FROM MANUALS TO MOBILE:
Digital Literacy and Technology Adoption Among India's Community Health Workers

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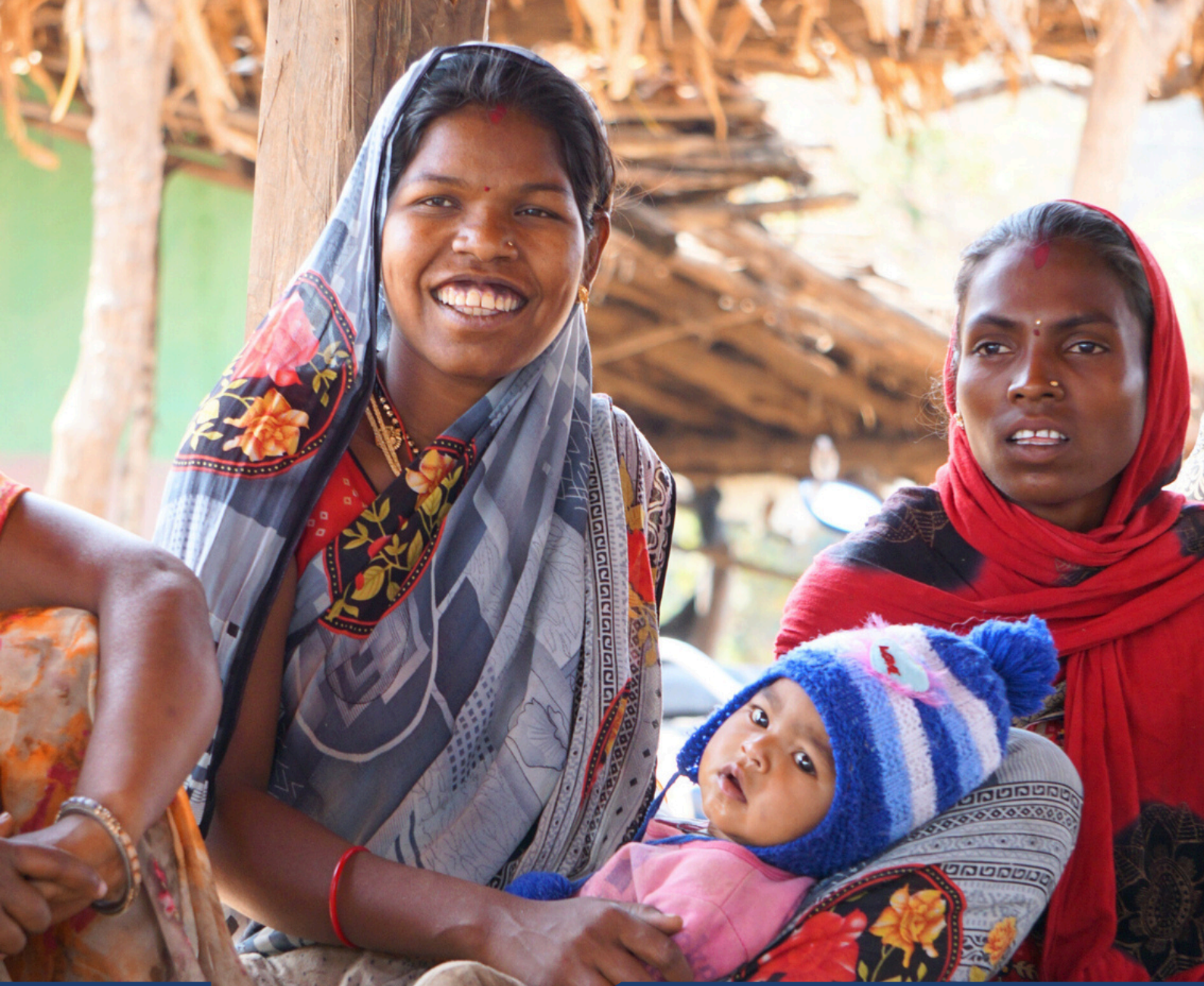
antara foundation



EXECUTIVE SUMMARY

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Community Health Workers (CHWs) are central to India's public health system, especially in delivering maternal and child health services at the last mile. As trusted members of their communities, CHWs play a vital role in improving healthcare access, continuity of care, and early intervention for vulnerable populations.

In recent years, digital health tools, ranging from mobile applications for service tracking to IVR-based training platforms, have emerged as powerful enablers of CHW performance. These tools hold tremendous promise of improving service coverage, enhancing data quality, and streamlining reporting. However, their adoption on the ground remains uneven and highly dependent on how they are introduced, designed, and supported.

This research explores the lived experiences of CHWs engaging with digital tools and unpacks the behavioural and systemic factors that shape adoption. Drawing on field insights, programmatic data, case study analysis and findings from the Akshita Baseline Study conducted in Madhya Pradesh, this study offers a grounded, human-centred view of India's digital transition at the frontline.

Key findings reveal a landscape of both challenge and potential. Most CHWs own smartphones but often share them with family members or rely on outdated devices. Digital literacy levels vary widely, shaped by generational differences, educational disparities, and regional constraints. One-time digital trainings, though common, rarely equip CHWs with lasting confidence, especially when paired with complex tools that are not tailored to their workflows. The burden of maintaining both digital and paper records, coupled with high data costs, usability barriers, and lack of real-time support, discourages sustained engagement.

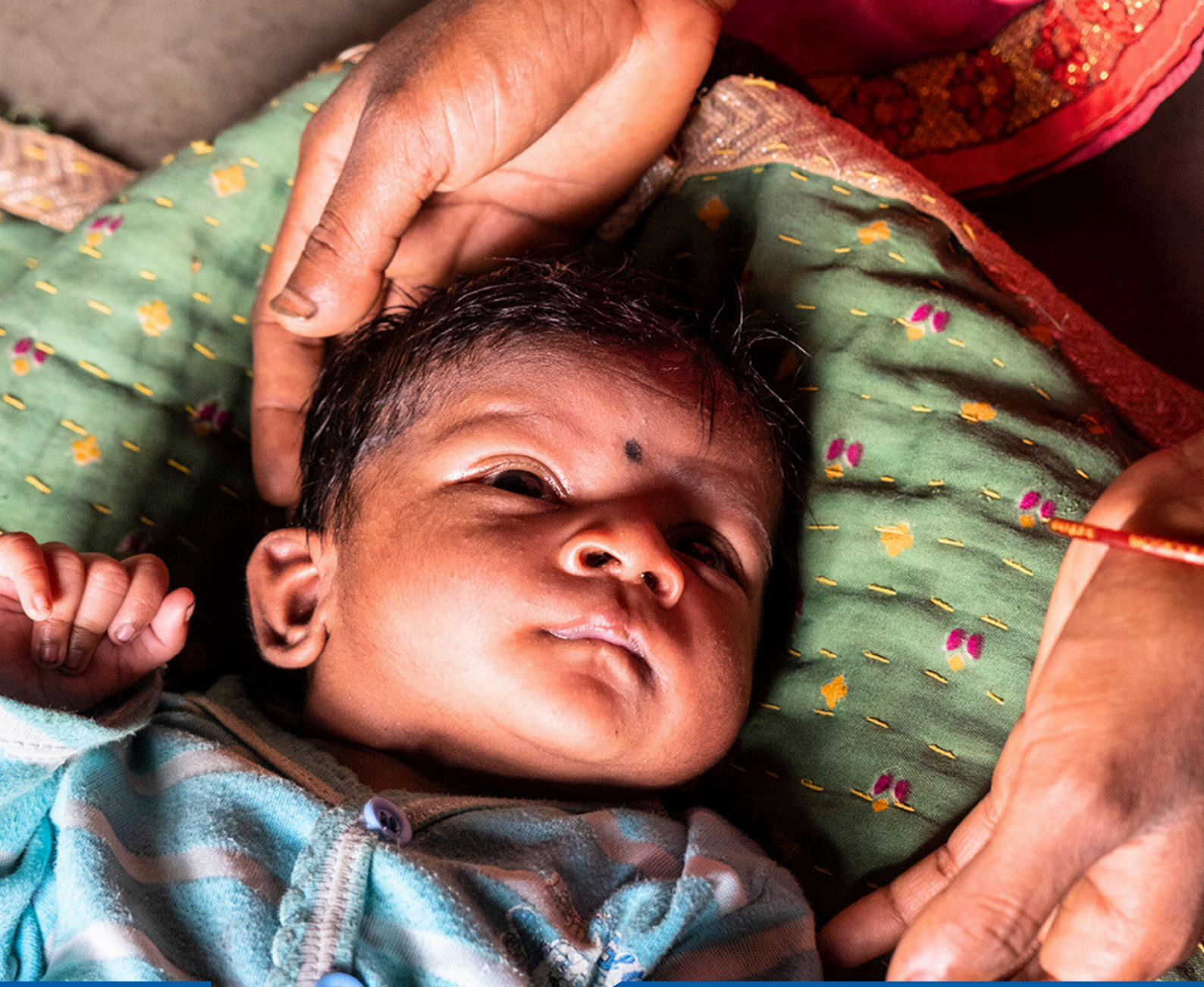
Yet, where digital tools succeed, common enablers stand out. CHWs are more likely to adopt technology when tools are intuitive, available in local languages, and capable of functioning offline. Training that is hands-on, peer-led, and reinforced over time leads to stronger confidence and consistent usage. Informal support networks, such as WhatsApp groups, often compensate for weak formal systems, allowing CHWs to troubleshoot issues in real time.

Programs that actively involve CHWs in design decisions, respect their feedback, and reduce duplication of effort see higher motivation and uptake.

Importantly, many CHWs are moving beyond basic usage to become peer mentors, co-trainers, and digital champions within their communities. Their growing comfort with digital tools is not only improving service delivery. It is also reshaping their professional identity, enhancing their social recognition, and building long-term capacity within the system.

For digital health tools to truly empower CHWs at scale, a shift in mindset is required. Technology must not be introduced as a compliance tool, but as a job aid that values CHWs' time, autonomy, and judgment. Training must evolve from one-time events to ongoing, multimodal support. Tools must be co-designed with CHWs, tailored for low-resource settings, and integrated with broader health systems to avoid duplication and fatigue. Supervisory structures must enable, not police, digital adoption.

While this study focuses on CHWs, its lessons are relevant for frontline workers across the development sector. As India's digital public infrastructure expands, the ability to create user-friendly, scalable, and inclusive systems will define its success. When CHWs are placed at the centre of digital innovation, the result is not only improved adoption but a more resilient and responsive public health system.



INTRODUCTION

1. INTRODUCTION

"It is 10 a.m. in a rural village in Madhya Pradesh, and Amina, a 32-year-old CHW is already on her way to visit an expecting mother. With her cloth bag slung over her shoulder, she reaches into it for her phone, a device she only recently purchased after months of saving. Having studied until the 10th grade, she is comfortable with basic reading and writing but has had little exposure to digital technology. The health department has introduced a new maternal health app for tracking antenatal care visits, but Amina is still familiarizing herself with its features. The icons seem confusing, and she is not sure if she has enough mobile data to sync the reports. Last night, her son borrowed the phone to watch videos, and now the battery is low. She sighs, making a mental note to check with her supervisor later. Digital tools have immense potential to support her work, and with the right guidance, she is confident she can make the most of them."

Amina's experience reflects the evolving landscape of healthcare delivery, where digital tools are becoming increasingly integral. Across India, CHWs are being introduced to latest technologies designed to enhance efficiency and improve maternal and child health outcomes. These initiatives, driven by national and state-level efforts, hold great promise. However, as with any transition, ensuring that CHWs have the necessary training and resources to effectively integrate these tools into their workflow is essential.

This research explores how CHWs in India are experiencing the shift to digital health tools including what enables adoption, what holds them back, and what system-level changes can strengthen their digital engagement. By examining both structural and behavioural factors across regions and initiatives, the study aims to provide actionable insights into making digital health truly work for those at the frontline.

1.1 Understanding the Landscape

1.1.1 The Role of CHWs in Public Health

Community Health Workers (CHWs) are a crucial part of India's rural health system, serving as the bridge between formal healthcare institutions and underserved communities. In the Indian context, CHWs primarily include Accredited Social Health Activists (ASHAs), Anganwadi Workers (AWWs) and Auxiliary Nurse Midwives (ANMs), all of them being female frontline workers who provide essential health services at the village level.

They operate within local communities to deliver maternal and child health support, promote disease prevention, and raise health awareness. Often, they are the first and only point of contact with the healthcare system for rural families.

CHWs were formally integrated into India's public health strategy through the launch of the ASHA program in 2005, under the National Rural Health Mission (NRHM). The initiative was driven by a pressing need to improve healthcare access in remote areas amid the chronic shortage of doctors and nurses. The government envisioned a cadre of locally selected women who could mobilize communities, deliver key health messages, and connect households to government services.

Over time, their responsibilities have grown. CHWs now conduct home visits, monitor pregnancies, encourage institutional deliveries, and provide newborn care, often under challenging conditions with minimal infrastructure. ASHAs alone have been credited with increasing institutional deliveries from 47% in 2005 to about 80% in recent years.[1]

As the health system has evolved, so has the role of CHWs, from behaviour change communicators to data collectors, service providers, and digital intermediaries. Their expanding responsibilities have made digital tools both an opportunity and a burden, depending on how thoughtfully these technologies are implemented.

1.1.2 The Rise of Digital Health and Its Promise

Digital health refers to the use of mobile technology, telemedicine, electronic health records, and artificial intelligence to improve healthcare delivery. The World Health Organization recognizes digital health as a key driver for Universal Health Coverage (UHC), particularly in low-resource settings where access to healthcare facilities is limited.[2]

[1]https://mohfw.gov.in/sites/default/files/3201617.pdf
[2]https://www.who.int/docs/default-source/documents/gs4dhdaa2a9f352b0445bafbc79ca799dce4d.pdf

Health workers across India continue to rely heavily on extensive manual record-keeping to track service delivery. ANMs typically maintain service delivery registers (SDRs) with over 20 tables to document antenatal care, immunization, and other maternal and child health services.[3] AWWs are still responsible for nearly 11 different registers to monitor child nutrition, growth, and preschool education.[3] Additionally, labour room staff manage separate registers for deliveries, maternal outcomes, and stock tracking. These paper-based records are consolidated into summary reports, which are then fed into centralized portals like the Health Management Information System (HMIS) for monitoring health indicators. Despite growing digitization efforts, mobile and web-based applications are usually introduced alongside, rather than in place of, paper registers. This usual system has led to duplication of work, increased administrative burden and limited efficiency gains.

[3]https://chwcentral.org/indias-auxiliary-nurse-midwife-anganwadi-worker-accredited-social-health-activist-multipurpose-worker-and-lady-health-visitor-programs/

India's digital health journey has evolved significantly over the last two decades. The key phases below illustrate how flagship programs have shaped this evolution:

2005–2010: Centralized Reporting Begins

- NRHM launched the ASHA program, formalizing CHWs as key actors in rural health.
- Manual registers formed the primary mode of service documentation.
- Introduction of the HMIS brought in standardized national reporting, though data continued to be collected and entered manually.

2010–2015: Early Digitization

- The Mother and Child Tracking System (MCTS) and Reproductive and Child Health (RCH) Portal were introduced to digitize ANC, PNC, and immunization tracking.
- Digital tools were used largely by supervisors; CHWs remained on paper.
- The broader Digital India mission, launched in 2015, set the stage for increased technology use across government sectors.

2015–2018: Mobile-enabled Workflows

- Tools like ANMOL (for ANMs) and ICDS-CAS (for AWWs) allowed CHWs to record and sync data through mobile devices.
- The POSHAN Abhiyaan promoted digital tracking of nutrition indicators.
- These tools often supplemented existing paper workflows rather than replacing them, leading to parallel systems and increased workloads

2018–2021: Towards Integration

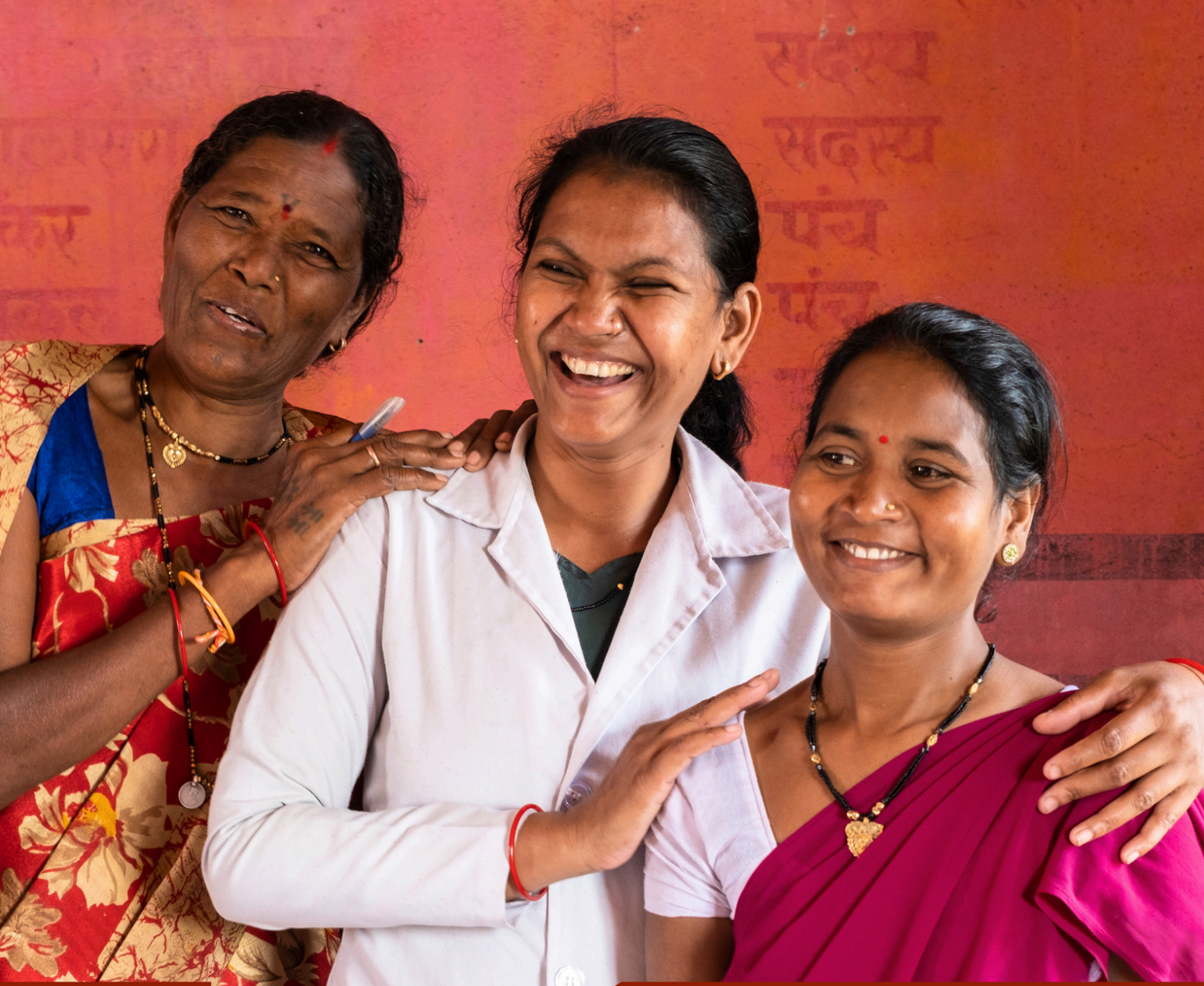
- The National Digital Health Blueprint (NDHB) proposed a federated health data architecture.
- Training platforms like Mobile Academy used IVR to deliver health education to ASHAs via basic phones.
- State-led pilots like ImTeCHO, mSakhi, and Simple provided task reminders, counselling prompts, and simplified workflows, designed specifically for CHW use.
- Peer learning and localised language content gained greater attention.

2021-Present: Real-Time Systems and Mass Adoption

- The Ayushman Bharat Digital Mission (ABDM) aimed to establish digital health IDs and integrated personal health records.
- During COVID-19, platforms like CoWIN, Aarogya Setu, and Google Plus Codes enabled real-time data management, contact tracing, and digital vaccination campaigns, supported by CHWs across India.
- These tools accelerated public acceptance and government investment in digital health infrastructure.

Post 2022: AI-Driven Support

- Recent efforts have begun introducing AI-based decision support, voice-enabled interfaces, and predictive alerts for high-risk pregnancies.
- These innovations aim to ease data entry, triage cases, and provide automated counselling but also introduce more complex interfaces.



METHODOLOGY

2. METHODOLOGY

One evening, Amina sits with her supervisor, trying to understand the latest health tracking app. But as she scrolls through the unfamiliar interface, she wonders: Did others struggle like this?

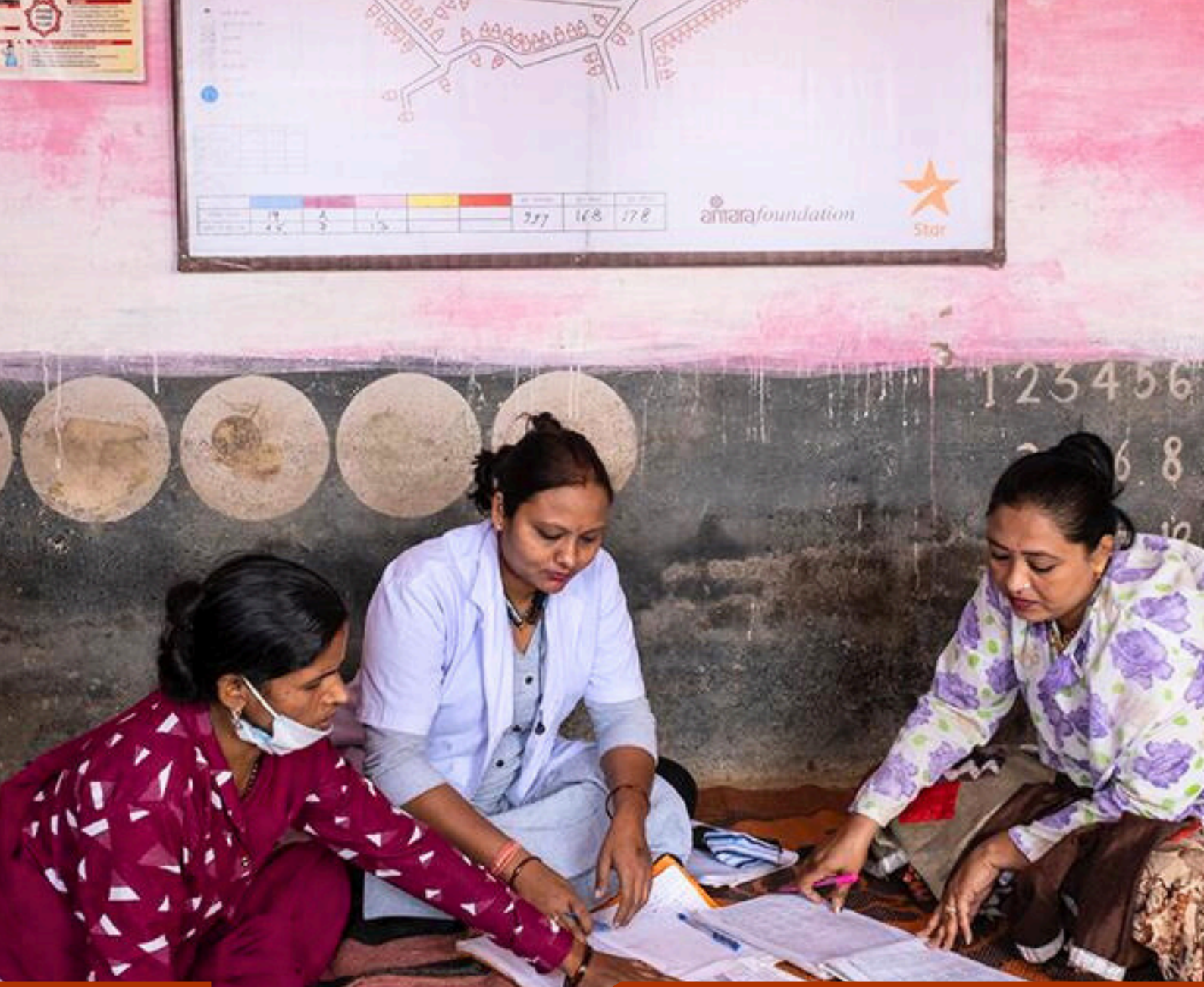
This study seeks to answer that question by examining how CHWs experience, adopt, and navigate digital tools in their day-to-day work. It combines literature review, program insights and contextual data from field research to better understand the systemic and behavioural factors that shape digital uptake at the last mile.

The analysis is anchored around several use cases such as mobile applications for tracking, telemedicine and remote consultations as emerging service delivery models, digital training platforms for capacity-building and data collection and reporting tools that CHWs rely on for service delivery.

To analyse these aspects, we employ:

- **Secondary Research & Literature Review:** Examining studies, reports, and program evaluations to assess related government initiatives and mobile-based learning programs, mapping known barriers and enablers of digital adoption.
- **Case Study Analysis**: Investigating real-world scenarios to understand the practical challenges and successes of CHWs engaging with digital health tools.
- **Primary Data from PCC Baseline Study (2025):** Draws on findings from a study conducted by Population Council Consulting (PCC) in Morena and Chhindwara districts of Madhya Pradesh. Commissioned by The Antara Foundation (TAF) under the Akshita Program, this research provided data on CHW smartphone ownership, digital usage patterns, and perceived barriers to adoption. These ground-level insights help contextualize national trends and highlight the lived realities of CHWs.

By combining ground-level insights with national-level analysis and lived experiences like Amina's, this research aims to offer a more human-centred understanding of what makes digital health tools truly usable, scalable, and supportive for CHWs.



FINDINGS

3. FINDINGS

As Amina sits on a wooden bench outside a health centre, she scrolls through the maternal health app on her phone, retracing her steps from the morning. She recalls her struggle to sync data during the home visit and wonders if other CHWs face similar hurdles. Her supervisor reassures her that she is not alone; many CHWs experience difficulties with digital tools. Amina listens closely, realizing that the challenges she encounters are part of a larger pattern.

3.1 The Digital Landscape CHWs Navigate

For most CHWs in India, engaging with digital health tools is not just about learning a new app. It is about navigating a complex web of limited digital exposure, infrastructure gaps, shared device use, and generational divides.

3.1.1 The Digital Reality of CHWs: Ownership vs. Usability

Across India, approximately 95% of CHWs own a smartphone[4]. However, ownership alone does not guarantee regular access or effective use. Many CHWs share phones with their family members, particularly male relatives. They often use outdated or malfunctioning hand-me-down devices, which limit their ability to use health applications reliably.

This was further reinforced by the findings from the Akshita baseline study. While 80–90% of women including CHWs reported access to smartphones, actual usage was limited to phone calls and WhatsApp. Only a few engaged in internet-based tasks or used health apps consistently. Frequent battery drains, poor device quality, and the absence of dedicated access continued to impede meaningful digital engagement.

[4]https://gh.bmj.com/content/bmjgh/6/Suppl_5/e007298.full.pdf

Amina echoes this experience: "It is my phone, but everyone in the house uses it. If it breaks, I just wait until someone can help me fix it."

3.1.2 Educational Disparities & Regional Variability

Beyond basic literacy, digital engagement requires numeracy, comprehension and confidence, skills many CHWs have not developed through prior exposure.

While Amina can follow step-by-step instructions, she finds data entry and troubleshooting daunting.

CHWs, especially those from older cohorts or tribal communities often face similar difficulties.[5]

Generational differences also shape comfort with technology. Older CHWs often hesitate to explore new apps, relying on informal support from younger colleagues or family members. This creates a cycle of dependency rather than independent engagement.[6]

Regional factors further exacerbate these challenges. For instance, CHWs have adapted to tools like NCD apps in Madhya Pradesh, but frequent data synchronization delays force them to maintain offline records, reducing efficiency.[7] In Jharkhand, the absence of interfaces in Santhali and other local languages creates barriers to digital adoption.[8] Similarly, in states like Meghalaya, geographical and infrastructural constraints hinder connectivity, rendering digital tools impractical in remote areas.[9]

3.1.3 Challenges in Digital Engagement

Despite high rates of smartphone ownership, full digital engagement remains constrained by multiple barriers including:

- **Network & Data Constraints:** Poor connectivity in rural areas makes real-time data entry challenging. In Chhindwara, network instability emerged as a major challenge, limiting the reliable use of digital tools. CHWs frequently faced duplication of effort due to the lack of offline syncing in many applications, resulting in data loss when connectivity failed. Therefore, CHWs in low-connectivity settings often continue maintaining paper records, negating the intended benefits of digital tools[10]. High mobile data costs, often borne out-of-pocket by CHWs, further discourage consistent use.

[5]https://www.ruralhealthinfo.org/toolkits/health-literacy/2/digital-literacy
[6]https://www.kcdigitaldrive.org/project/community-health-workers/
[7]https://rthresources.in/conversations-on-health-policy/digitization-of-health-services-part-ii-designing-health-information-systems-that-are-fit-for-purpose/
[8]https://intelehealth.org/wp-content/uploads/2023/01/eSanjeevani-Jharkhand-Impact-Report-2022.pdf
[9]https://blogs.isb.edu/bhartiinstitute/2024/05/27/navigating-the-digital-fog-in-meghalaya-the-abode-of-clouds-connectivity-challenge/
[10]https://ijpsl.in/wp-content/uploads/2020/09/Community-Health-Workers_Avantika-Ashmeet.pdf

- **Usability and Interface Issues:** Many health apps are not designed with low-literacy users in mind. Complex navigation, non-intuitive interfaces, frequent software updates, and technical jargon exacerbate usability challenges.[11] CHWs are expected to adapt, often without tools being adapted to their reality. Moreover, they fear data loss due to failed syncing or app crashes.

"I lost all my ANC visit data once because of a failed sync," Amina recalls. "Now I write everything in my register first, just in case."

- **Lack of Troubleshooting Support:** With no accessible IT helpdesks or support systems, even minor glitches go unresolved.

Amina shares, "When the app freezes or doesn't open, I just wait till someone at the centre can fix it."

These technical and design issues not only reduce efficiency but also discourage sustained engagement.

3.2. Gaps in Training and Design

Amina described her first digital training session as hurried and theoretical but over time, follow-up sessions and peer help began to make things clearer. When a younger colleague showed her how to navigate the app's updated menu, Amina realized she was starting to find her way.

3.2.1 Inadequate and Inconsistent Digital Training

Most CHWs attend just one digital training session. These sessions often rush through content without practical reinforcement. Reports suggest that fewer than 30% of the CHWs receive ongoing digital literacy support beyond initial training.[12] This results in skill attrition, lack of confidence, and low adoption rates.

- One-time workshops provide minimal follow-up.

[11]https://journals.sagepub.com/doi/10.1177/20552076241253994?icid=int.sj-full-text.similar-articles.1
[12]https://pmc.ncbi.nlm.nih.gov/articles/PMC10126829/

- Traditional classroom-style training does not emphasize active participation or real-life problem-solving. Research highlights that structured digital training dramatically improves CHW performance; those who receive interactive, hands-on training are nearly three times more likely to effectively use digital tools.[13] However, a common hurdle is that many digital health applications are designed with an assumption of a tech familiarity that CHWs do not always have.
- CHWs often rely on family members or peers for support, creating informal learning pathways but reinforcing dependency.

> *"My niece explains the new app better than the trainer did," Amina admits, half-laughing. "But what if she is not around next time?"*

The Akshita baseline shows CHWs prefer short, visual content in local dialects, underscoring the importance of user-friendly formats. Yet most training materials remain text-heavy, English-based, and detached from the field context.

3.2.2 Usability and Design Barriers

Even when CHWs learn to navigate apps, usability issues often undo training gains:

- Many digital tools require multi-step navigation, frequent logins, or toggling between screens, all of which are challenging for users who are not comfortable with mobile phones.
- Regular software changes also disrupt familiarity. With no accompanying guidance, CHWs can get confused by changed menus or missing functions.
- The lack of availability of digital tools in regional dialects often alienates those who do not speak Hindi. In linguistically diverse regions, providing content in local dialects can dramatically improve comprehension and usability. Feedback from CHWs has shown that when digital tools use familiar language and culturally relevant examples, they are more likely to engage with the material effectively.[14]
- Accessibility features like voice prompts, intuitive layouts, and pictorial instructions can help bridge digital literacy gaps. Yet few tools incorporate these elements.

> *As Amina explains, "If the buttons are too many or the menu changes, I don't know what to do."*

[13] https://pmc.ncbi.nlm.nih.gov/articles/PMC10905785/
[14] https://gh.bmj.com/content/6/Suppl_5/e005942

3.2.3 Access and Infrastructure Constraints

Structural constraints continue to limit digital adoption:

- **Smartphone Ownership and Accessibility:** Many CHWs often share devices. A survey indicated that while some CHWs are provided mobile devices by health programs, a significant percentage still rely on personal phones or shared devices. For instance, about 74% of frontline health workers reported receiving mobile devices from projects, while 26% used their personal phones.[15] Even when health programs provide smartphones, they often come with limitations such as insufficient storage, outdated software, or malfunctioning hardware that is rarely serviced. Some CHWs receive hand-me-down devices from family members, making it difficult to install necessary applications or access digital records efficiently.[16]
- **Internet Connectivity and Power Supply:** Unstable mobile networks and frequent power outages remain persistent barriers in rural areas. Real-time data collection, telemedicine support, and even something as simple as downloading an updated health module can take hours. CHWs in rural areas depend on intermittent mobile networks, making digital tools unreliable.[17] Compounding this challenge is limited electricity access. Nearly 50% of PHCs still report unreliable power supply, making it difficult for CHWs to keep phones charged.[18]

When Amina's battery dies, so does her access to crucial work-related information.

- **Data Costs and Affordability:** Data costs are a major barrier, especially for CHWs as they are mostly paid via incentives. While some programs offer reimbursements, most CHWs continue to cover expenses themselves. Findings from the Akshita baseline assessment reinforce this concern. Although 96% of women with mobile phone access could make calls independently, their engagement with digital tools was minimal. Most used phones primarily for communication, calls, and WhatsApp, while few accessed health-related information through apps or the internet. The study also pointed to unreliable electricity as a critical barrier, with frequent power outages in rural areas directly impacting CHWs' ability to keep their devices charged. In this context, affordability remains a critical barrier, as many CHWs prioritize their limited financial resources for essential living expenses over data subscriptions.[11]

[15]https://chwcentral.org/wp-content/uploads/2016/11/Mobile-Technology-in-Support-of-Frontline-Health-Workers.pdf
[16]https://gh.bmj.com/content/6/Suppl_5/e005942
[17]https://pmc.ncbi.nlm.nih.gov/articles/PMC10905785/
[18]https://pmc.ncbi.nlm.nih.gov/articles/PMC8117894/

3.3 Motivation, Mindset and Workload

Even when CHWs have access to devices and receive training, their motivation to engage with digital health tools is shaped by how well these tools fit into their daily routines, how useful they seem in practice, and whether they feel supported in using them.

3.3.1 Perceptions of Usefulness and Everyday Relevance

The success of any digital health intervention rests on whether CHWs perceive it as genuinely useful. Ideally, these tools should reduce workload, improve task efficiency, and support decision-making. In practice, however, many CHWs end up duplicating efforts, entering the same information into both apps and paper registers. This added burden often turns digital tools into an additional burden rather than an enabler.

The contrast between widely adopted platforms like WhatsApp and digital health applications illustrates this clearly. No formal training is required for CHWs to use WhatsApp. It is intuitive, fulfils an immediate need for peer communication, and naturally integrates into their routines.

Therefore, CHWs are naturally motivated to learn and use it.[19] Digital health tools, on the other hand, are often the opposite. They are complex, designed in a top-down manner, and focused more on data collection than making CHWs' work easier.[20] As a result, enthusiasm for these tools wanes when they complicate rather than ease daily work.

The perceptions of CHWs directly shape adoption rates. When they see tangible benefits, such as faster reporting, reduced paperwork, or improved patient care, motivation rises. Conversely, when apps are glitchy, difficult to use, or add tasks without reducing others, adoption declines. The inconsistency in donor-driven training programs across states and the lack of policy alignment further exacerbate this issue. Stronger institutional support and cohesive, field-relevant implementation strategies could improve both perception and uptake.

> *Amina's reflection captures this sentiment well: "The app could really help if it worked properly, and if someone was there to help when it did not."*

3.3.2 Incentives, Recognition, and the Weight of Workload

For many CHWs, the motivation to use digital tools is often linked to incentives. Programs that integrate financial and non-financial rewards encourage CHWs to embrace digital health solutions

[19]https://pmc.ncbi.nlm.nih.gov/articles/PMC8173666/
[20]https://www.ghspjournal.org/content/4/2/311#sec-14

more readily. The Khushi Baby program, for example, provides comprehensive support including training, fair remuneration, and essential supplies which helps CHWs feel valued and motivated to use digital reporting systems.[21]

Beyond financial incentives, digital literacy has also enhanced CHWs' professional identity. The Akshaya project in Kerala demonstrated how digital tools, when combined with ongoing training and public recognition, elevated CHWs' status within their communities. Many reported gaining respect and feeling more confident when equipped with mobile devices and apps, seeing them as symbols of authority and professionalism.[22]

However, motivation declines when digital integration feels like an imposition rather than an enabler. In many programs, CHWs are expected to manage multiple applications without additional compensation, despite the extra workload. The added administrative burden, especially when digital systems do not replace manual processes, often outweighs perceived benefits.

When thoughtfully designed, digital tools can genuinely streamline workflows. In Bihar, the Information Communication Technology-Continuum of Care Service (ICT-CCS) initiative demonstrated this in action. By integrating digital job aids into daily routines, it reduced paperwork and simplified reporting. As a result, CHWs spent less time on documentation and more time delivering care.[23]

For Amina, too, tools that aligned with her routine and reduced paperwork sparked renewed interest in learning. Small successes built her confidence.

3.3.3 Performance Monitoring, Surveillance Anxiety, and Friction Points

Performance-linked incentives have been used in several digital health initiatives to encourage adoption. While effective in some contexts, these incentives remain inconsistently applied and are often program specific. This inconsistency breeds disillusionment, especially when digital reporting systems are seen as additional tasks rather than solutions.[24]

Further complicating matters, several digital interventions have features that are perceived as surveillance tools. Applications like MDM360 Shield, launched in 2021, used GPS to track

[21]https://www.khushibaby.org/homepages/cases-html
[22]https://www.frontiersin.org/journals/health-services/articles/10.3389/frhs.2023.1119213/full
[23]https://pmc.ncbi.nlm.nih.gov/articles/PMC6875677/
[24]https://formative.jmir.org/2022/4/e29535

ASHA workers' daily movements. This triggered widespread anxiety. Many CHWs feared that system errors could falsely log them as absent or non-compliant, with real consequences on their incentives or reputation.[25]

As Amina logs out of the app and picks up her paper register, she reflects on the mixed promise of digital health tools.

The potential is there: to make her work easier, more efficient, and more respected. But for this potential to be realized, tools must be designed around CHWs' realities, not imposed upon them. Motivation grows when digital interventions are reliable, valued, and accompanied by supportive systems, not when they add invisible burdens or increase scrutiny without offering meaningful benefits.

3.4 What Works: Enablers of Digital Adoption

Several programs across India have demonstrated practical solutions to the challenges discussed above. The following enablers, drawn from both published evidence and frontline program experiences, illustrate what works in strengthening digital adoption among CHWs:

- Grounded and Ongoing Capacity Building: One of the strongest predictors of digital adoption is the quality, relevance, and continuity of training. CHWs are more likely to adopt and retain digital skills when training is practical, scenario-on, and reinforced over time. Hands-on, repeated training that simulates real-life scenarios increases recall and builds confidence.[26] Peer mentoring, on-the-job support, and visual aids in local dialects improve comprehension.

  Programs like the M-CAT pilot in Karnataka combined training with mentorship and small financial incentives (₹50 per form), alongside regular peer-led troubleshooting check-ins. This model created safe learning spaces where CHWs could openly discuss difficulties, leading to improved app usage, accuracy, and confidence.[27]

  Similarly, the Mobile Academy IVR platform provided digital training via voice messages in local languages, enabling CHWs to learn at their own pace, overcome literacy barriers, and revisit content as needed which is a critical enabler in rural areas with low digital comfort.[28]

Key insight: Structured, peer-supported, multimodal, and locally contextualized training models lead to higher digital confidence, retention, and sustained tool use.

[25]https://www.ideasforindia.in/topics/productivity-innovation/is-digitalisation-a-double-edged-sword-for-workers-in-indias-public-healthcare-system.html
[26]https://www.frontiersin.org/journals/health-services/articles/10.3389/frhs.2023.1119213/full
[27]https://nhsrcindia.org/sites/default/files/2021-06/ASHA%20Update%20Jan%202018.pdf
[28]https://www.cureus.com/articles/114372-acknowledging-the-role-of-community-health-workers-in-providing-essential-healthcare-services-in-rural-india-a-review#!/

- **User-Centred Design and Intuitive Tools**: The design and usability of digital tools play a critical role in their adoption by CHWs. As seen in the case of co-designed platforms like ImTeCHO, it succeeded not just because of technical features, but because they were built around CHWs' own problem statements. Instead of adding complexity, the most effective tools streamlined workflows such as cutting down on navigation steps, reducing data entry burden, and enabling quick access to patient information. These refinements improved not just tool usage but also the perception of digital tools as time-savers.[29]

Key insight: Simple, offline-capable, workflow-aligned tools developed in consultation with CHWs result in higher engagement and consistent usage.

- **Informal Support Networks:** In the absence of formal IT helpdesks, informal peer support networks have become vital digital enablers**.** Messaging groups, often formed on platforms like WhatsApp, function as quick-response channels where CHWs share tips, troubleshoot errors, and distribute job aids. Rather than isolated support moments, these peer exchanges are evolving into consistent, trusted sources of real-time problem-solving. Programs like M-CAT institutionalized these informal dynamics through buddy systems and monthly catchups, normalizing learning curves and encouraging collaborative problem-solving.[30]

Key insight: CHW-led, peer-driven support systems reinforce learning, improve digital confidence, and promote collaborative troubleshooting.

Amina, who once waited for others to fix app issues, now helps newer CHWs navigate syncing problems. Recently, when a colleague could not upload a form, Amina guided her through the syncing steps herself. "Earlier, I used to wait. Now I try to fix it first," she said. Her journey from a hesitant user to a local go-to person reflects how support systems can unlock quiet leadership.

[29]https://gil.gujarat.gov.in/pdf/Vol10/Newsletter_Imtecho_13102014.pdf
[30]https://gh.bmj.com/content/6/Suppl_5/e005039

- **Motivation beyond Mandates:** While financial incentives encourage uptake, non-financial motivators like social recognition, professional pride, and peer acknowledgment can be equally powerful. In Rajasthan, the Khushi Baby project linked CHWs' digital work to their social identity by offering visible tokens of recognition, such as digital ID necklaces, which fostered trust and respect.[21] In contrast, tools designed for surveillance, like MDM360 Shield, undermined motivation by creating anxiety and mistrust. When digital use is tied to control rather than support, enthusiasm fades. Adoption thrives in ecosystems where digital proficiency is celebrated, not policed.

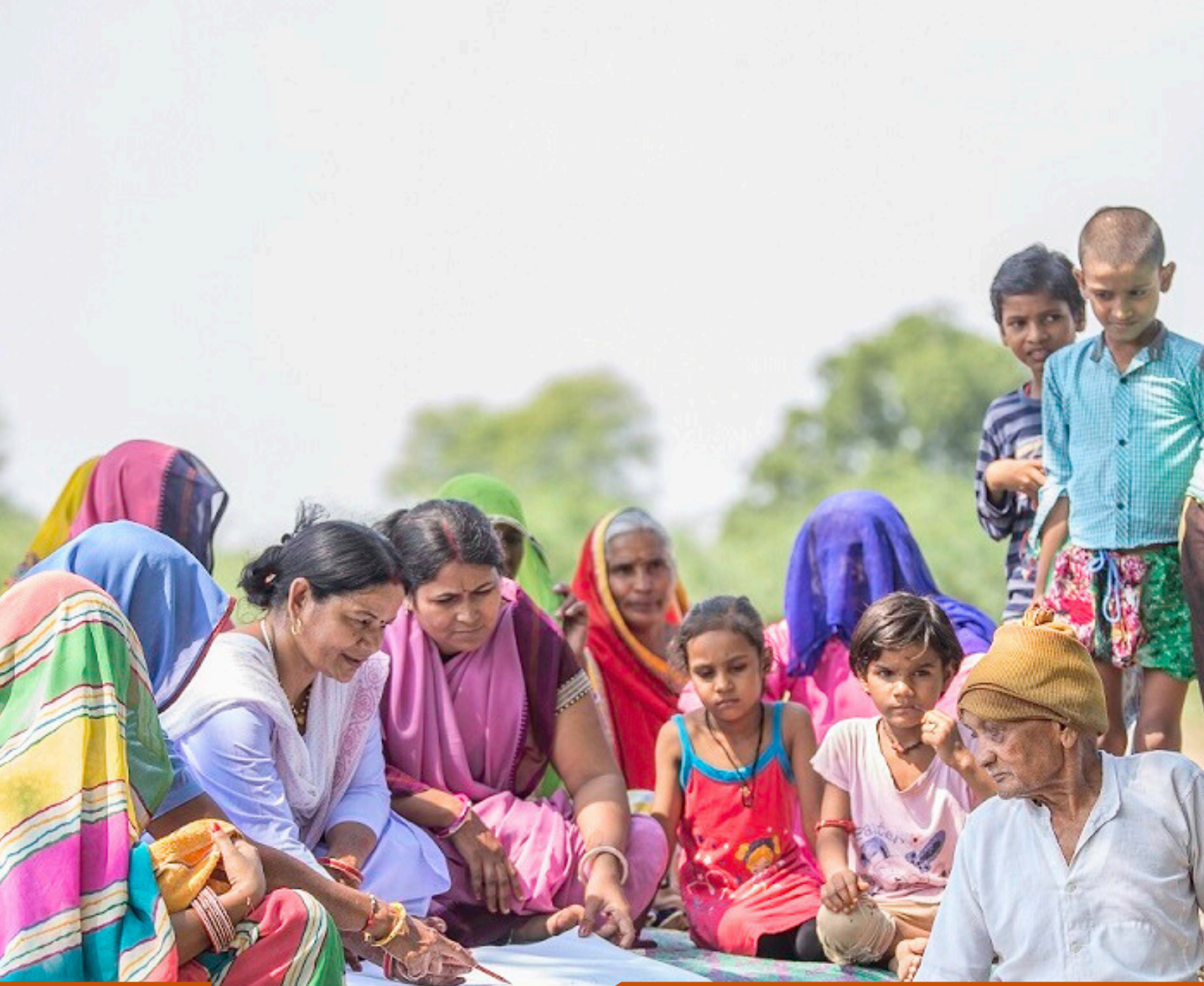
Key insight: Motivation is the strongest when CHWs feel valued, supported, and recognized and when digital adoption is framed as professional growth, not mere compliance.

For CHWs like Amina, being able to use digital tools not only reduced paperwork but also brought unexpected recognition.

"When our supervisor appreciated how quickly I submitted the reports, it made me feel like I am finally getting it," she shared.

- **Designing for Constraint, Not Ideal:** CHWs work in settings where electricity, connectivity, and device quality cannot be taken for granted. Tools that perform well in such contexts, like offline-first apps, lightweight file formats, and auto-save features, demonstrate markedly higher uptake. Digital interventions can successfully address these constraints by minimizing technical demands and reducing friction points within the user experience. This ensures that the app remains functional and usable even when infrastructure is suboptimal, for example, enabling offline data entry and automatic syncing once connectivity is restored.

Key insight: Tools that anticipate and accommodate infrastructural gaps are more likely to succeed in low-resource settings.



DISCUSSION

4. DISCUSSION

The uptake of digital health tools among CHWs is not simply a matter of technological introduction. It is deeply intertwined with existing healthcare structures, CHWs' working conditions, and broader systemic challenges. While digital tools hold immense promise in streamlining service delivery and enhancing CHW effectiveness, their success is contingent on how well they are integrated into daily practice, how they are perceived by CHWs, and how sustainably they are supported.

The Digital Dilemma: Empowering or Burdening CHWs?

Digital health innovations are often positioned as game-changers in improving CHW efficiency. However, for frontline workers like Amina, digital adoption is not a straightforward transition from inefficiency to efficiency. The introduction of mobile-based health interventions has, in some cases, streamlined processes, but in others, it has added layers of complexity including doubling documentation burdens, increasing cognitive load, and introducing surveillance mechanisms that CHWs may find intrusive.

A core challenge lies in the mismatch between digital design and on-ground realities. The most successful tools are those that integrate seamlessly into CHWs' existing workflows. Yet many tools are introduced without addressing key constraints: unreliable connectivity, lack of offline access, and the need to juggle multiple apps and fragmented data systems.

The Fragile Link Between Training and Sustained Digital Competency

Training remains the cornerstone of digital adoption, yet the predominant model constituting short-term, one-time workshops often fails to provide the reinforcement needed for sustained competency. CHWs, particularly those with limited digital exposure, require continuous engagement, refresher training, and real-time troubleshooting mechanisms to prevent drop-off in usage. The informal peer-support mechanisms that have organically emerged, such as WhatsApp groups, point to a need for more structured, ongoing digital literacy programs that go beyond initial training sessions.

Motivation and Perception: More Than Just Incentives

While financial incentives play a role, CHW motivation is deeply shaped by how they perceive

the tools. Recognition, trust, professional pride, and a sense of autonomy often drive more sustained engagement than monetary rewards alone.

However, when digital tools are introduced without clarity or reciprocity, (for example, when they do not replace existing manual processes) they are seen as burdens rather than enablers. CHWs who initially welcomed mobile-based reporting grew disillusioned when paperwork requirements remained unchanged. Similarly, tools that emphasized strict performance tracking without offering support were met with resistance.

Systemic Challenges: Fragmentation and Lack of Integration

One of the biggest barriers to seamless digital adoption is the lack of interoperability across different digital health platforms. Many CHWs find themselves using multiple apps for different health programs, leading to confusion, inefficiencies, and inconsistent data entry. Without a unified system, CHWs experience digital fatigue where the very tools designed to simplify their work instead become sources of frustration.

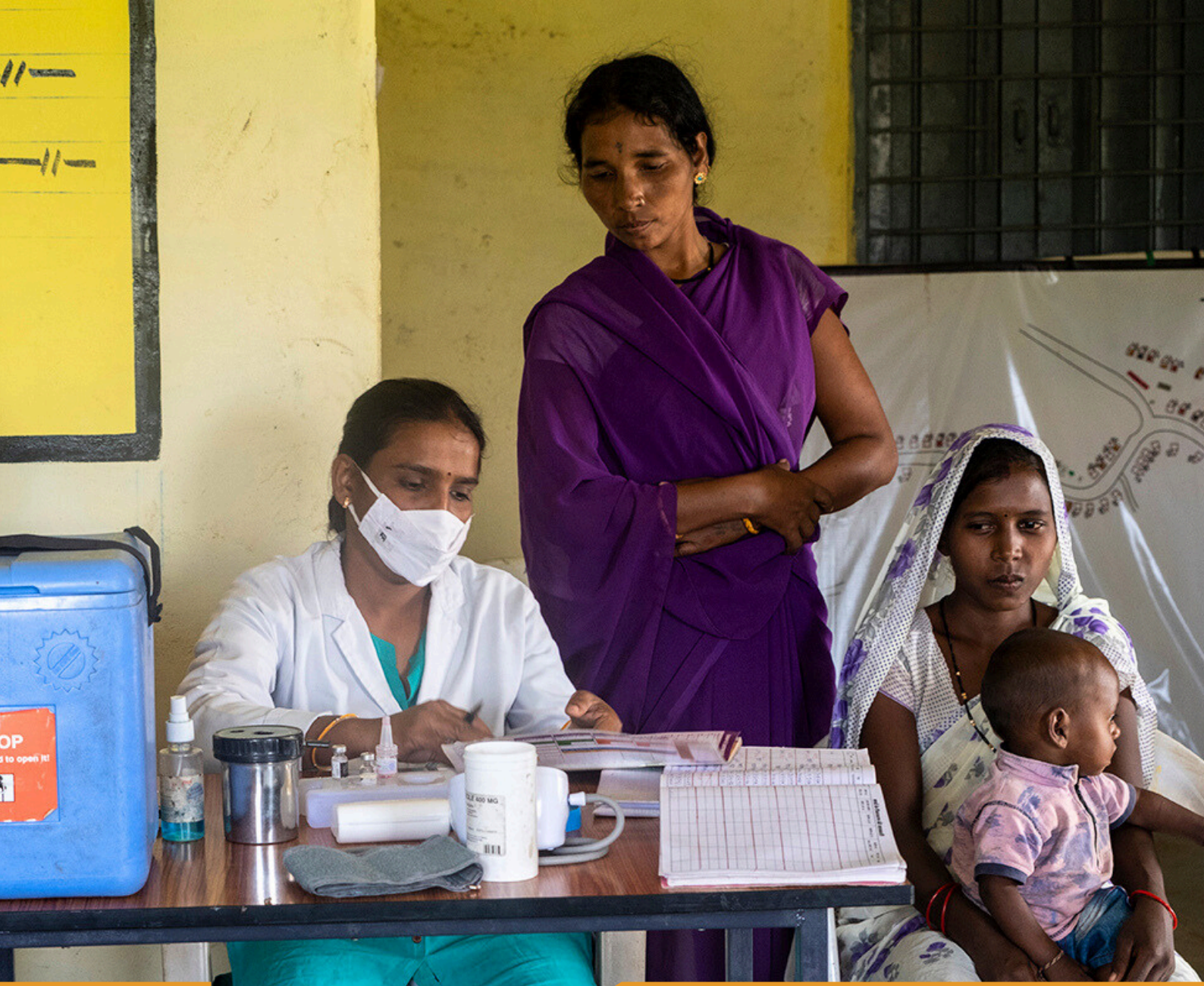
Moreover, supervision and technical support remain uneven. While some CHWs, like Amina, benefit from community troubleshooting networks, the absence of formal support structures means that those struggling with digital adoption often fall behind.

Bridging the Gaps: Towards Meaningful Digital Integration

For digital tools to fulfil their promise, they must be embedded in a larger system of care and accountability, not treated as stand-alone fixes. A supportive ecosystem is essential that addresses structural barriers, invests in CHW capability, and integrates digital tools into everyday workflows.

The real goal is not just digital uptake, but digital enablement. Tools must reduce workload, enhance decision-making, and strengthen service delivery; not overwhelm already stretched frontline workers.

This requires a shift from deploying technology to CHWs, to designing systems with CHWs.



RECOMMENDATIONS

5. RECOMMENDATIONS

Digital health tools hold immense potential to amplify the impact of CHWs, but their success hinges on more than just availability. For Amina and thousands of CHWs like her, the shift to digital is not just about learning an app. It is about navigating a system that often overlooks their daily realities. The challenge is not resistance to technology but a lack of meaningful support, intuitive design, and policies that align with CHWs' actual needs.

For digital adoption to be truly transformative, interventions must be designed with CHWs at the centre, ensuring that digital tools become enablers rather than burdens. The following recommendations offer practical, sustainable, and user-focused solutions to bridge the gap between policy intentions and on-the-ground realities.

1. Rethinking Digital Training: From One-Time Sessions to Ongoing Support

For many CHWs, digital training is a blur of instructions, hurried demonstrations, and overwhelming technical jargon.

> *Amina describes her first training session as rushed, abstract, and far removed from real-life application. By the time she was back in the field, much of what she had learned felt like a distant memory.*

Instead of short-lived, one-size-fits-all training, digital literacy efforts must be:

- **Blended and Continuous:** A mix of in-person workshops, virtual refreshers, and on-the-job mentoring ensures that skills are reinforced over time rather than crammed into a single session.
- **Peer-Led and Community-Based:** CHWs trust each other more than external trainers. Local peer-learning groups and WhatsApp-based troubleshooting networks can build digital confidence organically.
- **Multimodal and Simplified:** Video tutorials, interactive voice-based learning, and pictorial guides in local languages make digital training accessible to CHWs of varying literacy levels.
- **Integrated with Hands-On Supervision:** Supervisors should go beyond checklist-based evaluations, actively guiding CHWs through digital adoption challenges in real field conditions.

By shifting from one-time instruction to ongoing learning, CHWs can develop true digital confidence - the ability to adapt and troubleshoot as technologies evolve.

2. Putting CHWs First in Digital Design

Technology should simplify, not complicate a CHW's work. Yet, many digital platforms are designed in boardrooms rather than in the realities of rural healthcare delivery. To truly serve CHWs, digital tools must:

- **Work Offline by Default:** Poor connectivity should never be a roadblock. Seamless offline data entry and auto-syncing when the internet is available should be standard.
- **Be Intuitive and Minimalist:** Overcrowded screens and technical menus overwhelm CHWs. Large buttons, voice-assisted commands, and simplified navigation make tools user-friendly.
- **Integrate with Existing Systems:** CHWs juggle multiple apps for different programs, leading to frustration. A unified platform that consolidates various reporting needs can reduce redundancy.
- **Include Built-In Feedback Loops:** CHWs need a way to report app glitches and usability challenges directly, ensuring continuous system improvements based on real user experiences.

If technology is to become an enabler and not an obstacle, it must be designed alongside CHWs, not imposed upon them.

3. Reducing Digital Workload: Making Technology a Time-Saver, not a Task-Loader

One of the biggest reasons CHWs hesitate to embrace digital tools is that instead of easing their workload, digital adoption often doubles it. The promise of efficiency remains unfulfilled when digital platforms simply add to the burden.

To genuinely reduce workload, digital interventions must:

- **Eliminate Redundant Paperwork:** If a digital record is required, paper documentation should be phased out wherever feasible.
- **Automate Repetitive Tasks:** Features like autofill, voice-to-text, and AI-assisted decision support can minimize manual data entry.
- **Shift from Compliance to Support:** Digital tracking should not feel like surveillance but rather a guidance tool, offering CHWs reminders, performance insights, and real-time assistance.

When designed thoughtfully, digital tools can free up CHWs' time for patient care, rather than turning them into data-entry clerks.

4. Strengthening CHW Support Systems for Digital Adoption

No amount of training can prepare CHWs for every technical issue they will face in the field. The absence of real-time support often leaves them stranded when they struggle with app glitches or data sync failures.

To ensure CHWs never feel abandoned in their digital journey, support systems must be:

- **Supervisor-Led, Not Just Checklist-Based:** Supervisors should not just monitor digital adoption but actively support CHWs in overcoming challenges.
- **Backed by Dedicated Digital Helpdesks:** Toll-free helplines, WhatsApp groups, and rapid-response troubleshooting teams can ensure CHWs get assistance when they need it most.
- **Motivating, Not Punitive:** Instead of penalizing slow adopters, CHWs should be recognized and incentivized for developing digital proficiency.
- **Building Digital Literacy Beyond Job-Aid Apps:** Many CHWs struggle not just with specific apps but with broader digital skills like browsing the internet, sending messages, and filling online forms. Investing in tool-agnostic digital literacy programs, incorporating gamified learning approaches, can enhance their overall digital saliency. This foundational knowledge will enable CHWs to navigate any digital platform more confidently, making their transition to job-specific apps like ANMOL smoother and more intuitive.

When CHWs know they have support at every step, they are more likely to engage with digital tools proactively rather than reluctantly.

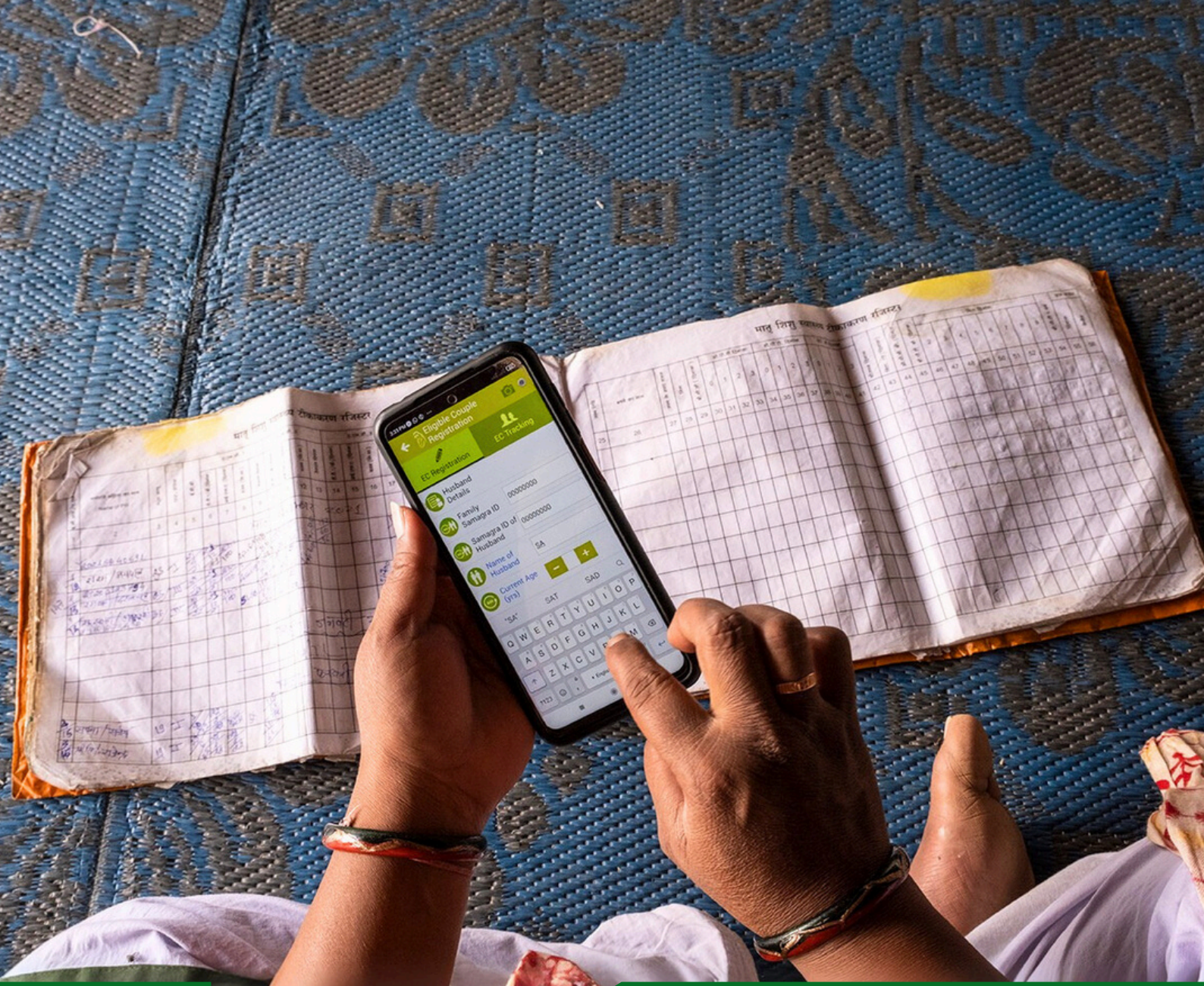
5. Embedding Digital Health into CHW Policy and Investments

For digital adoption to succeed at scale, it must be backed by long-term policy commitments and sustained investments. Too often, digital health initiatives start strong but fade into inefficiency due to lack of funding, inconsistent training, and fragmented implementation.

To ensure long-term impact, digital adoption should be:

- **Budgeted for Sustainability:** Digital health is not a one-time investment. Funds must be allocated for continuous training, system upgrades, and troubleshooting mechanisms.
- **Integrated into CHW Training Curricula:** Digital literacy should not be treated as an extra skill but a core competency, embedded into CHW certification programs.
- **Designed with CHWs, Not Just for Them:** CHWs should be active co-creators of digital solutions, ensuring real-world usability rather than top-down imposition.

Amina's story highlights an important truth: *technology alone cannot transform healthcare.* It takes thoughtful policies, user-centric design, and strong human support systems to truly empower CHWs in their digital journey.


Eligible Couple Registration
EC Registration
EC Tracking
Husband Details
Family Samagra ID
Samagra ID of Husband
Name of Husband
Current Age (yrs)

CONCLUSION

6. CONCLUSION

Amina's digital journey began with hesitation - with a borrowed phone, an unfamiliar app, and a training that felt too rushed to hold on to. But over time, her experience began to shift. Not because the app became easier, but because the ecosystem around her started to work better.

It was the encouragement of a supervisor who guided instead of inspecting. It was the moment her niece helped her navigate an update. It was the peer WhatsApp group where no question was too small, and the pride she felt when she helped another CHW solve a syncing issue. These were not dramatic breakthroughs, but they were small, steady wins. And they added up.

What changed was not just her skill, but her confidence. She began to see herself not just as a user of digital tools, but as someone shaping how they are used. She spoke up in review meetings. She mentored peers who once helped her. She started to trust her own judgment, even when the network did not cooperate or the app glitched.

Today, as she logs into the app, she does so not with uncertainty, but with intent. The challenges have not disappeared, but she no longer waits for someone else to fix them. She is part of the solution. Her story is not one of digital transformation imposed on her. It is one of ownership, adaptation, and quiet leadership from the ground up.

For thousands of CHWs across India, this is what meaningful digital adoption looks like. Not perfection. Not mastery overnight. But the presence of systems that honour their pace, respect their knowledge, and enable them to thrive. When CHWs are treated not just as health workers but as co-builders of digital change, the result is more than improved tools. It is a stronger, more humane health system that starts with listening, and ends with trust.