mHealth Supports Community Health Workers in Uttar Pradesh, India

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Objectives

Highlight use of mHealth in low resource settings
Describe Indian context
Profile mSakhi mHealth application in India
Address lessons learned and challenges
What is mHealth?

mHealth is the use of **mobile technology to support health outcomes**

Mobile technologies include phones, tablets, and netbooks
Explosion of mHealth Interventions

There are more than 1,000 mHealth interventions worldwide, many in developing countries.

- Many are pilots at small scale
- Evidence is still being generated on sustainability and scalability

Source: GSMA mHealth Tracker
mHealth Applications For Strengthening Public Health Systems
India Profile

Population in India
* 1.26 billion
* 17.5% of the world’s population

Maternal and Infant Mortality
* 19 percent of all maternal deaths globally
* 29 percent of newborn deaths globally

State of Uttar Pradesh: 200 million people; 75 districts;
In India, 50% of the maternal deaths is due to hemorrhage and sepsis...

Causes of maternal deaths in India, 1997-2003, SRS

- Hemorrhage, 37%
- Sepsis, 11%
- Complications of abortion, 8%
- Obstructed labour, 5%
- Hypertensive disorder, 5%
- Other disorders, 34%
Infections, birth asphyxia and birth trauma account for more than half of neonatal deaths in India....

The million death study collaborators, Lancet, 2010
Increased investment in facility based births with skilled birth attendance

Creation of community health workers: Accredited Social Health Activist (ASHA)
- Village women, low literacy
- 23 days training
- Performance based payment for home visits and deliveries
- Key link with the community
- Critical to help reduce infant and maternal mortality
ASHAs

• The Three A’s work as a Team: Accredited Social Health Activists with Anganwadi Workers (AWW) and are supervised by the ANMs (Auxiliary Nurse Midwife)
• Many Obstacles
• Little Support

150,000 ASHAs in UP
mSakhi

an interactive mobile phone-based job aid to support Accredited Social Health Activists (ASHAs) in improving nutrition and health outcomes

Mobile friend
**What is mSakhi?**

**mSakhi** is an interactive Smartphone based application for ASHAs and auxiliary nurse-midwives (ANMs)

**Uses** audio, graphic images, and short videos

✓ **Self-learning** and counselling tool

✓ **Decision support** for case management, diagnosis, assessment, treatment and referral

✓ **Real-time** monitoring and management
RMNCH+A continuum

- Eligible couple registration
- PW registration
- Family Planning Counseling
- Self-Learning
- ANC visit scheduling
- ANC + FP counseling
- Birth registration
- PNC visit scheduling
- HBNC home visit tool
- Immunization scheduler
- Immunization counseling tool
- IMCI 2 months-5 years tool
- Immunization scheduler + FP counseling tool
- School Health

Source: NRHM ASHA modules, HBNC GoI guidelines, RCH register (new)
The mSakhi system

Level 1
- ASHA app (Android phone)
- Based on RMCHA continuum
  - Self-learning
  - Counseling
  - Decision support
  - Management

Level 2
- ANM app (Android tablet)
- Based on RMCHA continuum
- VHND monitoring
- Sub-Centre Dashboard

Level 3
- Web Dashboard (Decision Support)
- Monthly Reports
- MCTS synchronization
How does mSakhi work?

https://www.youtube.com/watch?v=ICNy0-dEGGE&feature=youtu.be
Designed two operations research studies to measure **feasibility** and **effectiveness** of mSakhi against paper-based tools

**OR Study #1** as a **self-learning** and **counseling** job aid

**OR Study #2** as an integrated job aid (**self-learning, counseling, registration** and **decision support**) specifically for the postnatal period
Evaluation Methodology

• Intervention and control group design
  – Knowledge test (146 ASHAs)
  – Observation of ASHAs during home visits (200)
  – ASHA focus groups
  – Beneficiary survey (450)
Results
Use of mSakhi

Usage per ASHA **doubled**

- **Quarter 1**: 54 minutes
- **Quarter 2**: 118 minutes
- **Quarter 3**: 121 minutes

Source: ASHA usage data, web server, OR study 1
Use of mSakhi

Source: ASHA usage data, web server, OR study 1

- 10am - 6 pm: 53%  -- Counseling
- 6pm - 10pm: 33%  -- Self Learning

57,222 times or 1048 hours

Source: ASHA usage data, web server, OR study 1
ASHA Knowledge - MNCH

**ASHA MNCH knowledge scores** (max score = 66)

(p<0.001)

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Endline</th>
<th>Baseline</th>
<th>Endline</th>
</tr>
</thead>
<tbody>
<tr>
<td>mSakhi</td>
<td>40</td>
<td>50</td>
<td>38</td>
<td>44</td>
</tr>
</tbody>
</table>

Source: ASHA MNCH Data collected during baseline and endline, mSakhi OR-2, District Jhansi
ASHAs using mSakhi were more likely to deliver complete messages to beneficiaries

- 4 ANC checkups**
- Anemia*
- Preparedness for institutional delivery***
- Nutritious food and rest at daytime**
- ANC danger signs***
- Newborn danger signs*
- Child immunization*

Level of significance: *p<0.05, **p<0.01, ***p<0.001.
Significances of difference-in-differences in percentages were tested using Z-score test.
ASHAs identifying at least 6 critical newborn conditions (percentage) $p<0.05$

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<tbody>
<tr>
<td>mSakhi (n=29)</td>
<td>0</td>
<td>75.9</td>
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<tr>
<td>Paper tools (n=28)</td>
<td>7.1</td>
<td>57.1</td>
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</tbody>
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ASHAs using mSakhi demonstrated **higher knowledge** of critical newborn conditions (at least six).

Source: ASHA knowledge Data collected during baseline and endline, mSakhi OR-2, District Jhansi
ASHA Skills- Newborn Care

拇指 ASHAs using mSakhi demonstrated better newborn assessment skills

Source: Home visits Skills Observation Data collected during endline, mSakhi OR-2, District Jhansi
Beneficiaries’ MNCH Knowledge and Practices

- Improved in both arms, but higher in the experimental arm
  - Immediate breastfeeding ***
  - Keeping the newborn warm **
  - Exclusive breastfeeding *

- Increased knowledge did not always translate into practice.

Level of significance: *p<0.05, **p<0.01, ***p<0.001.
Significances of difference-in-differences in percentages were tested using Z-score test.
ASHAs opinions on mSakhi

“mSakhi is easy to use..., a lot easier than paper-based postnatal visit checklists and booklet”

“We have always been loaded with information but no one taught us how to counsel, this does....”

“...now mothers and her family members listen to me more seriously”
## msakhi Implementation Costs (USD)

<table>
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<tr>
<th>Category</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Smartphone (hardware)</td>
<td>$73 per ASHA</td>
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<tr>
<td>Training (5 days)</td>
<td>$29 per ASHA</td>
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<tr>
<td>Ongoing technical support (ICT resource person)</td>
<td>$41 per ASHA per year</td>
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<tr>
<td>Application development, server management, and data usage</td>
<td>$44 per ASHA per year</td>
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- **INR $187** - starting cost per ASHA per annum
- **INR $85** - recurring cost per ASHA per annum

Source: Costing study, msakhi OR-1, District Bahraich
Lessons Learned

1. mHealth applications can **improve** ASHAs’ knowledge and practices

2. mHealth has potential to improve **real-time monitoring and supportive supervision** of ASHAs

3. Regular **feedback** and ICT **support** is critical for sustained and proper use of mHealth tools

4. **Uptake** of mHealth applications increases if they substitute for existing paper processes (not run in parallel)
Key limiting factors in mHealth include:

- Gender inequities in mobile phone ownership
- Availability of services esp. in rural areas
- Cost of phones and voice/text services
- Literacy (reading ability and technology literacy)
- Lack of electricity
- Lack of effective models for scalability and sustainability
- Pace of technological advances
mHealth: What it takes...

mHealth Policy (standardisation, costs, security, etc.)

mHealth Program

- Mobile phones (Insurance, maintenance, etc.)
- Training (one time + ongoing)

Software/Application (evolving)

Interoperability/Integration with legacy HIS

Continuous Value Creation (content, VAS etc.)

Change management
mSakhi: Current Status

1. mHealth Lab: A collaborative effort of National Health Mission (NHM) GoUP, and IntraHealth with support from Qualcomm Wireless Reach to jointly develop mSakhi further, covering RMNCHA continuum and AWWs (330 FLWs)
2. mSakhi replication in Uttarakhand remote villages (230 FLWs)
3. mSakhi adaptation for NCDs in Jharkhand
4. mSakhi experience and evaluation results have been used to inform GoUP scale-up of mHealth application for 12,000 FLWs in five districts with 10M population through PPP. (mSehat).
Thank You