Maternal, Newborn and Child Health in Bellary District

A Situation Analysis

The Sukshema Project
2011

National Rural Health Mission, Karnataka State
Karnataka Health Promotion Trust
University of Manitoba
Karuna Trust
St John's Academy of Health Sciences
Intrahealth International
District Health and Family Welfare Department, Bellary

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Behind KSSIDC Administrative Office
Rajajinagar, Bangalore- 560 044

Phone: 91-80-40400200
Fax: 91-80-40400300
www.khpt.org

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Dr. V.D. Palekar, Project Director, Reproductive and Child Health, Directorate of H & FW Services and In-charge Director, State Institute of Health and Family Welfare
Dr. Mohan Raju, Executive Director, Karnataka State Health Systems Resource Centre
Dr. Manjula, Deputy Director, Training, State Institute of Health and Family Welfare
Mr. K.S. Shankar, Deputy Director, HMIS/MCTS, Directorate of Health and Family Welfare
Dr. P.K. Srinivas, Lead Consultant, NRHM
Dr. Neena Nanda, MCH Consultant, NRHM
Dr. Shapeti, JD Planning, Directorate of H&FW Services
Mr. Manjunath, CFO, Directorate of H&FW Services
Dr. Ziahullah, CAO, Directorate of H&FW Services
Dr. K. Siddesh, Deputy Director, EMRI &PNDT, Directorate of H&FW Services
Mr. Joyi V. Chacko, Demographer (D&E Cell), Directorate of H&FW Services
Dr. M. Chetan, State Demographer, Directorate of H&FW Services
Mr. Mallikarjun Sakkappa, Addl. Administrative Officer, GMS
Dr. Shivarudraswamy, Chief Supervisor, GMS
Dr. Prabhudev, Chief Supervisor, Equipment, GMS
Ms. Ishraf Begaum, Deputy Director, ICDS, MS Building
Dr. Nagaraj, Joint Director, PPP, KHSDRP
Dr. Srikanth Basur, District Health & Family Welfare Officer, Bellary District
Dr. M.K. Patil, Reproductive and Child Health Officer, Bellary District and
Dr. Lingaraj, DPMO, Bellary District

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FORWORD

Maternal and child heath is central to the goals of the national Rural Health Mission; the primary objectives are to decrease the maternal mortality ration, infant mortality rate and the total fertility rate. To achieve these goals, the NRHM has endeavoured to and other stakeholders. Only by working together we can overcome the key institutional and socio-cultural challenges in achieving the goals of an MMR of 100 per 100,000 and an infant mortality rate of 25 per 1000, and achieve more equitable health outcomes across the state.

In addition to convergence, decentralization and delegation of both administrative and financial powers have been hallmarks of the mission's strategy. For such decentralized decision making, data at the district level is the key. The *Sukshema* project has compiled primary and available secondary data for the 8 districts in the north of the state and has provided with the data required for district-level planning.

This data from *Sukshema* is timely and useful, as we have many challenges ahead of us in reducing maternal and infant mortality. Some districts are still facing a lot of access, quality and coverage issues. The first phase of the Karnataka Health System Development Project improved infrastructure requirements. In the second phase, we are focusing on Human Resources and Quality Health Care. Despite so many medical colleges and MBBS graduates, few are willing to work in rural areas. These staffing gaps lead to inequities in care, and key primary health indicators are still lagging. For example, UNICEF CES 2009 data suggests immunization is only 78% in the state.

While we have some excellent intervention models that have made strong inroads, such as the conversion of PHCs, and a number of demand-side incentive schemes (Janani Suraksha Yojana, Madilu Kits and Prasuthi Araike) – efforts need to be bolstered if such models are to provide enduring solution. As well as insufficient coverage of immunization – the much more challenging issues are the rare of institutional deliveries which is still a cause for concern, and deaths from postpartum haemorrhage and eclampsia.

To deal with issues such as this, we need to draw upon expertise from within the system, but also beyond the system, from other areas of the country and also globally, to find the most appropriate solutions for the challenges ahead. The report has highlighted key gaps and implications, recommendations to brid

ge the critical gaps in the districts MNCH programs in their districts.

S. Selva Kumar, IAS
Mission Director – NRHM
Department of Health & Family Welfare
Government of Karnataka

Dr. E.V. Ramana Reddy, IAS
Secretary to Government
Department of Health & Family Welfare
Government of Karnataka

The Sukshema Project is a partnership between the University of Manitoba, Karnataka Health Promotion Trust (KHPT), Intrahealth, Karuna Trust, St John's Academy of Health Sciences and the Government of Karnataka.

The team members include:

In Bellary district
Seema Huddar
Sateesh Gouda

Karnataka Health Promotion Trust Central Team
Ajay Gaikwad
Anindita Bhowmik
Arup Kumar Das
Beena Varghese
Bhupendra Prabakhar
BM Ramesh
Kaveri Gurav
Krishnamurthy
Lakshmi C
Mallika Biddappa
Mohan HL
Richa Kalra Kapoor
Rajiv Ranjan

University of Manitoba
James Blanchard
Lisa Avery
Sharon Bruce
Stephen Moses

Intrahealth
Anna Schurmann
Beth Fischer
Sara Lewis
Sharon Arscott-Mills

St John's Academy of Health Sciences
Annamma
Divya
Kiruba
Prem
Sanjiv Lewin
Sulekha
Suman Rao
Swarna Rekha

Karuna Trust
G.V. Nagaraj
H. Sudarshan

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Executive Summary

The NRHM

India launched its National Rural Health Mission (NRHM) in April 2005 to tackle the high burden of maternal, neonatal and child morbidity and mortality in India's rural populations. Key aspects of the NRHM are its scale, its focus on extending services to the rural poor, and its inherent flexibility for introducing innovative approaches for improving health system responses to improve maternal, newborn and child health (MNCH) outcomes. The NRHM in Karnataka has strong leadership and seeks to find innovative ways to improve health outcomes, with a view to achieving health equity between and within regions – renewing the emphasis on "Health for All". Investments have been made in strengthening infrastructure, building capacity of service providers, and ensuring security of health commodities. Some of the most impressive initiatives include the "Number 108" ambulance scheme, the *Janani Suraksha Yojana* scheme and Accredited Social Health Activists (ASHAs) – a community volunteer workforce – all of which have contributed to unprecedented increases in institutional deliveries across the region, and improved health outcomes.[1]

The Sukshema Project

In alignment with the NRHM's objectives and approaches, the Bill & Melinda Gates Foundation's (BMGF) Maternal and Neonatal Health Strategy seeks to improve MNCH outcomes in the world's poorest regions by catalyzing health system responses to ensure that critical, proven interventions during pregnancy and in the neonatal period reach underserved populations.[2] BMGF awarded funds to the University of Manitoba, in partnership with the Karnataka Health Promotion Trust (KHPT), St John's Medical College, Intrahealth and Karuna Trust to support the Government of Karnataka (GoK) to develop and implement strategies to improve maternal, neonatal and child health in alignment with the critical MNCH interventions among the rural poor in eight priority districts in northern Karnataka: Bagalkot, Bellary, Bidar, Bijapur, Gulbarga, Koppal, Raichur and Yadgir.

This is the *Sukshema* project. The project focuses on improving the availability, accessibility, quality, utilization and coverage of maternal newborn and child health services. An important component of the project is to promote evidence-based decision making at the district level in accordance with state and national guidelines. The project hopes that as data is made available and used for district-level decision making, this will increase availability, accessibility and quality of MNCH services, and ultimately to increased utilization and improved health outcomes.

To gather the required data, a series of assessments were undertaken, largely in 2010, including analysis of secondary data and collection of both qualitative and quantitative primary data (see *Methodology*, below). Each of the eight districts has a *District Maternal, Newborn and Child Health Situation Analysis*

[1] GOI, NRHM Mission Document 2005-2012

[22] Bill & Melinda Gates Foundation, 2009. Maternal Neonatal and Child Health Strategy, BMGF, Seattle. www.gatesfoundation.org/mnch

report, which consolidates these complementary data sources in one place, as a reference for decision making and planning. This report focuses on Bellary district.

In the table below (table a), key service utilization, outcome and impact indicators for Bellary district are shown alongside indicators for the state and the project districts (in northern Karnataka). The differences between the rates demonstrate the need for district-specific data for decentralized planning.

Indicators for Bellary district are roughly similar to the levels for the project districts, for example, institutional deliveries are at 46% andnewborn visits within 24 hours are around 50% in both Bellary and the project districts. For some indicators, Bellary is slightly higher – for example contraceptive use (with lower unmet need) and vaccination rates. These relatively good outcomes don't seem to have translated to strong impacts. Oddly, estimated mortality rates are higher in Bellary than the project district average, with for example, the maternal mortality rate being 413 per 100,000 live births compared to 408 in the project districts (see table a below).

Table a: Key maternal and newborn health indicators for Bellary district

Indicator	Bellary District	Project districts (Bagalkot, Bellary, Bidar, Bijapur, Gulbarga, Koppal, Raichur)	State
Fertility and Family Planning			
Average number of children:			
For 20-24 year old age cohort	2.9	2.0	1.7
For total rural population	1.9	3.5	2.8
Contraceptive Prevalence Rate	55.1	52.5	61.8
Permanent method/ Sterilization %	53.1	50.3	56.8
Spacing methods %	1.4	1.8	4.0
Unmet need %	16.8	19.3	15.7
Pregnancy and birth			
3 or more ANC visits %	64.3	65.2	81.3
Institutional deliveries %	45.5	45.7	65.1
Home deliveries %	54.1	53.6	34.1
Newborn visit within 24 hours %	50.5	50.4	64.2
PNC visit within 48 hours %	54.9	51.5	65.6
Newborn and Child health			
Breastfeeding *Initiated within one hour of birth %*	44.3	40.2	46.5
Vaccination (full vaccination) %	65.3	62.1	76.7
Mortality			
MMR (per 100,000 live births)	413	408	294
IMR (per 1000 live births)	96.5	67	51
Neonatal mortality (per 1000 live births)	63.8	50.9	39.5
Under-5 mortality (per 1000 live births)	130.5	91.7	64.1

Data source: DLHS 2007-8

The summarized findings are presented below, first at the system level and then according to the care component, from ANC to Essential Newborn Care.

The Health System in Karnataka

The health system in Karnataka has achieved an unprecedented increase in facility-based deliveries. Two contributors to this success are the "Number 108" Ambulance scheme and the *Janani Suraksha Yojana*

(JSY) scheme. The "Number 108" Ambulance scheme is a public-private partnership which provides a comprehensive emergency response service, transporting pregnant women to facilities for delivery. The JSY scheme pays below poverty line (BPL) women an incentive for facility-based births. However, the targeted nature of the JSY scheme makes it cumbersome to implement, with the paperwork for certifying low-income status a burden to health workers and families. In addition knowledge about the scheme is relatively low, and the amount received and timeliness of the payments uneven. As it only provides an incentive for facility-based deliveries, other components of care (such as PNC) may be neglected. Therefore, while a success, there is some room for improvement.

The NRHM has managed to fill staffing gaps through contracting and employing AYUSH doctors as medical officers (MOs). However, up to date information on human resources in the public system (vacancies and trainings) is not sufficiently available for accurate planning, making it difficult to prioritize vacancies, plan trainings or ensure even distribution of staff across the population. Across every care component, human resources need to be increased to ensure quality of care.

In addition, the present system of facility referrals is not methodical and documentation practice is inadequate, with few facilities maintaining charts, registers or filling out referral slips.

Bellary District

The service delivery framework

NRHM investments in the elevation of regular PHCs to 24/7 PHCs (including increases in staffing, infrastructure, equipment and drugs and supplies) have increased access to care for all care components. Some gaps still remain, especially in staffing and infrastructure. Despite NRHM's innovations in increasing human resources the distribution of staff across the population is uneven. Gaps in staffing lead to inequities in service provision. More staff need to be hired to fill such gaps, in particular, more ANMs need to be hired across the district, especially in Bellary and Hospet talukas. In addition, a lack of piped clean water, toilets, soap and waste management practices undermines the quality and safety of care provided in all facilities.

Antenatal Care

Antenatal care is the first point of contact for a pregnant woman with the health system, and provides an excellent opportunity to build a facility-patient relationship that can endure through the continuum of care. This is an opportunity that can be better leveraged; although over 96% of ANC registrations occur at sub-centres (SCs), less than 5% of SCs provide all elements of basic ANC services. Providers at all facility levels lack the knowledge and skills to deliver complete ANC services, especially counselling and treatment of pre-eclampsia. Due to these service deficits, women need to visit a variety of facility types to receive comprehensive antenatal care, including private facilities. Ultimately, a large proportion of antenatal care is sought in the private sector, even for disadvantaged groups.

The disparities between population subgroups (caste, wealth, residence) in receiving ANC and comprehensive care are large. Inadequate quality of service provision compounds existing risk factors,

for example; those with the highest risk factors for inadequate nutrition are also less likely to be counselled on good nutrition practices. Making antenatal care more comprehensive and accessible in the public sector, and at the community level, would likely reduce these disparities.

ANC care (including scans and tests) is the most expensive component of care, at an average cost of Rs 1200, compared to Rs 1000 for a facility based delivery and postpartum care. While this cost seems excessive, qualitative data captures the perceived importance of scan results in assuring parents a pregnancy is healthy.

Intranatal care

While the rate of institutional deliveries has increased with the JSY scheme, the rate in Bellary district is lower than in the state. For rural women who do not deliver in institutions, the main reasons cited were "not necessary" and "not customary". However, the high levels of reported delivery complications suggest a high need for skilled birth attendance, and the benefits of skilled attendance needs to be better communicated back to the community.

Qualitative data found a general preference for delivering in the private sector, despite the higher expense. The reasons were perceived efficiency, more supplies and a cleaner environment. For those who delivered in the government sector, the reasons were to avail in incentives and because they could not afford to deliver in the private sector.

The elevation of PHCs to 24/7 PHCs is a process that is not yet complete. Providers at this level often do not have the skills or supplies to treat important complications (such as eclampsia or post partum haemorrhage) and refer patients to higher level facilities, creating system inefficiencies. To further increase access, PHCs need to be strengthened to offer comprehensive intranatal care, particularly ensuring adequate numbers of providers with competencies to offer skilled birth attendance.

Post natal and newborn care

Improving facilities to encourage women to stay the recommended 48 hours after delivery would better enable post-natal care to be delivered. After delivery and once women have left the facility, post-natal follow up at the community level is *ad-hoc* and needs to be improved, it is important to improve the assured referral system from lower to higher institutions and higher to lower institutions. Only 46% of women in rural Bellary receive post natal check-ups within 48 hours of delivery. This compares poorly to 52% in project districts and 66% in the state. Disparities between population subgroups are large; for example only 40% of the poor received a post-natal check-up compared to 66% of the non-poor.

In Bellary, only 44% of women initiate breastfeeding within one hour of giving birth; an increase in skilled birth attendants would likely improve this. Qualitative data revealed that breastfeeding is considered the most important practice for ensuring the health of the newborn, but practices vary, with many avoiding giving babies the colostrum.

Essential newborn care and child health

At the community level, only 11% of women in Bellary know all the newborn danger signs. While low, this compares well to the rate in the project districts and the state (6% and 8% respectively). In addition, the percent of children under three years old who received a check-up within 24 hours of birth in rural Bellary is 43%, low compared to the rate in the project districts (50%) and with wide disparities between population subgroups. These two sets of indicators are a concern; if mothers do not know dangers signs and the child doesn't receive regular check-ups, problems are unlikely to be identified and acted upon. Even if the mother does receive a visit, care for sick newborns is uneven, with very few providers following protocols for the integrated management of childhood illness (IMNCI).

Safe Abortion

Unsafe abortion accounts for 8% of all maternal mortalities in India. Household survey data on pregnancy termination is not reliable and for this reason it is difficult to ascertain the incidence of abortion in Bellary district. Unhelpfully, provision of safe abortion services and post abortion care is inadequate at all levels of the government health system. In addition, post abortion contraceptive counselling and provision of contraceptives is low. Increasing the availability and accessibility of safe abortion, in a stigma-free environment, is an important way to reduce maternal mortality.

Family planning

Knowledge of family planning in Bellary district is near universal. The contraceptive prevalence rate is 55% in the district, but use of spacing methods is inadequate at only 1%. Lack of spacing is a contributing factor to poor newborn and infant health outcomes. In service delivery throughout the continuum of care, there are many missed opportunities for family planning counselling and commodity provision, especially the post-partum insertion of intra-uterine devices (IUDs).

Implications

The findings of the assessments carried out by the *Sukshema* project have implications across four domains: the system level; the facility level; service delivery at the community level; and health education and community support systems at the community level. These apply to all eight districts, including Bellary.

Implications for health systems

With the advent of the NRHM, the health system in project districts has become more dynamic and increasingly responsive. With the huge challenge of reaching the NRHM targets of an infant mortality rate of 30 per 1000 and a maternal mortality rate of 100 per 100,000[3], a number of challenges remain:

- Clinical record keeping needs to be improved to facilitate better clinical decision making
- A more structured referral system to streamline the flow of patients between facility levels is needed, allowing each level to specialize in different levels of care
- Greater coordination is required with private providers, to allow gaps in the public sector to be filled through partnerships and referral linkages with private facilities

[3] GOI, NRHM Mission Document 2005-2012

- An enhanced human resource information system would strengthen human resource management, including prioritization of vacancies
- Mechanisms for supportive supervision, mentoring and monitoring needs improvement – to build competencies and support quality of practice
- A merit-based career path could be created as a performance incentive
- Induction training for all staff, including contractual staff would ensure that everyone starts at the same level, as human resources are expanded
- Management training for MOs is required
- In-service training needs to be skills based and specific to job roles
- Clarity is required between the overlapping roles of ASHAs, *anganwadi* workers and ANMs
- Service statistics need to be used for forecasting and procurement of drugs and supplies
- A monitoring and indenting system is required to replace all non-functional equipment
- Increased awareness is required of all financial schemes
- The JSY scheme could be extended to all mothers (above and below poverty line)

Implications for service delivery in facilities

Service delivery in facilities is central to any strategy for addressing maternal and child health outcomes. While there have been many improvements in facility-based care, assessments performed by the *Sukshema* project has identified a number of gaps.

- Data on the high incidence of pregnancy complications need to be communicated back to the community.
- Basic emergency obstetric and newborn care (BEmONC) & comprehensive emergency obstetric and newborn care (CEmONC) need to be established, according to population norms
- Training of skilled birth attendance needs to be scaled up, with an emphasis on identification, treatment and referral of complications
- The quality of postpartum care needs to be improved, to encourage women to stay 48 hours after delivery. This would include improvements in sanitation, provision of food and ensuring a family-friendly environment
- Provision of safe abortion services at PHC and higher facilities will help reduce maternal mortality
- Many opportunities are missed for providing family planning along the continuum of care, especially post-partum IUD insertion and post abortion contraceptive counselling. In particular, birth spacing methods needs to be better promoted.

Implications for service delivery at the community level

Antenatal care, postnatal care, counselling and provision of contraceptives can all be provided effectively at the community and sub-centre level through ANMs, ASHAs and AWWs. The *Sukshema* project has arrived at the following implications:

- SCs should be strengthened to provide comprehensive antenatal and postnatal care at the community level, and mobile testing centres should be established to ensure that women do not need to visit multiple facilities for diagnostic services

- Community-level diagnosis, management and referral of ANC, post-partum and newborn complications all need to be improved.
- Stronger linkages need to be forged between facility-based deliveries and ANMs to improve community based delivery of postnatal care.

Implications for health education and community support systems

The prevailing cultural practices, beliefs and decision making process for health-seeking play an important role in creating demand at the community level. For this reason it is important to examine the beliefs and attitudes that prevent women from seeking care. Here is a range relating to different care components along the continuum of care:

- The importance on institutional deliveries needs to be promoted in a culturally appropriate way
- Knowledge of ante-natal, post-partum, and newborn danger signs needs to be increased at the community level
- Knowledge about the health and economic benefits of spacing births needs to be increased.
- A positive perception of government facilities needs to be promoted
- Awareness of financial schemes needs to be increased

Chapter 1: Setting the Scene

1.1 Introduction

The NRHM

India launched its National Rural Health Mission (NRHM) in April 2005 to tackle the high burden of maternal, neonatal and child morbidity and mortality in India's rural populations. Key aspects of the NRHM are its scale, its focus on extending services to the rural poor, and its inherent flexibility for introducing innovative approaches for improving health system responses to improve maternal, newborn and child health (MNCH) outcomes. The NRHM in Karnataka has excellent leadership and seeks to find innovative ways to improve health outcomes, with a view to achieving equity between and within intra-state regions – renewing the emphasis on health for all. Investments have been made in strengthening infrastructure, building capacity of service providers, and ensuring security of health commodities. Some of the most impressive initiatives include the 108 ambulance scheme, the *Janani Suraksha Yojana* scheme and Accredited Social Health Activists (ASHAs) – a community volunteer workforce – all of which have contributed to unprecedented increases in institutional deliveries across the northern Karnataka region.

The Sukshema Project

In alignment with the NRHM's objectives and approaches, the Bill and Melinda Gates Foundation's (BMGF) Maternal and Neonatal Health (MNH) Strategy seeks to improve MNCH outcomes in the world's poorest regions by catalyzing health system responses to ensure that critical, proven interventions during pregnancy and in the neonatal period reach underserved populations.[4] BMGF awarded funds to the University of Manitoba/Karnataka Health Promotion Trust to support the Government of Karnataka (GoK) to develop and implement strategies to improve maternal, newborn and child health in alignment with the NRHM's objectives and approaches. This is the *Sukshema* project. The project focuses on improving the availability, accessibility, quality, utilization and coverage of critical MNCH interventions among the rural poor in the eight priority districts in project districts (northern Karnataka) - Bagalkot, Bellary, Bidar, Bijapur, Gulbarga, Koppal, Raichur and Yadgir.

Project Goal and Objectives

The **goal** of the project is to support the state of Karnataka and India to improve maternal, newborn and child health outcomes in rural populations through the development and adoption of effective operational and health system approaches within the NRHM. To achieve this goal, the project is designed to integrate and align key aspects of the BMGF's MNH strategy with the NRHM's health system infrastructure and mechanisms in the 8 project districts. Key aspects of this strategic alignment form the expected **outcomes** of the project, which are:

[44] Bill & Melinda Gates Foundation, 2009. Maternal Neonatal and Child Health Strategy, BMGF, Seattle. www.gatesfoundation.org/mnch

1. Development of evidence and consensus for a package of critical MNCH interventions to be prioritized for improved availability, quality and coverage by the NRHM.
2. Development of effective mechanisms and approaches within the NRHM architecture for increasing the availability, quality and coverage of this package of critical interventions.
3. Establish systems within the NRHM and the health system for scaling up and sustaining the delivery of these critical interventions.
4. Translate and disseminate operational models and innovations arising from the project for endorsement and adoption at the state, national and international levels.

To achieve these results, the project has established four key objectives:

1. Enable expanded **availability** and **accessibility** of critical MNCH interventions for rural populations.
2. Enable improvement in the **quality** of MNCH services for rural populations.
3. Enable expanded **utilization** and population **coverage** of critical MNCH services for rural populations.
4. Facilitate identification and consistent **adoption** of best practices and innovations arising from the project at the state and national levels.

The first three objectives relate directly to the objectives of the NRHM, and are therefore intended to directly support the NRHM in Karnataka through accomplishing these objectives in project districts. The project approach is to support the NRHM to improve the functioning of programs and resources directed primarily at the interactions between health workers and families/communities at the home, community and first level health facilities to provide a focused set of critical interventions during pregnancy, delivery and in the neonatal period. The fourth objective relates to expanding the impact of the project by promoting the scaling up of effective strategies across Karnataka and India.

Project Phases

The project is implemented in two phases: 1) Planning and, 2) Implementation. The Planning phase (12 months) was intended to: 1) carry out various assessments related to project objectives, 2) design an implementation model for improving availability, quality and coverage of the interventions; and 3) develop health system responses necessary to implement the models. The Implementation phase (48 months) will focus on supporting the NRHM to implement and assess strategies for delivering the intervention package, and translating knowledge developed through the project for wider dissemination and endorsement and adoption of key elements by the NRHM at the national level.

Assessments

In line with the NRHM mission[5], an important component of the project is to promote evidence-based decision making at the district level in accordance with state and national guidelines. The primary guidelines referred to throughout this document are the *Operational Guidelines on Maternal and Newborn Health*, published by the NRHM in 2010.[6] However, for specific topics or details other guidelines are also drawn upon as required, and references are included in the text.

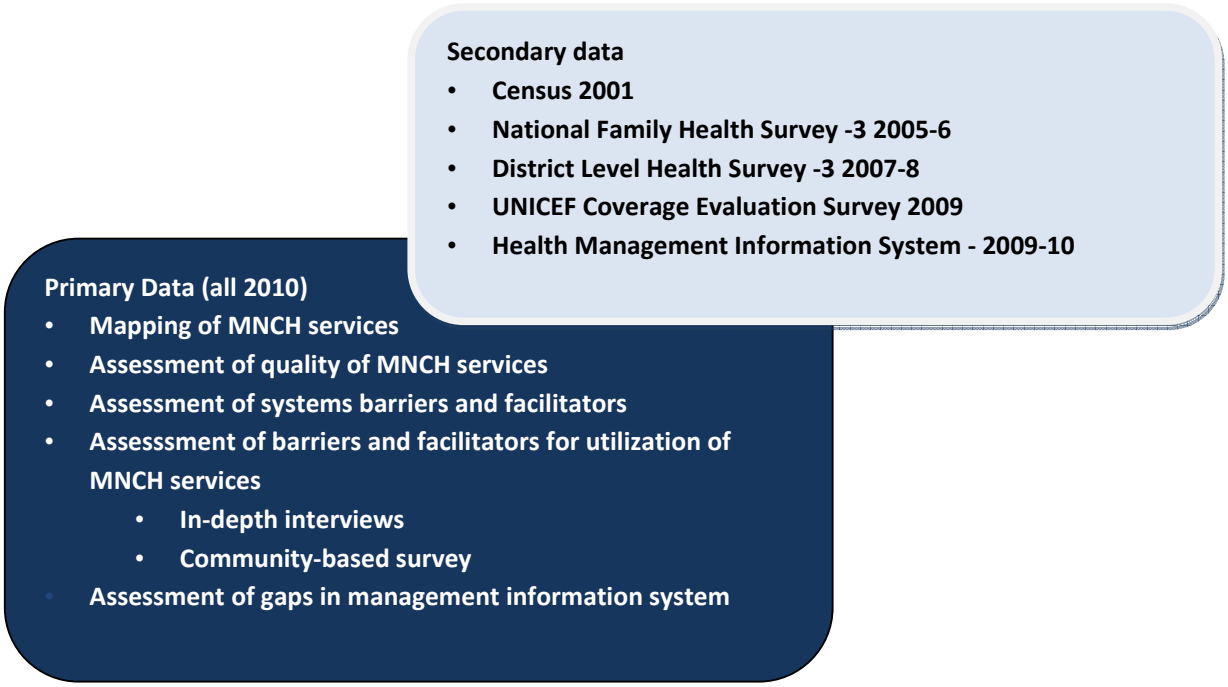
[5] GOI, NRHM, 2005. NRHM Mission Document 2005-2012

[6] National Rural Health Mission, Ministry of Health and Family Welfare, Government of India, 2010. *Operational Guidelines on Maternal and Newborn Health*, Delhi.

The project hopes that as data is made available and used for district-level decision making, this will lead to increased availability and accessibility of quality services –and ultimately to increased utilization and improved health outcomes.

To gather the required district level data, a series of assessments were done including analyses of secondary data and collection of both qualitative and quantitative primary data (see methodology section, and the figure below). The methods and tools developed and tested in the process can be adapted for routine use across the state and country. The district Maternal, Newborn and Child Health Situation Analysis consolidates these complementary data sources in one place, as a tool for decision making and planning.

Figure 1.1.a: Data sources for the Maternal Newborn and Child Health Situation Analysis



Organization of the report

The report includes an overview of the methodology for each assessment component, including research objectives, research questions, tools utilized and the strengths and limitations of each data source. Following this is The next section is an assessment of the policy environment and health system in the region, based on a variety of primary and secondary data sources. The report then shifts to the service delivery framework, first with an overview and then an assessment of each component of maternal and newborn health, following the continuum of care from ANC to delivery to newborn and child health.

For each MNCH component, the guidelines are outlined, which set forth standards of quality. This is followed by an analysis of utilization patterns according to household data, HMIS data and service statistics, with reference to NFHS and UNICEF CES as appropriate. For each care component, low

utilization defines the primary and fundamental gaps in public health services – that is people are not using them. Knowledge, behaviours, incidences of adverse health events and other indicators are described in this section to understand utilization. Other domains of the public health system (availability and accessibility of services, provider competencies to provide quality care) are then described in an attempt to answer why this is so. Concluding each section, implications are outlined that suggest areas for action and intervention. From analysis of the different data sources for each care component, the successes of the NRHM in improving MNCH and remaining service delivery gaps are highlighted.

The *Sukshema* project hopes that these analyses will be a useful resource for district level planning and for a variety of stakeholders in the field of maternal, newborn and child health.

1.2 Methodology and Data Sources

This assessment of the MNCH situation and response in rural north Karnataka includes a number of quantitative and qualitative components, triangulated in this report along with secondary sources. This section provides a brief overview of the methodology for each component of primary data collection. Research was guided by key questions around availability, accessibility, quality and barriers to utilization of services (see table 1). Except for the mapping component, methodology received ethical review and approval from both the University of Manitoba and St John's Medical College and Hospital (16th June 2010) ethical review boards. In the approved components and the health systems assessment, the privacy and confidentiality of respondents was assured and maintained.

In addition to the description of the different methodologies employed for primary data collection, we also review the secondary data sources used – the strengths and limitations of each data source are provided to assist in assessing differences in findings between sources.

Table 1.2.a: Summary of assessments

Question	Method
What is the availability and accessibility of MNCH services?	• Mapping of MNCH services in ALL private and government facilities (Sub-centres, PHCs, CHCs, THs, and DHs)

What is the capability of service providers to deliver quality MNCH services?	• Survey of a sample of facilities and providers (public and private, community-based services) using the following tools:
	  • Facility audit
	  • Knowledge tests including case studies
	  • Case record audits
	  • Direct observations
	  • Structured demonstrations
	  • Exit interviews

What are the community level facilitators and barriers for utilization of MNCH services?	• In depth interviews with community members • Exit interviews • Community surveys
What are the system facilitators and barriers for the provision and utilization of services?	• Review of policy/program documents • Review of secondary data • Semi-structured interviews with service providers and taluka, district and state health officials • An assessment of all Village Health and Sanitation Committees (VHSCs) in Bagalkot and Koppal districts
What are the available data sources and how are they used in program review and planning	• Discussions with the state Monitoring and Evaluation unit • Analyses of the existing Health Management Information System (HMIS) data

Secondary Data Sources and Analyses

The *Sukshema* project reviewed and analysed a range of secondary data sources, including the three rounds of District Level Household and Facility Survey (DLHS), NFHS 3, data from the Health Management Information System (HMIS), the Coverage Evaluation Survey 2009 the Concurrent Evaluation of the NRHM 2009 and the 2001 Census.[7]

The main secondary data source was the DLHS 3, which uses the Census of India 2001 sampling frame. A multi-stage stratified systematic sampling design was adopted. In each district, 50 primary sampling units (PSUs) were selected which were census villages in rural areas and census enumeration blocks (CEBs) in urban areas. In rural areas, villages were selected by probability proportional to size (PPS) sampling and in the second stage households were selected by systematic sampling. For urban areas, first, wards were selected by PPS systematic sampling. In the second stage, census enumeration blocks were sampled according to PPS sampling and in the third stage, households were sampled by systematic sampling. Districts with poorer social indicators were over-sampled, and the sample size was increased to account for non-response. All ever-married women age 15-49 years and unmarried women age 15-24 years from the sampled households were the respondents for individual questionnaires, while any adult household member was the respondent for household related questions.

Other data sources referred to include the UNICEF Coverage Evaluation Survey 2009 and the Concurrent Evaluation of the NRHM 2009. These surveys both employ systematic multi-stage sampling techniques, with either the village (UNICEF CES) or the facility (Concurrent Eval NRHM) as the first sampling stage.

While these data sources all have rich material on maternal, newborn and child health care seeking and health outcomes, none of them have sample sizes large enough to calculate reliable values at the district level. Aggregate calculations hide intra-regional inequalities, preventing accurate planning and resource allocation. In addition, neither the HMIS nor the vital registration system can provide accurate estimations of the MNCH impact indicators such as the maternal mortality ratios, neonatal mortality rate, infant mortality rate, and child mortality rate at the district level.

As our goal was to understand the situation at the district level, we focussed on analysis of the DLHS 2007-8 (third round) data. Analysis was performed by district according to a number of domains; caste, wealth quintile and place of residence. Wealth quintiles were divided into dichotomous variables of poor (bottom two quintiles) and non-poor (top three quintiles). For each variable, analysis focussed on key disparities within districts, with a focus on our target population – rural women. Maternal and infant mortality were calculated at the district level using regression analysis, according to a methodology developed by Singh and Ponnapalli[8]. In addition, population projections from the 2001 census were used to provide the denominator for many indicators. The formula used

[7] Methodologies for these data sources are described elsewhere. See for example; International Institute for Population Sciences (IIPS), 2010. *District Level Household and Facility Survey (DLHS-3), 2007-08*: *India. Karnataka*: Mumbai: IIPS.; International Institute for Population Sciences (IIPS) and Macro International. 2008. *National Family Health Survey (NFHS-3), India, 2005-06: Karnataka.* Mumbai: IIPS.

[8] Singh, S.K.; Murthy, P.K. Estimation of MMR using a regression approach at the district level in India, in Somayajula, U.V; Singh, K.K.; Subramanian, KVR 2011."Population and Reproductive Health: Perspectives and Issues", Hindustan Publications, Delhi

is p(t) = p(o)* exp.(r.t); where p(t) = projected population, p(o) = population in 2001, r= exponential growth rate and t=9. [9]

All calculations around ANC, delivery care and PNC services were for the woman's most recent delivery, within three years prior to data collection. This frequently meant the data was not capturing recent gains in institutional delivery and other indicators made through the NRHM interventions. In such cases, other data sources were drawn upon (CES, HMIS).

In addition, a review of the relevant literature and other key data sources was performed.

The strengths and limitations of the secondary data sources are outlined below.

[99] Since analysis, preliminary 2011 Census district population Figures have been released. These are the same as the projected estimates. See; Director of Census Operations, Karnataka; GoI. 2011. Census of India: Provisional Population Totals, Karnataka, Bangalore.

1.2.b Secondary Data Sources: Strengths and Limitations

Data Source and Sample size	Information collected	Strengths	Limitations
National Family Health Survey-3 (NFHS) 2005-2006 (Karnataka sample: 6008 women)	Demographic, reproductive health and child health information	• Collected periodically, every four years. • Provides estimates of different parameters at the national and state levels • Comparable over time. • Includes anthropometric data	• Does not provide estimates at the district level. • Data collected before implementation of many NRHM schemes related to MNCH (JSY, 108 Ambulance).
District Level Household and Facility Survey 2007-2008 Sample sizes for ever-married women: Bagalkot n=1164 Bijapur n=998 Gulbarga n=1157 Bidar n=1063 Raichur n=1336 Koppal n=1342 Bellary n= 1089 Karnataka n=27864	Demographic and reproductive health information	• Representative of entire household-based population in district • Captures both those seeking care from private providers and non-care seekers.	• Calculations are unable to be made for some variables as the sample size becomes too small (for example, pregnant women, who experienced complications, who did not seek care). • Data collected before full implementation of JSY scheme – data not perceived to be current.
HMIS data 2009-10	Administrative records capturing service utilization	• Routine. • Comes from the health system itself, important tool for program/facility management.	• Reporting error and bias: over-reporting of service statistics, under reporting of deaths. • Does not capture those that seek care from private/informal providers or those who don't seek care.

Facility level barriers and facilitators to care: Facility Mapping

The project conducted a facility mapping to assess availability and accessibility of MNCH services at all public and private facilities in the district. The mapping was necessitated by the absence of a comprehensive profile of the public and private facilities at the district level, including details on service delivery. Such a profile is a fundamental tool for the preparation of district project implementation plans.

Facilities were identified through lists provided by state and district officials. As these lists were not complete, snowballing was conducted to identify unlisted public and private facilities. Private facilities were defined as all private hospitals, nursing homes or clinics providing any MNCH services, either in-patient or out-patient. Clinics that only provided diagnostic facilities were not included.

The mapping tools (specific to facility types) were developed by a team of experts from the National Rural Health Mission and project partners in accordance with appropriate service guidelines, and all were pretested. The tools were designed to capture details of population/villages covered, physical infrastructure, staff, drugs, equipment and supplies, services (antenatal care, delivery, postpartum, postnatal, abortion, newborn and child), certain service statistics, and use of facility untied funds.

All field investigators were trained and provided with data collection manuals. In addition, the data collection was monitored for quality by a central team of public health experts through field visits and spot checks.

In Bellary, data were collected by 8 field investigators and 3 supervisors in June and July 2010, covering 299 sub-centres (SCs), 55 primary care centres (PHCs), 8 community health centres (CHCs), 6 taluka hospitals (THs), 1 district hospital (DH) and 74 private hospitals (for profit and non-profit) including nursing homes and clinics that provide MNCH services (Table 1). Facilities were approached with a letter from the government requesting their support and participation in the study. The auxiliary nurse midwives (ANMs) at the SCs, medical officers at the PHCs, CHCs and THs, and the district surgeon at the DH, were the primary respondents. At the private facilities, the medical doctor in-charge was the primary respondent. In many cases, multiple facility visits were required to meet with the appropriate respondent.

For each MNCH care component at each level the *Sukshema* project asked the primary respondent which services they routinely offer, according to a package of critical services listed in the NRHM guidelines. Both spontaneous and probed responses were collected (in the tables within the document, probed includes both spontaneous and probed responses). Spontaneous responses provide an insight into role clarity, knowledge of guidelines and provider preparedness. Taking into account different response biases (recall, social desirability), neither spontaneous nor probed responses necessarily indicate actual services provided. Service statistics too, were not consistently well maintained and so the quality and completeness of the data cannot be assured.

1.2.c: Facility mapping data: Strengths and Limitations

Data Source and Sample size	Information collected	Strengths	Limitations
Mapping data* Three different instruments SC n= 1962 PHC n=70 24x7 PHC n=333 Non-FRU CHC n=29 CHC FRU n= 36 TH n=34 DH n=8 Pvt n=488 Total n=2960 – all facilities in project districts	An audit of facilities covering; • Villages covered, other health care facilities and providers in the area (for SCs only) • Physical infrastructure • Staff in position • Equipments – availability and functionality • Drugs and supplies • Select output parameters from Facility Health Records • Untied funds and Rogi Kalyan Samitis • Monitoring activities • Service provision	• Comprehensive; covers most facilities in eight districts of Project districts (northern Karnataka). • First data set to provide such information • Provides a baseline for evaluation of interventions	• Population data not available for non-census villages covered by facilities • As the health system is dynamic, data is very time sensitive. Many changes have been made since mapping was completed.

***for the district specific sample size, please see the "service provider framework" section**

Provider Competencies to Deliver Quality Services

The *Sukshema* Project endeavoured to understand the service provider competencies for quality of care in the health system, from both a technical (provider knowledge, competence in service delivery) and client satisfaction perspective. The main objectives of this quality assessment were:

- To understand the gaps in the knowledge, skills and practice of care providers involved in MNCH service delivery in the public and private sector in the 8 districts of N Karnataka.
- To identify training needs of care providers at facility and community level, in both public and private sector involved in delivery of MNCH services
- To determine client satisfaction of MNCH services.

As assessing provider competency is a complex undertaking, the project employed a variety of tools and methods. The different tools used were a facility checklist, case record audits, exit interviews, knowledge questionnaires including vignettes, direct observations, and demonstrations. Some of the

tools are facility specific and some are provider specific. Tools were based upon current government guidelines for standards of care.[10][11]

The clinical quality assessment was conducted at a sample of public and private hospitals in each district by 32 field researchers in August 2010. The assessment covered the following care components; antenatal care, intranatal care, postnatal and newborn care, Field researchers were primarily medical doctors with a clinical background. The mapped facilities provided the sample frame for the quality assessment, and the sample was drawn through systematic random sampling, except for THs and DHs where all facilities were included. The final sample included 25% of Sub-centres; 33% of Primary Health Centres, 50% of Community Health Centres, 100% of First Referral Units, 100% of Taluka Hospitals, 100% of District Hospitals and 10 private hospitals in each district (80 in total) (some subcentres had to be replaced due to the non-availability of the primary respondent). Altogether for eight districts, 762 facilities were included in the quality assessment. The sample sizes were not large enough to provide district-specific results, and hence the findings for all the project districts (in northern Karnataka) are presented and discussed in this report. Field researchers worked in teams to collect information according to the relevant instruments. Before each tool was administered, field investigators obtained consent from the person in charge of the facility and each respondent. In some cases, sample sizes were small due to poor response rates, and poor record keeping in the case of audits.

[10] MOHFW, Maternal Health Division, GOI. 2005. Guidelines for Antenatal Care and SBA and LHVs, New Delhi.
[11] MOHFW, Maternal Health Division, GOI. 2005. Guidelines for Pregnancy Care and Management of Common Obstetric Complications by Medical Officers, New Delhi.

1.2.d: Provider competency data: Strengths and Limitations

Data source & Sample size	Information collected	Strengths	Limitations
Case studies and knowledge questionnaires (all self administered): SC= 482 and Higher facilities= 527 Case studies: SC = 1434; Higher facilities= 1399)	Provider knowledge about various issues of mother, newborn and child care and complications; in assessing the patient and recommending management of the health condition in the given case scenarios	• Captures both knowledge *and* problem solving skills. • Provides a baseline for evaluation of interventions	• Findings are not representative at the district level because of the smaller sample size. Findings are presented for all the project districts. • Does not capture ability to apply knowledge/skills in authentic setting.
Direct observations (SC=307; Higher facilities = 292)	Assesses skills and practice of ANC, PNC, and Neonatal health.	• Authentic context • Provides a baseline for evaluation of interventions	• Hawthorne effect: providers might be more conscientious than normal. • Sample size means findings are not representative at the district level, findings are presented for all the project districts.
Structured demonstrations (SC= 1777; Higher facilities = 2131)	Assesses skills and practice while performing a task to provide health care for neonatal and child health	• Does not affect patient confidentiality/privacy • Conducted when direct observation is not possible	• Inauthentic context
Exit interviews[12](n=362)	Assess; client satisfaction, experience of ANC & PNC, delivery, also covers costs of services.	• No recall bias	• Convenience sample, not representative
Facility checklist SC, n=490 PHC, n=132 CHC, n=34 Pvt, n=80	To assess infrastructure, systems for infection prevention/waste management, signal functions performed in emergency obstetric care/child	• Provides snapshot in time of facility operations	

[12] Also listed in the health systems assessment section

	care, protocols, referrals, waste management, abortion care, cause of maternal and infant deaths		
Clinical audit (SC= 1286; Higher facilities = 3863)	Assessments of case sheets/ registers recording client history and case management around specific conditions in the area of maternal, neonatal and infant health.	• Reveals facility's record keeping practice • Should reveal case management skills and practice	• Data quality depends on clinical record keeping practice of facility

1.2.e: Coverage of Provider Competency tools among facility types and care components

Facility type	Tool	Care Component					
		ANC	Delivery	PNC	EBN	CC	Abortion
SC	Knowledge qns	482	482	482	482	482	-
	Case scenarios	-	-	-	478	956	-
	Demonstrations		-	-	962	1180	-
	Audits	-	-	-	-	1286	-
	Exit interviews	-	-	-	175	-	-
	Direct Observations	-	-	175	175	132	-
	Protocols	376	376	376	376	376	-
PHC	Knowledge qns	230	230	230	230	230	-
	Case scenarios	239	150	239	-	454	-
	Demonstrations	-	-	-	631	474	-
	Audits	266	350	-	358	104	-
	Exit interviews	90	-	49	49		-
	Direct Observations	87	-	49		58	-
	Protocols	130	130	130	130	130	-
HF	Knowledge qns	147	147	166	166	166	-
	Case scenarios	155	107	155		271	-
	Demonstrations	-	-	-	369	293	-
	Audits	-	490	91	381	241	107
	Exit interviews	64	-	241	241	-	-
	Direct Observations	75	-	58	-	45	-
	Protocols	73	73	73	73	73	-
PVT	Knowledge qns	117	117	131	131	131	-
	Case scenarios	127	58	127	-	153	-
	Demonstrations	-	-	-	220	164	-
	Audits	-	344	20	308	45	108
	Exit interviews	48	-	7	71	-	-
	Direct Observations	59	-	38	-	26	-
	Protocols	-	-	-	-	-	-

Community-based facilitators and barriers to service utilization

To understand community based facilitators and barriers to service utilization, in-depth interviews were conducted with women and families selected from facility records. The objectives of the qualitative assessments were to:

1. To determine participants' understandings of a healthy pregnancy, including delivery, and ill health in the neonate;
2. To determine the actions or behaviours undertaken by participants to facilitate a healthy pregnancy and delivery, and to promote good health in the neonate;
3. To determine the available and preferred health care alternatives for pregnancy, delivery and care of the neonate; and
4. To determine the decision-making processes involved in pregnancy, delivery and care of the neonate.

The sample was drawn to include women at various stages in the life-cycle; pregnant women; women with young children from three districts in northern Karnataka; Gulbarga, Bagalkot and Bellary. The sample was recruited through ANMs and AWWs; part of ANMs role is to maintain a register of all pregnant women in their community. All interviewers were trained in qualitative interviewing, and data was collected in pairs. Prior to each interview, informed consent was collected. Training of 44 field staff was conducted from the 16th -19th August 2010, followed by data collection in October-November.

To further assess the client perspective, a community based survey was conducted. For the community based component, respondents were selected through a multi-stage sampling technique; subcentres were randomly sampled, and then villages within the catchment area were selected to ensure a sample that includes both care seekers and non-care seekers.

1.2.f: Community assessment data sources: Strengths and Limitations

Data source & sample size	Information collected	Strengths	Limitations
In depth interviews with women of reproductive age (18-49) (sample from facility records) Pregnant women, n=25 New mothers, n=20 Husbands, n=16 Grandmothers, n=23	Cultural facilitators and barriers to accessing care.	• Non-structured format allows interviewer to probe for depth on specific issues. • Allows participants to respond in their own words, in a culturally salient way.	• Sample bias: only women who have contact with health system (ANMs/AWWs) included in sample (sampled from register of pregnant women).
Exit interviews – questionnaire (n=362)	Cost of maternal and newborn services, care received, provider attitudes	• Provides a perspective on quality of care with no recall bias. • Quantitative survey data is comparable across districts. • Captures formal care seeking population	• Convenience sample
Beneficiary interviews in community. Sample drawn from facility records of women who have given birth in the last 12 months, and with help of ASHAs. • For mothers with children under 3 months (n=150): questions covered post natal and newborn care. • For mothers with children over 3 months and less than 12 months (n=150): questions covered immunizations	• Where services are received • Cost of maternal and newborn services • Attitude of providers • Episodes of childhood illness/ care seeking • PNC care. • Barriers to accessing care • Details on government schemes	• Specificity of time period reduces recall bias	• Excludes women who have no contact with ASHAs • Small sample size limits generalizability

Health System Barriers and Facilitators to Care: Health Systems assessment

The goal of the health systems assessment was to understand the system level facilitators and barriers to the delivery of MNCH services from the supply side. Semi-structured interviews were conducted with health department officials at state and district levels, and providers at various facilities across DHs, THs, CHCs, PHCs, SCs and private facilities. The interviews covered human resource systems, governance, health service delivery, HMIS, finance and infrastructure relating to MNCH service delivery. Interviewer training (2 days) and data collection took place in August 2010 by six field investigators. Before each in-depth or exit interview verbal consent was obtained.

1.2.g: Health systems assessment data sources: Strengths and Limitations

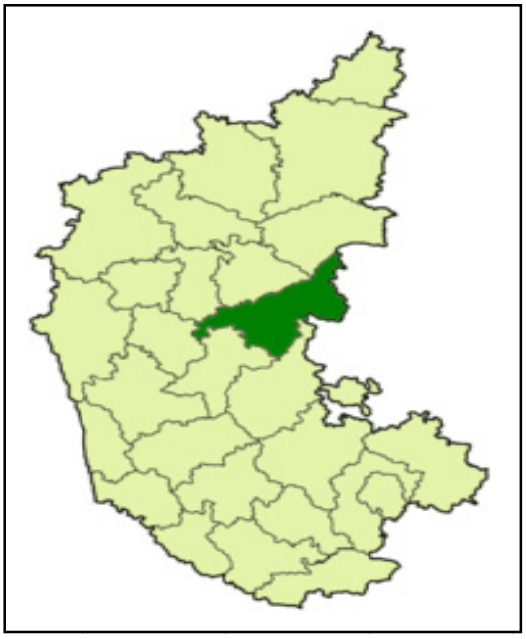
Data source & sample size	Information collected	Strengths	Limitations
In-depth interviews with providers and officials (n=66)	Provider's perspective on system level issues	• Allows participants to respond in their own words, in a culturally salient way. • Semi-structured format allows interviewer to probe for depth on specific issues. • Semi-structured format captures provider's own perspectives and priorities. • Large sample size increases transferability (application of results for other sites/contexts) • Exploratory, reveals areas for further investigation	• Exploratory rather than conclusive
Literature review of: • policy and administrative documents • journal articles		• Policies and guidelines tell us how situation 'should be': Allows a framework against which the situation can be assessed • Budget and spending analysis can reveal political will that accompanies policies	• Policies and guidelines may not always reflect implementation

Chapter 2: Bellary District Profile

Bellary District is situated on the eastern side of Karnataka state. Geographically, its location is 15° 30’ and 15° 50’ north latitude and 75° 40’ and 77° 11’ east longitude and has an average elevation of 445 meters (1459 ft). The district is bound by Raichur district in the north, Koppal in the west, Chitradurga and Davangere in the South, and Anantapur and Kurnool districts of Andhra Pradesh state in the East. Bellary district has a total area of 241 square kilometres and a population of 25.3 lakhs (2011 census) with 978 females per 1000 males.

Thirty-five percent of the population is urban, spread over 11 towns; and 65 percent of the population is rural, spread over 524 villages. As per the 2001 Census, 57% of the district population aged 7 years and above is literate, with a higher literacy rate among males than females in urban areas (69% and 45% respectively) and rural areas (70% and 50%). Among the talukas, the literacy rate is highest in Hospet at 61%, closely followed by Hadagalli (60%). Overall, 37% of the district population belongs to either Scheduled Caste (19%) or Scheduled Tribes (18%) and this is particularly visible in Hadagalli (30%) and Kudiligi (46%) Tehsils.

Figure 2.a: Map of Karnataka, with Bellary highlighted



Data source: Maps of India *www.mapsofindia.com/*

Figure 2.b: Map of Bellary and its Talukas

Data source: Maps of India *www.mapsofindia.com*

The prominent language spoken in Bellary is Kannada. Other languages like Telugu, Urdu, and Hindi are also spoken by small portions of the population. According to DLHS 2007-8 data, the literacy rate of women aged 15-44 is only 55%. Of the same demographic, 19% is scheduled caste, and 18% scheduled tribes. The majority of the population in Bellary is Hindu (95% of the rural female population aged 15-44 in Bellary is Hindu), who coexist with a small Muslim minority (5%) (table 1, appendix).

Maternal and Child Health Indicators in Bellary district

The table below illustrates the key maternal, newborn and child health impact-level indicators for Bellary district, the project districts (northern Karnataka) and the state (table 3.a). These estimates have been calculated using a methodology applying national level mortality rates to the estimated number of live births at the district level (see *Methodology*). While Bellary's indicators are typical for the project districts, this table demonstrates the inequalities within the state of Karnataka, with the project districts in the north faring worse than the state aggregate rates. This demonstrates the importance of having district-specific data, as many inequalities are lost in state aggregate data.

It must be noted that the DLHS data is from 2007-8 and does not represent the full impact of many NRHM interventions. In particular, it is likely that the rate of institutional deliveries has increased and possibly the number of ANC and PNC visits. To counter the lack of up to date data at the district level for district level planning, the *Sukshema* project undertook a variety of assessments to enable more accurate district level planning for MNCH (as described in the *Methodology*). However, data for many indicators, such as accurate measures of maternal and infant mortality, are still required.

Indicators for Bellary district are roughly similar to the levels for the project districts, for example, institutional deliveries are at 46% in both Bellary and the project districts. For some indicators, Bellary is slightly higher – for example contraceptive use (with lower unmet need). These relatively good outcomes don't seem to have translated to strong impacts; estimated mortality rates are higher in Bellary than the project district average, with for example, the maternal mortality rate being 413 per 100,000 live births compared to 408 in the project districts (see table 2.a below).

Table 2.a: Summary of Impact indicators for Bellary district

Indicator	Bellary District	Project districts (northern Karnataka) (Bagalkot, Bellary, Bidar, Gulbarga, Koppal, Raichur, Yadgir)	State
Mean number of children born:			
For 20-24 year old age cohort	1.9	2.0	1.7
For total rural population	2.9	3.5	2.8
Contraceptive Prevalence Rate	55.1	52.5	61.8
Institutional deliveries	45.5	45.7	65.1
MMR *Per 100,000 live births*	395	408	294
IMR Per 1000	61	67	51
Neonatal mortality Per 1000	38.7	50.9	39.5
Under-5 mortality Per 1000	71.8	91.7	64.1

Data source: DLHS 2007-8

Chapter 3: The Health System

This section provides an overview of the health system in Karnataka, with a special focus on the project districts in the north of the state. It covers the policy and programmatic environment; information management practices; community support systems; referral systems and transport connections; human resource systems and training; procurement and logistics; and, government schemes and incentives.

Key points:

- The NRHM has managed to fill staff gaps through contracting and employing AYUSH doctors as medical officers (MOs)
- Up to date information on human resources in the public system (vacancies and trainings) is not available for accurate planning.
- The *Janani Suraksha Yojana* scheme has led to increases in facility based births but knowledge of the scheme is low and implementation is uneven
- Evidence suggests that the success of the JSY scheme may lie in incentive paid to the ASHA, not the incentive paid to the mother (who frequently do not receive the incentive)
- The present system of referrals is not methodical, documentation practice is inadequate with few facilities maintaining charts, registers or filling out referral slips.
- Preliminary reports suggest the 108 Ambulance scheme has been key to increasing the number of institutional deliveries by helping women reach facilities.

With the introduction of NRHM, there has been a big push towards increasing the availability of MNCH services through the improvement of PHCs to 24x7 PHCs, and CHCs to FRUs, by providing additional infrastructure. The NRHM has also been successful in providing alternative solutions to the low level of human resources through contracting. This section highlights the many successes of the NRHM in strengthening the health system, as well as identifying remaining gaps.

This chapter provides an overview of the policy environment, the service delivery framework, community support systems and linkages, referral systems, human resource systems, procurement, HMIS, financial schemes and budgeting and spending. The primary sources of data drawn upon are the health systems assessment, the quality assessment and the facility mapping which included self-reporting of services provided and audits of facility records. Due to the dynamic nature of the health system, changes may have been made since this assessment was completed (July-August 2010) and the figures may not reflect the current reality, but still provides a snapshot of NRHM progress.

3.1 Policy and programmatic environment

The health delivery system at the district level is governed by state and national programmes. Health policy in India is formulated at the central level by the Ministry of Health and Family Welfare, and implemented at the state level by the Department of Health and Family Welfare. A *National Health Policy* was written in 2002, which allowed for a state policy to be developed, adapting the key elements to the needs of the state[13]. In Karnataka, the *Integrated Health Policy* was written in 2004, and as with the national policy, some of the main pillars include equity, quality of care and client satisfaction, public private partnerships and continuing medical education.[14] Planning is done at state and district levels according to these policies and other guidelines.

The state also has legal stewardship over the private sector, although this is not necessarily practiced. A 2007 bill ordered that all private facilities should be registered with the district authorities for the purpose of oversight, but not all private facilities have registered.[15] [16]Private providers also engage with the state in public-private partnerships, such as the *Suvarna Arogya Suraksha* Trust, *Thayi Bhagya* scheme, the 108 Ambulance services, contracting in of specialist providers, and contracting out of PHC management.

While there are both national and state policies and guidelines, health is constitutionally a state concern and health expenditure is met largely by the state budget.[17] In the field of public health policy, Karnataka is a state leader. Prior to the central government's introduction of PHCs throughout India, the state of Karnataka had already established a number of primary health units for providing comprehensive health, including curative, preventive and rehabilitative care.[18] Karnataka has also provided national leadership in terms of tackling corruption within the health sector.[19] The state also has premier scientific, technical and research institutions that can provide the evidence required to improve health systems. Karnataka also has a strong tradition of excellent in tertiary education. Rajiv Gandhi University and its affiliated colleges helps provide the state and nation with the human resources it needs to provide health for all.

[13] Government of India, National Health Policy 2002, available online at http://stg2.kar.nic.in/healthnew/PDF/NATIONAL%20HEALTH%20POLICY%202002.pdf

[14] Government of Karnataka, The Karnataka State Integrated Health Policy 2004, available online at: http://stg2.kar.nic.in/healthnew/PDF/STATE%20HEALTH%20POLICY.pdf

[15] Government of Karnataka, Karnataka Act No. 21 of 2007: The Karnataka Private Medical Establishments Act 2007

[16] Yasmeen, A. 2010. 'Many Hospitals Yet to Register Under KPME Act', The Hindu, Saturday, Oct 16

[17] Government of Karnataka, The Karnataka State Integrated Health Policy 2004, available online at: http://stg2.kar.nic.in/healthnew/PDF/STATE%20HEALTH%20POLICY.pdf

[18] National Rural Health Mission,Government of Karnataka, Dept of Health and Family Welfare Services 2009. Programme Implementation Plan 2010-11, Bangalore.

[19] Sudarshan,H, Prashanth, N.S., Good Governance in Health Care: The Karnataka Experience, The Lancet, Published online, January 12, 2011DOI:10.1016/S0140- 6736(10)62041-7

Key Health Programs in Karnataka

As well as national and state policies, maternal and child health has been guided by a number of key programs, a series of which are outlined in table 2.1.a below. The primary current ones are the National Rural Health Mission (NRHM) and the Karnataka Systems Development Reform Project (KHSDRP), both of which work in hand to improve systems and infrastructure. The Reproductive and Child Health (RCH) Program also has key relevance to MNCH issues, but ended in 2010. RCH officers still exist at the district level.

Table 3.1.a: Timeline of Key National and State Health Programs relating to MNCH in Karnataka

Years	Programme	Implemented by
1992-3 - 1998-9	CSSM – Child Survival and Safe Motherhood	GOI, UNICEF
1997-8 – 2004-5	RCH 1	GOI
2005-2010	RCH 2	GOI, World Bank
2006-2012	KHSDRP	GOK, World Bank
2005-2012	NRHM	GOI

NRHM

The NRHM (2005-2012) was launched to provide accessible, affordable and accountable quality health services to the rural population, including the poorest and those in the most remote areas. States with the poorest health indicators are classified as special focus states, and provided with more intensive support. Karnataka is classified as high performing. The thrust of the mission is on establishing a fully functional, community owned, decentralized health delivery system with inter-sectoral convergence at all levels, to ensure simultaneous action on a wide variety of determinants of health like water, sanitation, education, nutrition, social and gender equality. In such an integrated framework there is a move away from health as a vertical program, with an understanding of the many contextual factors affecting health of populations. [20]

Some of the NRHM's most important interventions include the 108 Ambulance service, ASHAs, and Primary Health Care centres that are open all hours.

The Karnataka Health Systems Development Reform Project

The KHSDRP is a project supported by the World Bank to improve health service delivery across all 30 districts in Karnataka. It commenced in 2006 and after its commencement began working in hand with the NRHM. The Project aims to increase utilization of essential health services (curative, preventive and public health), particularly in underserved areas and among vulnerable groups, to accelerate achievement of the health-related Millennium Development Goals. The activities include the following:

- Implement an organizational development plan, to cultivate an environment geared toward results based management and PPPs
- Expand coverage of existing government programs in primary care and public health through increased spending and better performance.

[20] GOI, NRHM, 2005. NRHM Mission Document 2005-2012

- Introduce innovations in service delivery and health financing along four different dimensions of service: infrastructure development and maintenance, delivery of priority curative services, planning and delivery of public health services, and accessibility to safe delivery and hospital inpatient services.
- Support all project management, monitoring and evaluation activities.
- Support innovations in PPPs (including mobile clinics, citizen help desks, contracting in of specialists from the private sector, contracting out of Primary Health Care Centres etc).
- Develop a new Health Management Information System
- Improve procurement, distribution and quality control systems
- Support the Suvarna Arogya Suraksha Trust, a health insurance scheme for BPL families in the five districts of Gulbarga division.

Administration

There is a multi-layered apparatus at the state level to translate policy into practice, from the Minister of Health and Family Welfare in Bengaluru to district surgeons in each district hospital. The Minister of Health and Family Welfare converts the 2004 state *Integrated Health Policy* into actionable plans. The Principal Secretary of Health provides the administrative support to formulate, monitor and implement these plans. The Department of Health and Family Welfare's Commissioner coordinates and monitors the working of various programs and project wings of the department. The Director of Health and Family Welfare services heads the department and is assisted by additional directors for each program component.

At the district level, there are a number of officers implementing and reporting state and national programs, as follows; District Health and Family Welfare officer, the District Leprosy Officer, the District Reproductive and Child Health (RCH) officer, the District Malaria Officer, District TB Officer, DFWO, DAPCU, and District Surveillance Officer. With the merger of the NRHM and KHSDRP, district program management officers assist the DHOs in other tasks relating to these programs. The District Program Management Unit and the Block Program Management Unit add managerial inputs into program implementation. Clinically, district surgeons at district hospitals oversee curative and preventative services. In addition, there are 176 Taluk Health Officers who implement programs at the taluk level.[21]

[21] GoK, DHFW, NRHM, Programme Implementation Plan for 2010-2011, Bangalore

3.2 Information Management

Clinical Record Keeping

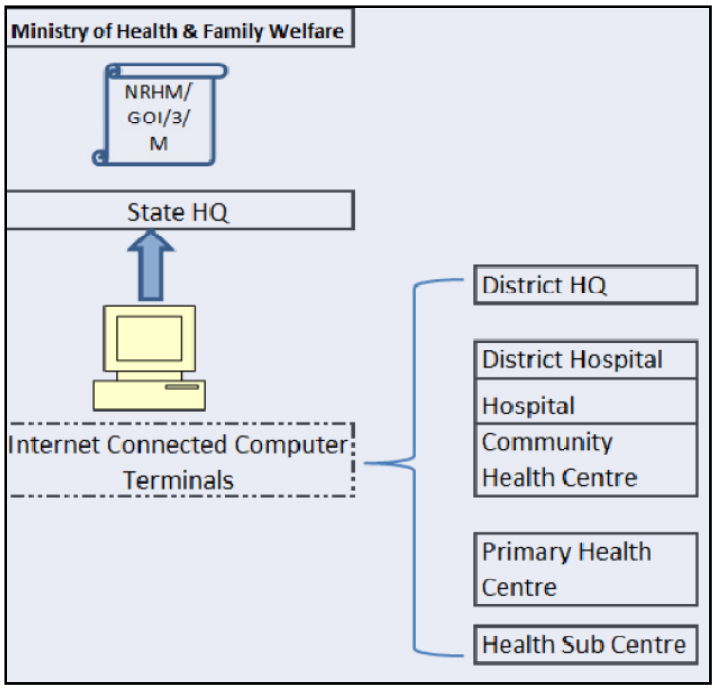
Up-to-date, accurate and comprehensive patient records facilitate case management and accurate clinical decision making and referral. The data collection process for the quality assessment revealed that clinical records are not well maintained. For example, out of 593 attempted case record audits for eclampsia, only 146 were able to be completed (25%); for abortion audits, only 215 were able to be completed (35%) due to incomplete record keeping.

Health Management Information System (HMIS)

The broad range of interventions under the NRHM has increased the demand for disaggregated data on population and health for use in both micro-level planning and program implementation. The HMIS would ideally provide a continuous flow of good quality information on inputs, outputs and outcome indicators facilitating monitoring of the objectives of NRHM, ensuring information is available for decision making regarding scale up and replication.

Previously, reporting was done by taluka – however this system frequently double-counted individuals as they visited more than one facility during, for example, a pregnancy. To improve data quality, reporting formats were established by the Ministry of Health and Family Welfare, Government of India, in 2008 to facilitate standardised entry at the facility and the district level. These were only rolled out for use in Karnataka in September 2010, when facility-based reporting began with these formats, whereby each facility sends monthly reports to the Taluka Health Office for data entry, upload and aggregation. Computers have also been introduced at the PHCs to enable data entry at this level as well.

Figure 3.2.a: Data flow from facilities to state to national levels



Data source: MoHFW, NRHM, GOI 2008. Integrated HMIS Reporting Formats, New Delhi

Reporting responsibility at the SC level includes not just the facility, but also the catchment area. In the case of a care delivered in the community, for example with a home birth, it will be reported by the SC (lowest level of reporting) in the ANC register, the PNC register, the birth and death register, the referral register etc., and then sent to the PHC or Taluka Health Office for data entry (not all PHCs are equipped to do reporting). The reporting facility has an internet enabled data entry facility to enter and upload the data to the MoHFW server. Reporting facilities can also download data for analysis and data users (policy decision makers) can access the monthly report data from HMIS portal for analysis (see figure 3.2.a).

While this system has benefited from recent rationalization, the large number of registers that need to be maintained (currently 13 for maternal and child health, reduced from 17), with overlap between the different registers, means a high reporting load for providers, especially at the SC level. The high level of reporting may distract providers from delivering essential services.

A dedicated Health Management Information System (HMIS) web-portal has been established at the URL http://nrhm-hmis.nic.in. The HMIS system facilitates standardized compilation and calculation of the various indicators at different levels of the health care delivery system and allows programme managers to track monitoring indicators for management decision making.

Commenced in January 2011, the Mother and Child Tracking System (MCTS), is a scheme whereby ANMs use mobile phones to 'text' details from the *thayi* card to a central database. This scheme is in its nascent stages, but is expected to increase the quality of data available, for improved planning at the district level.

3.3 Community Support Systems and Linkages

Positive outcomes for maternal, newborn and child health do not just rely on service delivery, but also require active community participation and support. Community mobilization for maternal and newborn health is the process whereby community members gain the knowledge, optimism, and level of organization to achieve quality health care service. This might include providing peer health education, organizing transport linkages for pregnant women to reach facilities, or encouraging families to delay the age of marriage of their daughters. Marginalized and vulnerable sections of the community require more intensive efforts in the process of mobilization and service delivery. The key mechanisms to ensure the continuum of care in the community include ASHAs, Village Health and Sanitation Committees, *anganwadi* centres and *anganwadi* workers. ANMs also provide care at the subcentre or community level, but are part of the health care system and so are described in the *Service Delivery Framework* section.

Accredited Social Health Activist (ASHA)

ASHAs are a part-time community based volunteer workforce at the village level created under the NRHM. Their primary role is in building the community's awareness of their healthcare entitlements, in providing health education, in facilitating the community's access to essential health services and in delivering preventive and first contact curative care. The key roles to be performed by ASHAs include; track and mobilize women to attend monthly clinics, prepare birth preparedness plans, conduct home visits, support institutional delivery, make postnatal and newborn home visits, counsel on family planning, and support the ANM in updating the maternal and child health card. Under the JSY scheme (see *Government schemes* section), ASHAs are provided cash incentives to support mothers to deliver in facilities for their first two births.

ASHAs are meant to serve an average population size of 1000[22]. About 970 ASHAs have been recruited in Bellary district and each ASHA covers an average population size of 1628. Again, aggregate coverage figures are poor, but about 32% villages in the district do not have an ASHA.

In-depth interviews with ASHAs found that the workload varies, for some it is a full time job, and some have a lighter load and see few maternity cases. Furthermore, ASHAs called for more skills-based trainings to ensure knowledge can be translated into practice.

Village Health and Sanitation Committees (VHSC)

The Village Level Health and Sanitation Committees are village level bodies comprised of key stakeholders in a village and serve as a forum for village planning and monitoring. VHSCs were developed under the NRHM and are formed to ensure that:

- No section of the village community is excluded from services
- Engender an understanding in the community about health services and health related rights

[22] See guidelines online: http://164.100.52.110/NRHM/asha.htm

- Prepare a village health plan to suit local realities and necessities, including transport for MNCH emergencies
- Provide monitoring and oversight to all village health activities, provide guidance for improvements
- Ensuring that untied funds are appropriately used in the village for improving maternal and neonatal health in the village

The VHSC comprises 15 members including a minimum of 8 women members, and among the women members 3 of them should belong to SC/ST and 2 SHG members. Among the remaining 7 (male) members, a minimum of 2 should be belonging to SC/ST. The junior woman health assistant (ANM), junior male health assistant (MHW), primary school teacher (Preferably women), all *anganwadi* workers and ASHA workers of that particular village will be the ex officio members. The *Gram panchayat* member of the village is the VHSC president and the one of the ASHAs from the locality, its secretary.[23]

Anganwadi Centres

Anganwadi centres were established under the Integrated Child Development Scheme (ICDS) as child-care centres, providing nutrition support to young children and pregnant women through mid-day meals, pre-school education, supplementation for children from six months to six years, iron supplementation for pregnant women, awareness raising meetings and growth monitoring. The ICDS is a centrally run program implemented by the Department of Women and Child Welfare (not the Department of Health and Family Welfare, which oversees much of maternal and child health service provision). All pregnant women and children are registered at the *Anganwadi* centres. Vaccinations are also provided by ANMs at *anganwadi* centre sites. [24]

Anganwadi Workers (AWW)

Anganwadi workers are concerned with infant and child health through nutritional supplementation, growth monitoring, vaccinations and child care provided at the *anganwadi* centres. They are employed under the ICDS scheme, under the department of Social Welfare.

According to the ICDS protocols, there should be one AWW per 400-800 population in rural areas.[25] There are totally 1766 AWWs in the entire district; with more than one AWW (1.12) for every 1000 people. The aggregate coverage figures are good, however about 2.3% villages in Bellary district do not have any AWW. The proportion of villages with no AWW is relatively high in Hospet (6%) and Hadagali (4%) Talukas.

According to the interview with the joint director of ICDS, since the introduction of ASHAs, a new set of guidelines for *anganwadi* workers (AWWs) has been introduced to clarify roles between ASHAs, AWWs and ANMs. For example, AWWs used to distribute Vitamin A, tetanus toxoid vaccines and iron and folic acid tablets, but now this is done by ANMs. In terms of antenatal care both ANMs and AWWs register

[23] KHPT, 2010. Village Health and Sanitation Committees, Bangalore.
[24] ICDS guidelines, available online at: http://wcd.nic.in/icds.htm

pregnant women, make home visits, check swelling in hands and legs, counsel on nutrition and make referrals. Hence, there is still duplication and confusion about roles. This is augmented by the many departments who give work to the *anganwadi* workers; the health department, Sarva Shiksha Abhiyan, Food and Civil Supplies, Rural Development and the Panchayat Raj department.

Table 3.3.a: Availability of personnel at village level for MNCH services: Bellary

Staff	Number	Number per SC catchment area
ANM	288	0.96
MHW	127	0.42
AWW	1766	5.91
ASHA	970	3.24

Data source: Mapping data

3.4 Referral Systems and Transport Connections

The *Operational Guidelines on Maternal and Newborn Health* prescribe that all facilities accredited for safe deliveries should have an assured referral transport linkage and an assured referral facility linkage. An assured referral facility linkage is a CEmONC centre which agrees to provide emergency services on a cashless basis to any patient referred from a lower facility. It could be a public hospital or an accredited private hospital. The ideal situation is where every mother delivers in an institution with access to a referral centre within one hour, in case of complications requiring surgery and blood transfusion. The facility referred to should be contacted by phone about the referral with a brief history of the patient, so that on arrival the woman is received and treatment started immediately.

In addition, road access is required connecting homes to facilities and facilities with one another.

Referral Systems

Mapping data and quality assessment data have found that the process of referrals and communication between different facility levels is ad-hoc and unstructured, with little follow-up. In the project districts, the quality assessment found that only 9% of SC facilities (the most proximate level of the health system) had referral services chart with contact details available, 15% had separate referral-out register maintained, and 11% had referral slip/card available (see table 2.4.1). As the SC is the most proximate point of contact between communities and the health system, this needs to be improved so that SCs can operate as a conduit to appropriate levels of care as needed. At 130 PHCs assessed, 27% had referral charts displayed, 56% had out referral registers and just 29 % had referral slips.

Higher level facilities have higher levels of referral mechanisms in place with 42% of taluka hospitals displaying referral charts, and 60% having referral slips; but it is still inadequate to ensure facility linkages for comprehensive care. In the self reporting of service provision in the facility mapping, referrals were rarely provided, ranging from 42% for ANC (see figure 5.1.2.b), and intranatal care at PHCs (see figure 5.2.3.b), and 40% for safe abortion at PHCs (see figure 5.5.3.b).

Table 3.4.a: Percent of facilities with established referral systems in project districts

Referral system component	DH(7)	TH(33)	CHC(33)	PHC(130)	SC(370)	Private(78)
Referral service chart displayed	28.6	42.4	30.3	26.9	8.7	33.3
Referral out register maintained	71.4	81.8	69.7	56.2	15.1	15.4
Referral slip/card available	42.9	60.6	33.3	28.5	11.1	33.3

Data Source: Service Provider Assessment

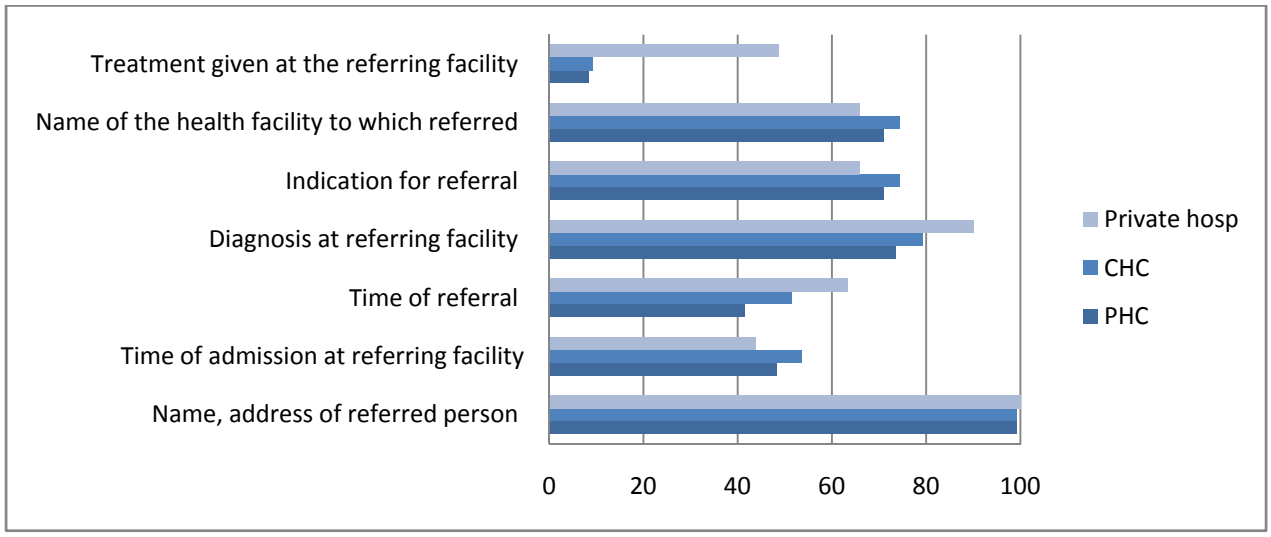
Referral audits

Since delays in referring and transfer of cases increases risks of maternal and newborn mortality, it is essential that referrals are documented properly to monitor their timeliness and effectiveness. The referring facility should use forms provided to note the particulars of the case to be transferred, the

time of admission, time of referral, the details such as diagnosis, indication for referral and the treatment given at the facility. The referring facility should inform the referred facility about the patient, note in their referral register who is accompanying and what mode of transport is arranged. All these steps would ensure that the mother or child being referred out reaches the destination facility on time and is received and followed up promptly. Each case referred out should be followed up and the outcome documented in the referring facility.

Audits of referral records were carried out at PHCs, higher level facilities and private facilities. Among the 621 records of referral audited, 55% had the time of admission and 51% had the time of referral. 16% recorded the treatment given at the facility (see figure 3.4.a).

Figure 3.4.a: Percent of referral records with specific details listed at different facility types: PHC(n=265), CHC (n=140), Pvt hospitals(n=41)



Data source: Service Provider Assessment data

Only 8% of the 621 audits completed had a note of the person accompanying from the referring facility. 21% of the records had documented the mode of transport. Among them the “Number 108” ambulance service was listed in 22%, and there was no documentation in 45%.

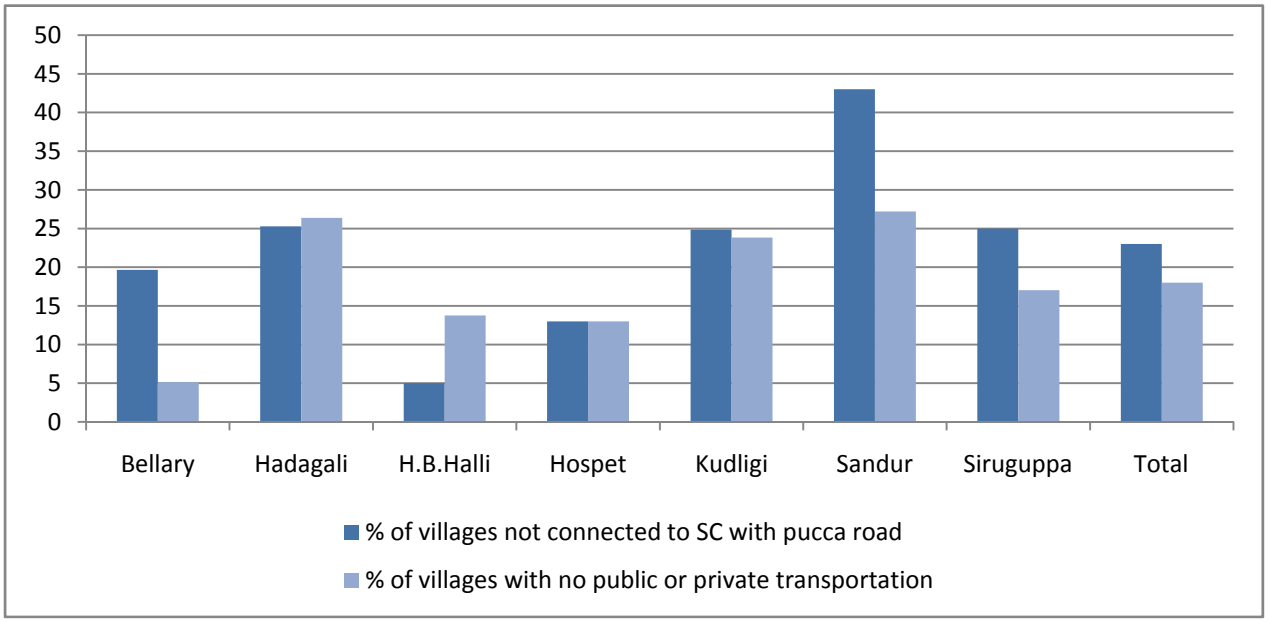
The highest number of referrals was made to the district hospital (42%); 54% from taluka hospitals, 51% from CHCs, 34% from private hospitals and 34% from PHCs. A significant 38% of cases had a different destination facility listed, such as THs and CHCs.

Clinical outcome of the client at the referred facility was documented through follow up in only 9% of referral records.

Transport Connections to SCs

A significant barrier in accessing health care is transport to the facility. Mapping data demonstrates that in the district 23% of the villages are not connected to a SC by pucca road, ranging from 5% of villages in HB Halli to 43% in Sandur Taluka. Furthermore, 18% of the villages have no public or private transport facility, ranging from 5% in Bellary to 27% in Sandur taluka. Unsurprisingly, the larger the village population size, the greater the chance they are linked to the SC with a *pucca* road and have transport facilities available. This provides a challenge for ANMs to pursue their domiciliary field work in smaller villages, as well as for women living in remote rural areas to access facilities.

Figure 3.4.b: Percentage of SCs connected by road to villages, and with availability of transport, in Bellary district



Data source: Mapping data

108 Ambulance Service

DLHS 2007-8 data reveal that the poor often rely on ambulance services to reach facilities for deliveries (see table 15, appendix). In-depth interviews with ASHAs reveal that the 108 Ambulance service is crucial, and is often the only mode of transport available for mothers. Commenced in 2008-9, the 108 Ambulance scheme is a public private partnership between the Department of Health and Family Welfare, Government of Karnataka (GoK) and Emergency Management and Research Institute (EMRI, AP).[26] Under the scheme, the GoK provides funds for these services under its state budget, the National Rural Health Mission and other relevant schemes, running it on a no-loss, no-profit basis. EMRI provides comprehensive emergency response services (medical, police, fire) using a single toll free number on a 24/7 basis. Response is supposed to be provided within 30 minutes in rural areas, and 20 minutes in urban areas, with an average per trip distance of 25km. There are 517 ambulances deployed throughout

[26] Department of Health and Family Welfare, GoK; Emergency Management and Research Institute, 2008. Memorandum of Understanding for Providing Emergency Response Services in Karnataka

the state, with roughly one for each lakh population, providing either advanced or basic life support. This is a little under the WHO recommendation of one ambulance per 60,000 people, but there are plans to scale up once community demand increases.

The 108 scheme also involves accreditation of destination health facilities to ensure that they can provide the care required.

Private sector partners in Bellary district

As utilization data demonstrates (see table 4, appendix for example), private providers are an important source of health care for all population groups. The *Operational Guidelines on Maternal and Newborn Health* suggest that whenever suitable private providers of care for maternal and newborn health exist, effort should be made to engage with them based on transparent and clear standards of care, timely payments and appropriate supervision.

With little regulation, the private health care sector varies in quality of service provision and technical proficiency, from informal providers to specialist doctors. In-depth interviews with private providers in project districts found that few participate in the *Thayi Bhagya* scheme (see section 3.7) and deaths are reported for the HMIS, and so these facilities are partially networked into the public system.

3.5 Human Resource Systems and Training

According to the *Operational Guidelines on Maternal and Newborn Health*, the district needs to have one senior programme manager (reporting directly to the DHO) and one contractual programme manager to ensure training, hiring and supportive supervision is run according to plan. This is not the case in the project districts. In Karnataka under the NRHM, at the state level there is a District Program Manager and an Accounts Manager who oversee human resources.

The key issues in human resources for service delivery in maternal and newborn health are:

- Getting an adequate number of skilled providers in place, including leveraging partnerships with private providers
- Ensuring that the skills of providers are adequate to deliver quality services
- Ensuring that there is a positive workforce environment and supportive supervision
- Ensuring that there is human resource planning for managers and supervisors

Hiring

To ensure an appropriate number of skilled providers are in place, the government has two pathways through which to employ people in the government health system, the regular system for permanent posts and contractual appointments under NRHM. For human resources to be hired through the regular system, the district health officer (DHO) assesses vacant positions and provides the details to the directorate. Regular appointments are done through the Karnataka Public Service Commission and it takes 1 to 1.5 years. Contractual recruitment has occurred through a number of different avenues; direct special recruitment by the state government and recruitment under the NRHM by the District Health Society (DHS) through District Recruitment Committees (DRS) for MOs or Aarogya Raksha Samiti (ARS) for paramedical staff.

With the Department of Health and Family Welfare, there are about 70,000 employees in the state with one chief administration officer providing oversight. Unfortunately, the DHOs are frequently unable to assess the vacancy positions in a timely manner, and do not have details about vacancies in different districts. District officers have a limited role in planning HR for the district. Many vacancies exist, and hiring specialists for rural posts in particular remains challenging.

The NRHM has been successful in rapidly increasing the availability of human resources for health in rural areas through recruiting additional staff on a contractual basis. However, there are large differences between the pay and status of regular staff and contractual staff for similar work, and contractual staff have little administrative, financial and management decision making power. In-depth interviews with providers found that across all cadres, there is a discomfort with the discrepancy in pay, status and conditions between regular and contractual staff, and that typically, contract workers are stronger performers than regular staff. From interviews with District Program Medical Officers and Reproductive and Child Health Officers, the suggestion to regularize positions after a fixed period was raised.

Another incentive to facilitate the appointment of staff in rural areas is the Remote Area Allowance (RAA), and the Tribal Areas Allowance and mobility support.[27] RAA is given to all staff at the PHC level. However, the implementation of this scheme varies across districts. For the most part, incentives are given based on remote postings, but not on actual residence in the locality. This means frequently providers are not residing in the area of their posting, undermining their ability to be on hand in an emergency. There are no performance based incentives. From in-depth interviews with District Program Medical Officers and Reproductive and Child Health Officers, the suggestion emerged to provide good quality housing to attract and retain staff in remote facilities.

In addition to hiring, specialist staff have been deployed through in-sourcing at the FRU and THU level since 2009, in attempt to fill gaps at higher levels of care. [28]

Training

To ensure that the skills of providers are adequate to deliver quality services, the government has a system in place to provide regular training programs. The coverage of trainings, including induction trainings, is uneven (see table 3.5.a). Only 18% of ANMs in the SCs are trained in integrated skills development (ISDP) compared to 69% in immunization and 79% in integrated management of neonatal and childhood illnesses (IMNCI) training. Among the staff nurses, most of the PHC/CHC staff has received trainings in IMNCI, SBA while the coverage for all other trainings such as ISDP, immunization and BEmOC training is inadequate at all levels of facilities. Coverage of trainings for medical officers is inadequate at all levels of facilities except ISD trainings at district level and IMNCI trainings at PHC and CHC level.

All training provided by the health system is in-service training rolled out by the State Institute of Health and Family Welfare (SIHFW). All training is delivered according to NRHM/GoI guidelines and modules are adapted for use in Karnataka. Train the trainer (TOT) sessions are held centrally and then delivered through district training centres and medical colleges across the state. In addition, direct trainings are provided by various government agencies and departments, for example the Karnataka State AIDS Prevention Society (KSAPS) provides training relating to HIV prevention and care. Initially training needs assessments were performed under the first Reproductive Child Health Program (1996-2004 -RCH1), but this has been discontinued in the second phase of the program. Priority for training is currently given to inadequate performing districts.

Administration and management training is scheduled once in two years for the health department's administration cadre, with content developed by the Administrative Training Institute in Mysore.

According to data from interviews, trainings are typically evaluated at two intervals, one immediately after the training and one three months after the training to assess skills and knowledge. However, the evaluations often do not capture the relevancy and applicability of the trainings to job roles.

[27] GoK, DHFW, NRHM, Programme Implementation Plan for 2010-2011, Bangalore, p.92
[28] GoK, DHFW, NRHM, Programme Implementation Plan for 2010-2011, Bangalore

Furthermore, interviews also reveal there are delays in the preparation of training modules and inadequate availability of materials. For example, the module for the 2009 SBA training was not available by December of 2009. Sometimes, a lower cadre of staff gets trained while the higher cadres do not; undermining the lower cadres' ability to apply the new skills they have learned. Additionally, a lack of scheduling results in trainings occurring haphazardly, sometimes over burdening a particular cadre and repeating material. SIHFW is sometimes not able to spend its entire training budget.

Certain cadres are not provided training, such as contract staff and AYUSH doctors. For example, the SIHFW has commenced a 15-day induction training for MOs recruited to permanent positions, but MOs on contract (as opposed to permanent staff) receive no such training. This means key providers are not able to provide the essential package of care.

Table 3.5.a: Percent of staff trained in various skill areas

Cadre and skill area	Facility type				
ANM	**SC**				
Integrated skill development training	18				
Immunization training	69				
IMNCI training	79				
Staff Nurse	**DH**	**TH**	**CHC**	**PHC**	**Pvt.**
Integrated skill development training	28.4	13.6	11.9	3.8	1.1
Immunization training	52.3	40.3	37.3	22.5	16.7
BEmOC	28.4	10.7	3.7	6.7	8.2
IMNCI training	36.6	27.9	48.5	60.9	8.9
SBA training	38.3	27.6	51.5	63.2	16.7
Medical officer	**DH**	**TH**	**CHC**	**PHC**	**PVT**
Integrated skill development training	79.7	17.2	26.6	17.6	3.3
Immunization training	6.4	15	50	35.7	19.9
Non Scalpel vasectomy	1.2	11.3	20.3	7.2	10.6
Medical termination of pregnancy	2	14	23.4	10.9	25.8
Minilap	2.3	17.2	36	14.5	23
BEMoC	2	14.5	25	11.9	24.5
IMNCI	4	22.7	78	52.8	19.8

Data source: Service Provider Assessment

Supportive Supervision, Mentoring and Monitoring

Along with training, periodic on-the-job mentoring visits provided by a team of supervisors is also central to improved performance. Supportive supervision is key to translating trainings into improved practice, to ensure that knowledge and skills are applied appropriately in the job setting. Ideally during a supportive supervision visit, the supervisor assists the service provider in her tasks, follows up to see that gaps in supplies are bridged and provides training and encouragement as needed. According to successful models of supervision, a supervisor follows a checklist to ensure that every skill is rehearsed,

every protocol is understood and followed, all the inputs are in place and all processes and outputs recorded appropriately. [2930]Our assessments found that there was no mechanism in place for supportive supervision, and protocols were not available.

Career Advancement

There is a lack of merit-based career advancement in the health system among all cadres. Very few promotional opportunities are available to ANMs to become LHVs or staff nurses, and progress is slow. SNs also experience slow professional development. The SNs start their career at the PHC level and progress to senior staff at the PHC and then Grade II at the Taluk hospital.

On the other hand, MOs have automatic time-bound promotions every 6 or 13 years, moving from PHC to CHC level. Interviews found that many MOs who move to the district level are given a high level of administrative responsibilities, for which they are given no training and are thus ill-prepared. Interviews with MOs found that the suggested solution to this burden was a parallel cadre to deal with management and administration, or, training in administration.

[29] Rowe, A.; de Savigny, D.; Lanata, C.; Victora, C. (2005) How can we achieve and maintain high-quality performance of health workers in low-resource settings? The Lancet, DOI:10.1016/S0140-6736(05) 67028-6

[30] NRHM, MOHFW, GOI, 2008. Quality Assurance for District Reproductive and Child Health Services in Public Health System, New Delhi.

3.6 Procurement and Logistics

As chapter five describes, many facilities are short on equipment, drugs and supplies. While these shortfalls do not entirely account for the partiality of service provision, they do undermine the ability of providers to offer comprehensive and quality care. This has been given policy attention; the 2004 state *Integrated Health Policy* outlines the need for rational and efficient drug purchase and use. Furthermore, the *Operational Guidelines on Maternal and Newborn Health* provides clear guidelines:

- Drugs and supplies needed for the provision of care through the continuum of care should be available as per the approved drugs and supplies list, without interruption, in each and every facility
- Every district should have a district warehouse with a minimum stock of three months of all the drugs and supplied required, with an inventory management system.
- Every facility should indent when their stocks fall below an estimated three months requirement. Transport of supplies to the periphery should be assured to the district SCs and all facilities without a vehicle to transport the stocks immediately.
- Procurement systems must ensure that drugs, supplies and equipment at the district level are replenished when stocks fall below a three month threshold

Drug Supply and Logistics

Each facility has a budget limit for the purchase of drugs, as follows:

- PHCs have 1 lakh
- CHCs have 5-10 lakh
- THs have 20-25 lakh

Facilities submit an annual indent to the district drug warehouse (DDW). A consolidated list is then submitted to the Karnataka Drug Warehousing and Logistics Society (KDWLS). The KDWLS floats the tender and these are scrutinized by a technical committee. Once the tender is selected, drugs are supplied straight to the DDW within 60 days. Quality control includes certificates from suppliers and sending random samples to labs for analysis.

According to in-depth interviews, those preparing the indents for the drugs do not have much training in forecasting and are not able to prepare a realistic indent. Additionally, national programs also supply drugs in addition to the indent, causing excess drug stock. Due to the limited budget, not all drugs are ordered at replacement levels. The interviews also revealed that when there is a shortage, untied funds are often used to maintain stock.

Equipment

KDWLS supplies all equipment including furniture and office equipment based on an approved list. The process typically takes 8 months to one year. The maintenance unit of KDWLS takes care of repairs, replacements and warranties.

There is no routine equipment audit across all facilities. Since NRHM, facilities no longer procure equipment through KDWLS, and so funds are now unspent.

3.7 Government Schemes and Incentives

There are two conditional cash transfer programs in the state to promote maternal and child health care seeking among disadvantaged groups, primarily BPL card holders. All schemes provide support for the first two births only. These schemes have uneven uptake due to low awareness, irregular funding, and uneven implementation.

JSY and Prasuthi Araike

Janani Suraksha Yojana is a central scheme under the NRHM introduced in 2005 that provides cash transfers to pregnant woman from poor and marginalized families, to cover the transport, diet and medical care costs of delivering in an institution (amounts provided listed in the table below). The scheme also involves the ASHA drawing up a "micro-birth plan" with each beneficiary, to ensure they are ready to go to the most convenient facility at the time of delivery. Eligibility for the scheme is with a BPL card or if they are from a SC or ST community. However, if the mother has no BPL card but her annual income is under 17,000, she can obtain an income certificate with the assistance of ASHAs and AWWs. In rural areas, most of the people seeking care at public facilities are eligible for such a certificate.

The scheme also provides incentives for ASHAs to promote institutional deliveries and guide and support the pregnant woman to seek appropriate care. The scheme also provides a smaller sum for women who opt to deliver at home using skilled birth attendance.

Table 3.7.a: Incentive Schedule for Mothers and ASHAs under the JSY scheme

Place of delivery	**Rural**		**Urban**	
Institutional deliveries	Mothers	ASHAs	Mothers	ASHAs
	700	200	600	200
C-sections	1500	200	1500	200
Home deliveries	500	Nil	500	Nil

Data source: *Operational Guidelines on Maternal and Newborn Health*, 2010

As well as supporting deliveries in public hospitals, there is an additional state-funded scheme, *Prasuthi Araike*, which provides benefits (Rs 2000) for deliveries by BPL mothers in accredited public or private institutions. In-depth interviews with providers and mothers suggest that this scheme is not working well across the project districts, mainly due to unavailability of state funding to support it.

The service provider assessment found that 78% of SC facilities in the project districts had information about the JSY scheme on display. Despite this, community survey data demonstrate that only 47% of women know about the JSY scheme (when prompted, see table 2.7.b). Low levels of awareness translate to a low level of uptake; a number of data sources suggest low coverage of JSY. DLHS 2007-8 data finds that only 15% of rural women in Bellary benefit from JSY or state specific schemes (table 16, appendix). More recent data shows higher numbers of recipients. Among respondents of exit interviews with recently delivered women, only 14% of women reported receiving the JSY stipend at discharge (see

table 2.7.b). Community survey data found that 34% of eligible women received the incentive, of which 28% received it at discharge and the remainder were asked to collect it later. Service statistics collected during facility mapping on the other hand, record 55% of women benefitting from the JSY/*Thayi Bhagya* scheme (recipients of both schemes are included in the same indicator).

This data on low uptake of the JSY scheme suggests that the key to the scheme's success may lie in the incentive paid to the ASHA, rather than to the mother.

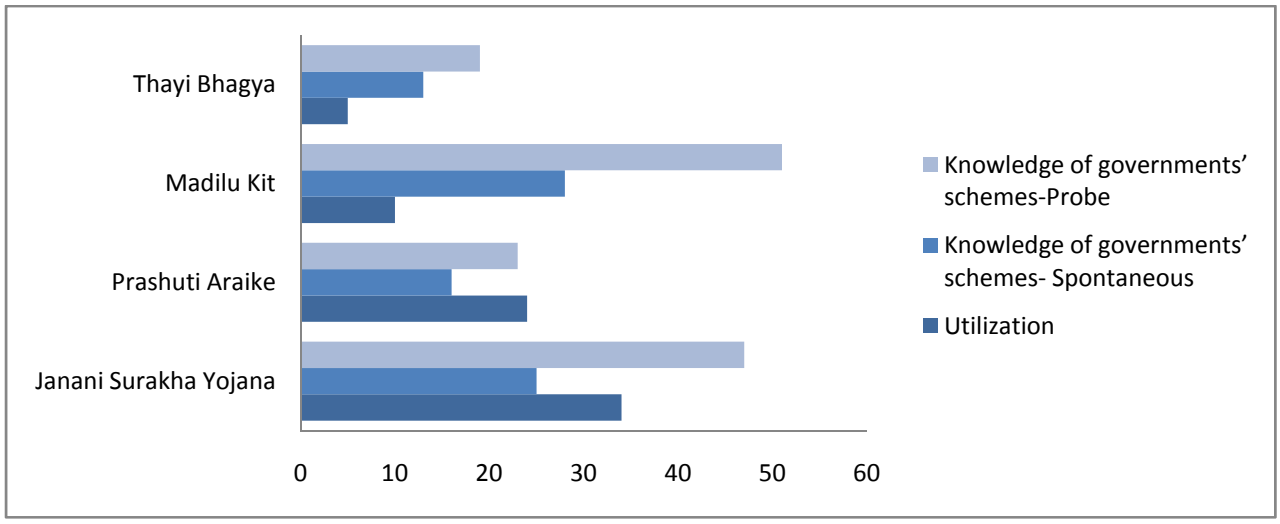
Madilu Kits (MK)

The *Madilu* kit (MK) scheme provides BPL mothers with a kit of 19 key items relating to maternal and infant health and hygiene. Supply of the kits has been irregular, and a backlog has been created from an irregular and inadequate supply. At the time of assessment, the current supply was being used to cover new mothers, and the remaining stock provided to mothers who gave birth over the last three months but did not receive the kit. Awareness of the scheme is also low; only 51% of mothers in the community survey knew about it (more than the rate of women who know about the JSY scheme – 47%). Facility service statistics record only 25% of recently delivered women receiving the kit. The quality assessment found that only 54% of SC facilities had information about the scheme on display.

Thayi Bhagya

Based on the well known *Chiranjivi* model from Gujarat, this scheme provides free services to BPL pregnant women delivering in registered private hospitals. The hospitals are paid Rs 300,000 for each 100 deliveries, with 10% paid in advance. According to interviews, at the time of the assessments the scheme has not been popular across the project districts, with the exception of Bagalkot district (where facility statistics record 41% of women who recently delivered as beneficiaries). Some private providers reported that they find the compensation inadequate to cover the cost of deliveries. This is primarily because of the high rates of c-section referrals to these hospitals, increasing the cost of care.

Figure 3.7.a: Knowledge and Utilization of Government Schemes in project districts (n=342)



Data source: Health Systems Assessment, Community survey, Facility-based exit survey

One reason why the *Thayi Bhagya* scheme may have low uptake is low awareness among providers in the government system on which private providers they can refer to, that is, which private providers are participating in the scheme. As part of efforts to improve referral systems, the private facilities that are part of the scheme should be made known to government providers.

Table 3.7.b: Knowledge and Benefit from Government Schemes

	Knowledge of Schemes %				Benefit from Schemes %	
	Community interview (n=320)		Exit Interviews (n=305)		Community Interview (n=301)	Exit interview (n= 291)
	Spontaneous	Probed	Spontaneous	Probed		
JSY	25	47	28	41	34	14
MK	16	23	20	23	24	15
PA	28	51	30	44	10	1
TB	13	19	12	14	5	1

Data source: Health Systems Assessments, Community interviews and exit interviews

Understandings of the schemes

The qualitative assessment found that incentives were a factor in the decision to deliver in a government facility. Respondents reported that in order to qualify, *thayi* card (mother's card) must be created during pregnancy and delivery must occur in the government hospital; home deliveries were ineligible to receive benefits. Most were informed of the scheme from the ASHA, Anganawadi or other villagers. Benefits discussed by respondents included coverage of delivery cost and a kit of useful items for the mother and child.

In accordance with the community survey, of the respondents who had registered and created a mother's card, only a fraction had actually received any of the expected incentives.

3.8 Implications

A variety of data sources were utilized to provide an overview of the health system. From the compilation of the findings, a number of clear implications emerge, outlining clear areas for action or intervention. These are outlined below.

Information Management

Clinical record keeping needs to be improved, to facilitate better clinical decision making
Standard case sheets for key maternal and neonatal health issues should be provided to all facilities and providers required to maintain them as this helps ensure providers follow standard practice (according to protocols). Introducing audits every 6 months to see quality improvement will allow staff to take ownership, feel that they are participating in change and actually see the improvement. Audits also allow the program planners to monitor the practice and adherence to standard protocols.

Referral Systems and Transport Connections

A structured referral system
The referral system at present is not structured in a way to direct the flow of patients from lower facilities to FRUs and higher facilities thereafter. This results in, for example, a high burden of normal deliveries at higher facilities like TH and DH, and so specialist care is compromised. Formal referral systems should be established starting with the supply of standard referral registers, referral slips to the facilities and sensitization to the staff toward maintaining a good system for referral linkages. Training is needed for providers at all levels to refer promptly, communicate with the referred facility, and follow up on the outcome. Such a system would streamline the flow of patients correctly in order to distribute the patient load among the facilities to ensure better service delivery.

Greater coordination with private providers
The high rates of care seeking in the private sector suggest that the private sector has better population reach, making public-private partnerships an attractive option to address gaps in the public sector. The *National Health policy* of 2002 and the state *Integrated Health policy* of 2004 both highlight the need to coordinate with private providers in a more systematic manner. Additionally, the KHSDRP has established a model of contracting in specialists, and contracting out PHC management. These models can be further scaled up to fill existing gaps in project districts, especially with blood banks, and specialist providers. There are 9 private facilities that provide both the C-section and blood transfusion facilities in the district.

In addition, any private providers participating in the *Thayi Bhagya* scheme, which are then part of the referral network, should be made known to the government providers who would refer them. Tours of the facilities could be conducted, and lists of participating private facilities can be made available to government providers.

Human Resources Systems

Human resource management could be strengthened through a Human Resources Information System

Strengthen the programme management unit to help with human resources management, including supportive supervision and deployment. There is a need to strengthen the currently existing management information systems to track training needs at the district level to enable program planners to address the needs through timely appointments, trainings and refreshers. This would also be an important support to the recently introduced counselling based transfer policy.[31]

A merit-based career path could be created as a performance incentive

Create merit-based opportunities for training and promotion for providers at all levels, so there is an incentive to perform well. For MOs, abolish time-based promotions and make them merit/performance based.

Clarify roles between ASHAs, AWW and ANMs

While there is a need for ANMs, ASHAs and AWWs to work together on some tasks, clarity and clear lines of responsibility are required, including between first and second ANMs. Once clarity is established, a mechanism to relay this clarity to workers, through existing platforms such as the monthly meetings and supportive supervision is required. In addition, there needs to be clarity in roles between the first and second ANM.

Training needs to be skills based, and followed up with supportive supervision

The service provider assessment reveals that despite a fair knowledge base, gaps exist in the skills and practice. This may indicate that the current system of trainings is focused on imparting knowledge, but lacks in providing follow up supportive supervision and mentoring to build skills. Trainings should be followed by supportive mentorship and follow up refreshers to reinforce the skills and practice. This is provided for in the state *Integrated Health Policy* (section 5.13).

Additionally, coverage of training programs is not high enough to have a sustained impact on health outcomes. Training needs to be delivered more widely, with priority given to high volume facilities.

Induction training for all staff, including contractual staff and AYUSH doctors, could be expanded

Many staff who participated in the quality assessment, especially the recently employed contractual staff, had not received basic induction trainings. For example; IDSP training for ANMs, SBA training for SNs, BEmOC training for MOs/ SNs of selected 24/7 PHCs, IMNCI trainings, etc. The trainings should follow an in-depth training needs assessment specific to the roles played by the care providers, and emphasize clarity of job roles and responsibilities.

Training AYUSH doctors in key MNCH skill areas should be expanded as they constitute such a large part of the healthcare workforce.

[31] Aiayappa, M. 'Medical Staff Transfers through Counselling' in The Times of India, 25th May 2011, http://articles.timesofindia.indiatimes.com/2011-05-25/bangalore/29581082_1_transfer-policy-transfer-of-medical-officers-rural-areas

Management and administration training for all MOs needs to be scaled up

A pre-service finance and administration training program is provided for in the 2004 State Integrated Health Policy, but does not appear to have a high level of coverage. The program that does exist focuses on financial management; however MOs needs skills on a variety of management areas. A revised program with greater coverage could be provided to all MOs or a specific cadre dedicated to management and administration.

Procurement and Logistics

Data use for logistics and procurement

The 2002 national *Health Policy* and the 2004 state *Integrated Health Policy* both advocate rationalizing drug procurement and supply. The mapping data suggest that the systems could be further improved through using facility records for forecasting and procurement of drugs and supplies.

A monitoring and indenting system to record and replace or repair non-functional equipment is required

Too frequently equipment is non-functional, but is not replaced or repaired in a timely manner. This undermines the quality of care possible in facilities, and creates an unpleasant environment.

Government Schemes

Increased awareness of all financial schemes is required

Linkages to the community such as ASHAs can be utilized to increase awareness of financial schemes.

The JSY scheme could be extended to all mothers

Karnataka is currently classified as a high performing state, based on aggregate data. For the JSY scheme, classification of 'high' and 'low' performing should be done at the district level to ensure equity within as well as between states. In addition, almost 70% of mothers at public facilities have or are eligible for BPL cards. Thus, the JSY can be made available to all mothers in the project districts (northern Karnataka), reducing the administrative burden to both mothers and facilities without significantly increasing the cost burden to NRHM, and reducing corruption in the attainment of income certificates.

Increase care components covered under JSY scheme

Inclusion of PNC and spacing of births would increase coverage of these services and practices, contributing to improved maternal and child health outcomes.

Chapter 4: Service Delivery Framework

Care for pregnancy, childbirth and newborn care can be provided at any of the three facility levels, and by a variety of providers. The package of care outlined for the three levels starts at level one for community based care and increases to level three for obstetric complications. Level one represents the minimum standard package of care that should be available. The following section provides an overview of the facility types, infrastructure, different personnel, and geographic and population distribution of public facilities across the district.

Key points

- Aggregate population coverage of facilities and staff is fair, but needs to be redistributed according to the population distribution so it is more equitable
- A lack of clean water, toilets and inappropriate waste management practices undermines the safety and quality of care at all facility levels
- To meet the current guidelines of at least two ANMs per SC, more ANMs need to be hired across the district but especially in Bellary and Hospet talukas
- NRHM investments in the elevation of PHCs to *24x7 PHCs* has improved infrastructure and increased institutional deliveries

The *Sukshema* project mapped all public and private health facilities (n=456*) in Bellary district in June and July 2010 (see table 4.a, and methodology). These are organized into three levels of care, as per table 4a and 4b.

Table 4.a: Taluka-wise number of facilities mapped, Bellary District

Type	Bellary	Hadagali	H.B.Halli	Hospet	Kudligi	Sandur	Siruguppa	# Mapped	# of facilities
SC	56	44	37	29	57	35	41	299	299
PHC	1	1	1	0	0	0	0	3	3
24x7PHC	11	9	7	7	7	4	7	52	52
CHC(FRU)	1	0	1	0	1	1	1	5	5
CHC	0	1	0	0	2	0	0	3	3
TH	0	1	1	1	1	1	1	6	6
DH	1	0	0	0	0	0	0	1	1
Private	41	1	4	16	1	4	7	74	94
Total	117	57	51	57	69	45	57	453	473

Note: Additionally 2 maternity homes and 1 ICDS facility were mapped in Bellary Taluka.
Data source: Mapping data

The public health system is managed by a district health and family welfare officer (DHO), and in every Taluka, a Taluk Health Officer (THO). The THO oversees the PHCs, CHCs and THs in the Taluka. Sub-Centres typically report to a PHC. The reporting structure is similar to the different levels of service

delivery, outlined in the table below. Each facility type offers different services and includes different provider types within a referral network, ideally to enable all patients to receive comprehensive care. The lowest and most proximate level of facility to the community is the sub centre, and the highest the district hospital. The geographic distribution of different facility types is illustrated in figure 4.a.

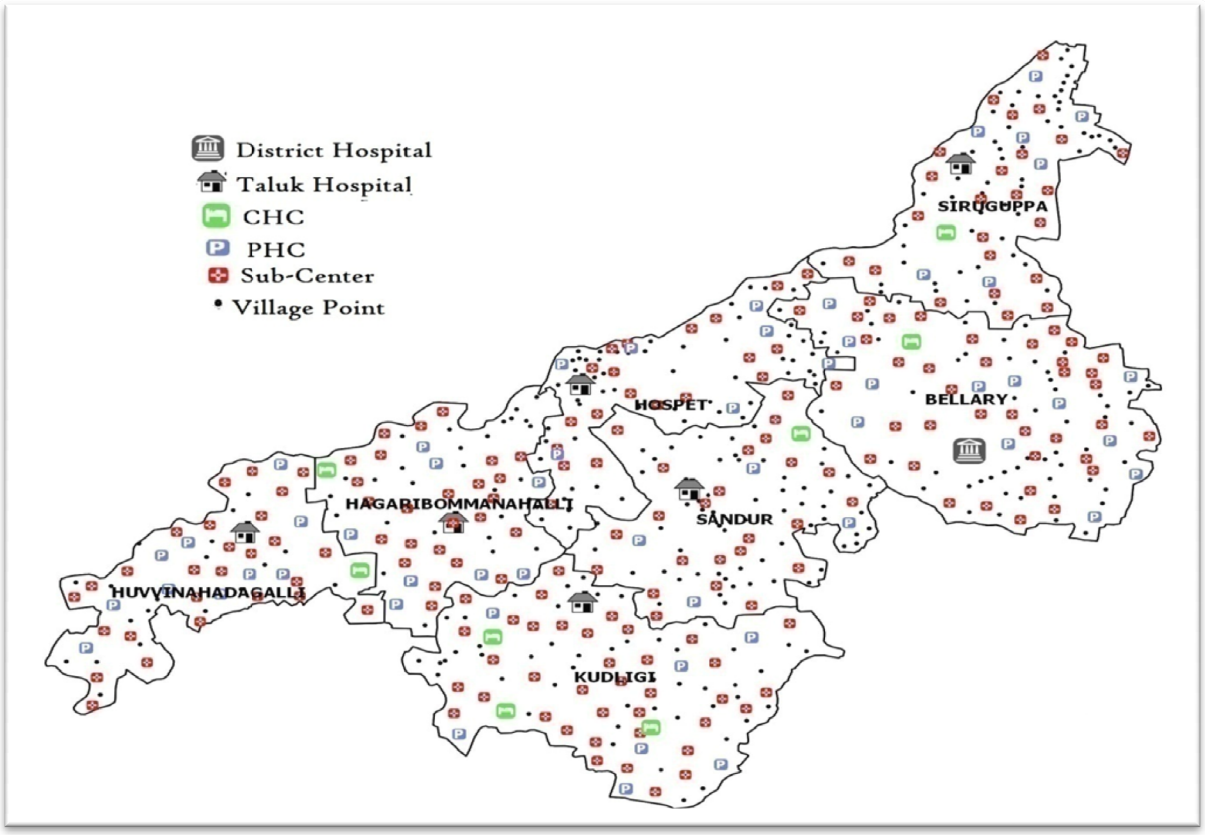
Table 4.b: Summary of Different Levels of Service Delivery for Maternal, Newborn and Child Health

Level	Facility types	Staff	Services Offered
Level 1: Skilled birth attendance (SBA)	SCs, Home births, PHCs not designated as 24x7 PHCs	Minimum two ANMS trained as SBAs ASHAs or other community health volunteers to provide home visits during the neonatal/postpartum period	Comprehensive antenatal care; Home deliveries assisted by a skilled birth attendant; Facility based deliveries
Level 2: Basic Emergency Obstetric and Newborn Care (BEmONC)	Designated 24x7 PHCs, non FRU CHCs, or private nursing home with equivalent facilities	Two MOs trained in BEmONC Three SNs trained in SBA and Navjaat Shishu Suraksha Karyakram (NSSK)[32]	Skilled deliveries including assisted deliveries, essential and emergency newborn care.
Level 3: Comprehensive Emergency Obstetric and Newborn Care (CEmONC)	FRU CHCs, THs, DH	Obstetrician/Gynecologist Anesthetist Pediatrician Or MBBS doctor trained in above skills + 4 other doctors and nine SNs One lab tech trained for blood transfusion support	As outlined in BEmONC, plus all complications managed including c-sections, blood transfusions, advanced resuscitation and care of sick newborns.

Data source: Operational Guidelines on Maternal and Neonatal Health, NRHM

[32] NSSK is a basic newborn care and resuscitation training program, launched to address newborn care at birth and to ensure the best possible support in life for the newborn. The objective of the initiative os to have one trained person basic newborn care and resuscitation at every delivery. For more details, see: GoK, DHFW, NRHM, Programme Implementation Plan for 2010 – 2011, Bangalore.

Figure 4.a: Map of Bellary district showing the location of government health facilities



Data source: Sukshema Mapping data

Note: A total of 88 facilities are not separately shown in the map, as there are multiple facilities located at the same town/village.

4.1 Sub Centres

SCs provide level 1 services. The sub-centre is the lowest and most proximate level of service delivery to the community with auxiliary nurse midwives (ANMs) and male health workers providing care to a defined catchment area. It is the primary site of pregnancy registrations and is equipped to provide basic antenatal care, delivery care at SCs and at homes, post natal care visits and immunizations and child health.

Each SC is meant to serve a population of 5,000.[33] While aggregate coverage in Bellary District is fair, distribution is inequitable: 56% of SCs cover an average of about 7,000 population, including 5% that cover an average of 13,000 population. The Taluka-wise population per SC ranges from 4,200 in Hadagali to 7,359 in Hospet, indicating that the latter needs more number of SCs in rural areas (Table 4.1.a).

According to the *Operational Guidelines on Maternal and Newborn Health*, the infrastructure each SC is supposed to have includes a labour table and newborn care corner to provide immediate care for newborns. Mapping data reveals inadequate infrastructure; in Bellary district, 55% of the SCs have separate labour rooms, and only 10% of these have electricity powered lamp (table 4.3.a). Findings from in-depth interviews with ANMs suggest that a number of SCs do not have adequate buildings, many more require repairs and few have running water. These infrastructure deficits provide an unattractive and unhygienic work environment and undermine the safety and quality of care available.

SCs have resources available that are not being utilized for infrastructure improvement. All SCs are provided with Rs 10,000 untied funds, however ANMs report that this is insufficient, provided irregularly and not utilized.

Table 4.1.a: Percent distribution of SCs by the population covered, Bellary

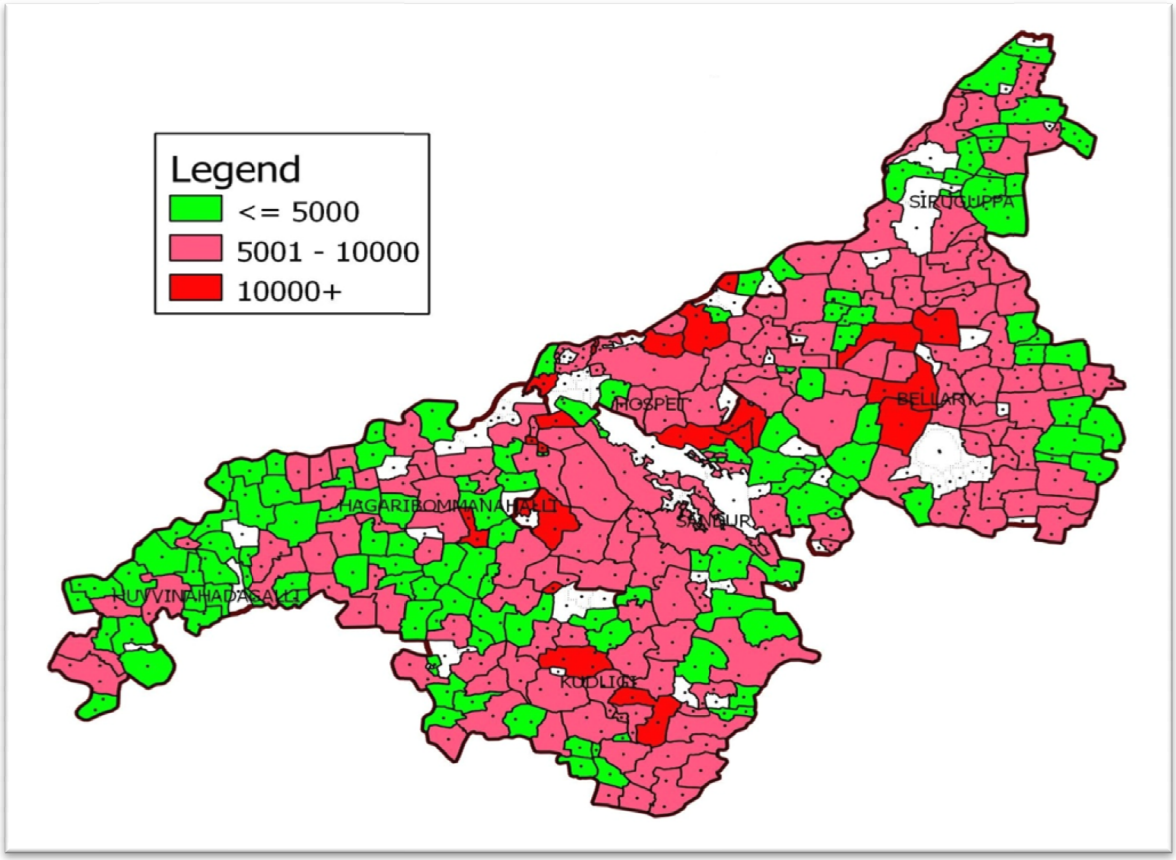
Taluka	Population* covered			Mean	N
	<=5000	5001-10000	10000+		
Bellary	33.9	57.1	8.9	6570.07	56
Hadagali	73.2	26.8	0.0	4210.48	41
H.B.Halli	60.0	37.1	2.9	5426.09	35
Hospet	28.0	56.0	16.0	7359.60	25
Kudligi	40.8	55.1	4.1	5565.96	49
Sandur	37.5	56.3	6.3	5837.63	32
Siruguppa	36.1	63.9	0.0	5615.14	36
Total %	44.5	50.4	5.1	5752.15	274**
Total mean	3528.22	6938.12	13441.82	5752.15	

*Projected for the year 2010
** SCs that serve the rural population only are considered

Data source: Mapping data

[33] Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India 2010 *Indian Public Health Standards for Subcentres: Guidelines,* New Delhi

Figure 4.1.a: District map showing the coverage of population by SCs, Bellary



Data source: Mapping data

*** This GIS map uses population projections from the 2001 census. The areas coloured white do not match the villages as per the 2001 census.**

Provider Types and Staff Availability at the SCs

Auxiliary Nurse Midwives

ANMs are generalist community level health workers who operate from SCs and PHCs. The *Operational Guidelines on Maternal and Newborn Health* suggest that there should be two ANMs trained as SBA at each SC (which is supposed to serve a population of 5000), but only 2% of SCs have 2 ANMs in the district and 6% have no ANM at all (see table 4.1.c). There are 288 ANMs in Bellary district (including both permanent staff and contractual employees). Each ANM covers an average population of 5484, much higher than the 2500 listed in the guidelines.[34]

Uneven distribution of SCs (see earlier) means many ANMs serve a population too large for one person to provide comprehensive services. These figures suggest an overstretched workforce in terms of topical and population coverage. There is a need to increase the number of ANMs across the board but especially in the talukas with larger catchment area populations, such as Hospet and Bellary.

[34] There are different sets of guidelines on ANM-population ratios. The IPHS guidelines suggest that there should be one ANM per 5000 population.

ANMs are supervised by Lady Health Visitors (LHVs), who operate from the PHCs. However, only 23 out of 55 PHCs have LHVs in place.

Table 4.1.b: Population distribution of ANMs

Taluka	# of ANM (regular and contractual)	Population covered per ANM	# of ANM per 2500 population
Bellary	59	6236.00	0.40
Hadagali	42	4129.43	0.61
H.B.Halli	37	5179.59	0.48
Hospet	27	6814.44	0.37
Kudligi	56	4869.34	0.51
Sandur	34	5515.21	0.45
Siruguppa	33	6125.61	0.41
Total	**288**	5483.82	0.46

Data source: Mapping data

Table 4.1.c: Percent distribution of SCs with the number ANMs

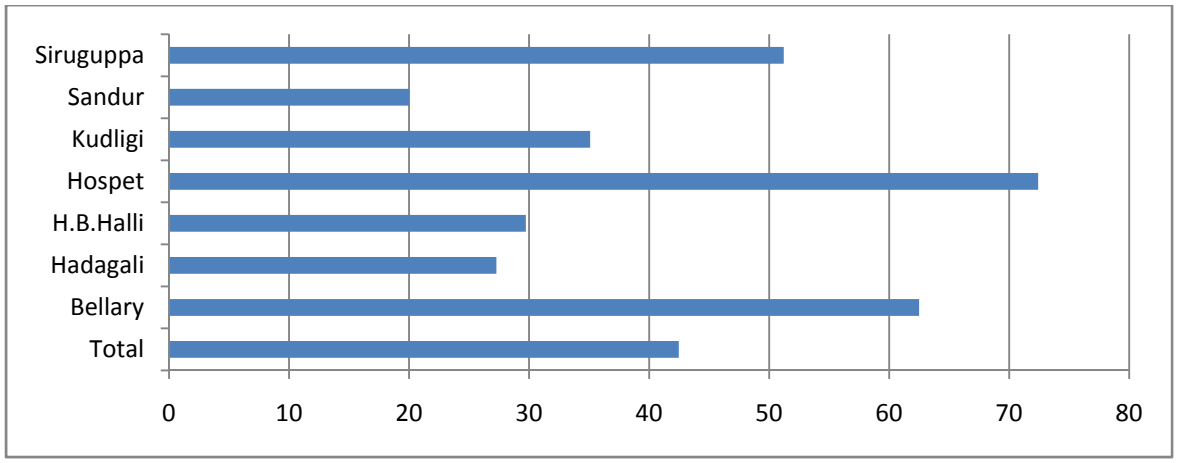
Taluk	Both regular and contractual ANM	Only regular ANM	Only contractual ANM	No ANM	N	Mean
Bellary	7.1	89.3	1.8	1.8	56	1.05
Hadagali	0.0	81.8	13.6	4.6	44	0.95
H.B.Halli	5.4	75.7	13.5	5.4	37	1.00
Hospet	0.0	89.7	3.5	6.9	29	0.93
Kudligi	0.0	86.0	12.3	1.8	57	0.98
Sandur	0.0	65.7	31.4	2.9	35	0.97
Siruguppa	0.0	61.0	19.5	19.5	41	0.80
Total	2.0	79.3	13.0	5.7	299	0.96

Data source: Mapping data

Male Health Workers (MHWs)

Male health workers implement national and state health programs (such as TB and malaria). Their role in maternal and newborn health is limited to community mobilization around family planning. They are typically not involved in MNCH, and so are not comprehensively assessed in this study. However, where there is a deficit of MHWs, it means that ANMs are spread thin across a large number of health areas and are unable to give MNCH the attention it requires. Only 43% SCs in Bellary district have a male health worker (see figure 4.1.b).

Figure 4.1.b: Percent of SCs with a MHW in Bellary District, by Taluka



Data source: Mapping data

4.2 Primary Health Centres

This is the first level of service delivery for rural populations where doctors are present, and is where most public sector deliveries are performed in Bellary District (21% of projected deliveries, see figure 5.2.2.a). About 95% of 55 PHCs in Bellary district are designated as 24x7 PHCs, which are better resourced, open all hours and better equipped for deliveries. There is meant to be one PHC per 30,000 people[35] and aggregate coverage in Bellary District is good, with 64% serving a population of 30,000 or less. However, some PHCs in the South and South east (for example, Kudligi and Sandur talukas) serve around populations 40,000 (see Table 4.2.a).

According to the *Operational Guidelines on Maternal and Newborn Health*, PHCs are required to have the following infrastructure; a labour table, a newborn corner, a vacuum extractor and stabilization unit. Most of the PHCs have the necessary service delivery infrastructure, with some important gaps – only 53% had kept the soap for washing hands near the handwash at the time of mapping. Around 44% PHCs have newborn care corners and 15% of PHCs have ambulances facility (Table 4.3.a). Only 42% of PHCs in the project districts had colour coded bins for proper waste disposal, and as with SCs, PHCs also lack clean toilets and clean drinking water, undermining the quality and safety of care provided.

Across all the project districts, waste management practices are uneven with only 42% of PHCs with colour coded bins, and most waste buried.

Certain 24x7 PHCs (and CHCs) are to be designated as basic emergency obstetric and newborn care (BEmONC) centres. According to UNFPA guidelines there should be one BEmONC centre for every 100,000 population.[36]

Table 4.2.a: Distribution of PHCs by population covered, Bellary

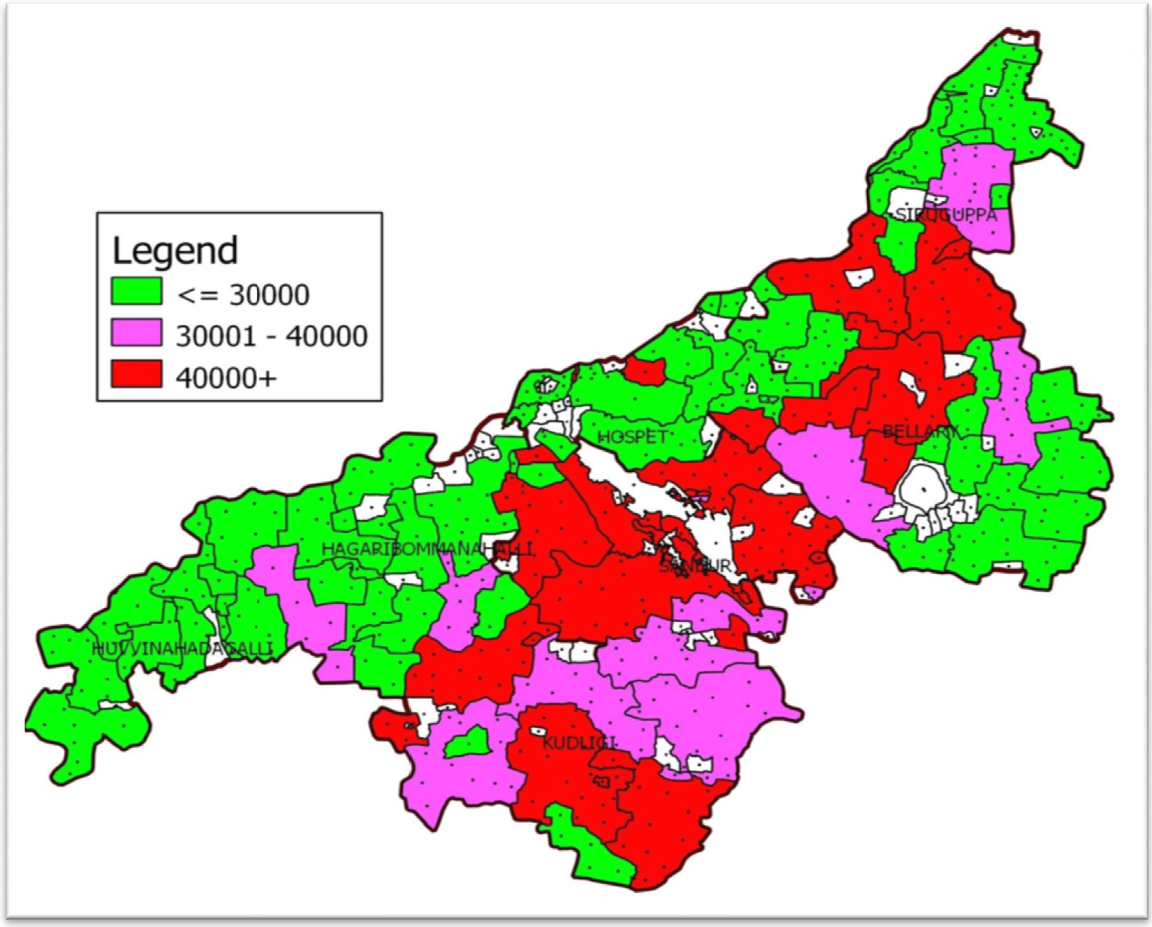
Taluka	Population covered				N
	<=30000	30001-40000	40001+	Mean	
Bellary	8	2	2	30660.30	12
Hadagali	9	1	0	17343.60	10
H.B.Halli	7	1	0	20874.90	8
Hospet	6	0	1	26284.30	7
Kudligi	1	3	3	38954.70	7
Sandur	0	1	3	46879.30	4
Siruguppa	4	1	2	28877.90	7
TOTAL (%)	35 (63.6)	9 (16.4)	11 (20.0)	28267.20	55

Data source: Mapping data

[35] Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India 2010 *Indian Public Health Standards for Public Health Centres: Guidelines,* New Delhi

[36] UNICEF, WHO, UNFPA, 1997 *Guidelines for Monitoring the Availability and Use of Obstetric Services*, New York.

Figure 4.2.a: Map of Bellary district showing the population coverage by PHCs



Data source: Mapping data

Note: Areas coloured white are the urban areas or SCs that report directly to CHCs or villages that do no match with the census 2001 village list . This map is based on the village-wise population projections from the 2001 census.

Provider Types at PHCs

Staff Nurses

Staff nurses are available from the PHC level and higher level facilities, and are key service providers for maternal, newborn and child health. The *Operational Guidelines on Maternal and Newborn Health* require 3-5 staff nurses or ANMs with SBA training and NSSK. The availability of SNs is quite good at 24x7 PHCs where 85% of facilities have three or more SNs on staff. The availability is poor at the PHCs which have not been upgraded to 24x7s. None of the regular PHCs (n=3) have SN (see table 4.2.b & 5.2.3.a).

Medical Officers

Like staff nurses, medical officers are available from the PHC level within the public health system, at both PHCs and 24x7 PHCs. The *Operational Guidelines for Maternal and Newborn Health* require 1-2

MOs with BEmONC and IMNCI training at all BEmONC centres. Medical officers are in shorter supply than SNs – None of regular PHCs have MOs and 89% of 24x7 PHCs have only one MO on staff (see table 4.2.b). Medical officers can either be MBBS qualified (allopathic medicine), or AYUSH doctors. Fourteen of the 55 PHCs have only AYUSH doctors. AYUSH-qualified MOs have a limited role in MNCH as they cannot perform deliveries or emergency obstetric and newborn care without additional in-service training (of which coverage is poor).

Table 4.2.b: Distribution of PHCs according to the number MOS and SNs , Bellary District

	Medial Officer				Staff Nurse				Total # of PHC
Taluka	**Both allopathic and AYUSH**	**Only allopathic**	**Only AYUSH**	**None**	**Both regular and contractual**	**Only regular**	**Only contractual**	**None**	
Bellary	6	5	1	0	1	0	9	2	12
Hadagali	0	4	4	2	0	0	9	1	10
H.B.Halli	0	4	2	2	0	1	6	1	8
Hospet	1	2	3	1	3	0	4	0	7
Kudligi	0	5	2	0	0	0	6	1	7
Sandur	2	1	1	0	1	0	3	0	4
Siruguppa	2	3	1	1	1	0	6	0	7
Total facilities	11	24	14	6	6	1	43	5	55
Total %	20	43.6	25.5	10.9	10.9	1.8	78.2	9.1	100

***Total includes 3 non-24x7 PHCs**

Data source: Mapping data

Lady Health Visitors

Lady Health Visitors (LHVs) provide oversight and monitoring to ANMs, and work out of PHCs. Mapping revealed that only 23 out of 55 PHC facilities have an LHV in place, undermining this level of supervision over ANMs.

4.3 Higher Level Facilities: Community Health Centres, Taluka Hospitals and the District Hospital

The higher facilities for provision of maternal and newborn health include Community Health Centres (CHCs), Taluka Hospitals (THs) and the District Hospital (DH). For level 3/CEmONC care, the infrastructure required by the *Operational Guidelines on Maternal and Newborn Health* includes a labour table, new born care corner, vacuum extractor, stabilization unit, blood transfusion capability and sick newborn care unit. The infrastructure for maternal, newborn and child health at CHCs and THs is adequate, including neonatal care corners (5 out of 6 THs, all CHCs). However, blood storage facilities are inadequate at both types of facilities (only three blood storage units at the TH level and one at the DH), and the availability of neonatal care corner is adequate (five out of six THs have a newborn care corner and three CHCs have). In both cases, the private sector is also not better provisioned, with 4 private facilities having blood storage units and 27 having neonatal corners. Only one public facility has a neonatal intensive care unit (NICU) (see table 4.3.a).

Across the project districts, waste management practice is inadequate at level 3 service provision, with only around half having colour coded bins (45% of CHCs, 51% of THs and 57% of DHs) (4.3.b)

According to UNFPA guidelines, one Comprehensive Emergency Obstetric and Newborn Care (CEmONC) centre should be available for every 5 lakh population[37], and thus there needs to be 5 for the whole district – but only the district hospital is able to provide comprehensive CEmONC services.

Specialist Staff

It is difficult to recruit and retain specialist staff in rural north Karnataka, and as per the mapping, staffing for CEmONC and essential newborn care is low. Key gaps are the availability of anaesthetists who can perform anaesthesia for surgeries, and paediatricians. To counter this gap at a state level, the in-sourcing of specialist staff began in 2009-10 for FRUs and Taluka Hospitals (see human resources section).

[37] UNICEF, WHO, UNFPA, 1997 *Guidelines for Monitoring the Availability and Use of Obstetric Services*, New York.

Table 4.3.a: Infrastructure available in different facility types

	SC (n=299)	PHCs (n=3)	PHCs24x7 (n=52)	CHC (n=3)	CHC FRU (n=5)	TH (n=6)	DH (n=1)	Pvt facilities (n=74)
Labour room								
Soap for hand wash	59	0	29	3	2	6	1	43
Separate labour room	163	1	51	3	5	6	1	44
Labour room has functioning electricity powered lamp	17	0	6	0	1	2	1	43
Labour room functional 24x7	-	1	50	3	5	6	1	43
Labour room has generator/inverter back-up	-	1	39	3	4	5	1	44
Labour room has neonatal corner	-	0	24	3	0	5	1	27
Labour room has piped water supply 24*7	55	1	43	3	3	6	1	43
OT								
OT functional 24x7	-	0	9	0	2	6	1	41
OT has piped water supply 24x7	-	-	0	1	4	6	1	41
Hand soap in OT	-	-	0	1	2	5	1	41
OT has generator/invertor back-up	-	-	0	2	3	5	1	35
General Infrastructure								
Separate laboratory	-	1	47	3	5	5	1	40
Pharmacy for drug storage and dispensing	-	1	45	2	4	6	1	37
Blood storage unit	-	-	-	0	0	3	1	4
Telephone connection	-	0	28	3	4	6	1	56
Computer	-	0	36	3	4	6	1	39
Access to internet	-	0	9	3	1	6	1	35
Ambulance	-	0	8	2	3	6	1	11

Table 4.3.b: Percent of facilities with waste management systems

	DH(7)*	TH(33)	CHC(33)	PHC(130)	SC(370)	Pvt(78)
Waste segregation						
Color coded bins available in the facilities	57.1	51.5	45.2	41.6	NA	19.2
Waste disposal method followed						
Incinerated	14.3	6.1	3.0	0.8	0.7	5.1
Buried in pit	28.6	81.8	66.7	66.2	40.0	19.2
Burned	42.9	33.3	57.6	58.5	42.1	32.1
Discarded Externally	0.0	3.0	0.0	3.8	9.3	3.8
Transfer/contracts	42.9	24.2	3.0	2.3	23.8	69.2

- Bellary district hospital was not included

Data Source: Service Provider Assessment

4.4 Implications

Improved hygiene is needed at facilities

Supply of clean drinking water and clean toilets at all facilities is needed to ensure care provision is safe and hygienic. In addition, **waste management practices in all facilities needs improvement.** Specific to infection control systems, sensitization/training of staff toward following the new waste management guidelines[38] should be coupled with supplying colour coded waste bins to all facilities and enabling contract agencies to pick up and dispose waste appropriately.

Staffing needs to be increased according to guidelines

Specifically, **more ANMs need to be recruited** to ensure coverage meets the current guidelines of 2 ANMs per SC, especially in Hospet and Bellary talukas. **Additional MOs and SNs** need to be appointed on a priority basis.

Dedicated BEmONC sites need to be established

It is **important to have at least one 24x7 PHC designated as a BEmONC centre for every 100,000 population.** With a projected population of about 25 lakhs, the district needs at least 25 BEmONC service centres. The population coverage and the delivery loads can be used as criteria for the selection of BEmONC sites. Other 24x7 PHCs can be strengthened to provide skilled delivery/ level 1 care.

Dedicated CEmONC sites need to be established

Given the total district projected population of about 25 lakhs, there is a **need to provide at least 5 CEmONC centres in the district.** Priority should be given to equip the designated facilities with all the equipment necessary for the provision of CEmONC services. In particular, there is a need for additional anaesthesia machines and blood bag refrigerators (necessary equipment of provision of caesarean section and blood transfusion).

[38] KSAPS, Government of Karnataka, *Sub: Guidelines on Bio-Medical Waste Management for Public Sector health Care Institutions in Karnataka – 2011-'12*, Circular: No.KSAPS/PPTCT-NRHM/15/2010-'11

Chapter 5: Components of Maternal, Neonatal and Child Health Care

Improved maternal, newborn and child health outcomes depend on effective health systems that deliver a package of high quality interventions along the continuum of care. The *Operational Guidelines on Maternal and Newborn health* highlight the need to ensure care of the pregnant mother from conception up to 42 days post delivery, including ante-natal care, delivery, post partum care (first six hours), post natal care and essential newborn care. Along the continuum, family planning and safe abortion services should be available to ensure pregnancies are wanted. The *Sukshema* project has also included key child health care components such as immunization and care seeking for childhood illness.

This section provides an assessment of service provision according to each care component in the continuum. For each care component, the project assesses the following questions:

1. What are the current levels of utilization of the services? How does utilization differ according to rural/urban residence, caste, and wealth index? Data from the third round of DLHS is used to describe the levels and differentials in the utilization of each care component, with a focus on disparities and the specific situation of rural women – the main target group of the NRHM. Additionally, the utilization levels in the district are compared with those in the project districts and in the state as a whole.
2. What is the availability of services, drugs, supplies and equipment for each care component at each facility level? District-specific mapping data is used to describe the current situation.
3. What is the competency of providers at each level to provide care?

5.1 Antenatal Care

This section provides an overview of the guidelines, a description of utilization patterns including socio-cultural factors, an analysis of availability and accessibility of services, an assessment of service provider competencies, and a summary of implications regarding antenatal care – the period from conception to delivery.

Key Points:

- Antenatal care is the first point of contact for a pregnant woman with the health system, and provides an excellent opportunity to build a facility-patient relationship that can endure through the continuum of care.
- Women need to visit a variety of facility types (including the private sector) to receive comprehensive antenatal care
- ANC care (including scans and tests) is the most expensive component of care, at an average cost of Rs 1200, compared to Rs 1000 for a facility based delivery and postpartum care.
- Although over 87 % of the ANC registrations occur at SCs, less than 5% of the SCs are providing all elements of basic ANC services
- ANC occurs both in the public and the private sector; for disadvantaged groups mostly in the public sector
- Some disparities exist between population subgroups in receiving antenatal care and in the comprehensiveness of care received
- Inadequate quality service provision compounds existing risk factors; for example those with the highest risk factors for inadequate nutrition are also less likely to be counselled about the importance of nutrition
- Providers lack the knowledge and skills to deliver complete ANC services, especially counselling and pre-eclampsia

5.1.1 Guidelines for Antenatal Care

The *Operational Guidelines on Maternal and Newborn Health* highlight that all women must have access to a package of antenatal services provided in the community or at the facility by a skilled provider who has the necessary equipment and supplies. The guidelines say that all mothers should have a minimum of four visits, including registration. ANC services are offered at three levels of the health care system, as per the diagram below (see table 5.1.1.a).

Table 5.1.1.a: ANC: three levels of service delivery

Level 1	Level 2	Level 3
• Registration within 12 weeks • Physical and abdominal examination • Check weight, BP • Identification and referral for danger signs • IFA supplementation • Essential lab services (Hb, urine, pregnancy test) • TT immunization • Counselling (nutrition, birth preparedness, safe abortion and institutional delivery) • Assured referral linkages for complicated pregnancies and deliveries	**Level 1 +** • Blood grouping • Rh typing • Wet mount test (saline/KOH) • RPR/VDRL • Linkage with nearest ICTC/PPCT	**Level 1 + Level 2 +** • Blood cross-matching • Management of severe anemia • Management of complication of pregnancies referred from level 1 and level 2

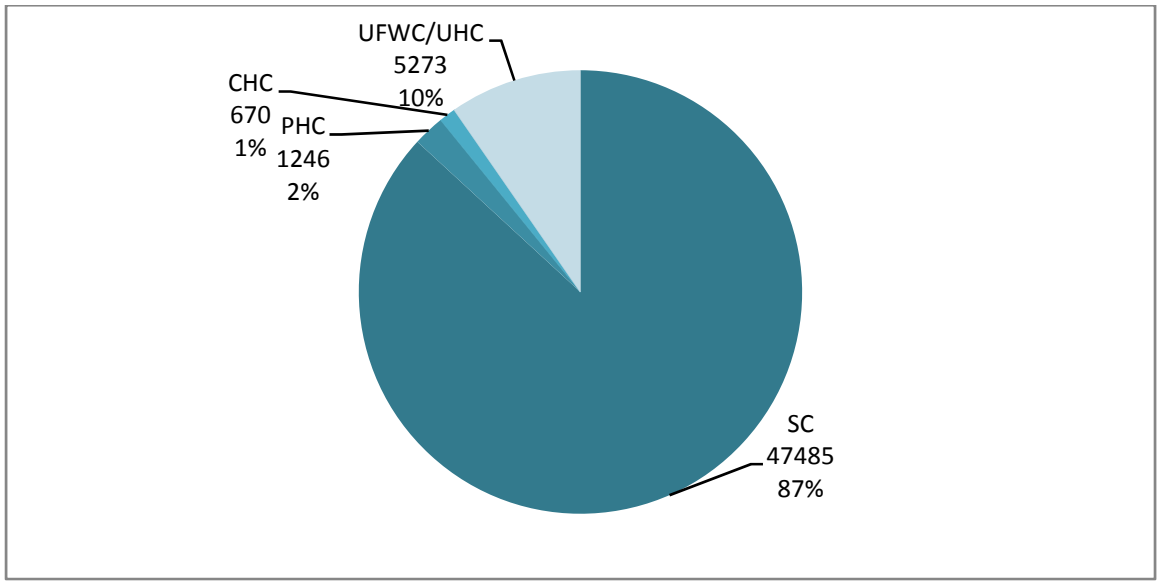
5.1.2 Utilization of Antenatal Care

Registration of the Pregnancy

Registration of the pregnancy is the first contact between a pregnant woman and the formal health care system. Ideally a registration would be an opportunity for health care provision, constituting the first ANC visit. However, many registrations only include taking record of the pregnant woman's contact details. HMIS 2009-10 data suggests that all of estimated pregnancies are registered in the district 66,498 registrations and 57,444 estimated pregnancies for the year[39], but only 51% of these are registered in the first trimester according to the guidelines. This may reflect poor outreach or poor understanding on behalf of the mother. Most of the registrations occur at the SC level (87%) (see Figure 5.1.2.a).

[39] The difference indicates a HMIS data quality issue.

Figure 5.1.2.a: Registration of pregnancies in Bellary district, 2009-2010



Data source: Mapping data, Audit of facility records

Note: 10% (5,273) of the registrations registered in UHC/UFWC are included in the graph

Understandings of Healthy Pregnancy

Qualitative data from the *Sukshema* project captured perceptions of a healthy pregnancy, which determine care seeking behaviour. The most commonly cited indicator of a healthy pregnancy was "scan results". Scans reassured the mother and family that the fetus was growing normally and there were no developmental issues. There was also a perception that the size of the mother's stomach indicated the health of the fetus, specifically a larger stomach was an indicator of a healthy fetus/pregnancy.

- "…in the hospital, they do this scanning and tell that the child is healthy and growing well in the womb" (Grandmother, Bagalkot)
- "Baby has grown or not, is it well or not we will come to know about it by scanning" (Pregnant woman, Gulbarga).
- "They will take them for scanning to understand the wellbeing of both child and mother. For some, they do this TV checkup (as they could see on screen, they term the scanning as TV check-up)and for others, they don't and it all depends upon the type of delivery they will have**"** (Grandmother, Gulbarga)

Understandings of Antenatal Care

From the qualitative interviews, it was found that the majority of respondents reported some level of antenatal care whether in public or private facilities. Women reported receiving prenatal scans, urine tests, blood tests including HIV tests and TT injections. One of the blood tests was reported to assess the volume of blood (high or low); the perception was that it is beneficial to have a lot of blood during pregnancy and less after delivery. Various tablets, syrups, and tonics were prescribed at the check-ups to promote growth of the fetus, and to increase the energy, strength and appetite of the pregnant woman. In many cases, ASHA workers or ANMs provided home check-ups during the antenatal period.

- **"…**I had too much of weakness unable to walk, talk and work also that's why I went for a check-up. They told blood level is too low and there is no much blood in the body. So problem may occur

during delivery they told. That's why we went to (names place) and they gave some suggestion with writing . Then we came to Government hospital here and they gave blood" (Pregnant woman , Bellary).

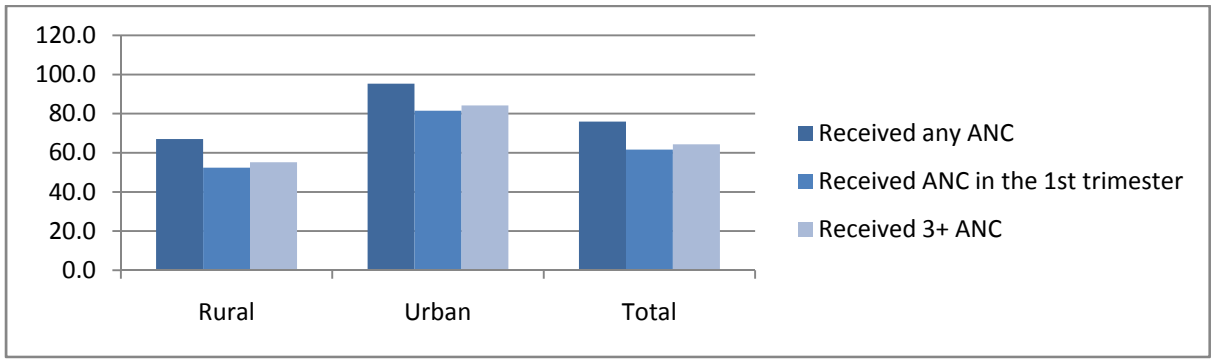
- "In (names hospital) they told like that. I don't have much blood and it will be a problem for my baby also. So they told to take one bottle glucose and one bottle blood" (Pregnant woman, Bellary).

ANC Visits

As for receiving actual care, DLHS 2007-8 data show that every one fourth of the women are missed for any antenatal check-ups and there is a large difference in rates of any ANC visit (pregnant women who received 'any'ANC visit) between 67% in rural areas against 95% in urban areas in Bellary district, compared to 90% in the state. DLHS records details of the respondent's last pregnancy, in the past three years. Furthermore, wealth disparities in accessing any ANC visit are high, with 23 percent point difference between poor (63%), and non-poor (86%) (see table 3, appendix).

According to DLHS 2007-8 data, a fair number of women seek an initial visit ANC checks in the district (76%); however all are not followed up by subsequent ANC visits (only 64% receive 3 ANC checks in the district)(see table 7 appendix). More recent data from exit interviews offers a more positive picture for the project districts, suggesting increases in antenatal care seeking, with 85% of women receiving 3 or more ANC visits (table 5.1.2.a); however we may expect exit interviews to find a higher level of care seeking, as the sample frame is composed of care seekers. Nevertheless, this is roughly in accordance with UNICEF CES 2009 data which records 78% of women in Karnataka received 4 or more ANC visits

Figure 5.1.2.b: Number of ANC visits



Data source: DLHS 2007-8

Table 5.1.2.a: Number of ANC Visits – Exit Interviews with pregnant women (n=362)

Number of visits	Percent
3 or more	85.4
1 – 2	9.7
0	4.4
Missing	.6
Total	100.0

Data source: Exit Interviews, Health Systems Assessment

Comprehensive Antenatal care

While disparities in receiving *any* ANC service are not great, the disparities in comprehensiveness of care received by different subpopulations are important to note. DLHS 2007-8 defines "full antenatal checkups" as three or more ANC visits, 100 IFA tablets or syrup and at least one tetanus toxoid injection. The rate of women who received full ANC checkups is quite low (35%) with high disparities between population groups. For example only 26% of rural women receive full ANC checkups compared to 53% of urban women; and only 19% of women from the poor receive comprehensive care compared to 46% of the non-poor (see table 7, appendix). Furthermore, across every domain of disadvantage (wealth quintile, caste status and residence location), the more disadvantaged populations received less comprehensive care, with fewer number of ANC components checked by the provider (tables 5 and 7, appendix).

While the disparities are smaller, similar patterns can be seen in terms of the advice provided (table 6, appendix). For example, only 64% of poor women were advised about better nutrition for mother and child, compared to 68% of the non-poor. This means poor quality service provision compounds pre-existing risk factors; those with the highest risk factors for poor nutrition are also less likely to be advised about the importance of nutrition. This may reflect lower levels of health literacy and less demand for comprehensive care among the poor.

Antenatal care in the Public and Private sectors

Pregnant women often have to visit a number of different facilities to obtain the care they require; 25% of women in the community survey report they are referred to different facilities for specific care components, 17% mention the lack of ultrasound equipment as a reason for going to multiple facilities. Results from the community survey also found that 63% of mothers report at least one visit to a private facility (table 5.1.2.b). There are both push and pull factors sending women to the private sector – referrals from MOs in government facilities and a perception of higher quality care in the private sector.

DLHS 2007-8 data for Bellary district confirms that across all population subgroups there is a marginal difference in number of antenatal care occurs in the public and private sector, for example 59% of SC/STs seek care in the public sector and 45% seek care in the private sector (as is clear from table 3, appendix). Disadvantaged groups are more likely to seek care in the public sector than other groups, with 59% of scheduled castes and tribes, compared to 44% of the rest of the population (see tables 3 and 4, appendix); and 72% of the poor compared to 42% of the non-poor. While public sector care seeking for antenatal care is low across all facility types, it is relatively high at the sub centre level at 25% for rural women; 25% for SC/ST and 31% for the poor compared to9% in the region and 10% in the state (see table 4 appendix)

It should be noted that this data reflects the situation prior to the deployment of ASHAs and infrastructure improvements brought in with the NRHM. With the greater public outreach that ASHAs offer, coupled with the JSY incentives, we can expect more contact with the public system. However, data from the community survey and exit interviews suggest that most antenatal care visits still occur in the private sector (see table 5.1.2.b).

Table 5.1.2.b: Percent of ANC visits by facility type*

Facility type	Community Interviews (N=342) %	Exit Interviews (N = 346) %
SC	35	22
PHC	50	33
CHC	7	17
TH	10	14
DH	6	19
Pvt	63	70

***multiple answers possible**

Data source: Community interviews and exit interviews, Health Systems Assessment (see methodology for details)

Reasons for Not Seeking Antenatal care

With poor follow through it is important to identify the reasons women themselves provide for not accessing care. According to DLHS 2007-8 data for Bellary district, reasons for not seeking care do not explicitly refer to the system itself, instead they cite reasons such as 'not necessary' or 'cost too much' (table 8, appendix). This suggests a need for stronger outreach by the health system and interpersonal communication may be important to impart knowledge and explain the importance of ANC services in culturally appropriate terms. Interpersonal communication can be provided both through domiciliary visits and during ANC visits at the facility.

Understandings of Problems in Pregnancy

Two different types of information emerged in response to questions about problems in pregnancy, relating both to normal discomfort and to pregnancy complications. With regard to the former, vomiting, loss of appetite, headaches, weakness, fainting, dizziness, indigestion, diarrhea, as well as pain in legs, arms, back and abdomen were commonly mentioned. More serious health problems and complications included lack of fetal movement, vaginal bleeding, burning sensations while urinating, and undergoing a caesarian section delivery.

Women had knowledge of the seriousness of hypertension and pre-eclampsia. High blood pressure was understood to be a serious complication that caused swelling of hands, legs and face and a slow delivery. Methods to prevent hypertension included consuming less of the following foods: salt, spicy items (chili), masala, and sour items (e.g., pickles).

- "If B.P is there they tell that the legs will swell and after getting up from sleep face will be swollen it seems. That's why we should take less amount of salt… It creates problem during delivery time they say" (Pregnant woman, Bellary).
- "They will check whether it's [blood pressure] low or high. If it's high means during delivery it will be a problem that's why it should be normal it seems… delivery won't occur fast" (Pregnant woman, Gulbarga).
- "One of my neighbours she had experienced these problems, told me this. Her B.P. was high, then swollen legs, and even during "Hadiyodraga"(delivery time) she had fits. And the "Kusu" (Baby) was affected but I didn't know what exactly had happened" (Pregnant woman, Bagalkot).

Respondents described conditions that can afflict pregnant women that are outside of the realm of western biomedicine. These include "evil eye", evil spirits and solar or lunar eclipses. It described that affliction with the evil eye or evil spirit can occur in the outdoors in the afternoon and evening, and can lead to miscarriage and maternal mortality.

- "…some "Ravu" will attack it seems and we will feel giddiness it seems… Will cause head rotation and will fall if it attacks…. It will take out the baby [cause abortion] for pregnant women it seems. If it attacks means they lose self control and either it will take the lady and baby will be alive or it will take baby and lady will be alive. That's it" (Pregnant woman, Bellary).
- "At that time just I was standing there and moved to come down. That's all some "Ravu" evil wind came and I fell down…. Even if they remove it my baby was not alive… within one week everything happened. Nobody could save my baby" (Pregnant woman, Bellary).

Care Seeking for Pregnancy Complications

According to DLHS 2007-8 data for Bellary district, the disparities between population subgroups in reporting of pregnancy complications are not as high as for other indicators (table 9, appendix). The rate of reported pregnancy complications in Bellary district is slightly higher than the rate at the state level (52% vs 50%). Health care seeking for pregnancy complications is 80% with large disparities between population subgroups – for example, 71% of rural women sought care compared to 96% for urban women. However, the small sample size means these figures should be regarded as indicative rather than representative. Consistent with other care components, most care seeking for complications in rural Bellary district occurred in the private sector (64%) (Table 9, appendix).

Cost of Antenatal care

According to facility-based exit interviews, the cost of ANC is the main expense in the entire continuum of care, at a median amount of Rs 1200 compared to Rs. 1000 for deliveries (see table 5.1.2.c) – primarily because of the cost of scans. The median expense for antenatal care increases with wealth status, with the richest third paying roughly the same as the non-BPL card holders (Rs. 2900 and Rs 2820 respectively).

Table 5.1.2.c: Median expenses for ANC, delivery and post-partum care

Respondent sub-category	ANC	Delivery and pp care
All Respondents (n=329)	1200	1000
Wealth status		
Poorest (n=83)	1980	1292
Poor (n=185)	2200	1025
Least poor (n=53)	2900	1900
BPL Card holder (n=232)	1985	1085
Non-BPL card holder (n=95)	2820	1620

Data source: Health Systems Assessment, Facility exit survey

5.1.3 Availability and Accessibility of Antenatal Care

ANC Services

While the rate of women receiving any ANC visit is high in Bellary district, the rate of women obtaining comprehensive care is low. To understand why there is poor follow through it is important to examine the availability and accessibility of comprehensive ANC services within the public system.

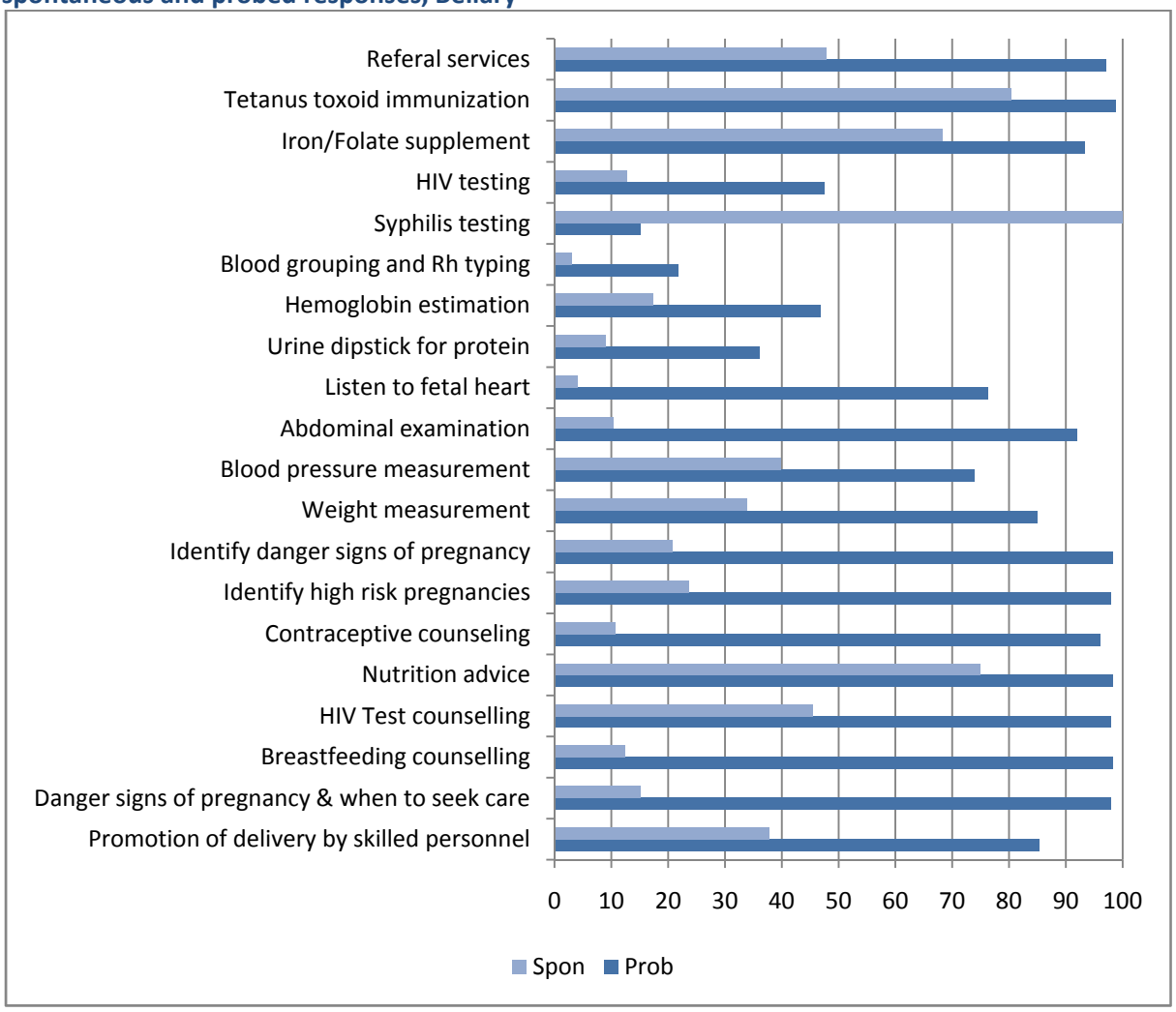
Figures 5.1.3.a and 5.1.3.b demonstrates the availability of different ANC components, as reported by ANMs working at the sub-centre level and MOs working at the PHC level. Both spontaneous and probed responses are recorded, the project cites spontaneous responses as an indication of clarity about the range of services routinely provided at the facility and service preparedness.

Only about 5% of providers at SCs and less than 10% at PHCs report offering comprehensive ANC services. This is in accordance with DLHS 2007-8 data; the self reporting of components of antenatal care received revealed that most women receive incomplete care both in terms of care and advice. In addition, providers' spontaneous reporting of service components is low, demonstrating a lack of clarity about what should be provided at the facility.

At the SC level, reported service provision is inadequate. Provisions of tetanus toxoid injections (80%) , Iron folic acid tablets (68%) and nutrition advice (75%) have reasonable coverage, but all other care components are well below 50% (Figure 5.1.3.a). The key gaps includes syphilis testing, blood grouping Rh typing, listening to foetal heart sounds, urine dipstick testing for protein, abdominal examinations, identification of high risk pregnancies and danger signs in pregnancy, contraceptives counselling, breast feeding counselling, HIV testing and counselling on danger signs of pregnancy. Of particular concern is the low level of advice given about skilled delivery, even when providers are probed on this topic.

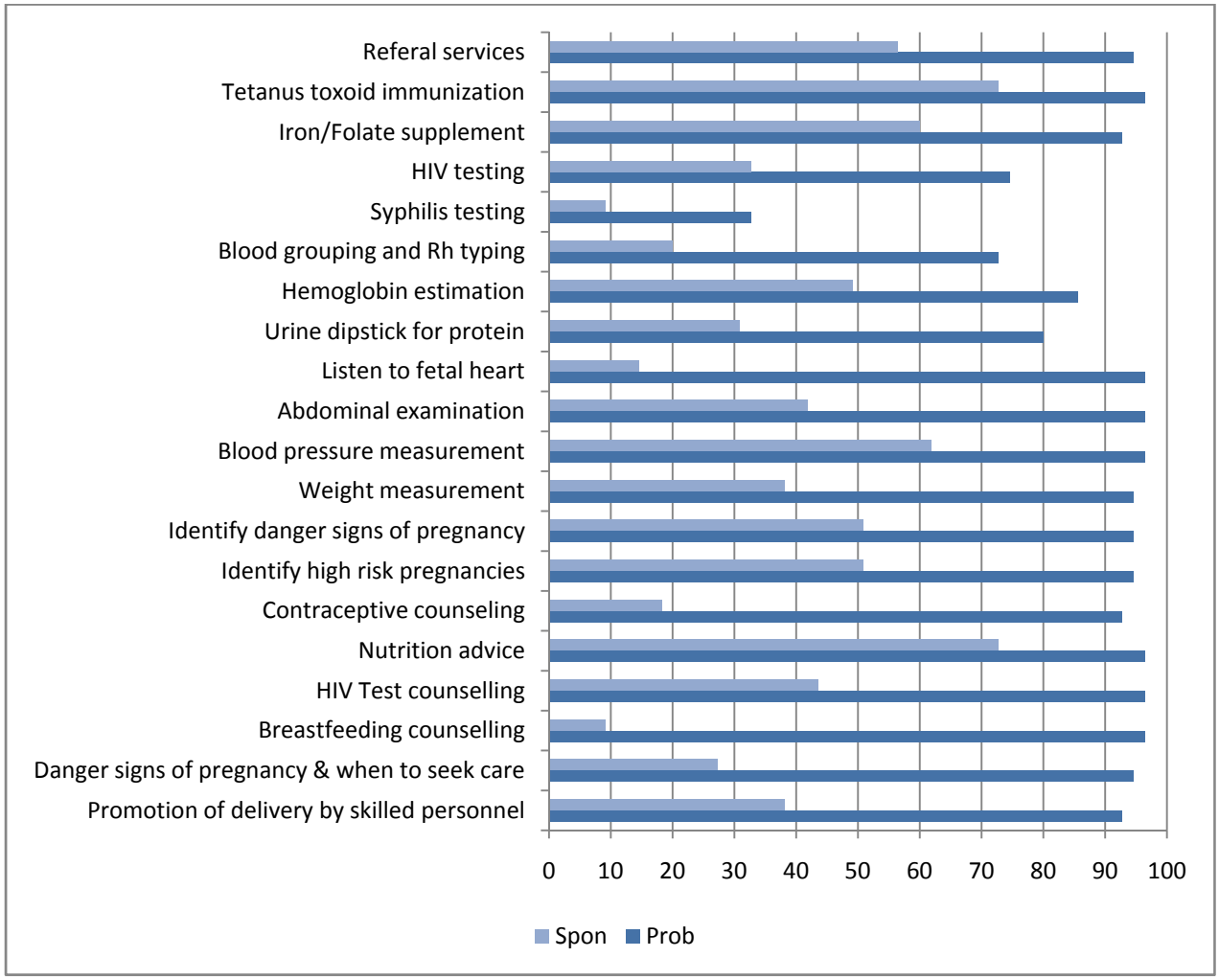
At the PHC level, no service component was listed by more than 73% of providers (Tetanus toxod immunization 73% and nutrition advice was listed by 73% of providers), and many of the gaps at the SC level are repeated. Key gaps include, syphilis testing, listening to foetal heart sounds, counselling contraceptives, Blood grouping and Rh typing, danger signs of pregnancy , urine dipstick for protein HIV testing and weight measurement of pregnant women (Figure 5.1.3.b). The repetition of service gaps at different levels of the system is a concern, indicating the challenge pregnant women in receiving comprehensive care, even in the case of a strong referral system.

Figure 5.1.3.a: Percentage of SCs where specific ANC counselling/check-up services are available, spontaneous and probed responses, Bellary



Data source: Mapping data

Figure 5.1.3.b: Percentage of PHCs where specific ANC counselling/check-up services are available, spontaneous and probed responses, Bellary



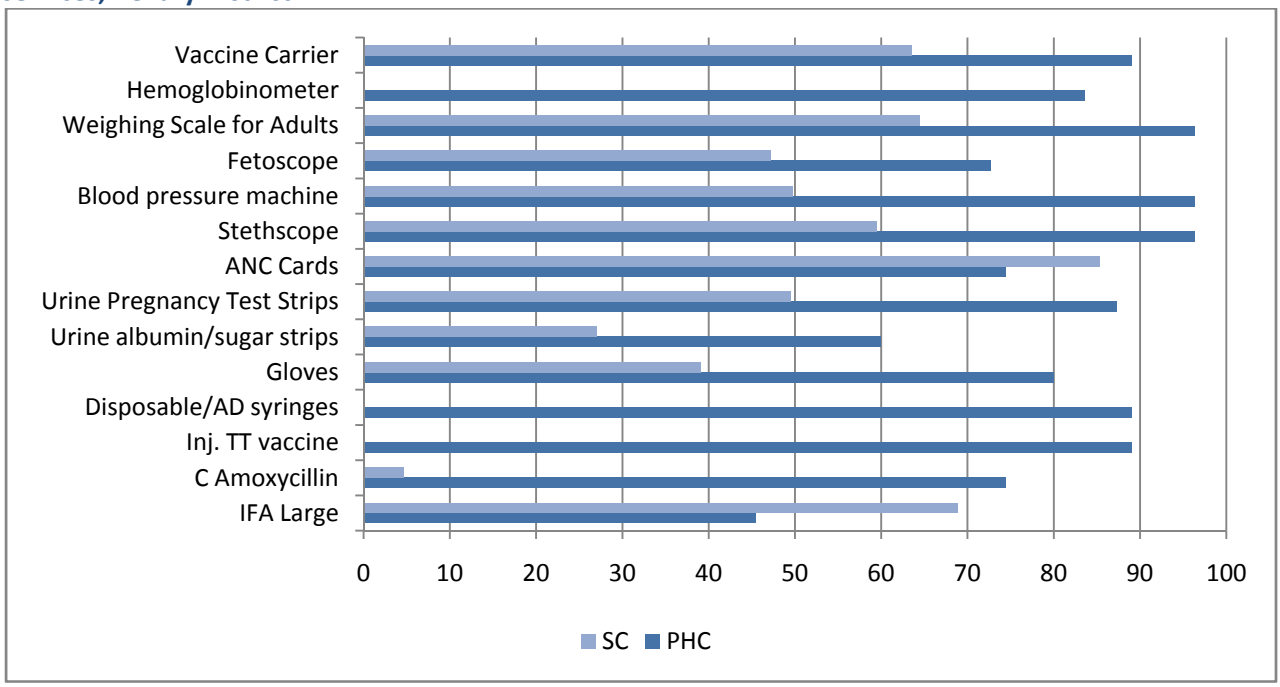
Data source: Mapping data

Drugs, Equipment and Supplies for ANC Services

Less than 10% of the SCs have the required equipments for offering basic complete antenatal care. Key gaps include blood pressure machines, disposable syringes, urine pregnancy strips, urine protein strips, gloves and fetoscopes, (figure 5.1.3.c). No SCs are storing tetanus toxoid injections; while it is reported as a routine service at the SC, it is shipped from the PHC on specific immunization days. At the PHC level, more than 60% of facilities have the equipment to provide basic antenatal care, and about 45% have the required drugs. Key gaps in drugs include amoxycillin capsules at the SCs and IFA tablets at PHC. Key gaps in equipment include urine protein strips and fetoscopes (figure 5.1.3.c).

While inadequate supplies may account for the lack of comprehensive care in some cases, figure5.1.3.c indicates that supply levels are generally higher than rates of service provision. For example, 73% of PHCs have a fetoscope, and nearly 96% have a stethoscope, but in only 15 % of cases did providers listen for a fetal heart beat at PHCs. At the SC level 47% of SCs have fetoscopes and over 60% have stethoscopes, but in only 4% of cases did providers listen for a fetal heart beat (see figure 5.1.3.c and 5.1.3.a). This suggests that while logistics may need to be improved, there are other reasons for the shortfalls in service delivery.

Figure 5.1.3.c: Percent of SCs and PHCs with specific drugs and equipment necessary for providing ANC services, Bellary District



Data source: Mapping data

- **Vaccine carriers and TT injections are stored only at PHCs, and hemoglobinometers are not required at the SC**

5.1.4 Service Provider Competencies to Offer Quality Antenatal Care

This section comprises of the care provided to the woman during her pregnancy (the antenatal period) at the SCs, PHCs, CHCs, THs, the district hospital and private hospitals. Provider competencies, including knowledge, skills and practice, were assessed for ANMs, SNs and MOs.

Routine antenatal care

Knowledge

Provider knowledge on routine antenatal care was assessed through a self-administered questionnaire. All providers scored poorly on questions relating to pregnancy complications and danger signs, such as severe anaemia. ANMs and SNs had the least knowledge about danger signs of pregnancy, which means they are unlikely to be able to identify and refer problems in a timely manner (table 5.1.4.a).

Table 5.1.4.a: Percent of providers who correctly answered questions about antenatal care

Knowledge of ANC	Obstetricians (n=86)	Medical officers (n=133)	Ayush medical officers (n=35)	Staff nurse (n=184)	ANM(n=482)
Components of antenatal care	96.5	92.4	97	78.6	73.2
Danger signs in pregnancy	89.1	73.6	71.4	50.8	20.1
HIV testing services to a pregnant women	51.1	50.3	45.7	40.1	53.6
Complications in pregnant woman with severe anaemia	93	78.9	77.14	41	47.1

Data source: Service Provider Assessment data

Skills and Practice

The first antenatal visit is crucial for the client since it is the first contact with a care provider .It is essential to; elicit complete history including date of last menstrual period (LMP); calculate and inform about expected date of delivery (EDD); obtain an obstetric history about previous pregnancies and any complications; ask about danger signs in present pregnancy; foetal movement; conduct a focussed physical examination including height and breast examination; provide IFA; TT and de-worming. In addition counselling the client for danger signs, birth planning, newborn care, nutrition, HIV, financial schemes and family planning are all ideally performed at the first visit.[40] Blood and urine tests may be advised and explained at the first visit, and followed up in the subsequent visits.

The follow up visits entail calculating gestational age and comparing it with the progress of pregnancy, physical examination to be done at all visits especially weight, blood pressure, abdominal examination and foetal heart rate, vaginal examination at the later visits to ascertain if normal delivery is permissible,

[40] MOHFW: Maternal Health Division, GOI, 2005. Guidelines for Antenatal Care and SBA by ANMs and LHVs, New Delhi.

prescribe investigations and medications if required and detection of any complication. Clients should be counselled for danger signs and when to seek care, at each visit.[41]

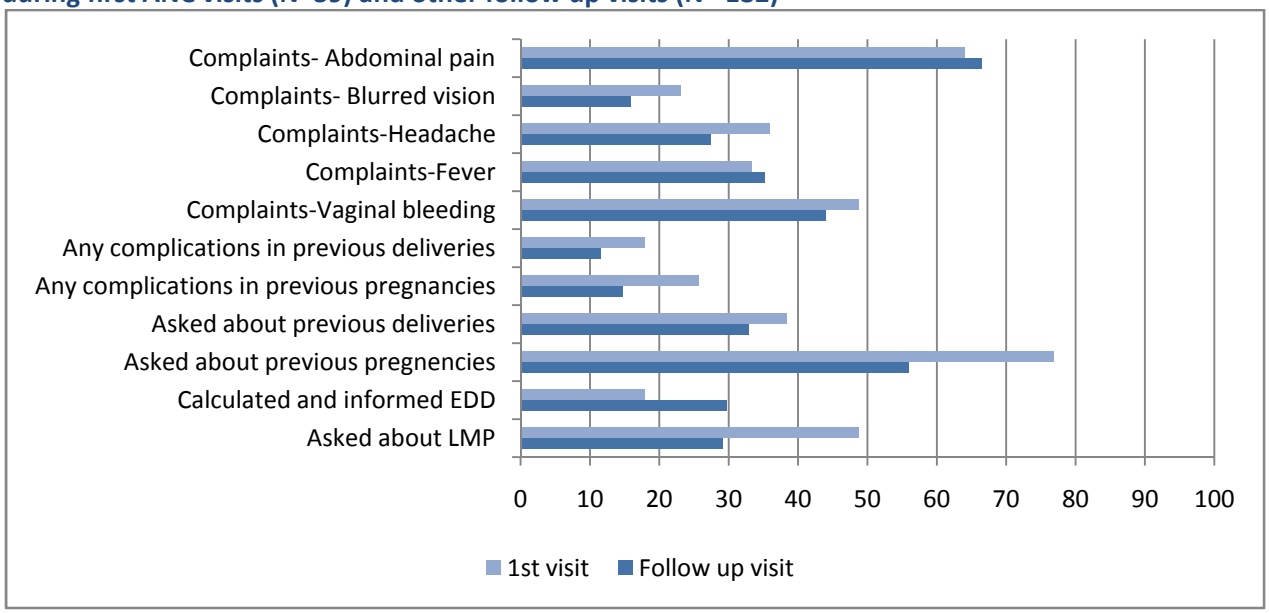
Providers' skills and practices were assessed by observing them directly while they provided antenatal care. 221 antenatal cases were directly observed at PHCs, CHCs, higher facilities and 59 private hospitals. 39 of these direct observations were for the first antenatal visit, and 182 follow up visit cases were observed, including 22 cases in which the visit sequence could not be determined and was not noted.

The observations identified several shortcomings in following care protocols for history taking, physical examination and counselling (see table 10, appendix).

Direct observations: History taking

Key gaps were noticed in eliciting history even in the first visit such as asking about LMP, informing about EDD and complaints about previous deliveries. Eliciting danger signs such as blurred vision, headache, fever and vaginal bleeding was low in all visits (Figure 5.1.4.a).

Figure 5.1.4.a: Direct Observation ANC: Percent of providers who elicited various aspects of history during first ANC visits (N=39) and other follow up visits (N= 182)



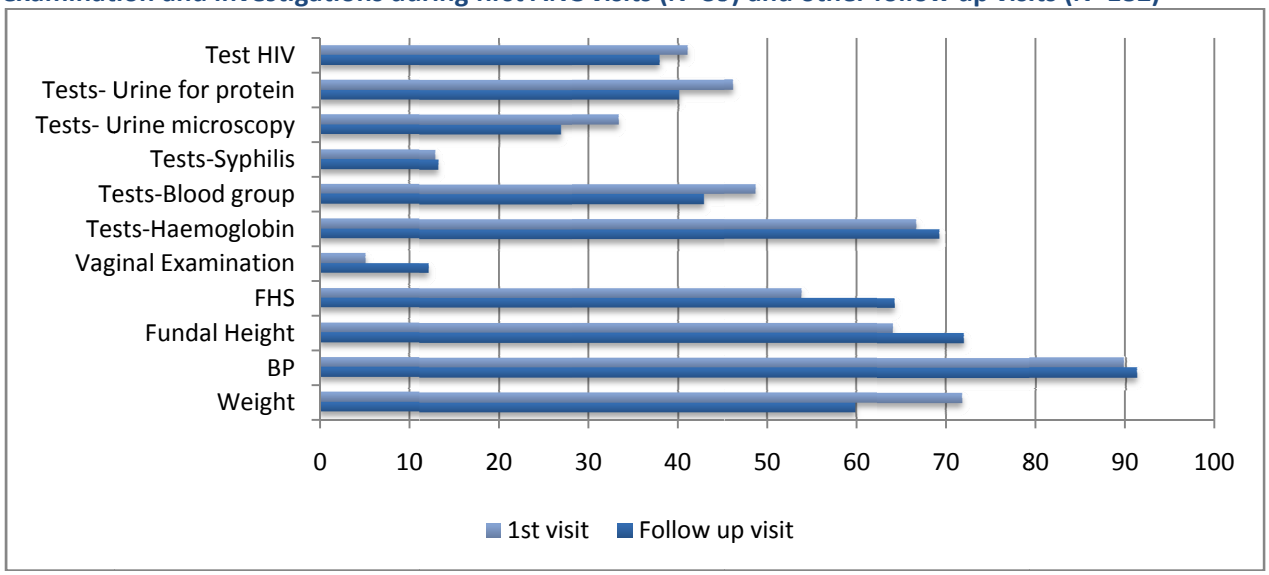
Data source: Service Provider Assessment data

Direct observations: Physical examination and investigations

There are only very minor differences in service provision between first and subsequent antenatal visits. Measurement of weight, height, advice for blood group and haemoglobin are all required at the first visit, and levels of provision were adequate but could still be improved further. Measurement of BP is good at 90% on first visit and 91% on subsequent visits (Figure 5.1.4.b).

[41] MOHFW: Maternal Health Division, GOI, 2005. Guidelines for Antenatal Care and SBA by ANMs and LHVs, New Delhi.

Figure 5.1.4.b: Direct Observation ANC: Percent of providers who conducted components of physical examination and investigations during first ANC visits (N=39) and other follow up visits (N=182)

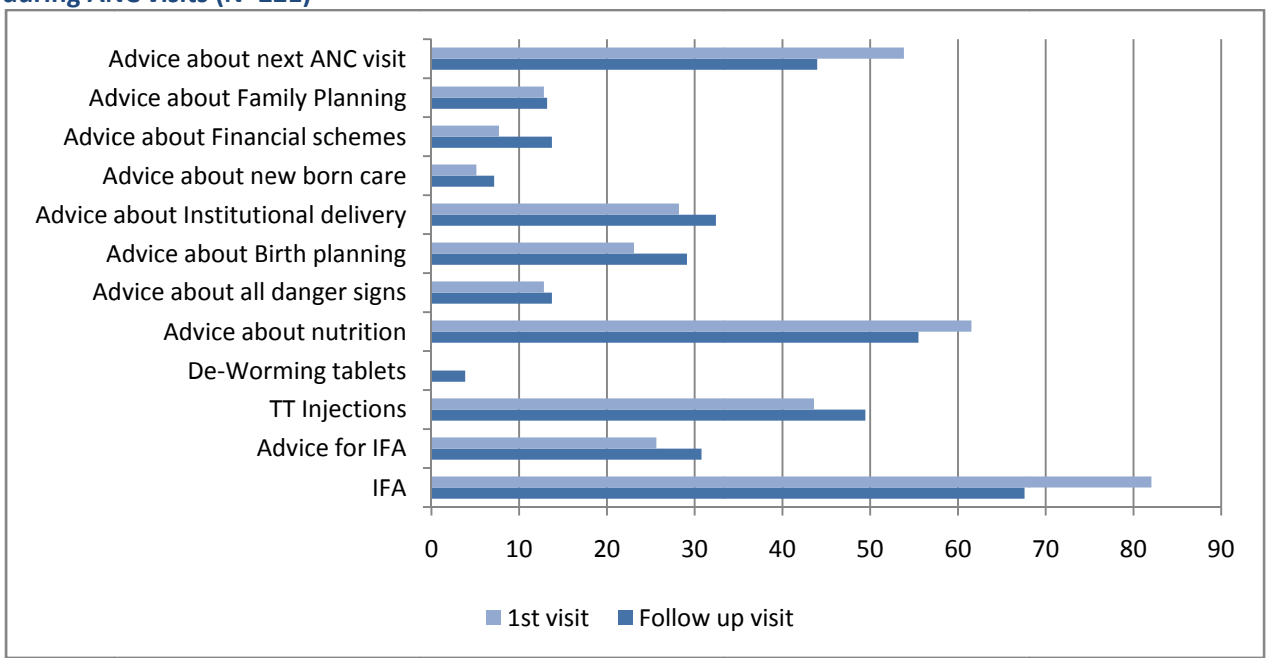


Data source: Service Provider Assessment data

Medications and counselling

Counselling for newborn care and danger signs during pregnancy, essential at the first visit, was low. Counselling for birth planning, family planning or financial schemes was also inadequate (Figure 5.1.4.c).

Figure 5.1.4.c: Direct Observation ANC: Percent of providers who gave medication and counselling during ANC visits (N=221)



Data source: Service Provider Assessment data

ANC services at different facilities

All facility types showed similar patterns in terms of partiality of care provided. History taking was similar, except lower at PHCs for a number of domains. Specific components of history taking are as follows; asking about LMP (26% PHCs vs 41% higher facilities); calculating EDD and informing (12.6% PHCs vs 34% higher facilities); asking about danger signs (37% PHCs vs 48% higher facilities); fever (29% PHCs vs 40% higher facilities); headache (25%PHCs vs 33% higher facilities) and blurred vision (13.8% PHCs vs 38.6% higher facilities) (see table 10, appendix).

Physical exams were also similar across facilities with the exception that private providers were more likely to weigh pregnant women.

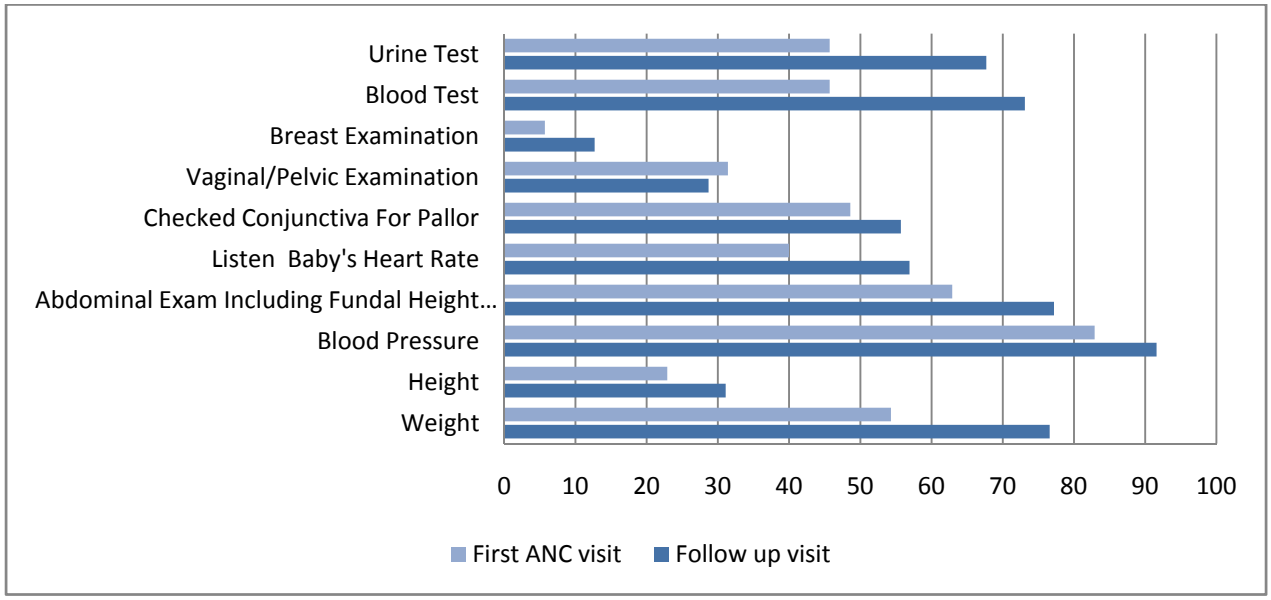
CHCs and private facilities consistently offered more lab investigations than PHCs. For example- haemoglobin testing was performed in 56% of PHCs vs. 69% of higher facilities; blood group testing was performed in 28% of PHCs vs. 48% of higher facilities; urine for microscopy and syphilis was performed in 1% of PHCs vs. 21.3% of higher facilities and HIV testing was performed in 23% of PHCs vs. 48% of higher facilities (see table 10, appendix).

In accordance with DLHS 2007-8 data, providers were not observed taking an active role in encouraging birth planning for an institutional delivery. Counselling on danger signs was inadequate in most observations, with PHC providers rarely counselling about symptoms of eclampsia. Counselling among private providers was marginally better but still lacking. Private providers were more likely to advise about the next ANC visit. This lack of advice provision among public providers might contribute to women not completing the recommended four ANC visits (see table 10, appendix).

Client perspectives: women receiving ANC care

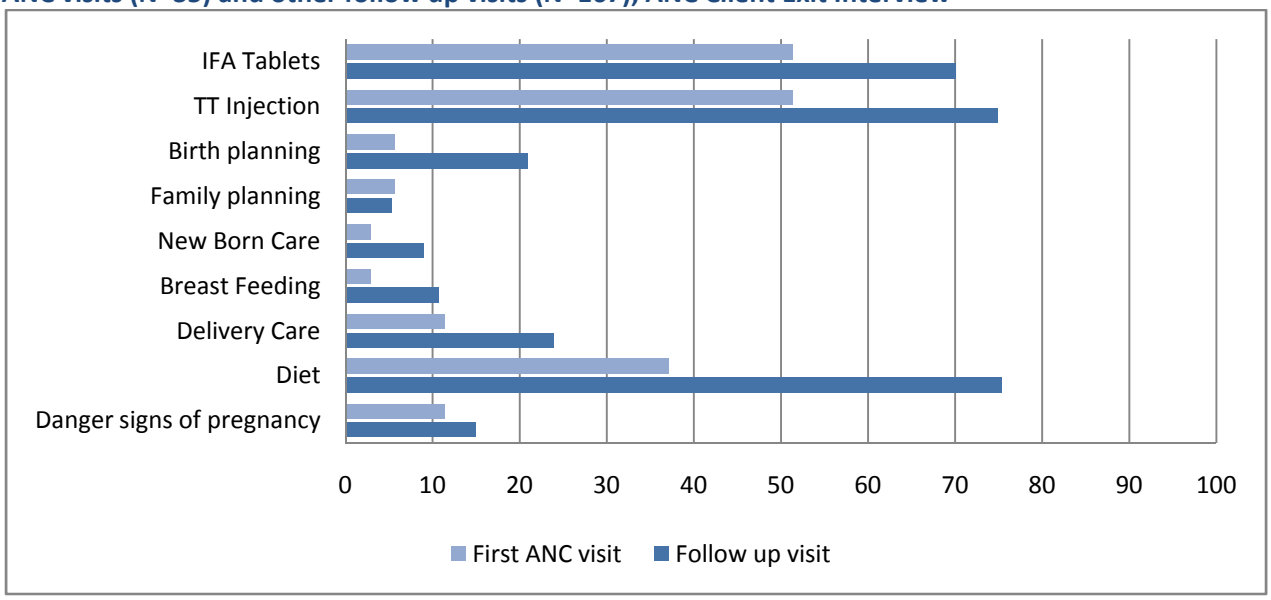
Pregnant women who had just visited the facility for an ANC visit were interviewed about their experience; 35 of the clients were interviewed after their first visit, while 167 were interviewed after follow up visits, including the 4 clients who could not articulate the number of the ANC visits to the facility. Findings from this assessment further confirmed that providers are not delivering adequate counselling about danger signs, birth preparedness and are not performing the required examinations during ANC visits (Figure 5.1.4.d & Figure 5.1.4.e). Gaps were reported in the measurement of height, breast examination at the first visits. Clients were not counselled adequately at their first ANC visit and counselling for danger signs is poor at any visit (table 11, appendix).

Figure 5.1.4.d: Percent of providers delivering all components of physical examination and investigations in first ANC visit (N=35) and follow up visits (N=167) according to ANC Client Exit Interview



Data source: Service Provider Assessment data

Figure 5.1.4.e: Percent of providers delivering all components of counselling and prescriptions in first ANC visits (N=35) and other follow up visits (N=167), ANC Client Exit Interview



Data source: Service Provider Assessment data

At all facility types provision of service components, including examination, tests and prescribing medications, was consistently below 40%, with counselling components especially danger signs and birth planning ,being particularly low. Service provision was reported to be slightly better at PHCs than higher facilities or private hospitals (see table 5.1.4.b).

Table 5.1.4.b: Percent of providers providing all components of antenatal care, ANC Client Exit Interview

ANC care	PHCs (n=90)	CHCs and higher facility (n= 64)	Private hospitals (n=48)
Focussed physical examination and tests			
Checked weight	33.66	18.8	20.29
Checked blood pressure	41.58	26.73	21.78
Performed abdominal exam	35.14	21.28	18.31
Listened to baby's heart rate	24.75	16.33	12.87
Performed vaginal exam	10.89	9.4	8.91
Conducted blood test	24.25	25.74	18.31
Conducted urine test	27.22	19.80	16.83
Counselling			
Counselled on signs of complications in pregnancy	9.4	2.5	2.5
Counselled on diet	29.70	19.80	19.30
Counselled on delivery care	10.39	5.9	5.44
Counselled on breast feeding	2.9	3.9	2.47
Counselled on newborn care	2.4	3.4	1.9
Counselled on family planning	2.4	1.4	0.9
Counselled on birth plan	9.4	5.4	3.4
Medicines given/prescribed			
Prescribed TT	30.69	21.78	18.31
Prescribed IFA	30.19	20.79	15.84

Data source: Service Provider Assessment data

Client satisfaction

The client exit interviews also assessed pregnant women's satisfaction with their encounter. Findings indicate that 70% of pregnant women were satisfied with the providers' personal manner and technical skills, slightly better at the private facilities. The waiting time was longer at the CHCs and higher facilities (see table 11, appendices).

Documentation

Audits of clinical records provided information both on the quality of documentation which is important for continuity of care and referrals as well as insights into whether providers were following recommended care protocols.

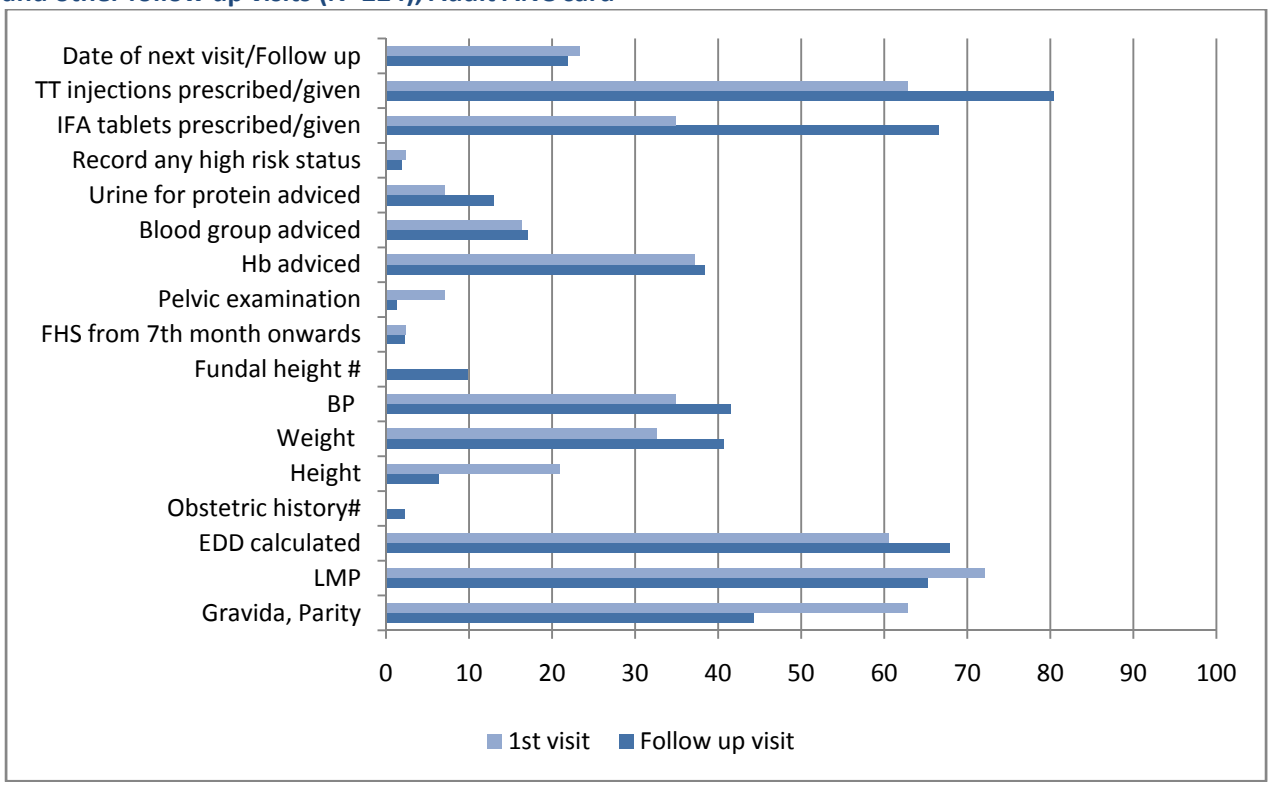
ANC card audits

The audit of ANC records including cards (*thayi* card) and ANC registers, which document the visit of a pregnant woman for check up during pregnancy and the ANC services provided. There were 267 ANC records audited at PHCs and higher facilities, 43 of the 267 audited for a first ANC visit and 119 were for other follow up visits. 106 records especially those from the registers did not record the number of the ANC visit. These have been included in the follow up visits for analysis (N=224) (Figure 5.1.4.f.)

Though recording of history of the pregnant woman- gravida, parity and LMP, physical examination as height measurement was better on first visits, the documentation was not adequate. De worming tablets were prescribed in less than 1% cards, though it is an important intervention in treatment and

prevention of anaemia. Record of BP, weight, tests advised and high risk noted, if any, was poor in all cards audited (Figure 5.1.4.f).

Figure 5.1.4.f: Percent of records with components on antenatal care recorded in first visits (N=43) and other follow up visits (N=224), Audit ANC card



Data source: Service Provider Assessment data
 # : parameters not evaluated at the first visit, if it is within the first trimester of pregnancy.

Complications in Pregnancy

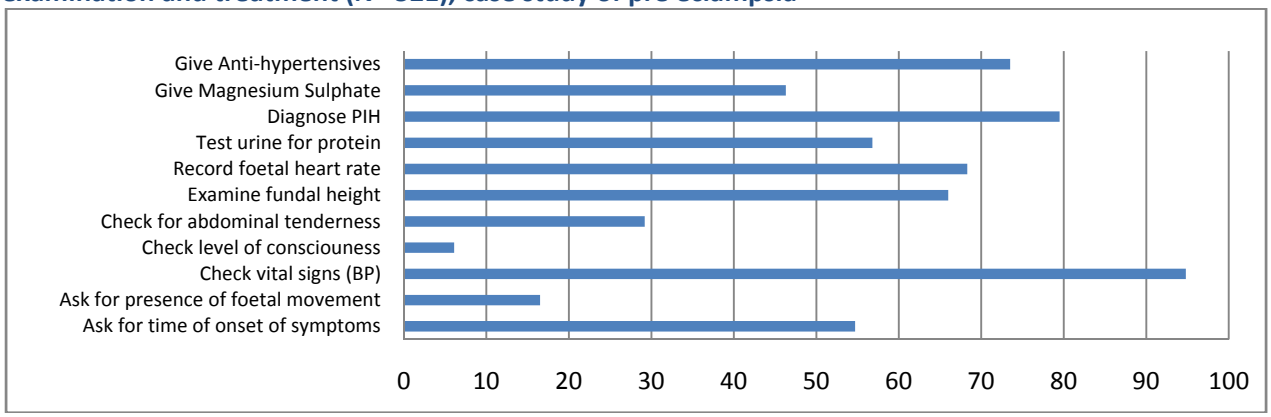
Preeclampsia and eclampsia are important complications which affect women during pregnancy and the *Sukshema* project assessed management of these cases. Prompt detection and initial management is essential at the level 1 facilities (SCs and PHCs), where the patient should be diagnosed and stabilised before referring her to BEmOC and CEmOC facilities equipped to treat such patients.[42]

Case study: Pre eclampsia

Providers from the level of PHC and above were presented with a case study about preeclampsia and were asked to answer specific questions about physical examination, diagnosis and management of the patient in the case. Gaps were seen in history taking and physical examination especially level of consciousness. Less than 50% of providers knew about the use of magnesium sulphate, a medication which is well documented to reduce morbidity and mortality from preeclampsia (Figure 5.1.4.g).

[42] MOHFW: Maternal Health Division, GOI, 2005. Guidelines for Antenatal Care and SBA by ANMs and LHVs, New Delhi.

Figure 5.1.4.g: Percent of providers who identified appropriate steps in history taking, physical examination and treatment (N= 521), case study of pre eclampsia



Data source: Service Provider Assessment data

Some variations in provider knowledge based on the case studies were observed by level of facility with providers at CHC and higher levels demonstrating marginally better levels of knowledge; however overall knowledge levels for treating these conditions could be improved. Comparing the performance between the provider cadres, knowledge of pre-eclampsia was particularly low among staff nurses (table 5.1.4.c).

Table 5.1.4.c: Percent of providers answering correctly for pre eclampsia , case study

Pre eclampsia case scenario	Obstetrician (n=89)	Medical officer (n=138)	AYUSH MO (n=37)	Staff nurse (n=248)
Asked about time of onset of symptoms	44.9	47.8	56.8	62.1
Asked about foetal movements	29.2	13	16.2	13.7
Checked BP	96.6	97.8	94.6	92.7
Checked level of consciousness	12.4	6.5	8.1	3.6
Checked fundal height	82	68	62.2	58.5
Checked FHS	85.4	65.9	67.6	38.3
Performed urine protein test	85.4	65.9	67.6	38.3
Diagnosed PIH/preeclampsia	97.8	85.5	86.5	67.7
Gave Magnesium sulphate	84.3	50.7	40.5	30.2

Data source: Provider assessments

5.1.5 Implications for Antenatal Care

Utilization

Increase interpersonal communication to convince pregnant women of the importance of accessing comprehensive antenatal care

Many women in Bellary district cite "not necessary" as a reason for not seeking antenatal care (78%) (see table 8, appendix). Interpersonal communication through domiciliary visits or presentations at community gatherings is an important medium to convey the importance of antenatal care, birth planning in culturally appropriate terms.

Improve outreach to disadvantaged populations

Coverage of comprehensive ANC care needs to increase with outreach to marginalized groups, such as the poor, scheduled castes and tribes and religious minorities. Planning for improved coverage could be aided by micro-planning and stronger coordination with ASHAs.

Access and Availability

Strengthen Sub-centres to provide comprehensive antenatal care

As sub-centres represent the first contact for a majority of the population, the *Sukshema* Project recommends strengthening SCs to provide all components of ANC services. To address the issue of pregnant women going to higher level facilities for diagnostic services, providers at the subcenter level could be trained to offer more tests and mobile testing services could be provided (see below). Providing comprehensive antenatal care at the Sub-Centre level and through community outreach programs such as Village Health and Nutrition Days coupled with a strong referral system will allow more effective follow up and continuity of care from pregnancy through postnatal care.

Mobile testing services, including ultrasounds would increase access to comprehensive care

To ensure that women can receive comprehensive antenatal care at public facilities, without undue costs, mobile health clinics have already been established under the KHSRP. Rather than being free-standing clinics, a mobile testing service could support existing facility infrastructure, ensuring women had access to care throughout the continuum of care – and especially in remote areas.

Service Provider Competencies to Offer Quality Care

The capacity of providers to offer quality ANC services needs to be strengthened

In both the public and private sector, ANC service delivery is not comprehensive and provider counselling is especially weak. This may suggest; a catchment area with a high population and inadequate staff diluting coverage, a low level of role clarity; a lack of provider competencies, incentives or time available to perform more complete ANC services. Intervention is required to improve

performance in ANC delivery; including allocation of adequate staff, refresher training, optimizing task shifting with ASHAs for outreach, supportive supervision, job aides and checklists.

Improve diagnosis and management of pre-eclampsia

The provider competency assessments demonstrated significant shortcomings in provider knowledge and ability to diagnose and treat eclampsia which accounts for an estimated 18% of maternal deaths globally.[43] Although service provider assessment data on preeclampsia shows that checking BP is typically practised; awareness knowledge and skills in recognising other signs such as foetal movements, level of consciousness and giving magnesium sulphate were low and needed to be increased. Additionally providers need to be well versed on how to manage and refer pre-eclampsia and eclampsia cases.

[43] WHO, UNICEF 2010, *Countdown to 2015 Decade Report: Taking Stock of Maternal, Newborn and Child Survival*, Geneva.

5.2 Intranatal Care

This section provides an overview of the guidelines, a description of utilization patterns including socio-cultural factors, an analysis of availability and accessibility of services, an assessment of service provider competencies, and a summary of implications for intranatal care – the period from labour to six hours post-partum.

Key points:

- The JSY scheme has caused unprecedented increases in institutional deliveries.
- For rural women who do not give birth in institutions, the reasons cited are "not necessary" and "not customary".
- Despite higher costs, there was a preference for delivery in the private sector, for perceived efficiency, more supplies, and a cleaner environment.
- Cost data demonstrates that the poor pay more for delivery services than the middle wealth tertile.
- 24x7 and non-24x7 PHCs are not equipped to provide comprehensive intranatal care, with insufficient staff with competencies to offer skilled birth attendance and insufficient equipment, drugs and supplies.
- Protocols on identification and management of delivery complications (use of partograph, AMSTL, mag sulphate for eclampsia) are not being followed. Complications are generally referred up, creating inefficiencies.
- A large number of normal deliveries are occurring at higher level facilities, creating system inefficiencies.
- Except the district hospital and few Taluk Hospital, no facilities are able to offer comprehensive CEmONC care

5.2.1 Guidelines for Intranatal Care

Intranatal services, including delivery and the post partum period (six hours post-delivery), are described according to three different levels of care, depicted in the table below (5.2.1.a), as per the *Operational Guidelines on Maternal and Newborn Health*. The Government of Karnataka policy is to encourage delivery at 24/7 PHCs with referral systems for higher level care as needed.

Table 5.2.1.a: The three levels of delivery care

Level 1: SBA Level	Level 2: Basic Emergency Obstetric Care	Level 3: Comprehensive Emergency Obstetric Care

• Delivery by SBAs (SC, PHCs not scheduled as BMeOC sites and home deliveries conducted by SBA
• Normal delivery with partograph
• AMTSL
• Infection Prevention
• Identification and referral of danger signs
• Pre-referral management for obstetric emergencies
• Assured referral linkages with higher facilities
	• Designated BEmOC centres, CHCs
	• All in level 1+ availability of the following services around the clock:
	  • Episiotomy/ suturing cervical tear
	  • Assisted vaginal deliveries
	  • Stabilization of patients with obstetric emergencies
	  • Referral linkages with higher facilities
		• All in Level 2 + availability of the following services around the clock:
		• Management of obstructed labour
		• Surgical interventions (eg. c-sections)
		• Comprehensive management of all obstetric emergencies
		• In house blood bank storage
		• Referral linkages with higher facilities such as medical colleges

5.2.2 Utilization of Intranatal Care

Location of delivery

Delivery with a skilled attendant is essential in preventing and managing complications of delivery and decreasing maternal mortality and morbidity. Additionally, NRHM and the Government of Karnataka policy promotes facility based births. For this reason, it is important to examine the location of delivery.

For institutional deliveries, the disparities between district and the state are important to note. According to DLHS 2007-8 data, the rate of deliveries in public facilities is much lower in Bellary district (23%) than at the state level (33%). The rate of deliveries in private facilities in the district (23%) is less than the rate at the state level (32%). With low rates of institutional deliveries, the district has a high rate of home births at 54% compared to 34% at the state level (table 12, appendix).

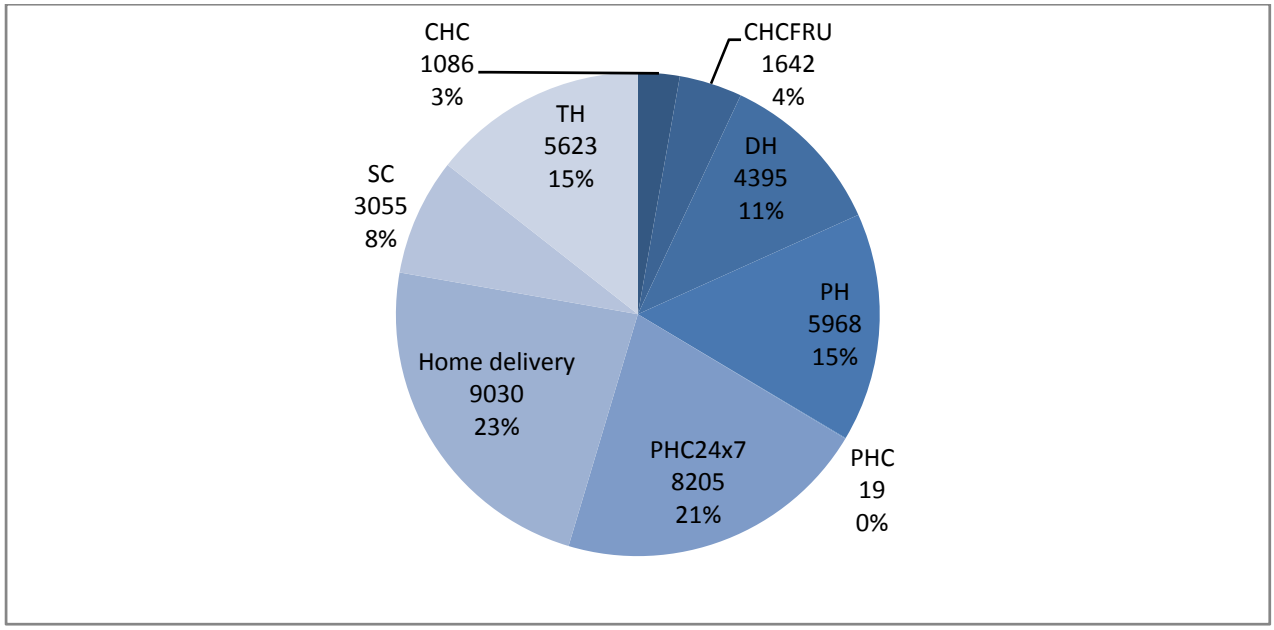
However, the 2007-8 DLHS data used for analysis here does not capture the major gains made in increasing the percent of facility based births since the introduction of the ASHAs, the 108 Ambulance services or the JSY scheme, so should be regarded with some caution. More recent UNICEF CES 2009 data records 86% of deliveries in Karnataka occurring in institutions[44], and the 2009 Concurrent Evaluation of the NRHM records 66% of deliveries in Karnataka occurring in institutions.[45] The reason for the variation in these state level data sources is not clear.

[44] GoI, MOHFW, 2009. Coverage Evaluation Survey: Karnataka Fact Sheet. New Delhi.
[45] International Institute for Populaiton Sciences (IIPS), 2010. Concurrent evaluation of the National Rural Health Mission (NRHM): Fact Sheet: States and Union Territories. Mumbai.

This data varies from the mapping of service statistics, which registers all pregnancies and attempts to record the location of all births. This data records 23% of births occurring at home, and 15% occurring in the private sector, leaving 62% of births occurring in the public sector (77% in institutions). According to the service statistics only 8% of recorded births occur at the SCs level, and the average load of delivery per SC during 2009-10 was 10 per year, but most have no deliveries. Most public sector deliveries occur at the 24/7 PHCs (21%) and at the THs (15%). Overall, service statistics record 33% of births occurring at CHCs, THs and the DH – representing an inefficiency – a high proportion of births are occurring at high level facilities which should be dedicated to treating complications rather than normal births (see figure 5.2.2.a).

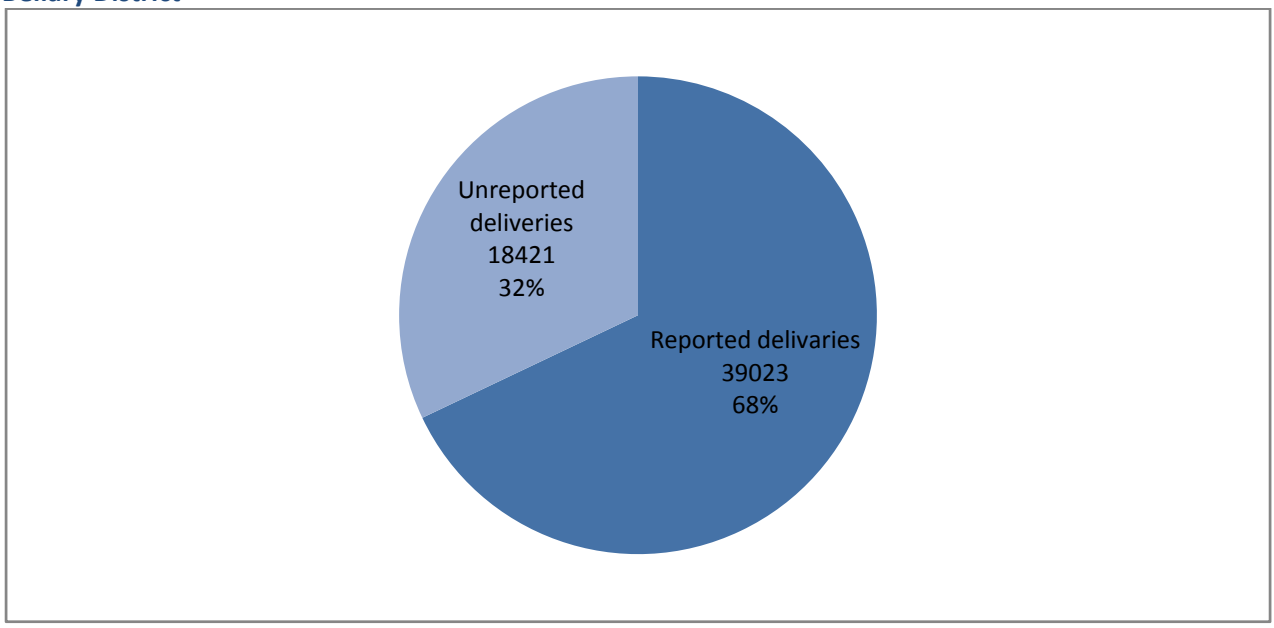
However, in the service statistics many pregnancies are lost to follow up. If we use a projection of the expected number of births as the denominator (see methodology for how this is calculated), we find that 32% of births are not accounted for in HMIS records (see figure 5.2.2.b). The differences in the data sources are not surprising. The percent of home births is lower in the recent service statistics than in the 2007-8 DLHS (23% vs. 54%) possibly reflecting both loss to follow up and the effects of recent NRHM interventions.

Figure 5.2.2.a: Distribution of reported delivery, by facility type Bellary District



Data Source: Facility based data, captured in mapping

Figure 5.2.2.b: Expected number of deliveries (n= 57 444) and reported and unreported deliveries, Bellary District



Data source: Facility data, captured in mapping data

Deliveries in the public and private sectors

From the qualitative assessments, many respondents indicated that if they had the means they would choose private over government facilities. Respondents reported that the quality of care and the facilities themselves was superior at private versus government hospitals. Private hospitals acted more quickly and efficiently, gave "proper" treatments, provided a neat and clean environment, had supplies like water and demonstrated care.

The decision to go a private hospital for delivery was often made by people other than the pregnant woman (grandmothers, husbands, etc.). These decisions seemed to be based on past experience with a hospital (sometimes not related to prenatal care or delivery but to visits and care for other types of conditions), or a preference to receive care from a particular doctor. While some respondents had directly experienced both settings, others had heard negative things about government hospitals and feared going. Moreover, private hospitals were chosen when there was a history of delivery or pregnancy complications, due to perceived superior quality of care.

Finances seem to be both a push and pull factor in delivering in a government facility, in terms of the lower cost and the incentive payments. Respondents in the qualitative assessment who delivered in a government institution indicated that although they may have preferred to go to a private hospital, they could not afford it. Respondents also indicated that they were aware of incentives and wanted to avail of them.

Negative comments about government hospitals included lack of basic facilities (e.g., toilet, water) and dirty conditions, for example bed covers not being changed or cleaned between patients. Some respondents discussed the poor treatment provided at government hospitals, with little care and long waiting periods. For example, medical personnel at some government hospitals were reported to be

abusive during delivery and would scold and hit women if they felt she was not working hard enough to deliver the baby. There was a fear that any complaint of pain would result in a c-section at a government hospital, and a subsequent fear of mortality from c-sections.

As well as resource considerations, those that chose to deliver in a government hospital over a home setting did so to ensure a faster delivery (shorter labour) as there is typically an injection provided at the these hospitals. It should be noted that not all negative comments were based on first-hand experience – many were based on stories heard from others.

Understandings of a safe delivery

From the qualitative interviews, there was a good understanding of what constitutes a safe delivery as well as delivery danger signs. Generally, deliveries that occur in the home were called "normal" deliveries. Vaginal deliveries were desired over c-sections. For the most part, caesarian sections were done when complications arose (e.g. the baby's head is obstructed or labour is slow). However, there was a general sense of fear from respondents that going to the hospital meant having a caesarian section.

Key People Who Influence Decision Making for Institutional Deliveries

According to DLHS 2007-8 for Bellary district, personnel within the formal health care system have little influence on women's decision whether to give birth in an institution, compared to her family and social network (table 17, appendix). Of all the people considered influential, the highest was the pregnant woman's relatives/friends (26%) followed by her husband (24%) and then "Mother" (21%). Of all the health professionals that are reported to have any influence, doctors are the most influential at 19%. Less than 7% of women report that community level workers (ANMs and AWWs) have influence over their decision-making. This lack of influence over location of delivery is not surprising considering that only 37% of rural women get advice about institutional deliveries during pregnancy registration (see table 6, appendix). This suggests an inadequate level of outreach by community-based workers on the issue of institutional deliveries. It should be noted that this data predates deployment of the ASHAs and the JSY scheme under the NRHM. The data also suggest that pregnant women's mothers may be an important target for information education and communication or behaviour change communication interventions.

Reasons for Not Delivering in an Institution

Again, the reasons for not seeking institutional delivery must be examined. According the DLHS 2007-8 data, urban women in Bellary district are more likely to cite "not necessary" (41%) as a reason for not seeking an institutional delivery, and rural women are more likely to cite "not necessary" (56%) and "not customary" (33%). In addition, in Bellary district many women cite "no time" as a reason (17%) and "better care offered at home (13%) as a reason; this is lower than the state or project district rates (both 19%) (table 13, appendix). In fact, the quality of home care is not bad – with 90% of home deliveries using a new blade to cut the chord, and 61% of babies immediately wiped dry and wrapped without being bathed (table 14, appendix).

From the qualitative assessment, the main reasons cited for home deliveries were convenience, comfort, and minimal expense. In most cases, knowledgeable and skilled birth attendants were available for the delivery. Respondents' indicated that when the mother was in good health and was perceived to have a low risk pregnancy (or had had previous low risk deliveries), it was safe to have the delivery at home. There was a general perception that having a delivery in a hospital (primarily government hospitals) meant having a forced caesarean section, causing people to opt for a home delivery. A few also mentioned that hospitals were too far from their home, and there was simply more support and encouragement provided when delivering at home.

- "If the delivery is at home, it is best. At home, neighbours or family members will take good care. There in the hospital, if the delivery is simple, there will not be a problem, otherwise, nurses will become angry and scold and give too much problems, because of this for deliveries which have complications, we take to the hospital. Otherwise, if it is a normal delivery, there is no need to go to the hospital. For some people who have had a risky first delivery and had a caesarean, they will as a precaution go to the hospital. They should not have complications in future. I never had any problems with any of my deliveries, they were normal, so I never went to the hospital" (New mom, Bagalkot).

Delivery Complications

As with pregnancy complications, the rate of women aged 15-44 self reporting delivery complications in Bellary district (56%) is higher than the project districts' rate (43%) and state levels (44%). Reported delivery complications are lower for disadvantaged groups; this may reflect a bias in that more advantaged groups are better able to identify a complication. These rates are higher than those recorded in service statistics (captured in the mapping data), which record 80% of deliveries as normal (20% delivery complications) – with the key difference being that service statistics are captured for the care seeking population, and are recorded by health providers.

Disparities in reported *post* delivery complications follow more predictable patterns, with disadvantaged groups experiencing higher rates of complications, though disparities are small (for example, 33% of rural women report complications compared to 29% of urban women). Disparities in care seeking for post delivery complications follow similar patterns; the highest disparity is between poor (80%) and non-poor (66%) populations. All these rates are much higher than the Karnataka 2009-10 HMIS data which records only 6.2% of deliveries having any obstetric complications, possibly reflecting a data quality issue in the self reporting of DLHS 2007-8 data, or under reporting in the HMIS.

Cost of deliveries

According to both exit interviews and the community survey (see tables 5.1.2.c and 5.2.2.c), expenditure on delivery is lower for BPL card holders than non BPL card holders. More surprisingly, and consistent across the two data sources, expenditure is lowest for the medium third, and highest for the poorest third, for example in the community survey the poorest third pay 2250 and the middle third pay 1775 (table 5.2.2.c). However the samples for the exit survey and the community survey were not directly comparable; in the community survey 60% of women delivered in a private hospital, and in the exit surveys only 29% had done so. Additionally, in the community survey there was strong likelihood of recall bias, with a high level of non-response.

As mentioned earlier, while the costs of delivery are high, according to exit interview data, they are not as high as the ANC expenses, which includes the cost of scans (5.1.2.c).

Table 5.2.2.c: Median expenses of delivery and post-partum care, community survey

Respondent sub-groups	Median hospital expenses	Median other expenses (travel, food)
All Respondents (n=96*,)	3000	500
Wealth status		
Poorest (n=32)	2250	400
Poor (n=36)	1775	600
Least poor (n=26)	3525	450
BPL Card Holder (n=55)	2000	400
Non-BPL Card Holder (n=41)	3000	575

Data source: Community Survey

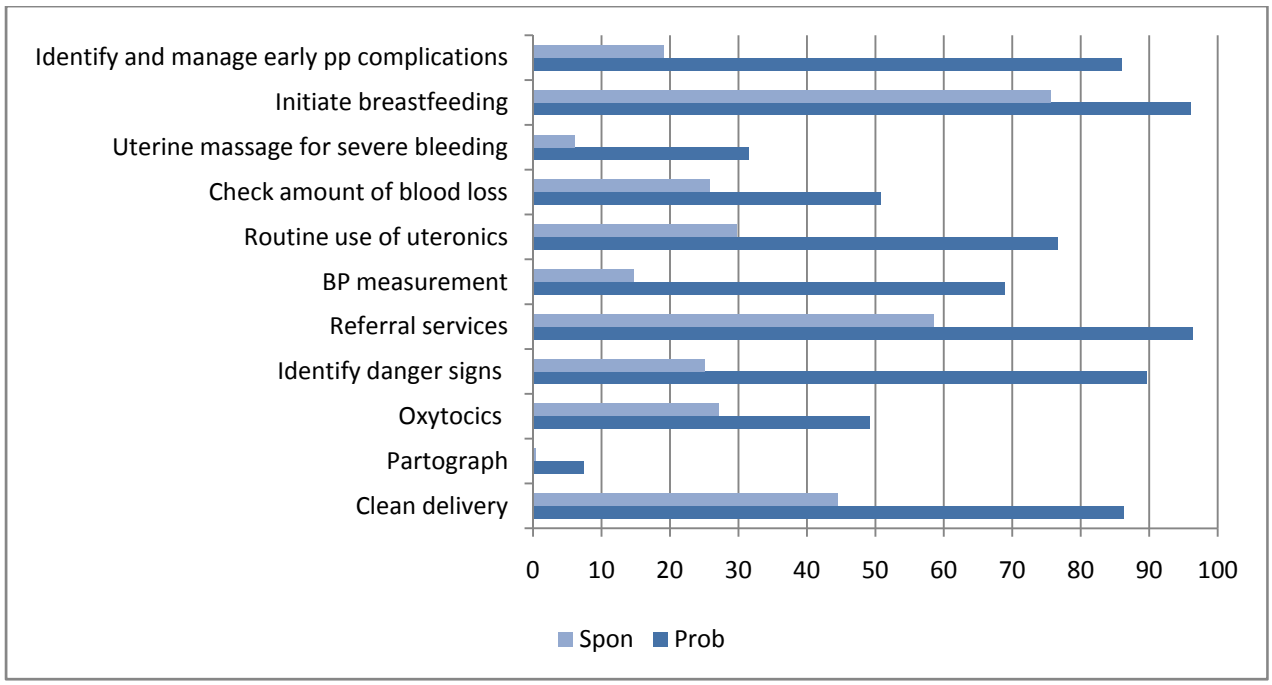
5.2.3 Accessibility and Availability of Intranatal Care

Level 1 Intranatal Care – SBA Level

As so few reported births occur at the SC level (8%) and current state policy is to encourage institutional births at PHC level or higher, this analysis of Level 1 services focuses on the PHC level. Sub-centre information is included to illustrate the extent to which SCs can accommodate unplanned deliveries or support deliveries at home. We asked ANMs in sub-centres and MOs at PHCs which services are routinely offered at their facility. None of the providers at SCs listed all elements of delivery and postpartum care as available at the facility, with only 44% listing clean delivery (Figure 5.2.3.a). The key gap is in the use of the partograph for identifying obstructed labour ,uterine massage for severe bleeding, blood pressure measurement and use of oxytocics for active management of the third stage of labour to prevent post-partum haemorrhage.

Provision of immediate postpartum care is weak with less than 5% of SCs and PHCs providing all the components (Figure 5.2.3.a & 5.2.3.b). Key gaps are in identification and management of early PP complications, estimating blood loss, providing uterine massage for severe bleeding and routine use of uterotonics. Considering that the leading cause of maternal mortality is post partum haemorrhage[46], these gaps are critical.

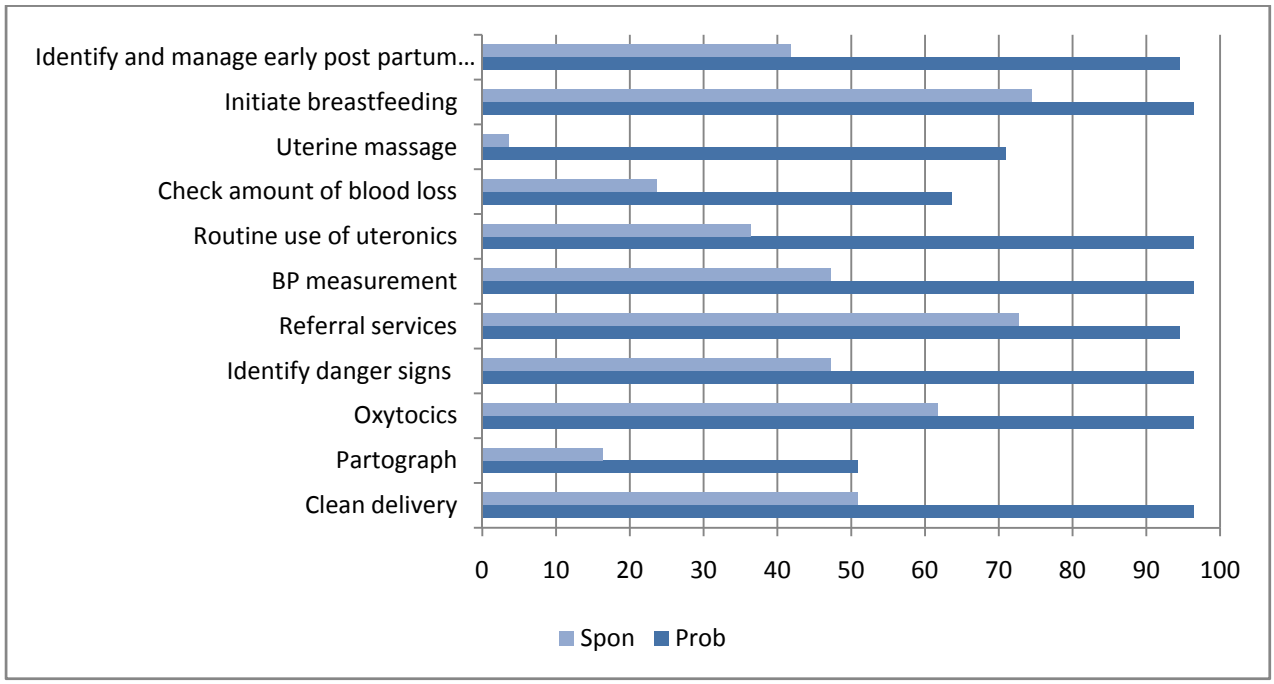
Figure 5.2.3.a: Percentage of all SCs (n=299) reporting the availability of Level 1 delivery and postpartum services, Bellary, including both spontaneous and probed responses.



Data source: Mapping data

[46] WHO, UNICEF 2010, *Countdown to 2015 Decade Report: Taking Stock of Maternal, Newborn and Child Survival*, Geneva.

Figure 5.2.3.b: Percentage of all PHCs (n=55) reporting the availability of Level 1 delivery and post partum services, Bellary, including both spontaneous and probed responses.



Data source: Mapping data

Staffing for Level 1 Intranatal care

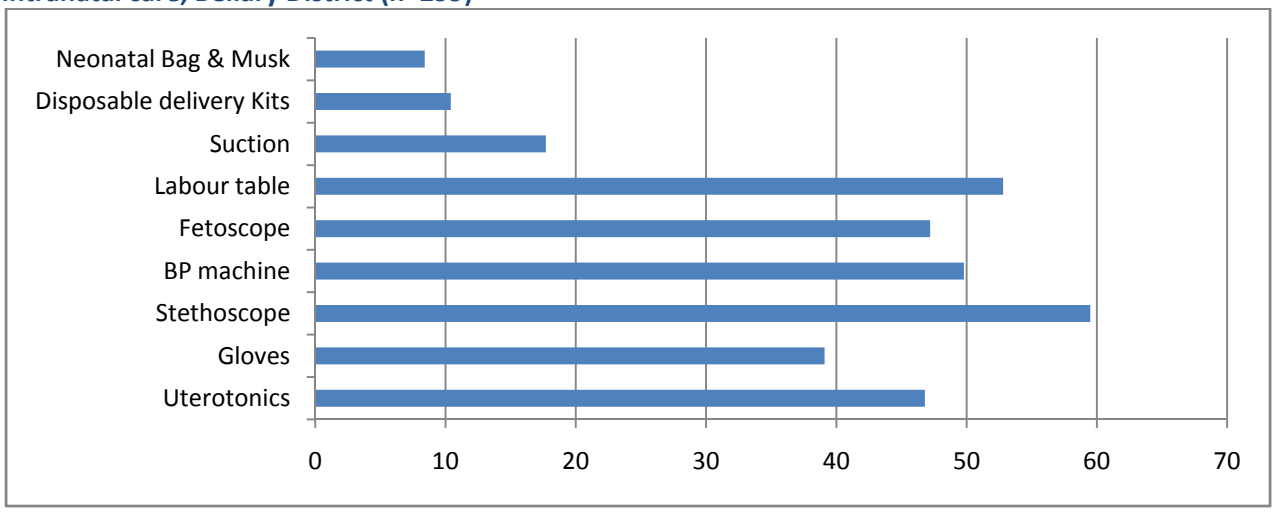
The *Sukshema* Project suggests that all 24/7 PHCs not designated as BEmONC centres should provide level 1 delivery services, while still adhering to the guidelines for 24/7 PHCs. As mentioned in the service delivery framework section, each 24/7 PHC should have 2 medical officers and 3 staff nurses or ANMs available for maternal and newborn health services. All these providers should have received training in skilled birth assistance (SBA), however only 63% of SNs in the project districts have SBA training (see Human Resources and Training section). In Bellary district, of the 52 PHCs, 19 PHCs have no allopathic medical officer, 5 have no medical officers and two have no staff nurses. Of the PHCs with no allopathic doctor, 14 have AYUSH doctors (table 5.2.3.b). AYUSH doctors typically do not have preservice SBA training, and are not involved in all maternal and newborn care services. For many of the PHCs in Bellary, the staffing is insufficient to offer level 1 care especially on a 24/7 basis.

Equipment and Drugs for Level 1 Intranatal care

The availability of safe delivery equipment at SCs and PHCs (non 24/7 PHCs and 24/7 PHCs) is depicted in figures 5.2.3.c and 5.2.3.d. Supply of sterilizer/autoclave at PHCs is low, and availability of neonatal bag and mask, disposable delivery kits and suction at the SCs is similarly low.

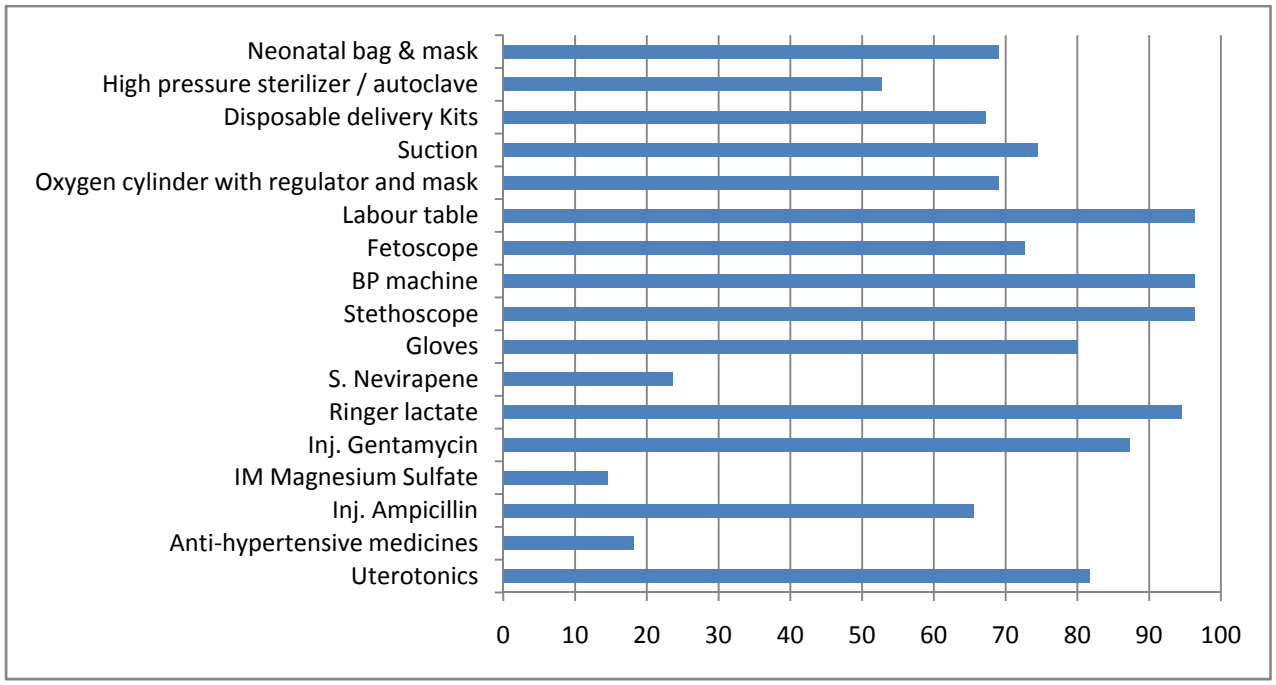
In terms of drugs, SCs are not well supplied to provide Level 1 services. PHCs fare little better, with no PHCs having the full supply of drugs required. Key gaps include antihypertensives, magnesium sulfate and nevirapine.

Figure 5.2.3.c: Percent of SCs reporting availability of equipment and drugs necessary for Level 1 intranatal care, Bellary District (n=299)



Data source: Mapping data

Table 5.2.3.d: Drugs and equipment for Level 1 intranatal care at 24x7 and non 24/7 PHCs (n=55)



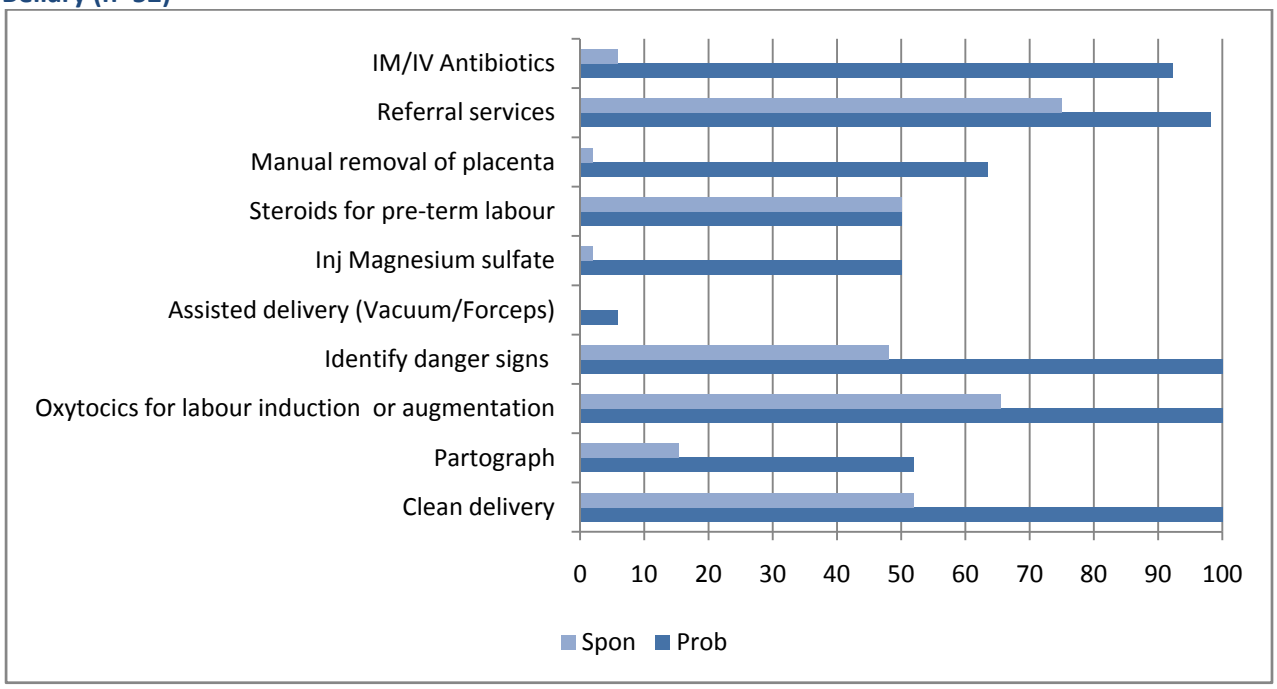
Data source: Mapping data

Level 2 Intranatal care – Institutional Basic Obstetric and Neonatal Care (BEmONC)

BEmONC services are offered at designated 24/7 PHCs and non-FRU CHCs (see figure 5.2.3.e). However, utilization data indicate that patients typically access BEmONC at higher level facilities because they are better staffed and better equipped (see table 11, appendix). The UNFPA recommends there be one BEmONC centre for every 100,000 people, which means there should be about 25 in Bellary district (based on projected population figures). For all other 24/7 PHCs that are not scheduled as BEmONC centres, the *Sukshema* project suggests they provide level one skilled deliveries. Despite the fact that there are 52 24/7 PHCs and 5 non FRU CHCs, none of these facilities meet the requirements of a BEMONC centre. Not all of these facilities need to be designated as BEmONC, prioritization is required to ensure appropriate population coverage.

None of the respondents at 24/7 PHC or CHC facilities listed all the components of basic emergency obstetric services (BEmONC) as being routinely offered at their facility, suggesting low availability; none of PHCs routinely provide assisted deliveries; only 2% of 24/7 PHCs routinely provide manual removal of the placenta; 2% give magnesium sulphate injections for eclampsia, and 6% provide IM/IV antibiotics. At the three non FRU CHC facilities in Bellary district, in spontaneous responses none of them provide assisted delivery services (spontaneous and probed).

Figure 5.2.3.e: Percent of 24x7 PHCs where components of BEmONC services are routinely available, Bellary (n=52)



Data source: Mapping data

Staffing for Level 2 Intranatal Care (BEmONC Services)

Of the 52 24x7 PHCs, 19 have no allopathic MOs and 14 have only an AYUSH provider who typically does not perform deliveries or BEmONC services. The ability of these facilities to offer Level 2 care then depends on the staff nurses. However, only 7% of SNs in the project districts have BEmONC training, and only 12% of MOs do (see *Human Resource and Training* section). Staffing is adequate, 47 of the 52 24x7 PHCs have 3 or more SNs, the recommended staffing required to provide 24/7 care. However, attention needs to be given to the other 5 PHCs to ensure they have the recommended staff to ensure adequate BEmONC care. Staffing is also described in the *Service delivery framework* section.

Table 5.2.3.b: Distribution of 24x7 PHCs (n=52) and non FRU CHCs (n=3) according to the availability of MOs and SNs, Bellary District

	Medical Officers by type				**Staff Nurses by type**				**Total**
	Both allopathic and AYUSH	Only allopathic	Only AYUSH	None	Both regular and contractual	Only regular	Only contractual	None	
PHC	11	22	14	5	6	1	43	2	52
CHC	0	3	0	0	3	0	0	0	3
	Allopathic Medical Officers (numbers)				Staff Nurses (numbers)				Total
	0	1	2		0	1	2	3+	
PHC	19	30	3		2	3	3	47	52
CHC	0	1	2		0	0	3	3	3

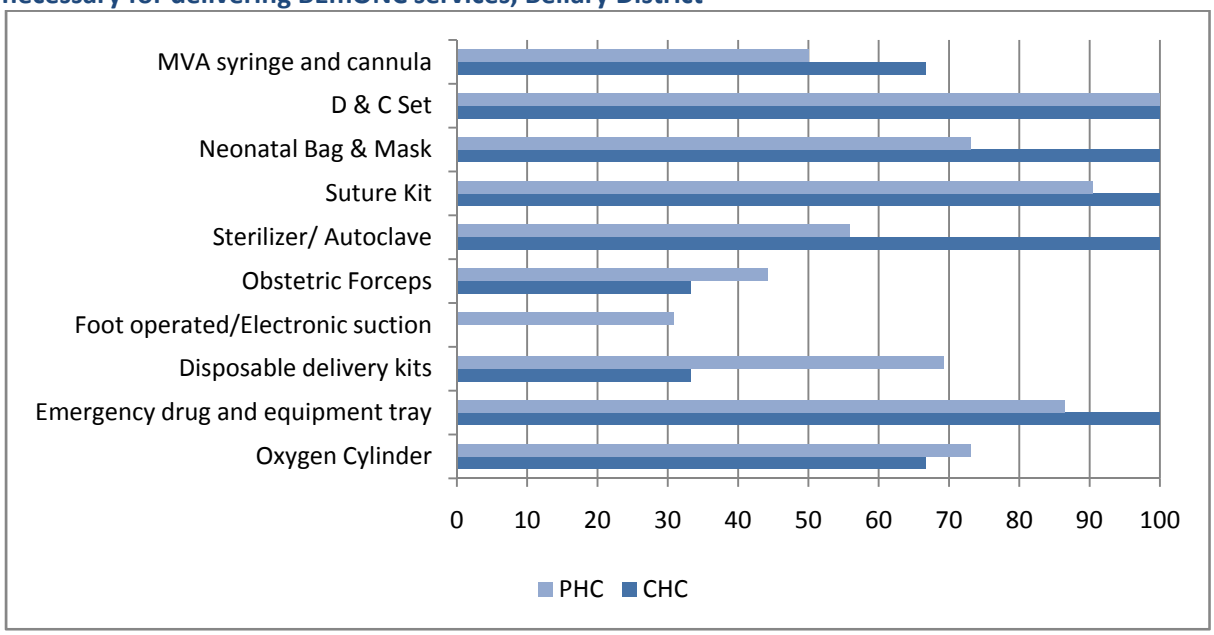
Data source: Mapping data

Drugs and Equipment for Level 2 Intranatal care (BEmONC)

Only 30% of the 24x7 PHCs and none of the CHCs have all the required equipment for BEmONC (Figure 5.2.3.f). Key gaps are availability of obstetric forceps and vacuum suction sets.

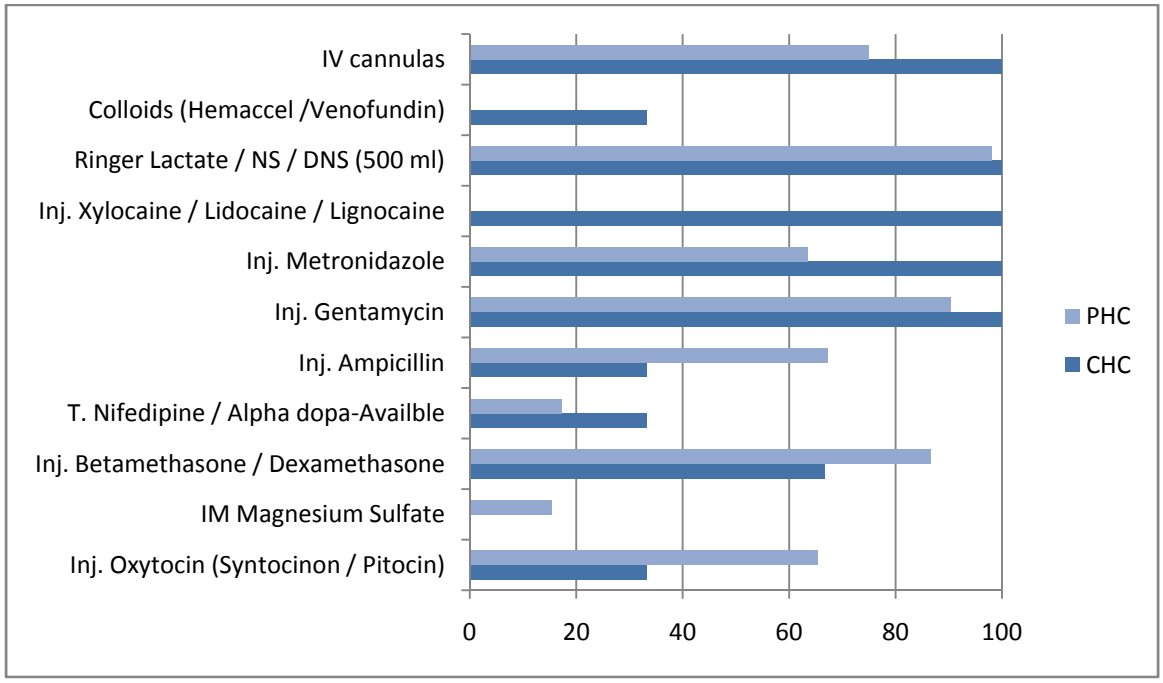
None of the 24x7 PHCs or non-FRU CHC have all necessary drugs for BEmONC available (figure 5.2.3.g). The biggest gap is in the availability of colloids - necessary for treating hemorrhage and sepsis - and magnesium sulphate – a necessary and low-cost drug for treating pre-eclampsia and eclampsia. Again, the inadequate availability of supplies cannot account for the shortfalls in service delivery. Obstetric forceps and vacuum cup and suction apparatus are available in 44% and 30% of PHCs, which doesn't account for the fact that none of these provide delivery assistance.

Figure 5.2.3.f: Percent of 24x7 PHCs (n=52) and non FRU CHCs (n=3) that have specific equipment necessary for delivering BEmONC services, Bellary District



Data source: Mapping data

Figure 5.2.3.g: Percent of 24x7 PHCs (n=52) and non-FRU CHCs (n=5) by the availability of drugs necessary to provide BEmONC services, Bellary District



Data source: Mapping data

Level 3 Intranatal Care Institutional Comprehensive Level (CEmONC)

UNFPA guidelines recommend one CEmONC centre per 500,000 people. Sites for CEmONC centres would ideally be based on population density; infrastructure and geographic distribution.

Service Availability for CEmONC

Higher level facilities including 6 THs and 1 DH conduct C-sections.[47] The total number of c-sections carried out in these centres was 4468 during 2009-10 (11% of all deliveries). In addition, 37% of the private facilities mapped provide c-sections. However, the availability of services routinely offered for comprehensive emergency obstetric care at FRUs and Taluka Hospitals is inadequate, no CHC/ FRU or private facility has included all components of CEmONC in the list of delivery services provided at the facility (table 5.2.3.c). Only the district hospital routinely provides all service components required for CEmONC care.

[47]These facilities have reported C-section during the year 2009-10. However, when asked about the different delivery services offered at the facility, only 2 each of the CHCs and THs listed C-section, unprobed, .most listed it when probed.

Table 5.2.3.c : Number of CHCs, THs and the DH providing components of Level 3 Intranatal Care (CEmONC services), Bellary

	CHC (n=5)		TH (n=6)		DH (n=1)	Pvt Hosp(n=74)	
	Spon	Probed	Spon	Probed	Spon + Probed	Spon	Probed
Delivery							
Clean delivery	3	5	2	6	1	20	43
Partograph use	0	3	0	3	1	5	29
Oxytocics for labour induction or augmentation	1	5	3	6	1	29	44
Identification of danger signs	3	5	3	6	1	25	44
Assisted delivery (Vacuum/Forceps)	0	2	1	4	1	4	43
Manual removal of placenta	1	4	0	4	1	3	43
Inj Magnesium sulfate	0	4	0	6	1	3	43
Steroids for pre-term labour	0	3	0	4	1	3	44
IM/IV Antibiotics	2	5	1	4	1	12	46
Blood transfusion	0	1	0	4	1	7	39
Caesarean Section	0	0	1	5	1	4	41
Referral services	3	5	1	6	1	19	45
Post partum care							
Blood pressure measurement	4	5	3	6	1	40	49
Check amount of blood loss	1	5	3	6	1	13	42
Uterine massage for severe bleeding	0	3	1	6	1	2	38
Routine use of Uteronics (Methergin/ Oxytocin/Misoprostol)	3	5	3	6	1	27	44
Initiate Breastfeeding	4	5	6	6	1	31	44
Identify and manage early post partum complications	3	5	2	6	1	18	44
Referral services for mothers	2	5	1	6	1	21	44
Family planning counseling	0	5	2	5	1	15	45
Counseling on infant immunization	3	5	3	6	1	19	43
Drying & Warmth/Kangaroo Care	1	5	1	5	1	37	46
Clean cord care	1	5	1	5	1	16	46
Oral Suction	1	5	1	5	1	23	45
Oral polio +BCG vaccine	4	5	1	5	1	28	37
Weigh baby	2	5	1	5	1	30	47
Identify neonatal danger signs	3	5	1	5	1	18	47
Referral services for neonates	3	5	0	4	1	19	46

Data source: Mapping data

Staffing for CEmONC

For the provision of CEmONC, a number of medical specialists are required. The *Operational Guidelines on Maternal and Newborn Health* requires the following:

- An obstetrician
- An anaesthetist
- A lab technician
- 9 staff nurses

At the time of mapping, staffing in Bellary district did not meet these criteria. Four CHCs, and 2 THs do not have an OBGYN specialist (table 5.2.3.d). none of the CHCs and 3 THs have no anaesthetist. None of the CHCs and THs have surgeons available. Currently there are 8 MOs and 12 SNs (including 8 contractual SNs) at the CHC level. A key gap is availability of OBGYN specialists, surgeons and anaesthetists.

Table 5.2.3.d: Availability of staff required for the delivery of CEmONC services in FRU CHCs, THs and Private Facilities, Bellary District

	FRU CHC (n=5)				TH (n=6)				Private Facilities (n=74)			
Staff	**0**	**1**	**2+**	**Total staff**	**0**	**1**	**2**	**Total staff**	**0**	**1**	**2**	**Total staff**
Gynaecologist	**4**	**1**	**0**	**1**	**2**	**4**	**0**	**4**	**71**	**2**	**1**	**3**
Medical officer (allopath)	**0**	**2**	**3**	**8**	**0**	**0**	**6**	**12**	**5**	**30**	**39**	**108**
Medical officer (Ayush)	**5**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**74**	**0**	**0**	**0**
Staff nurse (regular)	**2**	**2**	**1**	**4**	**0**	**0**	**6**	**12**	**22**	**4**	**44**	**110**
Staff nurse (contractual)	**1**	**0**	**4**	**8**	**0**	**0**	**6**	**12**	**74**	**0**	**0**	**0**
Anaesthetist	**5**	**0**	**0**	**0**	**3**	**3**	**0**	**3**	**74**	**0**	**0**	**0**
General surgeon	**5**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**72**	**2**	**0**	**2**
Paediatrician	**4**	**1**	**0**	**1**	**5**	**1**	**0**	**1**	**74**	**0**	**0**	**0**

Data source: Mapping data

Equipment, Drugs and Supplies for CEmONC

Additionally, availability of supplies is also low, and repeats many of the absences in lower facility levels. Only 50% of the FRUs have blood transfusion equipment, magnesium sulphate, assisted delivery equipment or partographs. The limited availability of LCSC in CHCs sets is also a concern. The absence of anaesthesia equipment in CHCs and 33% of TH's, means limited possibility for performing surgeries in these locations (see tables 5.2.3.e and 5.2.3.f)

Table 5.2.3.e: Availability of equipment necessary for delivery CEmONC services at CHCs, THs and Pvt Hospitals, Bellary District

	CHC (n=5)	TH(n=6)	DH (1)	Pvt hosp (n=74)
Emergency drug and equipment tray/ trolley in LR	3	6	1	45
Foot-operated or electrical suction apparatus	1	6	1	42
Obstetric Forceps	3	5	1	43
Vacuum cup and suction apparatus	2	6	1	41
Autoclave	3	5	1	43
Delivery kits	1	3	1	42
Suture Kits	4	6	1	44
D and C Set	4	6	1	40
Oxygen cylinder	1	3	1	42
Spinal needle set	0	6	1	39
Boyles Apparatus	0	5	1	39
Endotracheal tubes (adult size)	1	4	1	40
Pulse oximeter in OT	0	4	1	40
Urinary catheter	2	3	1	46
Neonatal Bag and Mask	3	4	1	48
LCSC Set	0	6	1	40
Blood bag refrigerator	1	0	1	10
Anesthesia machine	0	2	1	39
Sterilization set	4	6	1	41
Nitrous oxide	0	4	1	40
Halothane / Isoflurane /Enflurane vaporizer	0	3	1	37

Data source: Mapping data

Table 5.2.3.f: Availability of drugs/supplies essential for CEmONC services at CHCs, THs, DH and Pvt Hospitals, Bellary District

	CHC (n=5)	TH (n=6)	DH (n=1)	Pvt Hosp(n=74)
T. Nifedipine / Alpha dopa	1	2	1	44
Inj Oxytocin	1	1	1	43
Injectible antibiotics (Ampi+Genta+Metro)	4	6	1	53
Inj Magnesium Sulfate	0	2	1	43
Inj Diazepam	0	3	0	52
Inj. Betamethasone / Dexamethasone	2	5	1	47
Ringer Lactate / NS / DNS	5	6	1	51
Colloids (Hemaccel /Venofundin)	0	0	0	33
inj spinal anaesthesia (Bupivacaine, Lidocaine)	4	6	1	50
Inj. Thiopentone (Pentothal) / Ketamine / Propofol	0	1	1	37
Inj Furosemide (Lasix)	5	3	1	48
Inj. Dopamine	1	2	1	44

Data source: Mapping data

Summary of Emergency Care Signal Functions

Signal functions refer to a set of interventions used to treat direct obstetric complications that make up the majority (roughly 80%) of maternal deaths globally. These interventions are key components of basic and comprehensive emergency obstetric care; treatment of obstetric emergencies in hospitals and health centres.[48]

According to data from the service provider assessments, a review of facilities' ability to provide emergency obstetric care across project districts demonstrates similar trends to the situation in Bellary. Among the sample of facilities in project districts only the district level hospitals are able to offer all emergency obstetric care signal functions. Signal functions related to emergency obstetric care were performed in the last six months in most of the higher public health facilities and private facilities except administration of parenteral anticonvulsants for eclampsia and performing assisted vaginal delivery in CHCs and PHCs. Also availability of blood transfusion and performance of caesarean section was inadequate in CHCs (table 5.2.3.g).

The non performance of the signal functions were reported as due to reasons such as issues with drugs/equipment supplies, lack of trainings and lack of required staff.

[48] Bailey, P.; Paxton, A.; Lobis, S.; Fry, D. 2006. The availability of life-saving obstetric services in developing countries: An in-depth look at the signal functions for emergency obstetric care, International Journal of Gynecology and Obstetrics 93, 285—291

Table 5.2.3.g: Percent of facilities offering Emergency Obstetric Care Signal functions

Signal function	PHC (130)	CHC (33)	TH (33)	Private (78)
I.V Access with 16 G/18 G Cannula	88	91	100	100
Administer parenteral antibiotics	94	97	100	97
Administer uterotonics drugs	89	94	100	95
Administer parenteral anticonvulsants for eclampsia	41	39	85	74
Perform assisted vaginal delivery	12	39	70	76
Perform manual removal of placenta	56	61	100	78
Perform blood transfusion	7	15	46	90
Perform surgery (C-Section)	1	18	76	87
Removal of retained products of conception	17	42	85	92

Data source: Mapping data

5.2.4 Service Provider Competencies to Offer Quality Intranatal Care

This section includes assessment of the services provided during delivery and the postpartum period (until discharge) at PHCs and higher facilities, and private hospitals. The section is broadly divided into two parts: normal labour and delivery and management of complications in delivery. Provider competencies (knowledge, skills, practices and documentation practice) were assessed by using different types of tools to assess the knowledge, skills and practice and documentation practice of providers from a sample of facilities.

Display of protocols

Availability of specific protocols related to labour and postpartum care was generally poor. Availability of protocols for eclampsia and postpartum haemorrhage management were relatively better in district hospitals compared to other facilities, including private hospitals (table 5.2.4.a). It is not clear if the presence of protocols has an effect on the quality of care.

Table 5.2.4.a: Percent of facilities with protocols on display

Protocol	DH(7)*	TH(33)	CHC(33)	PHC(130)	SC(370)	Private(78)
Management of Asepsis in labour	14.3	6.1	19.4	4.4	0.0	0.0
Active management of third stage of labour	28.6	15.2	22.6	15.9	1.0	5.5
Management of Eclampsia	42.9	27.3	29.0	28.3	1.0	11.0
Management of Postpartum haemorrhage	42.9	27.3	35.5	31.0	1.0	5.5
Management of Postpartum fever	0.0	0.0	6.1	2.3	0.2	2.6

- **Bellary not included – under renovation**

Data source: Service Provider Assessment data

Normal Labour and Delivery

Knowledge

Self administered questionnaires were used to gauge the level of knowledge about labour, delivery and postpartum care. Key gaps were observed in all knowledge areas, especially for ANMs and nurses. Knowledge of correct order of AMTSL procedure, infection prevention and postpartum care (monitoring BP, pulse and uterine tone every 15 minutes) was inadequate even in medical officers (table 5.2.4.b).

Table 5.2.4.b: Percent of correct answers by provider type, knowledge questionnaireIntranatal and postpartum care

Intra natal and postpartum knowledge	Obstetrician (n=86)	Medical Officer (n=133)	Ayush MO (n=35)	Staff nurse (n=234)	ANM (n= 480)
Prevention of HIV transmission from positive mother to child	91.8	90.9	94.2	80.7	25.5
Partograph finding that indicates need for urgent referral from a facility without an OT	91.8	90.9	94.2	80.7	57.5
Active management of the third stage of labour essential for all deliveries	90.7	83.4	80	69.6	12.2
Appropriate order of AMTSL	43	45.1	37.1	28.6	16.4
Methods to decrease the risk of infection during delivery	88.3	65.4	60	38.4	16.39
Postpartum care					
Steps to monitor the mother during first 2 hours of delivery	63.9	41.3	25.7	35.4	30.1

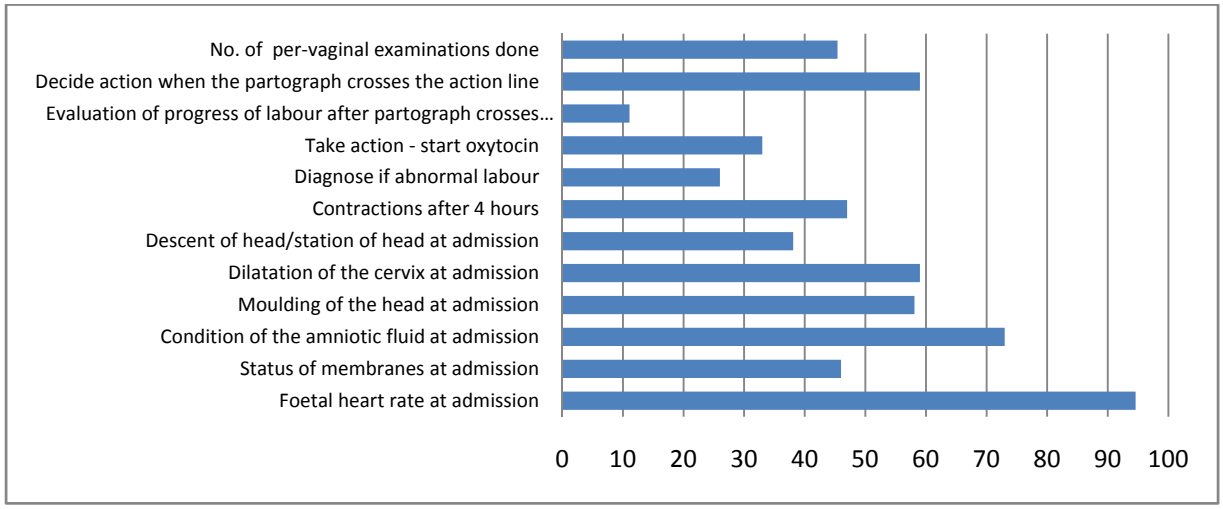
Data source: Service Provider Assessment data

Case study: labour and use of partograph

Use of the partograph is a simple intervention that helps identify an abnormal labour and aids in timely management of a delivery. Failure to use the partograph can mean delays in the diagnosis of obstructed labour[49]. A case study requiring providers to interpret a partograph to estimate progress of labour and appropriate management was also used to assess knowledge about labour and delivery. Providers were required to look at a completed partograph specimen and answer questions about the findings and management. The *Sukshema* project collected 315 completed case studies (206 providers either refused or could not complete this case study). Gaps were observed in reading and interpreting the findings in the partograph correctly, including abdominal and vaginal examination. Evaluation of progress of labour was done correctly by only 10% providers (Figure 5.2.4.a).

[49] MOHFW: Maternal Health Division, GOI, 2005. Guidelines for Antenatal Care and SBA by ANMs and LHVs, New Delhi.

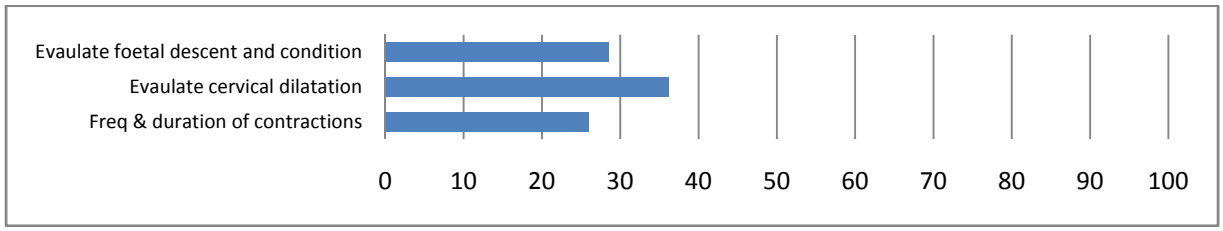
Figure 5.2.4.a: Percent of providers correctly answering questions for physical examination and action to be taken (N= 315), case study labour and use of partograph:



Data source: Provider Assessment data

Only 11% of providers were able to enumerate all the parameters which should be evaluated (frequency and duration of contractions; cervical dilatation; foetal descent and condition) when cervical dilatation crossed the alert line (Figure 5.2.4.b).

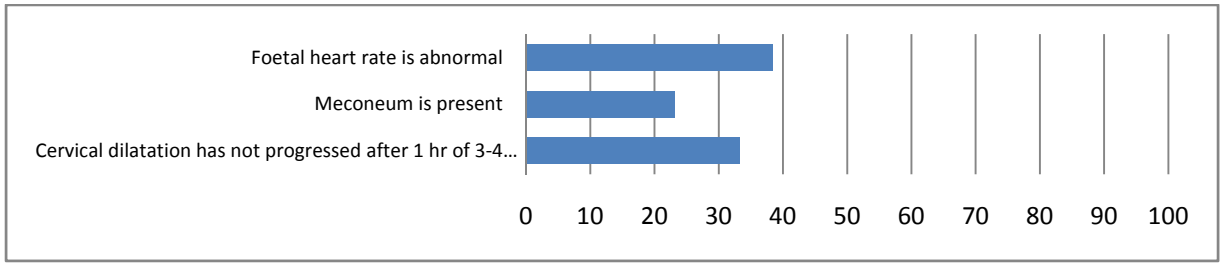
Figure 5.2.4.b: Case study labour and use of partograph: Percent of providers who could evaluatethe progress of labour from partograph (N=315)



Data source: Provider Assessment data

Less than 25% could justify the decision to do a Caesarean section based on cervical dilatation, contractions, presence of meconium and abnormal foetal heart rate (Figure 5.2.4.c).

Figure 5.2.4.c: Case study labour and use of partograph: Percent of providers who could list the indications for c-section from partograph (N=315)



Data source: Service Provider Assessment data

Some variation in the ability of providers to analyze the partograph was observed by both provider type and facility type; PHC providers (n=150) were less able to read the partograph than providers at higher level facilities (facility type not displayed below). Gaps were observed in reading the status of moulding of the head and diagnosing abnormal labour, and calculating the number of per vaginal examination done (table 5.2.4.c).

Table 5.2.4.c: Percent of correct answers: Case study labour and use of partograph

Labour- use of partograph Case study	Obstetrician (n=86)	Medical officer (n=71)	AYUSH MO (n=22)	Staff nurse (n=129)
Partograph findings at admission				
Foetal heart rate	95.8	91.9	95.5	96.1
Status of membranes	66.2	44.2	27.3	38.8
Condition of the amniotic fluid	84.5	70.9	68.2	68.2
Moulding of the head	84.5	60.5	36.4	44.2
Dilatation of the cervix	70.4	54.7	63.6	55
Descent of head/station of head	45.1	47.7	31.8	29.5
Status after 4 hours				
Contractions	69	48.8	40.9	32.6
Diagnose abnormal labour	47.9	19.8	13.6	10.6
Take action - start oxytocin	60.6	29.1	22.7	20.9
Status after 8 hours				
Evaluate progress of labour	15.5	8.1	13.6	10.1
Decide action when the partograph crosses the action line	90.1	53.5	40.9	48.8
Total no. of per-vaginal examinations done	65.7	41.9	22.7	39.5

Skills and Practice

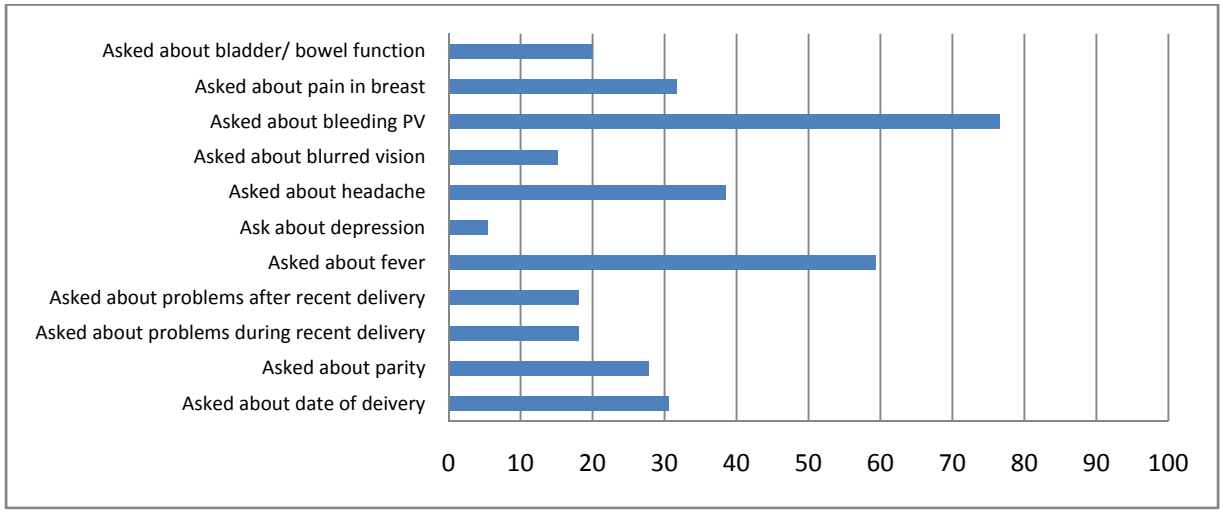
Direct observations of postpartum examination at the facility

The first six hours following a delivery are extremely crucial for the mother as the majority of deaths due to postpartum haemorrhage occur during this time period. The mother is required to be examined every 15 minutes for 2 hours following delivery to detect whether the uterus is contracted, if any tear or perineal injury is repaired, if the bleeding is within the normal limits and vitals (pulse and blood pressure) are maintained. [50]

Direct observations were conducted of postpartum care provided to women after delivery at PHCs and higher facilities. *Sukshema* conducted 145 direct observations of providers giving postpartum care, revealing gaps in history taking especially asking about danger signs (see Figure 5.2.4.d).

[50] MOHFW: Maternal Health Division, GOI, 2005. Guidelines for Pregnancy Care and Management of Common Obstetric Complications, New Delhi.

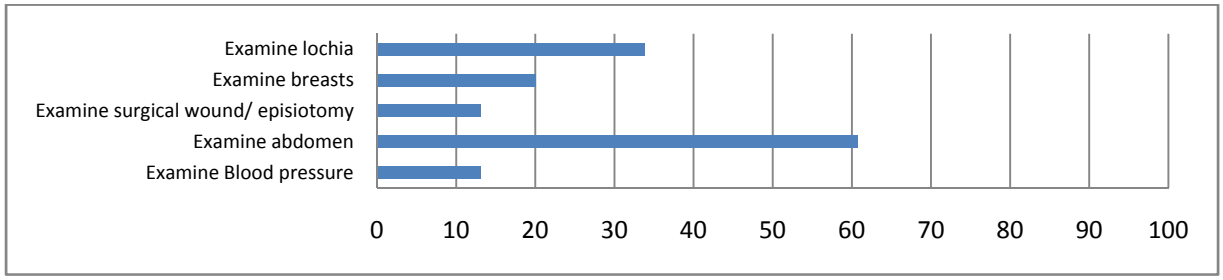
Figure5.2.4.d: Direct observation Post partum care at facility: Percent of providers eliciting components of history (N=145)



Data source: Service Provider Assessment data

All the components of focussed postpartum examination, except abdominal examination, were lacking including checking BP, lochia, surgical wound/episiotomy and breast examination (Figure 5.2.4.e).

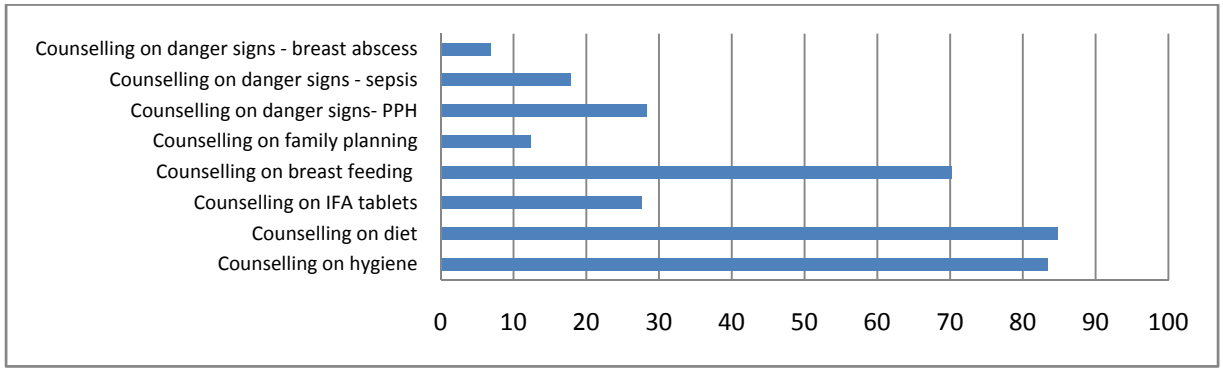
Figure 5.2.4.e: Direct observation of postpartum care at facility: Percent of providers performing components of a physical examination (N=145)



Data source: Service Provider Assessment data

In addition, providers failed to counsel recently delivered women about intake of IFA tablets, family planning and danger signs. The findings are consistent across facility levels, demonstrating that quality of care needs to be improved at all levels in both public and private sectors (Figure 5.2.4.f).

Figure 5.2.4.f: Direct observation post partum care at facility: Percent of providers delivering components of counselling (N=145)



Data source: Service Provider Assessment data

Client satisfaction

Client exit interviews are also a source of information on the quality of postnatal care provided to women who delivered in an institution. The data indicates that most women reported that they received appropriate postpartum care and counselling, although counselling on danger signs for mothers and newborn could be improved (table 5.2.4.d).

This beneficiary reported data suggests that more complete physical examinations are being conducted than what was directly observed (as with the DLHS 2007-8 data in the utilization section). For example, direct observations indicated that blood pressure was monitored in fewer than 20% of observations compared to 80% of women who said they had their blood pressure taken. Likewise, women reported receiving counselling messages more often than observed during postnatal care observations (table 5.2.4.e). These differences may reflect low levels of health literacy or social desirability bias on the part of the respondent.

Table 5.2.4.d: Exit interview Postpartum care at facility: Components of Postpartum care

During PNC visit, checked (in %)	Exit Interview (N=362)
Examination of the mother	
Blood Pressure	79
Temperature	64
Abdomen examination (fundal height)	71
Legs for tenderness	72
Perineum for stitches	58
Breast for tenderness	67
Any complications	20.7

Data source: Service Provider Assessment data

Table 5.2.4.e: Exit interview Postpartum care at facility: Counselling of mothers for postpartum care

Counselling of mothers at facility (in %)	Exit Interview (N = 362)
Immunization	77
Exclusive breast feeding	80
Nutrition	78
Danger signs in mother	51
Danger signs in child	46
Family planning	55

Data source: Service Provider Assessment data

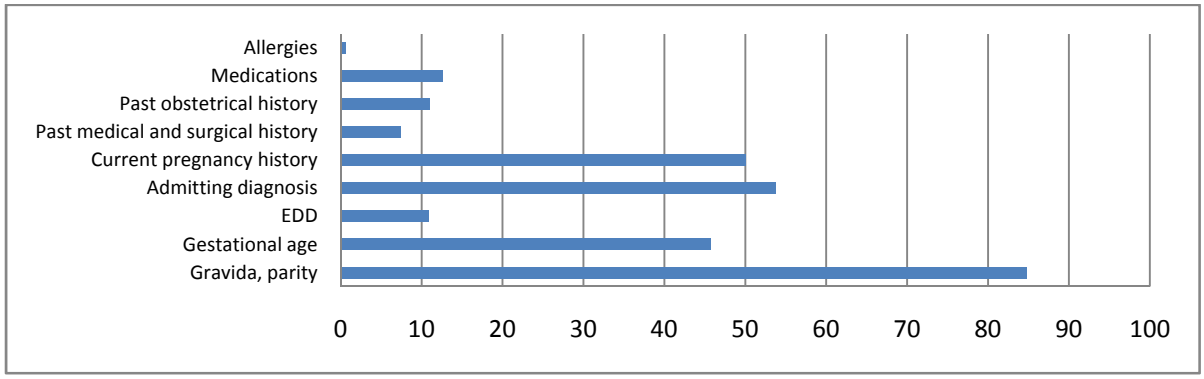
Documentation

Audits of labour documents and PPH case sheets were conducted to review the level of documentation of labour/delivery case sheets and registers.

Labour/delivery: History taking

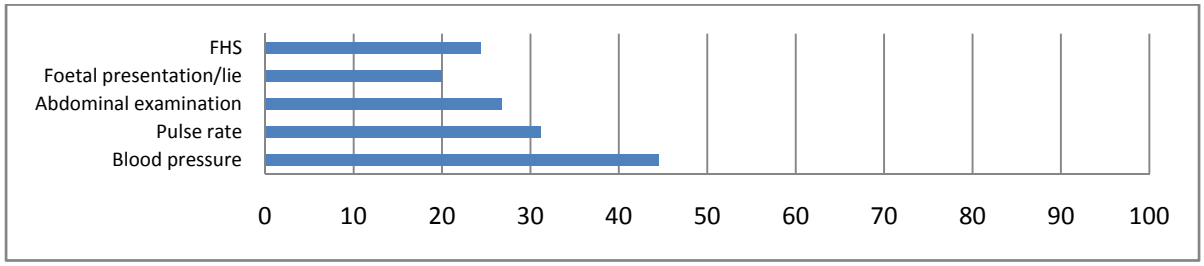
A total of 1038 cases of labour/delivery cases were audited from case sheets or registers. The clinical records checked showed gaps in the documentation of a complete history (see Figure 5.4.2.g). In terms of conducting physical examinations, the documentation of all components was well below 50% (see Figure 5.4.2.h). In addition, a complete vaginal examination was inadequately documented (see Figure 5.2.4.i).

Figure 5.2.4.g: Audit of Labour/delivery clinical records: Percent of records with components of history taking (N=1038):



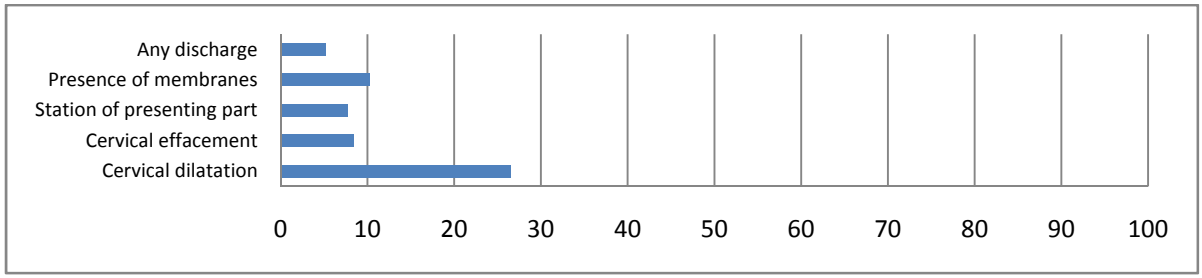
Data source: Service Provider Assessment data

Figure 5.2.4.h: Audit labour/delivery clinical records: Percent of records with components of physical examination (N=1038)



Data source: Service Provider Assessment data

Figure 5.2.4.i: Audit labour/delivery records: Percent of records with components of vaginal examination (N=1038)



Data source: Service Provider Assessment data

Use of partograph

The assessments detected that a partograph was documented as used to monitor labour in only 95 (9%) cases. Out of the 95 cases in which providers used partographs, only 8% had filled in all the relevant information like date, time, gravida and parity, gestational age and the status of the membranes. Just 7% documented the findings every four hours on the partograph.

Delivery note

Just 6 of the 1038 records had a comprehensive delivery note mentioning mode of delivery, time of birth, sex and weight of the baby, tears, completeness of placenta and blood loss.

Of the 1038 labour cases, 850 recorded normal delivery, 14 assisted vaginal deliveries by forceps or vacuum method and 117 had noted delivery by Caesarean section.55 records did not mention the mode of delivery. In 175 cases a record of an episiotomy or perineal tear was recorded, and of them 119 documented its repair.

In regard to the management of the third stage of labour, only 70 cases (7%) had recorded an estimation of blood lost during the delivery. Only 102 recorded providing AMTSL itself, while 207 recorded administering a uterotonic injection and 351 (34%) had a note about the completeness of placenta, which is crucial to check to prevent post partum haemorrhage.

Of the 14 cases of assisted vaginal deliveries, only 5 recorded the indication for forceps or vacuum application. Of the 114 records for caesarean delivery, only 57 had recorded the indication for performing Caesarean section. After delivery, just 7 cases had documented all postpartum care components of BP, uterine massage and bleeding per vagina, being performed every 15 minutes for the first hour.

Management of delivery and postpartum complications

Knowledge

Providers' knowledge about management of complications during intranatal and postnatal care was assessed by using a self administered questionnaire. Key gaps were seen for all the questions, more so for ANMs and nurses. Key gaps in the knowledge of medical officers were around the causes of post partum haemorrhage, specifically use of magnesium sulphate and postpartum endometritis (table 5.2.4.f.).

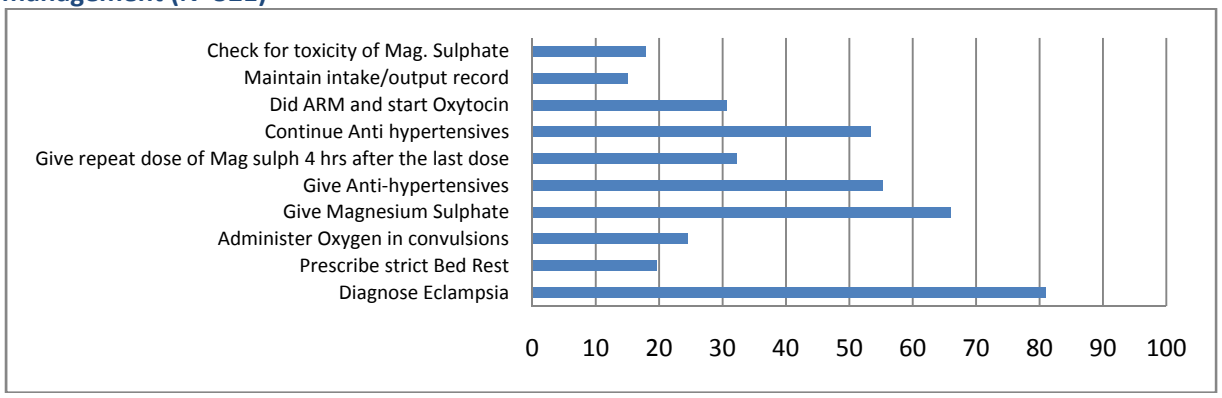
Table 5.2.4.f: Percent of correct answers on provider questionnaires, management of complications in intra-partum care

Management of complications	Obstetrician (n=86)	Medical officer (n=133)	Ayush MO (n=35)	Staff nurse (n=234)	ANM (n=480)
Magnesium sulphate as the most effective method to control eclamptic convulsion immediately	75.58	66.9	68.5	58.5	31.1
Contra indications for vacuum extraction in prolonged labour	89.53	80.45	77.14	47	33.0
Signs and symptoms of ruptured uterus	91.8	84.96	60	57.2	56.2
Treatment of postpartum endometritis	80.23	63.15	45.71	39.74	38.2
Women with 30 weeks pregnancy and sudden profuse watery disc	90.69	78.94	77.14	57.26	30.1
A case of full term pregnancy with labour pains since 12 hrs	90.69	66.91	60	61.53	62.9

Case study: eclampsia

The *Sukshema* project administered 521 providers from PHCs and higher facilities the eclampsia case study, revealing knowledge gaps about the management of eclampsia. Providers did not identify the critical requirements of recording input and output and monitoring for toxicity of magnesium sulphate by checking respiratory rate and tendon reflexes (Figure 5.2.4.j.).

Figure 5.2.4.j: Case study eclampsia:Percent of providers answering correctly for appropriate management (N=521)



Data source: Service Provider Assessment data

Some variations in provider knowledge based on the case studies were observed by level of facility with providers at CHC and higher levels demonstrating marginally better levels of knowledge; however overall knowledge levels for treating these conditions could be improved. Comparing the performance between the provider cadres i.e. specialists, Medical Officers, AYUSH MOs and staff nurses at PHCs and higher facilities, the main knowledge shortfalls were observed in staff nurses (table 5.2.4.g).

Table 5.2.4.g: Case study eclampsia: Variation in providers' knowledge of treatment of eclampsia

Eclampsia Case scenario	Obstetrician (n=89)	Medical officer (n=138)	Ayush MO (n=37)	Staff nurse (n=248)
Diagnosed eclampsia	97.8	92	83.8	67.7
Gave oxygen during convulsion	42.7	29	24.3	14.9
Gave Magnesium sulphate	96.6	69.6	73	51.2
Gave anti hypertensive medicines	74.2	58	67.6	44.8
Repeated Magnesium sulphate	64	36.2	24.3	19.4
Did ARM	62.9	25.4	32.4	21.8
Recorded input-output	27	15.2	16.2	8.9
Monitored toxicity due to Magnesium sulphate	32.6	18	10.8	12.9

Data source: Service Provider Assessment data

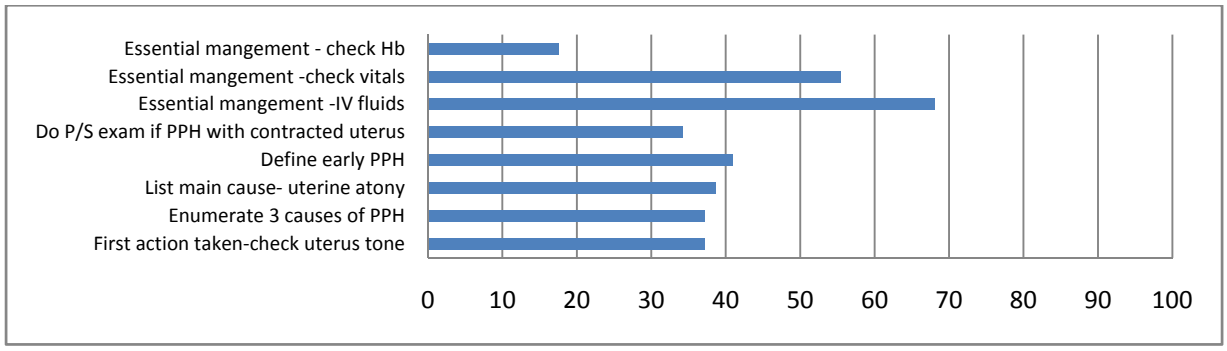
Case study: Post partum haemorrhage (PPH)

Another case study administered at PHCs and higher facilities pertained to the identification and management of postpartum bleeding 30 minutes after delivery of a 4th gravida at a health facility, who had received oxytocin/ misoprostol following birth of the baby. The causes of PPH are uterine atony, retained placenta, tears or lacerations, ruptured uterus and bleeding disorders. Uterine atony is the commonest cause.[51] 521 case studies were obtained. Other than provision of intravenous fluids, knowledge of most providers in defining, diagnosis of cause and management of PPH, was below 50%.

[51] MOHFW: Maternal Health Division, GOI, 2005. Guidelines for Pregnancy Care and Management of Common Obstetric Complications by Medical Officers, New Delhi.

Providers at CHCs and higher performed better than providers at PHCs in analyzing the case study on PPH (see table 20, appendices).The providers assessed at the PHC level included 112 nurses, 91 MOs and 34 AYUSH MOs. The findings point to the need for improving knowledge so that they can promptly diagnose, treat or refer patients of PPH (Figure 5.2.4.k).

Figure 5.2.4.k: Case study Postpartum Haemorrhage: Percent of providers answering correctly for diagnosis and management of PPH (N=521)



Data source: Service Provider Assessment data

Documentation

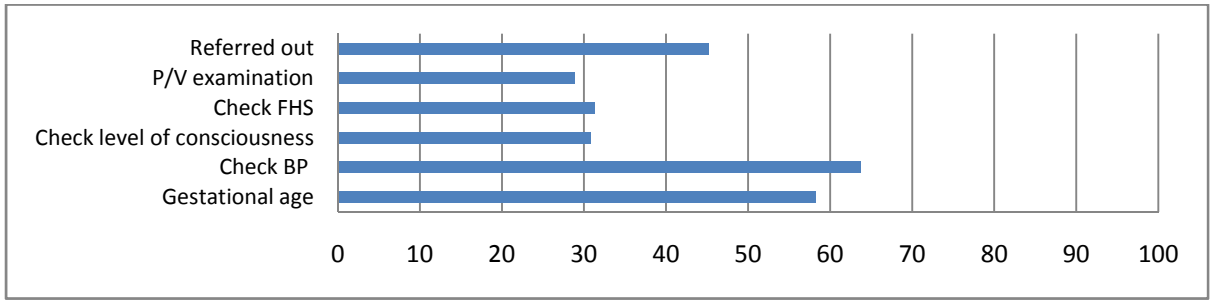
Eclampsia audit

Eclampsia cases need to be properly documented with a complete history regarding the duration and nature of complaints, examining blood pressure, level of consciousness and foetal heart rate. The gestational age has to be established at admission for antenatal and intra-natal patients and is crucial for clinical decisions about management of the patient regarding induction of labour or arrangement for referral to a higher facility for delivery.[52]

About 146 cases of eclampsia were reviewed from case sheets or registers, of which 62% were admitted with eclampsia in the antenatal period, 22% were in labour and 13% were admitted in the postpartum phase. Gaps were found in the initial history recording and physical examination of the patients of eclampsia. This data is consistent with the inadequate knowledge providers exhibited in the case study of eclampsia – that is; one reason the details are not correctly recorded is that the symptoms are not understood. Gestational age was observed to be noted in less than 60% cases. About 45% cases (66) were documented to be referred out (Figure 5.2.4.l).

[52] MOHFW: Maternal Health Division, GOI, 2005. Guidelines for Pregnancy Care and Management of Common Obstetric Complications by Medical Officers, New Delhi.

Figure 5.2.4.l: Audit eclampsia clinical record: Percent of records with componentsof essential history, examination, referral(N= 146)



Data source: Service Provider Assessment data

Management of eclampsia

A case of eclampsia has to be managed carefully as it is a potentially fatal condition, for both mother and foetus. After admitting the patient, an initial diastolic blood pressure of more than 110mmHg needs to be stabilised by anti hypertensive medicines like alpha dopa, nifedpine or hydralazine or labetolol. The patient has to be catheterised, an hourly input/output chart needs to be maintained and relevant laboratory investigations conducted. Delivery of a loading dose of magnesium sulphate injection is required at admission.[53] At SBA level, the patient has to be referred out after initial treatment or delivered and referred out if the patient comes in labour.

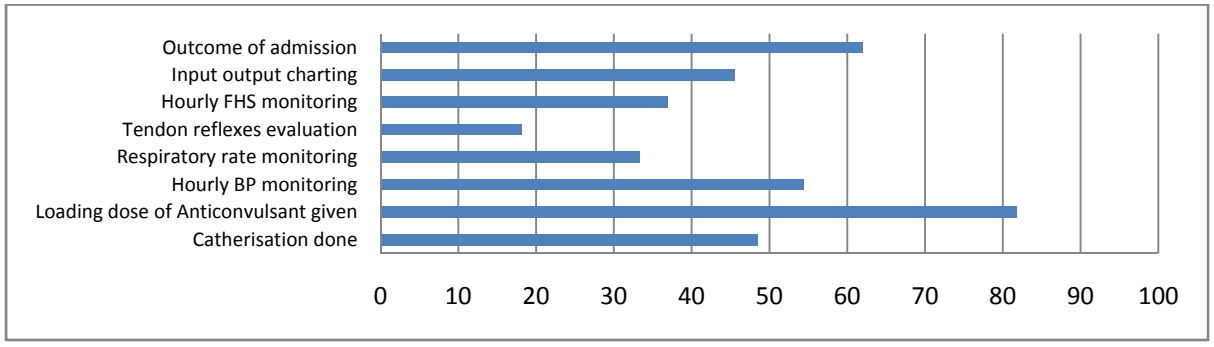
Management of eclampsia at BEmONC and CEmONC facilities includes treating the patient with anti hypertensives and anti-convulsants like magnesium sulphate in repeat doses, and termination of the pregnancy by inducing labour. Magnesium sulphate has to be given at maintenance dose up to 24 hours from delivery or last convulsion. The patient has to be monitored for toxicity due to magnesium sulphate overload by regular monitoring of blood pressure, respiratory rate and deep tendon reflexes.[54]

Of the 146 eclampsia cases audited, 78 cases were recorded as receiving complete treatment at the facility (were not referred out). Another 32 cases (41%) recorded any hypertensive medicines administered if the diastolic BP was found to be 110mmHg; nifedipine was given in 24 cases, alpha dopa in 3 and hydralazine or labetalol was given to 1 case each. On admission, 27 women received anticonvulsants, and of these, 25 received magnesium sulphate; 19 of the 25 cases which were started on magnesium sulphate received repeat doses up to 24 hours of delivery or last seizure.

Of these women treated for eclampsia, 12 delivered normally, 3 by assisted methods and 2 by caesarean section. In 37% of cases the case record did not document the type of delivery. In 52 cases (65 %) the maternal outcome and 54 (76%) of foetal outcome were recorded. There was a record of 2 maternal deaths and 10 still births (Figure 5.2.4.m).

[53] MOHFW: Maternal Health Division, GOI, 2005. Guidelines for Pregnancy Care and Management of Common Obstetric Complications by Medical Officers, New Delhi.
[54] MOHFW: Maternal Health Division, GOI, 2005. Guidelines for Pregnancy Care and Management of Common Obstetric Complications by Medical Officers, New Delhi.

Figure 5.2.4.m: Percent of records with components of eclampsia management, audit of eclampsia records: (N=146):

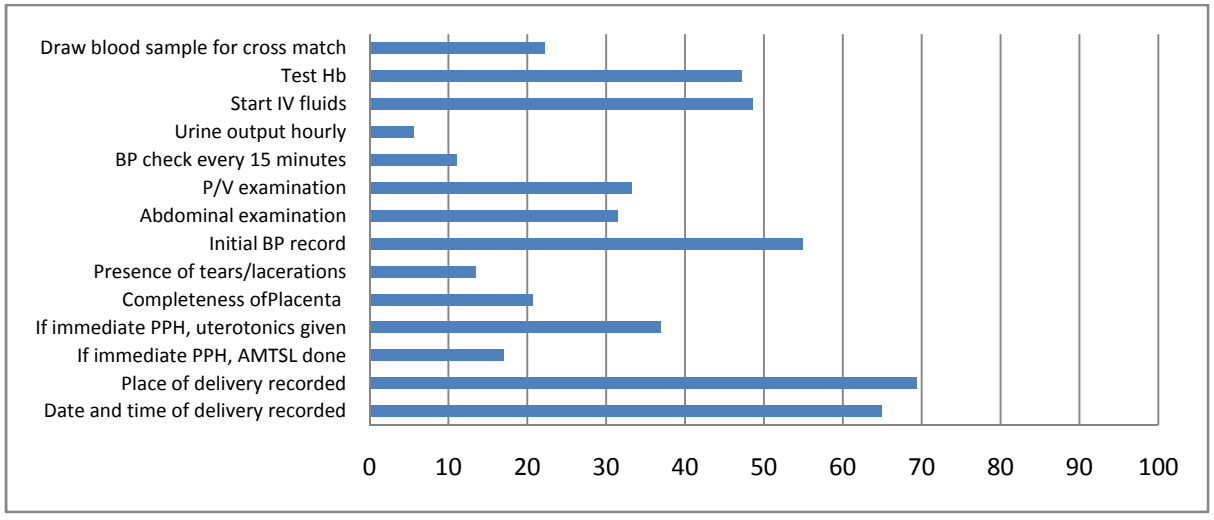


Post partum haemorrhage audit

Case records of postpartum haemorrhage should have the relevant history elicited like whether AMTSL was done, completeness of placenta checked, and a complete physical examination done at admission. There should be a note that the patient is started on an IV for stabilization, administering oxytocics and prostaglandins to control the bleeding, catheterisation and an output chart maintained. Tests such as haemoglobin estimation and blood transfusion have to be arranged for all severe cases. Subsequently, the cause of PPH has to be established and treatment given as per the cause detected, and then documented.

The *Sukshema* project reviewed 111 clinical records of PPH. Key gaps observed included eliciting a complete history, conducting examinations and proper management of a case of PPH (Figure 5.2.4.n).

Figure 5.2.4.n: Percent of records with components of PPH management (N=111)



Data source: Service Provider Assessment data

From the 72 cases which received treatment in the facility, the cause of PPH was documented in only 45 cases (table 5.2.4.h). The sample size is small because this is a rare event, however, handling of this rare event is key to reducing maternal mortality.

Table 5.2.4.h: Percent of records with key details recorded, audit of clinical records of PPH:

Cause of PPH as recorded in case sheet	Number of cases	Percent of PPH causes identified (N=33)	Management Provided for Identified Cause
Uterine atony	8	24%	2 received fundal massage 7 received oxytocin 4 received methergin 3 received misoprostol
Retained placenta	11	33%	6 documented manual removal 1 curettage
Lacerations	11	33%	8 documented repair of laceration

Data source: Service provider assessments

5.2.5 Implications for Intranatal Care

The different assessments and analysis highlight a number of key areas for intervention. The key implications of the analysis are outlined below.

Utilization

Data on complications needs to be communicated back to the community
District level data about the high rate of delivery and post delivery complications needs to be communicated to the community, to emphasize the need for skilled attendance at births in institutions.

Access and Availability

Human resources for intranatal care need to be increased
Human resources for intranatal care can be bolstered through training/capacity building, contracting with the private sector and increasing staff numbers. SBA training (including identification of obstructed labour, especially partograph use) needs to be provided to AYUSH doctors and SNs, prioritizing high volume facilities. There is also a need to prioritize training for mid level care providers/ MBBS doctors in anaesthesia, OBGYN and other specialist skills.

Additionally there is a need to increase staffing for Intranatal Care; all PHCs should have at least one each of MO and SN, but ideally the full suite of staff should be provided, as per the guidelines. All the CHCs and TH should be provided with OBG specialist, surgeon and anaesthetist, using different mechanisms of recruitments/ consultancies/ contracts.

Establish dedicated BEmONC and CEmONC sites
As mentioned in the Service Delivery Framework section, dedicated BEmONC (one per 30,000 people) and CEmONC (one per 100,000 people) sites need to be developed, supported by a strong referral network. Site selection should be based on population distribution, availability of staff, infrastructure, and equipment. The *Sukshema* project prepared a list which is available on request.

Service Provider Competencies to Provide Quality of Care

Increase SBA
With the recent developments in the National Rural Health Mission, there has been an increased uptake of institutional deliveries. It is important that these deliveries are attended by care providers at high professional standards. The public health system needs to raise the standards of intranatal care in facilities with a focus on partograph and AMTSL to address critical complications including obstructed labour and post partum haemorrhage. Gaps have to be addressed through refresher training, audits of clinical records and ongoing mentoring.

Improve postpartum care, including management of complications

Though there has been a rise in institutional deliveries, the quality of postpartum care at the facilities is weak as the management of postpartum care and complications is not being conducted as per protocol. It is essential to reiterate the importance of these to decrease maternal mortality due to causes that could be prevented by skilled management of the postpartum phase.

5.3 Postnatal and Newborn Care

This section provides an overview of the guidelines, a description of utilization patterns including socio-cultural factors, an analysis of availability and accessibility of services, an assessment of service provider competencies, and a summary of implications regarding postnatal and newborn care. The focus of this section is care at the community level.

Key points:

- In Bellary District, 44% of women initiate breastfeeding within one hour of giving birth. Disparities between population subgroups are high.
- Qualitative data reveals that breastfeeding was considered to be the most important means of promoting health in the neonate.
- Only 46% of women in rural Bellary District receive post natal checkups within 48 hours of their delivery.. This compares poorly to the project districts' rate of 52% and the state rate of 66%. Disparities are observed among population sub-groups, which is more than 20 percent points across
- Few women stay the requisite 48 hours after delivery, and postnatal follow up at the community level is ad-hoc, with inadequate delivery of day 2 and day 4 visits.
- Providers are not delivering counselling or performing exams during home visits

5.3.1 Guidelines for Postnatal and Newborn Care

The post natal period includes 42 days after delivery; it is a time where both mother and baby need care and attention – in hand. Attention must be paid to a variety of care components including breastfeeding, early immunizations, prevention of secondary PPH and infection prevention for both mother and baby. An important issue is number and timing of home visits – in Bellary district these occur through the SCs or PHCs. The guidelines for post-natal and newborn care are presented below (figure 5.3.1.a). In particular, home visits are expected to occur on days 3, 7 and 42 for mothers and newborns with additional visits for the newborn on day 14, 21 and 28.

Table 5.3.1.a: Post-natal and Newborn Care: three levels of service delivery

Level 1	Level 2	Level 3
• Min 6 hrs stay post delivery • Counselling for feeding, nutrition, family planning, hygiene, immunization, post natal check up • Home visits on day 3,7, 42 - for mother and baby • Timely identification of danger signs and referral	• All level 1+ • 48 hours stay post delivery and all the postnatal services for zero and 3rd day for mother and baby • Timely referral of women with post-natal complications • Stabilization of mother with postnatal emergencies • Referral linkages	• Level 2 services + • Clinical management of all maternal emergencies

5.3.2 Utilization of Postnatal and Newborn Care

Understandings of healthy neonates and health of the new mothers

From the qualitative assessment, understandings of health of the new mother and newborn were captured. Signs of a healthy neonate included breastfeeding without problem, good disposition (i.e., not irritable or crying excessively), sleeps well, normal elimination and plays quietly (i.e., moves arms and legs freely). Signs of illness in a neonate included breathing difficulties as a result of phlegm in chest, fever, cold, difficulty passing stool accompanied by a hard stomach, infection at the umbilicus, and low birth weight. Other problems included cleft lip and palate, and "twisted arms and legs."

Activities to promote health in the neonate included check-ups, immunizations (BCG and polio drops), bathing, breastfeeding (described below) and removal of the evil eye. Neonates are bathed daily, except if a fever is present.

- "What to do, without thinking why the baby is crying, we remove *nadar* (evil eye). This is an old tradition that we follow. *Nadar* means we take garlic, broomsticks, and a little chili and we remove *nadar*. Now see all sorts of people will come home and after seeing the child, they will say the child is *dappa-chanda* (fat and beautiful), then the children will get affected by *nadar*. If we ward off that "nadar," then the children will become silent. We hold in the left hand and turn it three times and we put it in the fire. Otherwise, we make an *allida* (cotton) *gombi* (doll), and then we burn it. Then, the children will play silently. This is a tradition followed from earlier" (New mom, Bagalkot).
- "Even for baby we give bath only in the evening, after we put him in to the Cradle, we remove evil eye, afterwards we put *Dhoopa* ('Dhoopa' – a traditional way of treating a baby, after the bath with the help of incense under the cradle). With the help of salt, we show this salt on his face, afterwards we put this salt into fire (oven). By doing this, we have strong belief that, evil eye will not occur. It's an old traditional method, as everyone does these things to a baby, we also been following it" (Husband, Bagalkot).

With regards to the post-partum mother, there was mention of pain, bleeding, swelling and infection; however limited mention of severe maternal morbidity or mortality. One respondent mentioned that maternal mortality was caused by the evil eye.

Postnatal visits for the Mother

Few women stay at facilities after delivery for the required 48 hours (HMIS, Aug-Oct, 2010), with exception of caesarean section births, making it difficult to deliver post-natal services at the facility. Additionally, referral linkages are weak between facilities and communities, undermining follow-up of deliveries with post-natal care. DLHS 2007-8 data report that only 46% of women in rural Bellary District receive post natal checkups within 48 hours of their delivery. This compares poorly to the regional rate of 52% and the state rate of 66% (see table 21 appendix). The disparities between population sub groups are large; only 40% of the poor received a postnatal check-up compared to 66% of the non-poor. This household survey data is roughly in accordance with more recent Karnataka 2009-10 HMIS data which record 42% of registered pregnancies being followed up within 48 hours after delivery, and 33% being followed up after 48 hours and within 14 days of delivery.

Breastfeeding

According to DLHS 2007-8 data, 44% of women initiate breastfeeding within one hour of giving birth in Bellary District. There are disparities' in initiating breastfeeding within the hour among sub group such as rural 40% against urban 55%, SC/ST 38% against others 53% and poor 35% against non-poor 51%, which accounts more than 20 percent points across all sub-groups . The rate could be increased and disparities reduced with a higher level of skilled attendance at birth. While rates of early initiation are low, the rate of women who have initiated breastfeeding increases to 67% within 24 hours after birth and decrease to 33% of women breastfeeding after 24 hours of birth. This DLHS data is in contrast to the 2009-10 HMIS data for Karnataka which suggests 82.6% of newborns were breastfed within one hour of birth.

The qualitative assessments also provided a perspective on breastfeeding. Breastfeeding was considered to be the most important means of promoting the health of the neonate. However, breastfeeding practices varied considerably. Some respondents reported feeding the neonate immediately after birth, while others reported feeding within the first 2-6 hours after birth. Some waited until a day to feed the neonate as there was a belief that "bad milk" came out on the first day. Thus, doctors advised new moms to spill out the colostrum and give only breast milk. Colostrum was believed to cause lumps in babies' stomachs or formation of phlegm in the throat. In one particular case, the baby was not fed for first three days as a fasting ritual until the *namaz* (prayer and naming) ceremony. However, in most cases the first few days that babies were not given colostrum or breast milk, they were given honey or sugar water to satiate their hunger. In cases where the production of breast milk was limited, cow's milk was supplemented.

- "After three days (we feed milk). [Up to three days] We make it suck sugar water. Add sugar and water and with finger we make it suck… after three days milk begins to come it seems, so after three days one should feed it seems" (New mom, Bagalkot).
- "On the day of delivery, no milk will be produced. Only *maru dina* (day after) it is produced. First all the *keta haalu* (bad milk) which comes initially is not given to the baby. Later, when the better milk starts, that is given. The doctors had kept some white color water. We gave that only to the baby. They (doctors) told us not feed breast milk that day. *Karab halu*, (bad milk) *gatti halu* (thick/hard milk) we should not give the baby to drink… babies will get *gadde* (lumps) in the stomach. The baby stomach will be spoiled and they will vomit" (Grandmother, Gulbarga).

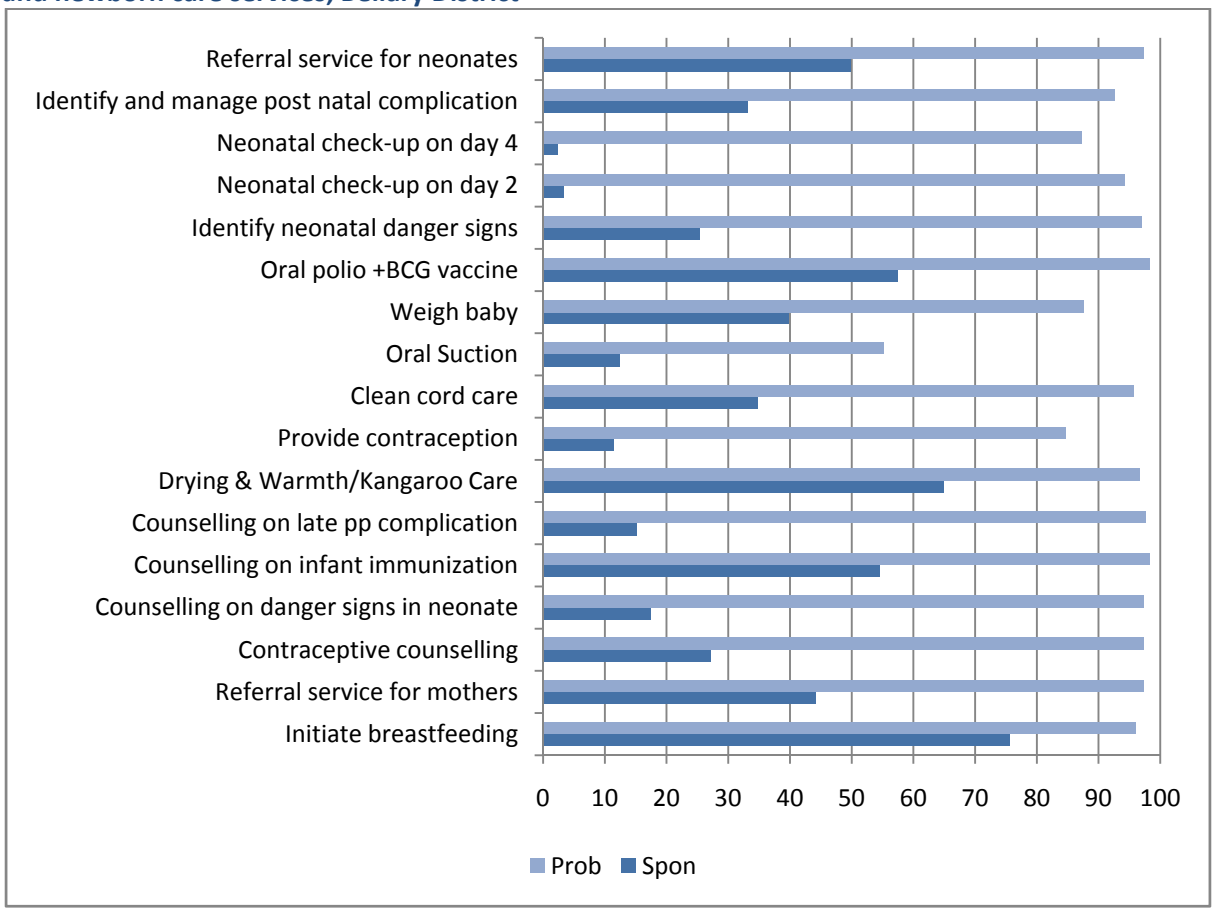
- “In our community, till such time of ‘...naming the child’, nothing would be fed to child. They do other things but infant will not be fed until the naming ceremony is over**.** After 3 days, breast milk is given to the infant baby. For the first three days, the child will be given nothing. The infant baby will be in fasting for the first 3 days” (Grandmother, Bagalkot).

5.3.3 Accessibility and Availability of Postnatal and Newborn Care

Services

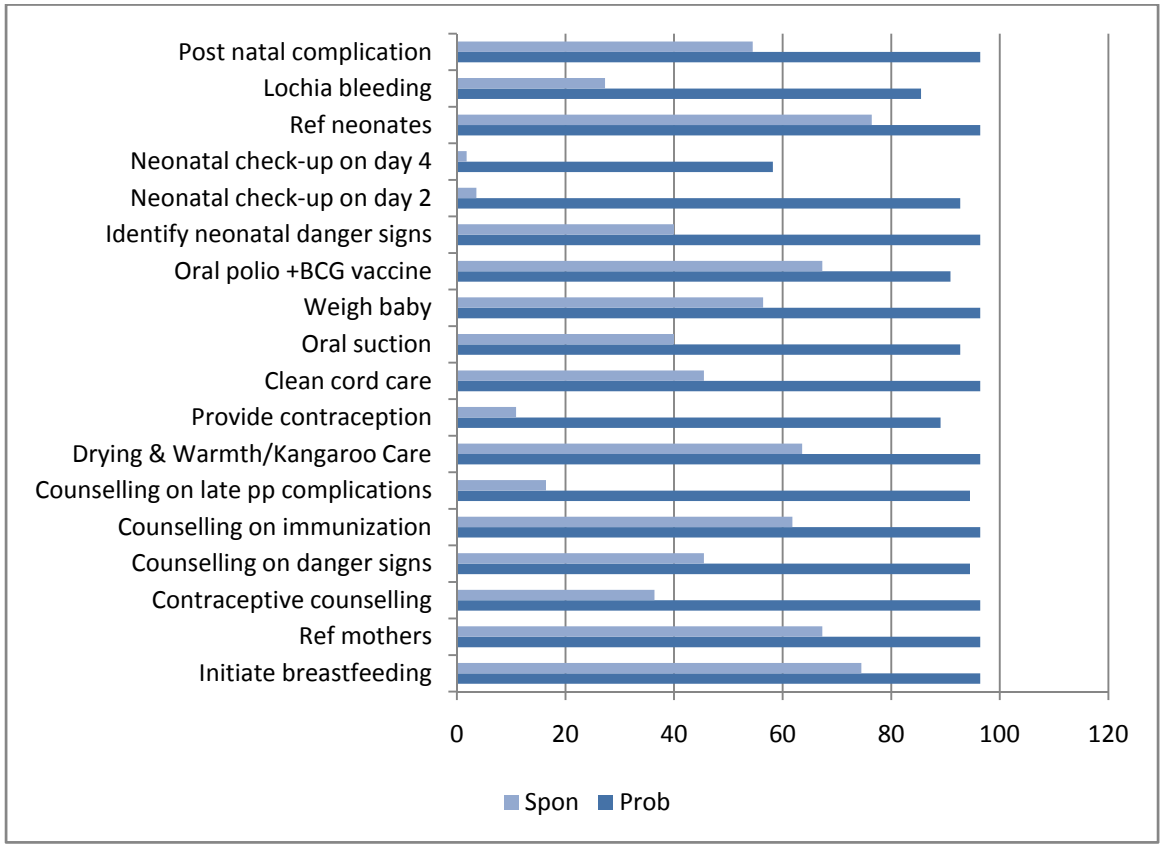
The household survey data on utilization is in accordance with the service delivery data provided by facilities, which record inadequate coverage of Day 2 and Day 4 postnatal visits, oral suction, provision of contraception, counselling on late post partum complication and danger signs in neonates, However provision is fair for initiation of breast feeding, drying warmth, kangaroo care and immunisation services (Figure 5.3.3.a). Prioritization should be given to improve postnatal visits and ensuring the delivery of critical maternal and newborn services during these visits.

Figure 5.3.3.a: Percent of SCs (n=299) reporting the availability of different components of postnatal and newborn care services, Bellary District



Data source: Mapping data

Figure 5.3.3.b: Percent of PHCs (n=55) reporting the availability of different components of postnatal and newborn care services, Bellary District



Source: Mapping data

Staffing

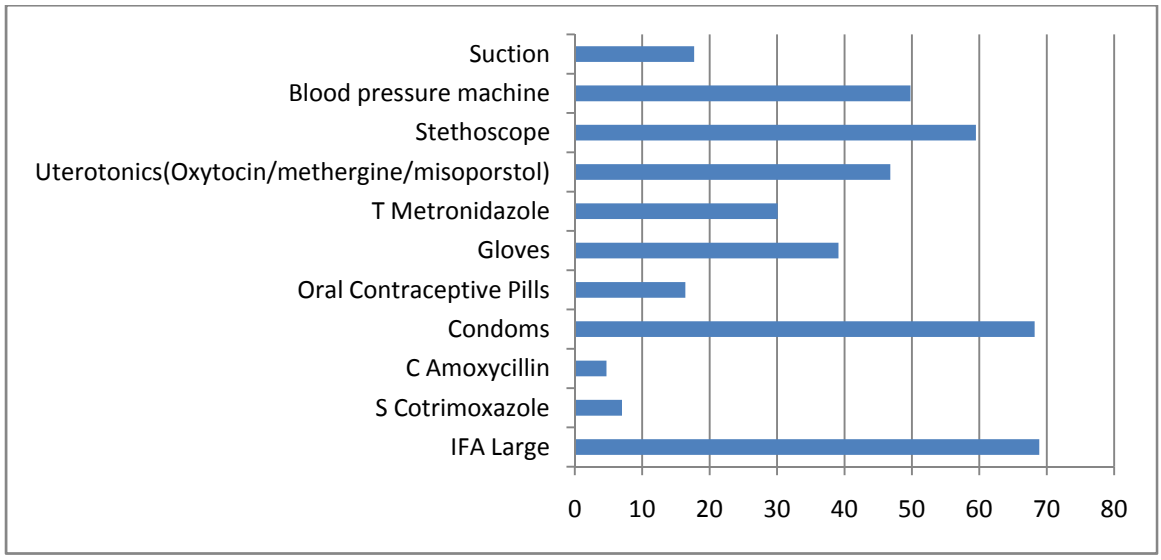
At facilities post-delivery, skilled nurses are expected to provide postnatal and newborn care services and counselling during the mother and child's stay (at PHC level and above the stay is supposed to be 48 hours).

In the community, ANMs are expected to provide visits in the home on days 1, 3, 7 and 42 for the mother and 14, 21 and 28 for the newborn. ASHAs are also expected to visit mothers and their newborns. As observed during mapping, significant overlap between the functions of ANMs and ASHAs exist, which can hamper effective delivery of post-natal and newborn care.

Equipment, Drugs and Supplies

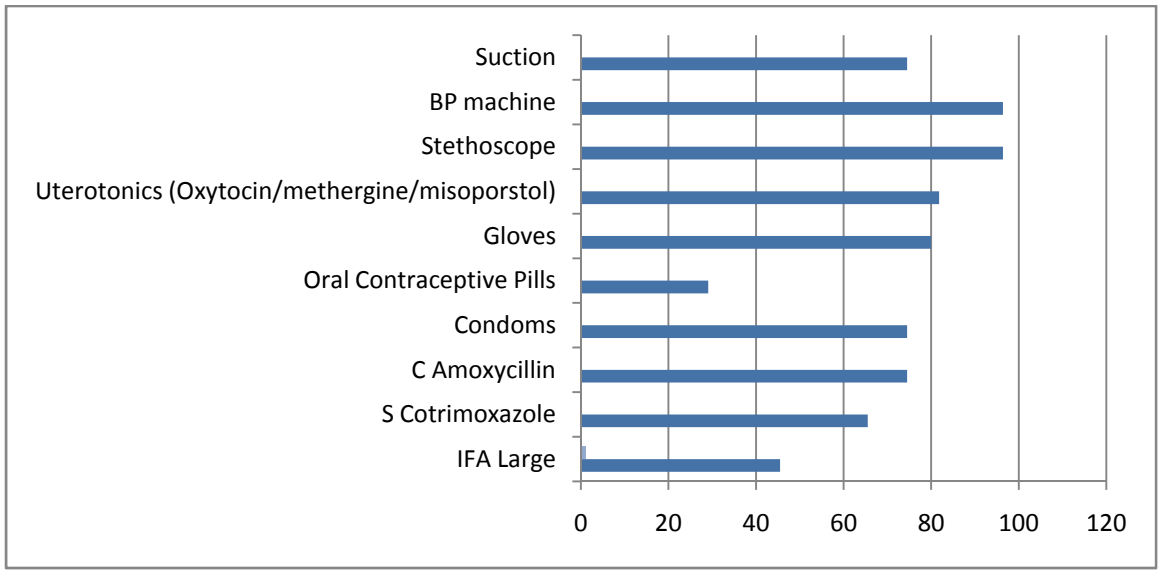
The equipment, drugs and supplies for postnatal and newborn care at SCs are inadequate. For example, drugs such as C Amoxycillin, S Cotrimoxazole, OCP and T Metronidazone and equipments such as suction and BP machines are available at only 50% of sub-centers.

Figure 5.3.3.c: Percent of SCs with Drugs and Equipment for Postnatal and Newborn Care (n=299)



Data source: Mapping data

Figure 5.3.3.c: Percentage of PHCs with Drugs and Equipment for Postnatal and Newborn Care (n=55)



Data source: Mapping data

5.3.4 Service Provider Competencies to Offer Quality Post Natal and Newborn Care

ANMs are required to provide postnatal care to the mother and the newborn after delivery. According to the NRHM guidelines two visits should be within the first week to help identify early any complications like PPH and infection in mothers, any problems with feeding, cord infection or jaundice in newborns and provide advice or refer the mother and/or child. For high risk babies for example low birth weight or premature babies, ANMs are to provide 4-6 home visits. The postnatal visits should continue throughout the 6 weeks of postnatal period. [55]

Knowledge

ANMs were given a knowledge test on the key components of maternal and newborn care necessary to manage during the postnatal period with questions relating to; physical examination essential for the postpartum visits; days of visits; and danger signs (see table 5.3.4.a). Key gaps were seen for the questions about involution of uterus by the 10th day after delivery and danger signs of the postpartum period.

Table 5.3.4.a: Percent of correct answers by providers on community based postnatal care knowledge questionnaire

	ANM (n=482)
Number of SBA postpartum visits mother should receive after delivery	64.3
Involution or height of the uterus by the 10th day after delivery	22.8
Nutrition for the lactating mother	60.6
Danger signs of postnatal period and when to seek care	45.9

Data source: Service Provider Assessments

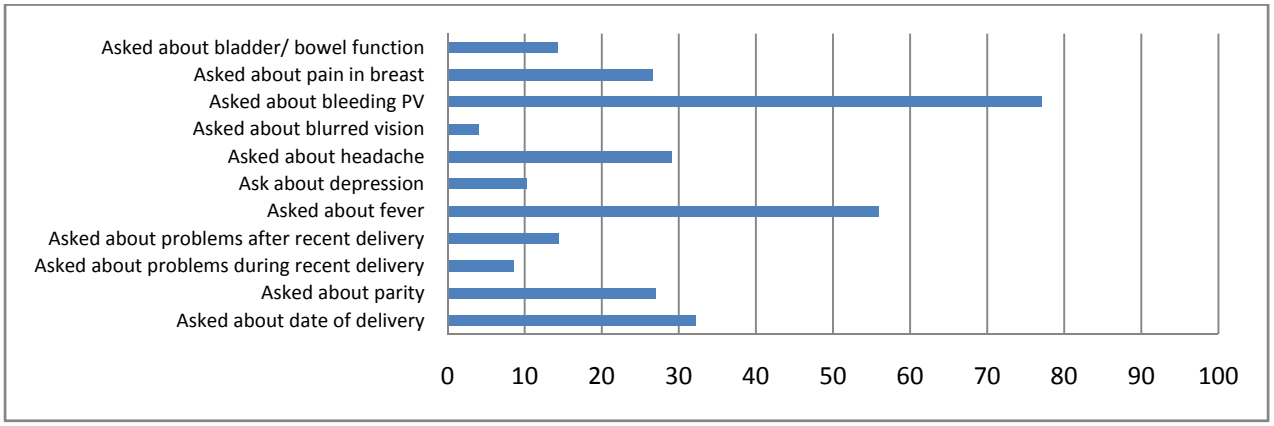
Skills and Practice

To assess the quality of care provided during postnatal home visits, direct observations of ANMs conducting postnatal visits to recently delivered women at the community level were carried out.

The postnatal home visits observed during the assessments occurred within the first week of birth but not necessarily at the recommended interval within the first week. Gaps were observed in eliciting of history of the recently delivered mothers. Other than the history of fever and vaginal bleeding, less than 40% enquired about any other complaints related to the danger signs of eclampsia, breast abscess or sepsis (figure 5.4.3.a). Here it is important to take into account that AMNs may not ask about date of delivery or parity since they may already know the woman's particulars.

[55] National Rural Health Mission, Ministry of Health and Family Welfare, Government of India, 2010. *Operational Guidelines on Maternal and Newborn Health*, Delhi.

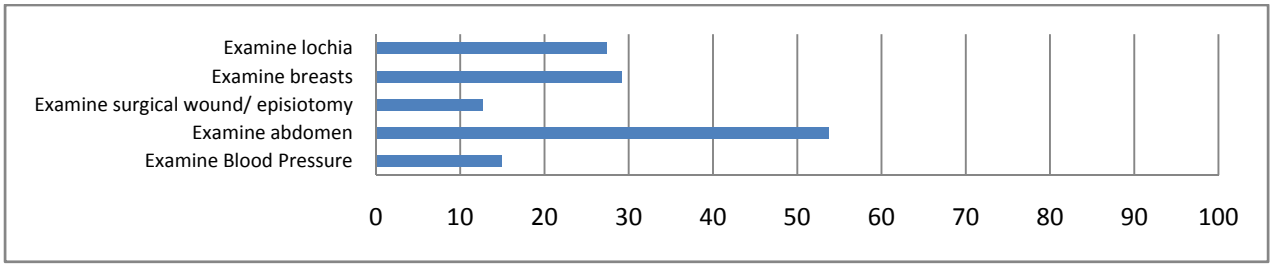
Figure 5.3.4.a: Percent of providers eliciting components of history taking during direct observation of postnatal home visit (N=175)



Data source: Service Provider Assessments

Key gaps were also observed in performing focussed postnatal examination. Except for abdominal examination, ANMs did not carry out any of the other components of breast examination, BP checking, inspection of surgical wound and lochia examination, which are important in detection of danger signs (Figure 5.3.4.b).

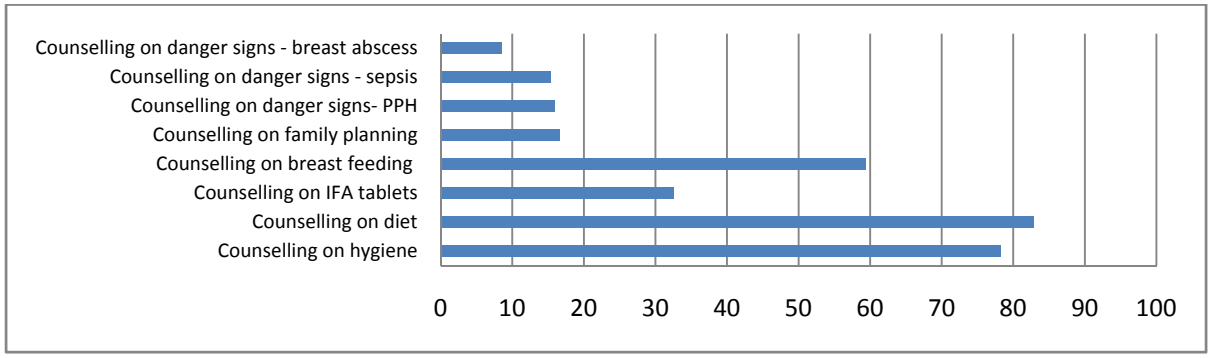
Figure 5.3.4.b: Percent of providers delivering components of physical examination during direct observation of postnatal home visit (N=175)



Data source: Service Provider Assessments

Counselling of mothers and family members regarding the care of the mother and child was also noted to be deficient, especially pertaining to intake and side effects of IFA, danger signs of the postnatal period and family planning (Figure 5.3.4.c).

Figure 5.3.4.c: Direct observation of postnatal home visits: Percent of providers delivering components of counselling (N=175)

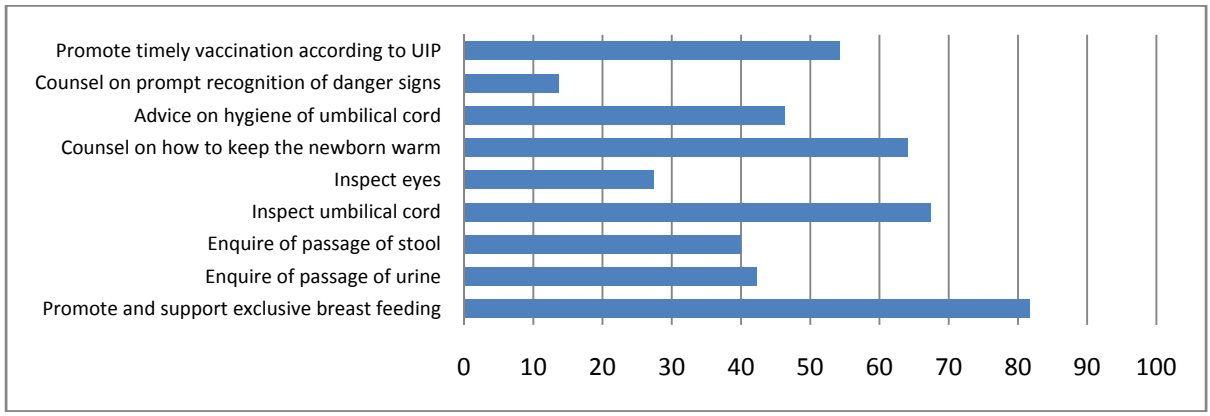


Data source: Service Provider Assessments

Newborn care

Gaps were observed in eliciting the history of passage of urine and stool, physical examination of the baby and counselling (Figure 5.3.4.d). While providers gave advice for the mother and newborn, the advice provided was often not sufficiently comprehensive, especially about danger signs for the mother and newborn (in accordance with the DLHS 2007-8 data in the *Utilization* section). Providers were more likely to counsel about hygiene, nutrition and emphasize cord care, warmth and exclusive breastfeeding for the newborns.

Figure 5.3.4.d: Direct observation of postnatal home visits: Percent of providers delivering components of newborn care (N=175)



Data source: Service Provider Assessments

Demonstration of breastfeeding counselling

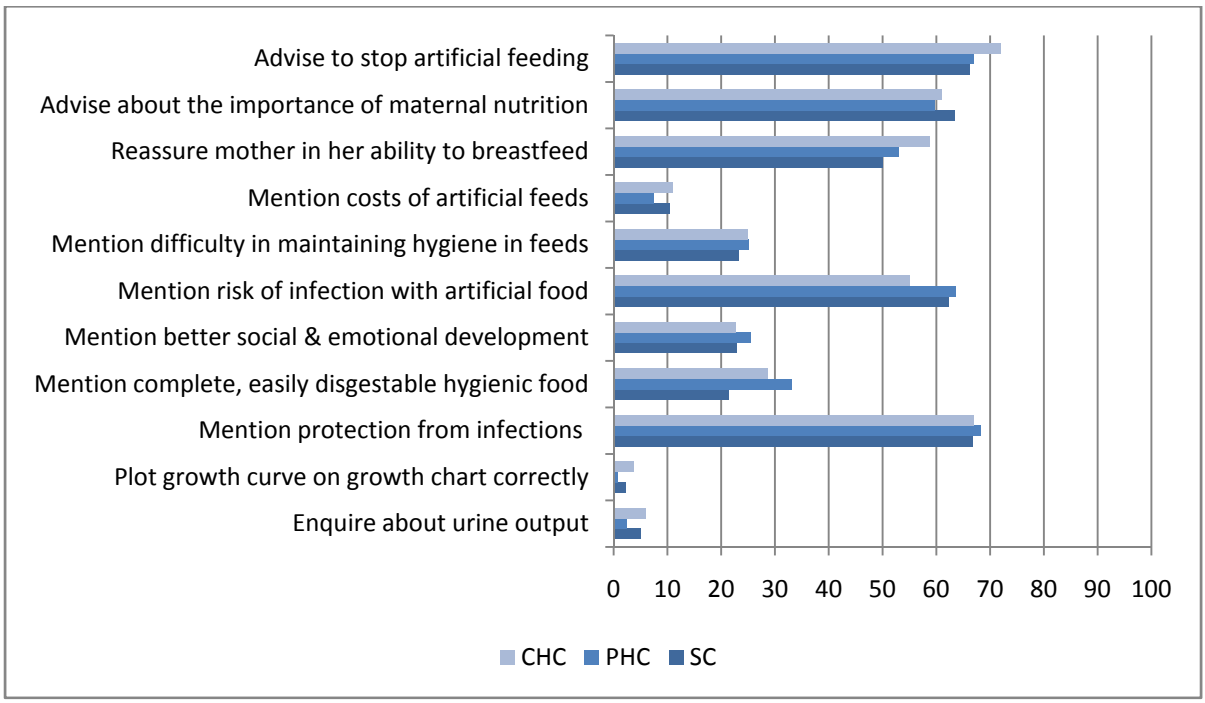
Demonstration of breast feeding counselling were conducted at 480 SCs (with ANMs) and at 455 PHCs, higher facilities and Private hospitals (with SNs), by giving the health care provider a case scenario where a mother, enacted by the field investigator, has to be counselled for breast feeding her 6 week old baby.

Less than 5% of the ANMs (total 455) and Staff Nurses (total 244) attempted to verify whether the baby was being breastfed adequately or if the baby was growing well. Gaps were observed in enquiring about

urine output and reassuring the mother about the baby's growth. Other than explaining about protection from infections (pneumonia, diarrhoea), few ANMs and staff nurses could explain any other benefits of exclusive breastfeeding.

Skills of breast feeding counselling in medical officers and AYUSH doctors were similar to nurses, and all were deficient, which denotes a need for training for all cadres of staff in this care component (Figure 5.3.4.e).

Figure 5.3.4.e: Percent of providers who delivered appropriate counselling components regarding breastfeeding, by facility during breastfeeding counselling demonstration (SC=480), (PHC=239), (CHC and higher facilities =136)



Data source: Service Provider Assessment data

5.3.5 Implications for Postnatal and Newborn Care

Utilization

Increased SBA would likely increase early initiation of breastfeeding

According to DLHS 2007-8 data, only 44% of women initiate breastfeeding within one hour of giving birth with high disparities between population subgroups. If a higher number of births were attended by a skilled attendant who counselled and supported women to immediately breastfeed, this rate would increase and strengthen newborn health and survival.

If women who have institutional births stay in facilities longer, it's easier to provide the requisite post-natal care

Prioritize the stay of women delivered at facilities to stay at least for 48 hours through variety of mechanisms including increasing quality of care, addressing facility level issues that affect women's desire to stay for 48 hours after delivery (provision of meals, making facilities woman and family friendly, improve sanitation), and implementing the payment of the JSY incentives linked to the stay in the facility for 48 hours post partum.

Access and Availability

Improve referral systems and facility linkages to increase post natal visits in the home

Develop innovative methods of communication (e.g. use of mobile phones) between higher level facilities and the community, to enable the ANMs to provide community level post-natal and newborn care services. Additionally, include post-natal visits as a part of the JSY package.

Increase care at the community level

The postnatal period is crucial for both the mother and the newborn, since morbidity and mortality of both the mother and child is linked to complications that arise during this period.[56] The quality of care has to be improved at the community level to improve the status of maternal and neonatal health.

While this assessment did not cover the competencies of ASHAs to support postnatal and newborn care, her role is also important in providing counselling and supporting ANMs to carry out recommended guidelines for postnatal and newborn visits.

Provider Competencies for Delivering Quality Postnatal and Newborn Care

[56] WHO, UNICEF 2010, *Countdown to 2015 Decade Report: Taking Stock of Maternal, Newborn and Child Survival*, Geneva.

Improve provider capacities for postnatal care

The assessment also points to the need to improve provider's capacity to provide postnatal and newborn care services. Providers lack knowledge and skills to conduct physical exams, detect and treat complications and offer counselling and advice. Enhancing these skills is especially critical for ANMs who are tasked with providing postnatal home visits.

5.4 Essential Newborn Care and Child Health

Neonatal mortality in Bellary is about 65 deaths per 1000 live births. In India neonatal mortality accounts for 55% of deaths for children under 5; three quarters of all neonatal deaths occur during the first week of life; and about 20% occur within the first 24 hours (2008 data)[57]. This is also the period when most maternal deaths occur. This section provides an overview of the guidelines, a description of utilization patterns including socio-cultural factors, an analysis of availability and accessibility of services, an assessment of service provider competencies, and a summary of implications for essential newborn and child health care. The focus of this section is on facility and community based care.

Key points:

- Provision of essential newborn care in the facility is satisfactory
- Knowledge of newborn danger signs is relatively high in Bellary, 11% of women know all newborn danger signs, compared to 6% in the project districts and 8% in the state. However, this is not high enough.
- The percent of children under 3 years of age who received a check up within 24 hours of birth in rural Bellary is 43%, low compared to the project districts' rate of 50%, with wide disparities between population sub-groups
- Few providers are following IMNCI protocols to manage sick children
- Providers lack the skills and knowledge to provide growth monitoring or counselling on childhood nutrition

5.4.1 Guidelines for Essential Newborn and Child Care

The guidelines for essential newborn services are provided in the table below (table 5.4.1.a). For child health, the availability of services, drugs and equipment required to treat the primary causes of infant and under-five mortality are listed, to assess system readiness in achieving the national goals of mortality reduction.

[57] WHO, UNICEF 2010, *Countdown to 2015 Decade Report: Taking Stock of Maternal, Newborn and Child Survival*, Geneva.

Table 5.4.1.a: Essential Newborn Services: three levels of service delivery

Level 1	Level 2	Level 3
• Neonatal resuscitation • Keeping baby warm • Infection prevention • Initiate immediate breastfeeding • Weighing of newborn • Clean cord care • Identification, management and referral of sick neonates, LBW and pre-term newborns • Screening for congenital anomalies • Immunization at day 0 (OPV and BCG)	**Level 1 services +** • Antenatal corticosteroids to the mother in case of pre-term babies to prevent Respiratory Distress Syndrome (RDS) • Immediate care of LBW newborns (>1800 gms) • Vitamin K for premature babies	**Level 2 services +** • Care of LBS newborns (<1800 gms) • Care of sick newborns

5.4.2 Utilization of Essential Newborn and Child Care

Understandings of Newborn Illnesses

The qualitative assessment revealed understandings of newborn illness, treatment and causes. The reported illnesses that affect the neonate were colds, fevers, coughs, throat infections, stomach ache and constipation. Medical treatment was sought for most of these conditions, but respondents also indicated that they purchased drugs at shops without seeking medical advice first. Home remedies were also used to treat the above conditions.

Newborns are susceptible to the evil eye (*Nedaru/Nadar/Drishti/Nazar*). Signs that the baby is afflicted by the evil eye include fever, crying, discomfort and "troubling over silly things", not breastfeeding properly and irritability (kiri kiri). Causes of evil eye include someone wishing ill upon a newborn, someone whose vision is not correct staring at the baby "with exaggeration" and thinking the baby is good looking, and a "wind evil" brought into the house. Ways to prevent evil eye are not allowing people from outside to hold the baby and washing one's hands and feet upon entering the home (in the case of "wind evil").

Furthermore, women are not aware of newborn danger signs to know when to seek care for their baby. Knowledge of all danger signs for rural women is only 8%. Overall in the district, 11% of women know all danger signs, compared to 6% in the project districts and 8% in the state (table 25, appendix). Community based workers (ANMs, ASHAs) have a strong role to play here in increasing awareness.

Newborn Visits and Care Seeking in the Postnatal Period

According to DLHS 2007-8 data, the percent of children under 3 years of age who received a check up within 24 hours of birth in rural Bellary is 43%, low compared to the project districts' rate of 50% (see table 23, appendix). There are wide disparities between population subgroups; only 42% of scheduled

castes and tribes received a check up compared to 62% of the rest of the population; only 37% of the poor receive a check up compared to 61% of the non-poor (see table 23, appendix). The private sector is providing most of the newborn care; 39% of rural children in Bellary district received a check-up from a private hospital or clinic, while only 5% received a home visit from an ANM (see table 24, appendix).

The 2009 CES indicates improvements in newborn care with 83% of newborns having received a check up within 24 hours after birth in the state of Karnataka. As this is higher than the DLHS 2007-8 state rate (66%), this indicates a general increase in checkups over time, and we can also expect the numbers to have increased in Gulbarga between 2007 and 2009.

Childhood Vaccination and Care

According to DLHS 2007-8 data, full vaccination rates in Bellary district are low at 65%, compared to the state rate of 77%, with large disparities between SC/ST and other populations (table 26, appendix). Additionally, most vaccinations (41%) occur in Govt. facilities, with only 8% occurring in the private sector – a reversal of the pattern for most other care components. In rural Bellary, 69% of vaccinations occur in the *anganwadi* centres administered by ANMs (table 27, appendix). This 2007-8 DLHS data is in contrast with the HMIS 2009-10 data which records 83% of children being fully vaccinated. Worryingly, among those who did not vaccinate their child, 32% said this was because they were not aware of the need (16% at the regional level, 144 people) (table 30, appendix).

Incidence of diarrhoea and care seeking

In rural Bellary, household access to potable water is often a challenge, leading to a high incidence of diarrheal diseases and contributing to high rates of child malnutrition (according to NFHS-3, 44% of children under five in Karnataka are stunted). For this reason, it is important to review incidence of diarrheal disease in Bellary district. According to DLHS 2007-8 data, 9% of children suffered from diarrhoea in the two-weeks prior to data collection, with the non-poor having a higher incidence (11%) than the poor (3%). Incidence is only marginally lower in Bellary district (9%) than in the project districts (11%) or the state (10%). In roughly half the cases ORS was administered, and again ORS was more likely to be administered among the poor and rural as compared to non-poor and urban, respectively. A large disparity in ORS administration also existed between SC/ST and other population groups (32% Vs 60%). As with other care components, most mothers sought care in the private sector; in Bellary district 24% of mothers with a sick child sought care in the public sector, and 71% sought care in the private sector (see table 29, appendix).

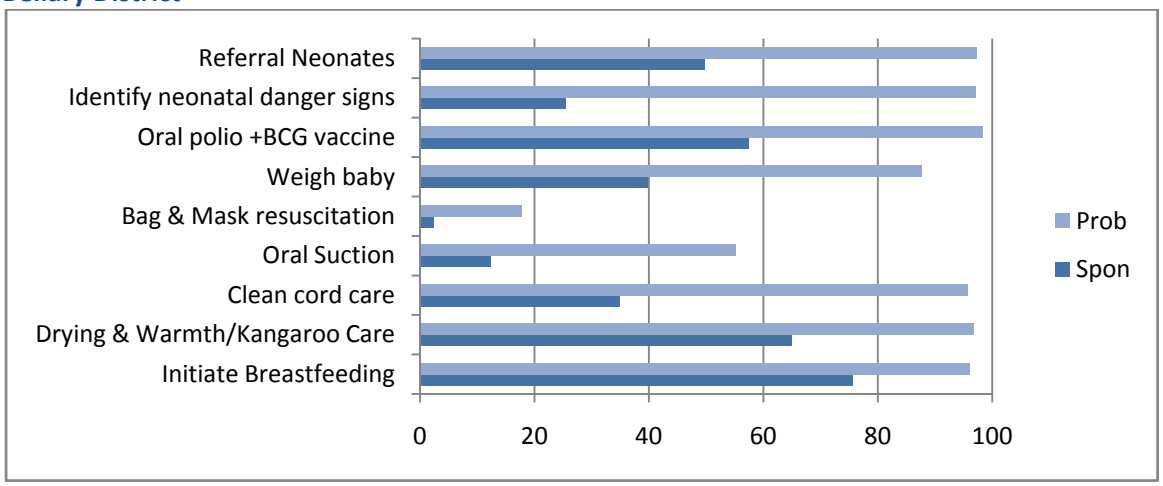
Incidence of ARI and care seeking

According to DLHS 2007-8 data, 33% of children in Bellary district experienced symptoms of acute respiratory infection (ARI – cough, fever, rapid breathing) two weeks before the survey (338 children). Of these children, 68% received treatment, of which 69% was in the private sector (see table 30, appendix).

5.4.3 Availability and Accessibility of Essential Newborn and Child Care

All levels of health facilities report gaps in essential newborn care service delivery, a challenge for the system in the face of specialist staff shortages. The availability of newborn care components is depicted in figure 5.4.3.a and 5.4.3.b. Except for initiation of breast feeding and keeping the baby dry and warm the availability of all components of new born care is inadequate in SCs and PHCs. The biggest gaps are around the life saving services such as resuscitation (CPR, bag and mask) and oral suction.

Figure 5.4.3.a: Percent of SCs (n=299) with the availability of specific essential newborn care services, Bellary District

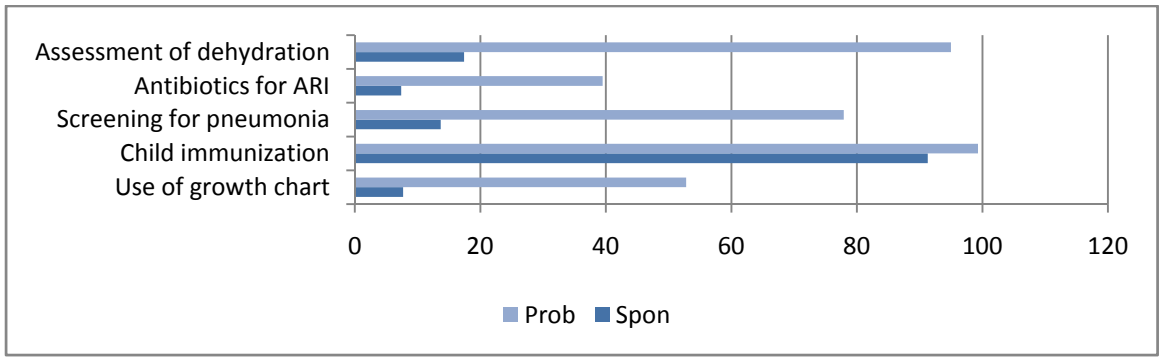


Data source: Mapping data

Availability of child health services are similarly inadequate at the SC level (figure 5.4.3.b). Less than 5% of facilities report all care components as available, and only immunization (in 92% of SCs) is commonly reported as available. Of particular concern is the low level of assessment for dehydration, use of growth chart, antibiotics for pneumonia (ARI) and screening for pneumonia.

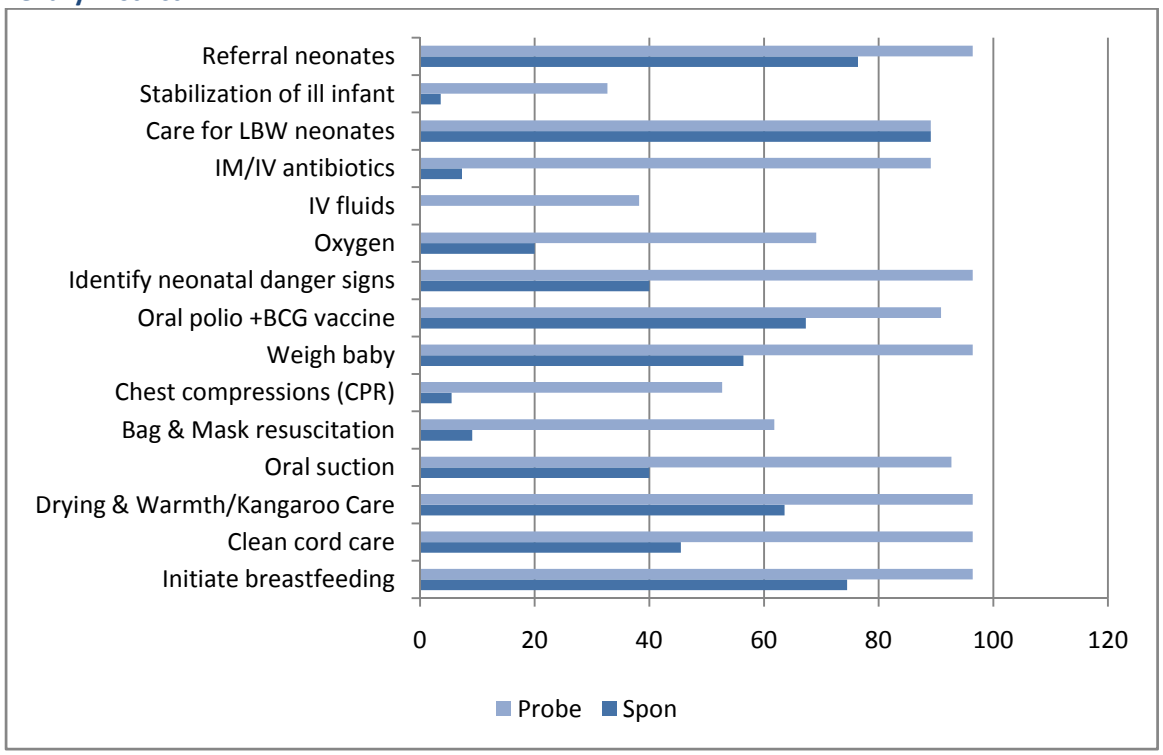
Availability of child health services is better at the PHC level than the SC level. Except for immunization, keeping the baby warm and care for LBW neonates, most care components are under-reported (figure 5.4.3.c).

Figure 5.4.3.b: Percent of SCs with child health care services available (n=299)



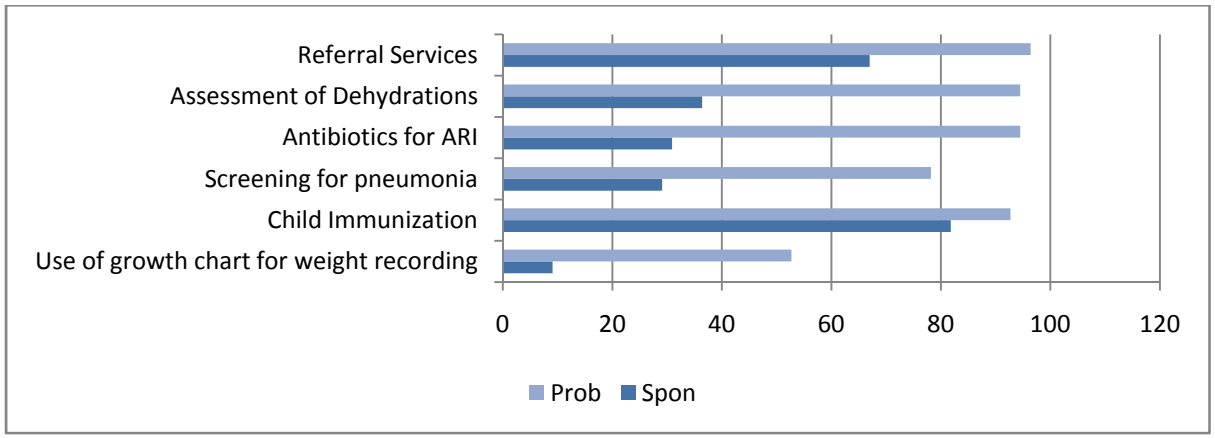
Data source: Mapping data

Figure 5.4.3.c: Percent of PHCs (n=55) with the availability of specific essential newborn care services, Bellary District



Data source: Mapping data

Figure 5.4.3.d Percent of PHCs where child health care services available (n=55)



Data source: Mapping data

The essential newborn care services reported by providers to be available are more comprehensive and more readily available at the CHC and higher facilities, but gaps were observed in the provision of IV fluids, provision of antibiotics, and stabilization of ill infants is lacking in many facilities.(table5.4.3.c)

As with other care components, higher level facilities provide a more comprehensive range of child health services, with immunizations being the highest reported service component. Very few facilities offer management of shock, although most refer (Figure.5.4.3.c and 5.4.3.d).

Staffing

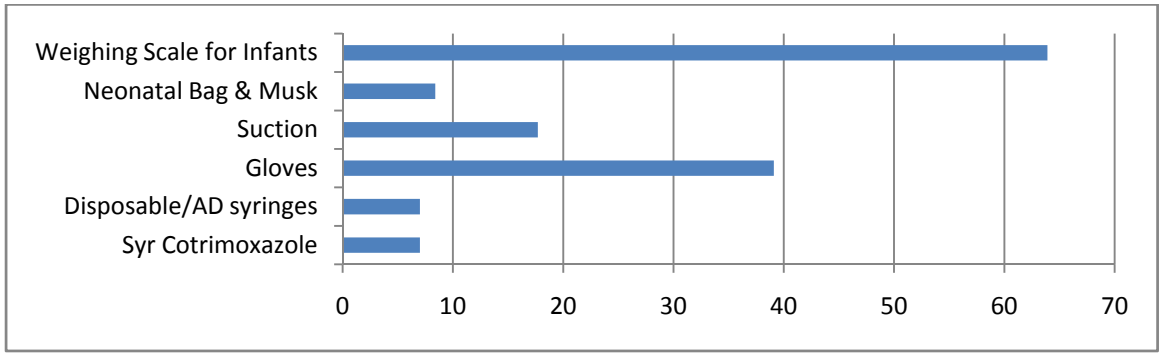
As noted earlier, at the PHC level MOs and SNs are expected to be trained in IMNCI and be able to diagnose and treat common childhood illnesses. ANMs are expected to be trained in IMNCI as well as to identify, treat mild cases, and/or refer sick children at the community level. ANMs are the cadre with the highest rate of training in IMCI, 79% of ANMs in the project districts are trained in IMCI, compared to 61% of SNs and 53% of MOs (see table 2.5.1, in the Human Resource Systems and Training section). The fact that ANMs are trained, but higher level cadres are less likely to be trained, means ANMs skills are likely not reinforced through supervision. Higher level facilities are expected to have paediatricians/neonatologists available. In the project district, only CHC and one TH has these specialist staff on board.

Equipment, Drugs and Supplies

The availability of drugs and supplies needed for the delivery of essential newborn care is good across the SCs and PHCs, except for antibiotics in SCs; and phenobarbitone, inj. diazepam, inj adrenaline and dextrose ampoules at PHCs and higher level facilities (table 5.4.3.c).

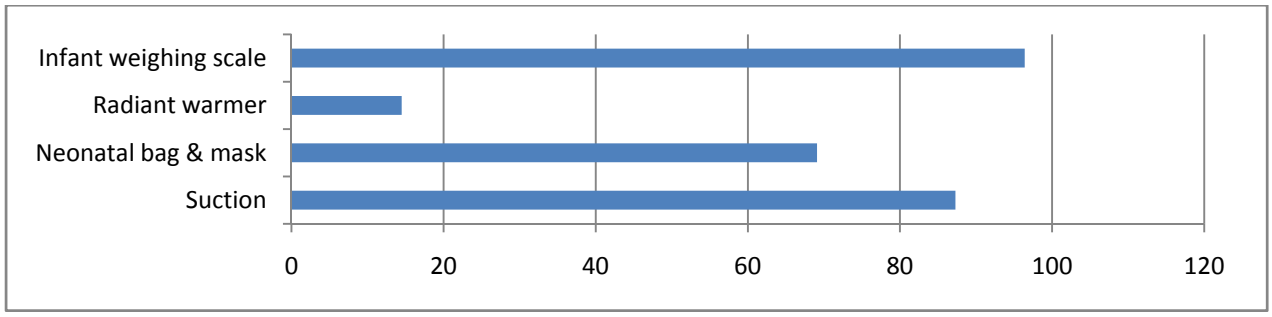
Conversely, the availability of equipment necessary for delivery essential newborn care in the SCs and PHCs is inadequate (figure 5.4.3.e and 5.4.3.f). Less than 9% of the SCs have bag and mask so they would not be able to perform newborn resuscitation if required during a home visit or SC birth. About 68% of PHCs have bag and mask available, but only 15% have a radiant warmer/incubator. The availability of equipment is equally inadequate in higher facilities (table 5.4.3.d). Key gaps include laryngoscopes, phototherapy units ; meconium aspirator and nebulizer.

Figure 5.4.3.e: Percent of Subcentres with equipment for essential newborn care (n=299)



Data source: Mapping data

Figure 5.4.3.f: Percent of PHCs with the equipment for essential newborn care (n=55)



Data source: Mapping data

Table 5.4.3.c: Percent and number of PHCs, CHCs, THs and the DH with the availability of drugs/supplies necessary for providing essential newborn care services, Bellary District

	PHC (n=55)	CHC(n=8)	TH(n=6)	DH (n=1)	Pvt hosp(n=74)
IV cannulas	40	8	5	1	50
Inj. Adrenaline	21	4	3	1	57
Inj. Phenobarbitone	8	2	1	1	46
Inj Diazepam	15	0	3	0	52
Inj Paracetamol / Diclofenac Sodium (Voveran)	50	7	4	1	51
10% or 25% Dextrose ampoules	13	6	2	1	46
Ringer Lactate / NS / DNS	52	8	6	1	51
Inj. Ampicillin	36	3	1	1	43
Inj. Gentamycin	48	7	5	1	51
Syr Cotrimoxazole	36	5	2	1	46
Inj. BCG Vaccine	46	8	6	0	29
Oral Polio Vaccine (OPV)	46	6	6	0	35

Data source: Mapping data

Table 5.4.3.d: Number of CHCs, THs and the DH with the availability of equipment for the delivery of essential newborn care services, Bellary District

	CHC(n=8)	Th(n=6)	DH (n=1)	Pvt Hosp (n=74)
Foot-operated/electrical suction	4	6	1	42
Neonatal Bag and Musk	6	4	1	48
Laryngoscope (neonatal)	1	2	1	46
Endotracheal intubation tubes (neonatal)	3	4	1	44
Meconium Aspirator	1	2	0	42
Radiant warmer/incubator	2	4	1	35
Phototherapy unit	1	2	1	31
Feeding tubes for baby	3	4	1	47
Pulse oximeter in OT	0	4	1	40
Glucometer/ Dextrosticks	4	5	1	39
Weighing Scale for Infants	8	5	1	52
Oxygen cylinder with regulator and mask	3	3	1	42

Data source: Mapping data

Facilities are much better equipped with drugs, supplies and equipment for provision of child health services. Some gaps remain, such as the nebuliser – with four CHC and three THs having one. For drugs, key gaps include injections of adrenaline, and injections of diazepam and phenobarbitone

Table 5.4.3.e: Percent of facilities with equipment for child health care

	PHC (n=55)	CHC (n=8)	TH (n=6)	DH (n=1)	Pvt hospital (n=78)
Stethoscope	96.4	100	100	100	98.6
Weighing Scale for Adults	96.4	100	100	100	95.9
Nebuliser/ MDI (Metered dose inhaler)#	-	50	50	100	59.5
Weighing Scale for Infants	96.4	100	83.3	100	70.3
Ice Lined Refrigerator (Large/Small)	89.1	100	100	100	58.1
Deep Freezer (Large/Small) / Refrigerator	87.3	100	83.3	0	50

Not asked in PHCs

Data source: Mapping data

Table 5.4.3.f: Percent of facilities with drugs for child care at PHCs and higher facilities

	PHC (n=55)	CHC (n=8)	TH (n=8)	DH (n=1)	Pvt hosp(n=78)
Syr Cotrimoxazole/Cap Amoxycillin	85.5	87.5	66.7	100	68.9
ORS Packets	96.4	100	100	100	73
Oral Polio Vaccine	83.6	75	100	0	47.3
DPT Vaccine	87.3	100	100	0	47.3
Measles Vaccine	85.5	87.5	100	0	43.2
Inj. Adrenaline	38.2	50	50	100	77
Inj. Dopamine	0.0	12.5	53.9	100	59.5
Inj. Ampicillin	65.5	37.5	16.7	100	58.1
Inj. Gentamycin	87.3	87.5	83.3	100	68.9
Inj Paracetamol	90.9	87.5	66.7	100	68.9
Ringer Lactate / NS / DNS	94.5	100	100	100	68.9
Inj Diazepam	27.3	0	50	0	70.3
Inj Phenobarbitone	14.5	25	16.7	100	62.2

Data source: Mapping data

Summary of Emergency care signal functions across all levels

Signal functions are a package of critical life-saving services. Among the sample of facilities in project districts assessed for quality of child services, signal functions related to emergency child care showed variations across facilities (table 5.4.3.g). Newborn resuscitation performance was inadequate in TH, CHCs and PHCs. Provision of nasogastric feeds, phototherapy and nebulisation was inadequate in CHCs and PHCs. Generally the district hospitals and private hospitals seemed to be performing better with provision of emergency newborn care. Private facilities were more likely to report that they had the required equipment to offer emergency child care services suggesting that it might be possible to contract with these providers to fill gaps in the public sector. The non performance of the signal functions were reported as due to reasons such as issues with drugs/equipment supplies, lack of trainings and lack of required personnel.

Table 5.4.3.g: Percent of facilities offering Emergency Child Care Signal functions:

Signal function	DH(7)	TH(33)	CHC(33)	PHC(130)	Private(78)
Perform newborn resuscitation (bag and mask)	100.0	87.9	87.9	72.3	89.7
Perform newborn resuscitation (intubation and ventilation)	85.7	30.3	30.3	22.3	64.1
Neonatal I.V Access with 22G/24G Cannula	85.7	63.6	54.5	37.7	64.1
Nasogastric feeds	85.7	57.6	27.3	34.6	67.9
Phototherapy	71.4	36.4	36.4	13.1	53.8
Nebulisation	100.0	51.5	36.4	34.6	71.8

Data source: Mapping data

5.4.4 Service Provider Competencies to Offer Essential Newborn and Child Care

This section includes newborn care at the facility and child care at facility and the community levels, under two broad sections, namely routine newborn and child care and management of sick newborn and childhood diseases. Newborn care at the community level was described in the postnatal section.

Display of protocols

Availability of specific protocols related to newborn and child care was very poor. Protocols for different care components are more likely to be displayed in the district hospital than other facility types (table 5.4.4.a). It is not clear if the presence of protocols correlate with quality of care.

Table 5.4.4.a: Percent of facilities with protocols on display

Protocol	DH(7)	TH(33)	CHC(33)	PHC(130)	SC(370)	Private(78)
Routine newborn care	14.3	15.2	19.4	15.9	0.0	1.4
Assessment & management of child with pneumonia	28.6	6.1	9.1	1.5	3.1	5.1
Assessment & management of child with diarrohea	28.6	6.1	21.2	3.1	3.8	6.4
Assessment & management of child with fever	14.3	9.1	9.1	2.3	2.8	2.6

Data source: Service Provider Assessment data

Routine Newborn and Child Care

This includes care of the newborn, breastfeeding practice, weaning of the infant known as complementary feeding, immunization and charting the baby's growth. Exclusive breastfeeding in the first 6 months of life is recommended universally by WHO to prevent neonatal and child mortality due to diarrheal illnesses, pneumonia and other infections.[58] The introduction of complementary food in infants around 6 months constitutes a crucial determinant of the child's health. Inappropriate weaning practices can cause the infant to become malnourished as well as increase the risk of gastrointestinal infections. Immunization against six major childhood illnesses is offered under the national immunization schedule and is considered mandatory for all children. Growth monitoring helps to keep track of a child's anthropometric measures like weight and height. The growth chart is a handy tool for the health provider to identify children with malnutrition at the earliest instance and thus helps initiate corrective action including supplementary feeding or medical intervention.[59]

Knowledge

The knowledge of providers in newborn and child care was tested using a questionnaire. Gaps were found in knowledge of common conditions in newborns, specific conditions in newborns, position and attachment of baby while breastfeeding and complementary feeding. A third of the providers did not

[58] See, for example: http://www.who.int/nutrition/topics/exclusive_breastfeeding/en/

[59] IAP,2007. IAP Growth Monitoring Guidelines for Children from Birth to 18 years: Indian Paediatrics 44:187-197

know the WHO recommended period of exclusive breastfeeding (six months).[60] More than 40% erroneously expressed the view that infants up to one year of age can be maintained only on milk feeds (table 5.4.4.b).

[60] For recommendations, see here: http://www.who.int/nutrition/topics/exclusive_breastfeeding/en/

Table 5.4.4.b: Percent of providers who had correct knowledge of newborn and child care

Community and facility based Routine newborn and child care	Peadiatrician (n=33)	Medical Officer(n=133)	AYUSH MO (n=35)	Staff nurse (n=234)	ANM (n=482)
Newborn care					
Breastfeeding initiation - within half hour after delivery	93.93	95.5	91.4	91.8	95.9
Frothing at the mouth of newborn baby – not normal	54.5	60.9	45.7	55.5	46.5
Baby cries even after feeding – does not mean mother has less milk	63.6	59.3	51.4	42.3	46.9
Exclusively breastfed baby with loose stools on day 5 - normal	90.9	62.4	54.2	54.2	54.8
Breastfeeding and occasional sips of water – not exclusive breast feeding	87.8	81.9	77.14	70.1	70.3
Women with flat nipples – does not mean difficulty in feeding	18.18	17.29	28.57	15.8	24.1
Pre-lacteal feeds increase the risk of sepsis	75.75	60.15	54.2	55.5	29.3
Attachment of baby during breastfeeding					
Identified correct picture of breast feeding	90.9	88.7	68.6	86.75	94.4
Chin touching the breast	81.81	81.2	80	76.06	54.8
Mouth wide open	93.9	89.4	71.4	86.3	89.8
Lower lip turned outward	78.7	81.9	80	81.6	78.6
More areola showing above than below	54.1	60.6	54.2	52.1	54.8
Specific conditions in newborn					
Birth weight 3 kg, and 2.5 kg on day 5 – not normal	63.6	34.5	34.28	43.5	53.9
First motion not passed till 24 hours – investigation required	63.6	54	60	59.8	81.7
A girl baby with bleeding per vagina on day 5 – investigation not required	81.8	54.8	48.6	38.8	26.3
Umbilical hernia – surgery not mandatory	93.9	75.18	62.8	47.8	48.5
CHILD CARE - Complementary feeding					
Exclusive breast feeds - till 6 months	75.75	84.2	80	78.2	80.5
Complementary feeds to be started – at 6 months	78.78	77.4	65.7	71.79	79.0
Mother can continue breast feeds - till 24 months	54.54	45.8	37.14	42.3	28.6
Semi-solid feeds for 9 month baby - 2 to 3 per day	27.27	38.3	34.2	42.3	42.7
Giving only milk feeds till one year of age – not correct	87.87	72.9	54.2	71.36	96.1
Adult type of food (family food) start by – 12 months	69.69	33.83	34.2	35.89	40.2

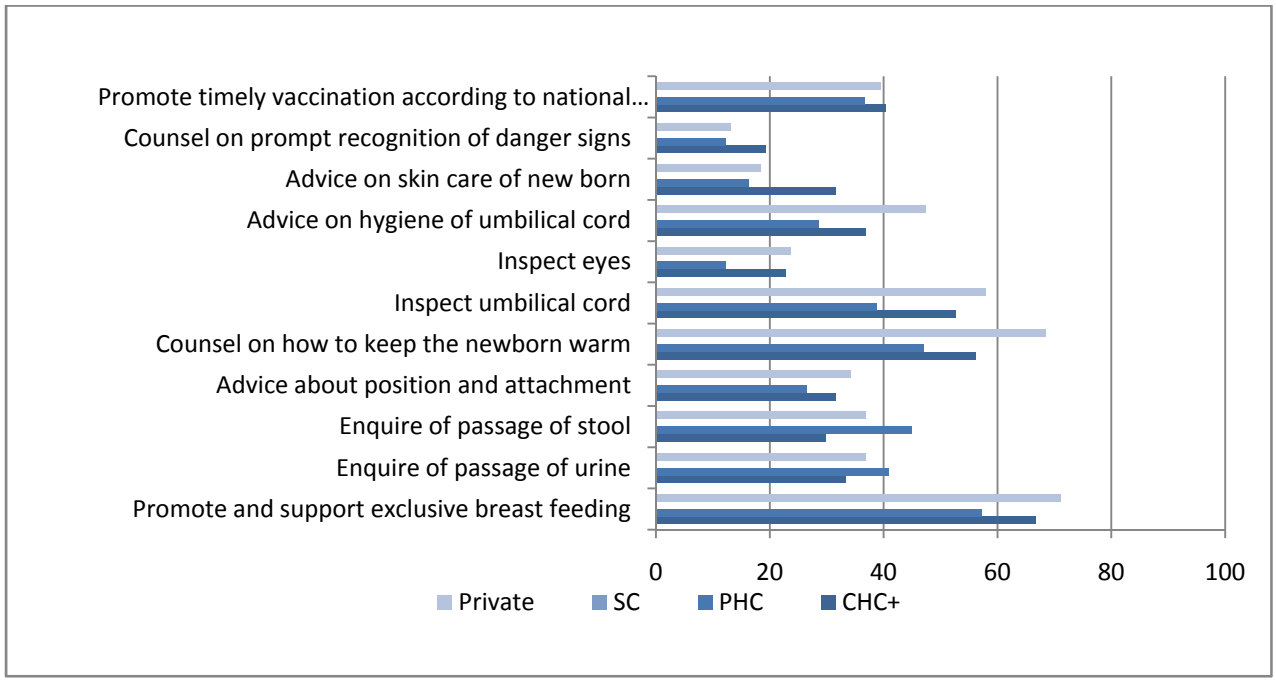
Data source: Service Provider Assessment data

Skills and Practice

Post natal checkups at facilities

Direct observations of postnatal checkups at facilities (n=145) revealed that the quality of service provision was inadequate. Providers were found to be lacking in history taking, examination of the newborn, counselling on care of the newborn and danger signs. Teaching parents to recognize danger signs in the neonate was accorded low priority, with only 15% of parents receiving such information (hence the low level of knowledge of danger signs found in the DLHS 2007-8). No appreciable differences in practices could be observed between the different cadres of staff and between private and public hospitals (Figure 5.4.4.a).

Figure 5.4.4.a: Percent of newborns receiving care components during a direct observation of a post-natal check up (PHC 49, CHC and higher 58, Private 38)



Data source: Provider Assessment data

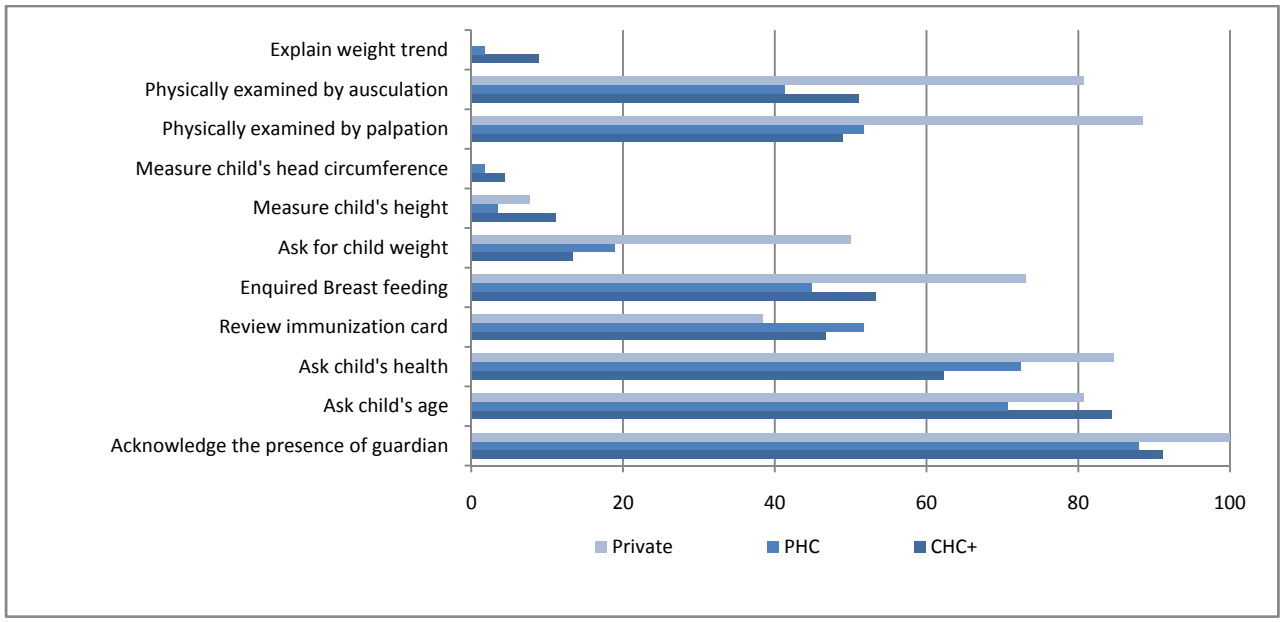
Direct observation: Well baby clinic

A well baby clinic is organized in every health centre and hospital, usually simultaneously with the immunization session. The *Sukshema* project conducted 129 direct observations of well baby visits at PHCs and higher facilities and 132 at sub centres. At SCs, history taking and reviewing immunization status was fair (60-70%) but enquiring about breastfeeding was low at 43.9%. Physical examinations were poorly performed for all components like height, weight, palpation etc. Less than 50% AMNs provided any information for nutrition or any appointment date for subsequent visits.

At PHCs (58), higher facilities (45) and private facilities (26), providers reviewed the immunization history of the child or feeding patterns only in half the children and asked for a weight measurement in

less than a quarter. Private providers more commonly weighed children (50%), and performed much better in physical examination. Growth monitoring by all providers is non-existent (Figure 5.4.4.b).

Figure 5.4.4.b: Percent of providers who conducted components of physical examination and investigations during direct observation of well baby clinic (N=129)



Data source: Service Provider Assessment data

Demonstration of weight measurement

Since accurate recording of the weight of a baby at birth is a vital part of neonatal management during, 122 staff nurses were asked to demonstrate the steps involved in weighing a baby, using a rag doll (or a neonate wherever available, with parental permission). About 50% of the nurses did not check for zero error or tare the scale after placing a cloth on the pan. About 13% nurses recorded the weight even when the reading was still not stable. The performance was comparatively better among nurses from the CHCs and other higher level facilities.

Demonstration of temperature measurement

Temperature monitoring is another important element of in-hospital care of neonates and children. A sample of 126 SNs were asked to demonstrate the steps in measuring the temperature of a newborn. 60% of the SNs chose a wrong spot (other than the axilla) to record the temperature and 87% of the SNs removed the thermometer before the mandatory three minutes. Nurses from private hospitals performed better.

Demonstration of intramuscular injection

A total of 475 ANMs and 435 nurses (PHCs and above) were requested to demonstrate stepwise, the intramuscular injection of 0.5 ml of a drug to a 12 month old child. Of the ANMs and nurses assessed, between 5-7% chose an inappropriate syringe and/or needle for administering the dose. The correct site on the child's body for the injection was not known by providers and 12-14% chose incorrectly (other

than antero-lateral or lateral aspect of thigh) to administer the injection. The technique was better understood, 64% ANMs and 73% nurses inserted the needle using the correct technique (perpendicularly, holding down on the thigh) and 46% ANMs and 71% nurses checked the position by withdrawing the plunger before pushing it down to give the injection. Incorrect techniques of administering intramuscular injections were observed more frequently in ANMs than in nurses.

Demonstration of growth charting

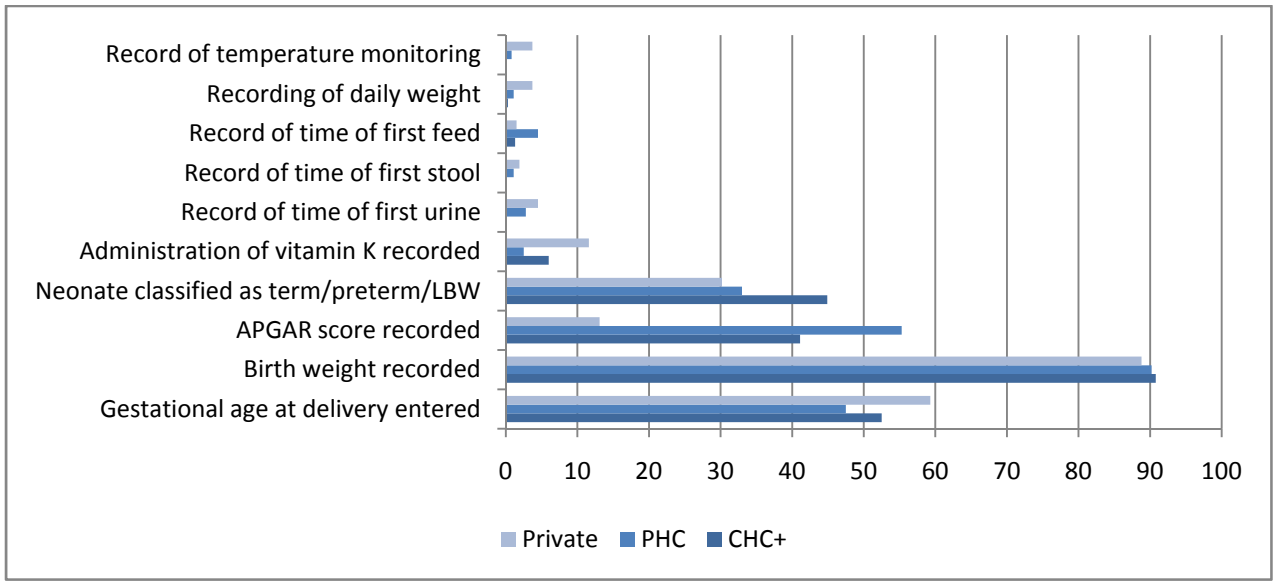
Filling out growth charts is typically the task of *anganwadi* workers, however, ANMS are also supposed to be able to read and plot a growth chart. To assess if the staff in the health sector possessed adequate growth charting skills, 235 ANMs and 227 nurses were requested to plot growth charts for the preconceived growth patterns of two children; a 6 month girl who has been gaining weight normally and a 7 month old boy who has faltered growth from the fifth month onwards. The lack of practice in plotting showed, only 45.5% ANMs and 49.5% nurses plotted weights along the y axis, and the age along the x axis. Additionally, only 41.3% ANMs and 61% nurses had joined the weight points by a line to trace the growth curve of the child. As few as 25.5% ANMs and 33% SNs identified if weight is normal or low weight for age (as indicated by the low weight for age line on the "Road to Health" chart).

Documentation

Newborn clinical records

A total of 942 records from PHCs and higher facilities were examined. It was found that other than birth weight, all other parameters were documented poorly. Less than 40% of the neonatal records classify the baby as term or preterm. APGAR scores were recorded in less than 40% of the records. The completeness of records was better in the private hospitals, while among public sector, district hospitals fared better (figure 5.4.4.c).

Figure 5.4.4.c: Percent of records with components of newborn care (N=942)



Immunization card

The immunization card is a record that a child has received a vaccine, including the time of administering the vaccine. These are generally filled up at the sub centre or in the community by the ANMs as they provide immunizations. Among the 873 immunization cards reviewed, other than date of birth and name of the baby, no other parameter was filled appropriately for age. Among children aged less than 6 months, only 17% had received the third dose of OPV and DPT vaccines at the appropriate age of 14-16 weeks, by 16-20 weeks 32% received it, and after 20 weeks, 51% (all children received it eventually). Among children aged 1 year or less, only 21% had received a measles vaccine at 9 months (appropriate age), 64% at 9 to 12 months and 15% after 12 months (all children received it eventually). Information on administration of six monthly vitamin A doses in children aged 10 months or more was only recorded in 34% of cases.

Growth Chart

The *Sukshema* project conducted 413 audits of growth charts of children at the sub-centre level. None of the ANMs were maintaining growth charts for children under their purview, despite such cards having been distributed, as growth monitoring is traditionally considered the duty of the *anganwadi* worker. Hence ICDS growth charts maintained by the *anganwadi* worker were examined. Of the cards reviewed, 70% documented the child's date of birth along the '0' time line on X and 65% had weights plotted on Y axis correctly, but in only 24% cards all plotted points were joint by a line, which shows incomplete documentation.

Management of Sick Newborns and Childhood Illnesses

Neonates who are born preterm, small for gestational age (SGA) or have other conditions, require specialized care in addition to the essential care advocated for all newborns. Health providers at all levels should be aware of the complications that can occur in preterm and SGA babies, so that timely management and referral services can be instituted.

Knowledge

Gaps were observed in the knowledge of nurses and medical officers, AYUSH doctors and specialists, relating to resuscitation of sick newborn, doses of epinephrine and care of a low birth weight baby (table 5.4.4.c).

Table 5.4.4.c: Percent of providers with correct knowledge of sick newborn and childhood illnesses

Knowledge Sick newborn	Paediatrician (n=33)	Medical Officer (n=133)	Ayush MO (n=35)	Staff nurse (n=234)
Sick Newborn Care				
Baby does not respond to stimulation – Ventilation	60.6	28	31.4	11.9
In high risk delivery , two skilled persons are required for resuscitation & management	72.72	48	48.5	42.7
In meconium stained amniotic fluid baby - indications for tracheal suction	27.27	33	34.3	26.9
After stimulation and suction of a newborn, apnoea continues - Give positive pressure ventilation	75.75	45	57	30.7
Self inflating bag with oxygen source but no reserve – contains 40% oxygen	39.3	30.8	20	26.4
Using self-inflating bag to ventilate a baby - causes of no observable change	51.5	23.3	20	18.3
Correct depth of chest compressions in a newborn	57.57	43.6	34.28	27.3
Correct doses of Epinephrine, an emergency drug	18.18	15.03	5.7	7.69
Low birth weight baby (1.9kg baby born at 38weeks, by normal delivery)				
Classify the neonate – Term, LBW, SGA	66.6	45.8	42.8	35.4
Problems to monitor for – hypothermia, hypoglycemia	93.9	89.4	82.8	82.4
If blood sugar 35mg/dl , treatment -feed baby and repeat blood sugar	48.8	42.4	40	38
Advice on care of LBW baby	93.9	93.9	94.2	86.3

Case Study: Sick newborn

A case study of a 10 day old baby with cough and poor feeding of one day duration was administered to 478 ANMs, where they were asked to assess and note the management of the sick baby. History of convulsions was elicited by only 9% of providers. Assessment of the respiratory rate and chest in-drawing was at 50% but checking for nasal flaring and bulging fontanelle or boils was poor. Just 23.6% ANMs could classify the case as a possible serious bacterial infection. Only 27.2% ANMs gave a first dose of antibiotics. Though 73.6% advised immediate referral, only 40% suggested writing a referral note, 28% gave oral feeds to the baby before transferring and 42.5 % advised the mother to keep the baby warm during transfer.

Case study: Diarrhoea

Use of a clinical vignette of a child with diarrhoea with some dehydration revealed that knowledge on management of this common condition was inadequate among providers. Almost none of the providers

could list all the features that would permit identification of a seriously ill child (only 1% could) or grade the severity of dehydration (2% could) at the initial assessment. Diagnoses were also inadequate, 60% of providers offered an incorrect diagnosis (other than diarrhoea/gastroenteritis) while over 55% did not grade the dehydration correctly (moderate/some). Only 30% of providers incorrectly recommended treatment of the child on an outpatient basis, while more than half (56%) recommended the incorrect use of IV fluids, even initially. Only 13% of providers could estimate the correct amount of fluids to be given over the initial four hours. About 40% opined that child feeding should be restricted and 33% wrongly prescribed antibiotics. Only 17% recognized that the child had to be reassessed after four hours of ORS treatment.

Case study: Acute Respiratory Tract Infection

A clinical vignette of a 2 year old child with a 2 day cough and mild fever was presented to health providers to assess knowledge about acute respiratory tract infection (ARI) management. Almost none of the providers (99%) listed all four clinical features (ability to take feeds, consciousness, seizures and vomiting) required to identify a seriously ill child in the initial assessment. Only 5% listed all features for the grading of the severity of the respiratory infection (respiratory rate, chest in-drawing, noisy breathing and cyanosis).In terms of the diagnosis, 76% diagnosed the child correctly to have LRTI/pneumonia. Private providers were more likely to offer other diagnoses. Of all staff (across all cadres and hospitals) 60% preferred the child to be admitted, while IMNCI guidelines recommend only children with severe or very severe pneumonia to be managed in the hospital. While 95% identified the need for antibiotics in the child, only about 40% incorrectly recommended parenteral antibiotics. About a third of the providers prescribed an antibiotic other than first line drugs (cotrimoxazole or amoxycillin) and even among those choosing the correct drug, a correct dose was prescribed by only 55%.

Skills and Practice

Demonstration: Newborn resuscitation preparation

The *Sukshema* project conducted an observation of delivery preparation among SNs; 233 SNs from PHCs and higher level facilities were requested to identify and display all resuscitation equipment that should be at hand at the time of a delivery, in anticipation of a newborn with difficulty breathing. Only 3 of 233 nurses demonstrated *all* items considered essential for resuscitation of a term neonate, and 3.9% identified only the basic items. At the CHC and higher facilities, a more comprehensive set of items is required, but none of the nurses demonstrated the whole set; 30% of nurses did not list a neonatal resuscitation bag (ambu bag) and 45% did not list an oxygen cylinder/source as essential for resuscitation.

Demonstration: Dose calculation

The *Sukshema* project asked 284 staff nurses and doctors to estimate the dose of gentamycin injection required for a neonate with sepsis weighing 4 kilograms and provide additional instructions if necessary. 46% of the paediatricians and 23% of allopathic medical officers estimated the dose required correctly as 7.5 mg per kg per day of gentamycin. 31.4% of paediatricians correctly identified the volume of the solution needed or provided correct dilution instructions, while 19.6% of the allopathic medical officers

did so. Only 6% of nurses correctly estimated the dose of the antibiotic. No appreciable differences were found between private and public providers and among different levels of care.

Demonstration of oral rehydration solution (ORS) preparation

To elicit information on the providers' knowledge and skills about preparation and use of ORS a demonstration was arranged with 470 ANMs and 231 staff nurses. Results were mostly positive, although there is room for improvement. Of the sample, 60-62% demonstrated all basic aseptic precautions considered essential in the preparation and storage of ORS, 85 - 91% of ANMs/nurses chose a WHO formula ORS sachet but only 17% SNs and 22% ANMs remembered to check the date of expiry on the packet. Results were not all bad; 81 to 85% of the ANMs/nurses emptied the entire contents of the sachet in to the container, and 77 – 81.5% among these added a measured quantity of 1 litre of water.

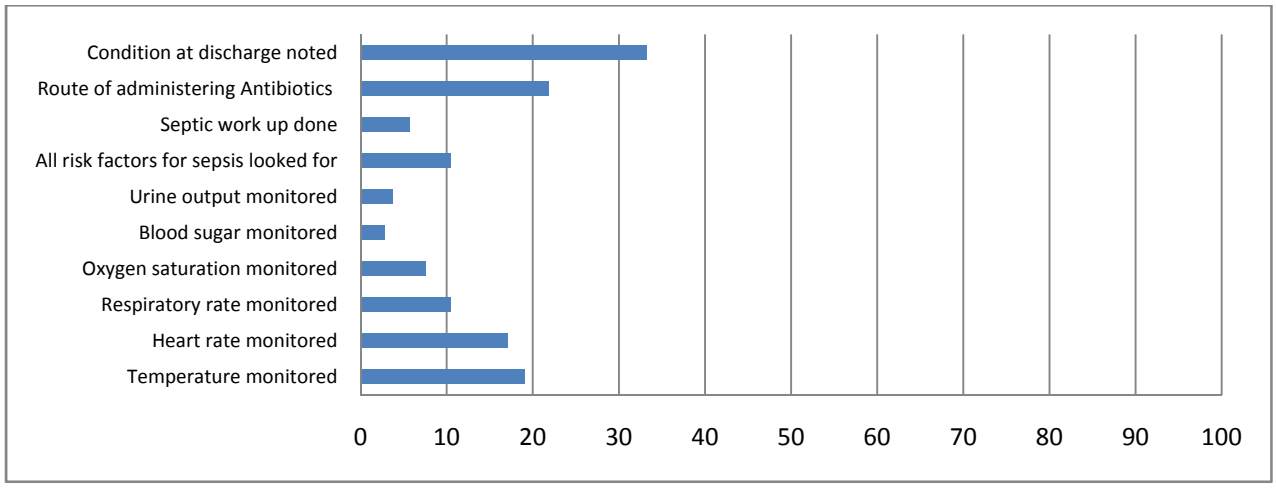
Documentation

To assess the actual patterns of management of sick newborns and children with ARI and diarrhoea admitted in the hospitals, an audit of case records was done in CHCs, taluka hospitals, district hospitals and private hospitals admitting such cases. Similar to other record audits, due to inadequate recording practices, the information obtained was not useful to gauge the actual quality of practice.

Audit: Sick Newborn records

105 clinical records of sick newborns admitted at CHCs, higher facilities and private hospitals were audited. Recording of vital parameters used to monitor a sick newborn was inadequate. Less than a third of neonates with respiratory distress had documented use of oxygen in their records. Only 15% of asphyxiated neonates were documented as having been shifted to specialized unit post resuscitation and 8% had been monitored for hypoxic ischemic encephalopathy. Only in 7% of neonates with seizures was a first line anticonvulsant drug such as phenobarbitone or phenytoin documented to be used. The route of administration was documented in just over a fifth of the records. A final diagnosis and the condition at discharge were mentioned in 55% and 33% of the records respectively. Private facilities did not fare better in any of these parameters (Figure 5.4.4.d).

Figure 5.4.4.d: Percent of sick newborn records with components of care recorded (N=105)



Diarrhoea clinical records

Audits of 188 case records of children admitted with diarrhoea in CHCs and higher hospitals presented a picture similar to other audits. Less than a third had the duration of diarrhoeal illness recorded. Only 14% had weight of the child at admission recorded. Recording of the medical history was incomplete and even a partial physical examination was documented in only 26% of cases. Monitoring of children on an hourly basis was not recorded. Over 20% did not have a gastrointestinal diagnosis recorded. Use of zinc was low at 7%. The severity of dehydration was not recorded in more than 70% of cases, and use of ORS was not documented which is the only treatment modality required in children with no or mild dehydration. About two-thirds of children with some or moderate dehydration had also been given intravenous fluids, while the first line of management is again ORS. Over 80% of children with severe dehydration had documented use of IV fluids and the amount of fluid used. All these children had received either ringer lactate or normal saline. The clinical outcome at discharge was recorded only in 30% cases (Table 33, appendix).

Acute Respiratory Infection clinical records

On examining 202 case records of children admitted with respiratory infection in PHCs, CHCs and higher hospitals, documentation of clinical findings and treatment was inadequate. The duration of respiratory symptoms was recorded in less than 51% of records. Hourly monitoring of admitted children for cyanosis, chest in-drawing and respiratory rate were not documented. Though a respiratory diagnosis was recorded in 72% of cases, a diagnosis of mild pneumonia or severe pneumonia (as per IMNCI guidelines)[61] was made only in 31 cases.

While 58% of children with pneumonia received oral cotrimoxazole or amoxycillin, 60% of the severely ill children received an antibiotic other than the IMNCI recommended parenteral ampicillin. 50% of

[61] Ministry of Health and Family Welfare, GoI, 2003. IMNCI Guidelines: Module 5 – Assess and Classify the Sick Child aged 2 months up to 5 years. New Delhi.

children with severe pneumonia and 85% of those with wheezing were not documented to have received oxygen.

5.4.5 Implications for Essential Newborn and Child Care

The assessments and subsequent analysis of all the data regarding essential newborn and child care services have some clear implications for intervention planning. The primary implications are outlined below.

Availability and Accessibility

Partner with private providers when NICU services are required.
The lack of services in public facilities may present opportunities to seek this level of care from the private sector, through partnerships and inclusion in referral networks.

Prioritize Strengthening of Higher Level Facilities for Essential Newborn Care
Given that less than 6% deliveries happen at SC level, prioritization should be to improve the availability of equipment at PHC level and higher facilities. This will entail filling critical vacancies for paediatricians and neonatologists and ensuring adequate equipment, drugs and supplies to offer essential newborn care.

Provider Competencies to Provide Quality Essential Newborn Care

Build Capacity to Ensure that all Essential Newborn Services Can be Delivered at each Level According to the Guidelines
This section of the report is primarily concerned with facility based services, however, community based care must be well equipped to identify and refer cases of sick newborns to higher facilities. Assessments found that even though many providers had been trained in IMNCI few were properly following the protocols. Strengthening their capacity to identify, diagnose, treat and refer sick children is critical. Supportive supervision, clinical mentoring, refresher workshops, additional clinical practice and job aides could help providers to perform better.

Improve quality of care at well baby clinics
Well baby clinics are an important opportunity to provide promotive and preventive aspects of health care. However, few providers monitored growth or provided advice on nutrition or immunization. More emphasis should be given to this platform, to promote health in the community.

Improve facility based post-natal checkups
Facility-based post natal check-ups are inadequate across all domains; history taking, physical exam; advice management of problems encountered. Refresher training, supportive supervision and mentoring are all capacity building mechanisms that could be employed to improve quality of post-natal check-ups.

Improve documentation

Supply of printed case records that make it mandatory and simple enough to document features and management of clinical cases is imperative. Good record keeping is a prerequisite for quality assessments in health care. Training of health workers in completing records and periodic checking by supervisory personnel should be instituted.

5.5 Safe Abortion as per the MTP Act

This section provides an overview of the guidelines, a description of utilization patterns including socio-cultural factors, an analysis of availability and accessibility of services, an assessment of service provider competencies, and a summary of implications relating to safe abortion. Safe abortion counselling is available at the community level, but otherwise, abortion procedures are available at PHCs and above.

Key Points:

- Unsafe abortion contributes to high rates of maternal mortality and morbidity, and accounts for 8% of all maternal deaths in India
- Household survey data on pregnancy termination is unreliable, for this reason, it is difficult to know the prevalence of abortion in Bellary district
- Provision of safe abortion, post abortion care and post abortion contraceptive counselling and contraceptives is inadequate at all facility levels

5.5.1 Guidelines for Safe Abortion Care

Death due to unsafe abortion is still a significant cause of mortality and morbidity, accounting for 8% of all maternal deaths in India[6263] To ensure that all pregnancies are wanted and to prevent mortality and morbidity from unsafe abortion, the *Operational Guidelines on Maternal and Newborn Health* provide for safe abortion up to 12 weeks, according to the graphic below. Abortion services are available at the PHC level and above (level 2 and 3). However, SCs are expected to provide counselling and referrals for safe abortion.

Table 5.5.1.a: Safe abortion: three levels of service delivery

Level 1	Level 2	Level 3
• Counseling and facilitation for safe abortion services	• MVA/D & C at first trimester, • post abortion contraceptive counselling and provision	• Level 2 services plus • D & C in 2nd trimester • Management of all post-abortion complications

[62] Sample Registration System, GOI. 2003. Maternal Mortality in India: 1997-2003, Trends, Causes and Risk Factors, Register General, New Delhi.

[63] Departmental data suggests that unsafe abortion accounts for only 1% of maternal mortality – see: Government of Karnataka, DHFW, NRHM, 2010. Programme Implementation Plan for 2010-2011, Bangalore.

5.5.2 Utilization of Safe Abortion Care

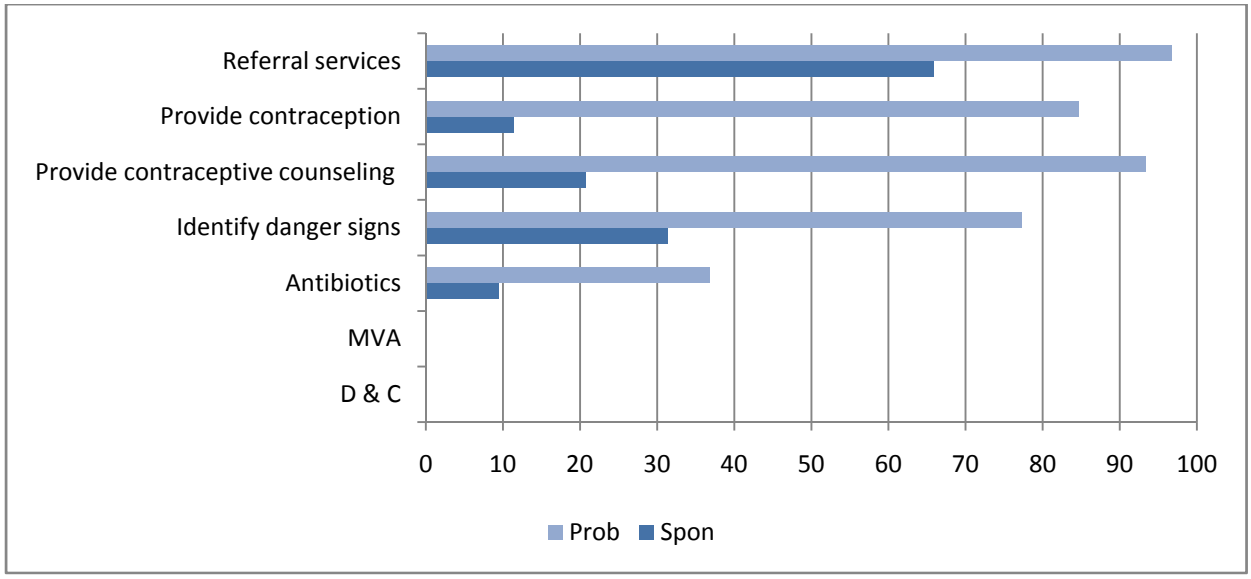
The reported rate of safe abortion in the project districts is 1%, the same as the state level (table 34, appendix). This figure likely represents under-reporting due to stigma and high prevalence of care seeking in the informal sector.

5.5.3 Availability and Accessibility of Safe Abortion Care

Services

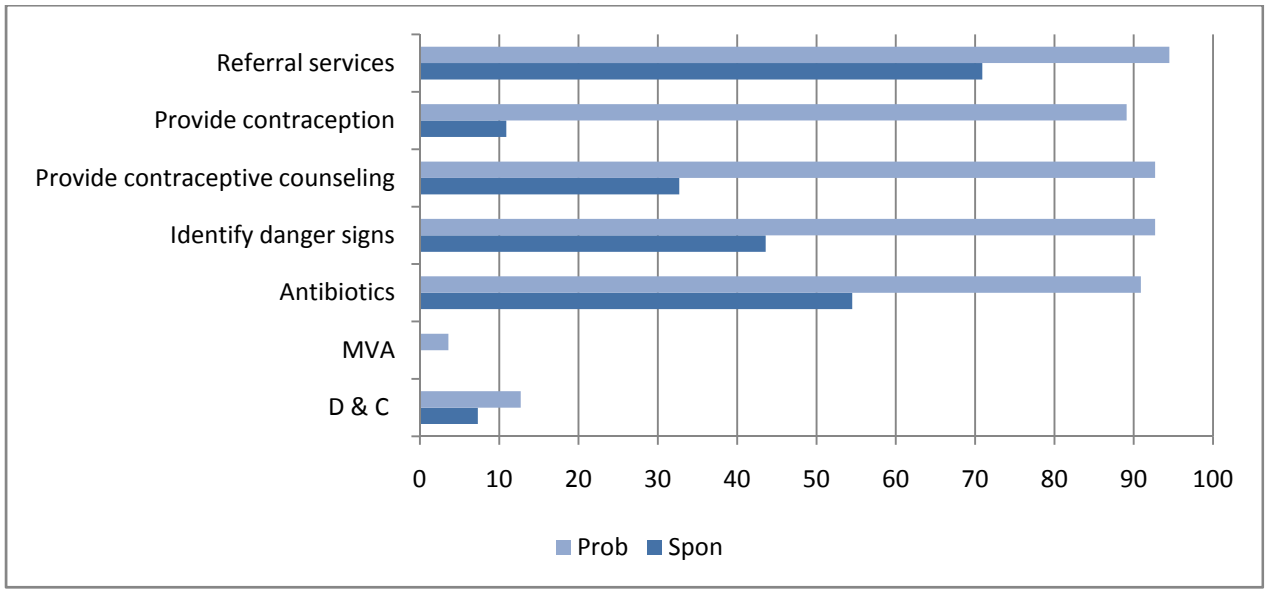
The availability of abortion related services is inadequate at the PHC and SC level. Only a little over a half of the SCs routinely provide referrals, and only 20% provide counselling. The key gaps at the PHC level include provision of MVA or D and C and provision of contraception. Availability of MVA at the PHCs is particularly low at only 4% (figure 5.5.3.b). At the CHC and THC level service provision is better but MVA is still not widely available (table 5.5.3.a).

Figure 5.5.3.a: Percent of SCs (n=299) where safe abortion services are available, Bellary District



Data source: Mapping data

Figure 5.5.3.b: Percent of PHCs (n=55) where safe abortion services are available, in Bellary District



Data source: Mapping data

Table 5.5.3.a: Number of CHCs, THs PHs and the DH where safe abortion services are routinely available, Bellary District

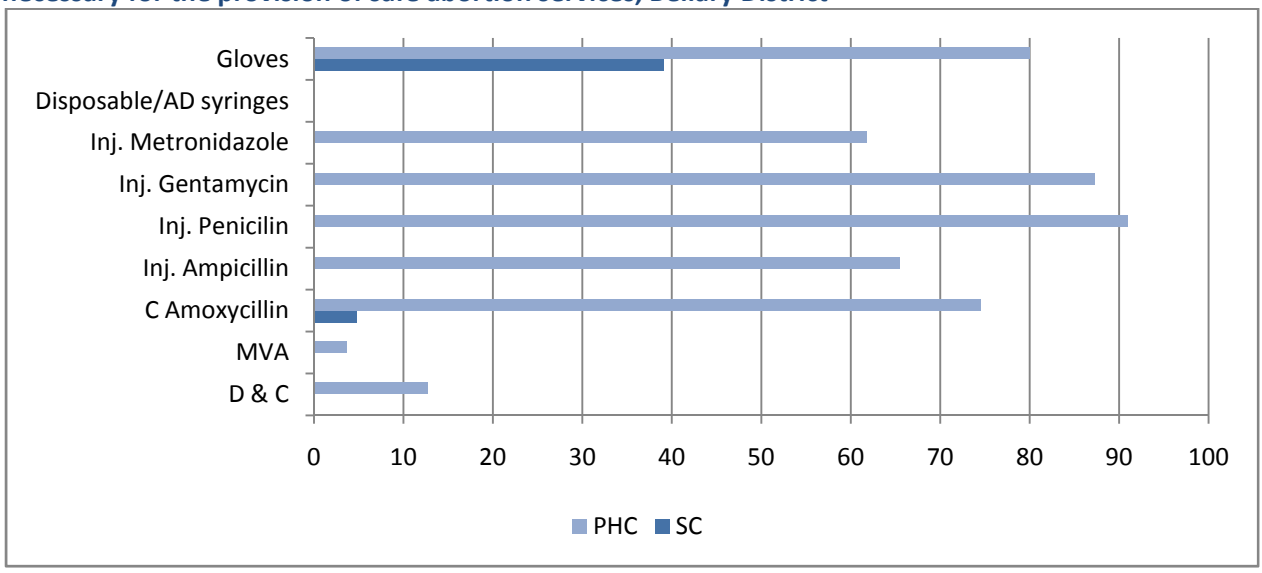
Services	CHC (n=8)		TH (n=6)		DH (n=1)		PVT (n=74)	
	Spon t	Prob e	Spon t	Prob e	Spon t	Prob e	Spon t	Prob e
D and C	1	4	2	6	1	1	0	39
MVA	0	1	0	3	0	1	4	38
Antibiotics post-abortion	7	8	2	6	0	1	29	43
Post-abortion illness management	5	8	1	6	0	1	25	43
Contraceptive counseling post-abortion	3	8	3	6	0	1	22	43
Provide contraception post-abortion	2	8	4	6	0	1	11	40
Abortion referral services	3	8	1	5	0	1	22	43

Data source: Mapping data

Drugs, Supply and Equipment

Availability of MVA syringe and cannula at the PHCs is inadequate at around 4% (figure 5.5.3.c).

Figure 5.5.3.c: Percent of SCs and PHCs with the availability of drugs, supplies and equipment necessary for the provision of safe abortion services, Bellary District



Data source: Mapping data

Table 5.5.3.b: Percent of CHCs, THs, DH and private facilities with the availability of drugs, supplies and equipment necessary for the provision of safe abortion services, Bellary District

	CHC (n=8)	TH (n=6)	DH(n=)	Pvt (n=74)
Drugs/Supplies: C Amoxycillin	75	66.7	100	66.2
Inj. Ampicillin-Available	37.5	16.7	100	58.1
Inj. Penicilin-Available	100	100	100	59.5
Inj. Gentamycin-Available	87.5	83.3	100	68.9
Inj. Metronidazole-Available	62.5	100	100	66.2
Disposable/AD Syringes	100	83.3	100	78.4
Gloves	75	66.7	100	64.9
D and C Set	87.5	100	100	54.1
MVA syringe and cannula	37.5	66.7	100	55.4

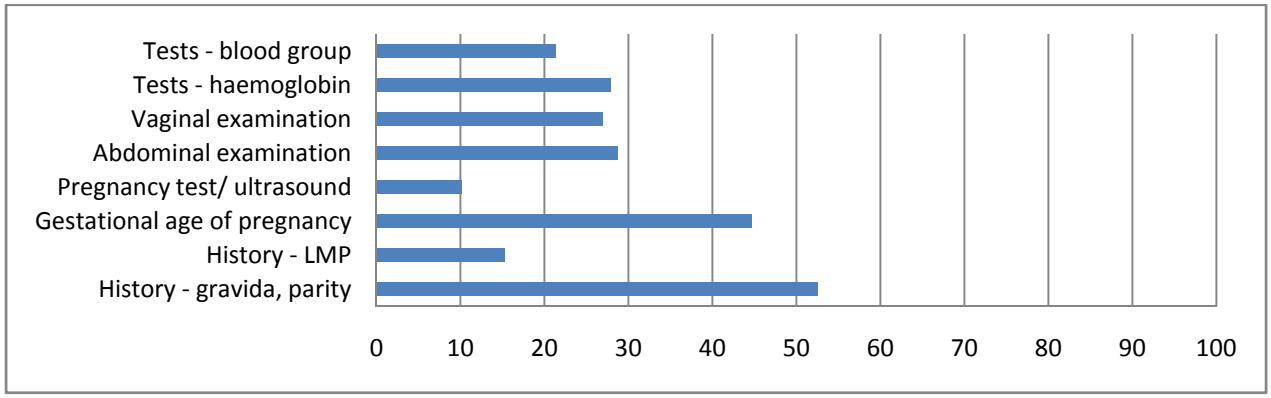
Data source: Mapping data

5.5.4 Service Provider Competencies to Offer Quality Safe Abortion Care

Audits of clinical records of abortion

Each patient admitted at a facility for an abortion, has to be evaluated prior to the day of the operation. A complete history about the patient has to be recorded especially gravida and parity and gestational age, which determines the type of procedure to be selected and the risk evaluation for the procedure. For an early pregnancy, manual vacuum suction is a method which can be used with low range of skills and no anaesthesia. Pregnancies of more than 12 weeks required more expertise, specialists/ trained doctors and the use of anaesthesia. Confirmatory tests for pregnancy, test for haemoglobin status, physical examination especially an abdominal and vaginal examination are mandatory. Administration of antibiotics is required to prevent sepsis and uterotonics for control of bleeding. Post operative care and counselling are also required for prevention of infection and recognition of any danger signs.[64]

Figure 5.5.4.a: Audit of clinical records of abortion (N= 215): History taking and investigations

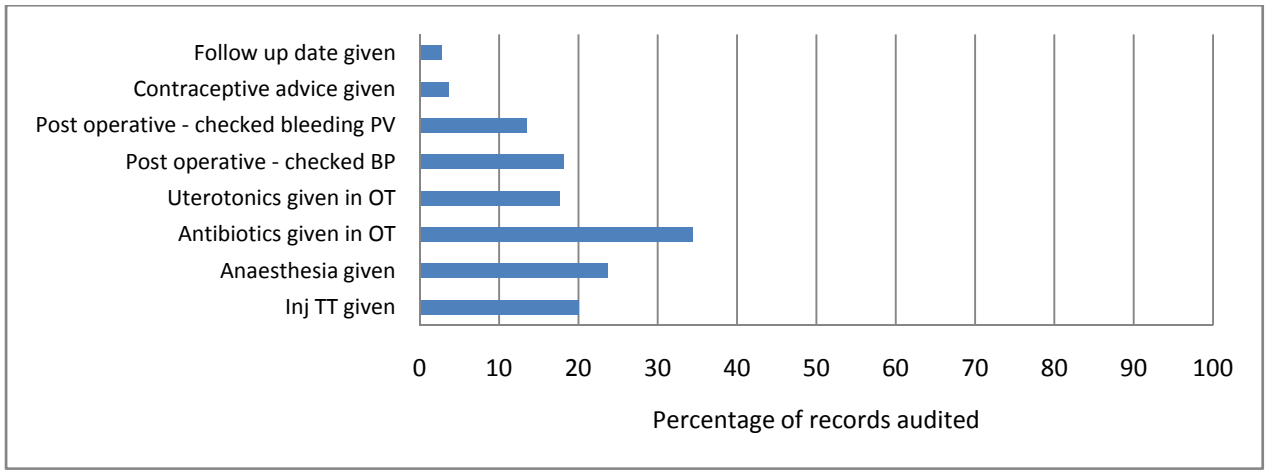


Data source: Service Provider Assessments

The methods selected for conducting the abortion were recorded as; 14% MVA, 47% D and C and 2% using electronic vacuum aspiration method (remainder missing). Gaps were observed in all the relevant parameters of history taking, physical examination and tests. Important among them are LMP, confirmatory test of pregnancy, estimation of gestational age of the pregnancy, physical examination and blood tests (Figure 5.5.4.a). Follow up was poor, only 4% each received contraceptive advice and a follow up appointment (Figure 5.5.4.b).

[64] MOHFW: Maternal Health Division, GOI, 2005. Guidelines for Pregnancy Care and Management of Common Obstetric Complications by Medical Officers, New Delhi.

Figure 5.4.4.b: Audit of records of abortion (N=215): operative and post op management



Data source: Service Provider Assessments

5.5.5 Implications for Safe Abortion Care

Availability and Accessibility

Strengthen safe abortion services at all levels
Strengthen provision of safe abortion at the PHCs and higher facilities, including provision of antibiotics and uterotonics. In the absence of specialist staff, promotion of MVA use for first trimester terminations at the PHC level should be a priority. *Training in use of MVA is already part of the 2010-11 program implementation plan.*

Ensure private, confidential and stigma-free service provision
To prevent women seeking abortions from informal providers, ensure that abortion care provision is without stigma or judgement and that confidentiality and privacy is ensured.

A greater emphasis needs to be placed on post abortion contraceptive counselling and provision of contraceptives
Links should be made with family planning all along the continuum of care, but especially in hand with abortion services.

5.6 Family Planning

This section provides an overview of the guidelines, a description of utilization patterns including socio-cultural factors, an analysis of availability and accessibility of services, an assessment of service provider competencies, and a summary of implications pertaining to family planning service provision.

Key points:

- Knowledge of family planning is near universal
- CPR is 55% in the district, but use of spacing methods (IUDs, injectibles) is poor. Lack of spacing is a contributing factor to poor newborn and infant health outcomes
- The contraceptive choices available to women are insufficient
- There are many missed opportunities for family planning service delivery along the continuum of care

5.6.1 Guidelines for Family Planning Services

The guidelines for family planning service provision are depicted below (table 5.6.1.a). Family planning counselling and commodities provision is provided at the community level; IUDs, injectibles and tubectomies are provided at the PHC and above.

Table 5.6.1.a: Guidelines for family planning service provision

Level 1	Level 2	Level 3
Condoms, OCPs and IUDs	Level 1 + plus male sterilization and tubectomy	Same as Level 2

5.6.2 Utilization of Family Planning Services

Fertility in rural Bellary is not very high, with a mean of 2.9 children for rural women, and a mean number of children in the 20-24 cohort of 1.9 (see table 2, appendix). These numbers are close to the state total fertility rate of 2.6children per woman – suggesting that Bellary district has benefitted from the many gains made in family planning at the national and state level.

Knowledge of family planning among ever-married women in Bellary is near universal, with low disparities between population groups (table 35, appendix). Current use of any modern method among married women (15-44) also has low disparities, with more rural women using contraception than urban women (57% and 51% respectively). However, the primary contraception utilized is sterilization at 56% of rural women and 47% of urban women (table 36 & 37, Appendix).

However, despite high levels of knowledge, and low disparities, there are high levels of unmet need, with 17% of women in Bellary wanting to prevent pregnancy, but not using a method, and 6% wanting to delay or space pregnancies but not using a method. Additionally, less than 1% of rural women are using spacing (non-permanent) methods (table 36, appendix). The mean age of sterilization for rural women aged 15-44 is 24 years old, indicating young child bearing (table 38, appendix). As spacing between pregnancies is associated with improved maternal, newborn and infant health outcomes[65], the low use of spacing methods is cause for concern.

Counter to the trend for other care components, sterilization mostly occurs in government facilities; with 24% at government hospitals, 24% at Community Health Centres and 27% at Primary Health Centres. Only 12% occurred in private facilities (tables 39, appendix). Of the sterilized rural women in the sample, 70% received a government benefit (table 40, appendix).

With a low CPR and the primary method used being sterilization, it is important to look at the advice women are receiving. Only 12% of rural women (15-44) not using a modern method were advised by health care workers about contraceptive use. An additional 14% were advised by family members, and 12% 'other' (table 41, appendix). There is a clear need to increase IEC/BCC communication efforts to promote spacing.

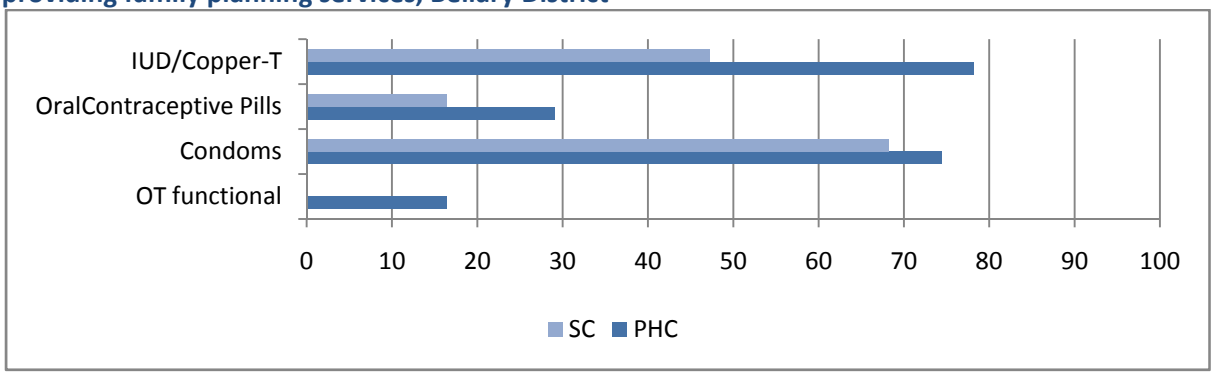
[65] See for example, Norton, M. 2005. New Evidence on Birth Spacing: Promising Findings for Improving Newborn, Infant and Child and Maternal Health. International Journal of Gynaecology and Obstetrics, 89, s1-s6

5.6.3 Access and Availability of Family Planning Services

Low utilization of modern spacing methods cannot be explained by low availability of services. Around 78% of PHCs and 68% of SCs have modern spacing methods available (Figure 5.6.1.a). However, few women are counselled on contraceptive use. Only 27% of SCs and 34% of PHCs routinely provide contraceptive counselling as part of post-natal care (see figure 5.3.3.a and 5.3.3.b – in *Postnatal Care* section). Additionally, only 32% of PHCs and 21% of SCs routinely offer contraceptive counselling after abortion services (figure 5.5.3.a and 5.5.3.b. – in *Safe Abortion* section). Provision is not any better at higher level facilities, only 3 of 8 community health centres and 3 of 6 taluka hospitals routinely offer contraceptive counselling after abortion services (table 5.5.3.b). This represents a high rate of missed opportunities to promote spacing methods. While low, this rate of service provision is much lower than the rate of women who report receiving advice from a health care provider, cited above.

As mentioned above, the main contraceptive utilized is sterilization for which women receive a cash benefit. However infrastructure for tubectomies is inadequate; only 16% of the PHCs have a functional OT (5.6.3.a). This is due to most tubectomies occurring during camps, rather than routinely.

Figure 5.6.3.a: Percent of SCs and PHCs with the availability of equipment and supplies necessary for providing family planning services, Bellary District



Is this table 5.6.1.a or 5.6.3?

Data source: Mapping data

5.6.4 Implications for Family Planning Services

Utilization

Use of spacing methods could be increased through incentives

Spacing methods have been shown to decrease maternal and infant mortality, and increase childhood nutrition. Though the fertility rate in rural Bellary is not very high, there is still scope for reduction. However, the cash transfers given for sterilization and the subsequent high prevalence of sterilization provide a disincentive for spacing, contributing to maternal and infant mortality. Stipends should also be paid to mothers who space their births, or use long acting methods such as IUD.

Encourage postpartum family planning including IUDs

The efficacy of postpartum insertion of IUDs is increasingly well established[66] but rarely offered. Providing this service immediately post delivery would enable women to better space births and avoid unwanted pregnancies. Providers would need special training to offer this service for postnatal women within 48 hours of birth. Women could also be counselled on other postnatal contraceptive methods during the 48 hour stay.

Availability and Accessibility

The contraceptive choices available to women need to be increased

The contraceptive choices available are insufficient. To increase method choice and dispel misconceptions, awareness raising/BCC also needs to be conducted around long-acting methods such as injectables and implants. These also need to be added to the supplies provided at PHCs and higher level facilities.

Family planning counselling and commodities provision needs to be integrated along the entire continuum of care

In a context where rural fertility remains high, and maternal and infant mortality are also unacceptably high, family planning is an important intervention and should be integrated into all care components along the continuum of care.

[66] Grimes D, Schulz K, van Vliet H, et al. Immediate post-partum insertion of intrauterine devices. *Cochrane Database of Systematic Reviews* 2007;4:CD003036. (abstract)

Chapter 6: Conclusions

The findings of the assessments carried out by the *Sukshema* project have implications across four domains; the system level, the facility level, and the community level both in terms of service delivery and health education.

The Health System

Despite innovations in increasing human resources instituted through the NRHM (such as contracting) distribution of staff across the population is uneven. Gaps in staffing lead to inequities in service provision. This is a difficult problem to address, as there is no up to date information available on vacancies.

The JSY scheme has led to unprecedented increases in institutional deliveries across the country and within the project districts. However, the coverage of these schemes has been low; only 14% and 34% of the exit interviews and community survey respondents reported receiving any JSY benefit (respectively), despite over 60% of the sample being below poverty line. The exit interviews of beneficiaries of the incentive schemes also suggest that there is some delay in receipt of the benefits from both JSY and MK schemes. In addition, knowledge about the scheme is low. As it only provides an incentive for a facility-based delivery, other components of care are neglected (such as post-natal care and birth spacing).

Service Delivery in Facilities

The rate of institutional deliveries has increased with the JSY scheme, but still rates in Bellary district are lower than in the project districts (northern Karnataka) or state. Unfortunately, providers at the PHC level do not have the skills or supplies to treat complications (such as eclampsia or post partum haemorrhage) and refer such cases to higher level facilities, creating system inefficiencies. To increase access to care, PHCs need to be strengthened to offer (at least) high quality level 1 intranatal care, particularly ensuring adequate numbers of providers with competencies to offer skilled birth attendance.

In terms of infrastructure, a lack of piped clean water, soap and waste management practices undermines the quality and safety of care provided in facilities.

In Bellary, only 44% of women initiate breastfeeding within one hour of giving birth, an increase in skilled birth attendance would likely improve this.

In addition, only 46% of women in rural Bellary receive post natal check-ups within 48 hours of delivery. Disparities between population subgroups are large, only 40% of the poor received a post-natal check up compared to 66% of the non-poor. Improving the environment and quality of facilities would encourage women to stay the requisite 48 hours after delivery, better enabling post-natal care to be

delivered before the mother returned home. After leaving the facility, follow-up at the community level also needs to be improved (see service delivery in the community section).

Unsafe abortion accounts for 8% of all maternal mortalities in India. Household survey data on pregnancy termination is not reliable and for this reason it is difficult to know the incidence of abortion in Bellary district. Unhelpfully, provision of safe abortion services and post abortion care is inadequate at all levels of the public system. In addition, post abortion contraceptive counselling and provision of contraceptives is poor.

Service Delivery in Communities

Although over 96% of pregnancy registrations occur at sub-centres, less than 5% of the sub-centres are providing all elements of basic antenatal services. Women need to visit a variety of facility types to receive comprehensive antenatal care, including private facilities. Ultimately, most antenatal care occurs in the private sector, even for disadvantaged groups, leading to very high costs. Gaps are observed in the availability of counselling services, BP measurement and lab tests. Birth planning is almost non-existent, and referral systems are inadequate. The availability of some of the equipment and supplies related to ANC provision is inadequate. A large proportion (55%) of the sub-centres caters to more than the stipulated 5,000 population.

Few women stay in the facility the requisite 48 hours after delivery. Additionally, post-natal follow up at the community level is ad-hoc, with inadequate provision of domiciliary visits. The percent of children under three years old who received a check-up within 24 hours of birth in rural Bellary is 43%, low compared to the regional rate of 50% and with wide disparities between population subgroups. Except for the immunization services, most elements of newborn care were weak, particularly the day 2 and day 4 visits. In particular, newborn counselling has been inadequate and few women are familiar with danger signs. As these 48 hours represent a time where over half of maternal and neonatal deaths occur, postnatal and newborn care needs to be strengthened.

Unfortunately care for sick newborns is uneven, with very few providers following IMNCI protocols. Gaps have been observed in the delivery of child services at community level such as monitoring of growth and nutrition, immunization, management of non-severe cases of pneumonia and diarrohea and referral services for severely sick infants.

There is a need to strengthen the provision of antenatal care, postnatal care, child health and family planning at community and sub-centre level, to ensure that women can receive comprehensive care. Mobile testing vans and visits from MOs can provide the scans and tests that ANMs are not able to provide.

Knowledge of family planning in Bellary district is near universal. The contraceptive prevalence rate is 55% in the district, but use of spacing methods is low at only 1%. Lack of spacing is a contributing factor to poor newborn and infant health outcomes. In service delivery throughout the continuum of care, there are many missed opportunities for family planning counselling and commodity provision. This needs to be strengthened at both the facility and the community level.

Community Support Systems and Health Education

The prevailing cultural practices, beliefs and decision making process for health-seeking play an important role in creating demand at the community level. For this reason it is important to examine the beliefs and attitudes that prevent women from seeking care. Following are a range relating to different care components along the continuum of care:

- For rural women who do not deliver in institutions, the main reasons cited were “not necessary” and “not customary”. However, the high levels of reported delivery complications suggest a high need for institutional deliveries, and this needs to be communicated back to the community.
- At the community level, knowledge of newborn danger signs is low with only 11% of women knowing all the danger signs, compared to 5.8% (6%) in the project districts and 8.3% (8%) in the state.
- Use of spacing methods is only 1% and most women are sterilized by age of 24 years. This suggests that knowledge about the health and economic benefits of spacing births needs to be increased.
- A substantial proportion of community members use private facilities for MNCH services, largely governed by the perception of higher quality of services. Developing and building a positive perception of all available MNCH services and providers in public health system through effective branding can enhance utilization.
- Exit interviews and community surveys, conducted among recently delivered mothers reflected low awareness of incentive schemes such as the *Janani Suraksha Yojana* (JSY) and *Madilu* Kit (MK) among pregnant and recently delivered women in project districts.
- Breastfeeding is perceived as the most important practice for ensuring the health of the neonate, however practices vary. Many mothers avoid giving the child colostrum, and providers encourage this. Rates of early initiation of breastfeeding are low in Bellary at only 44%.

List of Appendices

Appendices: Antenatal Care

Table 1. Background characteristics of currently married women

DLHS 2007-8 .

Percent distribution of currently married women age 15-44 years according to selected background characteristics, and place of residence, Bellary, Karnataka

	Bellary			Region**			State		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Age group									
15-19	9.2	10.8	9.7	14.2	9.1	12.9	8.6	5.6	7.8
20-24	25.1	22.0	24.1	23.9	21.4	23.3	20.4	18.6	19.9
25-29	21.5	20.8	21.3	20.3	21.1	20.5	21	22.6	21.5
30-34	20.8	17.9	19.9	16.5	19.8	17.3	18.3	20.6	18.9
35-39	13.7	18.2	15.1	14.9	16.8	15.4	18.1	18.3	18.2
40-44	9.7	10.4	9.9	10.1	11.7	10.5	13.5	14.3	13.7
Age at consummation									
Below 18 years	74.7	51.4	67.3	79.5	52.4	72.7	58.3	38.2	52.8
18 years +	25.3	48.6	32.7	20.5	47.6	27.3	41.7	61.8	47.2
Education									
Non-literate@	65.9	37.9	57.0	64.8	32.8	56.7	45.9	22.1	39.4
Less than 5 yr	5.4	5.4	5.4	8.4	6.5	7.9	11.3	6.5	10
5-9 years	17.7	24.7	19.9	16.2	24.4	18.3	26.1	27.6	26.5
10 years +	11.0	32.1	17.7	10.6	36.3	17	16.8	43.8	24.1
Religion									
Hindu	94.5	78.6	89.4	91.8	76.5	88	91.6	74.8	87
Muslim	5.3	21.0	10.3	7.6	22.3	11.3	7	22.2	11.2
Others	0.2	0.4	0.3	0.6	1.2	0.8	1.4	3	1.8
Castes/tribes									
Scheduled caste	37.6	24.0	33.2	22.9	17.1	21.4	19.8	13.6	18.1
Scheduled tribe	14.3	20.1	16.2	13.6	7.4	12	10.6	5.6	9.2
OBC	41.4	36.8	40.0	48.4	54.5	49.9	52.6	59.5	54.5
Others	6.7	19.0	10.6	15.2	21	16.6	17	21.3	18.1
Wealth index									
Poorest	16.6	3.1	12.4	21.9	5.9	17.9	14.4	3	11.3
Second	35.2	10.1	27.3	33.8	11.3	28.2	28.7	7.4	22.9
Middle	29.4	26.4	28.4	28.4	21.4	26.7	29.9	16.9	26.3
Fourth	11.9	26.9	16.7	12.9	28.8	16.9	19.5	29.6	22.3
Highest	6.8	33.5	15.3	3	32.5	10.4	7.5	43.2	17.3
# of women	621	290	911	5040	1694	6734	16719	6270	22989

Note: Unweighted cases. @ Literate but did not attended school are also included.

Table 2: Children ever born

DLHS 2007-8

Mean children ever born according to selected background characteristics of currently married women age 15-44 years, Bellary, Karnataka

Background characteristic	Bellary				Region**				State			
	Total	Male	Female	No of women	Total	Male	Female	No of women	Total	Male	Female	No of women
Age group												
15-19	0.57	0.19	0.38	89	1.01	0.52	0.5	870	0.82	0.42	0.4	1794
20-24	1.87	1.05	0.82	220	2.08	1.11	0.98	1567	1.77	0.91	0.86	4573
25-29	2.60	1.26	1.34	194	3.46	1.69	1.78	1381	2.62	1.33	1.29	4930
30-34	3.08	1.63	1.45	181	3.99	2.01	1.97	1165	3.05	1.54	1.5	4353
35-39	3.95	1.94	2.00	138	5.2	2.78	2.43	1036	3.62	1.87	1.75	4178
40-44	4.79	2.43	2.36	90	5.22	2.65	2.57	709	3.91	2.01	1.9	3148
Residence												
Rural	2.92	1.48	1.44	621	3.5	1.8	1.7	5035	2.86	1.46	1.4	16712
Urban	2.35	1.23	1.13	290	2.97	1.5	1.47	1693	2.47	1.27	1.2	6265
Castes/tribes												
SC /ST	2.95	1.52	1.43	449	3.39	1.68	1.71	2233	2.93	1.45	1.49	6253
Others	2.54	1.28	1.25	462	3.36	1.75	1.61	4495	2.68	1.39	1.29	16724
Wealth index												
Poor	3.05	1.59	1.46	360	3.82	1.91	1.91	3078	3.35	1.67	1.68	7818
Non-poor	2.54	1.28	1.26	551	2.99	1.57	1.42	3650	2.44	1.27	1.17	15159
Total	2.74	1.40	1.34	911	3.37	1.73	1.64	6728	2.75	1.41	1.34	22977

Note: Unweighted cases.

Table 3: Antenatal check-ups and source

District Level Health Survey Data 2007-8

Percentage of currently married women* (aged 15-44) who received any antenatal check-up during pregnancy by source and place of antenatal check-ups, according to selected background characteristics, Bellary, Karnataka

Background characteristics	Any antenatal check-ups	Number of women	Place of antenatal check-up					Number of women[1]
			Government health facility[1]	Private health facility[2]	Government and private	Home / community[3]	ICDS	
Residence								
Rural	67.0	232	56.4	49.7	10.5	2.3	3.0	155
Urban	95.3	107	46.2	55.3	4.4	2.2	1.0	102
Castes/tribes								
SC/ST	70.8	201	59.4	44.5	7.1	2.5	1.9	142
Other	83.5	138	43.7	61.0	9.2	1.9	2.7	115
Wealth Index								
Poor [a]	62.5	146	71.8	38.2	13.1	1.7	3.0	91
Non-poor	86.2	192	41.6	59.5	5.2	2.5	1.8	166
Total	76.0	338	52.3	51.9	8.0	2.3	2.2	257
Region**	79.9	2602	38.6	71.9	7.1	6.2	5.8	2074
State***	90.2	7576	49.2	54.7	7.7	4.2	4.9	6838

Note: * for the last birth in the past three years. [1]Among those who had received any ANC.

[1]Includes sub centre, primary health centre, community health centre, urban health centre/ urban health post/ urban family welfare centre, AYUSH hospital/clinic, government hospital or dispensary. [2]Includes private hospital/clinic or AYUSH hospital/clinic. [3]Includes own home, parents home and other

[a] Includes Poor /second, **unweighted. *** Source: State report Karnataka

Table 4: Place of Antenatal Check-up

District Level Health Survey Data 2007-8

Percentage of currently married women* (aged 15-44) who received any antenatal check-up during pregnancy by source and place of antenatal check-ups, according to selected background characteristics, Bellary, Karnataka

	Residence		Caste/tribes		Wealth Index				
Place of ANC	Rural	Urban	SC/ST	Others	Poor [a]	Non-Poor	Total	Region**	State
Government									
Hospital	15.6	26.3	17.9	22.2	20.7	19.4	19.8	16.1	20.3
Dispensary	0.0	2.3	0.0	2.0	0.0	1.4	0.9	1.6	1.1
UHC/UHP/UFWC	4.6	1.4	3.9	2.6	3.7	3.1	3.3	2.7	4.7
CHC	5.7	7.2	7.3	4.9	11.2	3.5	6.3	6.9	7.9
PHC	9.4	1.8	9.4	2.7	13.4	2.6	6.4	4.5	7.4
SC	24.6	8.2	24.7	9.9	30.7	11.2	18.1	9.2	10.2
AYUSH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Other public	1.5	0.0	0.8	1.0	1.3	0.7	0.9	0.2	1.0
NGO									
NGO hospital	0.2	0.7	0.0	0.9	0.0	0.6	0.4	0.3	0.4
Private									
AYUSH	2.2	0.0	1.3	1.4	2.0	1.0	1.3	3.2	2.1
Hosp/clinic	46.5	51.0	41.2	57.1	35.4	55.4	48.3	57.8	52.0
Other pvt	0.9	4.3	2.1	2.5	0.8	3.1	2.3	1.4	1.0
Community									
Place of ANC-Own home	0.2	0.4	0.2	0.3	0.0	0.4	0.3	3.8	2.4
Place of ANC - parents home	1.9	1.8	2.1	1.6	1.4	2.1	1.9	3.2	2.4
Place of ANC-others home	0.2	0.0	0.2	0.0	0.3	0.0	0.1	0.3	0.2
Place of ANC-Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.5
Anganwadi	3.0	1.0	1.9	2.7	3.0	1.8	2.2	5.8	4.9
Number of women[1]	155	102	142	115	91	166	257	2074	6838

Note: * for the last birth in the past three years. [1]Among those who had received any ANC

[a] Includes Poor /second, ** unweighted. *** Source: State report Karnataka

Table 5: Component of Antenatal Check-up

District Level Health Survey Data 2007-8

Percentage of currently married women* (aged 15-44) who received any antenatal check-up during pregnancy and received specific components of antenatal check-ups, according to selected background characteristics, Bellary, Karnataka

Background characteristics	Weight measured	Height measured	Blood pressure checked	Blood tested	abdomen examined	urine tested	breast examined	sonography / ultrasound	No of women
Residence									
Rural	64.4	39.2	75.7	74.7	69.6	86.9	58.3	48.7	155
Urban	84.9	59.5	81.3	85.5	79.1	85.2	64.8	62.4	102
Castes/tribes									
SC/ST	67.7	41.9	71.6	73.3	64.2	82.0	55.5	42.5	142
Other	78.5	53.9	85.8	86.1	84.7	91.5	67.5	68.5	115
Wealth Index									
Poor[a]	60.3	40.7	74.5	70.5	65.5	89.3	55.7	40.1	91
Non-Poor	79.3	50.9	79.8	83.7	77.7	84.6	63.7	61.9	166
Total	72.5	47.3	77.9	79.0	73.4	86.3	60.9	54.1	257
Region**	67.9	42.6	79.3	79.8	68.6	81.8	47.6	51.5	2074
State	79.6	57.8	87.5	88.4	79.1	88.3	63.2	65.5	6838

Note: * for the last birth in the past three years. [1]Among those who had received any ANC

[a] Includes Poor /second, ** unweighted

Table 6: Advice received during antenatal care

District Level Health Survey Data 2007-8

Percentage of currently married women (aged 15-44) who received advice on different components, according to selected characteristics, Bellary, Karnataka

Background characteristics	Breast feeding (A)	Keeping the baby warm (B)	Need for institutional delivery (C)	A and B and C	Better nutrition for mother and child	Cleanliness at the time of delivery	FP for spacing	FP for limiting	No of women
Residence									
Rural	75.7	60.8	37.1	26.6	63.7	58.2	36.8	37.0	155
Urban	82.9	68.7	44.7	40.7	71.3	66.3	51.3	48.4	102
Castes/tribes									
SC/ST	77.2	58.9	32.7	22.8	62.8	56.8	34.8	32.4	142
Other	80.2	70.1	49.3	43.8	71.5	67.2	52.0	52.8	115
Wealth Index									
Poor[a]	70.0	62.5	36.3	22.9	63.8	59.1	39.7	36.9	91
Non-Poor	83.3	64.7	42.2	37.3	68.3	62.7	44.0	44.1	166
Bellary total	78.6	63.9	40.1	32.2	66.7	61.4	42.5	41.5	257
Region**	70.5	67.9	45.7	36.6	60.2	41.3	42.0	69.6	2074
State	76.7	74.8	57.7	49.1	70.4	55.9	54.1	77.8	6838

Note: * for the last birth in the past three years. [1]Among those who had received any ANC

[a] Includes Poorest /second. ** unweighted case

Table 7: Antenatal care indicators

District Level Health Survey Data 2007-8

Percentage of currently married women (aged 15-44) who received different kinds of antenatal care by selected characteristics, Bellary, Karnataka

Background characteristics	ANC in first trimester	Three or more antenatal check-ups	At least one TT injections	100+ IFA tablets/ syrups	Full antenatal checkups[1]	No of women
Residence						
Rural	52.4	55.2	54.2	67.2	26.2	232
Urban	81.5	84.2	87.6	65.7	53.0	107
Castes/tribes						
SC/ST	54.6	56.7	54.3	66.2	25.7	201
Other	71.8	75.5	80.1	67.5	47.8	138
Wealth Index						
Poor [a]	45.1	48.0	50.0	64.7	19.3	146
Non-Poor	74.1	76.8	75.9	68.2	46.4	192
Total	61.6	64.3	64.8	66.7	34.7	338
Region**	58.3	65.2	73.9	50.7	26.8	2602
State***	71.9	81.3	86.9	64.1	51.1	7576

Note: * for the last birth in the past three years. [a] Includes Poor /second. ** unweighted case. [1]A minimum of least three visit for antenatal check-ups, at least one tetanus toxoid injection and 100 or more IFA tablets/syrups

Table 8: Reasons for not seeking ANC

District Level Health Survey Data 2007-8

Percent distribution of currently married women age 15-44 years who had no antenatal care visit by reason according to place and residence , Bellary, Karnataka

	Bellary[2]			Region[2]			State		
Reason for no antenatal check-ups	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Not Necessary	79.9	46.9	77.9	74.3	75.0	74.4	72.2	79.5	73.3
Not Customary	3.5	35.4	5.5	9.2	4.7	8.6	9.9	4.4	9.1
Cost Too Much	9.9	17.7	10.4	19.4	17.2	19.2	21.0	17.8	20.5
Too Far/No Transport	4.8	0.0	4.5	6.3	3.1	5.9	6.6	3.7	6.1
Poor Quality Service	2.1	0.0	1.9	3.3	3.1	3.3	2.9	1.7	2.7
Family Did Not Allow	3.7	0.0	3.5	10.9	10.9	10.9	11.7	9.8	11.4
Lack Of Knowledge	5.9	0.0	5.5	9.6	3.1	8.8	9.0	3.5	8.1
No Time To Go	4.9	0.0	4.6	8.5	3.1	7.9	8.0	7.3	7.9
Other	11.8	15.2	12.0	9.8	10.9	10.0	10.0	11.6	10.2
No of women	76	5	81	460	64	524	626	112	738

Note: [1]Based on women who have/had not received any antenatal check-ups for their last/ still/live births in past three year. [2]Unweigted case. * Figure not shown due to low number of cases.

Table 9: Care Seeking for Pregnancy Complications

District Level Health Survey Data 2007-8

Percentage of currently married women (aged 15-44) who suffered from any pregnancy complication and type of pregnancy complication by some selected characteristics, Bellary, Karnataka

Background characteristics	Any Reported Pregnancy Complication	Sought treatment for pregnancy complication	Number of Women	Location of treatment				Number of Women
				Government[1]	Private hospital/ clinic /AYUSH	NGO/Trust hospital clinic	Other	
Residence								
Rural	49.0	71.0	113	39.6	64.0	0.7	0.0	80
Urban	57.0	95.5	61	39.3	63.1	0.0	0.0	58
Castes/tribes								
SC/ST	42.4	73.9	85	43.1	60.3	0.0	0.0	63
Other	64.8	84.9	89	36.5	66.4	0.7	0.0	76
Wealth Index								
Poor [a]	46.2	69.4	67	54.2	53.3	0.0	0.0	47
Non-Poor	55.5	85.9	107	32.0	68.9	0.6	0.0	92
Total	51.5	79.5	174	39.5	63.6	0.4	0.0	139
Region**	46.8	78.1		33.6	69.0	1.2	2.1	
State	50.1	85.0		42.8	59.0	1.2	1.1	

Appendices: ANC service provider assessments

Table 10: Percent of Providers who performed ANC tasks correctly during direct observation, by facility

Protocol score	PHC (n=87)	Higher facility (N=75)	Private (N=59)
History taking			
Asked about Last Menstrual Period	26.4	41.3	30.5
Calculate and inform Expected date of delivery	12.6	34.7	40.7
Obstetric history			
Asked about previous pregnancies (gravida, para)	57.5	69.3	50.8
Asked about type of previous delivery(Normal, Assisted delivery, Caesarean)	32.2	34.7	35.6
Asked about complications of previous pregnancies (PIH, Diabetes, TB, bleeding etc)	14.9	18.7	16.9
Asked about complications after any previous delivery (PPH)	11.5	16	10.2
Current pregnancy complaints or danger signs			
Asked about vaginal bleeding	36.8	48	52.5
Asked about fever	28.7	40	37.3
Asked about headache	25.3	33.3	28.3
Asked about blurred vision	13.8	26.7	10.2
Asked about abdominal pain	65.5	61.3	72.9
Did the HCP ask about foetal movement	42.5	40	37.3
***Physical examination* – appropriate focussed examination**			
Weight	50.6	53.3	89.9
Blood pressure	87.4	90.7	96.6
Fundal height/foetal presentation	73.6	62.7	76.3
Listen to foetal heart rate	56.3	65.3	67.8
Vaginal exam	11.5	9.3	11.9
Advice provided on the most pertinent Investigations			
Haemoglobin	56.3	69.3	86.4
Blood group and Rh	27.6	48	62.7
Syphilis	1.1	21.3	20.3
Urine microscopy	12.6	32	45.8
Urine test for protein	31	37.3	61
HIV	23	48	49.2
Medications/ supplements			
Prescribe IFA	62.1	62.7	91.5
explain the purpose of IFA , side effects and how to take	25.3	28	39
Was TT given/prescribed	48.3	40	59.3
Was de-worming medication given	2.3	2.7	5.1
Counselling			
Mentioned danger signs(convulsions/fever/bleeding)	0	1.3	3.4
Ask client about birth plans	29.9	28	25.4
Advised about institutional delivery	35.6	34.5	25.3

Discuss possible reasons for refer out, if required	9.2	4	1.7
Discuss about newborn care	35.6	34.5	25.3
Discuss about immunization of newborn	6.9	5.3	8.5
Were financing schemes discussed for delivery	23	8	3.4
Was family planning discussed	9.2	10.7	22
Advised about next ANC visit	32.2	29.3	59.3

Table 11: Client satisfaction with ANC services by facility level, from Exit Interviews

	Location of ANC services			
Median Satisfaction rating (1=poor, 3= Excellent)	Total (n= 202)	Clients receiving care at PHCs (n=90)	Clients receiving care at CHC and above (n= 64)	Clients receiving care at private facilities (n=48)
Personal manner of physicians, nurses and other staff (grades – excellent, good ,poor)	17-22 % excellent 70% good 9% poor	13-17% excellent 70% good 14-17% poor	10-21 % excellent (Doctors 21%) 70-80% good, 6-10% poor	27-32% excellent 73% good, poor none
Technical skills and quality (grades – excellent, good, poor)	18-20% excellent 70% good, 8-11% poor	10-20% excellent 70% good 14-17% poor	12-15% excellent 80% good, about 6-8% poor	27-32 % excellent 70% good, 5% poor (No doctors)
Waiting time (none, average, long)	None 23.3% 53.3% average 17.3% long	30% none 47% average 13.3% long	12.5% none 52% average 33.3% long	35% None 43.2% average 13.5% long

Source: Service Provider Assessment data

Appendices: Intranatal Care

Table12: Place of delivery and assistance

District Level Health Survey Data 2007-8

Percentage of currently married women (aged 15-44) according to place of delivery, assistance during home delivery and safe delivery by selected characteristics, Bellary, Karnataka

Background characteristics	Institutional delivery	At public health facility	At private health facility	Delivery at home	Home delivery assisted by skilled[1] person	Safe[2] delivery	No of women
Residence							
Rural	36.2	18.1	18.1	63.3	10.2	46.4	232
Urban	65.6	32.2	33.4	34.4	7.8	73.5	107
Castes/tribes							
SC/ST	35.4	24.5	10.8	64.0	8.0	43.4	201
Other	60.2	19.7	40.5	39.8	11.6	71.8	138
Wealth Index							
Poor[a]	31.1	22.8	8.3	68.1	5.5	36.6	146
Non-Poor	56.4	22.4	34.0	43.6	12.5	68.9	192
Bellary Total	45.5	22.6	22.9	54.1	9.5	54.9	338
Region**	45.7	20.1	25.6	53.6	18.7	55.7	2602
State	65.1	33.1	32.0	34.1	19.1	71.6	7576

Note: * for the last birth in the past three years. [1]Based on home delivery; includes doctor/nurse/ANM,

[2] Either institutional delivery or home delivery assisted by Doctor/Nurse/ANM

[a] Includes Poor /second. ** unweighted case

Table 13: Reason for not going to health institutions for delivery

District Level Health Survey Data 2007-8

Percent distribution of currently married women* (aged 15-44) according to place of delivery by some selected background characteristics, Bellary, Karnataka

	Bellary[2]			Region[2]			State		
Reason for no antenatal check-ups	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Cost too much	6.2	5.7	6.1	9.5	11.0	9.7	9.6	9.7	9.6
Poor quality service	0.7	0.0	0.6	2.2	4.4	2.5	1.9	3.5	2.2
Too far/ no transport	4.2	3.2	4.0	6.6	4.4	6.3	8.0	4.9	7.5
No time to go	16.9	17.7	17.0	23.1	27.6	23.7	30.2	33.3	30.7
Not necessary	56.0	40.6	52.9	45.0	37.0	44.0	39.5	35.8	38.9
Not customary	32.7	31.7	32.5	40.1	38.1	39.8	39.4	40.3	39.5
Better care at home	12.7	9.0	12.0	18.5	18.8	18.5	18.5	18.1	18.4
Family did not allow	1.1	10.3	2.9	4.5	5.5	4.6	4.8	4.9	4.8
Lack of knowledge	2.4	6.3	3.2	2.6	2.2	2.6	2.3	1.2	2.2
Other	5.0	5.2	5.0	5.9	5.5	5.9	7.6	9.2	7.8
No of women	148	37	185	1232	181	1413	2234	412	2645

Note: [1]Based on women who have/had not gone to health institutions for delivery. [2]Unweigted case..

Table 14: Care during home delivery

District Level Health Survey Data 2007-8

Percentage of currently married women (aged 15-44) who had home delivery, according to basic care used for delivery by some selected characteristics, Bellary, Karnataka

Background characteristics	Disposable delivery kit (mamta kit) used?			The baby immediately wiped dry and then wrapped without being bathed			New/sterilized blade used to cut cord			No of women
	Yes	No	Don't know	Yes	No	Don't know	Yes	No	Don't know	
Residence										
Rural	30.3	57.0	12.7	57.6	40.1	2.3	90.2	2.9	6.9	147
Urban	32.8	64.2	3.0	76.4	23.6	0.0	91.4	6.1	2.5	37
Castes/tribes										
SC/ST	29.9	57.4	12.7	56.3	41.6	2.2	90.2	2.8	7.0	129
Other	32.7	61.0	6.3	73.4	25.6	1.0	90.9	5.4	3.8	55
Wealth Index										
Poor[a]	25.2	59.8	15.0	60.2	39.2	0.6	88.9	2.8	8.3	99
Non-Poor	37.4	56.9	5.7	62.8	33.9	3.3	92.2	4.5	3.2	84
Total	30.8	58.5	10.8	61.4	36.8	1.8	90.4	3.6	6.0	183
Region**	24.4	70.5	5.1	51.9	46.7	1.4	93.0	4.5	2.4	1395
State	25.9	69.0	5.1	51.7	46.8	1.5	93.1	4.7	2.2	2583

Note: For last birth in past three years. Table based on home delivery. a Includes first /second. ** unweighted.

Table 15: Mode of transportation used for delivery to reach health institution

District Level Health Survey Data 2007-8

Percent distribution of currently married women* (aged 15-44) who have/had delivery at health institution according to arrangement or mode of transportation to reach health institutions by some selected characteristics, Bellary, Karnataka

Background characteristics	Ambulance	Jeep/ Car	Motor cycle / scooter	Bus/ Train	Tempo/ Auto/ Tractor	Cart	Foot March	Other	Total percent	No of women[1]
Residence										
Rural	0.0	13.2	4.2	35.3	31.2	4.4	11.4	0.0	100.0	84
Urban	0.0	19.0	2.7	11.6	59.1	2.4	5.3	0.0	100.0	70
Castes/tribes										
SC/ST	0.0	6.9	2.6	27.6	49.7	0.0	12.8	0.0	100.0	71
Other	0.0	23.5	4.3	21.8	38.9	6.4	5.1	0.0	100.0	83
Wealth Index										
Poor[a]	0.0	5.0	0.0	38.3	34.3	10.5	11.2	0.0	100.0	45
Non-Poor	0.0	20.4	5.0	18.7	47.9	0.5	7.6	0.0	100.0	109
Total	0.0	15.8	3.5	24.5	43.9	3.5	8.6	0.0	100.0	154
Region**	0.4	18.7	2.6	17.4	51.4	1.2	7.7	0.3	100.0	1189
State	1.1	23.1	2.4	19.3	45.3	1.4	6.3	0.9	100.0	4931

Note: *for the last birth in the past three years.[1] Based on institutional delivery [a] Includes first /second.

** unweighted case.

Total percent may add more than 100.0 due to multiple response

Table16: Benefits from *Janani Suraksha Yojana* (JSY) and State Specific Schemes

District Level Health Survey Data 2007-8

Percent distribution of currently married women (aged 15-44) who get benefited of JSY and state specific scheme according to place of residence and some selected characteristics, Bellary, Karnataka

Background characteristics	Total	Number of women[1]	Delivery at the health facility	Number of women[2]	Delivery at home	Number of women[3]
Residence						
Rural	14.9	232	10.0	84	17.9	147
Urban	15.7	107	8.8	70	28.9	37
Castes/tribes						
SC/ST	15.4	201	7.9	71	19.7	129
Other	14.9	138	10.8	83	21.1	55
Wealth Index						
Poor[a]	13.6	146	7.4	45	16.6	99
Non-Poor	16.4	192	10.3	109	24.2	84
Total	15.2	338	9.4	154	20.1	183
Region**	7.3	2602	7.2	1189	7.3	1395
State	12.0	7576	13.4	4931	9.2	2583

Note: [1] for the last birth in the past three years. [2]Based on delivery at health facility [3]based on home delivery; [a] Includes Poor /second. ** unweighted case

Table 17: Motivation to have delivery at health institution

District Level Health Survey Data 2007-8

Percentage of currently married women (aged 15-44) who were motivated to have delivery at health institution according to some selected characteristics, Bellary, Karnataka

Background characteristics	Doctor	ANM	Health worker	AWW	ASHA	NGO/CBO	Husband	Mother in law	Mother	Relative/friends	Self	Other	No of women
Residence													
Rural	19.3	7.9	2.7	7.8	0.0	0.2	19.6	7.9	14.8	24.7	15.2	1.3	232
Urban	18.0	2.7	1.5	4.5	0.0	0.0	34.1	8.5	33.2	28.9	17.6	0.0	107
Castes/tribes													
SC/ST	16.9	8.1	3.3	8.8	0.0	0.2	21.4	5.7	13.7	25.8	16.6	0.6	201
Other	21.9	3.6	1.0	3.8	0.0	0.0	28.2	11.6	30.8	26.3	15.1	1.4	138
Wealth Index													
Poor[a]	14.9	4.8	4.3	9.7	0.0	0.0	11.2	5.8	10.4	22.9	15.7	1.4	146
Non-Poor	22.0	7.4	0.9	4.5	0.0	0.2	34.0	9.8	28.4	28.3	16.1	0.5	192
Total	18.9	6.3	2.3	6.8	0.0	0.1	24.2	8.1	20.6	26.0	16.0	0.9	338
Region**	14.0	10.1	1.9	7.0	0.1	0.5	30.3	18.3	33.1	30.6	25.5	1.4	2602
State	20.4	17.4	1.7	8.5	0.1	0.6	40.0	22.0	40.7	38.9	31.4	1.2	7576

Note: * for the last birth in the past three years. [a] Includes Poor /second. ** unweighted case.

Total percent may add more than 100.0 due to multiple response

Table 18: Care Seeking For Delivery Complications

District Level Health Survey Data 2007-8

Percentage of currently married women (aged 15-44) who suffered from any delivery complication and type of complication by some selected characteristics, Bellary, Karnataka

Background characteristics	Any Reported Delivery Complication	Any reported Post Delivery Complication	Sought Treatment for Post Delivery Complication	Location of treatment				Number of Women
				Government[1]	Private hospital/ clinic /AYUSH	NGO/Trust hospital clinic	Other	
Residence								
Rural	59.9	33.2	69.5	36.8	60.5	0.0	2.7	53
Urban	48.3	28.9	81.0	38.5	60.0	0.0	8.1	25
Castes/tribes								
SC/ST	52.7	30.4	72.8	49.0	51.0	0.0	3.7	45
Other	61.3	33.8	72.7	22.1	72.6	0.0	5.3	34
Wealth Index								
Poor [a]	59.3	35.0	80.4	50.9	49.1	0.0	0.0	41
Non-Poor	54.0	29.4	65.9	22.5	72.7	0.0	9.3	37
Total	56.2	31.8	72.8	37.4	60.3	0.0	4.4	78
Region**	43.3	33.5	75.2	28.7	63.8	0.3	10.1	
State	43.7	28.6	78.7	38.6	56.9	0.5	6.1	

Appendices: Intranatal Care Service Provider Assessments

Table 19: Percent of providers who performed key care components during postpartum care (within hospital stay for delivery), by facility type

	Percent of providers		
	PHC (n=49)	**CHC and higher (n=58)**	**Private (n=38)**
History taking			
Date of delivery	30.6	42	13
Parity	24.5	31.6	13.2
Problems an recent delivery	16.3	29.8	26
Problems after recent delivery	16.3	28.1	5.3
Complaints			
Fever	63.3	62.1	50
Depression	4.1	5.2	7.9
Headache	42.9	39.7	31.6
Blurred vision	18.4	13.8	13.2
Bleeding PV	79.6	79.3	68.4
Pain in breasts	30.6	39.7	21.1
Bladder/bowel function	18.4	29.3	7.9
Focussed postpartum examination			
Blood pressure	8.2	17.2	13.2
Abdominal examination for fundal height	57.1	65.5	57.9
Surgical wound exam	8.2	17.2	13.2
Breast examination	16.3	24.1	18.4
Lochia examination	40.8	41.4	13.2
Postpartum Counseling			
Hygiene	79.6	82.8	89.5
Nutrition	79.6	89.7	84.2
IFA	24.5	25.9	34.2
Exclusive breastfeeding	65.3	77.6	65.8
Contraceptive options	20.4	12.1	2.6
Advice on danger signs			
PPH	22.4	31	31.6
Sepsis	10.2	24.1	18.4
Breast abscess	6.1	6.9	7.9

Data source: Service Provider Assessment data

Table 20: Percent of providers answering correctly for postpartum haemorrhage case study

Postpartum haemorrhage case study	Obstetrician (n=89)	Medical officer (n=138)	AYUSH MO (n=37)	Staff nurse (n=248)
Identified the first action - check uterine tone	78.7	33.3	24.3	25.4
List 3 or more causes of PPH	46.4	66.3	18.9	22.6
Listed uterine atony among the causes	76.4	50.7	21.6	18.5
could define early PPH	58.4	45.7	45.9	30.6
Listed Per speculum examination to be done for PPH with contracted uterus	71.9	30.4	10.8	26.2
Prescribed starting IV	71.9	54.3	54.1	49.6
Listed checking vitals	79.8	71.7	64.9	62.1
Listed Hb as essential test required	41.6	17.4	13.5	9.3

Data source: Service Provider Assessment data

Table 21: Post natal check-ups

DLHS 2007-8

Percentage of currently married women (aged 15-44) who received post natal check-ups (within 48 hours of delivery) by selected characteristics, Bellary, Karnataka

Background characteristics	Post natal check-up	No of women
Residence		
Rural	46.1	232
Urban	74.2	107
Castes/tribes		
SC/ST	46.4	201
Other	67.4	138
Wealth Index		
Poor [a]	40.4	146
Non-Poor	66.0	192
Total	54.9	338
Region**	51.5	2602
State***	65.6	7576

Note: * for the last birth in the past three years. [a] Includes Poor /second. ** unweighted case.

Table 22: Initiation of Breastfeeding

Percentage of children aged under age 3 years whose mother started breastfeeding within one hour of birth, within 24 hours of birth, after 24 hours of birth and feed their child cloloustrum/khees according to selected background characteristics, Bellary, karnataka,

Background characteristics	Children received coloustrum/khees[1]	Within one hour of birth	Within 24 hours of birth[2]	After 24 hours of birth	Number of children
Residence					
Rural	76.8	39.8	61.8	37.4	213
Urban	83.9	55.3	78.1	21.9	89
Caste/tribes					
Scheduled caste/tribes	75.9	38.1	57.1	41.8	178
Others	83.3	53.0	80.9	19.1	121
Wealth Index					
Poor[a]	78.1	35.4	53.8	45.1	132
Non-Poor	79.5	51.3	76.8	23.1	170
District	78.9	44.3	66.6	32.8	302
Region**	79.2	40.2	63.8	35.7	2397
State	85.8	46.5	73.0	26.7	6040

Note: Table based on youngest but last one living children age below 3 years ** unweighted cases. [1]Yellowish thick milk secretion during the first dew days after child birth. [2] Includes within one hour of birth

Appendices: Essential Newborn Care

Table 23: Early childhood check-up

DLHS 2007-8
Percentage of children under age 3 years who received any check-up by selected characteristics, Bellary, Karnataka

Background characteristics	Received check-up within 24 hours of birth	No of women
Residence		
Rural	42.7	213
Urban	69.4	89
Castes/tribes		
SC/ST	42.0	178
Other	62.4	121
Wealth Index		
Poor	37.0	132
Non-poor	61.1	170
Total	50.5	302
Region**	49.8	2397
State***	63.5	6040

Note: * for the last birth in the past three years. [a] Includes Poor /second. ** unweighted case.

Table 24: Place of Early Childhood Check-up

DLHS 2007-8

Percentage of children under age 3 years who received any check-up according to place of check-up and place of residence, Bellary, Karnataka

Background characteristics	Rural	Urban	Total	Region*	State
Government					
Hospital	17.7	21.5	19.2	12.9	20.8
Dispensary	0.4	0.0	0.2	0.7	0.7
UHC/UHPC/UFWC	4.4	5.5	4.8	2.6	3.9
CHC/RURAL HOSPITAL	6.2	8.4	7.1	5.8	6.2
PHC	14.2	4.7	10.4	5.8	9.2
Sub centre	2.5	0.0	1.5	1.1	1.1
ICDS	0.0	0.0	0.0	0.2	0.2
NGO/trust/clinic	0.0	0.0	0.0	0.2	0.4
Private					
Private hospital/clinic	38.9	47.2	42.2	47.5	44.7
Private ayush hospital/clinic	0.0	1.2	0.5	1.3	1.1
Home					
Doctor home	10.8	4.8	8.4	13.9	6.2
ANM/nurse home	4.9	5.6	5.2	6.1	4.3
Other	0.0	1.2	0.5	0.5	0.6
Missing	0.0	0.0	0.0	1.2	0.7
TOTAL	100.0	100.0	100.0	100.0	100.0
Number of children	**91**	**62**	**153**	1194	3484

Note: * for the last birth in the past three years.

Table 25: Knowledge of Newborn Danger Signs, Bellary

Percentage of currently married women* (aged 15-44) who had knowledge of the danger signs of new born by some selected characteristics, Bijapur, Karnataka

Background characteristics	Knowledge of the danger signs of new born;									
	Blue tongue & lips	Difficulty in breathing	Cold/ hot to touch	Develop yellow staining on palm & soles	Abnormal movement	Poor sucking of breast	Baby did not cry	Any signs	All signs	No of women
Residence										
Rural	13.5	18.1	21.5	15.1	17.6	29.6	23.3	37.8	7.8	232
Urban	29.7	25.8	24.0	18.9	24.8	44.2	42.2	51.9	16.6	107
Castes/tribes										
SC/ST	19.1	19.3	22.5	15.9	19.2	35.2	31.0	45.4	10.7	201
Other	17.8	22.3	21.9	17.0	20.8	32.7	26.7	37.6	10.4	138
Wealth Index										
Lowest[a]	10.6	15.5	19.5	12.3	17.0	27.3	21.6	36.5	6.4	146
Else	24.7	24.3	24.4	19.4	22.0	39.5	35.1	46.7	13.7	192
Total	18.6	20.5	22.3	16.3	19.9	34.2	29.3	42.3	10.6	338
Region**	14.5	26.0	25.1	14.0	22.4	36.6	34.1	48.4	5.8	2602
State	19.9	30.1	27.9	16.8	26.0	41.6	38.4	53.0	8.3	7576

Note: * for the last birth in the past three years. [a] Includes Lowest /second. ** unweighted case.
Total percent may add more than 100.0 due to multiple response

Table 26: Vaccination of children

DLHS 2007-8

Percentage of children aged 12-23 months who received specific vaccination according to some selected background characteristics, Bellary, Karnataka

Background characteristic	BCG	DPT 1	DPT 2	DPT 3	POLIO 0	POLIO 1	POLIO 2	POLIO 3	Measles	Full vaccination[1]	No of children
Sex of the baby											
Male	94.7	91.6	90.4	76.6	22.8	96.7	96.7	80.6	86.7	72.9	52
Female	93.7	91	87.3	75.7	13.6	98.4	98.4	90.1	74.1	59.3	66
Residence											
Rural	94.3	91.8	89.5	74.4	21.3	96.8	96.8	83.1	80.4	64.1	87
Urban	93.7	89.9	86.3	80.8	7.4	100	100	93.9	77.7	68.7	31
Caste/tribes											
SC/ST	92.2	89.4	89	73	18.5	96.3	96.3	83.2	78	58.3	75
Others	97.5	94.7	88	81.7	16.1	100	100	90.8	82.7	77.8	42
Wealth Index											
Poora	88	91.2	91.2	78	28.5	97	97	88.3	84	70.9	36
Non-poor	96.8	91.3	87.6	75.2	12.8	97.9	97.9	84.9	77.7	62.8	81
District	94.1	91.3	88.7	76.1	17.6	97.6	97.6	85.9	79.6	65.3	118
Region**	93.2	89.4	84.8	74.3	17.8	96.4	93.3	83.2	74.8	62.1	809
State	96.8	94.9	92.1	84.8	11.5	98.1	96.4	90.3	85.1	76.7	2339

Note: Tables based on children aged 12-23 months who have born since jan 1, 2004. [1] BCG, three dose of DPT and polio and measles. [a]Includes poorest /second. ** unweghted cases

Table 27: Place of vaccination

Percentage of children aged under age 3 years who received any vaccination by place of last vaccination according to some selected background characteristics, Bellary, Karnataka

Background characteristic	Government[1]	Anganwadi ICDS centre	Pulse polio booth	Private[2]	Other[3]	Number of children
Sex of the baby						
Male	38.7	59.9	6.3	6.1	0.9	159
Female	43.8	58.5	9.4	8.9	2.2	168
Residence						
Rural	36.4	68.9	5.3	7.2	1.6	224
Urban	52	38	13.4	8.4	1.4	103
Caste/tribes						
SC/ST	36.4	65.7	6.2	7.1	2.1	191
Others	48.2	50.1	10.3	8.2	0.8	136
Wealth Index						
Poor[a]	31.3	69.3	4.3	6.8	2.1	106
Non-poor	46.2	54.3	9.6	7.9	1.3	221
District	41.3	59.2	7.9	7.6	1.6	327
Region**	35.3	67	10.9	8.7	2	2435
State	49.5	57.5	10.2	11.8	1.5	6824

Note: Table based on youngest but last one living children age under 3 years ** unweighted cases.
[1]Includes Hospital, dispensary, urban health centre/post, urban family welfare centre, community health centre, primary health centre, sub centre, AYUSH hospital/ clinic or other public health facility. [2] includes Private hospital, Doctor/clinic, AYUSH or other private health facility. [3] Includes non-governmental organization/Trust, mobile clinic or other places.[a]includes poorest/second. Total figure may not add to 100.0 due to multiple responses

Table 28: Reason for not giving vaccine

Percentage of children aged under age 3 years who did not received any vaccination by reason for not given vaccination according to place of residence

	Place of residence**				
Place of last vaccination	Rural	Urban	Total**	Region**	State
Child Too Young	57.1	*	54.5	60.4	66.9
Unaware of Need	0	*	31.8	16	11.1
Place Unknown	0	*	9.1	4.9	3.3
Time Unknown	14.3	*	9.1	6.3	5.3
Fear of Side Effects	0	*	22.7	16	13.1
No Faith in Immunization	0	*	13.6	11.1	8.2
Too Far to GO	0	*	9.1	2.8	2
Time Inconvenient	14.3	*	4.5	3.5	2.5
ANM Absent	0	*	9.1	9	7.4
Vaccine not Available	0	*	0	2.8	2.9
Mother Too Busy	0	*	4.5	4.2	4.1
Family Problem/Mother ill	0	*	4.5	2.8	1.6
Child ill Not Brought	0	*	0	5.6	4.1
Child ill Brought but not	0	*	0	3.5	2.1
Long waiting Time	0	*	4.5	0.7	0.4
Financial Problem	0	*	0	0.7	1.6
Child is Girl	0	*	4.5	0.7	0.4
Other	14.3	*	4.5	6.3	7.1
Number of children	18	4	22	144	244

Note: Table based on youngest but last one living children age under 3 years ** unweighted cases. * Figure not shown due to less number of cases. Total figure may not add to 100.0 due to multiple responses

Table 29: Diarrhoea among children

Percentage of children aged less than 3 years who suffered from diarrhoea (last 2 week prior to survey) , received ORS, sought treatment and place of treatment according to some selected background characteristics, Bellary, Karnataka

						Source of treatment					
Background characteristic	Children suffered from diarrhoea	No of Children[1]	ORS given	Sought for treatment	No of Children[2]	Government[3]	AWW/ ASHA	NGO	Private[4]	Other	No of Children[5]
Sex of the baby											
Male	9.4	164	41.4	62.4	15	22.2	0	0	77.8	0	9
Female	8	174	48.5	64.9	14	25	0	0	62.5	0	8
Residence											
Rural	8.8	235	54.7	65.6	21	16.7	0	0	75	0	12
Urban	8.4	103	20.9	58.7	9	40	0	0	60	0	5
Caste/tribes											
SC/ST	7.9	200	31.8	42.8	16	0	0	0	100	0	8
Others	9.7	138	60.2	88.2	13	44.4	0	0	44.4	0	9
Wealth Index											
Poor[a]	3.4	114	56.8	71.7	4	0	0	0	100	0	3
Non-poor	11.4	224	42.9	62.3	25	28.6	0	0	64.3	0	14
District	8.7	338	44.8	63.6	29	23.5	3	3	70.6	3	17
Region**	10.9	2588	47.7	70.5	281	24.2	3	1.5	67.7	1.5	216
State	10.2	7088	45.9	76.7	723	30.8	1.8	1.1	63.7	0.9	554

Note : Table based on last but one living children born after Jan 1, 2004. [1] Child age less than 3 years. [2] Children aged 3 years who suffered from diarrhoea. [3]Includes hospital, dispensary, Urban health post/centre, urban family welfare centre, community health centre, primary health centre, sub-centre AYUSH, and other public health facility. [4]Includes hospital. Doctor/clinic, AYUSH and other health facility. [5]Children aged less than 3 years and who were sought treatment

Table 30: Symptoms of ARI among children

Percentage of children aged less than 3 years who suffered from ARI (last 2 week prior to survey) , received ORS, sought treatment and place of treatment according to some selected background characteristics, [DIST NAME], Karnataka

	Acute respiratory Infections (in last 2 weeks)									Place of treatment #					
Background characteristic	Fever[§]	Cough[§]	During Cough-Breath faster	Fever/cough/ fast breath	Fever with fast breathing	Cough with fast breathing	No of Childr-en[1]	Sought treat-ment	No of Childr-en[2]	Government[3]	AWW/ ASHA	NGO	Private[4]	Other	No of Children[5]
Sex of the baby															
Male	15.5	25.6	30.5	31.7	4.4	13.1	164	57.4	52	28.3	0	0	70.6	1.1	25
Female	18	27.4	26.5	33.3	5.8	11.4	174	76.6	58	31	0	0	67.8	5.2	38
Residence															
Rural	16.3	28.4	27.2	33.4	5	12.4	235	67.3	79	23.1	0	0	76.8	3.4	46
Urban	17.9	22.2	31.9	30.6	5.4	11.9	103	69.1	31	48.7	0	0	47.2	4.1	17
Caste/tribes															
SC/ST	16.1	22.7	20.3	28.2	4.6	8.7	200	69.5	56	18.4	0	0	80.1	6.1	33
Others	17.8	32.1	40.2	38.9	5.9	17.3	138	66	54	42.2	0	0	56.9	0.9	30
Wealth Index															
Lowest[a]	14.4	29.3	32.9	32.8	5	16.4	114	52.7	37	42.7	0	0	57	8.5	18
Else	18	25.1	25.6	32.4	5.2	10.1	224	76.7	73	24.7	0	0	73.8	1.5	45
District	16.8	26.5	28.4	32.5	5.1	12.2	338	67.8	110	29.9	0	0	68.9	3.6	63
Region**	19.1	19	30.9	26.7	6.1	9.3	2588	75.2	796	24.9	0.8	1.5	74.6	2.6	389
State	20.5	20	26.5	27.7	6.2	9.1	7088	76.2	1961	30.2	0.7	1.4	69.1	1.4	1139

Note : Table based on last but one living children born after Jan 1, 2004. [§]Any time in last two weeks prior to survey [1] Child age less than 3 years. [2] Children aged 3 years who suffered from any symptoms of ARI. [3]Includes hospital, dispensary, Urban health post/centre, urban family welfare centre, community health centre, primary health centre, sub-centre AYUSH, and other public health facility. [4]Includes hospital. Doctor/clinic, AYUSH and other health facility. [5]Children aged less than 3 years and who were sought treatment. *Figure not shown due to less than 10 cases.# Multiple responses

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Table 31: Place of treatment for ARI

Percentage of children aged under age 3 years who suffered from any symptoms of ARI and sought treatment by place of treatment according to place of residence , Bellary, Karnataka

	Place of residence				
Place of last vaccination	Rural	Urban	Total	Region**	State
Government					
Hospital	3.3	0	2.4	12.3	8.6
Dispensary	0	9.8	2.6	1.9	0.5
UHC/UHP/UFWC	0.6	11	3.4	1.9	2.7
CHC	12.5	16.8	13.6	3.8	5.6
PHC	6.7	11.1	7.8	5.7	11.7
Sub Centre	0	0	0	2.8	1.3
Anganwadi/ICDS Centre	0	0	0	0	0.7
AYUSH hospital /clinic-public	0	0	0	0	0.1
Other public facility	0	0	0	0	0.5
NGO/Trust hospital/clinic	0	0	0	0	1.4
Private					
Hospital	28.1	19.4	25.8	49.1	35.2
Doctor/clinic	48.8	22.1	41.7	19.8	31.9
AYUSH hospital/clinic	0	0	0	0.9	0.5
Pharmacy/drug store	0	5.6	1.5	2.8	1.7
Other health facility	0	0	0	0	1.4
Other	3.4	4.1	3.6	2.8	1.4
Number of children	46	17	63	449	1139

Note: Table based on youngest but last one living children age under 3 years ** unweighted cases. Total figure may not add to 100.0 due to multiple responses. Figures not shown due to less number of cases.

IMM-ALLDIST /Sheet2/s

Appendices: Service Provider Competencies for Essential Newborn and Child Care

Table 32: Instruments required for newborn resuscitation term and preterm babies

TERM BABIES
Gloves
Sterile warm towels
Sourse of radiant warmth
Suction bulb/mechanical suction apparatus
Suction catheter
Bag and mask neonatal size
Oxygen source
PRETERM BABIES
Mask preterm
Suction catheter preterm
Neonatal laryngoscope
Neonatal endotracheal catheter
Meconium aspirator
Pulse oximeter

Table 33: Audit of case records regarding diahorrea

Elements of care	Higher facility (CHC+) (N= 177)	Private (N= 11)
History taking		
Duration of diarrhoea	31.3	9.1
Presence or absence of blood in the stools	6.3	90.9
Vomiting	48.3	100.0
Ability to drink fluids	4.0	0
Last urine passage noted	4.5	0
Physical examination	26.1	100
Weight at admission	13.6	0
Availability of a monitoring chart	2.3	0
Diagnosis and management		
Gastrointestinal diagnosis recorded	76.7	90.9
Severity of dehydration (no, some, severe OR mild, moderate, severe) noted	26.1	0
Was Zinc prescribed	6.8	9.1
Outcome of the admission recorded	29.5	36.4

Data Source: Service Provider Assessments

Safe Abortion Appendix

Table 34: Outcomes of pregnancy

DLHS 2007-8

Percent distribution of all pregnancies of currently married women (age 15-44) by outcomes[1] according to some selected background characteristics, Bellary, Karnataka

Background characteristics	Live birth	Still birth	Induced abortion	Spontaneous abortion	Total percent	Number of pregnancies
Age group						
15-19	95.4	0.0	0.0	4.6	100.0	32
20-24	93.9	1.5	1.3	3.3	100.0	174
25-29	94.8	1.1	0.0	4.0	100.0	84
30-34	90.7	0.0	0.0	9.3	100.0	24
35-39	78.7	0.0	8.5	12.7	100.0	13
40-44	100.0	0.0	0.0	0.0	100.0	1
Residence						
Rural	93.3	0.8	0.7	5.2	100.0	232
Urban	93.7	1.7	1.9	2.7	100.0	96
Caste/tribes						
Scheduled caste/tribes	97.1	0.5	0.0	2.4	100.0	187
Others	88.5	1.9	2.4	7.2	100.0	140
Wealth Index						
Poor[a]	95.6	0.0	1.1	3.3	100.0	139
Non-Poor	91.8	1.9	1.0	5.3	100.0	188
District	93.4	1.1	1.0	4.4	100.0	327
Region**	94.9	1.7	0.8	2.7	100.0	2590
State	93.1	1.8	1.2	4.0	100.0	6728

Note: [1] Outcomes from past three years. [a] Includes lowest /second. ** Unweighted cases. (): percentage not shown due to less number of cases.

BC_ALL DIST/Sheet1/AT

Family Planning Appendix

Table 35: Knowledge of family planning methods among ever married women

DLHS 2007-8

Percentage of ever married women (aged 15-49) who have knowledge about family planning methods according to selected background characteristics, Bellary, Karnataka

	Residence		Caste/tribes		Wealth Index				
Methods	Rural	Urban	SC/ST	Others	Poor [a]	Non-Poor	Total	Region**	State
Modern methods									
Any method	99.7	97.0	98.6	99.1	99.1	98.6	98.8	98.9	99.5
Female sterilization	99.6	96.5	98.6	98.5	98.9	98.4	98.6	98.7	99.3
Male sterilization	64.2	56.8	57.9	65.5	56.8	64.8	61.7	59.3	68.5
Intra uterine device (IUD)	63.3	75.0	57.6	76.6	54.9	75.0	67.2	58.1	75.4
Pills	75.3	80.8	69.2	84.9	66.5	83.8	77.1	70.9	79.8
Condom / *nirodh*	27.9	44.2	21.1	45.4	19.4	42.3	33.4	31.2	50.7
Female condom	11.4	21.7	11.2	18.4	7.6	19.4	14.8	14.5	22.7
All modern method[1]	8.3	15.9	8.3	13.2	5.5	14.2	10.8	11.7	19.8
Emergency contraceptive pills (ECP)	48.3	63.1	53.7	52.8	42.4	60.1	53.2	38.0	47.1
Injectables	47.0	54.8	50.2	48.9	38.8	56.4	49.6	38.7	45.4
Traditional method									
Rhythm	26.3	32.1	23.7	32.8	19.9	33.6	28.3	26.3	32.1
Withdrawal	33.8	33.5	36.1	31.4	28.8	36.8	33.7	33.8	33.5
Other method	1.1	2.5	1.9	1.2	1.4	1.6	1.6	1.1	2.5
Number of women	729	365	542	552	424	669	1094	8146	27863

Note: [1] Includes female/male sterilization, IUD, Pills, nirodh/female condom.

[a] Includes Poor /second,. ** unweighted.

FP ALL DIST/FP/AT/B

Table 36: Current use of contraceptive method

DLHS 2007-8

Percentage of currently married women (age 15-44) who are currently using any contraceptive method, limiting, spacing, traditional methods according to some selected background characteristics, Bellary, Karnataka

	Bellary				Region**				Karnataka			
Background characteristic	Any method	Limiting[1]	Spacing[2]	Tradtional[3]	Any method	Limiting[1]	Spacing[2]	Tradtional[3]	Any method	Limiting[1]	Spacing[2]	Tradtional[3]
Age group												
15-24	22.3	21.1	0.7	0	20.6	18.5	1.4	0.5	26.6	22	3.9	0.6
25-34	67.3	65.2	1.4	0.6	67.4	64.9	2.2	0.4	71	64.8	5.2	1.1
35-44	79.4	76.6	2.2	0.6	75.3	73.4	1.7	0.5	80.9	77	2.8	1.3
Number of living Children												
0	2.7	1.6	0	0	1.3	0.5	0.2	0.3	2.4	0.6	1.2	0.5
1	11.8	10.2	1.6	0	10.6	6.4	2.8	1.3	24.6	11.3	10.7	2.4
2	63.4	59.5	2.5	1.5	53.3	49.8	3.2	0.3	77.1	72	3.9	1.2
3+	85.2	83.9	1.1	0.2	78.8	77.4	1.3	0.3	84.2	82.3	1.8	0.3
Residence												
Rural	57.1	55.8	0.5	0.5	52.5	51.6	0.7	0.3	62.8	60	2.3	0.6
Urban	50.8	47.4	3.2	0.2	52.7	46.4	5.2	1	59.2	48.4	8.7	2.1
Caste/tribes												
SC/ST	48.5	48.1	0.3	0.1	50.5	49.6	0.6	0.3	60.4	58.8	1.2	0.5
Others	61.4	58	2.4	0.7	53.6	50.7	2.4	0.5	62.4	56.1	5.1	1.2
Wealth Index												
Poor[a]	52.9	51.9	0.6	0	51.9	51.4	0.5	0.1	61.5	60.7	0.8	0.2
Non-Poor	56.5	53.9	1.9	0.7	53.1	49.4	2.9	0.8	62	54.9	5.7	1.4
Total	55.1	53.1	1.4	0.4	52.5	50.3	1.8	0.4	61.8	56.8	4	1

Note: [1]Includes sterilization (male/female), [2] Includes IUD, Pills, condom (male/female). [3] Includes rhythm, withdrawal [a]Includes Poor /second. ** unweighted cases.

FPALL DIST/FP/BF

Table 37: Contraceptive prevalence rate

DLHS 2007-8

Percentage of currently married women (age 15-44) who are using specific contraceptive method according to some selected background characteristics, Bellary, Karnataka

Background characteristic	Any method	Any modern method[1]	Female sterilization	Male sterilization	IUD[2]	Pills	Condom / *nirodh*	Injectables	Rhythm	Withdrawal	Other	Number of women
Age												
15-24	22.3	21.8	21.1	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.4	308
25-34	67.3	66.6	65.1	0.1	0.3	0.0	1.1	0.0	0.6	0.0	0.0	375
35-44	79.4	78.7	76.4	0.2	0.1	0.5	1.5	0.0	0.6	0.0	0.0	228
# living children												
0	2.7	1.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	119
1	11.8	11.8	10.0	0.2	0.4	0.0	1.2	0.0	0.0	0.0	0.0	176
2	63.4	62.0	59.5	0.0	0.9	0.0	1.6	0.0	1.5	0.0	0.0	216
3+	85.2	85.0	83.8	0.1	0.3	0.3	0.5	0.0	0.2	0.0	0.0	399
Residence												
Rural	57.1	56.3	55.7	0.1	0.1	0.0	0.4	0.0	0.5	0.0	0.2	621
Urban	50.8	50.6	47.3	0.1	1.0	0.4	1.7	0.0	0.2	0.0	0.0	290
Caste/tribes												
SC/ST	48.5	48.4	48.0	0.1	0.0	0.0	0.3	0.0	0.1	0.0	0.0	449
Others	61.4	60.4	57.9	0.1	0.8	0.3	1.4	0.0	0.7	0.0	0.3	462
Wealth Index												
Poor[a]	52.9	52.5	51.9	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.4	360
Non-Poor	56.5	55.8	53.8	0.1	0.7	0.0	0.2	0.0	0.7	0.0	0.0	551
District	55.1	54.5	53.0	0.1	0.4	0.1	0.8	0.0	0.8	0.0	0.2	991
Region**	52.5	52.1	50.0	0.4	0.6	0.6	0.6	0.0	0.4	0.0	0.1	6734
State	61.8	60.9	56.5	0.4	1.8	0.9	1.3	0.1	0.9	0.1	0.0	22989

Note: [1]Includes sterilization (male/female), IUD, Pills, condom (male/female). [2] Intra uterine device, [3]Emergency contraceptive pills. [a]Includes Poor /second. ** unweighted cases.

FPALL DIST/FP/BF

Table 38: Age at time of sterilization

DLHS 2007-8

Percent distribution of currently married women (aged 15-44) by age at the time of sterilization according to some selected background characteristics, Bellary, Karnataka

Background characteristics	Age at time of sterilization					Total	Mean age[1]	No of women
	<20	20-24	25-29	30-34	35+			
Years since sterilization								
< 2	9.8	51.6	31.2	5.1	2.3	100	24.4	56
2-3	13.8	29.8	33.9	12.3	10.1	100	26.0	68
4-5	8.2	38.3	40.6	12.9	0.0	100	25.0	66
6-7	13.1	35.4	42.7	8.4	0.4	100	24.2	57
8-9	12.6	38.7	35.1	13.7	0.0	100	24.5	67
10+	16.2	47.1	29.6	7.1	0.0	100	23.4	170
Number of living Children								
0	0.0	0.0	100.0	0.0	0.0	100	25.0	2
1	25.0	32.1	35.1	7.8	0.0	100	23.5	18
2	19.4	46.6	26.8	6.6	0.5	100	23.0	128
3+	10.3	40.3	36.4	10.7	2.3	100	24.9	335
Residence								
Rural	14.5	44.7	31.1	8.3	1.5	100	24.0	346
Urban	9.9	33.2	42.2	12.4	2.3	100	25.1	138
Caste/tribes								
Scheduled caste/tribes	13.9	35.3	36.2	11.4	3.2	100	25.0	216
Others	12.6	46.3	32.7	7.9	0.6	100	23.8	268
Wealth Index								
Poor[a]	15.7	47.1	24.0	11.5	1.7	100	23.9	187
Non-Poor	11.6	37.8	40.7	8.2	1.8	100	24.6	297
District	13.2	41.4	34.2	9.5	1.7	100	24.3	484
Region**	13.9	44.2	30.9	9.3	1.7	100.0	23.98	3389
State	14.0	47.5	28.9	8.1	1.5	100.0	23.74	13065

Note: Table based on those who have been sterilized [1]Mean age of sterilization. * figure not shown due to a low number of cases. [a] includes lowest/second. ** Unweighted cases.

FPALL DIST/FP/DC

Table 39: Sources of sterilization

Percentage of currently married women (aged 15-44) who are currently using any sterilization by source according to place of residence, Bellary, Karnataka

	Bellary			Region**			Karnataka		
Source	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Government									
Hospital	22.9	26.3	23.9	36.3	30.4	34.9	30.4	36.1	31.7
Dispensary	2.5	2.3	2.5	4.5	2.5	4.0	2.3	1.6	2.1
CHC	26.3	19.1	24.2	22.5	18.2	21.5	18.4	14.0	17.4
PHC	29.4	20.2	26.8	23.1	13.0	20.7	24.7	10.5	21.4
Mobile clinic	0.0	0.0	0.0	0.0	0.5	0.1	0.1	0.3	0.1
Camp	3.2	3.3	3.2	2.7	1.3	2.4	9.2	6.0	8.5
Other public sector	5.4	0.0	3.9	1.0	0.6	0.9	4.4	3.7	4.2
NGO/Trust	0.5	0.0	0.3	0.3	1.0	0.4	0.5	0.7	0.5
Private									
Pvt Hospital	8.4	22.0	12.3	8.1	27.6	12.7	8.8	24.2	12.4
Doctor/clinic	0.3	6.7	2.1	0.7	3.2	1.3	0.4	1.7	0.7
Other private sector	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Other	0.0	0.0	0.0	0.0	1.4	0.4	0.3	0.8	0.4
Don't know	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.1
Missing	1.1	0.0	0.8	0.7	0.1	0.5	0.4	0.4	0.4
Total percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of women	346	138	484	2603	786	3389	10032	3034	13065

Note: Based on women who were sterilized **Unweighted cases.

FPALL DIST/FP/GF

Table 40: Cash benefits received after sterilization

Background characteristics	Received cash benefits	No of women[1]	At the time of discharge	At the time of first follow-up	After several visits	Total percent	No of women[2]
Residence							
Rural	74.9	346	92.0	5.4	2.6	100	260
Urban	57.7	138	96.9	1.7	1.4	100	79
Scheduled caste/tribes	74.1	216	88.7	6.7	4.6	100	160
Others	66.8	268	97.2	2.5	0.3	100	179
Poor[a]	78.4	187	92.5	5.4	2.1	100	146
Non-Poor	64.7	297	93.6	3.9	2.5	100	192
District	70.0	484	93.1	4.5	2.3	100	339
Region**	75.5	3389	96.6	1.6	1.1	100.0	2559
State	79.3	13065	97.4	1.4	0.7	100.0	10361

Note: [1]Women/husband who had gone under sterilization. [2]Women/husband who get incentive payment after sterilization. [a]Poorest/second. ** unweighted cases.

FPALL DIST/FP/GT

Table 41: Advice on contraceptive use

DLHS 2007-8

Percentage of currently married women (aged 15-44) who are currently not using any method or using traditional method and were advised to use modern contraceptive methods according to selected background characteristics, Bellary, Karnataka,

Background characteristics	Advised by health worker[1]	Advised by family member[2]	Advised by NGO/CBO	Other[3]	No of women[4]
Residence					
Rural	11.9	13.7	0.0	11.9	226
Urban	5.1	6.6	0.0	10.7	116
Caste/tribes					
Scheduled caste/tribes	7.1	12.2	0.0	11.1	186
Others	12.6	10.2	0.0	11.9	156
Wealth Index					
Poor[a]	9.9	13.1	0.0	12.6	143
Non-Poor	9.4	9.9	0.0	10.7	199
District	9.6	11.3	0.0	11.5	342
Region**	11.1	8.8	0.1	7.8	2670
State	17.8	9.4	0.1	8.1	7445

Note: Includes Doctor, ANM, Health worker, AWW, ASHA. [2] Includes husband/wife, mother-in-law, mother [3] includes relative/friends, other. [4]Women who are either currently non-users or users of traditional methods . [a] Lowest/second. ** unweighted cases.

Table 42: Unmet Need for Family Planning in Bellary District

DLHS 2007-8
Percent of currently married women (aged 15-44) who are not pregnant, do not want another child right now, and are currently not using any method, according to selected background characteristics, Bellary, Karnataka.

	Unmet need for Spacing	Unmet need for Limiting	Total unmet need	Table Total
Type of locality				
Rural	11.0	5.2	16.2	621
Urban	9.4	8.7	18.1	290
Caste				
SC/ST	15.2	5.1	20.3	449
Other	5.9	7.5	13.4	462
Wealth index				
Poor	12.3	7.1	19.3	360
Non-Poor	9.4	5.8	15.2	551
District	10.5	6.3	16.8	911
Project districts	12.2	7.1	19.3	6734
State	8.7	7	15.7	22989

Appendix: Glossary

Suvarna Arogya Suraksha Trust	An insurance scheme for BPL and SC/ST people in the Gulbarga division for tertiary care. Implemented as a public private partnership between the GoK and accredited private hospitals
108 Ambulance	An emergency response service provided through a public private partnership between the Government of Karnataka and Emergency Management and Research Institute
ANM	Auxiliary Nurse Midwife The female health worker who is in-charge of the health sub-centre, also called as Health Worker (Female) or Village Health Nurse
Antenatal	Time from start of pregnancy till delivery
Antepartum	Time before delivery
Antibiotics	Medicines to prevent and treat infections due to microorganisms like bacteria
ARI	Acute Respiratory Infection: Infection of the respiratory tract which commonly affects children; can range from ordinary 'common cold' to life threatening pneumonia
Arogya Kavacha	Emergency response services – also called the 108 Ambulance service
Arogya Raksha Samiti	A management board including and MO and members of PRIs. Overseas PHCs and governs use of untied funds
ASHA	Accredited Social Health Activist: A village level woman worker who provides a list of essential health services, introduced as part of the NRHM.
Assisted vaginal delivery	Delivery of the baby which requires the use of instruments like forceps, vacuum cup suction, to hasten the delivery.
AWW	*Anganwadi* Worker: A village level woman worker who is in-charge of the *anganwadi* centre, providing nutritional and other services to women and children. She coordinates with the ANM to provide MNCH services like registration of pregnancies, immunization etc.
AYUSH	Ayurveda, Yoga, Unani, Siddha and Homeopathy: Referring to the major streams of indigenous systems of medicine practised in India.
BMV	Bag and mask ventilation: A form of assisted breathing technique that is provided through a face mask and bag, used to treat individuals with difficulty in breathing.
CHC	Community Health Centre: A hospital that caters to a rural population of approximately 100000. It is the first point of referral in the rural areas and should have 3 or more doctors including specialists in Obstetricsand Gynaecology and Paediatrics.
CMO	Chief Medical Officer, usually the head of a PHC or CHC or Taluka hospital D and C – Dilatation and Curettage. It is a method used to perform abortions, under anaesthesia.
DDW	District Drug Warehouse
DHO	District Health Officer – The primary government official at the district level
DHS	District Health Society
Early neonatal	Period of seven days from the birth of the baby
Eclampsia	A condition in which a woman with severe pregnancy induced hypertension starts having seizures (fits) and associated symptoms like blurred vision, severe headache, abdominal pain etc,. It is a life-

	threatening event and can occur during pregnancy, delivery or even after delivery.
Fetus/Foetus	The baby developing inside the uterus of the mother (before birth it is called as fetus)
FRU (First Referral Unit)	A hospital that can provide an essential set of routine and emergency intrapartum and newborn care services 24X7 is designated as a FRU by the government and functions as the first level of referral for MNCH services in rural areas. . Critical services including caesarean section delivery, newborn care and blood transfusion must be provided in an FRU.
Growth chart (aka Road to health chart)	A graphical record of the change in weight of the child, measured at regular intervals. The weight at a particular point as well as the general growth pattern of a child can be compared against standard curves on the chart which represent normal growth. This helps to detect malnutrition early, so that necessary corrective measures can be taken. The growth chart is usually maintained by the *anganwadi* worker and ANM.
HA (Health Assistant)	A health worker usually positioned at the PHC, who is in-charge of supervision of health workers employed at the sub-centres under the PHC. The HA-male is also called as Senior Male Health worker and supervises family planning and other non-MNCH activities at the sub-centre. The HA-Female is also called as Lady health Visitor (LHV) or Headquarter ANM (HQ ANM) or Senior Female health worker and supervises the activity of ANMs at sub-centres.
HQ (Head-quarter)	Refers to the village / town where a particular health facility is located.
HW (Health Worker)	A health worker usually positioned at the sub-centre. The female health worker is called ANM and is in-charge of all MNCH activities. The male health worker usually takes care of family planning and other activities.
IDSP	Integrated Disease Surveillance Project. A 2004 initiative from the central government, run at the state level. Epidemiological surveillance to track and manage disease outbreaks.
IM	Intramuscular mode of giving injections (injection given in to muscle on arm or buttocks)
Infant	Baby up to 1 year age
Intrahealth	A US-based non-profit public health agency, with a strong focus on reproductive health, HR and capacity building
Intranatal	The time period during and immediately after delivery
Intrapartum	The time period during and immediately after delivery
IV	Intravenous mode of giving injections (injection given directly in to blood through a vein)
JSY	*Janani Suraksha Yojana* – a scheme which provides incentive payments to women who give birth in a facility
KDWLS	Karnataka Drug Warehousing and Logistics Society
KHPT (Karnataka Health Promotion Trust)	An organization set up as a partnership between Karnataka State AIDS Prevention Society (KSAPS) and University of Manitoba in 2003 to support and implement initiatives related to HIV/ AIDS and reproductive health. It works currently in 21 districts across Karnataka as well as bordering districts of Maharashtra and Andhra Pradesh.
KPSC	Karnataka Public Service Commission

Late neonatal	Period starting from 8th day of delivery and lasting up to 28 days.
LHV	Lady Health Visitor – An senior ANM that oversees nurses
LHV (Lady Health Visitor)	Refer Health Assistant
Lochia	Vaginal discharge after delivery, up to a period of 6 weeks
M and E	Monitoring and Evaluation
Maidlu Kits	A kit containing commodities for newborn care, given to recently delivered mothers. A state-level initiative
MCH	Maternal and Child Health
MNCH	Maternal, Neonatal and Child Health
MO	Medical Officer
MVA	Manual Vacuum Aspirator – syringe like instrument for doing abortions
Neonatal	Any matter related to newborns
Neonate	Newborn baby (up to 28 days of age)
NRHM	National Rural Health Mission, a programme by the Government of India that is aimed to improve the functioning of the health system and thereby the health of the population. The NRHM works through increased fund allocation for health, supporting infrastructure and manpower development, and strengthening supply, logistics and reporting systems throughout the country, with a special focus on underperforming states and districts.
NSSK	Navjat Shishu Suraksha Karyakram – child survival program
Oxytocics	Medicines used to increase uterine contractions (Inj Oxytocin/ Syntocinon/ Pitocin)
Partograph	A graphical record of the progress of labour (Refer to section on services)
Peurperium	Time period from delivery to 6 weeks after delivery (same as postnatal or postpartum periods)
PHC (Primary Health Centre)	A health centre which provides essential preventive and curative services for a population of about 30,000. It has one or more doctors, nurses and auxiliary staff. It has about 6 beds and can provide in-patient treatment.
PHU (Primary Health Unit)	A health centre which provides essential preventive and curative services. It has one or more doctors, nurses and auxiliary staff. It provides only out-patient services.
PIP (Project Implementation Plan)	An annual plan formulated by the District Health Mission based on inputs from all health facilities and programs in the district. It specifies the activities planned during the next financial year and the budget requirements.
Placenta	The tissue which connects the developing fetus to the wall of the uterus in the mother. Exchange of nutrients and oxygen takes place through placenta which also prevents entry of microorganisms and toxic substances in to the fetus.
Postnatal	Period beginning immediately after the birth of a child and extending for about six weeks
Post-neonatal	Period starting from 28 days after birth of baby and extending up to one year
Postpartum	Generally same as postnatal and puerperial periods; but used in the sense of first 24 hours after delivery in the mapping tools.
Prasuthi Araike	A state level incentive scheme which provides payments to BPL, SC

	and ST women to support them during the ante-natal and post-natal periods
Preeclampsia	A condition in which a pregnant woman has increased blood pressure and increased passing of albumin in urine. It can lead to eclampsia.
Pregnancy induced hypertension	Increased blood pressure seen in a pregnant woman that develops after 20 weeks of pregnancy
Premature	Refers to a baby born before completion of 37 weeks of pregnancy
Preterm	A delivery or birth (or baby delivered) before completion of 37 weeks of pregnancy
RCH	Reproductive and Child Health; refers to a national programme aimed at improving maternal and child health in India
Referral services	An individual who visits a health centre for certain services may have to be sent to a higher centre due to presence of conditions that can be managed only in such centres where trained personnel and facilities are available. Such a process is called *referral* and an organized system of referral is an essential service to decrease deaths and illness. An ideal referral system should include: • Advice on location and timings of the higher centre to which patient is referred • Provision of case notes/records/discharge summary that details the presenting condition of the patient, treatment given, progress made during stay at hospital, condition at the time of referral and reasons for referral • Maintenance of a referral register that has details of all patients referred • Arranging transport through ambulance or other vehicles, if necessary • Follow up of patients at the higher centre and after discharge
RAA	Remote Area Allowance – an allowance paid to staff posted in remote areas
SC (Sub-centre)	The lowest level of health facility in the public health system, manned by paramedical staff. It provides essential services including outreach activities to a population of approximately 5000.
Suction	The process of removing secretions and material from the mouth and upper airways of a newborn to facilitate breathing. It is done using a suction bulb manually or through a tube attached to a suction machine. These work by creating a negative pressure in the tube which aids in removing the materials.
SIHFW	State Institute of Health and Family Welfare – the state level body that manages training and capacity building
SJRI (St John's Research Institute)	A research institute that functions under the St John's National Academy of Health Sciences, Bangalore that is partnering with KHPT and UoM in the MNCH project by providing technical support and guidance.
Thaiya Bhagya	A state scheme that allows BPL women to give birth in accredited private facilities
Tocolytics	Drugs (Ex: Inj. Duvadilon aka Isoxusuprine) given to reduce/prevent contraction of uterus. They are used to prevent preterm deliveries.
TT (Tetanus Toxoid)	A vaccine used in pregnant mothers to prevent tetanus in the mother during postpartum period and in the newborn.
UFWC (Urban family	A health facility functioning in urban areas providing family welfare

Welfare centre)	and other MNCH services. There are three types of UFWCs Type I – caters to a population of 10,000 and is manned by a male and female health worker (ANM) Type II – caters to a population of 25,000 and is manned by an LHV, male and female health worker (ANM) and other staff Type III - caters to a population of 50,000 and is manned by doctors, nurses and other auxiliary staff
UHC (Urban Health Centre)	A hospital providing essential preventive and curative services in an urban area for a population of about 50,000
UMH	(Urban maternity Hospital) – A hospital that provides only antenatal, delivery and postnatal services, located in larger towns and cities.
Untied funds	These are funds provided to health facilities and Patient welfare societies under NRHM. These are to be used for essential or urgent activities that require relatively small sums of money. While all other fund allocations are under specific heads, untied funds have the freedom to be used as and when required.
UoM (University of Manitoba)	A Canadian university with a successful track record of implementing HIV and AIDS prevention and control programmes in India and in many other countries.
Poor	The bottom two wealth quintiles
Non-Poor	The top three wealth quintiles