SUMMER TRAINING

AT *SEVA MANDIR*, UDAIPUR FOR

***KHUSHI BABY* INC., Yale University**

(March 28-May 29, 2015)

- To conduct a pre study for Randomized control trial for efficacy and impact assessment of Novel mobile health solution for Vaccination record keeping in rural Udaipur.
- To determine the vaccine awareness of mothers in rural Udaipur.
- To compare the time effectiveness of *Khushi Baby* application over Manual method.
- Institutional, on field, & independent training of GNMs

By

Doma Sherpa

Under the Guidance of

Prof. Goutam Sadhu

MBA- Hospital and Health Management

2014-16

2015

INSTITUTE OF HEALTH
MANAGEMENT RESEARCH
(WHO Collaborating Centre for District Health System Based on Primary Health Care)

IIHMR UNIVERSITY

CERTIFICATE

This is to certify that **Doma Sherpa**, student of MBA Hospital and Health Management Batch- 2014-16 from IIHMR University, Jaipur has undergone her summer training with **Khushi Baby m-Health Project, Yale University at Seva Mandir, Udaipur, Rajasthan** from **28th March 2015 to 29th May 2015** as a part of partial fulfillment of the course, under my guidance and supervision. All data used in the study is first hand data collected by her.

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Her approach to the study designated has been sincere, scientific and analytical.

I wish her all success in all his future endeavors.

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KhushiBaby

TO WHOMSOEVER IT MAY CONCERN

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Ruchit Nagar
Co-Founder/Co-Director @ Khushi Baby
Student PI at Yale School of Public Health

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Senior Research Officer at IIHMR, Jaipur
Co- Primary Investigator of KB RCT

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List of abbreviations

AEFI	Adverse event following immunization
ANC	Ante natal care
ASHA	Accredited social health activist
BCG	Bacillus Calmette Guerin
CDC	Center for Disease Control
DLHS	District Level Household and facility durvey
DOTS	Directly observed treatment short course
DPT	Diphtheria, Pertussis, Tetanus
EPI	Expanded program of immunization
FHW	Frontline Health Workers
FI	Fully Immunized
GMSDs	Government Medical Supply Depots
GNM	General Nurse Midwife
GPS	Global Positioning System
Hep	Hepatitis
IDC	International Design Center
IEC	Information Education Communication
IMR	Infant Mortality Rate
KB	Khushi Baby
MCTS	Mother and Child Tracking System
m-Health	Mobile Health
MMR	Maternal Mortality Rate
NFC	Near Field Communication
NFHS	National Family Health Survey
NGO	Non government organization
OPV	Oral Polio Vaccine
RCT	Randomized control trial
RI	Routine immunization
SEA	South east Asia
SM	Seva Mandir
TBA	Traditional birth attendant
UId	Unique Identity
UIP	Universal immunization program
UNICEF	United Nations Childrenôs Fund
VPD	Vaccine preventable disease
WHO	World health organization

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ACKNOWLEDGEMENT

óOnce something is a passion, motivation is thereô

- Michael Schumacher

This internship was the most enriching experience of my life; it has provided me with a very different prospective to look at issues at the grass root level. I would like to express my deepest gratitude to all those who provided me the possibility to complete this report. A big thanks to Mohammad Shanawaz,s\ Senior Research Officer at IIHMR University and Ruchit Nagar,Co founder of Khushi Baby Inc,

Furthermore I would also like to acknowledge with much appreciation the crucial role of the staff of Seva Mandir, who provided me with all the required information I needed to carry out my project. Without the help of Dr.Kusum Mathur and Dr Harshlata Bookel it would have been impossible to complete the project. I am thankful to Mrs. Hardeep ji and Saddaf ji, Block health in charge of Girwa and Badgaon respectively for their timely support and guidance. Special thanks go to my co-interns who shared who help me assemble the parts and gave suggestion.

Last but not least the GNMs involved and the SM staff for working with us and supporting us throughout.

About the Organization

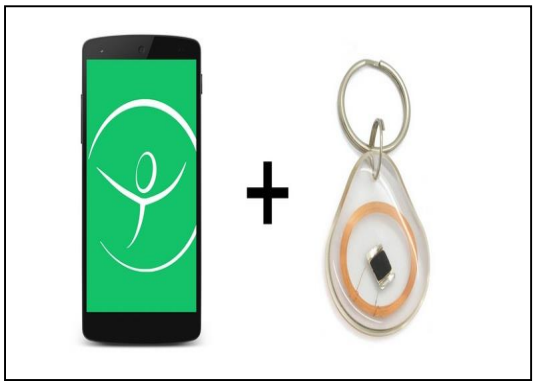
Khushi Baby Inc.

Khushi Baby (Happy Child) is an innovation developed in April 2014 out of the Yale Center for Engineering and Designôs course on Appropriate Technology, Yale University for the Developing World. It was at this juncture that Khushi Babyôs project team decided on a pilot study to address the persistent problem of child immunization and its documentation in Rajasthan with the aim to digitize and decentralize patient medical records at the point of care and as a result Khushi Baby partnered with Seva Mandir, a leading grass roots NGO in Udaipur, Rajasthan to conduct its Randomization Control trials through their vaccination outreach program.

Mission:

To track each childôs immunization to the last mile so that children do not continue to die from vaccine preventable diseases.

About Khushi Baby System



Khushi Baby (KB) project provides an inexpensive digital necklace and an accompanying mobile app that streamlines the process of vaccinating children. Itôs an appropriate technology that decentralizes patient information and above all provides a real-time measure of data with the help of a smart phone used by the health worker and a KB necklace for the child.

Figure1: Khushi Baby system- The mobile app and Necklace.

The technology: KB app is a like any other mobile application that can easily be downloaded in a near field communication (NFC) supporting android phone, NFC is a form of short-range communication that enables the wireless transfer of data. The KB necklace has a small NFC chip that stores patients records, the chip is embodied in a plastic body and tied to a black thread for the child.

How to use KB app?

The health worker can feed in the child personal and vaccination data in the app and simply scan the necklace to retrieve, edit and update information. As soon as the phone enters an area with cellular service, it uploads all vaccine data to the cloud database that can then be monitored via the Dashboard that provides real time analytics of the vaccination rates.

Khushi Baby plan for 2015-2016:

Beginning July 1 2015, KB Inc. is conducting a 9 month, 100-camp RCT and nested observational study to validate the efficacy of KB system and its particular features in partnership with Johns Hopkins University, Yale University, and Indian Institute of Health Management Research University, Jaipur.

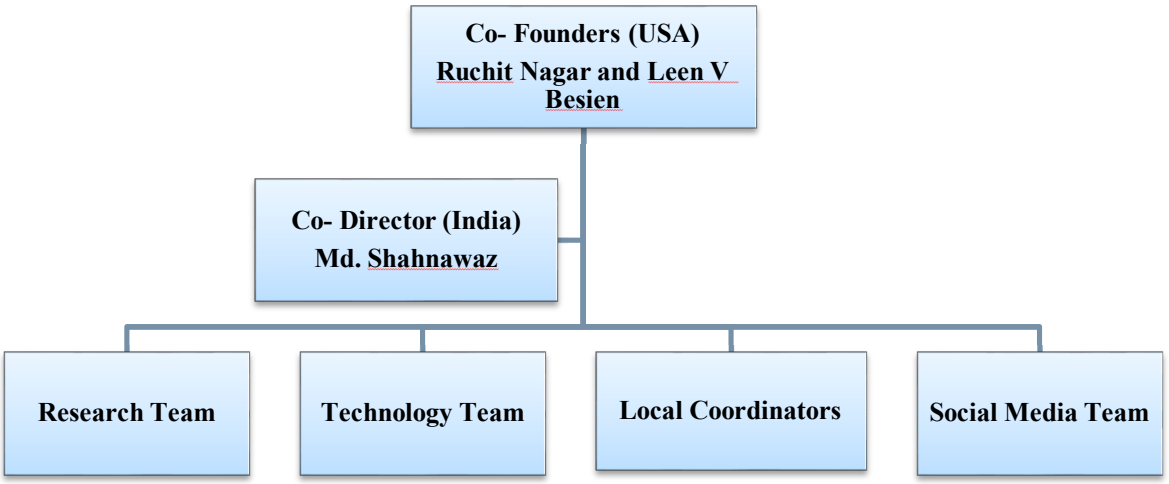
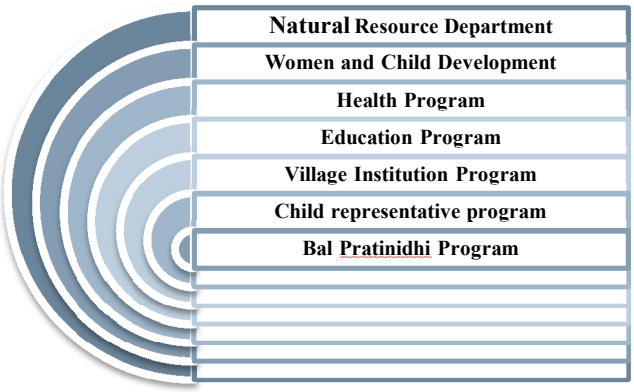


Figure2: A representation of Khushi Baby Inc. Organogram

Seva Mandir

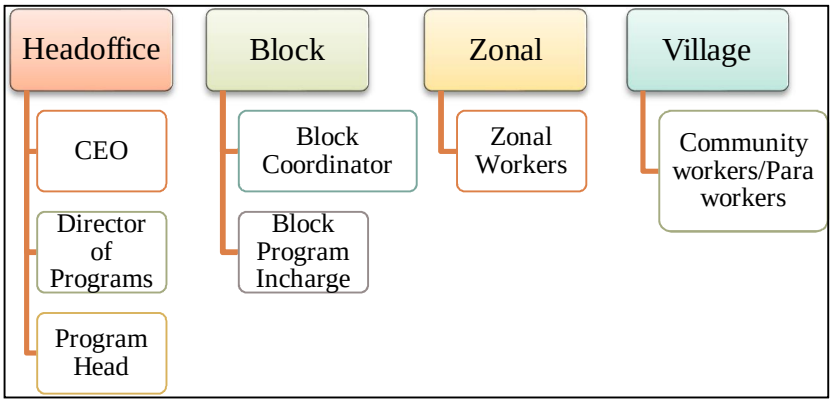
Seva Mandir means the õTemple of Serviceô It is a voluntary organization registered under the Society Registration Act 1958 and also registered in Rajasthan Public Trust Act, 1959. It is working with rural communities of Udaipur and Rajasamand districts for over 4 decades and covers over 600 villages and a population of 360,000 people living in Jhadol, Girwa, Badgaon, Kotra, Kherwara and Kumbhalgarh Blocks of Udaipur and Rajasamand Districts.



Mission: To construct the conditions in which citizens of plural backgrounds and perspectives can come together to benefit and empower the least. The commitment is to work for a paradigm of development and governance that is democratic and poly archaic.

For over 45 years, SM has worked in partnership with the people where over 90% of the people rely on agriculture and most live on less than Rs 20 a day, not only to improve their material well-being, but to build stronger and more ethical communities. Through its programs on governance, health, education, sustainable use of natural resources, womenôs empowerment, youth development, child care and social enterprise, Seva Mandir makes a tangible and transformative impact.

Figure3: Shows the seven programs running successfully under Seva Mandir.



SM seeks to institutionalize the idea that development and governance should not just be left to the state and its formal bodies, such as the legislature and the bureaucracy, but that citizens and their associations should engage separately and jointly with the state.

Figure4: Following is the pictorial representation of SM staff and workers:

Introduction

Vaccines have made a major contribution to public health but vaccines-preventable diseases (VPDs) are still responsible for significant deaths of under-five children. Despite Global efforts, the coverage in two WHO regions namely Africa and South-East Asia (SEA) still remain short of set targets for 2010. As a result, the SEA Regional Director has declared 2012 as the Year for Intensifying Routine Immunization (RI) in the Region. The recent immunization coverage surveys in India have shown gradual albeit a slow progress in the performance of RI in India over last few years but in some states the coverage is still quite low. Several new initiatives like introduction of Hepatitis B vaccine, second dose of Measles vaccine and pentavalent vaccine (two states), JE vaccine rounds, framing of the National Vaccine Policy, etc. are welcome steps. The challenges and barriers to achieve high immunization rates in the country are well recognized. Almost nonexistence of an effective VPD surveillance system in the country has further compounded the problem. The need is to address all the barriers to achieve high RI rates, which should include induction of innovative methods, proper monitoring of the program, improving operational efficiency and ócreaching every communityô, and integrated delivery of health interventions along with immunization. The development of an efficient VPDs surveillance, adverse event following immunization (AEFI) monitoring and post-marketing surveillance systems will go a long way in ensuring satisfactory performance of the health system. The decades old Expanded Program of Immunization (EPI), which was adopted in India as universal Immunization Program (UIP) also needs a revamp with inclusion of certain new vaccines. Decisions on implementing new and underutilized vaccines require scientific evidence and data, a reliable supply of affordable vaccines, which are adapted to the countryôs immunization schedule, and an integrated disease monitoring and surveillance system.

Routine immunization (RI) is an important tool to achieve the UN Millennium Development Goal (MDG)4 by ensuring childhood protection from infectious disease. In 1985, the Government of India launched the Universal Immunization Programme (UIP) to protect all infants (0-12 months) against six preventable diseases: tuberculosis, diphtheria, pertussis, tetanus, poliomyelitis, and measles. The goal of UIP was to ensure 100% coverage of all eligible children with one dose of BCG, three doses of DTP and OPV, and one dose of the measles vaccine. According to Coverage Evaluation Survey (CES) 2009, a nationwide survey covering all States and Union Territories of India conducted during November 2009 to January 2010 by UNICEF, the national fully immunized (FI) coverage against the six vaccines included in UIP in the age-group of 12-23 month old children was just 61%. Coverage with third dose of diphtheria, tetanus and pertussis vaccine (DTP3) is a widely accepted global indicator for RI program performance. India national estimates found DTP3 coverage was 72% (WHO India 2011), against a global target of 90 %. The District Level Health Survey 3 (DLHS 3) findings

suggest that the retention rate of childhood immunization was in maximum decline between the second round of DT and polio - 70 % and the third round - 56 % (Shekhar & Yadav, 2013).

M-Health solution to increase immunization:

In developing nations like India, many parents aren't able to keep track of their child's immunizations. Current solutions such as hard copies of records are easily lost, and there is no centralized location to retrieve this information. Moreover, in rural India, there is little incentive to get children immunized when it is at the price of losing valuable hours in the workday during which parents could otherwise be earning money for the family. These reasons compounded together ultimately mean that there are large hurdles to overcome in order to achieve effective and systematic immunization, and by extension, overall health in society. At the same time, the same rural population has a high growth rate of mobile phone usage. Khushi Baby seeks to leverage this fact to solve the problem of low immunization rates in rural India.

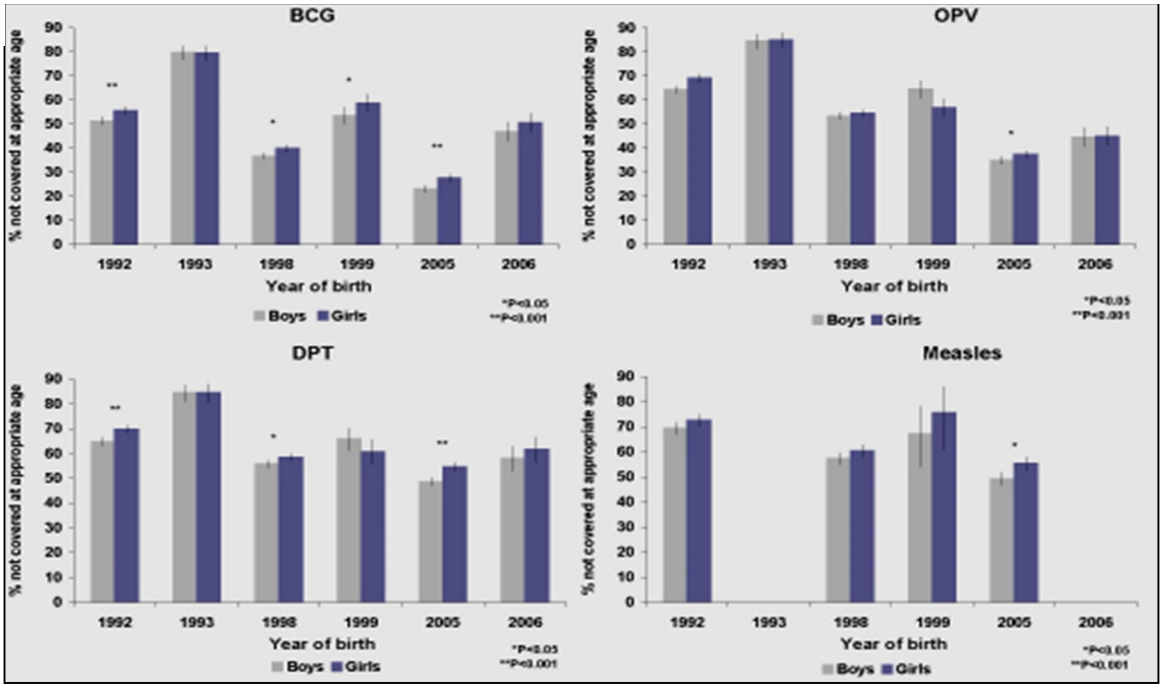


Figure5: Percentage of children without age-appropriate immunization coverage in India at the time of each NFHS survey, by antigen and gender. In Corsi et al, BMJ 2009.

Existing non-technical strategies:

- Medical Officers draw up micro-plans for immunization. This includes estimating population headcount and by extrapolation calculating an estimate of the number of children in a particular area under the age of 5 who need immunizations. Once the population and areas are determined, then a schedule of vaccination clinics is planned, taking into account the supply and storage of vaccines which requires refrigeration. [Department of Health and Family Welfare, Government of India, 2008]
- A national cold chain assessment by UNICEF in 2008 revealed that India has 4 national vaccine stores called Government Medical Supply Depots (GMSDs), which receives, stores and supply huge quantity of vaccines, cold chain equipment and logistics all over the country. The current practice of recording and reporting of cold chain equipments, spare parts, vaccine and logistics at all stores is carried out on paper, and this was found not to be the most efficient away of managing the supply chain and forecasting stock out situations.
- Most immunizations for children take place in public health centers or community clinics. Access to these clinics is a problem for the population who has to travel long distances to get there. In addition, there are difficulties in communicating when and where clinics are being held to the rural population and difficulties in ensuring reliable staffing of these clinics.
- Establishment of immunization camps staffed by a mobile immunization team to deliver vaccinations to rural parts of the country. [J-Pal Policy Briefcase, 2011]
- Social worker/community health worker outreach to villagers to identify children requiring immunization, educating mothers about the benefits of immunization and informing mothers and families about the availability of local immunization services [UNICEF] and undertaking directly observed therapy short-term (DOTS) programmes, where they observe and confirm that the vaccinations have taken place.
- Every child is given an official routine immunization card, indicating their name, the name of their parents and the date and type of each immunization performed. The nurse at the immunization centre also keeps a paper logbook of the children who have been vaccinated. [Banerjee et al 2010, BMJ]

The existing strategies found to be effective in improving immunization coverage, outreach, advocacy and communication, health facility practices, access to vaccines; it also may increase education and training, better data management, resources, changing management practices and allows combinations of above strategies.

Existing m-Health solutions:

The ascending curve of mobile cellular subscriptions is clearly different between developing and developed countries, as states World Bank data, with a higher velocity of increased access of this technology by the population (Figure 2), in the last years, in emerging countries such as South America (Brazil), India and China. For India a huge increase of the use of smart phones is forecasted, however more in urban than rural areas (Watson et. al., 2012).

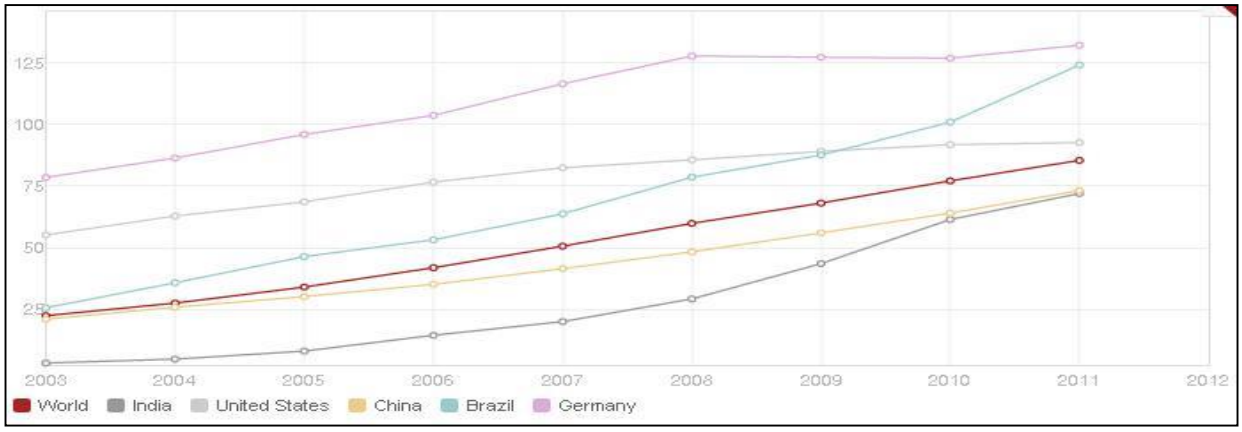


Figure6: Mobile cellular subscriptions (per 100 people) in developed and developing countries. Source: World Bank.

A similar trend is predicted for smart phones, even if penetration of these devices is low in rural areas. By 2015, forecasts suggest that between 32- 74 million units will exist in India, not including feature phones (IDC 2010; Strategy Analytics 2011, taken from Watson et. al, 2012; Watkins et al, 2012)

- mHealth solutions currently in use are messages distributed by SMS (e.g. SMS for life Frontline SMS; Déglise et al, 2012; Rakotozafy, 2012), internet reach-out campaigns or the use of smart phones and applications (so called apps) for special topics.
- The nationwide Mother & Child Tracking System, a web enabled name based tracking system which aims to track every child for assured delivery of immunization services based on the real time reporting on immunization coverage. The MCTS system is expected to make the immunization services more óCitizen Centricô by reaching out to families of the beneficiaries through mobile phone (SMS) and interactive voice response system (IVRS). The system is also expected to facilitate the functioning of the frontline health workers (FHWs) and health managers at district, state and national level to plan, implement and monitor services more efficiently and effectively by generating work-plans and decision support dashboards based on the real time reporting on immunization coverage.
- In Western Uttar Pradesh, an IVRS updates residents with mobile phones about the next polio vaccination round, prenatal visits to the doctor for pregnant women and much more. [Malaviya, 2010, AudienceScapes]

- A CDC partnership initiative in Patna, Bihar utilized Geographic Information Systems (GIS) technology. GPS units enabled capture of the geographic coordinates of the various stakeholders (the medical staff and children) and sites (immunization centers and vaccine storage facilities) involved in the immunization programme. Using this information, digital and paper maps were created to plan the most efficient routes to get vaccines and medical staff to the centers. [CDC, 2009]

Khushi Baby in collaboration with Seva Mandir as m-Health Solution:

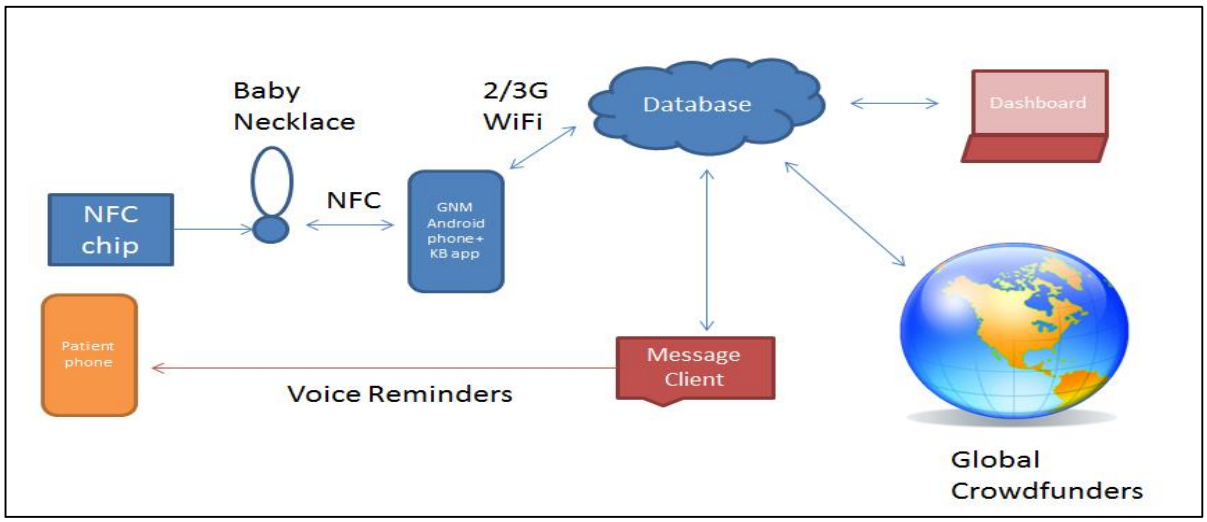


Figure7: Process Map of Khushi Baby. **Blue** indicates KB responsible components. **Red** indicates SM responsible components.

General process:

- NFC chip stores vaccine record for patient
- Phone interfaces with wearable chip to update vaccines given
- Data is saved on chip, phone, and also sent to the cloud by WiFi / 2G, 3G
- The database is used to inform the messaging client
- The database is used to populate graphs on the web-based, password-protected dashboard
- Key value adds: real time data, collecting new vaccine forecasting information (vaccine denials), automating check-in/check-out process for payment sheets, granular data for crowd funders.

Immunization Camp Process:

Traditional Birth Attendants (TBA) travel to each hamlet inside a village on foot, delivering verbal reminders to mothers about upcoming immunization camps by Seva Mandir.

- There is usually one TBA per village; there may be additional assistance in the form of a Seva Mandir Balsaki (caretaker of young children above age 2)
- This process usually takes place several days before the camp and requires at least 1 day worth of work
- The furthest hamlets can be 3-4 km away
- Mothers may not always be in their husbandôs house
- They can be in the field
- They can be at their parentôs house
- The TBA must mentally keep a note of which mothers have had new births, which mothers are pregnant, and which mothers have children that need to come to the immunization camps
- In some villages, there is access to an overlapping government facility staffed by Anganwadi workers where multispectral resources are available ï from immunizations to school supplies; the TBA must also be aware of who has received immunization from the Anganwadi workers before advising them to come to a Seva Mandir immunization camp.

General Nurse Midwives (GNMs) travel from the Block Office to the immunization camp:

- Each village has an immunization camp on a fixed day of the month (e.g. 14th)
- GNMs travel to the camp via motorcycle
- Typically immunization camps will have one GNM
- Teams of two go if they are female GNMs
- And/or assistance will be provided from 1 TBA or Balsaki who stays at the immunization camp

They carry:

- WHO style insulated container
- Vaccines
- Leather bag (heavy)
- Vaccine Supplies (needles, gloves, alcohol)
- Logbooks
- One for pregnant mothers
- One for children
- Other medications (anti-parasitics, nutrient supplements)
- Waste supplies (on their return)
- Sphygmomanometer (to measure blood pressure)

At the camp they may be provided a mat to sit on, lentil bags (stored away in a designated building for the camps participating in the lentils incentive program, and a scale for mothers

Field Workflow (camps run 1st to 26th of each month)

Upon reaching the camp, GNMs identify the SM board and have either the other GNM / Balsaki / TBA take a picture of them in front of the board

- This picture has a date stamp and serves as a monitoring tool to ensure attendance
- GNMs unpack their leather bag on the provided mat
- An immunization camp is slated to run from 9:30-12:30, but mothers often do not show up until 10:30 or 11 AM, pushing the camps end time closer to 2 pm
- Mothers come on foot to the camp and are treated first come first serve
- Priority is made for mothers with children then for pregnant mothers
- The GNM checks the mothers MAMTA card (a nationally distributed maternal and child health tracking card)
- These cards can be administered by government district hospitals or government health workers (anganwadiôs) upon delivery or upon the first immunization checkup

The GNM then correlates the patient with existing records in their child logbook:

- Usually they are able to find the child since there are only about 10 children attending each immunization camp or a new record is made
- The logbook is searched by going to the tab for the current camp and then looking through the list of names
- The GNM can issue a new MAMTA card if the mother has lost the card
- In cases where the childôs MAMTA card is empty or incomplete, or if the record is not available, the GNM must ask the mother to estimate the childôs birth date ï this date is often nonspecific and an estimate of the month the child was born
- The GNM must account for vaccines that were administered from other sources because mothers do not always come to SM for their shots (they could also go to Anganwadis). They may ask the mother if the child has received BCG, HepB, DPT, or polio birth doses.

After confirming the childôs birth date, the GNM administers vaccines:

- BCG vaccine vials are only opened if a minimum of five children are seen at the camp

- DPT and Hep are administered on childôs legs
- Polio is administered orally
- GNMs do not administer more than 2 injections to avoid creating fear / distress in mothers
- The GNM marks the MAMTA card with the date and the appropriate cell in the logbook with the date of the administered vaccine
- The mother thumbprints in the logbook to verify the vaccine was received
- The mother may be given a bag of lentils, antiparasitics, nutritional supplements before departing
- The process repeats for all mothers
- Pregnant mothers without children are weighed, measured for BP, and given a tetanus vaccine during an antenatal care checkup
- Upon finishing the camp, needles and waste are collected and put in the leather bag
- GNMs take a picture to ñsign outò
- They return to the block office and drop off
- The bag
- The vaccine box
- The motorbike

The process repeats for 10-15 days of the month, with GNMs visiting 1 camp per day 0-20 mothers + children are attended to per camp, with 10-40 vaccine doses given.

Rationale

The proposed study site, the Udaipur district of Rajasthan, has traditionally had lower immunization estimates than national levels while also performing poorly in other key developmental indicators, IMR of 63 per 1000 born infants and MMR of 265 per 100,000 women of reproductive age The most recent immunization estimates for this area were assessed in 2013 by the DHLS-4 survey, but data is incomplete for villages outside of the governmentôs catchment area.

In addition to potentially being able to increase demand for vaccination, the NFC chip pendant will improve the turn up rates by acting as a visible form factor for the mother and voice calls as reminder in their local language will motivate them to come to the camps. The Dashboard will provide real time analysis for efficient monitoring and tracking supporting the health in charge in his/her decision making.

The reasons for conducting this pre RCT phase are

- Training the GNMs with KB app
- Baseline data for sampling
- To test and try the functioning of KB application and make additional modifications
- To digitize existing data so that manual system can be replaced with KB System
- To identify areas in the immunization process where KB system can be used efficiently.

Objectives

Primary Objectives:

1. To conduct a pre study for Randomized control trial for efficacy and impact assessment of Novel mobile health solution for Vaccination record keeping in rural Udaipur Rajasthan.
2. To determine the vaccine awareness of mothers in rural Udaipur.
3. To compare the time effectiveness of KB App over Manual method.
4. Institutional, on field, & independent training of GNMs

Secondary Objectives:

i. To find out vaccination related awareness of women who came to immunization camps.
ii. To design IEC material (Leaflet, Audio, Video) for GNM, TBA, Balsakhi training.
iii. To record the GPS co-ordinates of different campsite via e-Trex (GPS device).
iv. To find out whether there is Mobile Network connectivity at campsites.
v. To determine the bugs with respect to App crash from the field.
vi. To take monthly GNM user feedback.
vii. To digitize immunization data of past 6 months in MS-Excel.
viii. To verify authenticity of data synced and compare it with logbooks.
ix. To follow up immunization camp in the month of may and see the retention of pendants.

Methodology

- **Study Design**:
  - Qualitative Research
  - Quantitative Research

- **Study Area:**
  - The study areas were 5 Blocks of Udaipur district of Rajasthan (Girwa, Badgaon, Kherwara, Kotra & Jhadol).

- **Study Population:**
  - 357 mothers of all the blocks who came for immunization camps in the month of April & May month(ANCs + child immunization)

- **Study Period:**
  - The study was carried out for 2 months from 28th March -29th May 2015.

- **Sampling Design:**
  - Purposive sampling- All the parents of children who came to Seva Mandirôs immunization camps were selected for the study.

- **Data Collection:**
  - **Interview method** - Face to face interview were taken of mothers who came to immunization camps. Relevant primary data was collected by interviewing the respondents with the questionnaire on different variables/parameters.
  - **Semi-structured Questionnaire** ï A questionnaire of close ended and open ended questions was made to get specific and relevant information from parent regarding the vaccination information. **Ref: Annexure**

- **Data Entry Time**- Time recorded by stop watch to know the logbook and KB App data entry time

- **Data Preparation:**

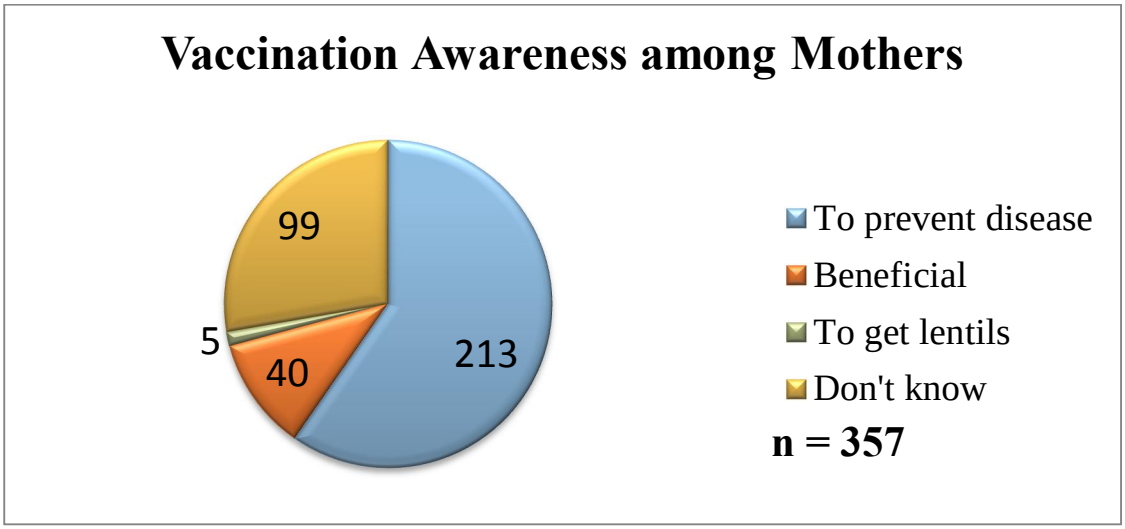
  - Data Entry- All the responses were entered into SPSS software
  - Coding of data- Different responses from the respondent were coded numerically for the closed ended questions and entered in SPSS software.
  - Cleaning of data- Missing values were removed from the dataset.

- **Data Analysis:**

  - Level of measurement ï nominal and ordinal
  - Frequencies and Percentages of different parameters were found out using SPSS software
  - Graphical Representation was done using Ms Excel Software.

Results

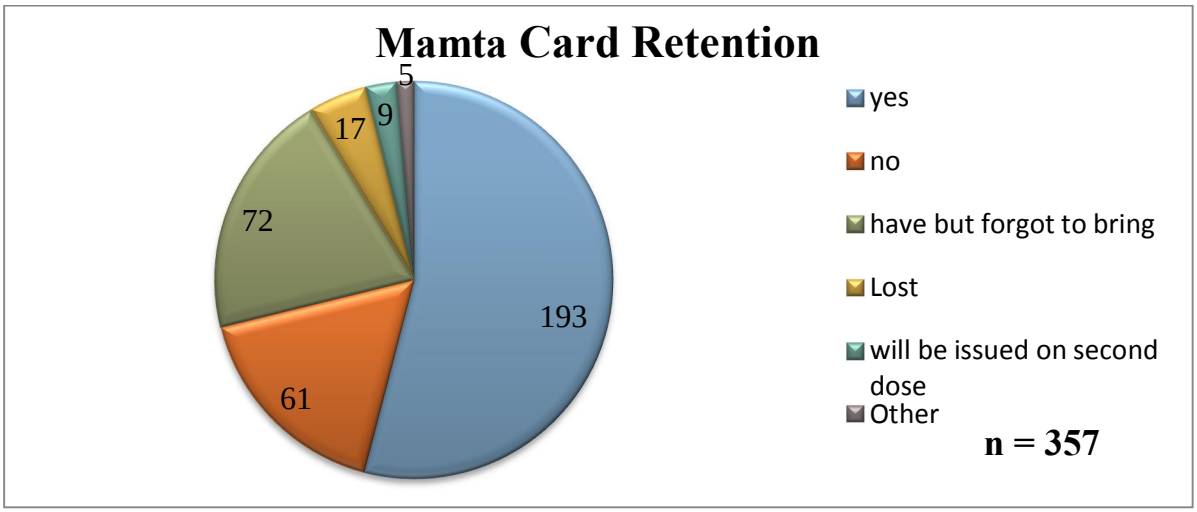
I) a. Vaccination Awareness:



Findings:

- Sixty percent (213) of the total mothers who came to immunization camps answered that vaccinations helps to prevent diseases.
- Only eleven percent (40) of mothers replied that vaccination was beneficial.
- Around one-fouth (99) of mother were unaware about the importance of vaccination and came to immunization camps on persuasion of TBAs / Informer / Balsakhis.
- Only 1 percent (5) of mothers said that they came to immunization camp for getting Incentives.

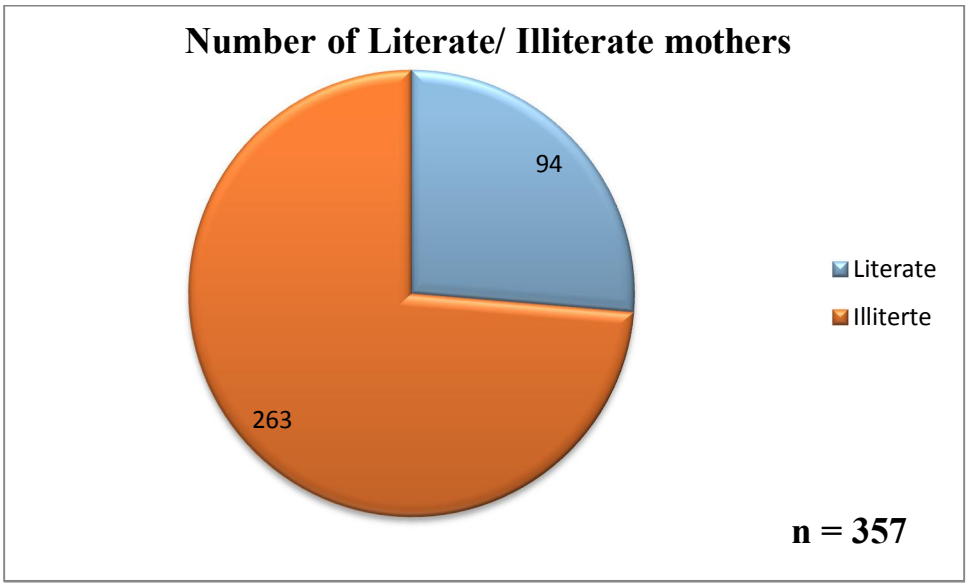
b) <u>Mamta Card Possession</u>



Findings:

- Almost fifty percent (193) of mothers who came to immunization camps said they had mamta card with them while seventeen percent (61) did not have mamta card because of some reasons.
- Twenty percent (72) of mothers forgot to bring their card at the campsites, while 5 % (17) mothers had lost mamta card.
- 3 percent (9) had come for first ANC check up so mamta card would be issued in subsequent visits

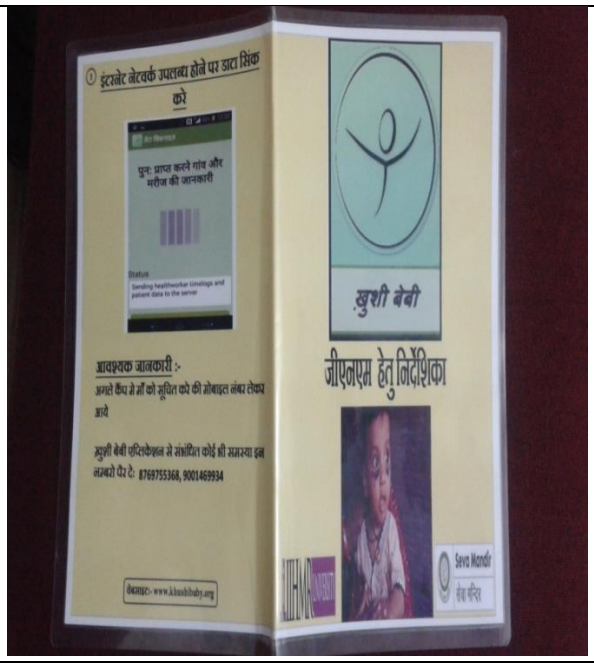
c) <u>Women who could read write and understand</u>



Findings:

- More than two third (263) mothers were Illiterate. (Literate here means women, who could read, write and understand.)

2. To design IEC material (Leaflet, Audio, Video) for GNM, TBA, Balsakhi training:



Leaflet for guidance of GNMs

A view of Dashboard showing voice call rules

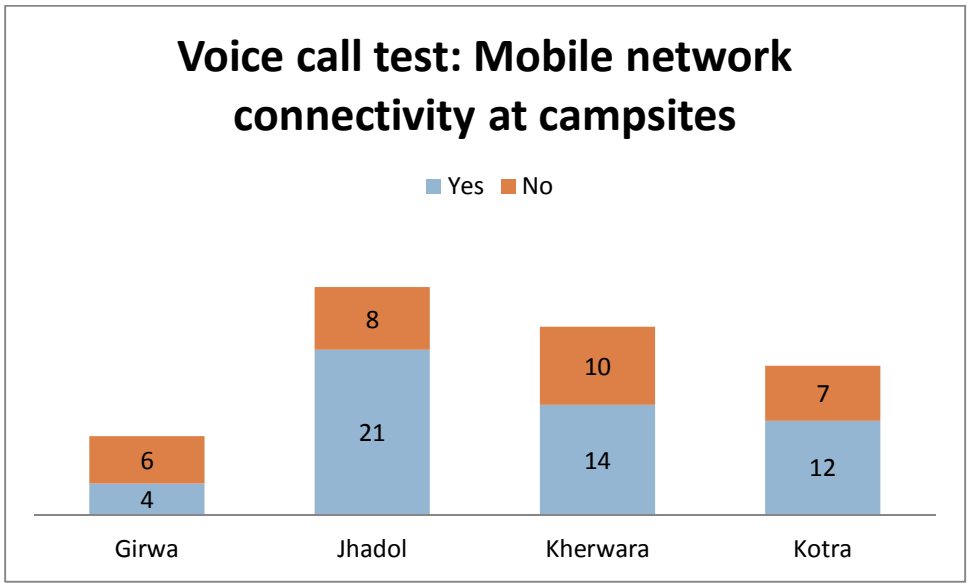
3. To record the GPS co-ordinates of different campsite via e-Trex (GPS device):

Badgaon	**Coordinates**
Block office	Elevation: 2316 ft n 24°36.419ôe 73°30.417ô
Chhali bhilwada	Elevation: 2301 ft, n 24° 36.420ôe 73° 30.419ô
Kotri kheda	Elevation: 2409 ft, n 24° 40.576ôe 73° 29.321ô
Anejhra phala	Elevation: 2206 ft, n 24° 34.559ôe 73° 29.367ô
Naalkawas	Elevation: 2263 ft, n 24° 35.952ôe 73° 30.360ô
Maada dang	Elevation: 2393 ft, n 24° 37.514ôe 73° 30.678ô
Girwa	**Coordinates**
Mohan dungri	**Elev: 1434 ft n 24°13.248 e 73°38.390**
Dagal bhatda	Elev: 1677 ft n 24°11.491 e 73°36.514
Dabban	Elev: 1402ft n 24°09.892 e 73°37.701
Bedakudi	Elev: 1669 ft n 24°11.958 e 73°37.500
Haylikudi	Elev: 1788 ft n 24°10.670 e 73°38.365
Lahudara	Elev: 1720 ft n 24°17.851 e 73°39.342
Nala	Elev: 1695 ft n 24°13.247ôe 73°36.673ô
Aava phala	24°12.844'n 73°39.71'e

Aamba ka vela	Elev: 1586 ft n 24°31.010 e 73°29.367
Nala phala	Elev: 1449 ft n 24°18.346 e 73°42.319

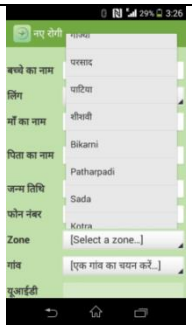
Table 1: Showing the coordinates taken at various campsites of Girwa and Badgaon

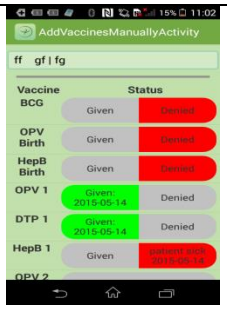
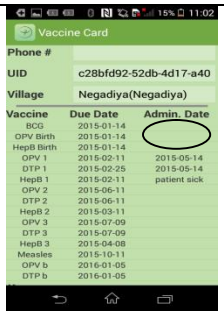
4. Mobile Network connectivity at campsites:

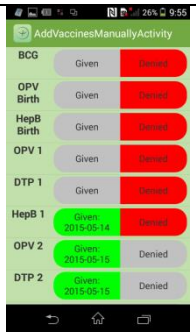
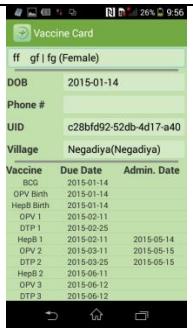


Findings:

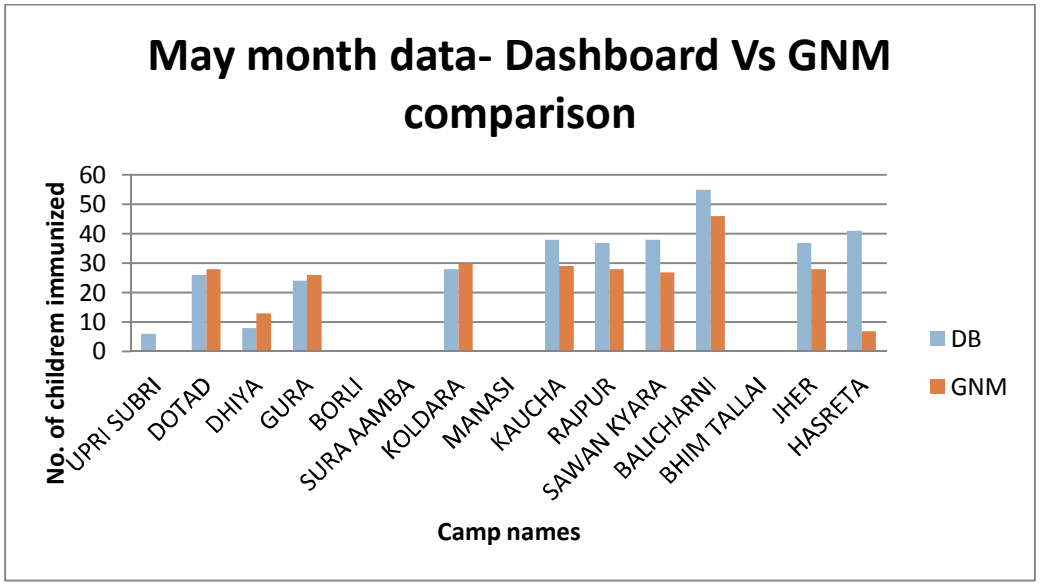
- 12/19 camps attended in Kotra have Mobile network connection.
- In Kherwara 14/24 camps have Mobile network connection.
- In Jhadol 21/29 camps have Mobile network connection.
- In Girwa 4/10 camps have Mobile Network connection.

5. App crash from the field			
1. The newly added zones and other advances do not show Hindi translation.			Bug Description: <short description here> Steps To Reproduce: 1.Change dictionary to Hindi 2.Select Zone and village 3. Sync data Expected Behavior: <Hindi conversion of the texts > Actual Behavior: <The newly added zones and village show English text. >

2.	The 5th denial reason in Hindi has some font error.			Bug Description: <the Hindi text of 5th denial reason i.e mother denies multiple shot is incorrect> Steps To Reproduce: 1.Enter patient information 2.Add vaccines mannualy 3.Denied reason no. 5 Expected Behavior: <माँ ने कई इंजे□शन से इनकार □या > Actual Behavior: <माँ ने कई इंजे□शन से मना??? या>
3.	If GNM only adds a denial reason in the entire process then all the previous denial reason gets deleted.			Bug Description: <Adding a denial reason leads to loss of previously added denial reasons > Steps To Reproduce: 1.Enter patient information 2. Open Add vaccines manually 3.Put any denial reason Expected Behavior: <Addition of the new denial reason with all other information unchanged > Actual Behavior: < The old denied reasons gets deleted>

4. If GNM gives a shot that was denied earlier and changes the denied as given then the entire denial reasons is deleted with the updated given.			Bug Description: <When GNM gives a shot that was denied before then the entire denial reasons gets deleted > Steps To Reproduce: 1.Add vaccines manually 2.Change to given 3. etc. Expected Behavior: <Change denied to given with other denial reasons unchanged > Actual Behavior: <The given is displayed but other denied reasons get deleted >

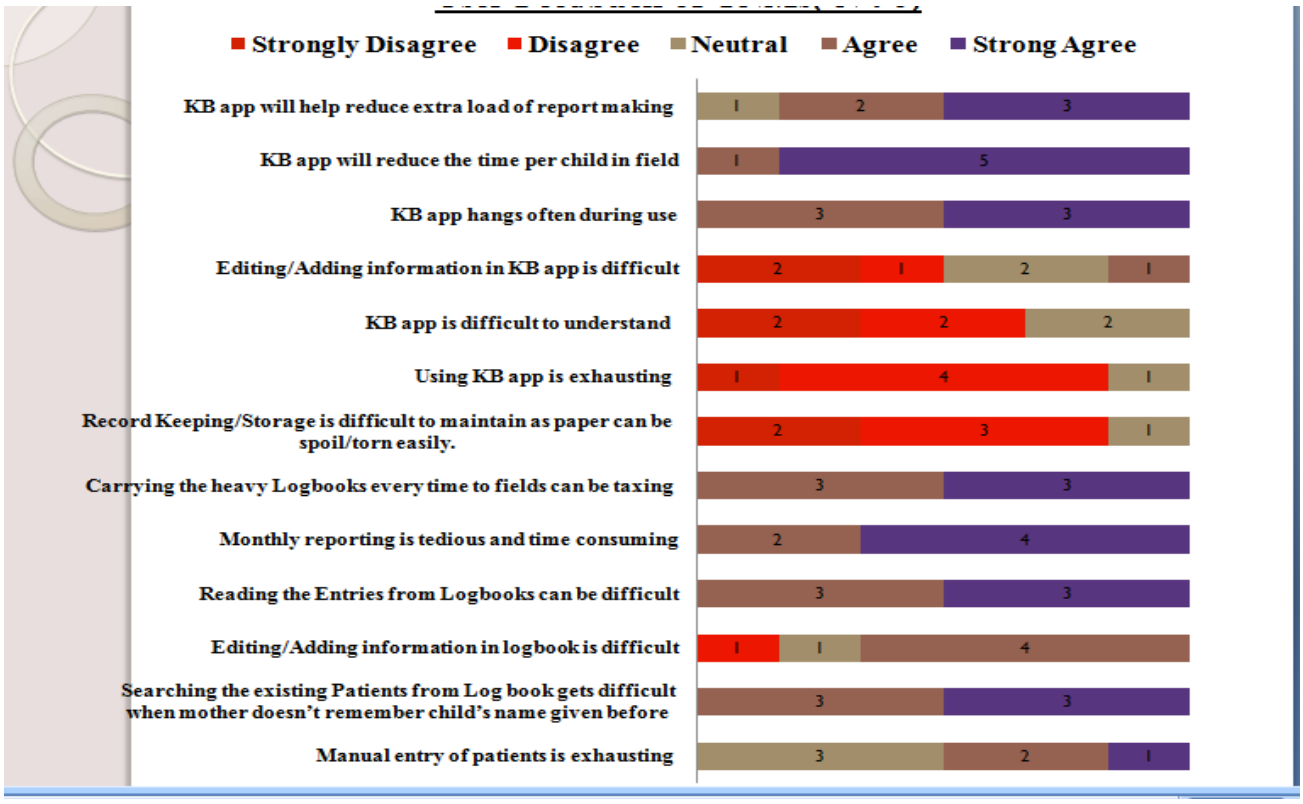
6. Verify authenticity of data synced and compare it with logbooks:

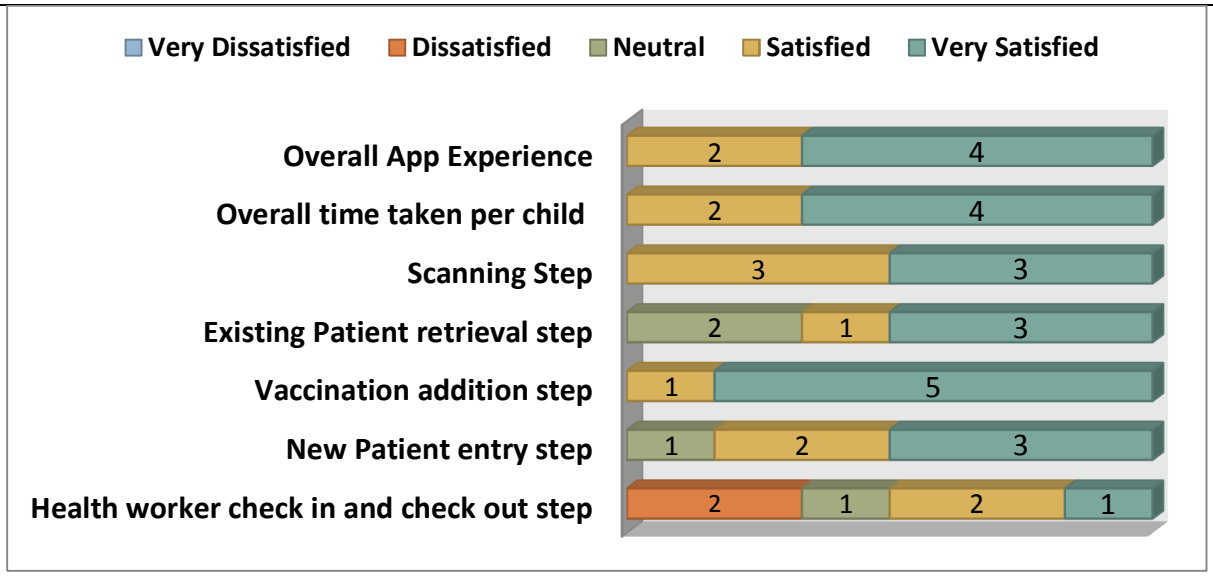


Findings:

The Dashboard data showed some minor variation with that of GNMs logbook data. This variation was however due to the following reasons:

- Entry of test patients while GNMs training
- Double entry made by GNM due to app crash
- Missing data due to data syncing error



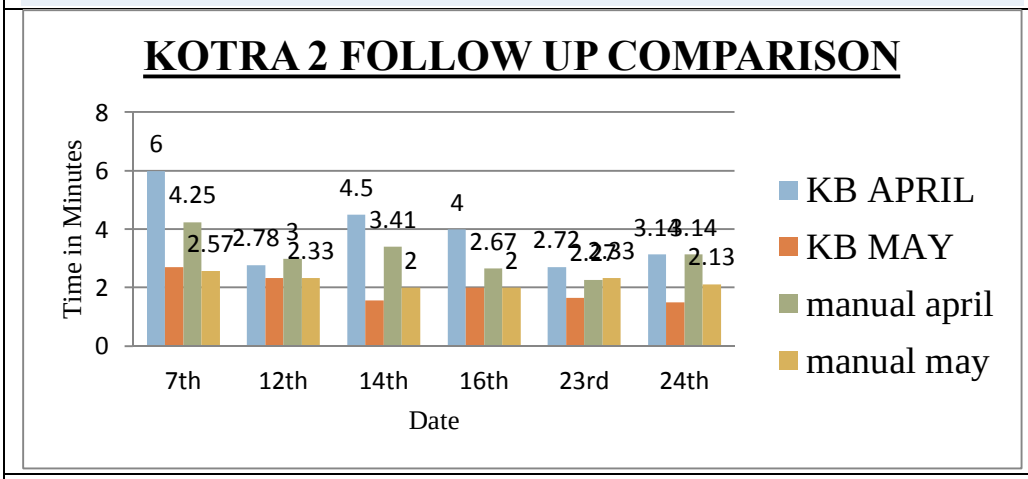


GNMs Manual and KB app feedback in likert scale. Ref: Annexure

Findings:

The GNMs were almost very satisfied with the overall app experience having (median 4.25 and mode 5) and they strongly agreed that KB app will reduce their workload.

7. <u>Time Efficacy of KB App Vs Logbook:</u>



Findings:

- In Kotra 1 & 2, Time taken by GNM to enter the data in KB App shows declining trend.
- Average time in May month was 3.09 min. as compared to April month average time 5.41 min. while Logbook data entry time shows consistent trend.

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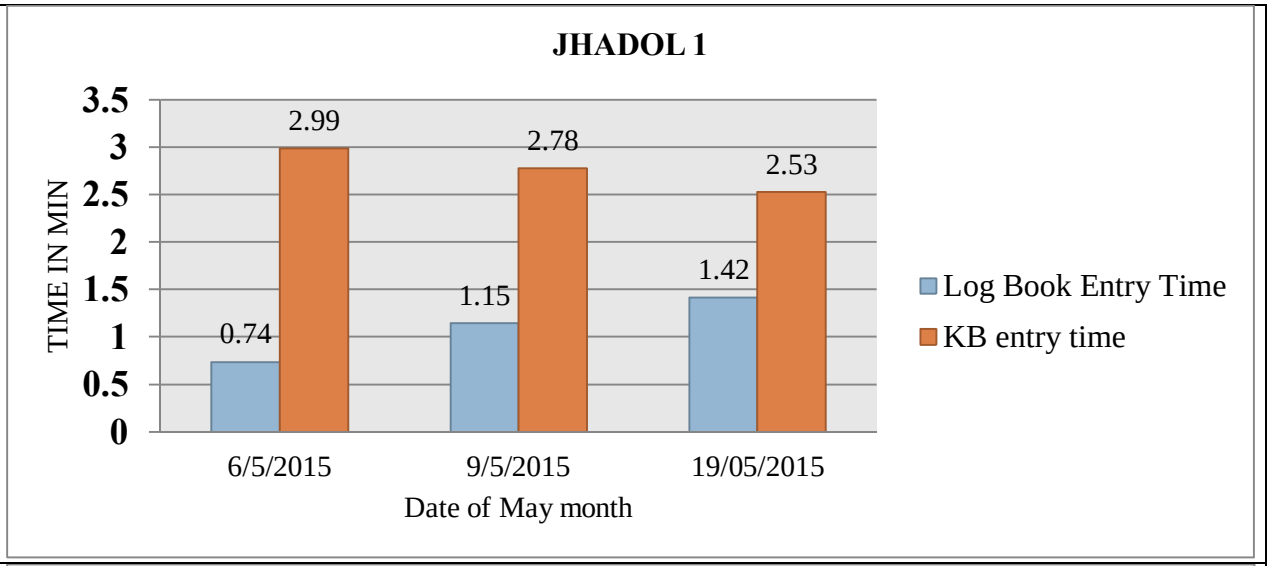
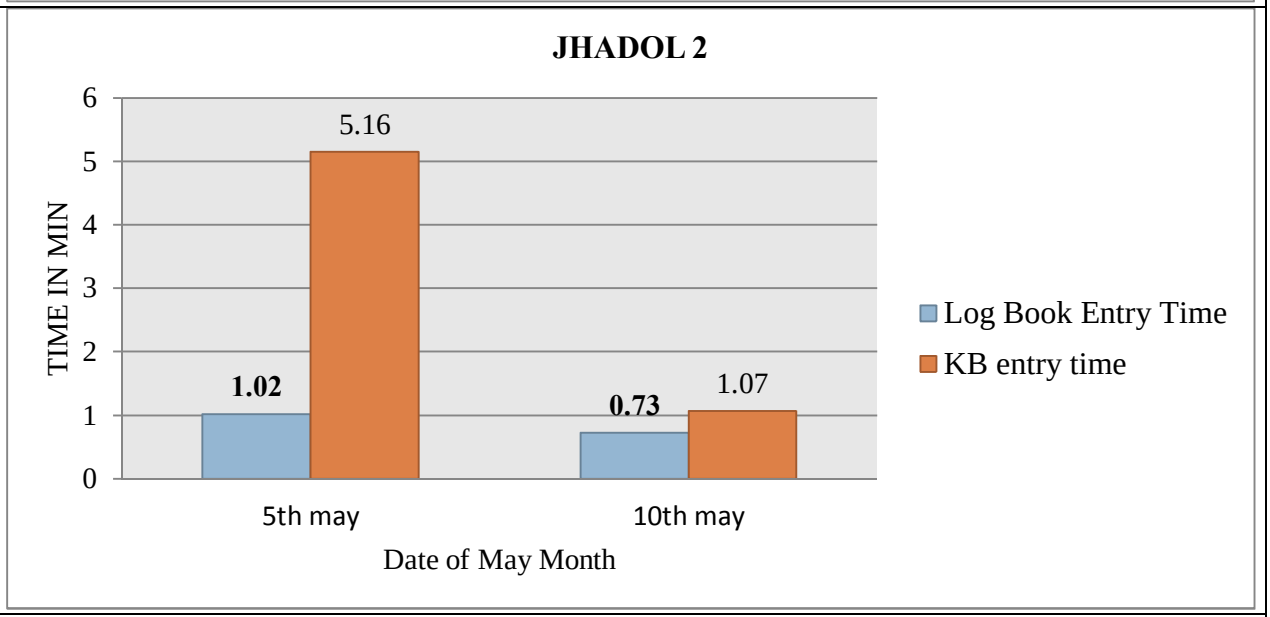
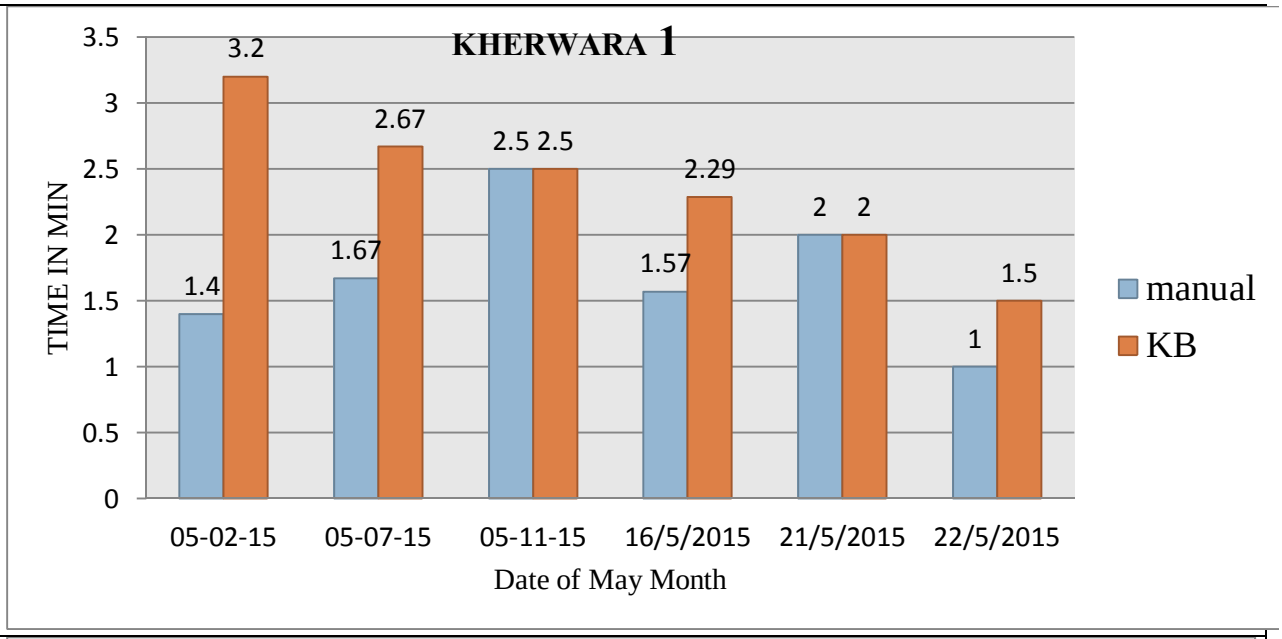
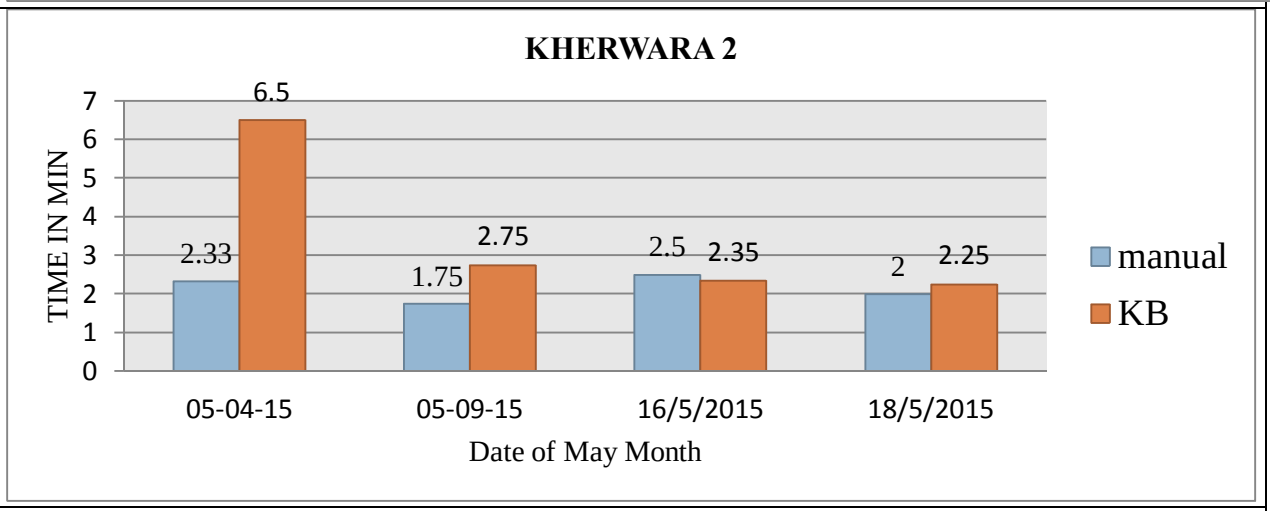




Findings:

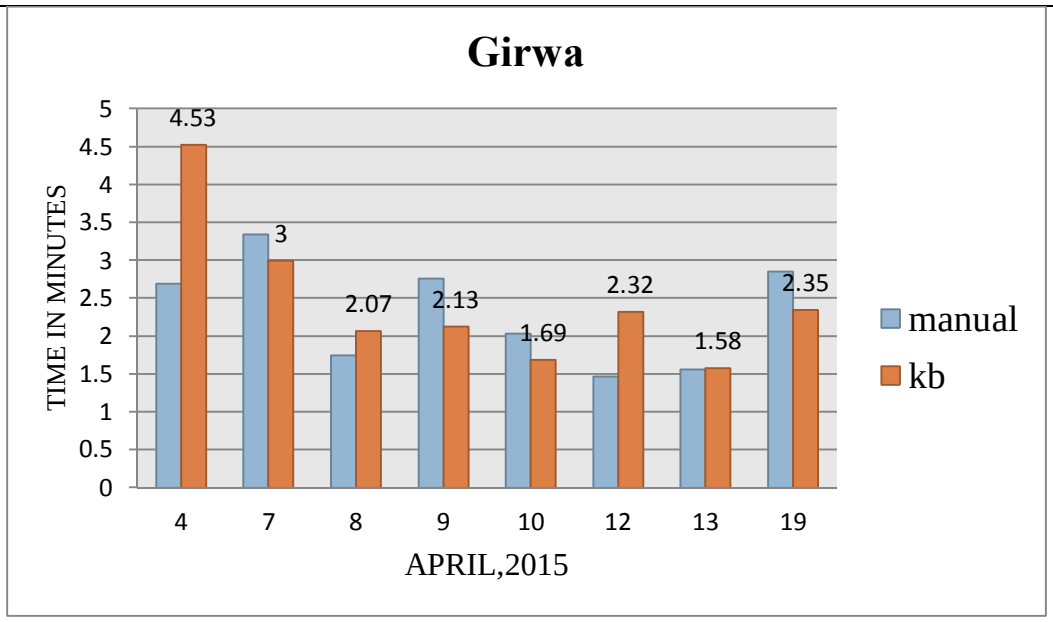
In Jhadol, average time taken by GNM to enter the data in KB App was 2.76 minutes in team 1 and 2.41 minutes in team 2.





Findings:

In Kherwara it shows 2.36 minutes and 3.46 minutes in team 1 & team 2 respectively.



Findings:

In Girwa average time taken by GNM to enter the data in KB App was 2.45 min.

Findings:

There is considerable decline in time taken to use the KB app from April 4th to April 19th. GNMs become fluent with the app after practice.

8. Pendant Retention in month of May-2015

S.No	Camp Site	Expected for follow up	Returned	Retention Of Pendants
1	Paoti phala	2	2	2
2	Aamli chapar	4	3	3
3	Amliya phala	2	1	1
4	Kaucha	11	6	6
5	Koldhara	3	3	3
6	Kada phala	4	3	3
7	Sawan kyara	8	3	3
8	Balicharni	3	3	3
9	Talab bhamra	8	3	3
10	Kakra pana	11	4	4
11	Hasreta	8	6	6

S.No	Camp Site	Expected for follow up	Returned	Retention Of Pendants
1	Ava Phala	16	7	7
2	Amba ka Vela	4	3	3

Findings:

It was seen than even though the turn up rate was lower than expected, mothers and family members accepted the KB necklace and retained them in the consecutive month. All those children who were given the pendant and came to camp had the necklace with them.

Observations & Learning from the Field

Human Resource Department

- Å High Attrition rate of General Nursing and midwifery (GNM)
- Å Lack of guidelines and training
- Å Compromised health and Safety of GNMôs
- Å Low wages and financial incentives
- Å Over burdened with work

Supply Chain Management

- Å Shortage of Drugs and Vaccines
- Å Improper storage of Vaccines
- Å No storage facility for Pentavalent vaccines
- Å Inefficient procurement of drugs and vaccines from CHC.
- Å Unavailability of Mamta Card (Jhadol) and non cash incentives (lentils and utensils)

Health and Safety management

- Å Deferring from standard immunization protocol.
- Å Improper disposal of syringes, cotton swabs and urine containers at the campsite.
- Å Unhygienic surrounding for vaccine administration.

Community

- Å Low awareness about health and vaccination
- Å Lack of education
- Å Negative perception about vaccinating their children
- Å Existing superstitious practices (eg. Daam)
- Å Preference to marriage and other ceremonies over vaccination.
- Å Prevalent child marriages and polygamy
- Å Lack of family planning

Community Workers

- Low incentives
- Lack of motivation
- mismanagement of vaccination coupons
- Camp attendance increases where mobilizers are involved. Ex. Balsakhiôs.

Record Keeping

- Poor maintenance of the logbooks and discrepancies in data.

ANNEXURES

1. QUESTIONNAIRE FORMAT

Type of questions: semi structured

Hamlet

TBA

Informer

GNM

A. Mothers Personal details:

1. Can we take some information about you?
2. What is your name?
3. Your age?
4. What is your husbandôs name?
5. How old is he?
6. How many Children do you have
7. How old is the child who is getting the vaccination
8. Do you have MAMTA card? If no? Why not?
9. Till what grade have you attended the school
10. Who helps remind you of the camp, who do you, go to camp with?

B. Mothers education and immunization knowledge

Do you have your childôs coupon?

How often do you take your child to get vaccinated: a.) Every month b.) Every two months c.) less than once every two months . d.) first visit

How often has your child got sick in past 6 months?

How will vaccination be helpful for your child? And why do you think so?

How many vaccination shots should the child get overall

Name any vaccine preventable disease

C.Economic status

Do you have a phone? Or in your family? If yes who?

Do you know the no.? Can you share with us?

What will be the most apt time to call you?

How far is your house from the camp?

Do you have mud/thatched / metal roof

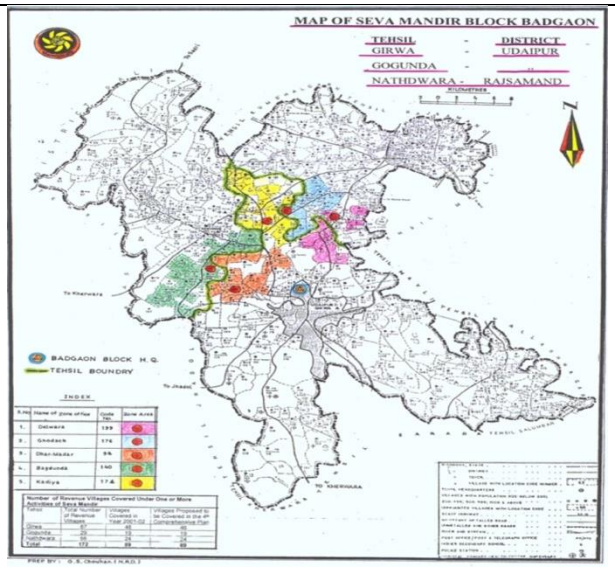
What type of latrine do you have

Do you have electricity

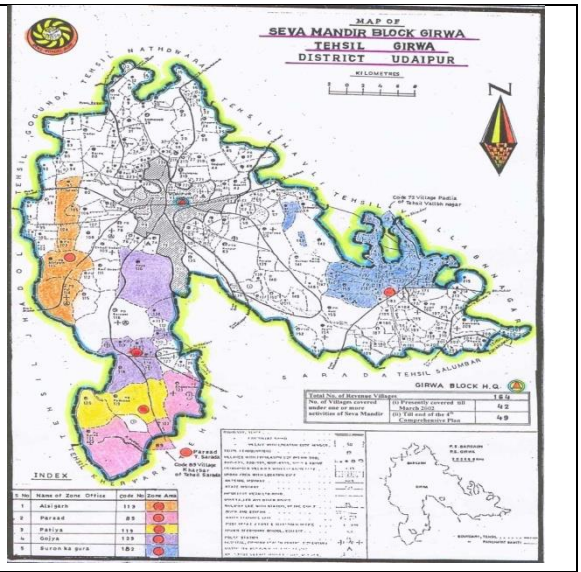
Do you have access to running water

What type of fuel do you use for cooking

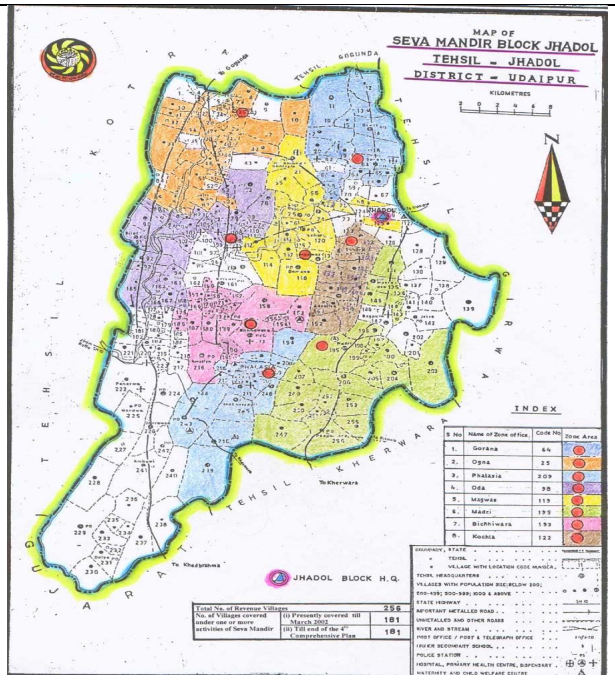
2. Seva Mandir, Block Maps:



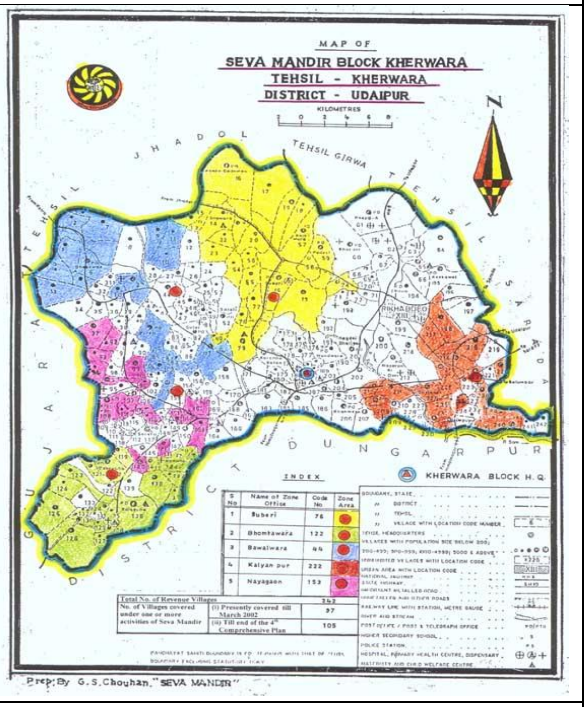
Badgaon



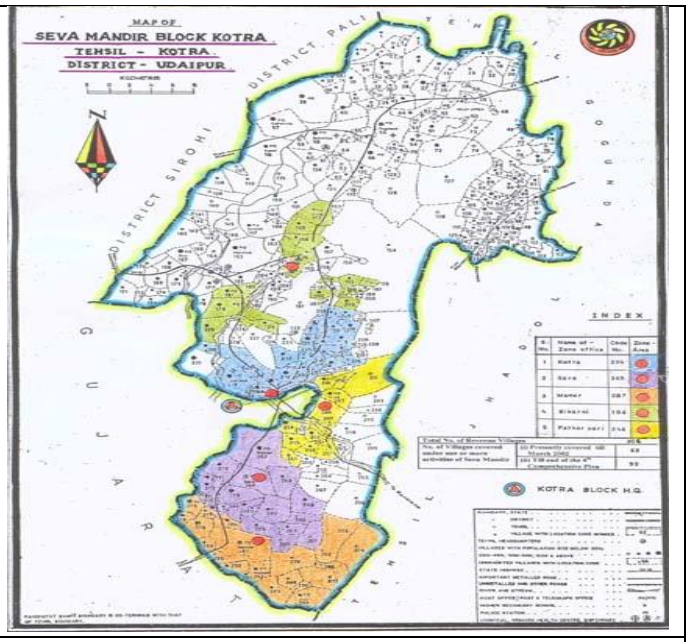
Girwa



Jhadol



Kherwara



Kotra

3. User Feedback form

3. GNM Monthly Usage Feedback: Khushi Baby App						
Date:		**GNM Name:**			**Block:**	
S.no	***Khushi Baby Stepwise Rating***	***Very Dissatisfied***	***Dissatisfied***	***Neutral***	***Satisfied***	***Very Satisfied***
1	Health worker check in and checkout step					
2	New Patient entry step					
3	Vaccination addition step					
4	Existing Patient retrieval step					
5	Scanning Step					
6	Overall time taken per child (App Vs Manual)					
7	Overall App Experience					
8	Any Suggestions?					

GNM general Feedback: Manual Method and KB App						
	Manual and KB Entry Feedback	***Strongly Disagree***	***Disagree***	***Neutral***	***Agree***	***Strongly Agree***
1	Manual entry of patients is exhausting					
2	Searching the existing Patients from Log book gets difficult when mother doesn't remember child's name given before					
3	Editing/Adding information in logbook is difficult					
4	Calculating the approximate age of child gets difficult when mother doesn't remember the D.O.B					
5	Reading the Entries from Logbook is annoying cause it's not written clearly					
6	Monthly reporting is tedious and time consuming					
7	Carrying the heavy Logbooks every time to fields is annoying					
8	Record Keeping/Storage is difficult to maintain as paper can be spoil/torn easily.					
9	Using KB app is exhausting					
10	KB app is difficult to understand					
11	Editing/Adding information in KB app is difficult					
12	KB app hangs often during use					
13	KB app will reduce the time per child in field					

14	KB app will help reduce extra load of report making					
15	Mobile phone as record keeping is better than log books					
16	Time taken to make the Monthly Report can take	1 day	2days	3days	4days	>5days
17	Time taken to make Six Monthly Report takes	1 day	2days	3days	4days	>5days
18	Time Taken to make annual report takes	1 day	2days	3days	4days	>5days

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