KhushiBaby

# 2022 ANNUAL REPORT


It takes a village to raise a child to be "Khushi".
We help that village be healthy as possible, through digital health solutions for community health workers.

KhushiBaby


# Index

"We started at the last mile. We are now transforming health systems.
But our work is not complete until we return back to the last mile."

Mohammed Shahnawaz, COO, Co-founder


KhushiBaby


# Annual Letter

**Dear Khushi Baby Family**

This has quietly been a formative year for us as an organization.

Our flagship Community Health Integrated Platform (CHIP), envisioned in 2018 and coined in 2020, is now emerging as an essential tool for the Rajasthan Department of Health. While our journey started with tracking health of infants - and hence our name 'Khushi Baby' - our approach has evolved to follow that beneficiary throughout the lifespan of primary health care with our platform, CHIP.

CHIP began as a community surveillance tool during the first wave of the COVID-19 pandemic in 2020, through which 14 million beneficiaries were reached by 60,000 community health workers. In 2021, the platform was re-applied for use of vector-borne disease surveillance. This past year, the Department of Health has worked with Khushi Baby to use CHIP for a digital health census, family planning services tracking, maternal and child health tracking, tobacco and alcohol screening, tuberculosis active case finding, vector-borne disease screening, and most recently for the measles and rubella elimination campaign. Our dashboard has additionally been used as part of state-wide screening camps and for prison-based hepatitis surveillance. In the District of Udaipur, our home since 2015, we reached over 70% of the entire district's population, including urban areas. Altogether, by the end of 2022, CHIP helped to track the health of 21M beneficiaries by 70,000 health workers, making it one of the largest, if not the largest, community-based, health worker platform in India. **At the time of this writing we have reached 35M beneficiaries.**


ASHAs have started to exchange their diaries for smartphones.

Last June, we celebrated a critical milestone. The Ministry of Health and Family Welfare, Government of India, approved a 107 Cr INR (13.6M USD) budget for scale-up of CHIP across Rajasthan, under the Health Systems Strengthening category. The funding would provide 75,000 health workers with funds to self-procure smartphones and incentive-based data-plan remuneration.

We have had to overcome substantial challenges. Over the last year CHIP was supported by department-specific policy mandates. An overarching mandate to remove paper-registers is still pending, and to a certain extent, health workers are still doing double the work for legacy reporting systems and protocols. Funds for smartphones have yet to be disbursed globally across the state. Data collected through the platform has yet to be linked to legacy state and central backend systems, while bureaucratic approvals and leadership transitions have led to delays. At the same time, intermittent requests from the department for new platform features had to be tactfully managed while refactoring our entire technology stack. The persistence of our policy and implementation team, to continue to push for integrations and manage the pain points of health workers, as well as the perseverance of the technology team to deliver a more stable platform, has proven to be invaluable.

Despite reaching a significant scale with digitally empowering healthcare workers, we have much room to improve when it comes to making an impact on health outcomes. Amongst our registered beneficiaries only less than 10% have been identified as high-risk or in need of follow-up services, suggesting a degree of underreporting. We estimate that only 10% of these beneficiaries (or 0.5% of the total) are receiving follow-up services at primary health centers. Tracking through the Medical Officer application however is incomplete in the current stage. Efforts to automate and scale our outreach efforts have also been reduced during scale up of the CHIP, due to a greater focus on completion of the digital health census to build the base population for longitudinal follow-up.

But we can feel the momentum building and a sea-change coming to public health. The Ayushman Bharat Digital Mission, recent country-wide roll-out of COWIN, and increased smartphone literacy and ownership amongst women is paving the way for a digital transformation in health care and greater adoption from frontline health workers to state health officials. Health officials are coming to realize, speak up and address the inherent barriers of a paper-based system with delayed remuneration, which is limiting the potential of  health workers to create impact in this digital age.

Our goal is to spread khushi (happiness) to millions of beneficiaries in underserved communities

The way forward will come through research, innovation, and collaboration and this is where Khushi Baby feels that we are at the leading edge. With Simprints, we demonstrated the first offline facial biometric for community health service verification in India with over 100K beneficiaries, even before UIDAI. With JHPIEGO, Khushi Baby has integrated multiple IOT devices within our longitudinal antenatal care tracking module. We have also integrated Prasav Watch, an intrpartum health tracking solution to complete the continuum of care to the facility level. With Google AI for Social Good's support, we have been able to predict seven maternal and child health outcomes through machine-learning models. Khushi Baby is now diving deep into geospatial analysis to estimate and visualize hundreds of primary health care indicators, such as multidimensional poverty index (valuable across many departments, even outside health) and zero-dose child counts, for the first time, at the granularity of the village level. Finally, Khushi Baby is partnering with Wadia Hospital and the Rajasthan Department of Health to launch the largest digital biomarker study for maternal anemia of its kind, to transform the smartphone into a diagnostic screening tool for potentially 250,000 nurses across India. Audio-based biomarkers for pediatric TB and ECG based cardiac risk triaging are also coming on the horizon.

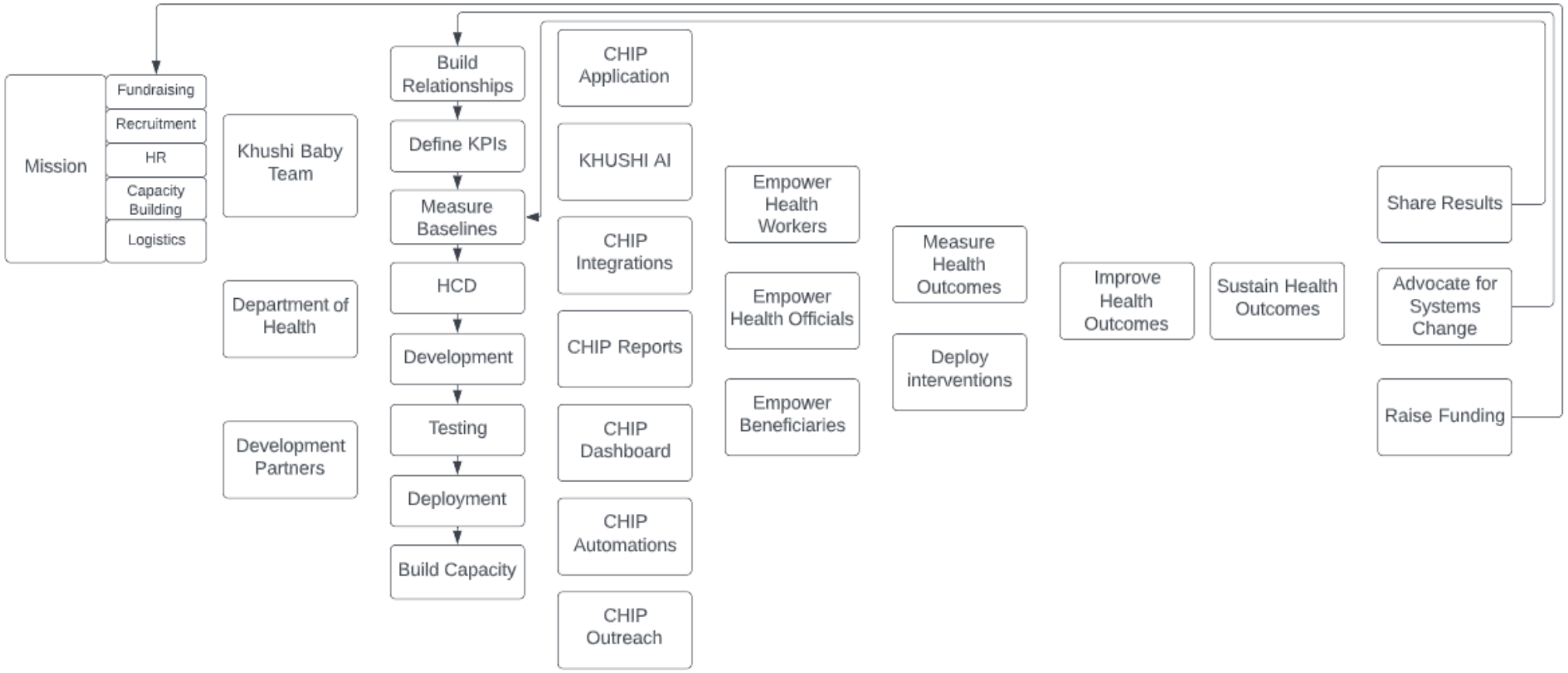
As evidenced by our inaugural Stakeholder Summit, attended by over 100 participants from 20 leading public health organizations in Udaipur this past November, our goal is to create an ecosystem for impact. Partnering with ARMMAN for example, will supercharge our ability to both train community health workers through CHIP by adding a learning management system, and streamline outreach to beneficiaries through their already scaled Kilkari platform. Partnering with groups like PATH and ASCI are opening doors to bring CHIP to entirely new geographies, which will force our platform to become increasingly adaptable, customizable, and user-driven. A new pilot awaits in with the Department of Health of Karnataka as well.

Across Jaipur, Udaipur, and our new Bangalore office, we are now 60+ members strong, and growing. We are patient yet restless. We have much more work to do, and we are ready for the journey ahead.

- Dr. Ruchit Nagar, CEO

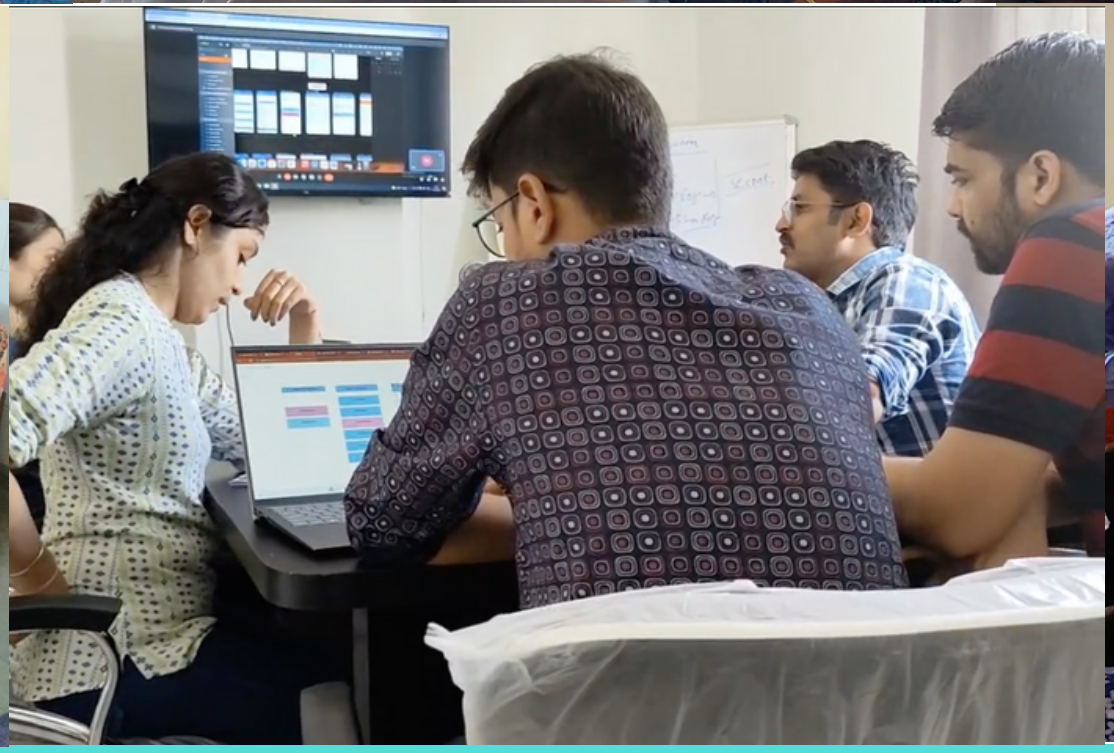

# TEAM KHUSHI BABY

# Khushi Baby
# Theory of Change



# Behind the Scenes





# Application Modules

Khushi Baby has facilitated capacity building of thousands of CHWs

# CHIP Roadmap

| | ASHA | ANM | MOIC | CHO | Other |
|---|---|---|---|---|---|
| Family Folder | | | | | Patient facing app |
| Family Planning | | | | | |
| Maternal Health | | | | | Labor Room |
| Child Health | | | | | RBSK |
| Non Communicable Diseases | | | | | |
| Cataracts | | | | | |
| Anemia | | | | | |
| Mental Health | | | | | |
| Outbreaks / IDSP | | | | | Outbreak Investigation Officer |
| Vector-borne | | | | | |
| Tuberculosis | | | | | |
| Leprosy | | | | | |
| Immunization Campaigns | | | | | Supervisor Module |
| Work Plan | | | | | |
| Health Sessions | | | | | |
| Government Forms | | | | | |

Live  Developed  Under Development


# Platform Features

Health workers spend up to 20 hours a month on paper-based reporting and tabulation. CHIP is helping reduce this burden.

| Components/Features | Current | Planned |
|---|---|---|
| Seed Data | Created by ANM from ground level, also can be added by officials via dashboard | Reconciliation against RCH, COWIN databases when access is made available |
| HW Registration | One-time OTP based | Aadhaar Facial RD authentication of HWs |
| User types | ANM, ASHA, MOIC, Labor Room, CHO | AWW, RBSK Officer, Outbreak Investigation Officer, ASHA Supervisor, LHV, Beneficiary |
| Beneficiary Consent | Filled by health worker | Beneficiary OTP based consent mechanism |
| Beneficiary Registration and Verification | Jan-Aadhaar (Rajasthan specific)Aadhaar QR code scan | Aadhaar Facial RD authentication of beneficiariesLocal deduplication when working offline |
| Household details | ASHA collects summarized figures at the household level | AI to take a photo of the houses and derive various variables automatically |
| Beneficiary details | ASHA reports suspected conditions; ANM reports checkup details and has IOT devices for some RCH data collection | AI to take photo of beneficiary to screen for factors such as anemia |
| Decision Support | RCH | Other modulesAI-on-edge classification |
| Health worker coordination | Uni-directional (ASHA to ANM to MOIC) | Bi-directionalIntegration with E-Sanjeevani |

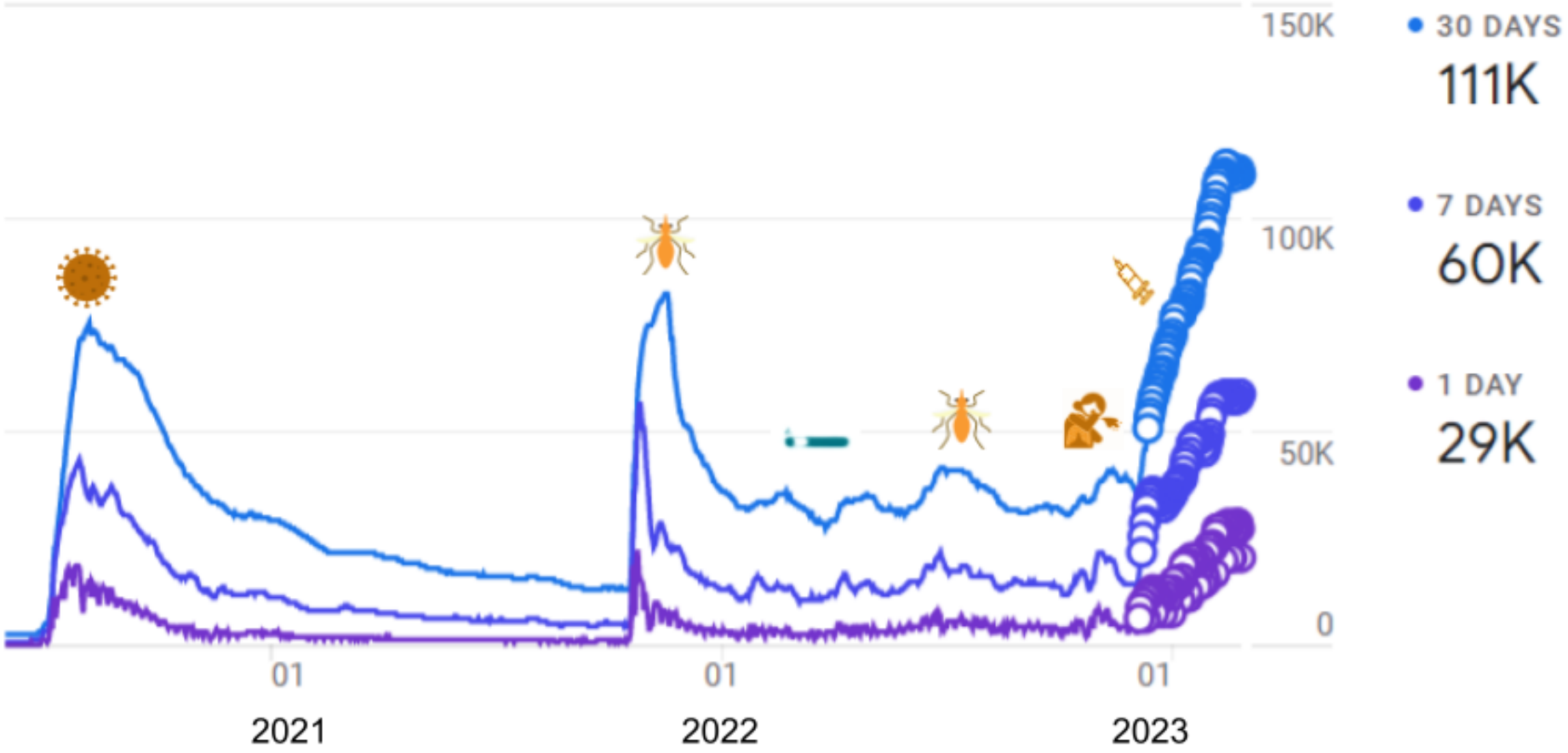
| Components/Features | Current | Planned |
|---|---|---|
| Workplan | Synthesizes workplan across all major programs for ASHA | Add GPS guided route-map suggestions |
| Quality Control | Nudges for surveys conducted too quickly, late at night and from fixed locations | Link incentives with data quality metrics |
| Syncing | Offline first, sync when connectivity available | Online first, switch to offline when connectivity missing |
| Beneficiary Outreach | In-house messages | Integrate with Kilkari 2.0 |
| Health Worker Training | Video-based trainings | Include quiz based learning within the app, integrate with Mobile Academy 2.0 |
| Government Integrations | Ongoing | ABDM, RCH, Nikshay, IHIP, NCD, ASHA payment backend integrations under process |
| Data for Decision-Making | Search across 200+ indicators, drill down on dashboard, see rankings and time series graphs for key indicators, see PIP key indicators | Call-center moduleTake action directly from the drill-down of the mapMeasure intervention results for digital interventions |

I think a lot of work has gone into this application... it is a unique solution, which I have yet to see in the past few years of my experience, in terms of the integration with different thematic areas coming together. This looks like a potential solution which, if we interconnect with the other platforms, can actually go in that direction of having a one stop shop.

- Dr. Sachin Gupta, USAID

# Reach

User activity over time



# Summary of CHIP Utilization to Date

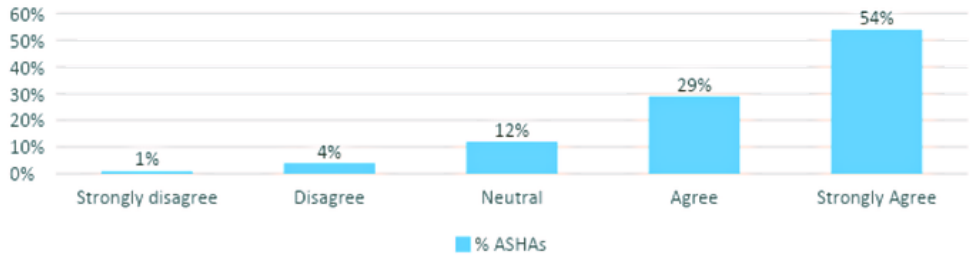
| Program | ASHAs + ANMs + MOs | Beneficiary Linelist |
|---|---|---|
| Family Planning | 5637 | 170737 |
| Maternal Health | 988 | 46524 |
| Intrapartum Health | 638 | 39548 |
| Child Health | 448 | 23254 |
| NCDs | 48637 | 17000541 |
| COVID-19 | 63116 | 14530809 |
| Tuberculosis | 48637 | 2880607 |
| Vector-borne Disease | 6184 | 318622 |
| Hepatitis | 1151 | 36245 |
| Immunizations | 36749 | 8695366 |

# Research and Development

## Human Centered Design

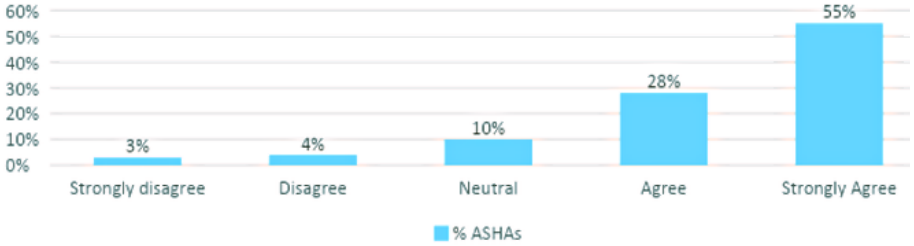
Khushi Baby has always had a strong commitment to human centered design and research. This objective has been enabled by having a team of 15 field monitors in Udaipur, Rajasthan, working daily with community health workers at the last mile to provide technical support, capacity building, and support in high-risk case follow-up. New application modules and features are tested directly with community health workers. For example, Khushi Baby partnered with Simprints to roll-out a facial biometric authentication feature in the Udaipur District for community-based verification of COVID-19 vaccination. An independent evaluation conducted by 4th Wheel studied the acceptability of the CHIP application with biometrics amongst 151 ASHA workers in Udaipur.

*Figure 6: Likert scale on perceptions that using App and facial biometrics is easy*




*It got easier once we started using the App. Khushi Baby team helps if we have any queries.*
*- ASHA, 26, Salumbar block*

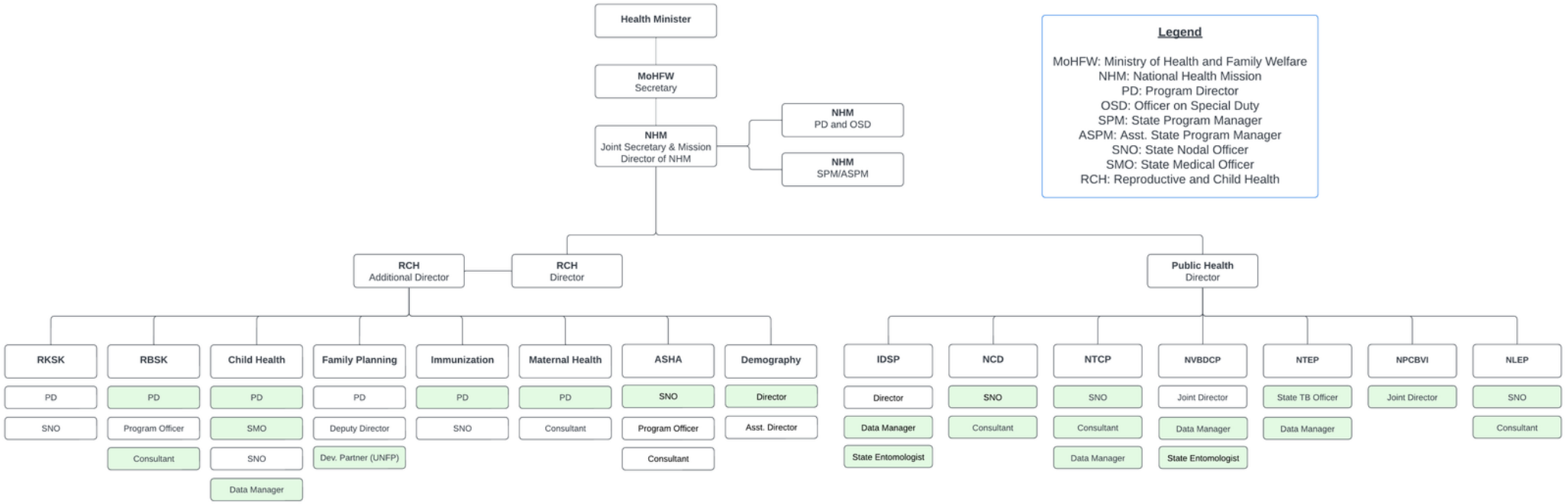
*Figure 8: Likert scales on perceptions that having a digital health data system will be useful for their job*




*"I don't have to make multiple trips. To get different data. Once this data is complete I will have all the data with me"*

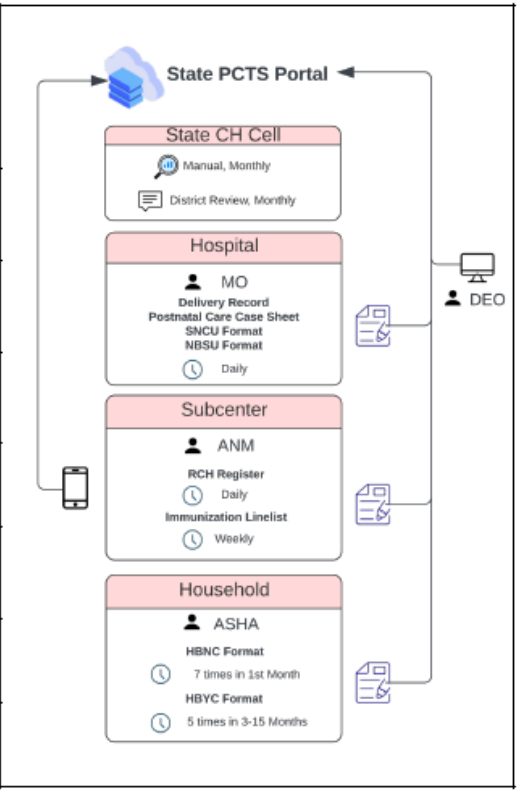
*"The availability of the data and medical records are very handy with the DHS app, no matter which location the ASHA is, she can access the details of patients and share them with concerned health workers"*

# Mapping the Health Informatics Landscape




The DMHFW has more than 12 primary health care program verticals, each with its own system for health tracking. Mapping these systems has been a research objective within Khushi Baby to understand opportunities for improvement and integration, especially with the introduction of the CHIP ecosystem. In collaboration with Warren Alpert Brown Medical School, Khushi Baby has performed qualitative research, interviewing 22 state level health officials and 17 community health workers, to map out the health information systems across Rajasthan, to develop and assign a technical maturity framework, and to identify barriers and opportunities.

| Health Worker | Location | Health Record | Format | Collection Frequency | Submission Frequency |
|---|---|---|---|---|---|
| MO | Hospital | NBSU Delivery Record | Excel | Daily | Monthly |
| | Hospital | PNC Case Sheet | Paper | Daily | Monthly |
| | SNCU | SNCU Record | Paper | Daily | Daily |
| ANM | Anganwadi | RCH Register | Paper/ Mobile App | Daily | Monthly/ Daily |
| | Anganwadi | Immunization Line List | Paper/ Mobile App | Weekly | Monthly/ Daily |
| ASHA | Household | HBNC | Paper | 1, 3, 5, 7, 14, 21, 28 days | Monthly |
| | Household | HBYC | Paper | 3, 6, 9, 12, 15 months | Monthly |

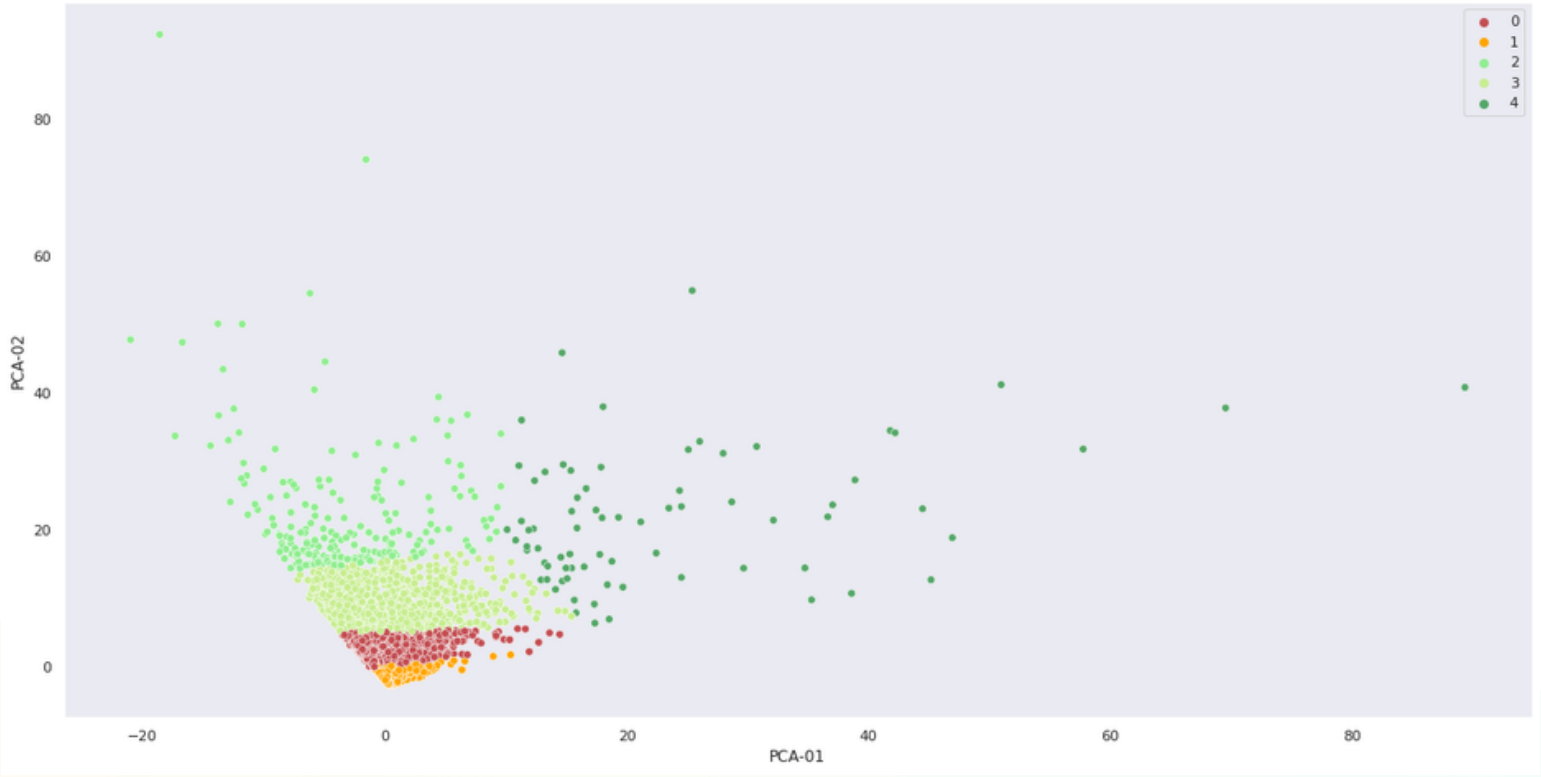



Practices of recording and reporting health records at DMHFW, Rajasthan on July 2022.

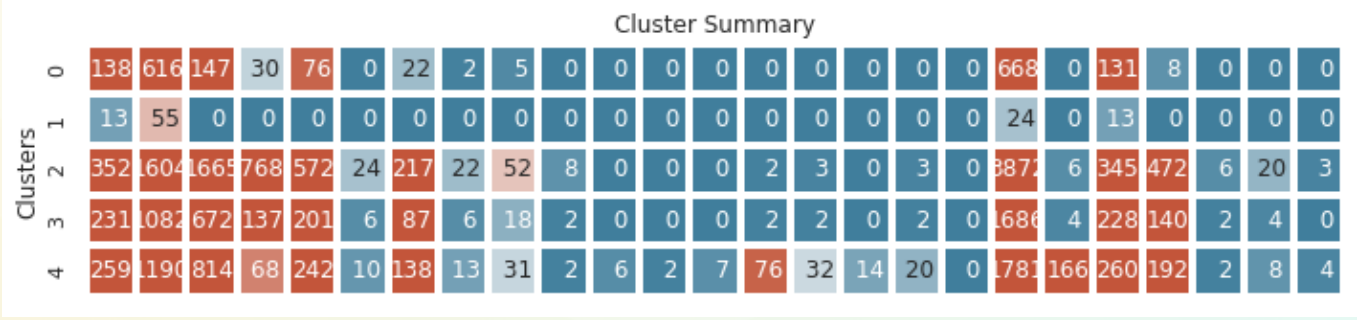
## Measuring Data Quality

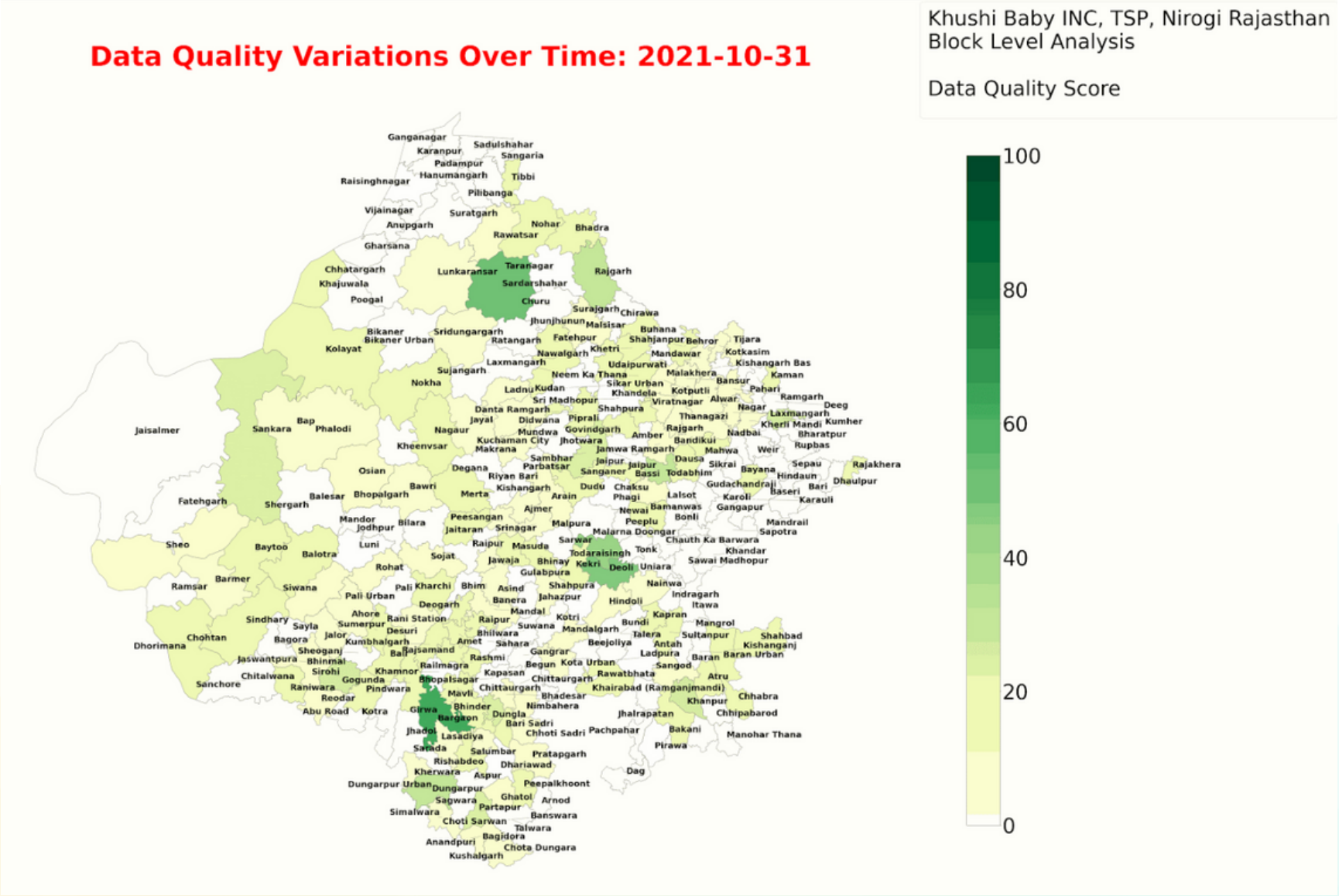
We have taken a rigorous and peer-reviewed approach to measuring data quality among community health workers. This effort serves two key purposes: first, to identify health workers who can benefit from supportive supervision, and second, to filter high quality data for use in our predictive models. In partnership with Google AI for Social Good, we have extended our research on data phenotyping via unsupervised clustering for ANMs to also include over 20,000 ASHAs. Additionally, we track a heuristically derived data quality score of ASHAs across space and time to strengthen real-time monitoring and inform local feedback.

## Scatter Plot of Health Worker Performance




## Unsupervised clustering of 20K ASHAs

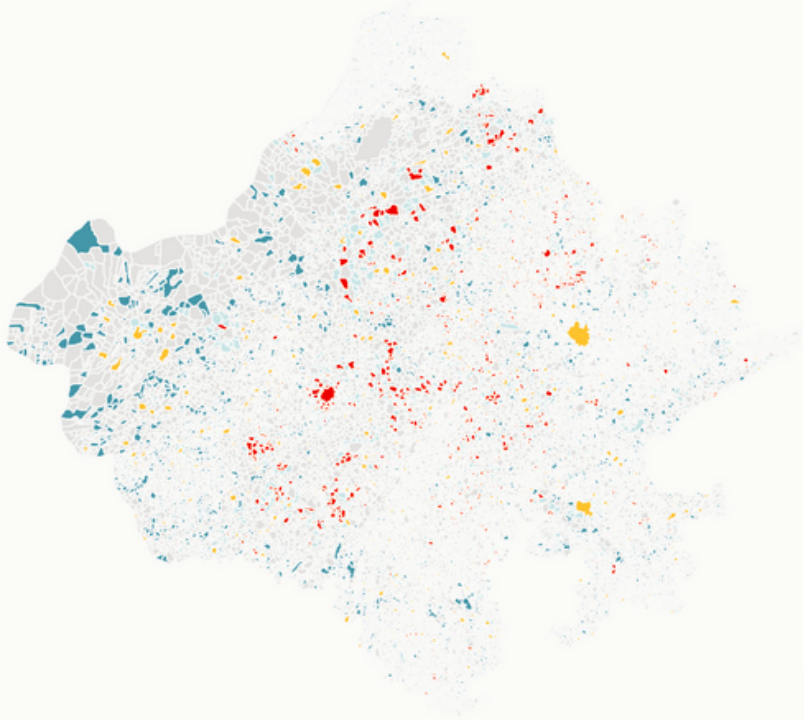





Spatiotemporal trends in ASHA data quality score

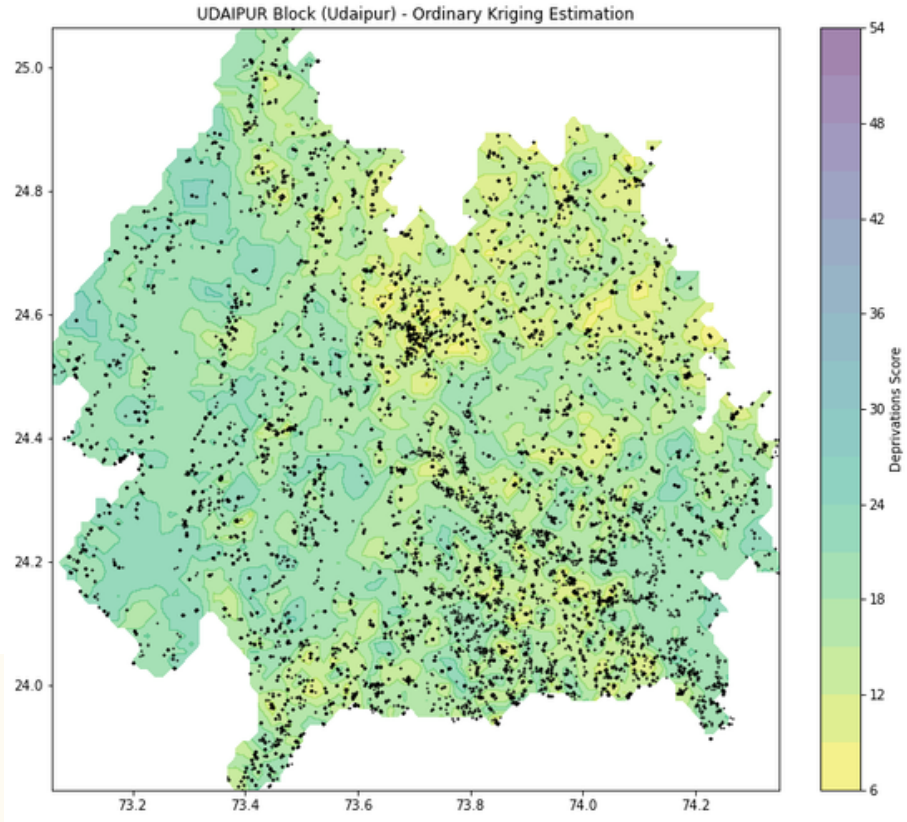
## Community Health Modeling

Our objective is to understand which communities are at highest risk, under the highest burden of disease, and in most urgent need of resources. This effort begins with primary epidemiological analysis from reported prevalence rates of key performance indicators between different geographies and over time. From there we apply filters of health worker data quality, identify spatial outliers, interpolate outcomes for areas of underreporting, and identify spatially relevant predictors for the outcomes using multivariate geospatial regression techniques. We are able to output map-based visualizations with village-level granularity on key performance indicators for health officials to take targeted actions

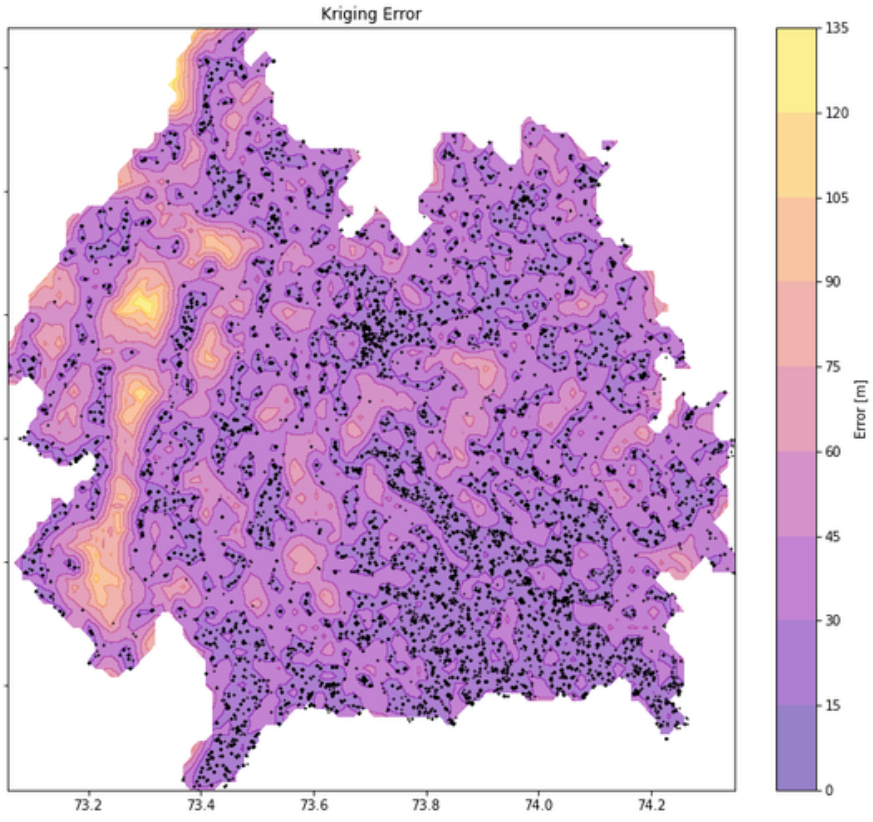


Spatial outliers of TB at the village-level.

> We aim to reshape fundamental building blocks of public health programs using digital solutions. We hope to create a solution, crafted in rural India with voice of health workers, that solves community challenges in public health,
>
> - Arulsrinivasan, Lead Backend Developer




Multidimensional poverty index interpolated predictions within the Udaipur District.




Confidence in interpolation

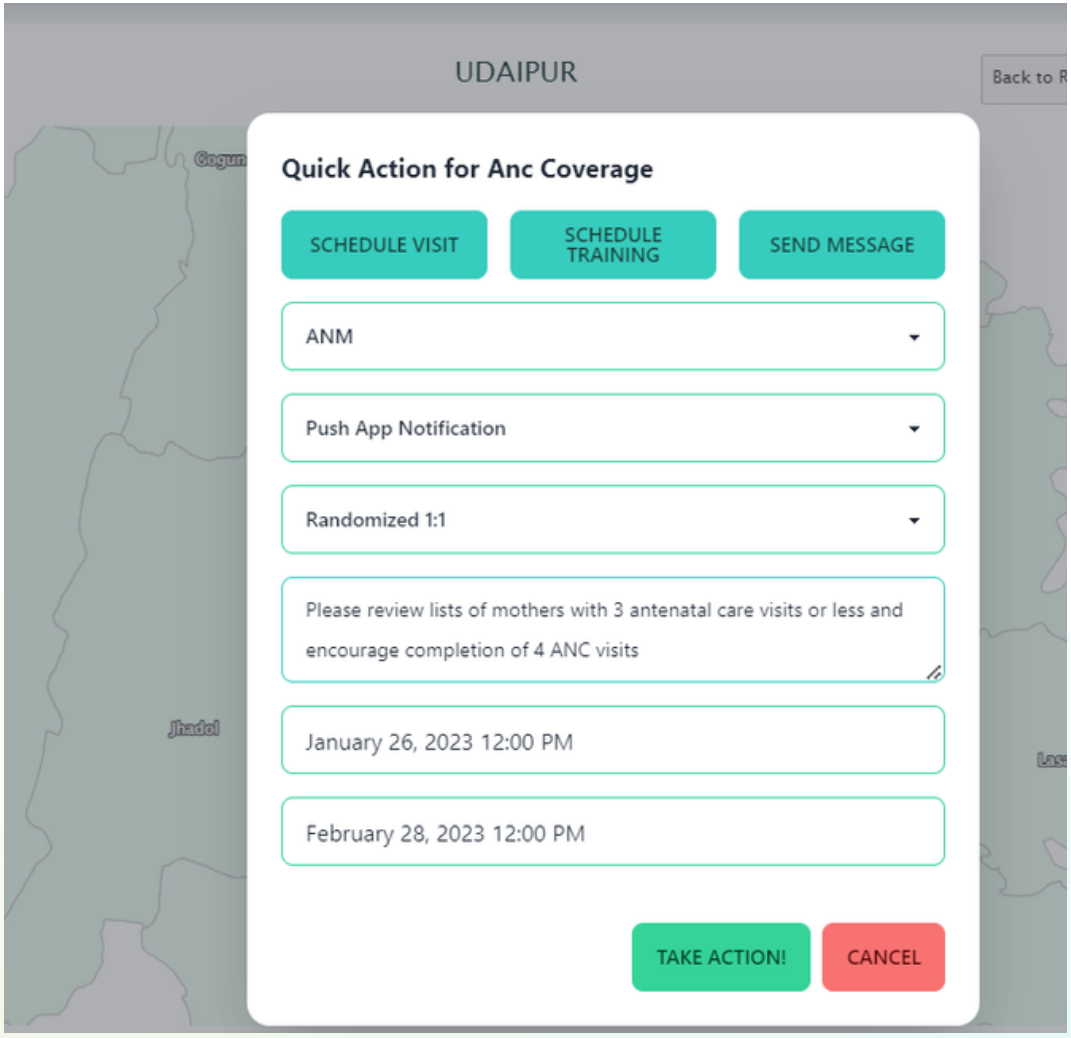
## Automated Impact Evaluation

Once communities at risk have been identified, health officials should not only be able to strategize and schedule interventions, but also be able to measure the impact of their interventions. Tools like Google's Firebase already have features to perform A/B tests in order to see effects of features on in-app engagement.

📍 Intervention results in! Complete ANC Coverage in **Jhadol** improved from 10% to 15% over the last month.

✅ Statistically Significant

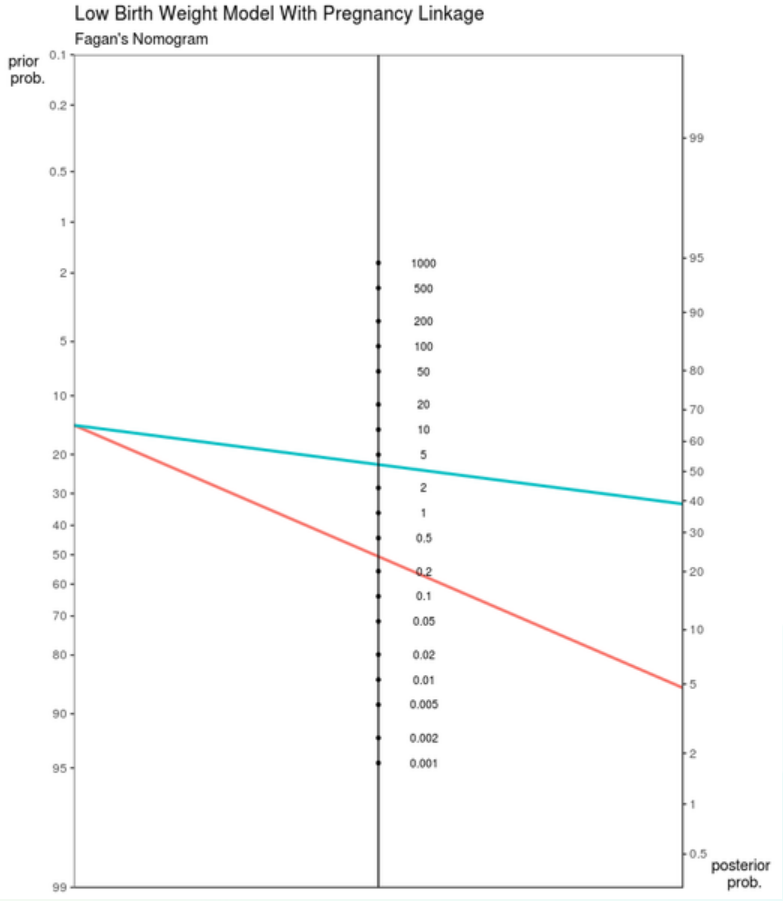
We are extending this concept to measuring effects of interventions on health outcomes. To achieve this objective, we are building a gamified dashboard for health officials that includes a mechanism to schedule randomized controlled trials (e.g. message campaigns, training sessions or local camps) with automated impact evaluation (using appropriate statistical techniques such as interrupted time series analysis) on key performance indicators.




Quick Action feature in the proposed gamified dashboard

# Individual Health Modeling


Explainable machine learning models to identify factors that contribute to probability of an outcome.

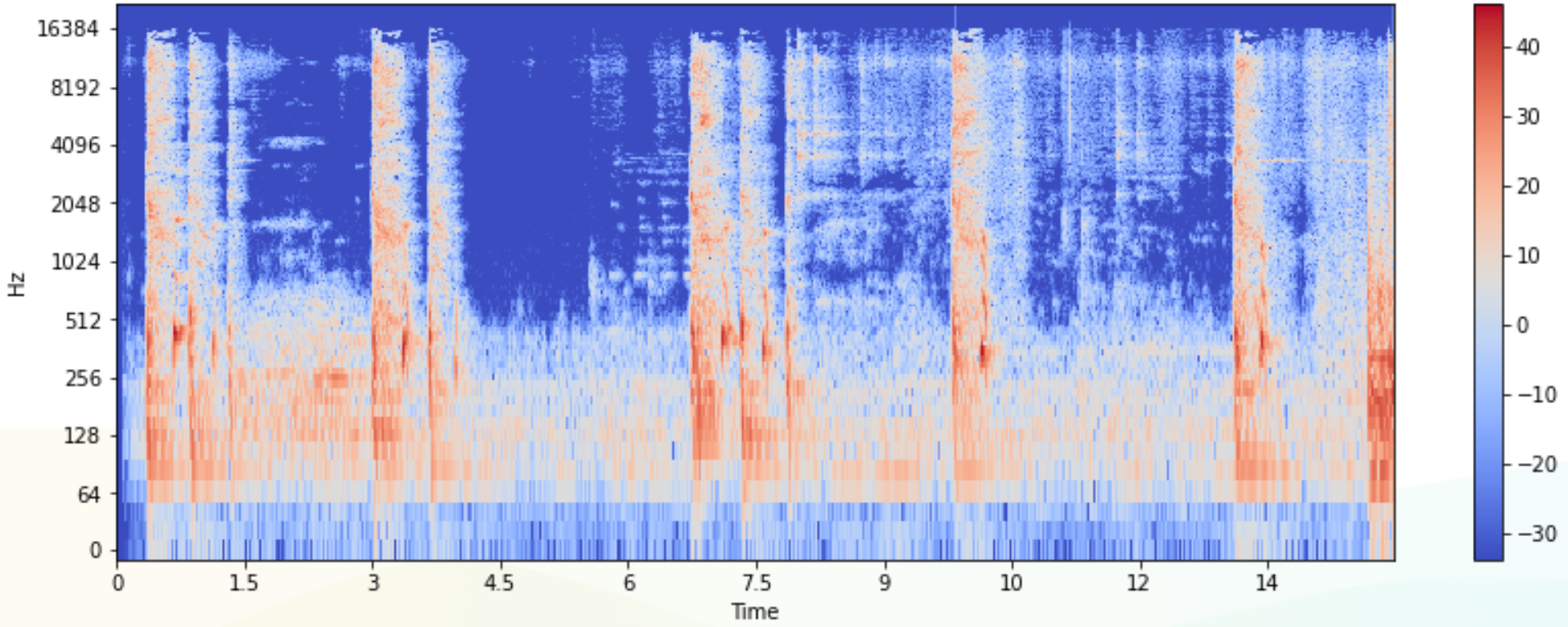



Pre-test probability of low-birth weight infant increases from 12.5% to post-test probability of 55% after application of our Random Forest model trained on over 6500 pregnancies, which incorporates social determinants of health and antenatal care parameters

How does an Auxiliary Nurse Midwife know which of the 50 pregnant women across 4 villages under her care are at highest risk? Beyond heuristic flags, there is an opportunity to use machine learning models to predict longitudinal health outcomes at the individual beneficiary level and relay this relative risk to the mobile application of the community health worker. In collaboration with partners Google AI for Social Good and JHPIEGO, we have developed 7 machine learning models to predict: maternal anemia, antenatal care dropout, stillbirth, low birth weight, severe underweight status at 2 months, and severe acute malnutrition.

Currently these models are being validated in prospective studies. Next steps include incorporation of the model findings into the health worker user interface, with a feedback mechanism to introduce a “human-in-the-loop” to further strengthen the model applicability to last mile settings.

## Smartphone Augmentation




Mel-spectogram of cough audio to be used in machine learning models for TB prediction.

With over 70K community health workers using smartphones at the point of care, there is an opportunity to improve screening tests by use of the smartphone's own detectors - in particular smartphone images. We are excited to launch 2 new projects to take advantage of the smartphone as a diagnostic tool.

First, we are partnering with Wadia Hospital in Mumbai to assemble a model to determine moderate maternal anemia from smartphone image inputs of the conjunctiva and tongue. This will be the largest study to date of its kind for pregnant women. We aim to enroll 3000 participants and collect data in real-world conditions, adjusting for differences in lighting and focus to build a lightweight model that can run offline on smartphones in rural settings. This is significant because existing screening methods for moderate anemia in rural India are imprecise (requiring a finger prick and subjective colorimetric evaluation). Additionally, identification of moderate maternal anemia can prompt treatment with iron sucrose infusions which can measurably reduce the risk of intrapartum and postnatal adverse health outcomes.

Second, we are excited to be working with the Tuberculosis Control Program within the Department of Medical, Health, and Family Welfare, Government of Rajasthan. We will be collecting audio samples of high-risk (symptomatic) beneficiaries during active case finding drives. These audio recordings will be converted into spectrograms which can then be used to predict tuberculosis status. The goal is to develop a lightweight model that can run on smartphones to improve risk stratification at the point of care, so that frontline health workers can prioritize completion of high-risk referrals

# Deployments

## Rajasthan

### Community Health Integrated Platform (CHIP)

The Community Health Integrated Platform (CHIP) is an effort to address the primary health gaps across all major health vertical programs (broadly Reproductive and Child Health, Non-communicable Diseases, and Communicable Diseases). The platform has been developed as per national guidelines (e.g. RCH Register, CBAC form, NCD Portal, Nikshay follow-up and registration, ASHA register, Delivery Register, IHIP formats), so that each health worker in the referral loop has a unified interface for tracking patients and reporting community health outcomes. The CHIP integrates primary health care verticals with modules for each of the three key health workers - ASHA, ANM & MOIC.

Initiation Date: January 2021

Many ASHA workers are becoming first time smartphone owners through CHIP's roll-out

## **Challenge:** multiple registers, applications and online portals without interoperability

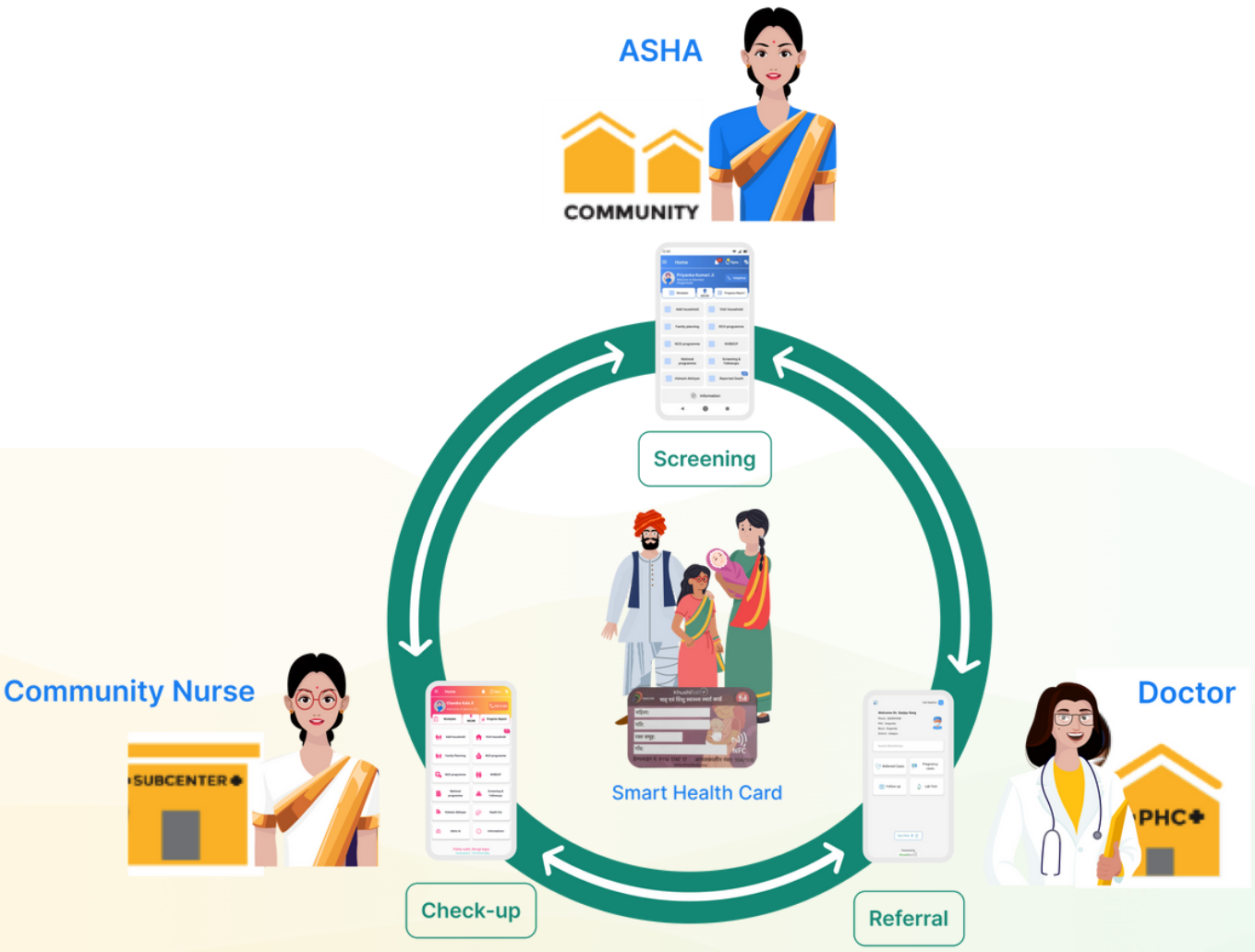
Beneficiaries


ASHA


Community Nurse


Doctor


**CHIP** : an offline, unified, mobile interface to support integrated, longitudinal of care tracking across NHM programs




## Health Programs

- FAMILY PLANNING
- MATERNAL HEALTH
- CHILD HEALTH
- HYPERTENSION
- DIABETES
- SMOKING CESSATION
- ORAL, BREAST, CERVICAL CANCER
- MALARIA
- TB
- HEPATITIS

## Focus areas:

- Digital Health Census
- Family Planning
- Maternal Health
- Intrapartum Health
- Infant Health
- Child Health
- Adolescent Health
- Diabetes
- Hypertension
- Anemia
- Oral Cancer
- Breast Cancer
- Cervical Cancer
- TB
- HIV
- COVID19
- Malaria
- Hepatitis
- Immunizations
- Smoking
- Alcohol use
- Cataracts
- Geriatrics
- Mental Health

## Features

- Unified interface for longitudinal care coordination across national health vertical programs
- Supports collection of over 800 indicators across national health programs
- Decision support before, during, and after care provision for community health workers
- Rapid registration through state citizen database and Aadhaar QR code scanning
- Offline-first, minimum typing, icon-based buttons, customized for the local language
- Integrated IOT devices for automated collection of vital parameters, and new smartphone diagnostics forthcoming
- Automated data quality checks at the time of using app and for health officials to compare performance
- Biometric and NFC integrations available to improve data authenticity and portability

> Khushi Baby has an advantage. They have public health expertise. They have technical expertise. They are understanding the government, public, and community health interests and translating them to the platform. Flexibility for receiving field inputs is giving a good acceptability to the system.
>
> - Dr. Rakesh Vishwakarma, WHO, State Lead, Rajasthan

## Data Explorer

Rajasthan

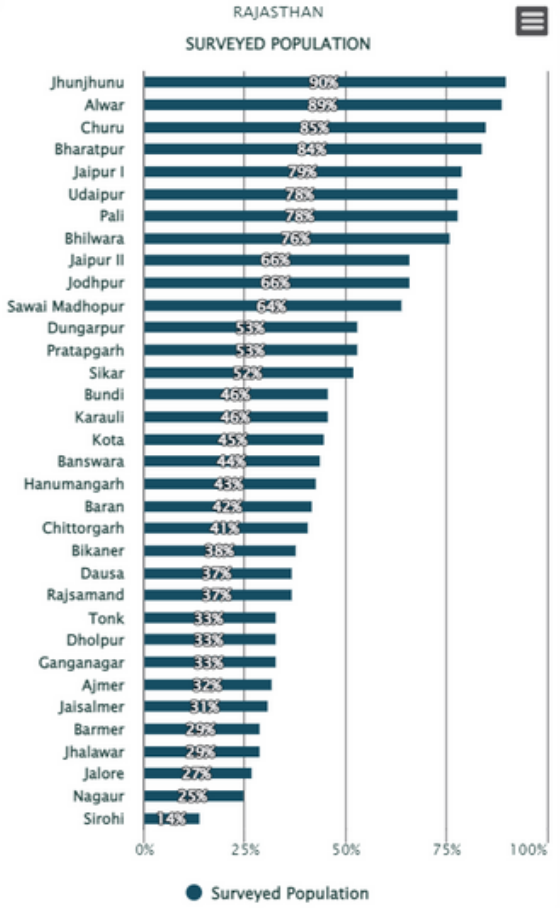
Search Indicator

- Demography
  - Surveyed population 60%
  - Infant population 1%
  - Child population 6%
  - Youth population 17%
  - Geriatric population 10%
  - Nomadic population 3%
- SES
- Health Status
- Maternal Health
- Immunization
- Data Quality

| Registered Population | Surveyed Population | Families Surveyed |
|---|---|---|
| 34299531 66.5% | 31188780 60.47% | 6526534 66.53% |
| Target: 51579746 | Target: 51579746 | Target: 9809961 |

Explore

GIS MAP


Registered Population

An ANM providing routine preventative maternal care at the MCHN session

## Progress

**70K+** unique users (ASHAs, ANMs and Medical Officers)

**35M** beneficiaries tracked

**3M** high-risk beneficiaries identified

## Challenges

- Policy mandate to remove paper-registers pending
- Integrations with key backend systems
- Distribution of incentives through existing financial platforms

"The surveys are horizontal but the programs and interventions that are being covered under the CHIP are vertical. This means, [after] surveying a family or a person once, they will come under different programs or verticals according to their need and group throughout their life. In this way, all programs will be delivered under one umbrella.

- Dr. Tarun Chaudhary, PD MH, DMHFW

Ministry of Health & Family Welfare

RECORD OF PROCEEDING
(RAJASTHAN)
2022-2024

National Health Mission

| | |
|---|---|
| | 2. Rs. 5382.68 lakhs for FY 22-23 & Rs 5372.68 Lakhs for FY 23-24: Community Health Integration Platform for Digital Health Survey and Real Time Basis |

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| Approved | |
|---|---|
| FY 2023-24 | GoI Remarks |
| | Reporting, creation of a new platform to integrate primary health care verticals into a unified interface with individual mobile application modules for ASHA, ANM and MO in charge, as proposed. |

## What ASHA says about CHIP.....

"I can register beneficiaries by simply scanning their Aadhaar code. When I enter the mother's last menstrual period date, it tells me her weeks of pregnancy. Before the monthly camp, I know who is due for vaccines. This all has been made possible by the ASHA Digital Health application."

- Lata Chauhan, ASHA, Pali District

# Powering up CHIP

| | |
|---|---|
| 400 + | Trainers Trained |
| 10K + | HWs trained |
| 181K + | Hours spent in the filed |
| 133K+ | Messages circulated on WA groups |
| 100+ | Video tutorials created for users |
| 490 | Health worker WhatsApp groups |

490


Dedicated Call centre that addresses issues of 300+ calls on daily basis

1 Communication

2 Capacity Building

3 Digital & Clinical Empowerment

> Khushi Baby has turned the traditional model of community health delivery system in to the modern model, which in turn has helped the dreams of "digital India" and "your health in your hands" come true.
>
> - Mukesh Trivedi, Field Coordinator, Khushi Baby

# Prasav Watch Labor and Delivery Tracking Tool

Prasav Watch is a mobile-based intrapartum health tracking tool in Rajasthan, India. It is designed to help labor room service providers monitor the progress of labor and make timely decisions to save the lives of mothers and infants and support healthy delivery outcomes. Prasav Watch uses 8 parameters based on 360-degree quality maternity care which includes service provision, patient's rights, input, supportive services, clinical services, infection control, quality of care and health outcomes. Prasav Watch fills in the missing piece on the longitudinal continuum of care between maternal and child health by allowing for primary capture of delivery outcome details.

Initiation Date: May 10, 2021

A staff Nurse uses Prasav Watch to review the history of patient

With the help of Prasav Watch Application, paperwork has been reduced and the referral process has become easier.

- Dr Prahlad, MOIC, PHC Hingonia

## Focus areas:

- Intrapartum health care of pregnant woman and child
- Making antenatal care history available to providers
- Clinical-decision support system for high-risk cases
- Referral to higher care facilities

## Progress

| | |
|---|---|
| 638 | unique users |
| 409K+ | cases registered |
| 16K+ | high risk referred beneficiaries |

## Challenges

- Integrating CHIP with a standalone system for the first time posed new technical challenges

## Partners / funders:

> The integration of the Prasav Watch with the CHIP platform enhances its potential by providing access to the patient's medical and gestational history, creating a continuum of care and facilitating the identification of high-risk beneficiaries, especially in less privileged areas.
>
> - Saket Kumar, Lead Data Engineer, Khushi Baby

Establishing the continuum of care through the intrapartum monitoring tool, i.e. the Prasav Watch, we are able to save time of the service providers at the labor room. That saved time of even four to five minutes can be utilized to deliver quality services to the clients coming into the labor room.

- Dr. Yashpal Jain, JHPIEGO

# Biometrically Authenticated Digital Health Census

Khushi Baby collaborated with Simprints, another technology non-profit, on a pilot project integrating Simprints' facial biometrics solution with the CHIP platform. The objective of the pilot was to facilitate unique registrations during the digital health census with real-time deduplication, to accountably verify COVID19 vaccination receipt, and to understand community perceptions regarding facial biometrics.

Initiation Date: September 2021
Closing date : April 2022

> “Names can be similar in a particular geography but the biometric cannot. This helps health workers to identify the same named beneficiaries with more accuracy. For the follow-up visits to the households, they do not need to search via name or go through the entire list of beneficiaries, they can directly scan the face and data can be retrieved and they can provide the services
>
> - Dr. Vijendra Banshiwal, Program Lead, Khushi Baby


KB Field Monitor conducting training session for ANMs and ASHAs

## Focus areas

- Authenticated digital health census
- COVID-19 vaccinations
- First pilot implementation of facial biometrics integrated with a community health worker digital health platform in India

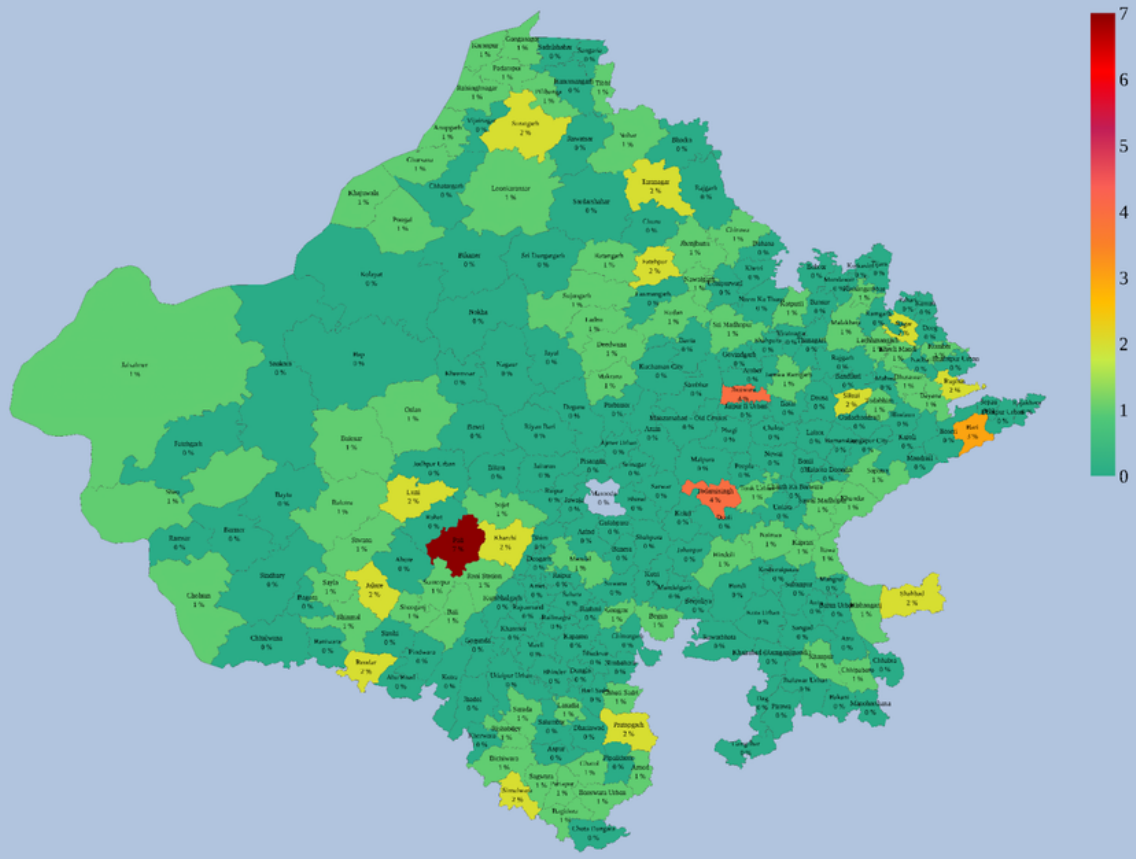
## Progress

| | |
|---|---|
| 3.5K | HWs Trained |
| 1.15 M | Surveys completed, |
| 117,K+ | Successful biometrics registrations |
| 132K+ | Covid-19 vaccine authentication for 1st and 2nd doses recipients |

## Challenges

- Regulatory uncertainty regarding use of facial biometrics
- Offline biometric template capture and encryption

## Partners / funders:




Status of anemia cases identified among the registered population under the Campaign (MNRCSS)

# Mukhyamantri Nirogi Rajasthan Chiranjeevi Swasthya Shivir (MNRCSS)

## (Chief Minister's Disease-Free Rajasthan Health Camps)

The Department of Health launched MNRCSS in late 2021. Through the initiative over 12,000 villages (gram-panchayats) received screening camps for primary health care issues. Teams of physicians, pediatricians, dentists, and para medical staff would conduct camps for hundreds to thousands of patients over the course of one to three days. Khushi Baby's CHIP Dashboard was used to track the progress of the health camps and map the disease burden and services rendered.

Initiation Date: 14th November 2021

Health camp at a gram panchayat under the MNRCSS Campaign

## Focus Areas:

- All major primary health verticals: family planning, maternal health, child health, NCDs, TB, long COVID-19, immunizations, general OPD care
- Distribution of disability certificates
- First effort to track camps digitally at the gram-panchayat level

## Progress

| | |
|---|---|
| 3.3M+ | People Screened |
| 2.7M+ | People Treated |
| 60K+ | Teleconsultations |
| 30K+ | High-risk referrals |

## Challenges

- Seed data management
- Lack of linelist data form beneficiaries
- Lack of mechanism to monitor for data quality.

## Partners / funders:

"It was the first time ever in Rajasthan that paperless reporting was used for screening health camps. Health teams would submit daily progress on the CHIP Dashboard, enabling real time monitoring of the campaign. dashboard also improved accountability of the camps by improving data transparency of services rendered. We believe that ultimately this had a positive impact on the quality of care received by beneficiaries.

- Dr. Rajeev Singh Dhakad, Government Relations Lead, Khushi Baby

# Janta Clinics- tracking RCH for the urban underserved

Janta Clinics represent Rajasthan's model for digitally enabled urban primary health care clinics. Twelve Janta Clinics in Jaipur have served as a model over the past three years and are now being replicated across the state in collaboration with the National Urban Health Mission division. The Janta Clinics are 500sqft cabins which provide outpatient department (OPD) services, routine maternal and child health care services, and pharmacy services. Khushi Baby's reproductive and child health tracking solution is used currently for RCH services.

Initiation Date: December 2019

## Focus area

- Maternal Health
- Child Health
- Health of underserved urban communities

## Progress

| | |
|---|---|
| 12 | Health Workers - |
| 738 | Pregnant Women Tracked |
| 1189 | Antenatal Care Visits conducted |
| 188 | High Risk PWs Identified |
| 3366 | Children tracked |
| 7638 | Child checkups carried out Vaccination |
| 61220 | tracked |


Antenatal monitoring through IOT devices at a Janta Clinic

> By ensuring that patients receive the right care and follow-up, as well as by giving them access to records of their medical history, Janta Clinics are helping improve health outcomes for the most marginalized urban communities in Jaipur.
>
> - Dr. Swati Kharbanda, Public Health Officer

# Project: Born Healthy

The program is an attempt to devise an evidence-based ANC model with a special focus on the identification and management of maternal infections as well as strengthening targeted supplementation of iron and calcium during pregnancy. Jhpiego in collaboration with Khushi Baby tested a model of improved ANC—called group antenatal care—that also used technology in the form of point-of-care diagnostics to make testing and treatment of key high-risk maternal conditions efficient, cost-effective and readily available. Strengthening identification and tracking of high-risk pregnancies was also a key focus area. The program was implemented in 55 facilities across 14 blocks of four districts of the state of Rajasthan (Bundi, Dholpur, Karauli and Udaipur). This model is being considered in revised antenatal care guidelines nationally.

Initiation Date: March 2021 to Dec. 2022

## Focus areas

- Maternal Health
- UTI, TB, and Malaria screening
- IOT device integration
- Referral linkages

## Progress

| | |
|---|---|
| 6637 | Pregnancies Registered |
| 693 | HR pregnancies identified |
| 1184 | Pregnancies referred to digitally enabled primary health centers |
| 712 | high risk pregnancies referred through the system who received care from doctors |

## Partners / funders:

# Maharashtra

## DL Shah Khushi Baby Wadia Project

Khushi Baby built a platform to digitally track reproductive and child health care services in the well-mother and well-baby OPD clinics of the Wadia Hospital. This platform took learnings form implementations in rural Udaipur, Rajasthan and urban underserved Jaipur primary health clinics for our first deployment with a safety net maternity and child hospital.

Initiation Date: March 2021

### Focus area

- Maternal Health
- Child Health
- Urban underserved primary health care

### Progress

**9900 +** Children registered and tracked

**8000 +** Automated voice calls delivered

### Partners / funders:


Nurse at Wadia Hospital provides an NFC-enabled health card with the child's vaccination records

> We do have a collaboration with the Wadia Trust hospitals where we are testing out interventions that Khushi Baby has piloted over the years. When you understand what's going on in different parts of the country, you can carry back some of those ideas and replicate them.
>
> - Smt Sujata Saunik, IAS, Additional Chief Secretary, Government of Maharashtra

# Andhra Pradesh

## Amma Kosam Project

Khushi Baby partnered with the Administrative Staff Colleges of India to roll-out a customized version of the CHIP Digital Health Census and Reproductive and Child Health tracking modules in the village of Tatipaka, Razole Mandal, Konaseema District. This is Khushi Baby's first implementation in a southern Indian state and includes integrated features such as Near Field Communication health cards.

Initiation Date: 19th September, 2022

### Focus area

- Digital Health Census
- Reproductive and Child Health

### Challenges

- New language and region
- Remote monitoring
- Pilot / lack of integration with state systems

### Progress

2090 Beneficiaries tracked

### Partners / funders:

Administrative Staff College of India
Leadership through Learning

The Amma Kosam App enables frontline health workers to provide better healthcare to underserved populations, improve overall health outcomes, and create healthier communities in Andhra Pradesh by combining human and technical effort. The usage of smartphones by healthcare professionals will greatly improve their skills, which is a positive step towards gender equality and a tech- enabled society.

-Dr. Murali Krishna Iyyanki
Chairman, ISPRS Working Group on Geospatial Environment & Health

# Team Reflections

What excites you about KB's future?

"rising from our inflection point"

"integrating our model"

"scaling with governments"

"empowering health workers"

'building digital capacity"

"decentralising technology"

"AI and ML for personalized health care"

"solving complex problems"

"building India's future"

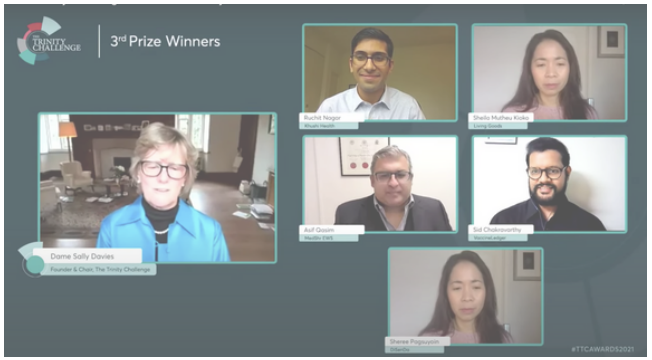
"making an impact"

"saving lives"

"spreading Khushi"

"becoming a national standard"


Khushi Baby team attending the village anganwadi session on nutrition


# Key Recognitions

- Winner - PATH Primary Health Care Technology Challenge (Digital Health)
- Winner - PATH Climate x Health Challenge (Risk Mitigation and Adaptation)
- Winner of the Social Innovation Health Care Initiative's India Healthcare Excellence Award
- Third place - Trinity Challenge for Pandemic Prevention
- Mohammed Shahnawaz (COO / Co-founder) recognized as Times Now Amazing Indian for leadership in implementation of our Community Health Integrated Platform
- Certificates of appreciation from Rajasthan DoMHFW for support for tobacco control and hepatitis screening statewide campaigns

# Stakeholder Summit

Khushi Baby organized a two-day Khushi Baby Stakeholder Summit 2022 on November 16 - 17, 2022 in Udaipur, Rajasthan. The theme of the Summit was "The Leading Edge: Digital Innovations for Transforming Community Health in India". The summit was well attended by 100+ participants and stakeholders. This summit uniquely spotlighted voices from the field. Four champion health workers provided their feedback on CHIP in a keynote panel (ASHA Bharti Meenariya shown on the left).

Representatives also came from Government of Rajasthan (SPM, PD MH, Immunization, RBSK,RKSK, SNO CH,SNO Immunization, SO, ASO, PO ASHA); development partners: WHO, USAID, BMGF, UNFPA, UN WFP, NIPI, JHPIEGO, PATH, PHFI, PSI, Plan India, ASCI, Save the Children, GH Labs, Seva Mandir; and philanthropic groups such as UBS Optimus Foundation and Kotak Mahindra Bank. Two former secretaries of health who managed health services for a combined 200M beneficiaries, Sujata Saunik (Additional Chief Secretary, Government of Maharashtra) and Rohit Kumar Singh (Secretary, Government of India), shared their perspectives during keynote addresses.

Khushi Baby also demonstrated its flagship CHIP platform in detail to the audience along with field visits to eight villages across Udaipur, where Village Health and Nutrition Day (VHND) camps were taking place for delivery of maternal and child health services. The visits highlighted use of the CHIP platform in the local context.

The event also saw the announcement of partnership & MoU signing between Khushi Baby and ARMMAN to leverage the synergies between the respective digital health platforms working at scale in India.

Khushi Baby Stakeholder Summit, 2022

“What excites me about the collaboration between Khushi Baby is how complementary we are. When to refer, how to counsel, adding those programming layers can make an end-to-end solution”

- Dr. Aparna Hegde, Founding Chairperson Armman


# Financials

FY2021:
Revenue: $983K
Expenditures: $625K*
*Included 226K for mobile phones

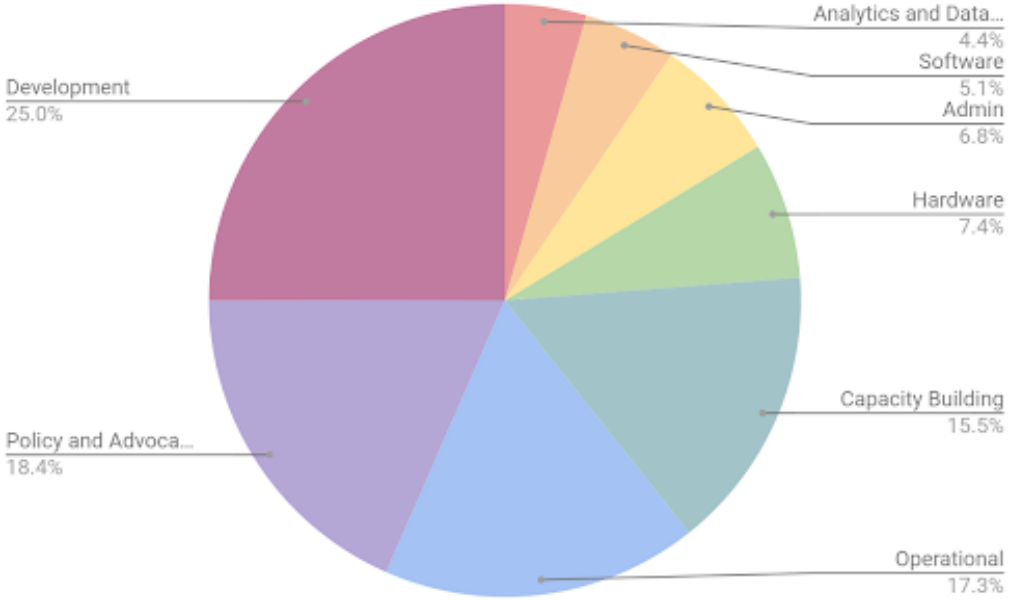
FY2022:
Revenue: $612K
Expenditures: $629K

Runway: 10.5 months
Balance: $650K

Supported by:

- Patrick J McGovern Foundation
- ARM
- Trinity Challenge
- Google.org

Raising: $1.5M



# Our Partners

## Funding and Mentorship Support

Gavi The Vaccine Alliance
Google.org
Patrick J McGovern Foundation
The Trinity Challenge
David Weekley Family Foundation
Fondation Pierre Fabre
Grand Challenges Canada® Grands Défis Canada
BOLD IDEAS WITH BIG IMPACT®
MIT SOLVE
Bill & Melinda Gates foundation
Goldman Sachs
unicef INNOVATION
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
Johnson & Johnson
THE/NUDGE
arm
C-CAMP Centre for Cellular and Molecular Platforms
PATH
HDFC BANK
Marico Innovation Foundation
Rambagh Palace Jaipur
aws
kotak Kotak Mahindra Bank

## Development Partners

Department of Information Technology & Communication (Govt. of Rajasthan)
World Health Organization India
jhpiego Saving lives. Improving health. Transforming futures.
Wadia Hospitals
Seva Mandir
D. L. Shah Trust For Applied Science, Technology, Arts & Philosophy
UNFPA
UNDP
simprints every person counts
Administrative Staff College of India Leadership through Learning

## Research Collaborators

SMU Singapore Management University
3ie International Initiative for Impact Evaluation
Harvard Medical School
Harvard School of Engineering and Applied Sciences
Google AI
IIHMR University
Brown Alpert Medical School
Yale School of Public Health

# Our motivation

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