workers to assist nurses** in facilities with essential care and motivate families in good newborn care practices (e.g. *mamta* cadre in Bihar, *yashodas* in Rajasthan). Efforts must also be made to ensure that their priority duties are postnatal care.

Reference*:* Rural health practitioners (RHPs) from Assam and rural medical assistants (RMA) from Chhattisgarh. The yashoda/mamta cadre has been piloted in states by the Norway-India Partnership Initiative and is set for state scale-up by the governments of Bihar and Rajasthan.

5. Improving information linkages for point-of-care support

SHORT-MEDIUM TERM

Despite numerous systems for tracking information about women and children, recording is tedious and not used for decision-making. Information recorded about individual mothers and children (e.g. MAMTA card, MCTS, facility registers) is not well used to identify complications and alert other care providers. Additionally these formats do not capture intranatal complications and/or specific care requirements in the postnatal period. Piloted efforts to streamline data collection and use (e.g. notifications systems) are required. Additionally, mobile outreach that complements the health system and provides antenatal care (e.g. NGO efforts, or 104 services in Andhra Pradesh, which are state-run and not discussed in this paper) for women need information linkages for intranatal care as well.

Reference*:* The IFHI (Bihar) 'case paper' detailed in results section provides a useful supplementary tool for decision-making during intranatal care. As an example of information linkages provided during the continuum of care, Dhemaji district in Assam has introduced a mother-child tracking system (pre-dating MCTS) that uses independently designed software, with fewer indicators than MCTS, but widely used for ANM and ASHA work plans, notifications across service care providers, and reminders for mothers.

6. Ensuring nurse-midwife welfare

MEDIUM-LONG TERM

Nursing staff, and particularly those trained as skilled birth attendants, has a critical role in India's aims for universal health coverage. Nursing education, quality assurance, adequate compensation, protection, and leadership require major reforms to address workforce inadequacies (e.g. underproduction, education gaps between theory and practice, haphazard deployment, exploitation and welfare concerns). Nurse-midwife leadership is required at the highest levels of policy discussions, reform, and planning for universal health care.

Reference*:* Models of nursing-led care globally (e.g. US, Sub-Saharan Africa); emerging midwife-led care models in South Africa, where midwife obstetric units have been established by provincial health systems and serve as primary level maternal and neonatal facilities (not yet a national model) (State of World's Midwifery 2011).

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