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Roll out of the Comprehensive **PRIMARY HEALTHCARE APPLICATION**

in Uttar Pradesh 🌀







List of Abbreviations

ABDM	Ayushman Bharat Digital Mission	IHAT	India Health Action Trust
ABHA	Ayushman Bharat Health Account	IMR	Infant Mortality Rate
ANC	Antenatal Care	IT	Information Technology
ANM	Auxiliary Nurse Midwife	LGD	Local Government Directory
ANMOL	Auxiliary Nurse Midwife OnLine	LMP	Last Menstrual Period
ASHA	Accredited Social Health Activist	LMS	Learning Management System
		MMR	Maternal Mortality Rate
AWW	Anganwadi Worker	MOIC	Medical Officer In Charge
BCPM	Block Community Process Manager	NCD	Non Communicable Diseases
BOC	Block Outreach Coordinators	NHM	National Health Mission
BPM	Block Program Manager	РНС	Primary Health Centre
СН	Child Health	PNC	Postnatal Care
CHC	Community Health Centre	PRA	Participatory Rural Appraisal
EC	Eligible Couples	RCH	Reproductive and Child Health
EHR	Electronic Health Record	RMNCH	Reproductive, Maternal, Newborn and Child Health
FAQ	Frequently Asked Question	TFR	Total Fertility Rate
FLW	Frontline Worker	ТоТ	Training of Trainers
GoUP	Government of Uttar Pradesh	UP	Uttar Pradesh
HEO	Health Education Officer	UP TSU	Uttar Pradesh Technical Support Unit
HMIS	Health Management Information System	VHND	Village Health Nutrition Day
HRP	High Risk Pregnancy	WPD	Work Plan for Delivery

Table of Contents





Background

Over the past decade, Uttar Pradesh has made significant progress in various health indicators - Total Fertility Rate (TFR) has reduced from 3.8 in 2005-06 to 2.4 in 2020-21¹; Maternal Mortality Rate (MMR) has reduced from 359 in 2007-09 to 167 in 2017-19² and Infant Mortality Rate (IMR) has reduced from 73 in 2005 to 38 in 2020³. To further improve its key health indicators, the state has implemented many targeted programs and interventions addressing critical barriers towards delivery of quality RMNCH services. This includes addressing existing gaps to overcome shortages of human resources, drugs and equipment and other infrastructural facilities. Another important aspect critical to designing innovative health programs, which the Government of Uttar Pradesh (GoUP) is proactively working towards, is the availability of quality health data. This calls for a robust data system that captures and generates a wide range of quality health data that can be used for public health sector decision-making. Digital transformation in healthcare can facilitate capture and the exchange of relevant information across the health ecosystem. It can facilitate creation of a continuum of care, that has proven potential to enhance health outcomes by improving medical diagnosis, data-based treatment decisions, digital therapeutics, clinical trials, self-management of care and person-centred care. As well it can create more evidence-based knowledge, skills and competence for professionals to support health care⁴.

¹IIPS and ORC Macro, National Family Health Survey-V, 2020-21

²Special Bulletin on Maternal Mortality in India, Sample Registration System, 2017-19
³Sample Registration System (SRS)-bulletin 2020 Volume 55-I

⁴https://apps.who.int/iris/bitstream/handle/10665/344249/9789240020924-eng.pdf

Existing RMNCH Digital Data Systems in Uttar Pradesh

A large number of health programs are operational under the National Health Mission and along with them a pool of Information Technology (IT) applications are functional under the digital health ecosystem. These IT applications have been designed and rolled-out at different times using different technologies⁵. While there have been many data systems mandated by the National Government and/or State Government under the programmatic areas of RMNCH, much of the efforts pertaining to delivery of services until now have focused around capture of facility-based indicators. Further, aggregate data systems like the Health Management Information System (HMIS) do not offer an opportunity for intensive microplanning that requires individualized data. Also, tracking of women from pregnancy to delivery and further follow-up of child growth and immunization is not possible unless unitized data is collected at source.

The ANMOL application, an initiative of the Ministry of Health and Family Welfare, captures unitized data on antenatal, postnatal and delivery services and enables tracking of children for complete immunization services and is linked with the Reproductive and Child Health (RCH) portal⁶. However, the ANMOL application enables data entry only at the ANM level. It does not facilitate enumeration of all individuals and lacks interlinkages with different service providers across the continuum of care.

To ensure timely availability of beneficiary wise data and to ensure tracking of women and children, there is a need for a digital data system that captures unitized data at source and enables interlinkages between different levels of health system.

⁵https://nhm.gov.in/uhc-day/Session%202/eBooklet%20on%20IT%20Initiatives%20of%20NHM.pdf ⁶https://rch.nhm.gov.in/RCH/s

Comprehensive Digital Health System for Uttar Pradesh – A Felt Need

The Government of India launched the Ayushman Bharat Digital Mission (ABDM) in September 2021 in order to develop the backbone necessary to support an integrated digital health infrastructure. ABDM aims at bridging the existing gap amongst different stakeholders of the healthcare ecosystem through digital highways and envisions the creation of a seamless online platform "through the provision of a wide range of data, information and infrastructure services, duly leveraging open, interoperable, standards-based digital systems" while ensuring the security, confidentiality and privacy of health-related personal information.

With this in mind, the Government of Uttar Pradesh (GoUP) started visualizing a comprehensive data health system for the state that would capture workflow based data at source. This would act as a single source of truth with information collected at the source enabled to capture individualized data. The primary users of the comprehensive data system will be the Frontline Workers (FLWs) - (ASHAs, ANMs), whereas the secondary users will include all health officials who could utilize the gathered data for monitoring, identification of gaps and development of implementation strategies and plans to close the gaps. The information on service uptake will be available in real-time, a function critical for immediate action. Individualized data will help identify and target left-out households, reducing inequity, and enable effective tracking of women and children to capture those who 'missed' a service.

About e-Kavach

e-Kavach, a comprehensive digital health application (mobile and web based), is a job aid for frontline workers and facility based users that enables longitudinal tracking of patient information using a unique ID (ABHA ID). The ABHA ID can be generated for enumerated as well as non-enumerated individuals in this application. A separate icon allows one to either generate ABHA ID, where none exists or to link ABHA ID that has already been previously generated. The e-Kavach includes various components of RMNCH [family planning, antenatal care (ANC), pregnancy outcome, postnatal care (PNC) and child health (CH)] programs as well as Non Communicable Diseases (NCD). These services are updated by the corresponding service providers (ANMs, ASHAs, facility staff) based



on the family health survey (enumeration) conducted and entered into the application by ASHAs in their respective areas. Enumeration is the base module of the application which captures family as well as individual details of all family members within a household. Enumeration is done once and can be updated based on requirement at any point of time. Programmatically, the ASHAs update their survey/enumeration once in six months Once the ASHA has completed enumeration, enlisting all households and its members in her area, a list of target members (eligible couple, children) is automatically generated for service provision. Updates in the data are feasible as and when they occur (death, new birth, marriage, new pregnancy, etc.,).

The ASHA, ANM and facility staff applications are interlinked, as depicted in Figure 2. Data entered into the application by any of the service providers will also be reflected in others' application.



Figure 2 Interlinkage between ASHA, ANM and facility staff applications

For instance, when the ASHA completes enumeration in her area, the list of Eligible Couples (EC) for that area is automatically generated. From the EC list the ASHA marks probable pregnant women while updating the date of their Last Menstrual Period, which goes to the ANM application for confirmation. When the ANM confirms the pregnancy of a woman, the woman is also marked as a pregnant woman in the ASHA's application. The ANC services provided by the ANM at VHND are also reflected in the ASHA's application. A pregnant woman who is identified with a High Risk Pregnancy (HRP) based on the examination and measurements conducted by the ANM, is reflected in the Medical Officer In-Charge (MOIC)'s dashboard. The MOIC can then take necessary action for treatment of the HRP woman. After the completion of the gestation period, the ANM at the sub-centre or the facility staff who deliver the woman can enter the delivery details of the woman. This delivery intimation goes to the ASHA who conducts the home visits for providing postnatal care services and the child is also reflected in the ANM application for immunization services. Hence, interlinkages between different service providers ensures effective tracking and timely care for the mother and child.

As of date, the service providers do not have direct access to the ABHA ID. However, the ABHA ID can be either provided by the individual or can be searched for, based on specific identification and demographic variables.

Benefits of e-Ka<mark>vach</mark>

ASHAs

- Automatic generation of due-lists
- Visit reminders
- Videos for counselling
- Easy identification of left outs and drop outs
- Separate bucket for HRP women and LBW children for referral and follow-up

ANM & CHO

- Automatic generation of due-lists
- Visit reminders
- Algorithm based identification of HRP women and LBW children
- Separate bucket for HRP women and LBW children for referral and follow-up

District and Block Officials

- Unitized data for analysis and review can identify left outs and drop outs
- Data upto ASHA level available on dashboard

Facility Staff

- Aids in clinical decision making based on previous record details
- Easy referral to higher facilities
- · Follow-up of complicated cases in community



Application Selection, Development and Rollout

Recognising the importance of digitalization of health data, the Government of Uttar Pradesh in consultation with the Government of India decided to pilot comprehensive digital health systems in the state.

The GoUP, with support from the Uttar Pradesh Technical Support Unit (UP TSU), a unit led by the India Health Action Trust (IHAT) in partnership with the Institute for Global Public Health, University of Manitoba, Canada, initiated a pilot on the comprehensive digital health application – e-Kavach in Uttar Pradesh (UP) in July 2021.

UP TSU explored data systems in various states of India and evaluated for workflow integrity that would facilitate last-mile care and digital inputs by FLWs, data collection at source and subsequent facilitation of data interoperability across the continuum of care. This would enable generation of unitised Electronic Health Records (EHR).

Subsequently, UP TSU organised a demonstration by various technology developers on the digital platforms that they had created or used in other states. The TeCHO platform implemented in Gujarat was selected for implementation in UP based on its workflow based system and its ability for seamless integration with Government of India (GoI) - RCH and Non Communicable Diseases (NCD) portals.

After the selection of the application, UP TSU, in discussion with GoUP, customized the workflow of the application for UP. UP TSU provided the following support to GoUP in rolling out the application:

- (i) Customization of the application workflow
- (ii) Development of training material
- (iii) Implementation support for the pilot (including conducting trainings, providing handholding and helpdesk support)

Process for Pilot and Rollout (July 2021 – till date)





The GoUP selected Bahua block in Fatehpur district for piloting the application. A decision would be taken for scaling up the application based on the learnings from the pilot intervention. The pilot and the roll-out of the digital application is detailed in the following section.

I. PREPARATORY ACTIVITIES

The preparatory phase included a set of activities that included arrangement of necessary infrastructure, ASHA & AWW mapping and developing training material for the stakeholders.







1. Mapping for creation of location hierarchy

Prior to the intervention, the National Health Mission (NHM) supported by UP TSU conducted mapping using Social mapping, a Participatory Rural Appraisal (PRA) method to map ASHA and AWW areas within revenue villages and to identify overlaps and left-out areas. Based on the mapping, the team suggested possible solutions in terms of hiring of ASHAs and re-alignment of ASHA-AWW areas to the District and block administration for corrective action. This alignment enabled the ASHA and AWW to provide service delivery to common sets of population. The mapping also involved linking ASHA areas with revenue villages (with Local Government Directory - LGD codes) in the block to create a location hierarchy

(StateDivisionDistrictBlockCHC/PHCSubcentreRevenue VillageASHA) for inclusion in the e-Kavachplatform.

2. Development of Training Material

The team developed training modules including handbooks and facilitator guides on each of the modules [Enumeration, Eligible Couples (EC), ANC, pregnancy outcome, PNC and CH) in the application for ASHAs, ANMs and master trainers. They also developed a concise training module for district level master trainers and a 4-page ready-reckoner on the enumeration module for ASHAs field reference during the enumeration exercise. In order to facilitate self-learning, the team also developed videos built-in with quizzes, FAQs along with other content for the Learning Management System (LMS).

3. Aggregation of smartphones for ASHAs

The tender for procurement of smartphones for ASHAs was still in process in July 2021. Therefore, the district team of Fatehpur aggregated around 170 smartphones from other blocks. The UP TSU and district

administration team checked, unlocked and configured these phones and procured new chargers and data cables, as required. These smartphones were then distributed to ASHAs of Bahua block during the block level training on the enumeration module.

4. Training Infrastructure

The UP TSU and District Administration team set up an antenna (sender-receiver) for WiFi connectivity at the venue, as there was a requirement for uninterrupted internet connectivity during the conduct of the training on the enumeration module of the application. Further, they used LED TVs for directly displaying the application during the orientation of FLWs.

5. Training of Master Trainers

Master Trainers oriented 36 block outreach coordinators (BOCs) from UP TSU on the digital application over a period of 3 days. The BOCs then trained the FLWs on the application. The team identified 25 BOCs of the 36 trained BOCs as master trainers. These 25 BOCs were provided a refresher training for 2 days, including mock sessions.

6. Development of Videos for counselling

The team developed 10 inline videos and 13 library videos for the application. These covered various topics across the RMNCH spectrum, e.g. birth-preparedness, exclusive breastfeeding, severe anaemia, danger signs, new-born care, etc., These videos would subsequently be utilized by the ASHAs as a job aid for counselling the beneficiaries during their visits. While the inline videos play automatically as part of the workflow of the application, the library videos can be used by FLWs, as and when required.

II. TRAINING

The team also developed a comprehensive training plan for orientation of state, district and block level functionaries and subsequent orientation of frontline workers on the digital



application. This would help with district and block level supportive supervision. The state ToT for all state level officials from the National Health Mission as well as the Directorate of Medical Health and Family Welfare was held on 23rd July, 2021. This was followed by a district level training of master trainers in Fatehpur district for all block and district level officials.



III. ENUMERATION TRAINING AND ROLLOUT

Post the preparatory activities and district ToT, the trainers trained around 161 ASHAs, 7 ASHA Sanginis and 23 ANMs from Bahua block in 10 simultaneous batches from 12th -17th August, 2021 at Bahua Inter College, Fatehpur. The training methodology included the following:

 Contextualization and orientation on smartphone use (Day 1): On the first day of training trainers oriented the participants on the need for digitalization of their

records and digital job aids. This was followed by a discussion on the process for conducting survey, and familiarization with the smartphones with the introduction to the application.



ASHAs entering dummy data during training

2. Enumeration module of digital app (Day 2): On the next day trainers conducted a detailed training on the enumeration module of the application along with handson practice sessions using different types of case studies. At the end of the session, all ASHAs were asked to make dummy entries in the application of their own and neighbouring households.





- 3. Enumeration rollout planning with Sanginis (Day 3): Based on observations made during the last 2 days of training, trainers categorised ASHAs into 3 categories i.e. "those who need more efforts", "low hanging fruits or those who need medium efforts" and "good performers". Based on this categorization, visit plans for ASHA Sanginis and the BOCs were developed.
- 4. Feedback and resolution of issues (Day 4): On the final day of training, trainers addressed the programmatic as well as technical issues and resolved them based on the practice and dummy entries.

IV ONSITE MENTORING (for enumeration)

UP TSU in discussion with the Fatehpur district and block

administration decided to mentor the ASHA Sanginis on providing handholding support to their ASHAs for the duration of enumeration based on the observations made during the training. A detailed field plan was drawn up depending on the



Pilot mentoring support structure

categorization of ASHAs as well as ASHA Sanginis on their understanding and use of digital application. Additional focus was laid on ASHAs and Sanginis who were finding it difficult to work on the application. A total of 10 block level mentors from UP TSU were positioned to provide support to ASHA Sanginis and ASHAs in order to complete enumeration in 30 days and ensure adequate coverage of ASHAs.

At the end of every day, all the ASHA Sanginis and block level mentors gathered at the CHC under the chairpersonship of Medical Officer In Charge (MOIC) Bahua in the presence of UP TSU staff to discuss the day's progress and any issues (technical or implementation related) that they encountered during mentoring. A dedicated helpdesk operated by internal UP TSU team was placed at the block level and in case the issues weren't resolved, they were further escalated to state level. A directory of all calls made was used to prepare a list of FAQs and a standard protocol. Also, WhatsApp groups were formed between ASHAs, Sanginis and Block mentors for



ASHA Sangini providing onsite mentoring during enumeration

feedback and reporting of issues in the application.

V. RMNCH TRAININGS FOR ASHAs AND ANMs

In the next phase, post enumeration, the trainings on RMNCH modules were carried out for ASHAs and ANMs. The ASHA Sanginis and a few nominated ASHAs were trained as trainers for ASHAs. The training methodology for these trainings was similar to the enumeration training for ASHAs. All the trainings were followed by onsite support and mentoring during household visits and VHND sessions.

- **1.** ASHA Sangini Training of Trainers (ToT): One of the key learnings from the enumeration rollout was that ASHA Sanginis, who are the closest available mentors for ASHAs, can play an important role in training and mentoring the ASHAs. Hence, in addition to the 7 ASHA Sanginis in the block, 7 competent ASHAs were nominated as trainers by the block team based on their performance during enumeration. The ToT on RMNCH modules for these trainers was organised in two phases. In the first phase, the Sanginis and the nominated ASHAs were oriented on the EC and ANC module, and in the second phase they were trained on the PNC module of the application. Apart from providing a detailed overview of the application to these trainers, mock sessions were held on the last day of the training to hone their skills for training the remaining ASHAs in the block.
- 2. ANM Training: The ANM training on the RMNCH module commenced on Friday, 24th September, 2021 with the child health module followed by the antenatal care and pregnancy outcome Module from 28th to 30th September, 2021 at CMO Office in Fatehpur. A total of 21 ANMs received training on the CH, ANC and WPD



module of the digital application. Post the trainings, mentoring visits to the VHNDs were organized for supportive supervision and resolution of any issues faced by ANMs during data entry on a real time basis. The ANMs



ANM entering service data during VHND

were also provided with a helpdesk number that they can call for any support required.

3. ASHA training: The ASHA Sanginis and nominated ASHAs further trained the A S H A s from their respective areas on the EC and ANC modules over a



ASHA Sangini training ASHAs

period of 2 days. This was followed by onsite support to the ASHAs by the ASHA Sanginis. Once, the ASHAs became comfortable with the idea of using the application for their daily activities, further trainings on the PNC module were organized.

4. Facility staff trainings: To ensure adequate rollout of the facility module (a web based module), the nurse mentor of the block facility was provided a 1-day ToT on the facility modules inclusive of delivery, ANC, Family planning, PNC and child health. The nurse mentor further trained the facility staff (staff nurses and ANMs) posted in all facilities of the block on a rotational basis over a period of 2 days (10th – 11th Feb).





Key Progress

The application has received a positive response from the FLWs. It eased their work and assists them to perform their tasks in a streamlined manner. Nearly 33,399 households and 1,62,529 members were enumerated in the application by ASHAs within a month post enumeration training. Post RMNCH trainings, the FLWs initiated data entry into the RMNCH module of e-Kavach. A total of 24,309 eligible couples, 2,504 children of age between 0-1 years and 1,276 pregnant women for ANC have been registered. A total of 6,180 ECs are using family planning methods. Household enumeration and LMP updating has helped in the automatic development of due lists that help the FLWs in service provision (immunization, ANC).

The application is also helping in the identification and followup of HRP women and sick new-borns. This will result in provision of timely and quality treatment to ensure a healthy mother and child.

"Until now whatever work I used to do, I used to record it in the ASHA diary and that register had to be carried everywhere I went and sometimes the pages of the register used to get torn. But now it has become easy to record our work in the application and the biggest advantage is that there is no need to carry the register and there is no fear of the pages getting torn. Now we are recording our work properly and easily and hope to do the same in the future."

> -Vidhya Devi, ASHA, Phulwamau

"Because of the application we can easily migrate details a family in and out of the village. The due list for pregnant women and children due for immunization is automatically generated through the application. The best part is that the data we enter into the application will not get lost."

> -Basanti Devi, ASHA, Mardanpur







Learnings and challenges

Key Challenges

Use of smartphones by FLWs: FLWs who were older in age or less educated or those who weren't familiar with smartphones were initially hesitant in using smartphones. While some FLWs showed eagerness to learn and gradually become familiar with the application, in other cases, family members or supporters of these FLWs were trained on the application to provide them with support during data entry.

Internet Connectivity: Some ASHA areas had poor internet connectivity where even the CUG SIMS provided to ASHAs did not work. While the application allows offline data entry, internet connectivity is required to login to the application and sync the entered data with the cloud server. Supportive mechanisms of incentives for internet recharge were created by the government in the pilot block in order to overcome these challenges. Moreover, the application allows FLWs to enter data during service provision on field and sync data to the server whenever they are in an area with good internet connectivity.

Modifications needed in the application based on field implementation: During enumeration or RMNCH service entries in the application on real time basis, some issues were reported by FLWs in the application based on which corresponding changes were made in the application workflow. For eg:

- There were not enough options for relationship with head of the family. Hence, along with incorporating commonly reported additional options, the option of "others" was added to the relationship dropdown.
- Due to several ASHAs making duplicate entries in the app during enumeration, the option of archival of families and members was added later in the app.
- Certain mandatory fields like phone number of Pregnant Woman, fundal height, length of child etc., were made optional as these were sometimes not available on field.



Some of the key learnings from the pilot were:

1. ASHA Sanginis as trainers for ASHAs: Since ASHA Sangini is the primary mentoring cadre for the ASHAs, it was realized that the role of training and mentoring of the ASHAs can be transferred to them to ensure a sustainable model of training.

2. Dedicated Helpdesk: A dedicated helpdesk support system or call centre with an SOP is beneficial for resolving queries from service providers as well providing them direct support. The call centre can also be used for data verification on a sample basis. In an ideal situation, we envisage requirement of a 50-member call centre. However, we are exploring the feasibility of the 104 call centre to integrate this function.

3. Dedicated master trainers: Dedicated trainers are required for training as well as initial handholding before transitioning the work to FLWs and government supervisory cadre to ensure quality rollout. While we envisage a requirement of 400 master trainers at block level, we are exploring cost-efficient models of scaling up, with no dedicated trainers, but digitized online training for Community HealthOfficers.

4. Importance of onsite mentoring support: Supportive supervision, oversight and mentoring are significant for effective rollout. Hence, it is essential to tailor the existing training modules to build the supportive supervision skills of the government cadre namely the BCPMs, BPMs, HEOs and MOICs.



Way Forward

Based on the successful implementation of the pilot, the e-kavach platform has been adopted by GoUP and is being scaled up across the state. Before the scale-up, approximately 80,000 smartphones were distributed among the ASHAs in 381 blocks across 65 districts of Uttar Pradesh.

Based on the learnings from the pilot, a cascade model of training has been adopted by the state for training the state, division, district and block level officials followed by the training of FLWs. A Learning Management System (LMS) has been developed to train the service providers on the e-kavach application through self-learning e-courses and track their progress. The LMS comprises of reading material (modules), audio and videos files along with quizzes for the FLWs to learn and evaluate their knowledge. The LMS Dashboard and LMS Report can be utilized to review the progress of the participants. Post completion of their training through LMS, each participant will have to enumerate a minimum of 3-5 households as dummy entries in the application, post which they would be moved to real time enumeration. Community Health Officers (CHOs) have been trained as trainers for providing training and mentoring support to ASHAs and ANMs. Once the enumeration is completed, the service providers will be trained on the RMNCH modules for updating the service details. Subsequently, this data will be integrated with the RCH portal. The progress of enumeration and other service entry details can be viewed on a web based dashboard available at the state, district and block levels. Further, State of Health (SOH) app, a mobile based application has also been developed for at-a-glance viewing of key RMNCH indicators by program managers at all levels. Detailed guidelines have been released by the GoUP on formation of validation committees for the review of progress and quality of data entered into the application. Mechanisms for weekly, fortnightly and monthly reviews have also been established to ensure adequate supportive supervision and sustainability of the application.





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