

# ROLE OF MOBILE PHONE IN FEMALE HEALTH WORKERS' WORK ROUTINE

*Results of a field study in Mysore, Karnataka, 2012*

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## Background

In Karnataka, like elsewhere in India, maternal and child health (MCH) services are provided in its rural areas through a large number of female health workers (FHW) located at the village and primary health center (PHC) levels. Each FHW is expected to serve a population of around 5000, spread over 3-5 villages, providing various primary health care services from prenatal care to child immunizations, child nutrition, family planning, as well as treatment for TB, malaria and other minor ailments. FHW's workload has been the subject of many studies over the past 3-4 decades that have repeatedly shown that FHWs spend 30 to 40 percent of their time just in recording health information, maintaining registers, and compiling reports. The data so laboriously collected are rarely used by FHWs, except for reporting.

India has recently experienced exponential growth in its telecommunications industry, with mobile phones reaching even the most rural areas. The availability and use of mobile phones by almost all health workers and by the majority of their clients provide an opportunity to see if this technology could help in reducing FHW's burden of data related work, making FHWs more productive, and improving the quality of services they provide.

With this objective, Project Dristhi<sup>1</sup> was initiated in Karnataka, India, which involved developing an Android-based mHealth application for FHWs and evaluating its impact on selected maternal and child health indicators.

The Application Development phase involved undertaking several formative research studies to understand health workers' information needs, barriers to meeting those needs, and current use of mobile phones in their work processes. These studies were meant to guide the Application Development so that FHWs find the resulting mHealth product useful and user-friendly.

This paper presents results from one such study undertaken in 6 PHCs of Mysore district aimed at understanding FHW's workload, their work flow, how they presently handle their work flow, and what support the mHealth product could offer to improve efficiency of their work flows.

## The Study Site

Mysore district is located 130 Km south west of Bangalore with a population of about 3 million (Census 2011), of which 58% live in rural areas and approximately 55.5% of females in rural areas are literate<sup>2</sup>, compared to the state average of 61.4% rural, and 53% literacy among rural women.

On all key health indicators, Mysore district is among the top 20% of districts in the state (DLHS3, 2007-2008)

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<sup>1</sup> Project Dristhi is a collaborative endeavour between WHO, Columbia University, and FRHS, and is funded by a grant from the Wellcome Trust UK, under its Research and Development for Affordable Healthcare in India initiative.

<sup>2</sup> Literate is defined as 'anyone above the age of seven who can read and write with understanding in any language. (Census of India)

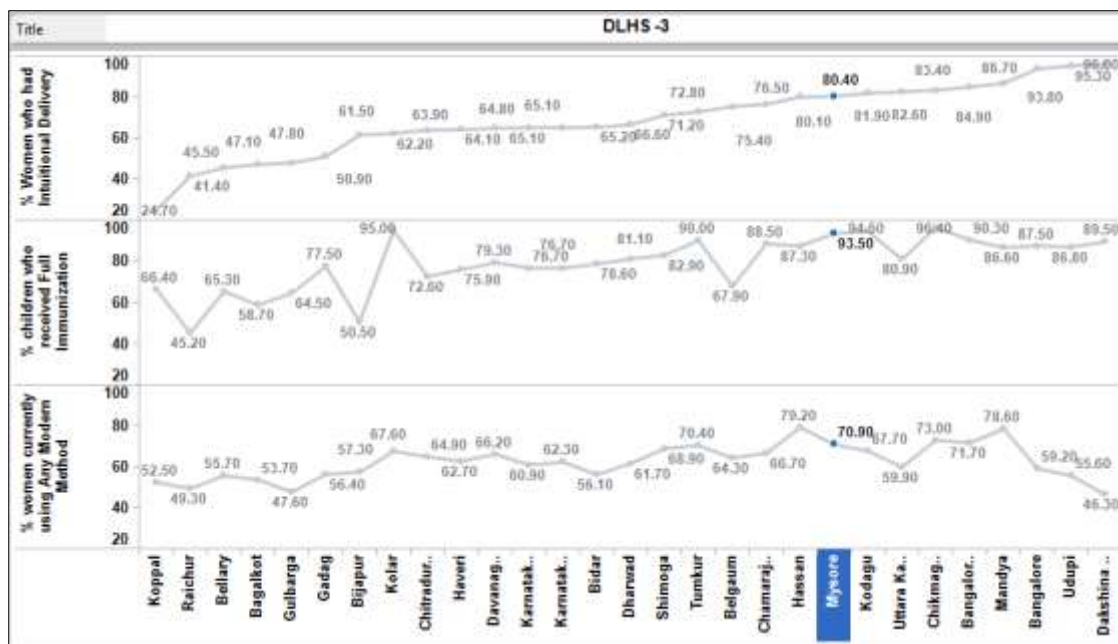


Illustration 1: Karnataka -DLHS -3

Mysore district is divided into 8 blocks. Its public health infrastructure consists of 2 tertiary care government hospitals, 2 Taluk level secondary care hospitals, 6 Community Health Centers, 150 Primary Health Centres (PHC), and 510 Sub-Health Centers (SHC). SHCs are managed by one female health worker (FHW) each. (NRHM, 2012)

### Study Methodology and Sample:

This study was conducted among 25 FHWs from 6 randomly selected PHCs in Mysore. These 6 PHCs had 36 FHWs in position, of whom we interviewed 25, using two semi-structured questionnaires (Appendix 1). One questionnaire explored FHW's workload, work flow and their health information needs. The other explored their access to and use of mobile phone technology for health-related work. The mobile phone usage questionnaire was also administered to 31 ASHAs and to 25 young mothers with children less than 2 years of age. All interviews were conducted in Kannada. The workload portion of the questionnaire took approximately 15 minutes to complete. The mobile phone usage portion of the questionnaire took approximately 5 minutes to complete. Participants' verbal consent was obtained before starting the interview.

### Study tool and Data collection

Both of the questionnaires (workload and mobile phone utilization) were initially prepared in English and translated into Kannada. The questionnaires were then back-translated to check for the accuracy of translation, which ensured that the English and Kannada versions matched closely.

Six field investigators, each with a minimum one year of field experience, carried out the surveys. Each of the field investigators underwent four days of training -- 3 days in the class

room and one day in the field-- on how to administer the questionnaire. During the class room training, the interviewers were trained to ask supplementary questions to help understand the work flow of FHWs, and the problems they face while discharging their duties.

The six field investigators worked in teams of two. Each team completed up to 3 interviews per day (one FHW, one or two ASHAs, and one mother) for a total of 81 interviews completed over 10 days.

## Findings

### Characteristics of the respondents

FHWs in our sample ranged from 25 to 59 years of age; about half of them were over 45 years of age. ASHAs were on average younger than FHWs; approximately half of them were above 30 years of age. This data regarding age was important to collect because younger age is considered to be an important marker for adopting new technologies, such as the mobile phone. Younger and more educated women are known to adopt new technologies more readily than older and less educated women.

Mothers selected for this study were younger than most of the ASHAs. The majority of them were between 20 and 30 years of age. Among the mothers, 8% were illiterate, while 52% had 10 or more years of education. All FHWs were educated for 10 years or more since 10th standard is the educational requirement for being appointed as a FHW. Similarly for ASHAs, the educational requirement is 8<sup>th</sup> standard.

Since the mHealth design team wanted to know the language proficiency of the potential users of the application, we gathered data on respondent's proficiency in Kannada (the state language), Hindi (the national language) and English, in terms of speaking, writing and reading.

Kannada reading and writing was near universal in all three groups. Among the study sample, 96% of FHWs, 65% of ASHAs, and 24% of mothers were reported of being able to read and write in English. Proficiency in Hindi was even less. Only half of the FHWs and very few of the ASHAs and mothers could read and write in Hindi.

### FHW's Workload

FHWs reported covering, on average, 827 households wherein there were 688 married women of reproductive ages, who they referred to as Eligible Couples (EC), as they are potential clients for reproductive and child health care services including family

➤ Population covered*	Average	Min	Max
<sup>3</sup> Population served	3978	1710	9000
Household	827	380	2000
MWRA Registered	688	45	972
Pre/post natal women	40	12	102
Delivery	6	3	12

Illustration 2: Population covered

<sup>3</sup> Population served is calculated based upon average House hold size in Mysore. (DLHS 07-08)

planning. The range of households FHWs covered varied from 380 to 2000, while the number of EC varied from 45 to 972, depending on the size of the village (Illustration 2).

As per the Government of India (GoI) norm, one FHW is expected to serve a population of around 5000 (i.e. 1000 households); register approximately 800 EC; and to have on record about 100 pre and postnatal women at any given point in time.

The average workload as reported by FHWs in our sample was slightly below the GoI norm (827 HH; 688EC) but the variation in their workload was high. Three FHWs reported serving populations of 7- to 9000, which was significantly higher than the norm, and therefore they had significantly higher workloads. These FHWs were also more senior in age (above 40) and found their workloads to be too high. At one of the PHCs, a health inspector informed the interviewers that because of the heavy work load, many FHWs were opting for voluntary retirement upon reaching the age of 50 (which is a retirement option provided by the government). Consequently, the remaining FHWs have to take charge of additional SHCs until new FHWs are appointed. This resulted in more work for most of the FHWs.

### **FHW's Workflow**

FHW's job description includes routine visits to all households in her area at least once a month, which amounts to visiting about 100 households per day, in addition to contacting about 15-20 priority houses having pre/post natal women or malnourished children.

FHWs are also expected to hold one ANC/Immunization clinic each week at her SHC and hold 2 health education days each month in the villages allotted to her. In addition to this, a FHW is required to attend 3 monthly meetings -- one with ASHAs, one at the PHC and one at the sector (or CHC) level. Additionally, she is expected to compile many reports and participate in periodic events such as the school health program, Polio vaccination or Vitamin-A days; family planning camps, etc. Typically, a FHW allocates 4 days per week to conduct routine household visits, during which she inquires after the health of all the family members, gives medicines for minor ailments like headache and fever, advises on referral where needed, and registers new pregnant women, postnatal mothers and their children.

FHWs in our survey reported visiting an average of 345 households per week, i.e., about 100 per day. That number varied between 120 and 800, depending on the number of households in their areas. In smaller villages, they were able to spend more time per household, while in larger villages they only had time to spend 1-2 minutes per HH. Their strategy for having to cover about 100 houses per/day was to quickly pass by homes with no health problems by saying "Hi" and "Hello" from outside and asking if everybody at home was alright. In some of those houses, someone usually complained about headache or skin rash and asked for medicine. To them, they typically gave a few tablets and asked them to go to PHC. They made a mark on the locked doors to indicate that they had visited the house. In houses where there was a postnatal or pregnant woman, they spent 12-15 minutes talking with the woman, looking at their signs and symptoms, looking at their laboratory results if they had any, and giving them advice.

## FHW's Workload Related to Mother care

According to the FHW, an average of 6 deliveries took place each month (range: 3 to 12 ), which is about 25% below the expected number, assuming a birthrate of 20 per 1000 population and the average population being served was 4000/per FHW.

This 25% shortfall in the recorded number of deliveries could be because some women obtain ANC and delivery services from private facilities and some delivery information for other women is delayed in reporting. Since delivery information triggers FHW's postnatal home visits, no delivery information means no timely post-natal visits are conducted. All FHWs in our sample, however, were very confident that they came to know about all deliveries in their areas on the same day!

Eighty-eight percent of FHWs sampled said they mostly visited pregnant women at their homes. Pregnant women often were not able to come to the SHC/PHC because of "family problems/ no family support" (20%), "no transport to reach SHC/PHC" (16%) or "preference for private facilities" (8%), they said. Lack of awareness about the services available, non-predictable availability of the service provider, or distance from the nearest facility were not mentioned as reasons for women not coming for the services.

How do FHWs come to know about a woman going into labor pain? 76% FHWs said that families of pregnant women inform them about the women going into labor pain, while fewer FHWs (24%) said that they hear about it from the ASHA, who is usually the first point of contact for most families. FHWs are usually called only when families perceive an emergency situation developing during labor, which happens in about 1 in 4 cases, FHWs said.

During such emergency situations, FHWs are called to check on the severity of the mother's signs & symptoms and to do something like give an injection (76%), advise on which hospital to go to (64%), and sometimes help arrange for transport (48%) (Illustration 3). Occasionally, when an ambulance is not able to arrive within the stipulated half an hour, family members call FHWs to find out how long they could wait before making alternative transport arrangements.

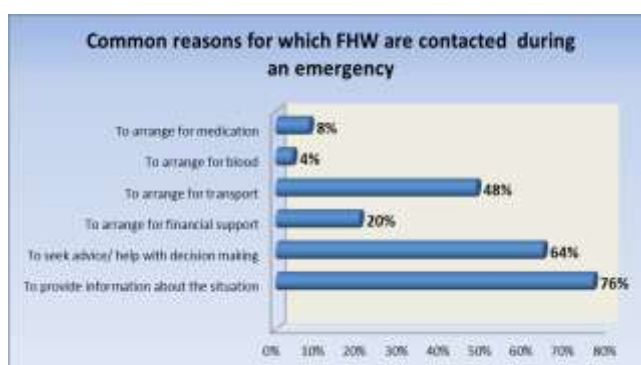


Illustration 3: Reasons for FHWs contacted during emergency

How soon do FHWs get to know about a delivery? Twenty-four out of the 25 FHWs said that they learn about a delivery on the same day, either from the woman's family members or from the ASHA, by mobile phone. *"Families informs us even about deliveries taking place outside our work area, like in (pregnant women's) mothers' villages because we develop good relationships with families by visiting them so very often"*, said one FHW. Only one



FHW, who was the oldest FHW (59), among the respondents said, she gets to know about a delivery within a week.

Mobile phones seem to be facilitating timely communication between ASHAs and FHWs about delivery and birth notification; only one FHW said that she receives this information from staff at the facility where the woman delivers. Hospital staff also sometimes notify FHWs about deliveries because discharge of delivery cases involves some paperwork related to the payment of JSY benefits that requires the presence of a FHW.

### **Workload related to Postnatal Care**

FHWs reported making, on average, 7 postnatal visits per month (range 3 to 10). FHW is expected to visit a postnatal mother on the 3<sup>rd</sup>, 5<sup>th</sup>, 7<sup>th</sup>, and 42<sup>nd</sup> day after delivery if the mother delivers at a hospital and is discharged 48 hours after the delivery. If she delivers at home, which is very rare in Mysore, or is discharged before 48 hours on the woman's request, the FHW is expected to visit her immediately upon reaching home (within 24 hours) and then on the 3<sup>rd</sup>, 5<sup>th</sup>, 7<sup>th</sup> and 42<sup>nd</sup> day. Any FHW strictly following this protocol would be making 18-20 postnatal visits per month (assuming an average 6 deliveries per month). Since they reported making around 7 visits per month, it can be assumed they are probably only making about half of the required number of postnatal visits.

The most common reasons for not being able to make the required number of PNC visit, as reported by the FHWs sampled, were: lack of time (48%) and lack of timely information about the delivery case (32%), since the 7-day window<sup>4</sup> earmarked for postnatal visits is too short for FHWs to ensure home visits to all PNC cases, in addition to completing the other scheduled activities like holding weekly immunization clinics and other monthly activities.

### **Workload from pregnancy related complications**

Responding to the question, "If there are 10 pregnancies in your work area, how many of them do you think, will have a complication" FHW said, average 2 out of 10 (i.e. 20%) pregnant women were likely to develop complications during pre-natal, intra-natal or post-natal periods combined (range: 1 to 4). HMIS data of 2010-11, which reports the service statistics, showed that FHWs in Mysore had reported 1198 complication cases among 28617 pregnant women (4%). (NHSRC, 2011). The district level health survey (DLHS), carried out during 2007-08 by independent investigators visiting house to house, had recorded 53.4% complication rate, as reported by pregnant mothers in Mysore district (block-specific data are not available from the DLHS survey (2007-2008). The huge discrepancy might be because mothers perceived many symptoms such as tiredness, severe vomiting, various aches and pains etc. during pregnancy, as pregnancy related complications. FHW considered only a few conditions such as Eclampsia, abortion, hemorrhage etc. as pregnancy related complicated but they recorded / reported only a few complication cases in the service statistics.

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<sup>4</sup> - After delivery, first 7 days is the most crucial period for Post natal visit.



The complications most FHWs mentioned were: spontaneous abortion (64%), Eclampsia/ pre-Eclampsia (40%); obstructed labor (24%), retained placenta (8%), Postpartum hemorrhage (8%), and anemia (24%) (Illustration 4). FHWs come to know about complication cases mostly during home visits or from ASHAs. Women with complications do not come to SHCs with complaints nor do they inform FHWs about her problems, either by phone or by sending a messenger. This might be because FHWs can do very little in such cases except to tell them to go to the PHC or to some higher level medical facility. As a result, pregnancy related complications do not add much to FHW's work load since FHWs neither treat nor accompany the women to referral facilities.

Pregnancy related complication* (multiple response)	
Eclampsia / Pre – eclampsia	40% (10)
Spontaneous abortion	64% (16)
Obstructed labor	24% (6)
Postpartum hemorrhage	8% (2)
Ruptured uterus	4% (1)
Retained placenta	8% (2)
Sepsis	4% (1)
Others (Anemia)	24% (6)

Illustration 4: Pregnancy related complication

### Workload from newborn related complications

Responding to the question, “*If there are 10 newborn in your work area, how many of them do you think develop complication*”, all FHW said, “1-2 newborns develop complication out of 10. Describing the type of complications the newborn develops, 92% of FHWs mentioned prematurity or very low birth weight, 48% mentioned acute respiratory tract infection, 28% mentioned birth asphyxia, and 20% said diarrhea (Illustration 5). They knew about these complications because they were trained in Integrated Management of Childhood Illness (IMCI), they said

New born complication* (multiple response)	
Acute Lower Respiratory Tract infection (ALRI)	48% (12)
Birth Asphyxia	28% (7)
Congenital abnormalities	4% (1)
Diarrhea	20% (5)
Prematurity/Very low birth weight	92% (23)
Other	4% (1)

Illustration 5: Newborn complication

FHWs are expected to make three special visits to households with high risk newborn (i.e. newborn having any one of the complications mentioned above) on the 14th, 21st and 28th day after the birth (ANM Guidelines). Therefore, newborn complications added to their workload because typically, these houses are spread out and might not be easy to cover during routine home visits.

### FHWs' perceptions about their Workload

72% of FHWs said their current work load was too high, while 28% said that it was manageable. The FHWs who said their work load was too high were not necessarily older or had less work experience or were serving too large a population. On the other hand, out of the 7 FHWs who said their workload was manageable, 6 had more than 17 years of work experience while one was working with a population of about 1200 instead of the average 4000.

All FHWs who said their current work load was too much wanted a reduction in the number of registers they were required to maintain and in the number of responsibilities they were given. One FHW said, *“Whatever new programme government starts, like JSY, Madilu kit, they (Gov) give the responsibility to us... that increases our work load more (than we can handle)”*

In a typical 25 working day month, FHWS are expected to spend 14-15 days in the field, doing routine household visits from 9 am to 1 pm. After that, almost every day in the afternoon from 2 to 4 pm, they update their records and registers either at the health center or at home.

Currently, FHWs maintain 28 registers and one diary, prepare 3 reports each month, and are expected to send about 50-60 SMS regarding specific health services they provide to woman and children (Box1-list). 64% of FHWs said that they often make mistakes in recording information and while manually compiling reports. It is embarrassing for them if those mistakes get mentioned in the review meetings with medical officers. They would avoid such situations if they had fewer registers to keep and reports to prepare, they said.

List of Registers and Reports	
1 Eligible couple register	15. RTI/STI Register
2. ANC register	16. Infection (RTI/STI ) Register
3. PNC register	17. Village Blindness (VBR) Register
4. Birth register	18. Blood Smear Register
5. Infant death register	19. T.B Register
6. Still Birth register	20. Leprosy Register
7. Maternal death register	21. H.I.V /A.I.D.S
8. Children diseases and death register	22. School Health program Register
9. General Death Register	23. Janani Suraksha Register
10. High risk pregnancy register	24. Janani Suraksha Expenditure Register
11. 0 to 1 year children register	25. Madilu Register
12. Immunization register	26. Un-tied Expenditure Register
13. Vitamin A register	27 Behavior Change communication Register (BCC)
14i. Sterilization Register	28. Stock and Issue Register
14ii. IUD Register	<b>Fortnight meeting Report</b>
14iii. OCP Register	<b>PHC -Monthly Report</b>
14iv. Condom Register	<b>HMIS – Report</b>

### Use of Mobile Phone in FHW's work

To understand the current use of mobile phones among FHWs, ASHAs, and Mothers for health related work, we gathered 5 types of information from 25 FHWs, 31 ASHAs, and 25 young mothers regarding their:

1. Access to mobile phones
2. Knowledge and ability to handle various functions of mobile phones
3. Knowledge and ability to undertake basic phone maintenance

4. Mobile phone usage for health purposes
5. Preferred mode for communication

### **Access to mobile phones:**

100% of FHWs and ASHAs and 84% mothers reported having access to mobile phones, either their own or through a family member. Practically all FHWs and ASHAs owned their phones. Among mothers, only 36% owned a mobile phone, 44% reported using their husband's phone, 4% reported using a neighbor's phone, while 16% had no access to a mobile phone.

### **Knowledge and ability to handle mobile functions**

All those having access to a mobile phone were comfortable in dialing and receiving calls on the mobile phone. 88% of FHWs, 97% of ASHAs and 40% of mothers reported that they also knew how to call a toll free helpline for assistance.

In terms of being able to handle higher level functions of the mobile phones: 96% of FHWs, 100% of ASHAs and 80% of mothers said they knew how to find phone numbers by searching in the contact list. Only one FHW did not know how to search the contact list as she did not own her own mobile phone but used her husband's phone. As a result, she did not use a mobile phone to call other FHWs, or ASHAs or her clients nor to send SMS to MCTS though the government had provided a SIM card to help send SMS or call any one in the health department, free of cost. Owning a mobile phone seemed like a precondition for using it for health related work.

92% of FHWs, 87% of ASHAs and 56% of mothers said that they were able to search for old SMS in their mobile phone; 68% in all three groups were able to take pictures with their mobile phone.

88% of FHWs, 94% of ASHAs and 76% of mothers said they are able read SMS in Kannada. Among the three FHWs who said they could not read SMS in Kannada -- one did not know how to open the inbox and read any SMS, whether they were in Kannada or English. The other two said that they had never seen a Kannada SMS because their mobile phone did not support the Kannada script. 96% of FHWs and 65% of ASHAs and 44% of mothers said that they are able to read SMS in English.

FHW's ability to write and send SMS was somewhat lower than their ability to receive and read SMS; but their ability to send SMS in English was better than sending them in Kannada. While 72% of FHWs reported being able to write and send SMS in English only 44% could do so in Kannada because their handsets did not support Kannada script. Of the 7 FHWs (28%) who said they could not write and send SMS in English - 6 were above 50 years of age and one did not own a mobile phone. 4 of them were not sending SMS to MCTS also and the remaining 3 were taking help from their family members to send SMS to MCTS. Our investigators also noted that some FHWs, especially the older FHWs perhaps were underplaying their ability to handle mobile phones when they were told about the mHealth

project. They were perhaps showing their reluctance to get involved in a new mHealth initiative by making the point that they were not good at handling technology.

45% of ASHAs said they are able to write and send SMS in English and 52% in Kannada. Among mothers, half could write SMS in Kannada but only 20% could write and send SMS in English because they could not read/write English.

76% of mothers said that they had ever received SMS but very few reported receiving those from health workers (4%). 44% of mothers said, they liked receiving SMS and all of them were educated for 10 or more years. 44% of mothers said, they had also received recorded messages and liked receiving information through recorded messages. 28% mothers said they had called customer service for information. The remaining 72 percent of mothers did not know how to or said they needed to call customer service centers.

To understand in what other ways the respondents were using mobile phones, we asked if they could use mobile phones to order gas cylinders, to vote for TV programs, to watch videos, to subscribe to news updates, astrology, cricket scores, to download caller tunes or to browse the internet. These questions were asked in two steps -- first, if they knew that those services are accessible by mobile phone and second, if they had actually obtained those services using a mobile phone.

Over 80% of FHWs and ASHAs knew that mobile phones could be used to watch video and over 50% reported watching videos over their mobile. Among mothers, 56% knew that mobile phones could be used to watch videos but practically none had watched videos on their mobiles, which may be because of the low-end mobile phones they were using.

All those who had access to mobile phones (either their own or their husband's) knew how to charge the phone batteries, while 96% of FHWs, 90% of ASHAs and 76% of mothers knew how to modify the volume, recharge the talk time and to lock/unlock the phones without assistance from others.

76% of FHWs, 81% of ASHAs and 64% of mothers said they never run out of battery, i.e. they keep the mobile charged all the time. 88% of FHWs, 45% of ASHAs and 52% of mothers said they never run out of credit, i.e. they ensure that there is sufficient balance to receive calls and make at least one call all the time. Also, 84% of FHWs, 71% of ASHAs said the phone connectivity in the village they lived in was good (Illustration 6).

Availability of Phone	FHW 25	ASHA 31	Mother 25
<i>Always keep the phone charged</i>	76% (19)	81% (25)	64% (16)
<i>Always Keep the currency</i>	88%(22)	45% (14)	52%(13)
<i>Always have good connectivity</i>	84%(21)	71% (22)	56% (14)
<b>Overall availability of phone<sup>5</sup></b>	64% (16)	19% (7)	32% (8)

**Illustration 6: Phone Availability**

<sup>5</sup> Over all availability of phone was calculated based on Mobile charged all the time, money in mobile to make call at most of the time and good connectivity in home.

By combining the three factors (i.e. battery charged, credit available and good connectivity) we derived the overall mobile phone availability (i.e. number of respondents said, most of the time their phone batteries were charged; they had currency in the phone and connectivity at the residence was good), which came to 64% among FHW, 19% among ASHA. Phone availability was low among ASHA because many ASHA had said, they frequently ran out of credit.

All respondents were using pre-paid connections which offered many low-cost options to keep the mobile connection active. For example, one could pay a minimum charge of 10 rupees per month and receive any number of calls, free. Another option was to keep 1 rupee balance on the phone and keep a recharge coupon ready for use whenever needed. FHWs and ASHAs were using such schemes to minimize the charges. ASHAs further minimize their cost by giving a "missed call" to the FHW, indicating that the FHW should call them back. "We usually call them back even though it is a cost to us", one FHW said.

In terms of the connectivity, FHWs who usually lived in larger villages or near towns reported having good mobile connectivity at home but only 56% of them said that the connectivity was good in all the villages they worked in. 56% of mothers corroborated that the connectivity was good in the villages they lived. Since the 25 mothers in our sample were selected from different villages, this finding suggested that in about 40% of villages, FHWs might not get adequate connectivity to operate the mHealth product. Connectivity however differed from provider to provider depending on the availability of towers in the area.

Though BSNL, the government service provider, claims to have good connectivity in the entire rural areas of Karnataka, Airtel, a private service provider, was the most popular connection among FHWs (44%), BSNL came a distant second (32%). Other private providers (MTS, Docomo, Idea, Reliance, spice, Vodafone) had 24% combined share in the connectivity (Illustration 7). FHWs preferred Airtel not because it was less expensive or because the connectivity was better but because of the superior marketing by Airtel and recommendations of the peers who were using Airtel. In fact, Airtel's basic call rate is 1 rupee per min while that of BSNL is 0.90 /min (Air12). Both providers have various attractive schemes like second pack, sms pack etc. for users. Overall the Airtel charges are somewhat higher than the BSNL charges for all the packs.



Illustration 7: Mobile providers

All FHWs except one, reported receiving an additional BSNL SIM card provided by the health department and Closed User Group (CUG) connection so they could call anyone in the health department, free of cost. However, ASHAs were not covered in the CUG scheme and hence they had to bear the cost of calls to other ASHAs and to mothers, which came to about 200-300 rupees per month, they said, which the government did not reimburse. Since most of

their work-related calls were to ASHAs (96%) and to mothers (84%), most FHWs reported using their own SIM card. A few reported using the government-provided SIM card especially if FHW's hand set had dual SIM facility. Some FHWs reported frequently changing between personal and official SIM cards in their phones.

### **Mobile Usage for Health**

48% FHWs reported using mobile phones "many times" to refer pregnant women for the emergency obstetric care to PHC while only 24% said they "many times" communicated with referral facilities beyond PHC. Over half of the FHWs had rarely or never communicated with referral facilities, first because they were not expected to do so and second because in their experience, referral facilities did not respond well to them. *"Often they do not receive (the call); if received they say "wrong number"; sometimes they slam the receiver saying doctor is not in"*, one FHW said. Doctors do not give out their mobile phone numbers to FHWs to avoid getting calls directly.

56% of FHW said they were "many times" using mobile phones to remind ASHAs to bring pregnant women to the clinic; 32% said they would use mobile phone to inform ASHA if they needed to reschedule the village immunization day, which was very rare. They had never rescheduled immunization day, they said.

Most ASHA reported using mobile phones "many times" to communicate with FHW when women started the labor pain (77%); when women needed referral to PHC (65%) and to remind FHW about pregnant women who needed to be visited at home (45%). ASHA also confirmed that they never had to use mobile phone to inform mothers about rescheduling of immunization days.

19% ASHAs mentioned that they occasionally called PHC medical officer but they also expressed similar hesitation about calling PHC doctors as the FHW expressed about calling the higher level referral facilities. 84% ASHAs said that they frequently call 108 ambulance services on behalf of mothers.

### **Mobile usage among mother for health**

In response to a set of questions designed to know how often mother had been in situation when they had used mobile phone for health purposes -- mothers said, they had used mobile phone many times (i) to get assistance from ASHA (80%), (ii) to know where to obtain medicines (72%), (iii) what to do during pregnancy (24%); and (iv) for child's health problem (32%). But they rarely had to call to know from where to obtain contraception or to call 108 ambulance service provided by the government.

Our exploratory work had suggested that FHW did not give out their mobile numbers to all mothers but only to a select few, from whom they did not mind getting calls. Giving personal numbers to over 1000 families was a burden, FHW had said.



## Mothers' Preferred Mode of Communication

We asked the mothers their preferred mode of communication to receive information on different health topics, such as reminders about immunization, ANC visit, laboratory test or family planning advice.

Over 60% mothers preferred in-person communication with ASHA or FHW for receiving all reminders and information. Phone calls was the next preferred option by about 25% mothers while SMS or Prerecorded Messages were the least preferred (< 10%), which was a rare event for them.

## Discussions and Conclusions

India has recently experienced exponential growth in its telecommunications industry, reaching rural areas to a significant extent in the form of mobile phone. This study, carried out in 6 PHCs in Mysore district, confirmed the near universal availability and use of mobile phones by all health workers and a majority of their clients, providing further support to the proposed mHealth initiative that will be attempting to exploit the mobile phone technology to the fullest extent, going beyond calling and receiving calls, to make the health workers more productive and improving the quality of services they provide. This study was undertaken to understand FHW's workload, their work flow, how they presently handle their work flow, and what support can the m-Health product offer to improve the efficiency of their work-flows.

The results from this study helped us to understand the constraints and opportunities for the Dristhi mHealth product. For example, one constraint we found was that nearly half of FHW were more than 45 years of age, and younger age is an important marker for being able to handle new technology like the mobile phone. Younger FHWs were more ready and comfortable in handling technology than older FHWs; in fact, older FHWs were found to underplay their ability to handle the mobile phone probably to indicate their reluctance to get involved in a new mHealth initiative.

Another constraint the study brought up was the heavy workload of FHWs, of which record keeping and report generation had a lion's share. FHWs were already complaining about new schemes and programs being imposed upon them, thereby increasing their workloads. It seemed obvious that they might resist the mHealth product if they see it as adding to their already heavy workload and not reducing it.

FHWs typically visit 100-120 houses per day, with some visits being done very quickly from outside the house if it is not a priority house, i.e. the house has a pregnant or postnatal mother or high risk child or a couple interested in adopting family planning method. FHWs typically decide on the priority based on their memory, rarely using any records. Would it not help if



the mHealth product can display the houses they need to visit, based on the beneficiary records in her phone?

At present, mobile phones seem to be facilitating timely communication between ASHA and FHW about delivery and birth notification. The urgency in communicating delivery information may also be because of the JSY scheme that requires release of JSY benefits before a woman leaves the hospital. This scheme however applies only to deliveries taking place in public health facilities. Nearly 25% deliveries that take place at either at private facilities or at home in Mysore district (estimate derived from DLHS-3 primary data) are not covered in JSY scheme and therefore birth notification in those cases might be not as prompt and also their PNC visits. The study seemed to confirm this shortfall when FHW reported about 25% fewer births in their areas than expected.

They also reported about 7 postnatal visits per month when the expected number was between 15-18, assuming about 3 visits per delivery, which was a shortfall of about 60 percent. This shortfall suggested that FHW find it difficult to make the required number of PNC visits within the 7-day window after delivery in addition to their other activities. They depend on ASHAs to inform them about any PNC complications, which perhaps does not happen to the desired extent because ASHA's responsibility with pregnant woman is complete with delivery notification until the child becomes 6 weeks old and is due for immunization. Thus it seems that the 6-week postnatal period, which is the most risky period, is when woman is left alone to take care of herself. We found this to be the most important gap in FHW's workflow when she is not able to remain in contact with postnatal woman and an opportunity for the mHealth application to focus on, by helping FHW to remain in contact with PNC homes, even by phone if necessary, and by helping mothers to identify the danger signs and empowering them to seek prompt treatment, when those signs occur.

FHW are expected to make three additional home visits to high-risk newborn within one month of the birth. Since these visit do not coincide with FHW's postnatal care visits, high risk newborn do add to FHW workload.

However, a large part of the workload that FHW find most overbearing is related to the upkeep of the registers, preparing reports and sending SMS to the MCTS system. Since the entire system works manually, FHW often make mistakes in recording information and compiling reports that exposes them to criticism by medical officers. If the mHealth product could reduce this burden, FHW will make less mistakes and may be more willing to adopt the technology.

Government of Karnataka's MCTS (mother and child tracking system) requires FHW to send 50-60 SMS mentioning the specific service they provided to mother and child using the Thaiyi card number to uniquely identify the beneficiary. FHW responses indicated that their ability or willingness to write and send SMS was somewhat lower than their ability and willingness to receive and read SMS. At the least, 1/3rd of FHW reported not sending SMS to the MCTS which suggested that SMS based product might not go well with FHWs.

Interestingly, FHW also reported that their ability to send SMS in English was better than that in Kannada. This implied that the mHealth product, could be developed in English since FHW were more comfortable using English than Kannada script on the mobile. We however needed to remember that English might be more acceptable in Mysore but might not be so in more rural districts like Koppal and Bagalkot, where this product is to be finally tested for the impact.

We also learned that having access to mobile phone is not the same as having "availability" of mobile phone all the time. Availability depends on a combination of factors like, person's ability to keep the battery charged, maintain credit on the phone and having good connectivity at the place of work/residence. The over-all availability thus defined, was found to be 64% among FHW and only 19% among ASHA because many ASHA tended to frequently run out of credit. Currently, that is not a major constraint because ASHA only make "missed calls" to FHW which are free. Data also showed that nearly 40% villages perhaps do not have network connectivity, which is a limitation the mHealth application will have to take into account.

FHW frequently use mobile phone to call or to receive calls from ASHA and to a lesser extent to mothers and PHC. Mobile phone seemed to have improved FHW's virtual presence in the field since she can give instructions to mothers during emergency or do the follow-up through ASHA on phone without being physically present with them. This flexibility might be one reason why FHW did not complain much about the cost of phone calls for work that they had to bear personally and not reimbursed by the government (though a sum of Rs 60/month was paid to them in the first month but not subsequently). To facilitate communication between FHW and ASHA, Gujarat government has included ASHA into the CUG scheme, which the Karnataka government has not, so far.

Yet FHW did not seem too concerned about the cost of communication with ASHAs and mothers. They would be more concerned if their physical movements were monitored through geo-positional systems embedded in the phone; or if their flexibility in arranging their work routine is curtailed, or if their workload actually increases because they are required to use the mobile phone and also to maintain the manual registers as before, which has been their past experience with any ICT gadget. If answers to all three questions are "No" then they might be more ready to accept an mHealth product.

On the client side, mothers overwhelmingly prefer personal mode of communication with ASHA and FHW to receive information on different health topics, such as reminders about immunization, ANC visit, laboratory test or family planning advice. Phone calls were the next but distant preferred option while SMS or Prerecorded Messages were the least preferred option and a rare event for them.

## Works Cited

Airtel [Online] // [www.Airtel.in](http://www.Airtel.in). - 07 07, 2012.

**ANM Guildlines NRHM** [Book].

BSNL [Online] // [www.bsnl.co.in](http://www.bsnl.co.in). - 07 07, 2012.

DLHS Survey- Karnataka [Report]. - 2007-2008.

**Medical officer's Manual DHFWS, Karnataka** [Book].

**NHSRC** HMIS Report 2010 -2011 [Report]. - [s.l.] : 2011, 2011.

**NRHM** HMIS- District wise facility list [Report]. - 2012.

**Zavier A.J.Francis** Factors associated with second trimester abortion in rural Maharashtra and Rajasthan, India [Journal].