



## **Internship Training**

**at**

**Khushi Baby**

**(February 24 to May 24, 2020)**

**A Project Report On**

**“Intermediate Assessment of ASHA app, a novel mHealth platform for recording health census in Rajasthan”**

*By*

**Mr. Abhishek Jain**

**Enrol No. : PG/18/001**

**Under the guidance of**

**Dr. Sutapa Bandyopadhyay Neogi**

**POST GRADUATE DIPLOMA IN HOSPITAL AND HEALTH MANAGEMENT**

**2018-2020**



**International Institute Of Health Management Research**





Ref: KB/Internship/20-21/16


Date: June 4, 2020

**To Whomsoever it may concern**

This is to be certified that **Mr. Abhishek Jain** from International Institute of Health Management Research, Delhi has attended the organization for his dissertation from 24/02/2020 to 31/05/2020 . He has been found capable in delivering all tasks in a well-organized manner. His dissertation project is well presented and approved on the topic of **"Intermediate Assessment of ASHA app, a novel mHealth platform for recording health census in Rajasthan"** During the period of his dissertation with us, he had been exposed to different processes & was found punctual, hardworking and inquisitive.

Wishing the best to **Mr. Abhishek Jain** for his future endeavours .

**Khushi Baby Association**

  
Director

**(Mohammed Shahnawaz)**  
**Chief Operation Officer**  
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## **TO WHOMSOEVER IT MAY CONCERN**

This is to certify that Abhishek Jain student of Post Graduate Diploma in Hospital and Health Management (PGDHM) from International Institute of Health Management Research, New Delhi has undergone internship training at Khushi Baby from 24th February to 24th May 2020.

The Candidate has successfully carried out the study designated to him during internship training and his/her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.

I wish him all success in all his/her future endeavors.

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**Dean, Academics and Student Affairs**  
**IIHMR, New Delhi**

**Dr. Sutapa Bandyopadhyay Neogi**  
**Associate Professor**  
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### Certificate of Approval

The following dissertation titled “**Intermediate Assessment of ASHA app, a novel mHealth platform for recording health census in Rajasthan**” at “**Khushi Baby**” is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **Post Graduate Diploma in Health and Hospital Management** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation.

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### **Certificate from Dissertation Advisory Committee**

This is to certify that **Mr. Abhishek Jain**, a graduate student of the **Post- Graduate Diploma in Health and Hospital Management** has worked under our guidance and supervision. He is submitting this dissertation titled **“Intermediate Assessment of ASHA app, a novel mHealth platform for recording health census in Rajasthan”** at **“Khushi Baby”** in partial fulfillment of the requirements for the award of the **Post- Graduate Diploma in Health and Hospital Management**.

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

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**CERTIFICATE BY SCHOLAR**

This is to certify that the dissertation titled **“Intermediate Assessment of ASHA app, a novel mHealth platform for recording health census in Rajasthan”** and submitted by **Abhishek Jain** Enrollment No. **PG/18/001** under the supervision of **Dr. Sutapa Bandyopadhyay Neogi** for award of Postgraduate Diploma in Hospital and Health Management of the Institute carried out during the period from **24th February to 24th May 2020** to embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

*Abhishek Jain*

**ABHISHEK JAIN**

**PG/18/001**

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**IIHMR, NEW DELHI**

## FEEDBACK FORM

**Name of the Student:** ABHISHEK JAIN

**Dissertation Organization:** KHUSHI BABY

**Area of Dissertation:** Scale Up Process of Khushi Baby Platform To The Rajasthan State under the Nirogi Rajasthan Campaign of Government of Rajasthan

**Attendance:** Fairly good.

**Objectives achieved:** Satisfactorily


**Deliverables:** Yes

**Strengths:** Good in communication

**Suggestions for Improvement:** Need to work on attention to details and quality of work, truthfulness in behaviour

**Suggestions for Institute (course curriculum, industry interaction, placement, alumni):**  
Require more to work on content, case discussion, system thinking

**Date:**  
**Place:** Khushi Baby, Jaipur

**Khushi Baby Association**  
  
**Director**  
**Signature of Organization Mentor**  
**(Dissertation)**

## **ABSTRACT**

**Background:** An accredited social health activist (ASHA) is the first contact with the primary health system in India. She advises women on childbirth in institutions, vaccinates children in hospitals, promotes family planning (with both terminal and metastatic methods), and treats illnesses and serious injuries with emergency care. She provides basic services to rural mothers and children, maintains separate data entry registers for each village, fills out various formats of monthly reports, and executes various other employment documents. Multiple sources of entry, duplicate data collection and false data entry are the primary challenges affecting the data collection and health system. In order to minimize the challenges Govt. of Rajasthan have developed a Nirogi Rajasthan ASHA application to get digital health status of each and every individual and addressing the issues of ground-level. Technology can come to the aid of primary care workers to address these challenges.

**Objectives:** The study included the following objectives:

1. To understand the strengths of using Nirogi Rajasthan ASHA app, the novel mHealth platform for recording the health census
2. To understand the difficulties associated with the use of Nirogi Rajasthan ASHA app
3. To explore different ways to improve its utilization in the field

**Methods:** The study was conducted in three blocks (Kishangarh, Bawri, and Khandela) of three district of Rajasthan- Ajmer, Jodhpur and Sikar. A total of thirty nine ASHAs (13 from Kishangarh, 13 from Bawri, 13 from Khandela) selected purposively were interviewed using a semi structured questionnaire. Telephonic interviews were conducted using semi-structured interview guide, according to the participant's convenience and in their first language. The data analysis was conducted using thematic analysis.

**Results:** Three main themes emerged- User Acceptability of Nirogi Rajasthan ASHA Application, ASHAs work efficiency and barriers to uptake of Nirogi Rajasthan ASHA. Participants expressed that with the introduction to mhealth application, there would be an ease in doing work and it would decrease their workload. Regarding efficiency, the respondents were of the opinion that this would increase their efficiency because it would provide real time data monitoring, entire process will be paperless, and it will provide one platform for all surveys.

However, they mentioned that there could be several technical and socio-cultural factors that could hinder ASHAs understanding of the concept and hence use of this application effectively.

Overall, ASHAs were positive about using ASHA application and its impact on data quality, health service delivery and community follow-up. Major challenges included tensions over non-availability of smartphones. They had worries about low financial status, poor connectivity in rural areas, and lower educational qualifications.

**Conclusion:** The alternate solution will help in minimizing double data entry and time taken by ASHA to do surveys. The findings may further be researched to know the intricate details of application use by ASHAs and the challenges that they face in handling ASHA application to consider it for scaling up.

**Keywords:** *Accredited Social Health Activist, ASHA application, Barriers, mobile health application, Nirogi Rajasthan*

## **ACKNOWLEDGEMENT**

Every successful story is a result of an effective team work, a team which comprises of a good coach and good team players. Likewise, this project report is no exception. This has been a meticulous effort of a group of people along with me. I want to take this opportunity to thank each one who has been a part of this report.

This dissertation 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**, CoDirector at Khushi Baby, **Ruchit Nagar**, Co-founder at Khushi Baby Inc. for giving me time and space from the induction and training schedule, to perform my fieldwork. In addition I would like to thanks my mentor, **Dr. Sutapa Bandyopadhyay Neogi** (Associate Professor - International Institute of Health Management Research, New Delhi) for her timely advice and encouragement for the successful conduction of my project.

I then take this opportunity to thank **Dr.Rajeev Singh Dhakkad** (Public Health Manager at Khushi Baby) for being a constant source of support and guidance during the data analysis part.

Last but not least the **ASHAs** involved in the study and all the staff for working with us and supporting us throughout.

## **TABLE OF CONTENT**

LIST OF ABBREVIATIONS .....	6
INTRODUCTION OF INTERNSHIP TRAINING .....	7
ORGANIZATIONAL PROFILE .....	9
INTRODUCTION OF STUDY .....	15
LITERATURE REVIEW .....	153
RESEARCH METHODOLOGY .....	33
RESULTS .....	41
DISCUSSION.....	66
CONCLUSION .....	70
RECOMMENDATIONS .....	72
REFERENCES .....	74
ANNEXURES.....	78

## LIST OF ABBREVIATIONS

<b>ANM</b>	Auxiliary Nurse Midwives
<b>ANC</b>	Ante natal care
<b>ASHA</b>	Accredited social health activist
<b>DLHS</b>	District Level Household and facility Survey
<b>FHW</b>	Frontline Health Workers
<b>GPS</b>	Global Positioning System
<b>IEC</b>	Information Education Communication
<b>IMR</b>	Infant Mortality Rate
<b>KB</b>	Khushi Baby
<b>MCTS</b>	Mother and Child Tracking System
<b>mHealth</b>	Mobile Health
<b>MMR</b>	Maternal Mortality Rate
<b>NRHM</b>	National Rural Health Mission
<b>NHM</b>	National Health Mission
<b>NFC</b>	Near Field Communication
<b>NFHS</b>	National Family Health Survey
<b>NGO</b>	Non government organization
<b>PCTS</b>	Pregnancy and child health tracking system
<b>UNICEF</b>	United Nations Children's Fund
<b>WHO</b>	World health organization
<b>OJSPM</b>	Online JSY & e-Shubh Laxmi Payment and Management
<b>PHC</b>	Primary Health Centre
<b>NCD</b>	Non-Communicable Diseases
<b>MOIC</b>	Medical Officer In Charge

## INTRODUCTION OF INTERNSHIP TRAINING

As an integral part of the Post Graduate Diploma Course, the final year students have to undergo three months of Internship Training in any organization with the objectives of learning of operations as well as getting a good-hand experience of the health care field.

The author was appointed to the Khushi Baby from 24<sup>th</sup> February to 24<sup>th</sup> May 2020 as a **Public Health Associate** and assisted them in data collection, compilation, auditing and preparing a project report.

The assignments were a combination of desks jobs, and visits to different departments to interview concerned persons for collection of data which were analysed and formatted. The author was guided by Mohammad Shahnawaz, Co-Director at Khushi Baby, Ruchit Nagar, Co founder at Khushi Baby Inc. who supervised the author's activities and provided necessary and & timely suggestions, and clarified doubts on regular basis during the internship.

The present report is a compilation of the author's learning and understanding of different activities regarding scale up process of Khushi Baby platform to the Rajasthan state under the Nirogi Rajasthan Campaign of Government of Rajasthan, with respect to operations, Research, training, documentation and Government relations. .

### **Objectives of the Internship:**

- To complete internship with full efficacy and efficiency.
- To understand working of whole of the public health system and to seek opportunity that will stimulate interest and provide experience.
- To carry out assigned tasks within the time frame.
- To prepare self to face the realities in the corporate sector.

# **ORGANIZATIONAL PROFILE**

## **ORGANIZATIONAL PROFILE**

### **ABOUT THE ORGANIZATION**

Khushi Baby was started in 2014 in Udaipur, Rajasthan, by Ruchit Nagar and Shah Nawaz to mitigate infant mortality through improved monitoring of antenatal and neonatal healthcare.

Khushi Baby was born out of a classroom project back in 2014. Khushi Baby is a non-profit with entities registered both in the US (est. 2014) and India (est. 2016). Our team consists of 30 full-time members based in Udaipur, Rajasthan who represent various disciplines: public health, medicine, governance, data science, software development, design, and social work.



Khushi Baby has delivered a platform as a service for tracking maternal and child health. They oversee the end-to-end process of design, development, deployment, monitoring and evaluation, and stakeholder engagement required to drive granular impact.

### **AIM**

To develop solutions to address the immunisation gap globally and come up with technology to bridge this and help people in the most remote villages.

### **VISION AND MISSION**

Our mission is to motivate and monitor the health care of mothers and children to the last mile.

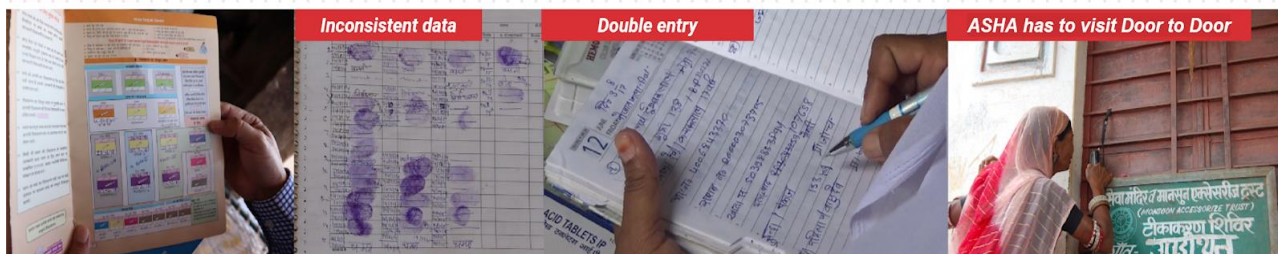
## INNOVATION

Khushi Baby has developed a comprehensive platform for tracking Reproductive Maternal Neonatal and Child Health care, tailored for last-mile settings without connectivity. The platform consists of the following key elements:

1. Near Field Communication (NFC) based health card for beneficiaries
2. Mobile application for frontline health workers to support point of care clinical decision making and planning for preventative health care camps
3. Analytics dashboard for health officials to take data driven engagements
4. Targeted automated voice call reminders in the local dialect for beneficiaries

The novelty of the platform begins with the NFC-based health card which allows the beneficiary to carry their health record with themselves, allowing for informed care when they interface with their next health provider. And because the health provider must scan the NFC-card and take the live biometric of the beneficiary, our system is also uniquely able to confirm the beneficiary was actually seen for services - a vital accountability check missing in other mHealth solutions.

### Before

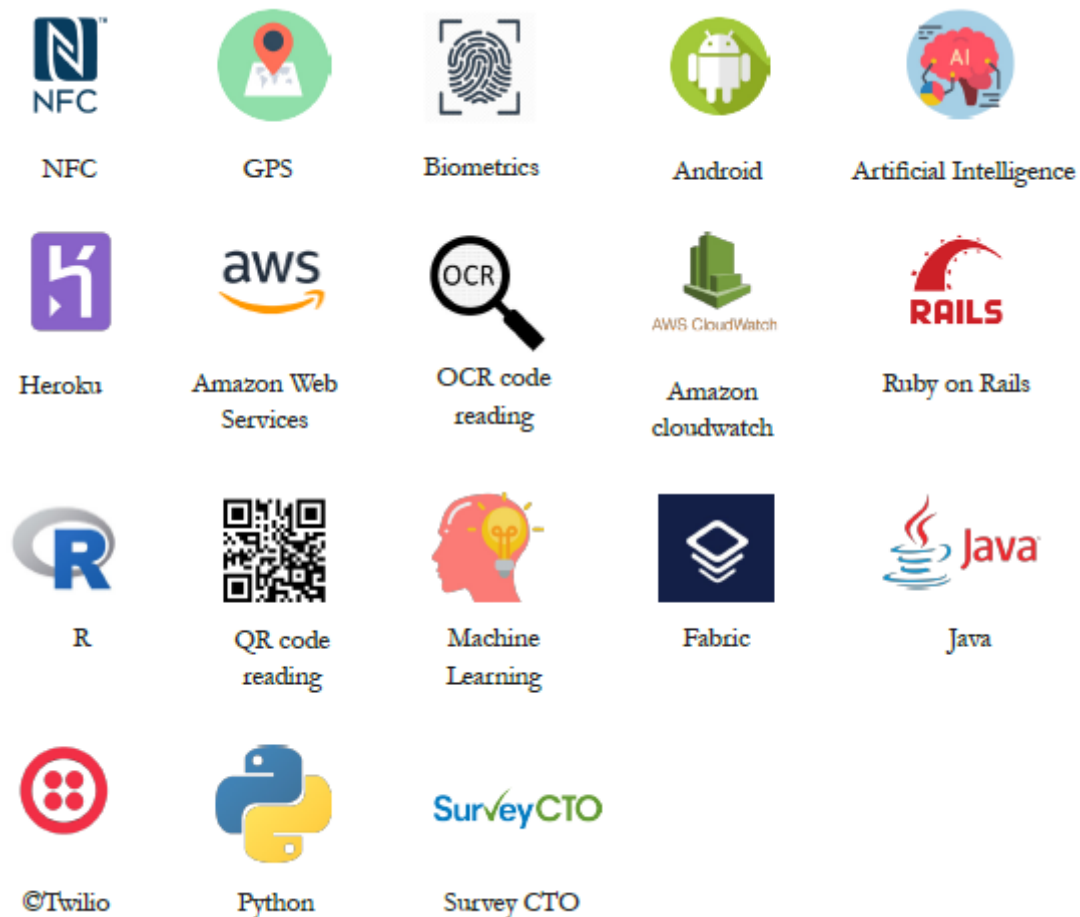


### Now



**KHUSHI BABY'S SOLUTION**

## TECHNOLOGY PROCESS



## IMPACT

- Over 150 ANM health workers in 5 blocks (~400 villages) have used the system continuously since 2017 to track the health of 47,000+ mothers and infants
- Our 2-year, 3200-mother randomized controlled trial, supported by the International Initiative for Impact Evaluation, showed the Khushi Baby system improved full infant immunization by 12 percentage points and decreased infant malnutrition by 4 percentage points.

## RECENT ACHIEVEMENTS

- Establishment of end to end IT enabled Janta Clinics for provision of primary healthcare services to the urban slums of Jaipur and
- The Nirogi Rajasthan Platform: a comprehensive digital health platform which will enable over 70,000 health workers across the state to conduct India's first digital health census of approximately 7 Cr residents and ensure community-based, longitudinal follow-up of reproductive and child health, NCDs, and other national health verticals.
- Khushi baby is also playing an unexpected, lead supporting role in the COVID19 response for the Department of Health and Family Welfare and Government of Rajasthan. The team has switched gears, adapting its tools for digital data collection, automated community outreach, localized content development, public health data analysis, and field operations to assist with the COVID19 response at scale.
- In partnership with WhatsApp and Infobip, Khushi Baby launched Rajasthan's WhatsApp COVID19 Chatbot on April 15 which has sent over 1.5 lakh messages to date. Beyond general citizen specific awareness, this chatbot is the first to introduce features for symptom reporting, safe delivery for pregnant women, and guidelines for health workers. As access to private health facilities remains limited, an integrated telemedicine feature is also being prepared for launch in the coming week, allowing citizens to chat with doctors over the familiar channel of WhatsApp.
- Khushi Baby's automated local dialect voice call system is being scaled to reach nearly 2 lakh expectant mothers in the coming two months to coordinate safe institutional delivery and conduct remote postnatal care follow-ups across the state. This scale-up is grounded in prior evidence. In a two-year randomized controlled trial, Khushi Baby's call system was found to decrease infant acute malnutrition by 26% and increase the odds of full infant immunization by 66%.

## PARTNERSHIPS

Khushi Baby's platform is now being scaled by the Rajasthan Department of Health and Family Welfare to five districts: Udaipur, Sirohi, Ajmer, Jodhpur, and Siker to reach 1M beneficiaries and enable 15,000 frontline health workers in 2020. Khushi Baby has been supported by GAVI, UNICEF, 3ie, Yale, Harvard Medical School, MIT-SOLVE, Pierre Fabre Foundation, Nudge Foundation, Grand Challenges Canada, ISIF ASIA, Women's Forum for the Economy and Society, Johnson and Johnson and Kotak Mahindra Pvt Ltd.



# **CHAPTER 1: INTRODUCTION**

## INTRODUCTION OF STUDY

### 1. Overview

ASHA's inclusion as a public health worker in India began in 2005 at the National Rural Health Mission (NRHM), which encouraged women to give birth and bring children to vaccination clinics. Promote family planning - taking urgent and temporary measures, treating serious illnesses and injuries with the help of an ambulance, keeping demographic records and improving hygiene in the countryside. Currently, nearly 900,000 ASAs are the first point of contact for most of the health sector and play an important role in the early detection and prevention of disease. ASHA played an important role in reducing infant mortality (IMR) from 58 deaths per 1000 births in 2005 introduced by NRHM to 33 deaths per 1000 births in 2017. 2004-06 Maternal mortality (MMR) 254 cases of maternal mortality per 1,000,000 women, and in 2014-16, 130 mothers per 1,000,000 women.

***“Training, connecting and empowering ASHAs by leveraging technology is a necessity at the moment, and the key to better healthcare. If last-mile health can be digitally empowered, ASHAs can bring in a sea change in primary and tertiary care.”***

Priorities in the development of cellular technology and healthcare have created a new field of electronic medical services. mHealth can be used by ASHAs, especially for point-of-care services, providing health information, data collection and monitoring. In addition, during home visits for identification and referral of cases, in case if ASHAs face problems, digital empowerment will be ideal, so that they can seek an expert opinion which would help them in indecisive and unresolved situations. However, it is to be noted that the capacities of ASHAs need to be built and trained in digital health tools.”

### 2. Background

People's lifestyle has changed due to rapid modernization and many other factors which have resulted in a major change in people's health and the way diseases are spread.

There are many stages of this change in spread of diseases to people, most of which are driven by social factors like lifestyle, occupation and income. These are the main reasons for the burden of diseases on the country and reducing the burden of communicable and non-communicable diseases in middle-income countries like India is a major challenge for the health system.

When people have to depend on private healthcare facilities for basic health services, the burden of expenditure on them increases, so there is a great need to improve public health services. In order to improve public health services and better access to beneficiaries, there is a need for instantly available (real time) and accountable data.

### **3. Challenges**

The biggest challenge for any country or state is to provide the best, accessible and affordable health services to its citizens. In terms of area, Rajasthan is the largest state in India. The Department of Medical, Health and Family Welfare of Rajasthan has been constantly giving importance to corrective actions in the field of reproductive and child health (RCH), and has been an leader in e-health and e-governance by digitalizing mother and child tracking.

But gaps exist at the grassroots levels that are allowing beneficiaries to miss out on essential primary services. Innovations are required to address these gaps, and in the wake of increased digitization of service tracking, the DOHFW also appreciates the need for data accountability.

*Accountable, longitudinal tracking of the health of individuals from family planning onwards, is a prerequisite to larger efforts towards improving key indicators in RMNCH.*

### **4. eHealth solutions today fall short**

India is seeing a rapid transformation and digitization of the public health care sector. Over the past 10 years, Rajasthan has been making strides in the e-health space. Since 2009, nearly 15 lakh yearly pregnancies have been followed up annually through Pregnant Woman and Child Health Information Management System (PCTS).

Digitized reporting across this platform now extends to beyond 400 key health indicators with individual level data, spanning multiple health verticals. Still when it comes to the process, there is scope for improvement. PCTS relies on second hand data entry by data entry operators to determine the ground-truth. Disparities are consistently found between PCTS linelist reports and national family overviews.

## **5. New Approach**

App-based solutions have shown promise - by allowing the primary data collector to be responsible for rapid reporting. Real-time reporting can inspire action at the district, block, and sector levels. The Rajasthan Department of Health and Family Welfare have taken a bold commitment to remove all registers for 17,000 ANMs and 50,000+ ASHAs by April 1 and transition to app-based reporting. The underlying objective is to get at the ground truth and to ensure no beneficiary is left out. In turn, the Department is proposing a new platform for authenticated tracking of RCH service provision via the Nirogi Rajasthan System.

The DOHFW proposes a 5-district scale-up of integrated Nirogi Rajasthan platform with NFC Technology, for which a budget of approximately 20 Cr is requested for FY 2020-21. This program aims to impact the lives of nearly 6 lakh mothers and infants at the last mile, while empowering 15,000 frontline health workers (ANMs and ASHAs) and 700 MOICs to provide informed care to those mothers and infants who may otherwise be left out.

The project will include the Districts of Ajmer, Jodhpur, Sikar, Sirohi, and Udaipur in the first phase. Udaipur was chosen due to the existence of the Khushi Baby platform across 5 blocks to track 30,000 beneficiaries for RCH service provision. Sikar was chosen due to the recent experience of activating several hundred ASHAs in 2 blocks to complete mobile-based health surveys of 7 lakh individuals. The other Districts were included to ensure geographic coverage, strong local leadership, and recognize the need to uplift Aspirational Districts (in the case of Sirohi).

## Current Status of Tracking: Fragmented

	Eligible Couple Identification	Family Planning follow-up	Antenatal Care	High Risk Pregnancy	Labor and Delivery	Postnatal Care	Infant Immunizations	High Risk Child	Child Growth & Nutrition	Early Childhood Development
Data Collector	ASHA	ASHA	ANM	ANM, PMSMA Doctor	SBA/Staff nurse	ASHA	ANM	ASHA, ANM, RBSK Doctor	AWW	AWW
Primary Source of entry	ASHA Diary, RCH Register	ASHA Diary, RCH Register	RCH Register	HRP Register	JSSY Case Sheet	ASHA Diary	RCH Register	ASHA Diary, RCH Register, RBSK Register	AWW Registers	AWW Registers
Rajasthan (Web Portals)	ECTS, ASHA Soft	AntaraRaj, Sahbhagita Software, FP LMIS, ASHA Soft	PCTS	KMKRAJ, PCTS	Dakshata Labor Room Management Information System	PCTS, ASHA Soft	PCTS	RBSK Raj		RBSK Raj
Rajasthan (Apps)			PCTS App (except registration)		Aasman Janitiri Daksh		PCTS App (except registration)			
National (Web portals)	RCH Portal	RCH Portal	RCH Portal	PMSMA Portal	RCH Portal	RCH Portal	RCH Portal	RBSK Portal	ICDS-CAS Portal	RBSK Portal
National (Apps)	ANMOL IMTECHO	ANMOL IMTECHO	ANMOL IMTECHO	IMTECHO?	ANMOL IMTECHO	ANMOL IMTECHO	ANMOL IMTECHO		ICDS-CAS	
Other real-time systems	Khushi Baby	Khushi Baby	Khushi Baby	Khushi Baby	Khushi-Janitri	Khushi Baby	Khushi Baby	Khushi Baby	Khushi Baby	Khushi Baby

**Bold: primary data collected at point of care**

Source: Khushi Baby System, Aapka Swaasth, Aapke Haath

<https://docs.google.com/presentation/d/1MmFXN14TWsFCMa3IbEGYk6UB7laKAOEx/edit#slide=id.p2>

### 6. Nirogi Rajasthan Platform

The Nirogi Rajasthan Digital Health Survey will be conducted in all districts of Rajasthan from April 2020. This is a first of its kind health survey in the state of Rajasthan in which every citizen of the state will be covered digitally. This health survey is conducted by more than 50,000 ASHA workers across the state through "Nirogi Rajasthan ASHA App" on Android smartphone. There are several benefits of conducting this paperless and mobile technology based survey on a large scale. By doing this work through the phone, ASHAs will not have to do any paper-work and they will not have to go anywhere for reporting. There will be no need to conduct a separate survey for TB or Leprosy or non-communicable diseases or Reproductive and Child Health (RCH) - all these will be added to the same service. The quality of data collected by ASHAs will improve which will help in making health services more better and quality.

This platform consists of mobile application modules for ASHA, ANM, and MOIC. The ASHA application will also feature an integrated health survey module to address the needs of multiple national health verticals beyond RCH. More than the mobile applications, there are multiple layers of upfront accountability.

***Key Objectives:***

- Integrated digital health census with household granularity
- Authenticated, longitudinal health tracking from village health camp to tertiary facilities
- Decentralized health record for RMNCH+A beneficiaries
- Individualized high-risk health scores for early prevention
- Automated community outreach voice calls and direct benefit transfers
- Automated reporting for all national health vertical programs, allowing health workers to focus on providing high-quality care

**7. Justification of Study**

The government launched the "Nirogi Rajasthan" campaign in December 2019. The objective of this campaign is to provide proper care to the elderly people, women, and children, as well as to provide better services and spread awareness about problems such as communicable and non-communicable diseases, vaccination and de-addiction.

The system of "Nirogi Rajasthan" campaign proposes a new platform for authenticated tracking of reproductive and child health (RCH) services. The platform includes mobile application modules for ASHA, ANM and medical officers. Due to inaccessibility and some other undesirable reasons, beneficiaries are often deprived of essential primary services. This module will try to reduce this gap by tracking people's health and making the system accountable.

ASHA serves as the first point of contact for any community and performs five major activities, such as home visits, participating in Rural / Urban Health and Nutrition Day, visiting health facilities, village level meetings Doing and Record Making. Asha plays her leading role in more parallel works besides RCH.

Along with RCH, there will be a comprehensive health survey for other communicable and non-communicable diseases (non-RCH) through this mobile application prepared for ASHA.

The non-RCH aspect of the mobile application is an integrated health survey module that will cater to the needs of various other national health aspects. In addition, ANM's RCH mobile application will be enabled with Near-Field-Communication (NFC), which will be implemented initially in five selected districts. Under this initiative, beneficiaries will be given "Jan-Aadhaar Health Cards with NFC Chip". This health card will take biometric information of the beneficiary and will also maintain the previous record of its reproductive and child health. This card will enable the beneficiary to avail more better health services. This is a major step towards authenticity and accountability of the figures.

## 8. ASHA Application

A mobile application has been developed by the Department of Health and Family Welfare, for the purpose of conducting a comprehensive Digital Health Survey in the state of Rajasthan. Through this application, digital health surveys on mobile smart phones will be conducted by ASHA collaborators. This application is known as "**ASHA Application**" or "**ASHA App**" for short.

### **Different modules in ASHA**



Eligible Couple



Family planning



Antenatal  
checkup



Postnatal  
checkup



Immunization



Early childhood

### ***Features of Asha App –***

- Asha will not need to record details on paper forms
- Very easy to operate and user friendly
- No internet needed while working
- Asha will neither have to make a report on paper nor go to the sector to submit her report
- There is no need to separate many surveys, like NCD, CBAC, Mental Health, TB, etc.
- Will prevent you from filling the wrong information or will alert you to correct if any wrong information is filled by mistake
- Information that may be difficult to obtain or the respondent may refuse to provide has not been made mandatory
- Will not proceed without filling the essentially taken information
- It will take information of only one member at a time, it will be beneficial that you can take information of other family members later also
- Only the questions applicable to a particular person will be shown, that is, the questions of which age or gender will not be applicable to the person, they will not be shown and will prevent the ASHA from asking inappropriate questions
- Clicking on a button will forward the data collected by Asha
- Will show profile / progress of Asha's daily work
- Asha's incentive amount will be calculated by herself, she will not have to fill a separate form, and it will continue to show the progress of your incentive
- Asha can call the help desk anytime and get help while working
- Based on the survey conducted by Asha, the DU list will show the risky cases, so that they will be able to complete their work on time and more effectively

### ***Required Mobile Smart Phone Type (Configuration)***

A minimum of (preferably:) mobile smart phones of the following configurations must be in order to operate the Nairobi Rajasthan Asha application:

- Screen Size: 5.1 inch
- Operating System: Android 5.0 - Lollipop
- RAM memory: 2 GB
- ROM memory: 8 GB

## **CHAPTER 2: LITERATURE REVIEW**

## 2. LITERATURE REVIEW

### *Context*

**Source: International Institute for Population Sciences (IIPS) and ICF. 2017.**

**National Family Health Survey (NFHS-4), India, 2015-16: Rajasthan. Mumbai: IIPS.**

**<http://rchiips.org/nfhs/NFHS-4Reports/Rajasthan.pdf>**

In India, high fertility and mortality rates are mainly borne by a group of states called as Empowered Action Group (EAG1) states, formerly known as BIMARU states. These eight states include Bihar, Jharkhand, Uttar Pradesh, Uttarakhand, Madhya Pradesh, Chhattisgarh, Orissa and Rajasthan. Only these states account for more than half of births (55%) in India, two-thirds of infant deaths (66%) and 8% of 10 maternal deaths (80%).

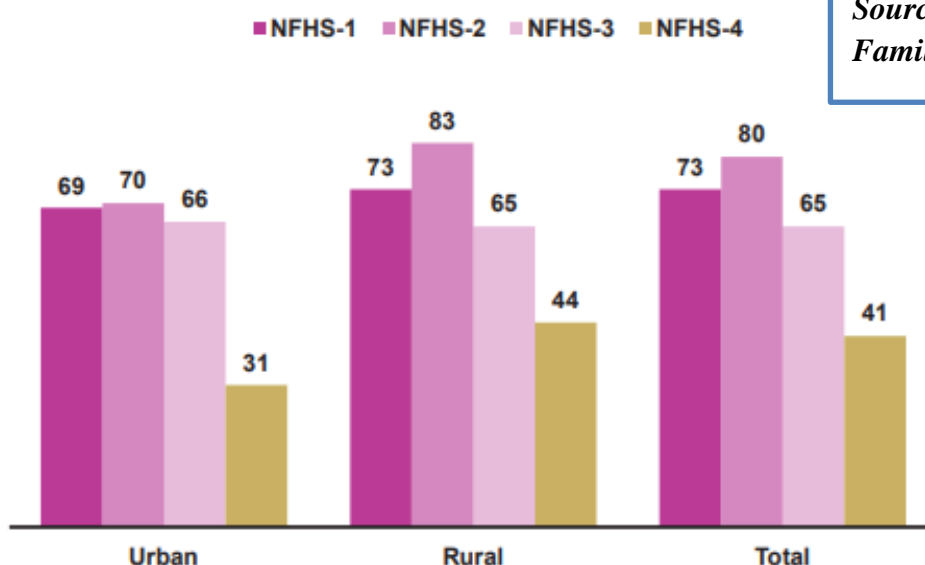
Rajasthan belongs to this group of states. Given that most of the population and health indicators are low in the state, the National Rural Health Mission (NRHM: 2005-2012) has considered it as a High Focus State. In Rajasthan, there are approximately 17,000 midwives (ANMs) and 55,000 certified social activists (ASHAs) caring for about 15 mothers and children each year.

Rajasthan's health performance on key indicators suggests a need to focus on those pregnant women and children who are getting missed out on the complete spectrum essential primary health services. As per the Sample Registration Survey (SRS 2019) statistics, Rajasthan has an infant mortality rate (IMR) of 42 in rural areas and 38 overall (compared to a nationally reported average of 37 for rural areas and 33 overall).

Rajasthan's maternal mortality rate is 199 compared to 130 nationally as per the SRS 2018 estimate. Overall *Rajasthan ranks in the bottom-tier of states for IMR and MMR.*

## Trends in Infant Mortality

Deaths per 1,000 live births



Source: NFHS-4 (National Family Health Survey) 2015-16

Table showing mortality profiles of Rajasthan

Indicators	Status
Estimated Live Births	16.54 Lakhs (Estimation based on SRS, 2017)
Reported Live Births	13.93 Lakhs (84.2%) (HMIS 2018-19)
Neonatal Mortality Rate	27 (SRS, 2017)
Estimated Neonatal Deaths	44,652 (Estimation based on SRS, 2017)
Reported Neonatal Deaths	21,786 (49%) (HMIS 2018-19)
Infant Mortality Rate	38 (SRS, 2017)
Estimated Infant Deaths	62,843 (Estimation based on SRS, 2017)
Reported Infant Deaths	31,158 (50%) (HMIS 2018-19)
Under 5 Mortality Rate	43 (SRS, 2017)
Estimated Under 5 Deaths	71,112 (Estimation based on SRS, 2017)
Reported Under 5 Deaths	35,593 (50%) (HMIS 2018-19)
Maternal Mortality Ratio	186 (SRS, 2015-17)
Estimated Maternal Deaths	3390 (Estimation based on SRS 2015-17)
Reported Maternal Deaths	1081 (42.5%) (State Report 2019-till Dec'19)
Reported Still Birth (SBR)	23,896 (17) HMIS 2018-19)

Furthermore, there are *differences in estimates of key indicators between PCTS beneficiary linelists and the national household-level surveys*. For example, PCTS estimates for IMR in the past two years are 22 and 24 for 2019 and 2018 financial years respectively.

This is nearly half of the SRS reported estimate of 38. Overall, the PCTS system in Rajasthan is likely to under report key health outcomes.

This observation also highlights the *need for a clear denominator for follow-up*. Beneficiaries tracked as eligible couples in ECTS are not uniquely linked to the PCTS system for RCH service provision tracking. Similarly there are *interoperability challenges across different phases of RMNCH*, such as high risk referral outcome reporting.

With the paper-based system at the grassroots level, there are serious concerns with data quality. Frontline health workers compile and report data by hand at the end of the month. As a result, there are delays to address MCHN session cancellations, high risk beneficiaries, and supply-side gaps. The reported data is not regularly back-checked by supervisors on the ground. Not all data is tied to a line-list and discrepancies exist within the reported data. Data is also reported on beneficiaries that may not have been examined by the frontline health worker. Manual error from data entry operators also is a cause for concern.



*The paperwork is interminable and copious: these are notebooks, registers and various survey forms meticulously maintained by ASHAs*

## ***The need for Innovations***

**Source: Combating Rural Child Malnutrition through Inexpensive Mobile Phones**

<https://dl.acm.org/doi/pdf/10.1145/2399016.2399113>

In rural areas of developing countries, archives and records are mostly kept on paper. Often there are several points for entering the same data, which are recorded in a central computer system in an urban area and transferred to some form of paper before summing them up. The process of copying and compiling data on paper is error-prone and time-consuming, and there is a long delay between initial data entry, data collection and digitization. High level of error in the data is especially problematic in the field of medical care. Need to aggregate data delays corrective actions, such as emergency medical care, as decision-makers need weeks or months to view data.

Current solutions, such as paper copies of records, are easily lost, and there is no central repository for retrieving this information. In addition, rural India has few incentives to prevent children if the cost of losing valuable time at work can bring money to the family. Together, these reasons must ultimately overcome serious obstacles to achieving effective and systematic vaccination and public health in society.

The system has improved the ability of healthcare providers to provide services and improve health outcomes using existing cellular networks and low-cost cell phones. More and more women give birth to gynaecologists, more and more women turn to medical centres and more and more women receive foetal care. This system has improved CHW's responsiveness and shows that mobile phones can be an effective way to improve healthcare system performance in situations where the Internet is down. The internet and associated technologies have the potential to expand health services in developing countries, increase health system efficiency, and lead to better patient outcomes.

eHealth covers a full range of applications for information and communication technologies (ICT), from traditional management reporting systems to more comprehensive healthcare management information systems (HMIS), telemedicine, electronic patient records, clinical decisions and patient portal support and various other technologies including the Internet and mobile applications.

In response to the challenges of paper-based tracking at the field level, several solutions have been developed to digitally collect MCH data in rural healthcare settings.

Solutions such as eJanSwasthya, Rajsangam, Medic Mobile, Commcare, mSehat, and ANMOL share several features: a mobile application for health workers to use to digitally collect structured health data in offline settings, validations to assist health workers to take actions, a mechanism to sync data to a cloud-based database, and a reporting mechanism such as a dashboard for district health officials to see progress against key indicators, and in some cases, use of SMS reminders for patients tracked with the system.

### *Efforts to digitize frontline workers*

#### **1. Mother and Child Tracking System (MCTS)**

**Source: Shelke, Madhuri. (2019). MATERNAL AND CHILD TRACKING SYSTEM. [https://www.researchgate.net/publication/338140818\\_MATERNAL\\_AND\\_CHILD\\_TRACKING\\_SYSTEM](https://www.researchgate.net/publication/338140818_MATERNAL_AND_CHILD_TRACKING_SYSTEM)**

Mother and Child Tracking System (MCTS) is an initiative of Ministry of Health & Family Welfare to provide information technology for ensuring delivery of full coverage of healthcare and immunization services to mothers and children up to 5 years of age.

This is an innovative web-based application developed by NIC to facilitate and monitor service provision and establish reciprocal communication between service providers and beneficiaries. Creating a work plan for ANM, sending regular warnings to service providers and beneficiaries for appropriate services, and an easy-to-use dashboard for health managers at various levels to monitor service delivery is very important to provide quality service delivery, micro-birth planning, delivery of universal vaccinations, and positive effects on important health indicators such as Infant Mortality Rate and Maternal Mortality Ratio. It will also help with evidence-based planning and ongoing assessment of service delivery for pregnant women and children.

Problems addressed: Absence of appropriate training, overburdened information by data entry operator (DEO) and auxiliary nurse midwife (ANM), poor network issues, slow server speed, and more frequent power failures were envisaged as major limitations for the effective implementation of MCTS. Nearly 18% of the clients reported receiving short message service (SMS) and only 6% could understand the SMS.



### **Benefits of MCTS to ANM/ASHA**

Key Learning: MCTS have led to increased accountability and improved supervision of frontline workers, apart from empowering and providing support to the community.

#### **2. Pregnancy, child tracking and health services management system (PCTS)**

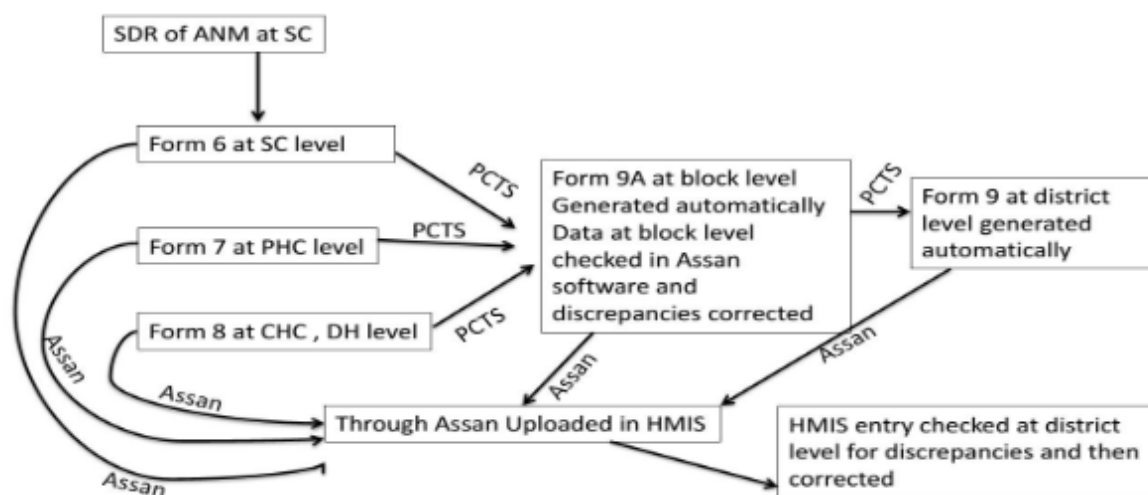
**Source: Pregnancy Child Tracking and Health Services Management System (PCTS) Gap Analysis Rajasthan**

<https://docplayer.net/14442116-Pregnancy-child-tracking-and-health-services-management-system-pcts-gap-analysis.html>

This is an online based application that was launched on 15 September 2009. The new version, which has been instructed by the Indian government, has been operating since July 1, 2010. The purpose of PCTS is to monitor every pregnant woman and her child on a case-by-case basis to reduce maternal and child mortality rates. .

This software helps maintain an online directory of health care facilities, automatically combines data and analyzes online trends. The Service Delivery List (SDR) is completed by ANM. This data is used to fill out forms 6, 7, 8 based on the PHC SC, CHC / DH level.

They are uploaded to PCTS by a data assistant or data entry operator. The list of lines (the appropriate area calculated by ANB, population and immunization) continues throughout the month. This is a list of the numeric rows given in Form 6. Forms 6, 7, 8 are then checked at the block level by the Operator blocking data either manually or with the help of the Assan software to correct the inconsistencies.



### Flow of data in State

Deviations are corrected at each facility. Form 9A is generated automatically at the block level. Likewise, District 9 automatically generates Form 9, which contains information from all blocks. In addition, information about the Assan software was uploaded to the Health Management Information System (HMIS), which was reviewed by the district nodal officer.

The PCTS has well developed tracking system primarily through key workers of ANMs and ASHAs. As of now mobile phones also have an important role to play as a tool for tracking the health of mothers and children for immunizations. PCTS has emerged as a powerful tool in recording information digitally which was earlier recorded manually.

Over all data quality and quantity was not so good and error were more before development of the HMIS and PCTS portals. Development of these softwares and their continuing up gradation helps in minimizing data errors and improved effective service indicators monitoring in the state.

Healthcare personnels associated with PCTS were mostly satisfied with the tools and techniques used in PCTS in capturing data and recording information. However they also pointed out some issues and challenges in using PCTS in most effective and efficient manner for pregnant woman and child. A need for improvement is required in terms of technology, process design, and adaptation to local conditions. Furthermore, there are *differences in estimates of key indicators between PCTS beneficiary linelists and the national household-level surveys*.

### **3. ASHA Soft: Online Payment and Monitoring System for ASHA**

**Source: National Health Mission Medical, Health & Family Welfare Department Government of Rajasthan**

<http://ashasoft.raj.nic.in/Private/login.aspx>

“ASHA SOFT” is used in the state of Rajasthan, where ASHA work is carried out, including visits, payments / incentives, to ensure that this is done quickly, transparently, and easily. There is evidence that this has shortened the time needed to incentivize ASHA in this country. ASHA SOFT is also connected to existing PCTS - Pregnancy Management, Child Tracking and Health Services, online software used by the Government's Department of Medicine, Health and Family Care as an effective planning and management tool for Rajasthan. This system manages online data about more than 13,000 public health facilities in the state.

#### **Strengths of ASHA Soft**

- No capital investment in any way (existing PC is used)
- Existing information Assistants/Computer operators are used – no new HR hired
- Sets of existing SMS Gateways are used ...better used
- Existing bankers are our partners
- Use of PCTS/ MCTS, which in turn improves entry regime
- Manual compilation of all information will be over
- Informed decisions will be encouraged

#### **4. OJSPM : Online JSY & e-Shubh Laxmi Payment and Management**

**Source: National Health Mission Medical, Health & Family Welfare Department Government of Rajasthan**

<http://nrhmrajasthan.nic.in/OJAS.htm>

OJAS is an internet system which enables the person to seize beneficiary wise information of payment for JSY Scheme and Shubhlaxmi Yojna, after due eligibility at CHC & above authorities fitness establishments.

Online fee of JSY scheme and Shubhlaxmi Yojna to beneficiaries financial institution accounts and generate numerous form of reports to screen the progress of the programme and numerous fitness information's.

The software popularly recognised "OJAS Software" has been conceptualized with following objectives:-

- To screen the performance of each delivery including female child every day/ month.
- Online system of payments in JSY and SLY
- To identify the gaps and need assessment at facility level and at community level.
- Well-timed and transparent payment for beneficiaries and system.

All records and reports now possible from OJAS :-

- Consequently, Rajasthan is the first state to start online payments of JSY and Shubhlaxmi scheme.
- Daily status of delivery at health institutes assessment is possible.
- The weight of baby can be seen at state level to ensure follow up on LBWs babies.
- Hospital stay of delivered women can be examined.
- Daily ratio of birth of girl child can be watched at every institutes and district and state level.
- Modalities of referral transport will be monitored.
- Mortality profiles of women can be watched at stay in institutes.

## 5. E-Jan Swasthya

**Source : UNICEF E-Jan Swasthya Mobile Application Design**

<https://www.behance.net/gallery/58609967/UNICEF-E-Jan-Swasthya-Mobile-Application-Design>

E-Jan Swasthya is an initiative of UNICEF India with Department of Health & Family Welfare and National Health Mission. It is for ensuring tracking of each pregnant women and child, improving inter-personal communication between ANM/ASHA and pregnant women and mother of young children, identification of danger signs amongst pregnant women and sick children. However all the efforts and investments are not getting translated into the results in terms of improving tracking and interpersonal communication and facilitation of decision of family member in case of danger signs. The major bottle-necks are due to the very complex system of tracking and is completely dependent on the technical system and user app for ANM/ASHA.

### *Benefits of digitization for the work of Front line workers*

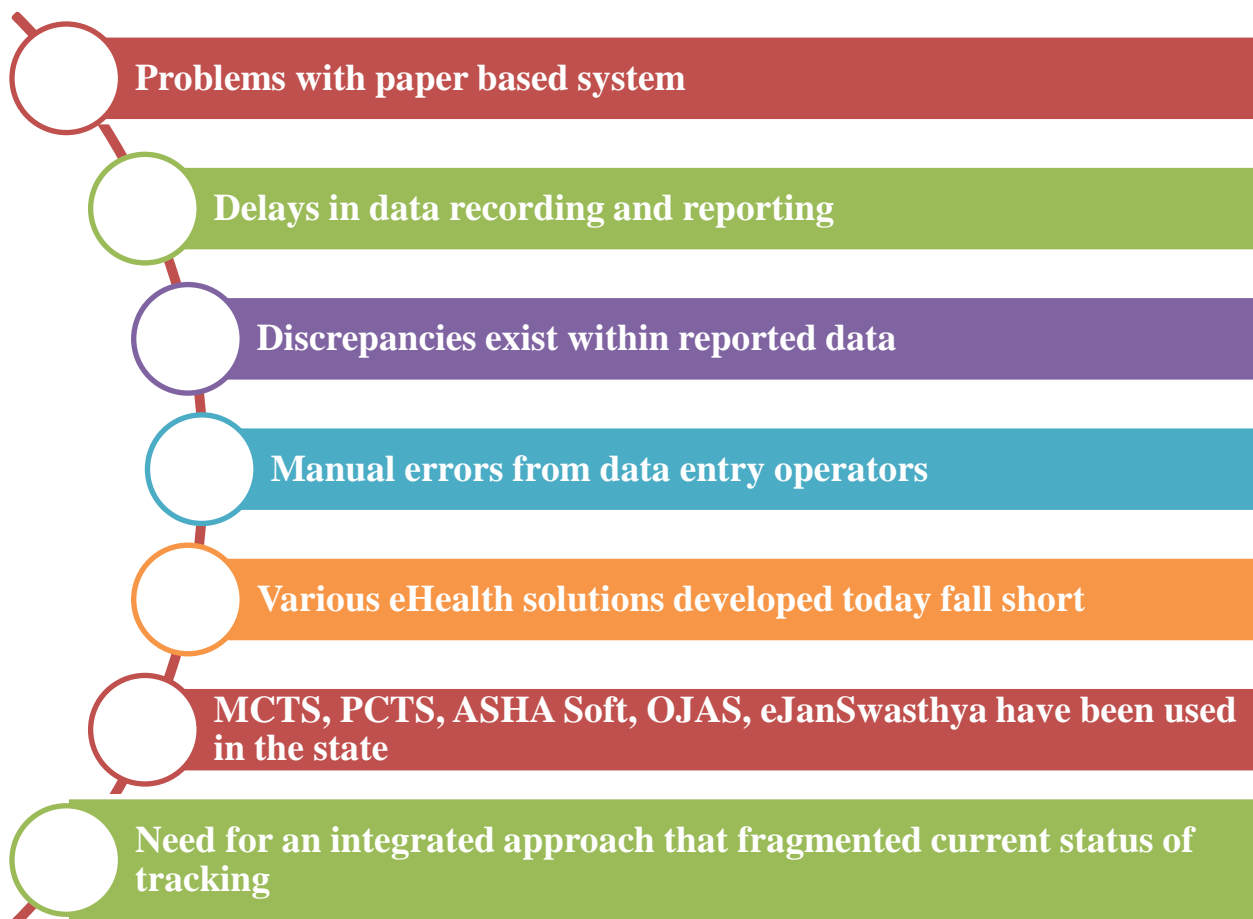
**Source: A Digital Disruption for Asha Workers Healthcare IT Public Health by EH News Bureau last updated Oct 4, 2019**

<https://www.expresshealthcare.in/healthcare-it/a-digital-disruption-for-asha-workers/414411/>

The main advantages for ASHAs is the ability to advise, convince and manage beneficiaries using multimedia, smart work tools (using individual service delivery data as a guide for providing health information). For ANM, this is their ability to generate reports and automatic service reminders. Block program managers benefit greatly from their ability to track pregnant women and newborns with high risk, as well as from the effectiveness of health professionals who use dashboards in real time. And of course, the beneficiaries responded that they appreciated receiving service warnings and health information, such as text messages and voice calls, in their own language, which meant improved health indicators for mothers, babies and families. Not all program components implemented in this phase provide training and information on demand for health professionals who use multimedia content.

### ***Summary of literature review***

There are so many e-health solutions however all the efforts and investments are not getting translated into the results. Therefore, the need of the hour is to have one real time reporting system.



## **CHAPTER 3: METHODOLOGY**

### **3. RESEARCH METHODOLOGY**

#### **Background**

The Nirogi Rajasthan ASHA application will be started from 1<sup>st</sup> April to 31<sup>st</sup> July 2020. In 5 districts (Jodhpur, Ajmer, Sikar, Udaipur and Sirohi) training have been conducted at the district level and one block in each of these districts and this is the basis of this study, to get an idea of what ASHAs think about this application and what are the benefits and strengths of using this application.

#### **Research Questions**

1. What is the perception of Accredited Social Health Activist (ASHA) regarding Nirogi Rajasthan ASHA app, the novel mHealth platform for recording the health census.?
2. What are the strengths and challenges of using the Nirogi Rajasthan ASHA app by ASHAs during her routine activities?

#### **Aim**

To improve the utility of ASHA app for program implementation.

#### **Objective**

1. To understand the strengths of using Nirogi Rajasthan ASHA app, the novel mHealth platform for recording the health census
2. To understand the difficulties associated with the use of Nirogi Rajasthan ASHA app
3. To explore different ways to improve its utilization in the field

#### **Study Type**

This study is an exploratory study to test out the feasibility of alternative m health solution against the currently used recording and reporting paper based system and to test a prototype of a mobile health application as an alternate solution that accounts for user preferences to overcome those challenges, exploration is required.

#### **Study Design and Setting**

Qualitative research was conducted using phenomenological approach. A phenomenological approach helps to study a phenomenon or event from people's perspective. The study was

conducted in three districts of Rajasthan- Ajmer, Jodhpur and Sikar three blocks namely Kishangarh, Bawri and Khandela in a period of April 2020 to May 2020 among ASHAs who are trained with Nirogi Rajasthan ASHA app.



**District map of Rajasthan and the study area**

### **Study Population**

A total of 39 ASHAs were interviewed, 13 of which were from Kishangarh block, 13 from Bawri block and 13 were from Khandela block. Out of 39 participants, 36 responded and response rate was recorded as 92.3%.

S.No.	Participant	Total Actual Sample	Total Approached	Total Completed
1	Ajmer	13	13	12
2	Jodhpur	13	13	11
3	Sikar	13	13	13
4	Total	39	39	36

**Table showing description of participants and response rate**

### **Data collection approach and tool**

As the aim of the research was to understand the real time experiences and difficulties of ASHAs regarding Nirogi Rajasthan ASHA app, the inclusion criteria was ASHAs who are acquainted with the ASHA app. The data collected approach was through purposive sampling technique. **Purposive sampling** helped the researcher to choose the participants on his or her judgement according to the study's inclusion criteria.

Semi-structured interview guide was prepared which include questions related to the experiences and difficulties of ASHAs in context of the regular work activity, before and after use of Nirogi Rajasthan ASHA app. **Telephonic interviews** was conducted using semi-structured interview guide, according to the participant's convenience and in their first language. Participation was voluntary and informed verbal consent was obtained from the respondents. While conducting the interview, the questions was asked by the researcher and the responses was recorded in the mobile recorder along which notes was collected.

### **Data Management and Analysis**

The audio recordings was transcribed and saved for the purpose of analysis. A coding system was developed to specify the information related to the “experience and difficulties regarding ASHA app”. The codes further lead to the formation of sub-themes and ultimately major themes which will reflect the interviews and will serve to answer the objective about perception, experience and difficulty faced by ASHAs regarding the Nirogi Rajasthan ASHA app, the novel mHealth platform for recording the health census.

#### **Example of codes, sub-themes and themes**

<b>THEMES</b>	<b>SUB THEMES</b>	<b>CODES</b>
<b>1. User Acceptability of Nirogi Rajasthan ASHA Application</b>	<ul style="list-style-type: none"><li>➤ <b>Introduction to mhealth application</b></li><li>➤ <b>Workable built system for the ASHA Sahiyogini</b></li><li>➤ <b>Ease in doing work and decrease in work load</b></li><li>➤ <b>Increased accountability and</b></li></ul>	<ul style="list-style-type: none"><li>➤ We got to learn on how to take survey on smart phones, previously we used to work on registers</li><li>➤ It will be easier to work and I'll get to learn some new</li></ul>

	<p><b>reliability of health records</b></p> <ul style="list-style-type: none"> <li>➤ <b>Availability of all data in phone at one click</b></li> <li>➤ <b>Increased sense of awareness and motivation</b></li> <li>➤ <b>Easy to operate and user friendly</b></li> <li>➤ <b>Ability to search instantly</b></li> </ul>	<p>things out of it</p> <ul style="list-style-type: none"> <li>➤ Yes training was very good, I am feeling more motivated than before</li> <li>➤ Yes the training was helpful. We can easily retrieve our data as well our payment details.</li> </ul>
<b>2. Enhancing ASHAs work efficiency</b>	<ul style="list-style-type: none"> <li>➤ <b>Real time data reporting</b></li> <li>➤ <b>Paperless information and document filing</b></li> <li>➤ <b>Improvement in data availability and quality</b></li> <li>➤ <b>Timeliness in work</b></li> <li>➤ <b>One integrated survey replacing all surveys</b></li> <li>➤ <b>Durability of records</b></li> <li>➤ <b>Faster payments and incentives</b></li> <li>➤ <b>Feeling of acknowledgment of hardwork</b></li> </ul>	<ul style="list-style-type: none"> <li>➤ Yes the training was helpful. Diary work will be over</li> <li>➤ It will take very less time</li> <li>➤ " I have not faced any kind of problem while using this app."</li> <li>➤ There are so many benefits for us in this app as we can reach any information via one click</li> </ul>
<b>3. Barriers in uptake of Nirogi Rajasthan ASHA Application</b>	<ul style="list-style-type: none"> <li>➤ <b>Non-availability of android mobile phones</b></li> <li>➤ <b>Poor network quality in rural areas</b></li> <li>➤ <b>Socio-economic/ financial barriers</b></li> <li>➤ <b>Pace of training is very fast</b></li> <li>➤ <b>Need to indulge more training</b></li> <li>➤ <b>Need practice for improvisation</b></li> </ul>	<ul style="list-style-type: none"> <li>➤ It will be easier for us to work; we can easily gather information whenever we want</li> <li>➤ Yes, it will help us a lot, as we don't have to maintain all these registers</li> </ul>

➤ **Lower educational qualifications**

- Yes, it will help us a lot, as we don't have to maintain all these registers
- It will save paper, and we don't have to carry much load with us while doing survey. Data will be save for longer time. Data regarding immunization will be stored safely.
- It helps us to provide any important information to the public and what work is being done in the area. Sometimes we forget the register or misplace the data this app will overcome all the issues.
- Yes, Definitely it will make my work easy. Apart from this, it will be cost effective as the money to spend for coping will be saved.
- Claim form will not be used and we

		<p>easily get all our payments at the end of month</p> <ul style="list-style-type: none"> <li>➤ No, I didn't understand anything as I don't have smart phone.</li> <li>➤ yes, I face many problems as I'm not that much educated</li> <li>➤ it's good app overall but we should also get smart phones as we all can't afford these phones</li> <li>➤ I just want that we all should get this training again as we all don't have these smart phones so it was little difficult to understand fully at that time.</li> <li>➤ I want that there should no recharge system for this app as there is always network problem in our village.</li> </ul>
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### **Trustworthiness of finding**

The validity of the study was maintained through various steps which include cross-checking of the interview, recordings and transcripts. Initially the researcher working separately on the transcripts and development of codes. The list of the codes then examined by the mentor to obtain the final list of codes. This list was further used for analysis and to maintain the reliability of findings.

### **Ethical consideration**

Ethical approval for the study was granted by Khushi Baby Organization, Udaipur and IIHMR, Delhi. Verbal consent was obtained from all the participants mentioning what all will be covered and asked in an interview. The participants were free to leave the study at any given point of time. Confidentiality of the participants was also maintained.

## **CHAPTER 4: RESULTS**

## RESULTS

### SECTION A

Section A highlights the basic information of the participants that were included in the study. It also explains the demographic features of the participants like name, age, education qualifications, and village name. This section helps to understand the general details of ASHAs and surrounding factors that affect work of ASHAs.

#### Basic information of participants

The study participant comprised 39 ASHAs. The basic characteristics of participants are outlined in Table 1. Regarding the age distribution, the average age of the participants included in the study was 36 years. The average education qualifications of the participants are Secondary i.e. 10th Class. Variation in the age group was built-in by conducting interviews with young adults as well as oldest old.

#### Details of participants

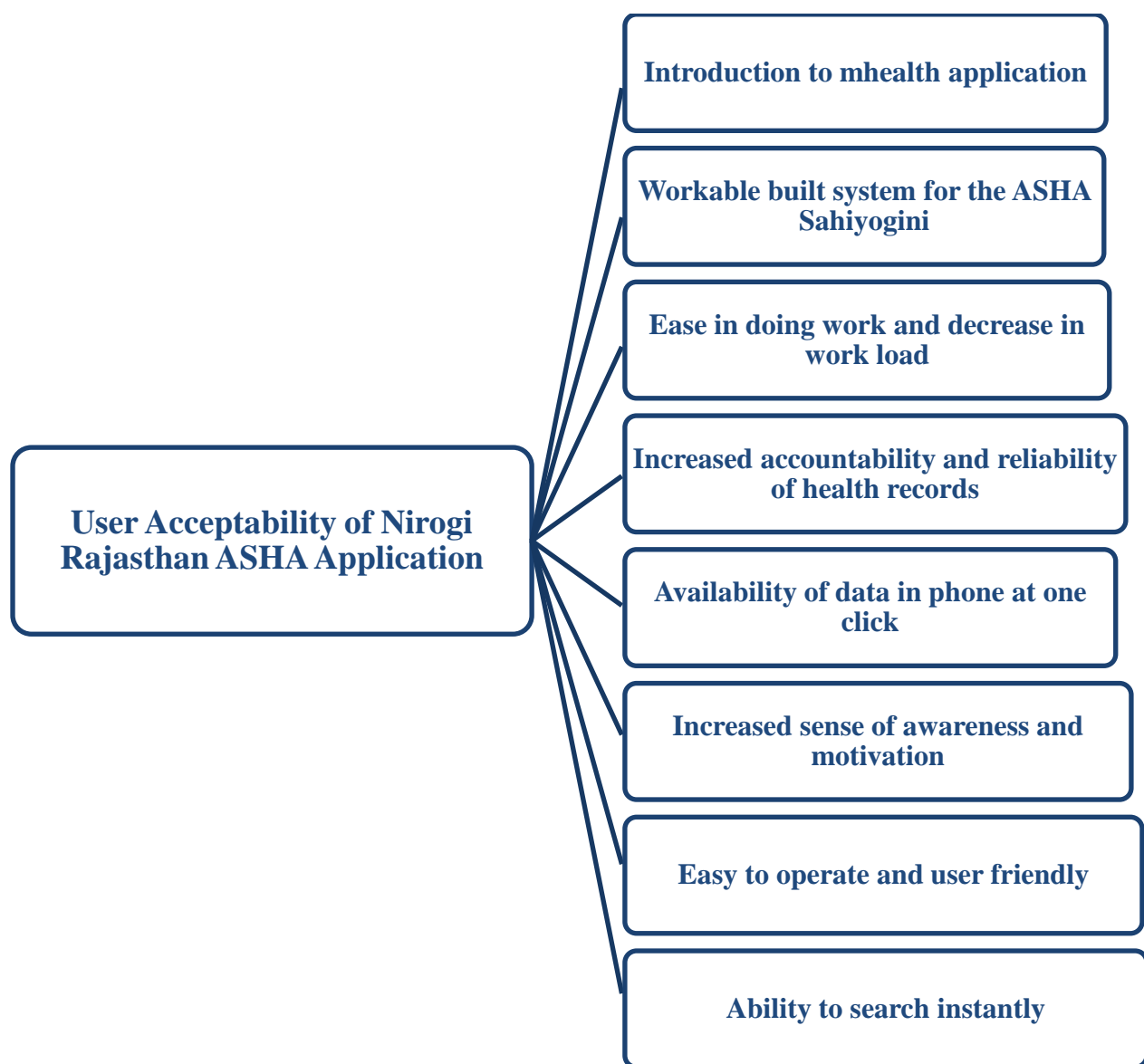
S.No.	Age	Number of Participants
1.	18-30	11
2.	31-50	23
3.	51+	2
	Education	
1.	Primary	4
2.	Secondary	18
3.	Higher Secondary	7
4.	Graduation+	7

### SECTION B

In total 57 codes were identified and a total of 23 sub-themes emerged from these codes. These sub-themes lead to the development of 3 main themes which were: 1. User Acceptability of Nirogi Rajasthan ASHA Application 2. Enhancing ASHAs work efficiency 3. Barriers in uptake of Nirogi Rajasthan ASHA Application.

## **1. User Acceptability of Nirogi Rajasthan ASHA Application**

User acceptability can be seen from an individual perspective but it can also reflect a more collective, shared assessment of the nature of an intervention. From the ASHAs perspective, the content; context and benefits achieved can have an impact on acceptance. We defined user acceptability here as *perception of ASHAs regarding this application*. How they are able to integrate themselves with the application, their level of adoption to this new technology and what they really think about this application. Participants shared experiences about the training, how much they have understood about working of application and what are their perception regarding the application. In nutshell they are getting familiar with the application, trying to adopt it in their routine work and feeling very much motivated and positive about the Nirogi Rajasthan ASHA Application.



**Fig 1: Summary of findings related to theme- User Acceptability of Nirogi Rajasthan ASHA Application**

### ***1. Introduction to mhealth application-***

Most of the participants reported that this is the first time that they got to know about using an mobile phone for doing all the work. ASHAs said that the instructors downloaded an application on their mobile phones to teach them how to do the survey, how to feed information regarding the head of the family and information of other members on the phone and how to scan Aadhar card for the family's identification and feeding their all details automatically in the phone. ASHAs reported that the trainers also talked about cell phones, surveys, diseases and also explained in detail what are the benefits of this mobile app to Asha. In general, ASHAs were satisfied using this mhealth application. The ASHA application was acceptable to users given that it introduced new tools to assist them in performing their assigned tasks.

One of the ASHAs shared her experience of that time in words like,

***“The training was very great. I get to learn how to do survey on a mobile phone and how we easily gather so much information from aadhar card for the identification of the house and family. It will be easier to work and I’ll get to learn some new things out of it”.***

### ***2. Workable built system for the ASHA Sahiyogini -***

Participants generally reported that the ASHA application will be easily integrated into their workflow and data compilation process. They were easily able to do household surveys within 15-20 minutes and incorporate registration of eligible couples. Many of them reported that they will automatically get the lists of ANC, PNC and immunization cases. It will be very easy for them to do the whole work. Based on the ease of integration, users were able to envision the ASHA application becoming a permanent part of their work.

One of the participants said,

***“I have gained knowledge on the mobile and it makes me able to do quality work and this increased my participation in different meetings. We can easily feed the data face to face which is right and meet our goals at time”.***

### ***3. Ease in doing work and decrease in work load-***

All the participants reported that after using the ASHA application, their work would become much easier. The mobile forms were perceived as straightforward and easily navigable. Earlier all the work had to be done in registers and many forms had to be filled up about the survey, ANC, PNC, HBNC, which were time taking. By enabling ASHAs to avoid redundant paper registers, the ASHA app saved time and allowed for more household surveys per day and week. Using it will make the work a lot easier than before and all the work will be done eagerly. We are very happy that our work will be done in a very simple and effective way.

ASHA aged 53 year old working said,

***“Yes I think so. I don’t need to carry pen, register and copies anymore. Mobile is going to make my life easy. I can give you any information through cell phone at one click. There is no need of maintaining diaries and files and my work will become easier”.***

Other participants said,

***“There are many benefits like we can store large data once and for all”.***

***“It has many benefits like it will help in saving time and sharing data”.***

### ***4. Increased accountability and reliability of health records-***

ASHAs reported that this application is an attractive option for collecting quality data for large number of people. They told that there were many ASHAs who forged data. They entered the data into the registers without meeting the beneficiaries. But now this practice will be controlled. Data can now be collected in real-time and is accessible across all levels of the health system through different reports and dashboards. It also provides a sense of reliability of the data collected.

Along with this, ASHAs are paid the exact amount the work which they are doing; therefore issues of false payments will also be resolved. This led to interest and accountability in the ASHA application, evidenced by continued discussion and engagement at various meetings throughout the project. Interviews with some highly qualified ASHAs from Jodhpur also suggest that this aided decision making and has helped create stronger links with policy makers for action.

One of the participants from Jodhpur block said,

***“ASHA app is going to ease my work and there will be no forgery fillings after using this app. It helps to hold all information, to disseminate the necessary information from top to bottom and vice versa, it also helps for decision making purposes by relying on the data”.***

#### **5. Availability of data in mobile phone at one click-**

Most of the ASHAs reported that after using this application, their work will be very easier. All the information is available in phone. They don't need to maintain many registers and ASHA diaries. Previously if they forgot to bring any register at the facility, they face many problems and get scolded but now all the information will be available in a concise format in the mobile phone. Even there are not any issues of data lost or duplication.

**Home screen of ASHA application showing different modules**



**Envisage to shift all work of ASHA to the digital mode**

ASHAs sharing their experiences by saying that,

***“It helps us to provide all important information to the public and supervisors what work is being done in the area. Sometimes we forget the register or misplace the data this app will overcome all the issues”.***

***“I can give you any information through cellphone. There is no need of maintaining diaries and files. It will ease the process of registration as well as payment related issue”.***

#### ***6. Increased sense of awareness and motivation-***

The ASHA application was acceptable to users given that it introduced new tools to assist health workers in performing their assigned tasks. In general, ASHAs were satisfied with the fact that government is thinking so much about them and they are an integral part of the system. Equipping them with the smartphones is really a remarkable thought. They were given training and informed how the mhealth have changed the traditional way of doing work. So, they were aware about new things and feel more motivated to do their work.

Some of the participants said like this,

***“Yes training was very good, I am feeling more motivated than before. The phone is good to work. For example, I may miss the appointment date of pregnant woman when I have work burden... but now I automatically get the due list of ANCs”.***

#### ***7. Easy to operate and user friendly-***

The majority of ASHAs reported that they found the application very easy and beneficial. It is "friendly" to the user, meaning it is not difficult to learn or understand. Asha told us that they didn't face any difficulty in understanding and using this application.

Mostly, Asha said that all the things were explained to us well during training and anyway, all this work is what we have been doing for years, the only difference is that now we will do all the work in the mobile phone instead of using so many registers which is very simple and convenient. Overall, there is no problem in running and using the mobile application. According to them, this is a very good and beneficial decision taken by the government.

Some of them shared their experience by saying that,

***“Yes I completely understand the app; I have not faced any kind of problem while using this app”.***

#### ***8. Ability to search instantly-***

Most of the ASHAs told at the time of the interviews that with the help of this application, they will get a lot of help in finding any information. Earlier, a lot of registers had to be handled and it took a lot of time to find every little information, but in ASHA application most of the things will be automatically filled like details of person from scanning aadhar card, LMP and EDD date of women's and it is easily found if we want to provide any information. We will be able to give quick update, with the help of the phone and our work will be very easy.

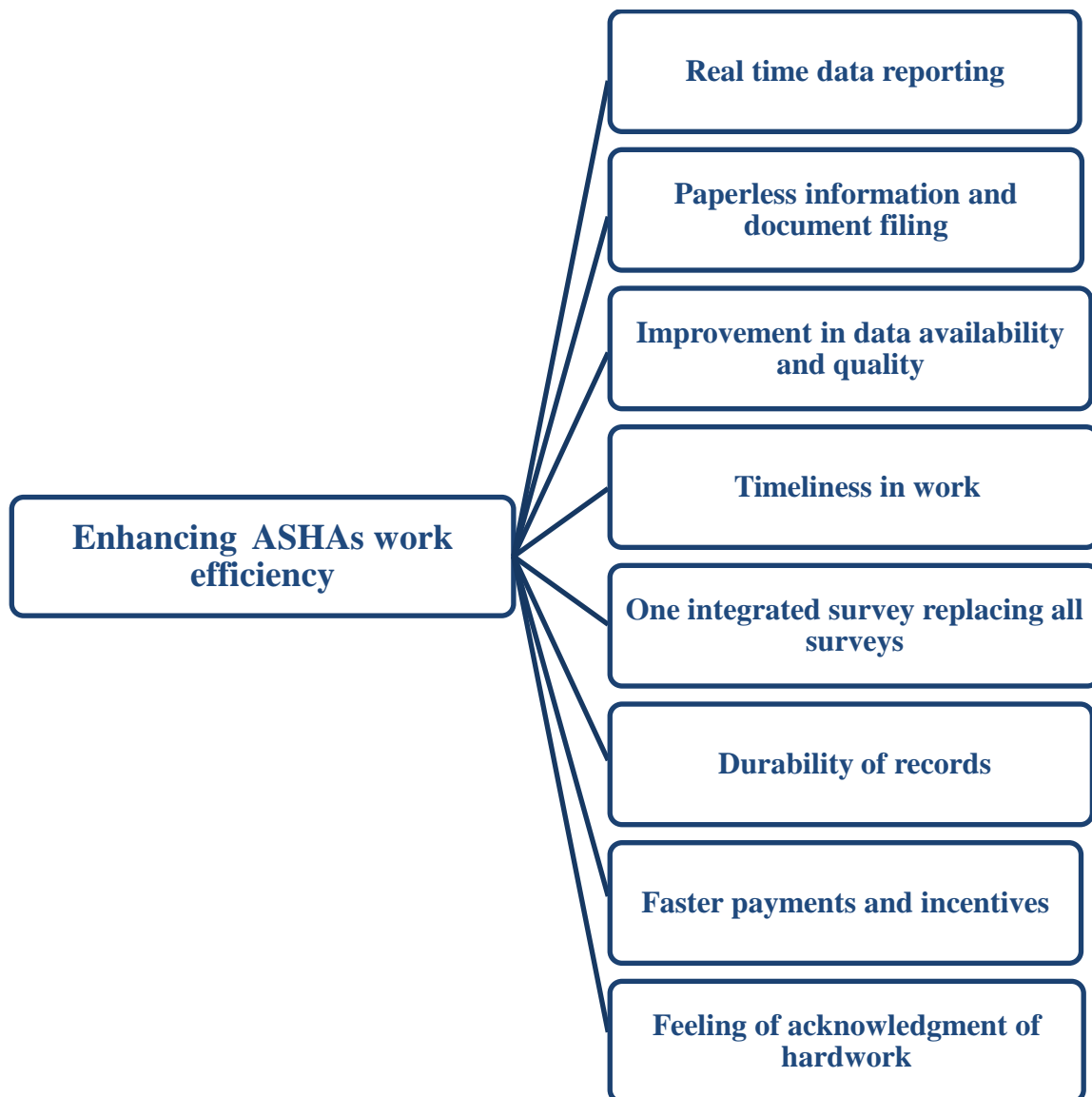
Some of the ASHAs expressed their thoughts by saying that,

***“In the register, on different pages you will find different households, so it takes time to look through it. There is no easy way to search it. Sometimes it's an ANC or High risk or Child Immunization. In the phone, everything is made faster. And if somebody asks, we can use this phone to refer and update the data. We can open the application and see who we need to follow-up”.***

***“In the App, when we enter the Last Menstrual Period (LMP), the Expected Date of Delivery (EDD) automatically appears and we don't have to write it again. The antenatal care checkup information also comes up automatically, along with the patient name and their previous record. So we don't need to pick up the register. This application really easy our work and we can search any information through it”.***

## **2. Enhancing ASHAs work efficiency**

From the interviews, it clearly emerged that ASHA application is going to help ASHAs by enhancing accuracy of recording and reporting their work. Empowering them digitally help increasing their financial status and influencing the way in which they work. Working with a mobile phone has provided access to opportunities that would otherwise be absent from their lives, it saves time and they will be able to do their work effectively and efficiently.



**Fig 2: Summary of findings related to theme- Enhancing ASHAs work efficiency**

### ***1. Real time data reporting-***

Most of the ASHAs reported that they were very happy with the use of this application. It help ASHAs to carry out functions such as household surveys, registration of eligible couples and reporting in an informed manner. It also enables real-time access to information about the health of women and children in high malnutrition burden areas. Replacement of myriad, voluminous registers with smart, hand-held devices is welcome. It makes workers lives easier and everybody knows they urgently need that help. It improves the quality of data they produce. Some of them mentioned that this ASHA application is a useful job aid for each of the workers that help them perform their tasks more effectively.

Many of them said,

***“We can easily feed the data face to face which is right. It avoids delaying of the reports and losing the data”.***

***“Yes, it will really help in my monthly reporting and data can be easily stored in my device only”.***

### ***2. Paperless information and document filing-***

ASHAs reported that paper registers were difficult to maintain and are not easily searchable. Information related to same person will be recorded in different registers and if someone asks for particular information then finding records can be time-consuming, difficult and often produce no results. The registers used by ASHAs to record the details of eligible couples and pregnancy details of mother have various fields, making it difficult to find entries. But when ASHA application is routinely integrated in our daily work it will be very useful for us to record and report all the information. Some of them even said that the application is very vast and time-consuming but as compared to registers it will save time. Everything will be recorded in the phone and this application will be a very good effort to digitize the traditional paper-work system for the ASHA workers and to store all mother and the child data on a central server. It will also help midwives (ANM) and health professionals, including doctors, to have easy access to data.



One of the ASHAs said,

***“Sir I will tell you what happens for the same mother we have to fill so many forms of ANC and PNC. Also, there are many mothers with the same names. It becomes very hard for me to find the correct names from these registers. But in this application automatically we get the due list plus work will be very easy”.***

Source: Vaccine Delivery Innovation Initiative,  
2009-10 Bill & Melinda Gates Foundation

### ***3. Improvement in data availability and quality-***

Most of the participants reported that paper medium of registers makes it easier to fudge data entries. It was observed that some ASHAs make false entries in the beneficiary list in order to get more incentives. This has resulted in many mistakes in data entry. Other limitations of the medium, such as wearing out of registers and ASHA diary before two years or smudged data entries due to dampening of ink, also prevent effective record keeping. Paper-based systems are inconvenient to transport. Because they were required to record information in so many different places, ASHAs were left with the difficulty of lugging multiple registers and forms with them. This presents transportation challenges. They said Nirogi Rajasthan ASHA application will be a solution to all these problems. They were easily managed to feed all data in the application without any problem and all the data will be available at any point of time. This application will be very helpful in capturing real data, improving availability of data collection and the data which we get is of utmost quality without any fudge results. All these factors contribute to the working efficiency of ASHA workers.

Some of them shared their experience by saying that,

***“It will save paper, and we don’t have to carry much load with us while doing survey. Data will be saved for longer time. Data regarding immunization will be stored safely”.***

***“It avoids delaying of the reports and losing the data”.***

#### **4. Timeliness in work-**

Most of the ASHAs said this application will provide a major benefit in saving time. Data is easily and eagerly entered into the mobile phone as compared to registers. Paper-based systems make duplication difficult. During the time of surveys and registration of pregnant women and home visits, ASHAs have to maintain multiple records (e.g. MCH register, beneficiary list, tally sheet, due list) with many overlapping fields. This prevented effective record keeping as many errors were found in the records completed by them. They said when they work with the application these inconsistencies will be decreased and a lot of time will be saved.



One of the participants said,

***"It has many benefits like it will help in saving time and sharing data. I have to make so many records. It takes up most of my time. I do not have ten hands, only two."***

Source: Vaccine Delivery Innovation Initiative, 2009-10 Bill & Melinda Gates Foundation

### **5. One integrated survey replacing all surveys-**

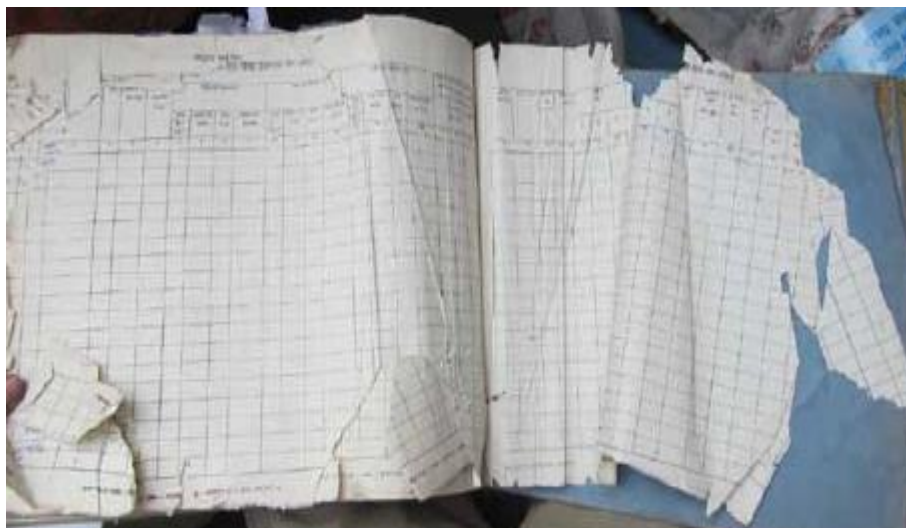
ASHAs reported that previously they have to do many surveys in one year related to TB, Leprosy, NCDs, and Mental Health and related to different national health programmes running in the state. But ASHA application integrated all the surveys together so we need to do household survey only for one time and automatically we get the list of patients suffering from different diseases, RCH due list, automated list of NCD cases and high risk mothers and children's. It will be a very useful application to work with and a single platform to capture overall health status of the individual.

Some of them shared their experience of training by saying that,

***“Sir, we were told in training that with this mobile app, different types of surveys will be done altogether and we will not have to go to the village again. It is good to hear that we will not have to go that far, repeatedly and automatically due list, list of diseases will be ready”.***

### **6. Durability of records-**

During the time of interviews, it was found that paper records were easily lost, worn out or difficult to maintain for longer period of time. Most of the forms or registers were either damaged (soiled by mustard oil, eaten by rats or destroyed by children) or misplaced due to burden of work. ASHAs said that if anyone asks us for a particular record, then we have to look in the register. Now the register may be torn but with this app we can retrieve any record at any time. We can take this phone and we no longer have to carry the register with us. We are not afraid of data getting lost or of the paper register getting torn; we can use the app to look at the data whenever we need. Data will be stored once and for all.



***Torn RCH register of ASHA***

Source: Vaccine Delivery  
Innovation Initiative, 2009-  
10 Bill & Melinda Gates  
Foundation



*Different forms and cards found in soiled and tattered conditions*

Source: Vaccine Delivery Innovation Initiative, 2009-10 Bill & Melinda Gates Foundation

### ***7. Faster payments and incentives-***

Incentives are closely related to time. ASHAs are not given incentives to produce any sort of updated records of household pregnancies and births in their coverage zones. This is one of the most important concerns derived from the interviews that ASHAs are not paid exact payments for the work which they have done. Most of the ASHAs told us that they face many issues and challenges when it comes to the salary and payments. They have to make photocopies of all the ANC, PNCs and home visits which will cost a huge amount of money and the data entry operator missed many of the work while uploading their monthly reporting which they have done during the month that results in under-payment. Financially, ASHAs are not very strong still they do their best to serve the community but the end result is that they were struggled. They are, however, provided incentives to encourage institutional births, and to mobilize children to attend MCHN sessions. Not surprisingly, these latter efforts are the focus of ASHAs' attention. Most of the ASHAs reported that they were happy to know that they need not to fill claim form and it get automatically generated in the application. They were paid the exact amount of money and incentives which they do and it motivates them and helps increases their work efficiency.

Some of ASHAs shared their feelings by saying,

*“Yes, definitely it will make my work easy. Apart from this, it will be cost effective as the money to spend for coping will be saved”.*

*“Claim form will not be used and we easily get all our payments at the end of month”.*



*“Paperwork is part of an ASHA worker's tasks, and they even bear the costs of the stationery and photocopying, says one of ASHA of Khandela block in Sikar district”.*

Source :

<https://ruralindiaonline.org/articles/caring-for-villages-in-sickness-and-in-health/>

### ***8. Feeling of acknowledgment of hard work-***

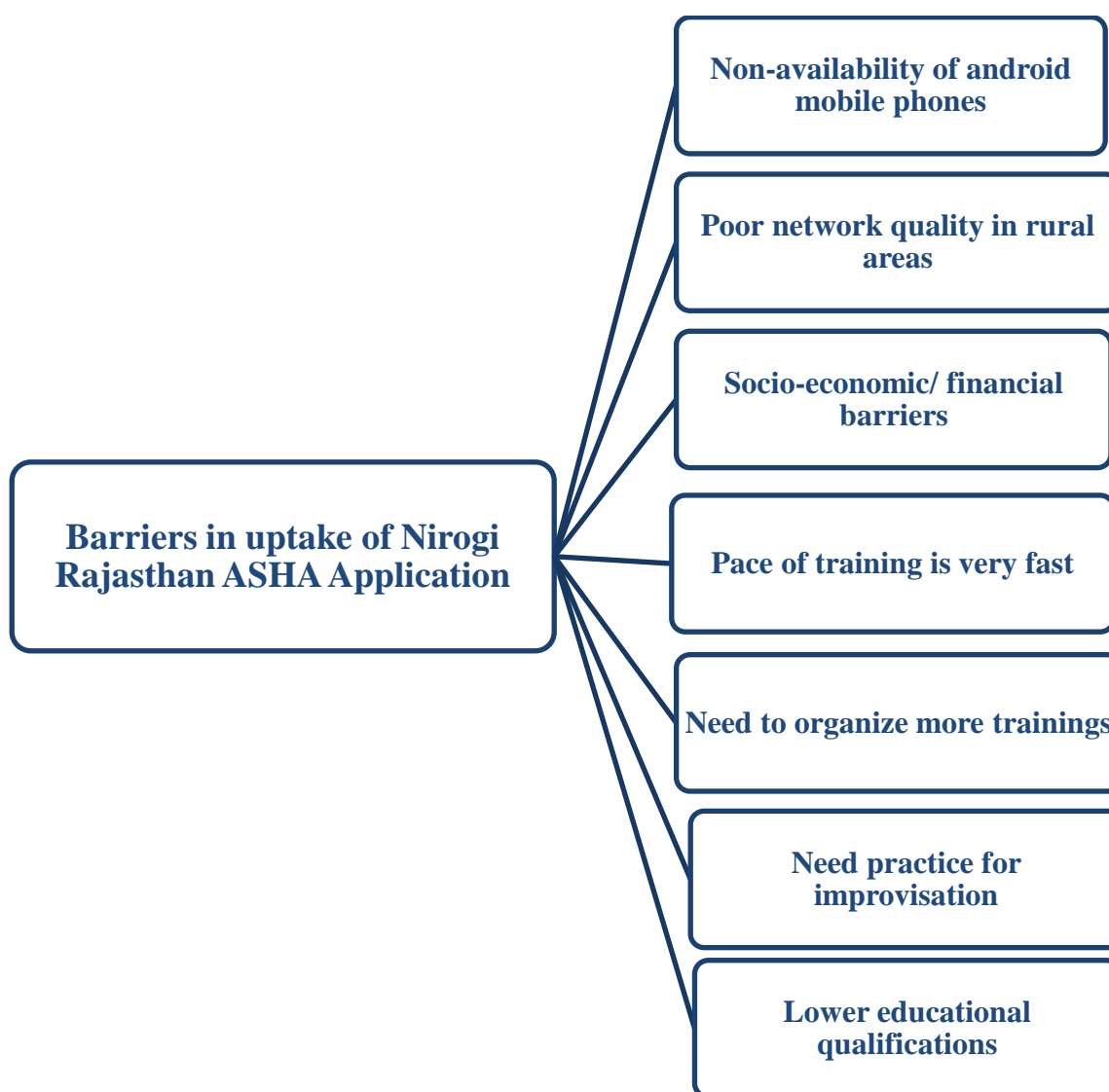
There were many participants who said that recognition and respect are very important for ASHA Sahiyogini for the work which they have done. ASHAs are the primary source of delivering services between health system and the community. For ASHAs, the progressive gains in credibility among the community appear to have generated an internalized perception of social recognition. This may have increased their legitimacy as service providers and their social standing in the community; this may further reinforce their emergent identity as healthcare workers. But what happened most of the time is they were not praised or acknowledged for the work which they have done and it losses their hope and determination but when they use mobile phones and able to do more better and efficient work they will be recognized and valued more in the community. So, ASHA application will help them in praising their work and increasing their social status in the community. Most respondents stated that people in the community look up to, and respect them, 'The fact (that) the village is happy and I am respected makes me very happy. The money is not a major issue. Whether it will be higher or lower, I am respected in society (and it) helps me feel good about myself. That is why I am still working for ASHA'.



***The paperwork is interminable and copious: these are notebooks, registers and various survey forms meticulously maintained by ASHAs***

### **3. Barriers in uptake of Nirogi Rajasthan ASHA Application**

This study helps us understand that there are several technical and socio-cultural factors that hinder ASHAs for understand and use this application effectively. Many participants expressed difficulty over not having a smartphone. They told us that many of them didn't have mobile phones at the time of training, so they found it difficult to understand. Other participants shared experiences of financial problems and low educational qualifications that impeded the user's understanding of the application. The participants felt that there were some other problems related to the training such as the pace of training was a little faster, the availability of time is very low and they do not get enough time to get full understanding on the application.



**Fig 3: Summary of findings related to theme- Barriers in uptake of Nirogi Rajasthan ASHA Application**

### ***1. Non-availability of android mobile phones –***

During the interviews most of the ASHAs said that they do not have smartphones. Many ASHAs from the bawri and khandela block did not have smartphones; they use simple mobile phones or keypads even if some of them have android phones in their family they didn't bring at the time of training. They told us that they understood the application a little bit while looking at the other Asha Sahyogini's mobile during the training. They have some theoretical knowledge about the application but not practically. Some said that what would be understood without a mobile phone, a little has been learned from above, about this mobile survey but when we use it, we will be able to give a detailed information and pros and cons of this application. So, non-availability of mobile phones was a major issue in understanding and using ASHA application.

Participants share their experience by saying that,

***“No, I didn’t understand anything as I don’t have smart phone”.***

***“I just want that we all should get this training again as we all don’t have these smart phones so it was little difficult to understand fully at that time”.***



**Mobile phones found within ASHA workers**

## **2. Poor network quality in rural areas -**

Some of the ASHAs said that there are huge connectivity and network issues in villages and desert areas that will create problem for them to work with the application. If we are doing household survey in a day and not able to sync and upload the data then it will create problem for them and for the respective people not to get data on time; this will result in delaying of reports. Apart from this some of the participants said that if we are not able to update the daily report on time then it will cut their payment and creates issues between supervisor and them. Therefore, some alternative could be thought if data get delayed due to any reason, it will not affect the job of ASHAs. So, poor network quality is regarded as one of the main extrinsic factor hampered the usage of ASHA application by ASHAs.

Some of the ASHAs said,

***“Yes, I am facing some issues as it stops working if we forget to fill any block and redirects us to the home page”.***

***“No, everything is fine but I want that there should some recharge system for this app as there is always network problem in our village”.***

**Picture showing lower internet connectivity in rural area**



### **3. Socio-economic/ financial barriers -**

The socio-economic background of the most of the participants was not uniform. Some participant faced financial distress to greater extent while some faced it to a little extent. Some participant's family financial condition was already very unstable so how to afford a new smartphone was a big question to them. Most of the ASHAs said that they have poor financial status, so they cannot afford a new smartphone and if there is any smartphone available in the family they are not allowed to use that as there husband and sons take away the mobile phones. Some also reported that government promises to provide some sort of help in buying smartphones initially but then no action or update is provided. Supervisor told us to bring our own mobile phones to work. So, it is a big problem for us to bring a mobile phone and that will create a major problem in understanding the application.

Some of the ASHAs said,

***“Right now I am using a simple small phone. I am thinking of purchasing a smart phone but due to COVID unable to do so”.***

***“It's a good app overall but we should also get smart phones as we all can't afford these phones”.***



**Picture showing poor condition of ASHA**

#### ***4. Pace of training is very fast -***

Some ASHAs said that the training was given very quickly, making it difficult for them to understand. The participants said that they were first given introduction, and then told about the Nirogi Rajasthan platform, and then they started a demo of ASHA application. The trainers and others were good, but due to lack of time, they were giving training quickly, the training was from about 10 am to 5 pm, but things were being told very quickly such as doing household surveys to registration of eligible couples and then switching to the tab of due list. Some of them reported that number of participants in the training program was large and they could not understand the things properly. Trainings should have been conducted in a better way because it is a new thing for them and they were not even capable of running the smartphones efficiently.



***Picture from the training of ASHA application at Bawri block, Jodhpur district***

### ***5. Need to organize more trainings -***

Some of the ASHAs said that they had received training in the initial phase and no refresher trainings were provided. A few said that trainings they received were effective, but revision trainings are required. Furthermore, a few said that trainings are necessary as they have poor orientation to certain functions and tabs understanding given in the application. According to the study participants, supervisors instruct them, but regularization of meetings with supervisors was lacking, so they sometimes are not able to clarify their doubts which affects their performance. ASHAs want that there should be more training sessions with expert supervision that will address all their issues; take follow-up of previous training so that they get an in-depth knowledge and become pro in using and handling ASHA application.

Some of the participants said,

***“Yes, but trainers and time should be increased so that we can easily learn more”.***

***“I don’t remember as I haven’t used the app from so long, I need more training sessions on this application”.***

### ***6. Need practice for improvisation -***

Some of the participants who are using ASHA application after training or those who want to practice on it said that we need some time to practice on the application to get better understanding. This was the first time when ASHA workers were given training over the mhealth application and most of them are those who don't even know how to use the smartphones so they said that they need to do a lot of practice daily to get expert in using this application and adopting it in their daily routine work. Some even said that they have taken the help of their colleagues and downloaded an application in one of their family members phone and they used to teach them how to use the application. They said that effective practice will help them in doing their work better and they are more easily able to understand the functioning of the system.

Few ASHA share their experience by saying that,

***“I guess this app will take a lot more time. This app requires much extra information. When I will do then only I will be able to tell you what are the pros and cons of this app”.***



Source: <https://www.intrahealth.org/msakhi-award-winning-mobile-phone-app-frontline-health-care>

***One of the participants is practising on the application at her home to get better understanding. She said that for the practice she have done her own house survey and some of her neighbour's household survey and by doing practice she will become expert.***

### ***7. Lower educational qualifications -***

It is interpreted from the interviews that out of total 36 participants 4 of the respondents have an educational qualification of primary class i.e. up to 8<sup>th</sup> class, 18 of the respondents have studied up to class 10<sup>th</sup> i.e. secondary while 7 have plus two qualifications, rest 7 of the respondents are graduated. Average qualifications of ASHAs are up-to 8<sup>th</sup> and 10<sup>th</sup> Class and therefore some of them reported that they faced difficulty in understanding the application. Though the application is a replica of their register work; they understand it completely but the issue is running and handling the smartphones.

Some of the old ASHAs aged 53 years said that she even doesn't know to write in English name and some said that they never used an android phone in their life; limits due to their lower educational qualifications and poor understanding and catching power. So' they faced a huge difficulty in using and accepting this mhealth application.

Some of ASHAs expressed their feelings by saying that,

***“Yes, I face many problems as I'm not that much educated”.***

***“Yes, I did but was not able to operate it fully so I took some help from my supervisor”.***



Source: Vaccine Delivery Innovation Initiative, 2009-10 Bill & Melinda Gates Foundation

**ASHA Sahiyogini tried to understand what is written on the wall and copied it on her notebook**

## **CHAPTER 5: DISCUSSION**

# Summary of Findings of the Study

## Lived experiences of ASHAs using Nirogi Rajasthan ASHA Application

### User Acceptability of Nirogi Rajasthan ASHA

Introduction to mhealth application

Workable built system for the ASHA Sahiyogini

Ease in doing work and decrease in workload

Increased accountability and reliability of health records

Availability of all data in phone at one click

Increased sense of awareness and motivation

Easy to operate and user friendly

Ability to search instantly

### Enhancing ASHAs work efficiency

Real time data reporting

Paperless information and document filing

Improvement in data availability and quality

Timeliness in work

One integrated survey replacing all surveys

Durability of records

Faster payments and incentives

Feeling of acknowledgment of hardwork

### Barriers in uptake of Nirogi Rajasthan ASHA Application

Non-availability of android mobile

Poor network quality in rural areas

Socio-economic/ financial barriers

Pace of training is very fast

Need to organize more trainings

Need practice for improvisation

Lower educational qualifications

## **Discussion**

The results of this study indicate that integrating mHealth solutions with strong engagement and support strategies can improve the quality and timeliness of ASHA data collection in Rajasthan. The decision to provide adequate and controlled training in a particular field of research allows applications to examine various forms of reporting that can be improved through increased data collection, management and use. The level of adoption and acceptability of this application to the end users was encouraging. Different benefits and strengths of using this application and most importantly difficulties faced by ASHA workers while using and handling this application were expressed. All these ground realities and valuable feedback from the study help us to contribute in knowing what are the things need to improve in this application.

The ASHA Nirogi Rajasthan application has improved the completeness and quality of data in the intervention area. ASHA uses the system to feel a greater sense of opportunity and power to better serve the community, as well as additional responsibilities to manage their time, workload and smartphone. The results also highlight the need to continue to consider the ethical dimensions of smartphone adoption, understand the socio-cultural, gender, and financial implications of their use, and reconcile active ASHA tracking with reputable tools for overcoming non-compliance reasons for understanding. ASHAs who used the ASHA application were very positive about the impact of mHealth on their work, the skills they develop, their relationship with the community, and their ability to do their work effectively and efficiently.

## **What is already known about this topic**

mhealth intervention have introduced new approaches to data collection, data flow and data sharing at various levels of the health system. This inevitably poses some teething challenges and requires support and follow-up.

Existing literature shows that technology is embedded within existing social, cultural, economic and political structures. mHealth intervention requires changes in the behaviour of ground-level workers in terms of usability, acceptability and feasibility. These changes are driven by social, cultural and economic factors and therefore require careful sensitization and customization to have the intended positive impacts.

### **What this study adds to**

mHealth is arguably an essential approach to supporting and empowering ASHA to better provide integrated services and feed information and priorities from communities into decision making processes. However, the experiences of the ASHAs and the technology influences on their workload and experiences have been less well examined. Our findings highlight that ***“ASHAs have the technical capacity to use electronic data capturing mechanisms to improve community follow-up, but that consideration should be given to addressing the ethics and equity of mHealth interventions to better support them”***.

Firstly, efforts are required to make sure mHealth reduces instead of increase workload of ASHAs. In this case the mHealth process focused on two priority health areas:

- ***All the registers maintained by ASHAs for recording and reporting data have been replaced with an android-based application.***
- ***In future further steps to expand this application across the whole package of work done by ASHA for different health programmes :***
  - ❖ Pregnant women under RCH Programme
  - ❖ Child Immunisation under RCH Programme
  - ❖ Postnatal Care & Child Health under RCH Programme
  - ❖ Peoples under NCDs Programme
  - ❖ EC Tracking under Family Planning Programme
  - ❖ High Risk Beneficiaries under RCH & NCDs
  - ❖ Blood Slides Collection for Malaria Identification under National Programme
  - ❖ Malaria Treatment under National Programme
  - ❖ Surgery of Cataract under National Programme
  - ❖ Leprosy Patients under National Programme
  - ❖ TB Patients under National Programme
  - ❖ Mental Health under National Programme
  - ❖

Another challenge in the project related to non-availability of smartphones .Many of the ASHAs who have come for attending the training sessions doesn't have smartphones and some of them were stated that they have very low financial status so they cannot afford smartphones. Again, where possible, make sure that all ASHAs are appropriately equipped, so they have an opportunity to practice their training and build their skills, would ensure the benefits are appropriately shared.

Clear follow-up after training sessions to make ensure they were able to understand all things clearly and if there were any issues in handling and using the application, those were also sort out and examined.

### **Limitations of this study**

This report summarizes results from a qualitative methodology. It collects data and perspectives in real time, which limits the ability to adopt a long-term perspective. We still don't know how, or whether the mHealth process will be sustained over time or what its impact have on responsive planning and governance. Ensuring ongoing process evaluation using qualitative perspectives of the ASHAs will continue to be important to ensure equity and ethics are meaningfully considered and addressed.

The sampling bias was also there because of the purposive sampling method. The limited access to the respondents because of the COVID-19 situation across the country. This arises because respondents were busy with the COVID work and wasn't able to give more detailed interviews. This can be avoided in future by conducting the study at different time approaching in-depth interview or focused group approach.

## **CHAPTER 6: CONCLUSION**

## **CONCLUSION**

The result of present study helped to understand the lived experience of the ASHAs using Nirogi Rajasthan ASHA application. The experiences were associated with strengths and the difficulties of using ASHA application.

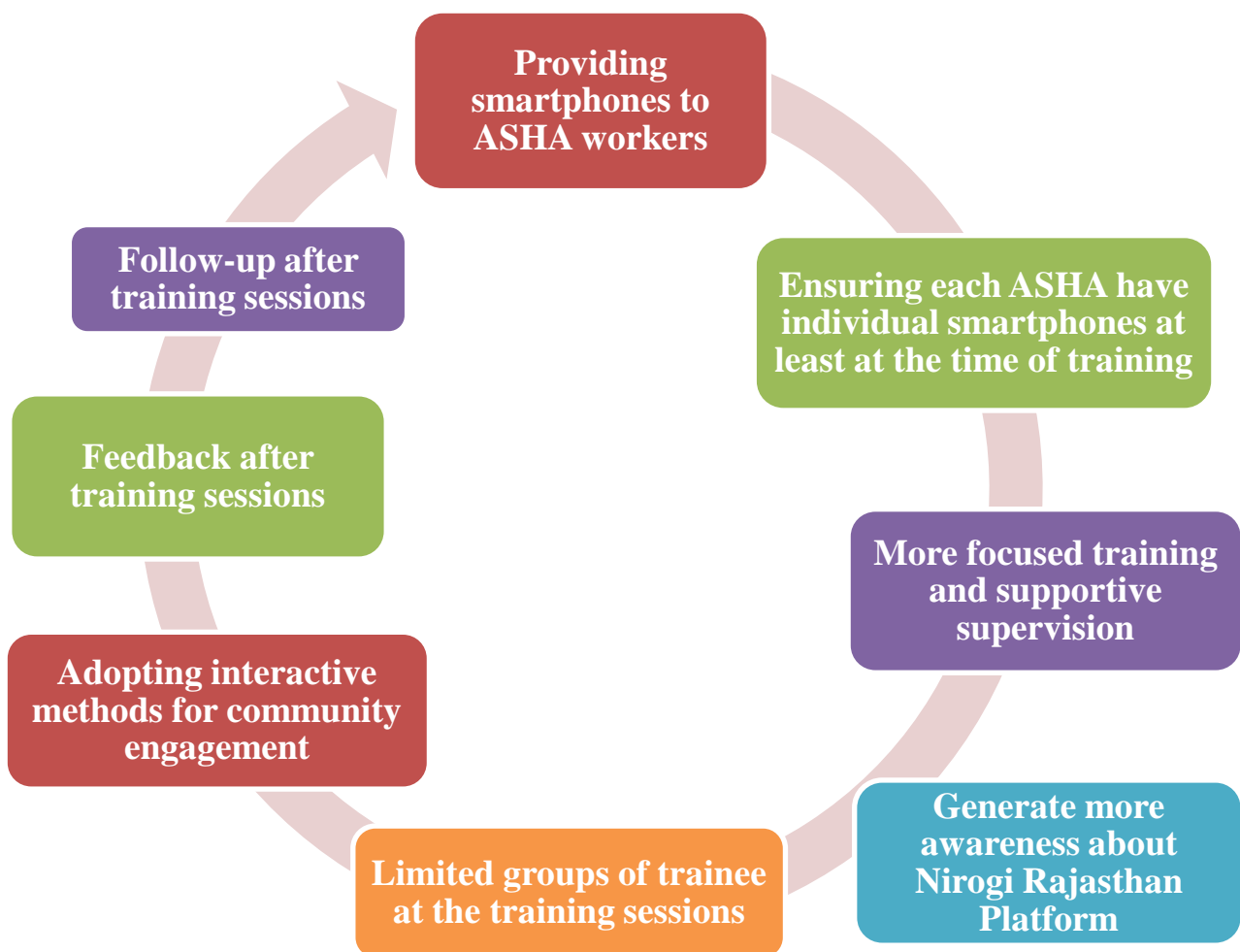
The ASHA mobile application has improved the quality and timeliness of data flow and the responsiveness and impact of the health system. ASHAs in Rajasthan play an important role in the relationship between the health system and rural communities. Through the provision of responsive smartphones and mHealth platforms, as well as targeted training and supportive monitoring, this cadre of ground level workers can use new technology and develop skills that have a positive impact on health care in their communities. ASHA is faced with a heavy workload, as is the case with many community-based providers, and we must do our best to ensure that this new technology engages them and interacts with community members rather than bearing new burdens. Mobile phones promise to address health inequalities in rural areas by closing the gap between access to public health information and service delivery.

The ASHA mobile application is a promising tool to help ASHAs in collecting and tracking data across all health settings. The results of this evaluation can be used as a guide for future mHealth innovation research to overcome infrastructure, human resources and technology challenges before and during the program. Qualitative assessments of end user perceptions should always remain a priority in efforts to optimize the use of mobile data applications to eliminate barriers to maternal, neonatal, and child care in Rajasthan and surrounding areas.

## **CHAPTER 7: RECCOMENDATIONS**

## RECOMMENDATIONS

- The Government of Rajasthan provide some guidelines to make ensure that all ASHAs are equipped with smartphones, so they have an opportunity to practice their training and deploy their skills.
- More focused training and supportive supervision
- Limited groups of trainee at the training sessions
- Follow-up after training sessions
- We must do our best to ensure that this new technology supports them in their workload and interactions with community members rather than bring new burdens



**Summary of recommendations**

## **CHAPTER 8: REFERENCES**

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# **ANNEXURES**

## **ANNEXURES**

### **INTERVIEW GUIDE :**

<b>INTRODUCTION</b>		
<b>Introductory message</b>	<a href="https://docs.google.com/document/d/1i6HlHjcp_Cf5NUQWAPg1zSb-vgA17fsBstGra9L_2OE/edit?usp=sharing">https://docs.google.com/document/d/1i6HlHjcp_Cf5NUQWAPg1zSb-vgA17fsBstGra9L_2OE/edit?usp=sharing</a>	
<b>Consent Letter (in Hindi language)</b>	<a href="https://docs.google.com/document/d/1MNWae3hdyfiQzBjeuR9r9P1Cxj8CcZYzurTTs3uyUuY/edit?usp=sharing">https://docs.google.com/document/d/1MNWae3hdyfiQzBjeuR9r9P1Cxj8CcZYzurTTs3uyUuY/edit?usp=sharing</a>	
If you agree to participate in the study, please let us know by saying YES	अगर आप अध्ययन में भाग लेने के लिए सहमत हैं, तो "हां" कहकर बता दें।	
<b>GENERAL DETAILS</b>		
<b>Place - (District/block/Sector/Sub Center Name)</b>		
<b>S.No.</b>	<b>Questions</b>	<b>Response</b>
1.	What is your name? आपका नाम क्या है ?	
2.	What is your age? आपकी उम्र क्या है ?	
3.	What is your village name ? आपके गाँव का पूरा नाम क्या है ?	
4.	Education Status आपकी उच्चतम शिक्षा का स्तर ?	
<b>TRAINING RELATED</b>		

1.	Have you received any training related to ASHA mobile application used for digital health survey ?  क्या आपने डिजिटल स्वास्थ्य सर्वेक्षण के लिए उपयोग किए जाने वाले आशा मोबाइल एप्लिकेशन से संबंधित कोई प्रशिक्षण प्राप्त किया है?	
2.	Please share your experience of this training. (How did you like training overall?)  कृपया इस प्रशिक्षण के अपने अनुभव को साझा करें। (आपको कुल मिलाकर प्रशिक्षण कैसा लगा?)	
3.	How did you get help in understanding the ASHA mobile application used for digital health survey in this training?  इस प्रशिक्षण में डिजिटल स्वास्थ्य सर्वेक्षण के लिए उपयोग किए जाने वाले आशा मोबाइल एप्लिकेशन को समझने में आपको कैसे मदद मिली?	
4.	What do you think will be the benefits of this digital platform?  आपके अनुसार इस डिजिटल प्लेटफॉर्म से क्या क्या फायदे होंगे ?	
5.	What was the best / interesting thing about this application and why?  आपको इस एप्लीकेशन की सबसे अच्छी/दिलचस्प बात कौन सी लगी और क्यों ?	

### WORK RELATED

1.	Do you have a phone?  क्या आपके पास फोन है?	
	What type of phone do you use?  आप किस प्रकार का फोन उपयोग करते हैं ?	
	Whether you have practised on the ASHA app after training or not ?  आपने प्रशिक्षण के बाद आशा ऐप पर अभ्यास किया है या नहीं?	

4.	<p>After using this ASHA application what do you think has your overall work will become –</p> <p>इस आशा एप्लिकेशन का उपयोग करने के बाद आपको क्या लगता है कि आपका समग्र काम कैसा बना रहेगा?</p> <p>1. Easier/आसान.....</p> <p>2. Harder/कठिन.....</p> <p>3. Stay the same/ समान.....</p>	
5.	<p>After using this ASHA application, what do you think which activities will become easier or more effective?</p> <p>इस आशा एप्लिकेशन का उपयोग करने के बाद आपको क्या लगता है कि कौन सी गतिविधियाँ आसान या अधिक प्रभावी हो जाएंगी?</p>	
6.	<p>Do you have any issues with the paper system?</p> <p>. क्या आपके पास पेपर सिस्टम के साथ कोई समस्या है?</p>	
	<p>What problems do you face during data submission and data entry?</p> <p>डेटा एकत्रित करने में ,भरने में और रिपोर्ट करने में वर्तमान में क्या - क्या समस्याएं आती हैं?</p>	
	<p>How long on an average would it take to do a one household survey (time in minutes)?</p> <p>एक गृह सर्वेक्षण (मिनटों में समय) को करने में वर्तमान में कितना समय लगता है ?</p>	
	<p>What do you think after using an ASHA application how much time it will take to do one household survey(time in minutes)?</p> <p>आशा एप्लिकेशन का उपयोग करने के बाद आपको क्या लगता है कि एक घरेलू सर्वेक्षण (मिनटों में समय) करने में कितना समय लगेगा?</p>	
<b>ASHA APP FEEDBACK</b>		
1.	<p>Do you feel that you will save time while working with an ASHA app?</p> <p>क्या आपको लगता है कि आप आशा ऐप के साथ काम करते हुए समय बचा पायेंगे ?</p>	

2.	Do you feel that you will save time while doing your monthly reporting when using the ASHA App?  क्या आपको लगता है कि आशा ऐप का उपयोग करते समय आप अपनी मासिक रिपोर्टिंग करते समय बचा पायेंगे ?	
3.	What problems do you think you will face while using ASHA App?  आपको क्या लगता है, आशा ऐप का उपयोग करते समय आपको क्या-क्या समस्याएं आती हैं?	
4.	What parts of the ASHA App would you like to change?  आशा ऐप में क्या बदलाव करवाना चाहेंगे?	
5.	What do you feel will be the biggest benefit from using the ASHA App?  आपको क्या लगता है कि आशा ऐप का उपयोग करने से सबसे बड़ा लाभ क्या होगा?	
6.	What is your overall rating of ASHA App (out of 5 stars)?  आशा ऐप को आप 5 में से कितने अंक देना चाहेंगे ?	

Thank you !

अपना समय देने के लिए आपका बहुत-बहुत धन्यवाद !

## TRANSCRIPTIONS OF INTERVIEWS:

### *Example showing full transcript of interviews in both Hindi and English language using Standard Verbatim Transcription*

Name of the Respondent: Mohini Devi

Name of the Interviewer: Abhishek Jain

Date of the Interview: 17-4-2020

List of Acronyms: I = Interviewer, R = Respondent

Hindi Quote	English Quote
I =aapka pura naam kya hain?	I =what is your name?
R =Mohini Devi	R =Mohini Devi
I = aapki umar kya hain?	I =what is your age?
R =35 years	R =35 years
I =aapke gaon ka pura naam kya hain?	I =what is the full name of your village?
R =bandasundari	R =bandasundari
I =aap kis block par kaam karti hain?	I =On which block do you work?
R = kishangarh	R =Kishangarh
I =aur aapke sector ka naam?	I =what is the name of your sector?
R =harmada	R =Harmada
I =aapki uchtamm ka staarr kya hain?	I =what are your educational qualifications?
R = 10 <sup>th</sup> standard	R =10 <sup>th</sup> standard
I =kyaa aapne aasha app se sambhandit training ko prapt kiya hain?	I =Did you get any training related to aasha app?
R =haan kiya hain	R =yes
I =toh aap apne training ke Anubhav ke baare me bataye aur woh training kesi thi?	I =so please tell me about your experience related to that training and what did you get to learn in that training?
R =usme hume mobile me survey lena shikhaya gaya	R =we get to learn on how to take survey on smart phones.
I =aapko jo training milli usse aapko aasha app samjhane mein madat milli?	I =so did you get any help by that training to understand aasha app?
R =haan milli thi	R =yes, I get some help
I =toh aapke anusaar iss aasha app se kya kya faayede honge?	I =according to you, what are the benefits you will be getting from aasha app?
R =saara kaam online ho sacta hain aur saara data store ho sacta hain	R =everything will be done online and data can be stored easily.
I =toh aapko aasha app ki sabse achi baat konsi lagi?	I =what is the most important thing you like about aasha app?
R =tikaa karan aur garvatti ki jhanch aur baaki sab cheeze bhi jaldi ho jaayegi	R = we can easily manage and store different type of data.
I =kya aapke paas khud ka phone hain?	I =do you have your own mobile phone?
R =hain par ab khraab ho gaya	R = yes, I used to have
I =toh jo aapki training hui uske baad aapne aasha app par abyaas kiya?	I =so did you practice on aasha app after getting that training?
R =haan kiya tha	R =yes, I did
I =toh aapko aasha app ache se samajh me aa gaya?	I =so did you understand the aasha app fully?
R =haan thoda thoda aa gaya baaki dheere dheere aa jaayega	R = yes, I'll get it gradually
I = toh aapne vo aasha app download karke dekhi thi?	I =so did you downloaded that aasha app in your mobile phone?
R =nahi tab mere paas smart phone nahi tha	R =no, I did'nt
I =toh aapne apne kisi trainer ko yeh baat batayi ki aasha app aapke phone me download nahi ho rahi?	I = so did you tell any trainer that you are not able to download the aasha app?
R = nahi, par mene apne supervisor ko batayi thi unhone koshish kari magar unse bhi nahi hua	R = no, but I told my supervisor and he was not able

<p>I =aapke paas jo phone hain vo konsa smart phone hain?</p> <p>R = nahi vo kharaab ho gaya ab naya hi laana padega</p> <p>I =toh aapke anusaar agar aap is app ka proyog karte hain toh aapka kaam asaan ho jaayega yaa kathin?</p> <p>R =kaafi kaam asaan ho jaayega kyuki register maintain nahi karna padega alag alag</p> <p>I = aur jo abhi aap saara kaam register par karti hain usme aapko koi samasya aati hain?</p> <p>R =nahi hume kisi prakaar ki koi samasya nahi aati</p> <p>I = jo aap ghar ghagr jaake survey karti thi toh usme aapko ek ghar ka survey karne mein kitna time lagta tha?</p> <p>R =aadha ghanta</p> <p>I =toh aapke anusaar jab aap saara kaam aasha app se karenge phone par toh aapko kitna samay lagega?</p> <p>R =zyaada hi lagega sir</p> <p>I =toh jab aapne aasha app ka proyog kiya toh usme aapko kisi prakaar ki samasya aayi?</p> <p>R = nahi kuch nahi aayi</p> <p>I =toh aapko app ache se samajh aa chuka hain?</p> <p>R = aa bhi gaya aur kahi nahi bhi aaya toh puch kar seekh lenge</p> <p>I =toh aap aasha app ko lekar koi sujhaao dena chahegi?</p> <p>R =gents ka naap nai vo kese karenge hum toh mahilaaye hain</p> <p>I = toh aap iss app aur training ko lekar koi aur baat batana chahegi?</p> <p>R =aur toh kuch nahi hain bas vo gents vaali problem hain</p> <p>I =toh aa piss aasha app ko 5 mein se kitne number dena chahyege?</p> <p>R =4 number</p> <p>I =aur agar aap iss app se related mujhse kuch puchna chahe yaa batna chahe toh bata sacti hain?</p> <p>R =nahi sir</p> <p>I =apna keemti samay dene ke liye bahut bahut dhanyawaad</p> <p>R =theek hain namaste</p>	<p>to do the same.</p> <p>I =which smart phone do you have?</p> <p>R =right now I don't have and I have to buy a new one.</p> <p>I =according to you, if you use this app so your work will be easier or will be more difficult?</p> <p>R = my work will be easier as I don't have to maintain any registers.</p> <p>I =Do you face any problem while working on registers?</p> <p>R =No, I don't face any kind of problem.</p> <p>I =how much time do you take in one survey while you do it on a register?</p> <p>R =half an hour (approx.)</p> <p>I =so when you will do every thing on the mobile app, how much time will you take in that case?</p> <p>R = it will take more time sir</p> <p>I =did you faced any problem while practicing on the app?</p> <p>R =no</p> <p>I =so have you understood the app well?</p> <p>R =yes, I have understood but if I'll face any problem, I'll surely take my senior's help</p> <p>I =would you like to give any suggestions for asha app?</p> <p>R =yes, as we can't take gents measurements as we are ladies.</p> <p>I =so would you like to share anything about the app or the training?</p> <p>R =no</p> <p>I =so please rate the app out of 5?</p> <p>R =4 out of 5</p> <p>I =so would you like to tell me anything regards or ask anything in regards to the app?</p> <p>R =no</p> <p>I =thank you so much for your valuable time</p> <p>R =thank you</p>
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**Link showing detailed information of participants and audio recordings-**

<https://drive.google.com/open?id=1OLVsupzT2YbudUd4fG7GU9Wm1RpnIyjiAUtNDLa4pQ>

**Link showing transcriptions of all the interviews-**

[https://drive.google.com/open?id=1hl1a8s7vbzaMXH78iM\\_sKYpTlknW36kH](https://drive.google.com/open?id=1hl1a8s7vbzaMXH78iM_sKYpTlknW36kH)

## CODES

We got to learn on how to take survey on smart phones, previously we used to work on registers
It will be easier to work and I'll get to learn some new things out of it
The training was very good. I get to learn how to do survey on a mobile phone and how we easily gather so much information from aadhar card
It was great. They have talked about cellphone, survey, diseases. How to use ID card and adhaar card for the identification of the house and family.
Yes, they've downloaded an application in the mobile phones to taught us that how you should do the survey, how you should enter the details of head of family members and related data
Yes training was very good, I am feeling more motivated than before
Yes the training was helpful. We can easily retrieve our data as well our payment details.
Yes the training was helpful. Diary work will be over
We can easily feed the data face to face which is right
Yes I completely understand the app
It's gonna be great. It will take around 10-15 minutes.
In the register, on different pages you will find different households, so it takes time to look through it. There is no easy way to search it. Sometimes it's an ANC or High risk or Child Immunization. In the phone, everything is made faster. And if somebody asks, we can use this phone to refer and update the data. We can open the application and see who we need to follow-up.
Understanding of application-yes, I'll get it gradually
I have not faced any kind of problem while using this app.
I have gained knowledge on the mobile and it makes me able to do quality work and this increased my participation in different meetings.
In the App, when we enter the Last Menstrual Period (LMP), the Expected Date of Delivery (EDD) automatically appears and we don't have to write it again. The antenatal care checkup information also comes up automatically, along with the patient name and their previous record. So we don't need to pick up the register. This application really easy our work and we can search any information through it.
We can easily meet our goals at time and can store the data in the device itself
I can give you any information through cellphone. There is no need of maintaining diaries and files. It will ease the process of registration as well as payment related issue
Yes I think so. I don't need to carry pen, register and copies anymore. Mobile is going to make my life easy.
There are so many benefits for us in this app as we can reach any information via one click
There are many benefits like we can store large data once and for all
It will be easier for us to work; we can easily gather information whenever we want
We can easily gather data and work can be done at ease.
We can easily do surveys in mobile phone and we can easily maintain our schedules
Yes, it will help us a lot, as we don't have to maintain all these registers
It has many benefits like it will help in saving time and sharing data.
Yes, it will really help in my monthly reporting and data can be easily stored in my device only.
It will save paper, and we don't have to carry much load with us while doing survey. Data will be save for longer time. Data regarding immunization will be stored safely.
It helps us to provide any important information to the public and what work is being done in the area. Sometimes we forget the register or misplace the data this app will overcome all the issues.

It avoids delaying of the reports and losing the data
Now I don't need ASHA diary and rough copies.They have talked about cellphone, survey,diseases.
How to use ID card and adhaar card for the identification of the house and family
Yes, Definitely it will make my work easy. Apart from this, it will be cost effective as the money to spend for coping will be saved.
Claim form will not be used and we easily get all our payments at the end of month
It will take more time when working with ASHA application
Yes, I have understood but if I'll face any problem, I'll surely take my senior's help
yes time will take place as I have to enter weight and height of the male person they are usually not found
Yes, as we can't take gents measurements as we are ladies.
No, I didn't understand anything as I don't have smart phone.
yes, I do face problems as I have to write down so many things
it will take 2 hours (approx.)
yes, I face many problems as I'm not that much educated
it's good app overall but we should also get smart phones as we all can't afford these phones
I just want that we all should get this training again as we all don't have these smart phones so it was little difficult to understand fully at that time.
yes, but trainers and time should be increased so that we can easily learn more
I just want that it should work properly and debugs should be solved
yes, I am facing some issues as it stops working if we forget to fill any block and redirects us to the home page
I don't remember as I haven't used the app from so long
yes, I did but was not able to operate it fully so I took some help from my supervisor
I want that ANC app should be there in the device.
no, everything is fine but I want that there should no recharge system for this app as there is always network problem in our village
No, but you should provide a big phone
No, I am working from last 14 years and never faced any issue ; no, problem while doing work on registers ; no problem , double entry is problem
It will take more time because of technical expertise with the app and we have to fill more details in it.
There are issues in child birth date and year, its not giving me the correct answer.
Right now I am using a simple small phone. I am thinking of purchasing a smart phone but due to COVID unable to do so.
I have faced a lot of issues. I was unable to open that app. It was asking for some ID password.
I guess this app will take a lot more time. This app requires many extra informations. When I will do then only I will be able to tell you what are the pros and cons of this app

### **Detailed list of 57 codes**

**Link for codes and thematic analysis-**

[https://drive.google.com/open?id=191OHs061S\\_3r9pXyQ9Bsm68\\_Od8enxfM](https://drive.google.com/open?id=191OHs061S_3r9pXyQ9Bsm68_Od8enxfM)

## **Project Timeline-**

<b>Project Timeline</b>		
<b>Task</b>	<b>Start Date</b>	<b>End Date</b>
<b>Research Proposal finalization</b>	2-4- 2020	10-4-2020
<b>Interview Guide</b>	9-4-2020	12-4-2020
<b>Phone numbers of ASHA and reporting in excel sheet</b>	10-4-2020	10-4-2020
<b>Discussion with KB team , mock interviews</b>	13-4-2020	14-4-2020
<b>Finalization of Interview guide</b>	14-4-2020	15-4-2020
<b>Interview schedules</b>	15-4-2020	21-4-2020
<b>Data Analysis</b>	22-4-2020	30-4-2020
<b>Discussion with KB team and mentor</b>	1-5-2020	2-5-2020
<b>Compilation and Dissertation report</b>	3-5-2020	9-5-2020
<b>Certificate and feedback form from KB</b>	11-5-2020	15-5-2020
<b>Submission into college</b>	18-5-2020	21-5-2020



*“There was a time when we used to give tablets (medicines) to help people and now the time has come when we are given tablets (mobile devices) and they are helping us all.”*

*– ASHA of 25 years*