




What is mPossible ? Health Systems Innovations from Person to Population

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mHealth

Untethered, yet connected:
Diverse application of wireless and mobile technologies designed to improve health research, health care services and health outcomes

Global Health Innovation

mHealth is not a single **THING.**
Mobile tools can be used to strengthen different parts of the health system.

Education and Awareness: Increasing the number of people seeking and following a recommended health service.

Diagnosis and Treatment Support: Mobile phones for support in providing diagnosis and as a prompt for a procedure.

Disease and Epidemic Outbreaks Tracking: Sending and receiving data on disease incidence, outbreaks, and other health events.

Supply Chain Management: Using mobile software to improve stock levels, track supplies, and monitor usage.

Remote Data Collection: Collecting data from patients, health workers, and other sources.

Remote Monitoring: Monitoring patients or equipment to ensure compliance with treatment or usage.

Healthcare Worker Training: Providing training and support to health workers.

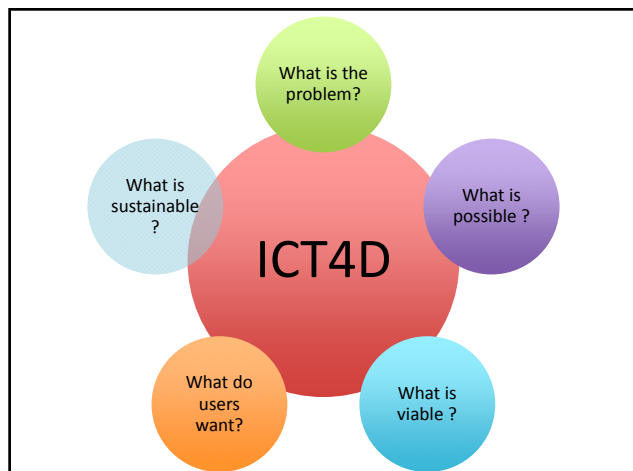
Global Health Solutions

mHealth Technical Evidence Review Group for RMNCH

<http://bit.ly/who-mterg>

"Providing governments and implementing agencies objective, evidence-based guidance for the selection and scale of mHealth strategies across the reproductive, maternal, newborn and child health continuum"

-mTERG Mission Statement 2012



Logos: POWERING mHealth, UNICEF, USAID, and others.

Labrique et al. GHSP, 2013

12 Common Applications of mHealth



Labrique et al. GHSP, 2013

mHealth doesn't work in a Vacuum



THREE LAYERS OF mHEALTH STRATEGIES

Patient
Knowledge and
Self-Efficacy

- INFORMATION
- DEMAND CREATION
- SUPPORT SYSTEMS

Provider
Competence and
Accountability

- WORK MANAGEMENT
- DECISION SUPPORT
- ENUMERATION
- SURVEILLANCE

Health System
Adequacy

- SUPPLY CHAIN
- STAFF AND FACILITY PERFORMANCE MONITORING
- REFERRAL SUPPORT

mHealth is not about the technology. Its a Health Systems **Catalyst**

EFFECTIVE COVERAGE

LACK OF PROOF

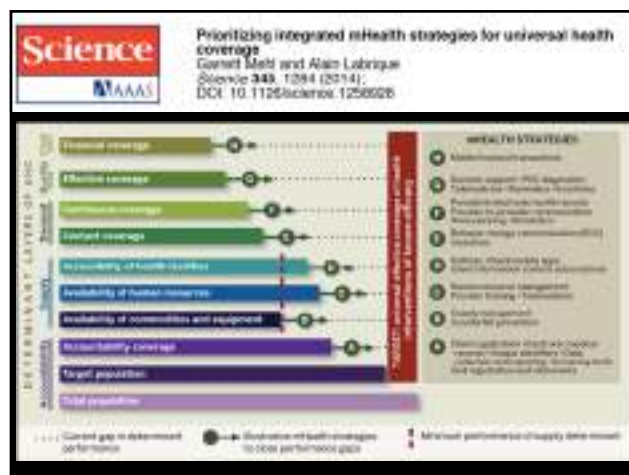
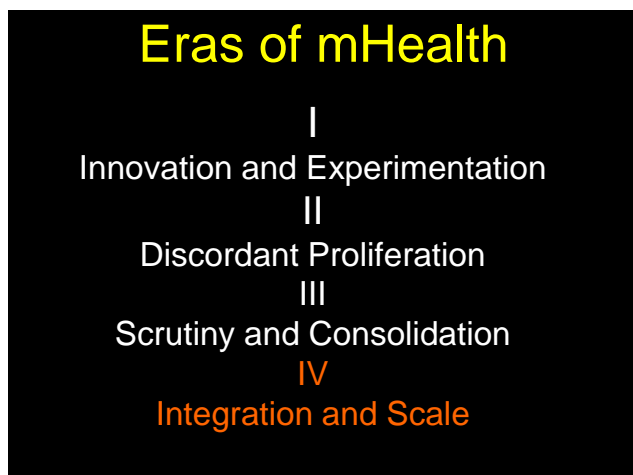
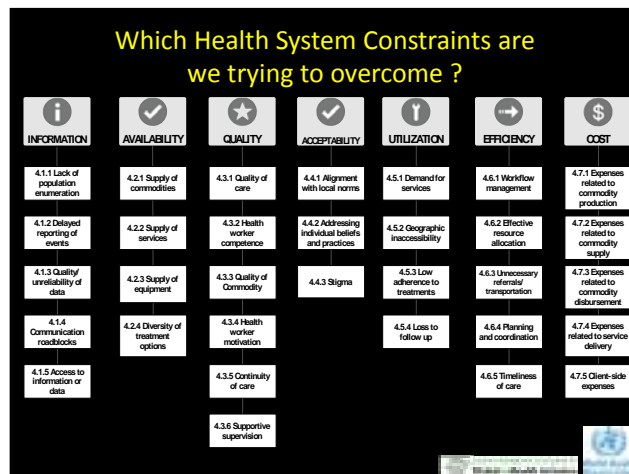
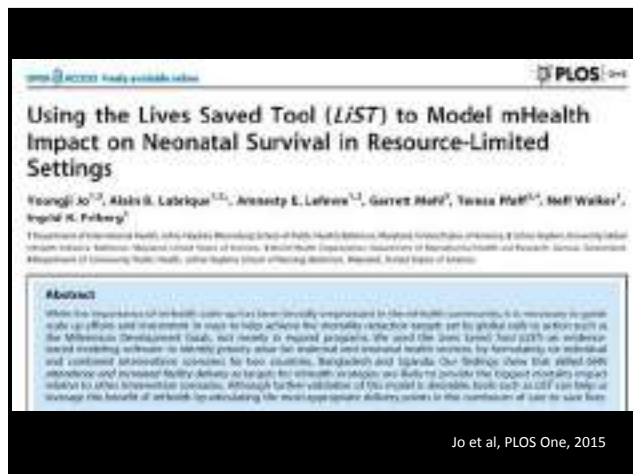
Shift focus from "Does mHealth work?" to "Does mHealth *optimize* what we know works?"

INTERVENTION OF KNOWN EFFICACY

TO FOLLOW GUIDELINES



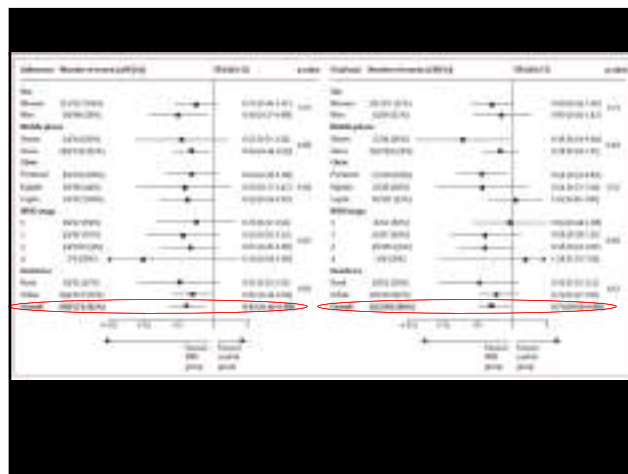
Jo Y, Labrique AB et al. PLOS One 2013



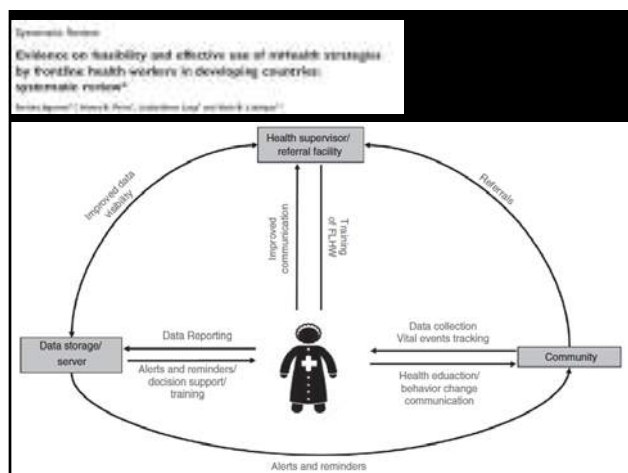


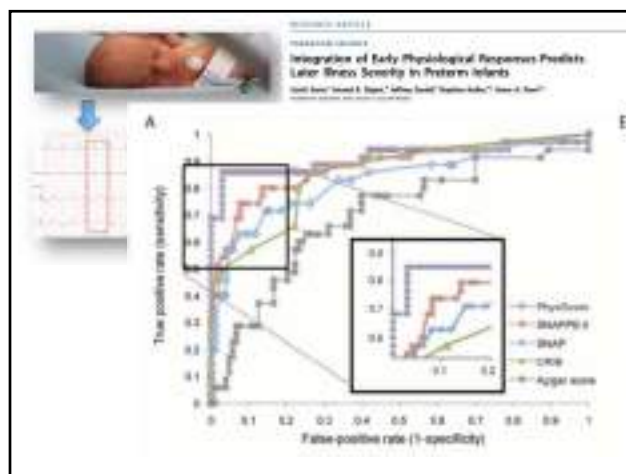
Targeting the **CLIENT**





Targeting the **WORKFORCE**





<https://www.youtube.com/watch?v=hAgzvD7WNFI>

Mobile Academy for Frontline Health Workers

Use IVR technology that is handset independent, audio based and accessed via a simple voice call to train Bihar's 200,000 community health workers to deliver life-saving information to millions of families.

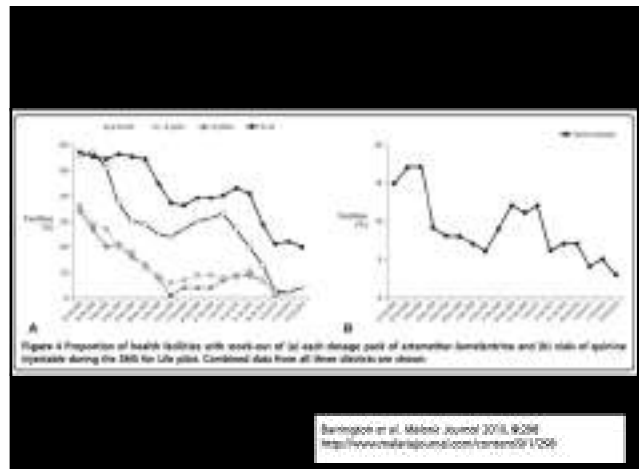
- Mobile Academy is a training course on maternal and child health.
- Covers 23 modules - from pregnancy until the child is 2 years of age.
- Designed to expand CHWs' knowledge of life saving preventive health and enhance their communication skills.
- Divided into chapters, lessons and quizzes.
- Accumulates yearfull score.
- Provides certificate for all those who pass.

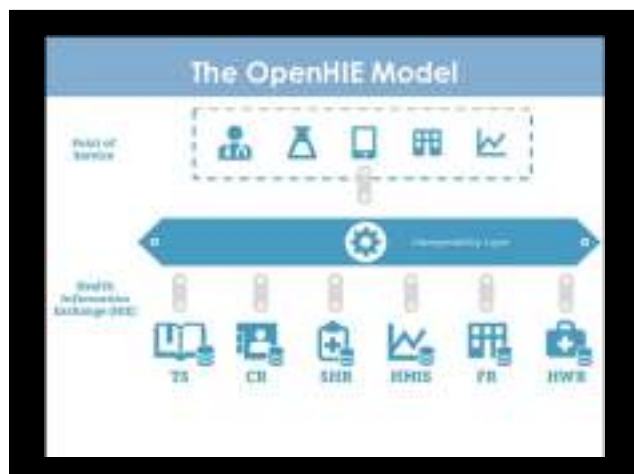
Sumitra Devi, student for Mobile Academy Certificate

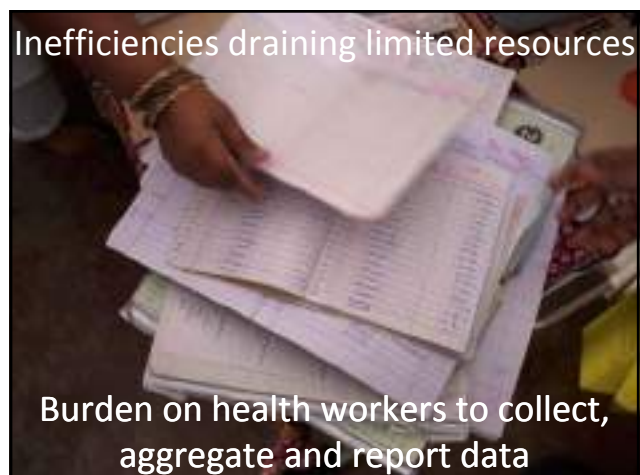
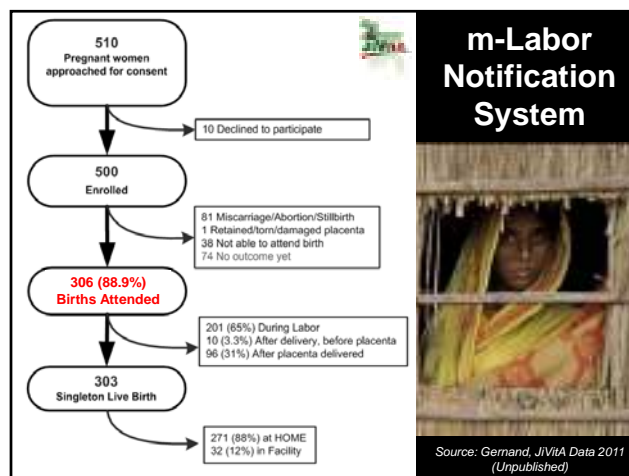
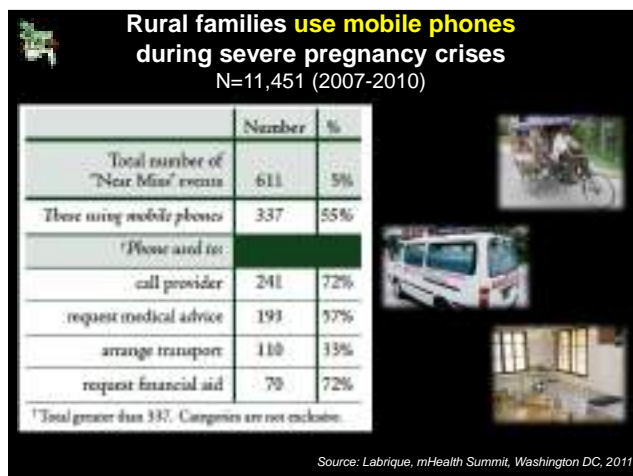
MEDIA ACTION



Targeting the **SYSTEM**









Tremendous time and effort is invested in manual data summarization and reporting.

19 registers contain 473 separate data fields !

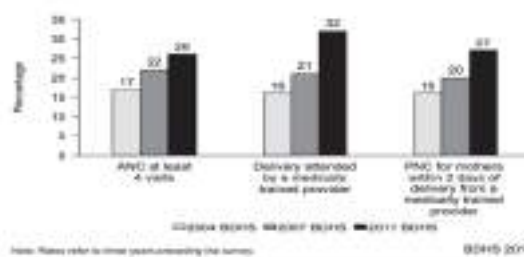
Only 60 fields would be required for a digital system to process the same information.

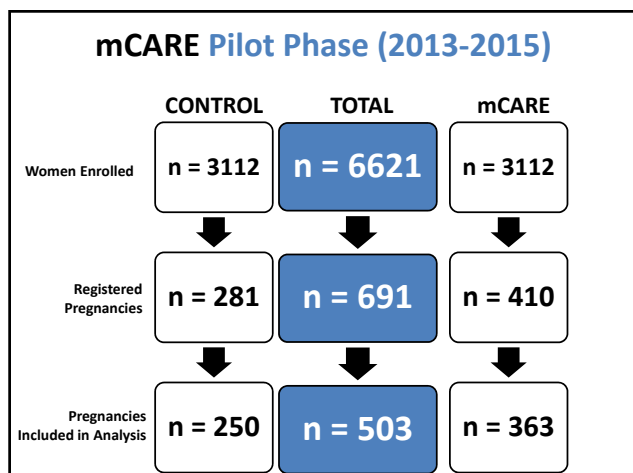
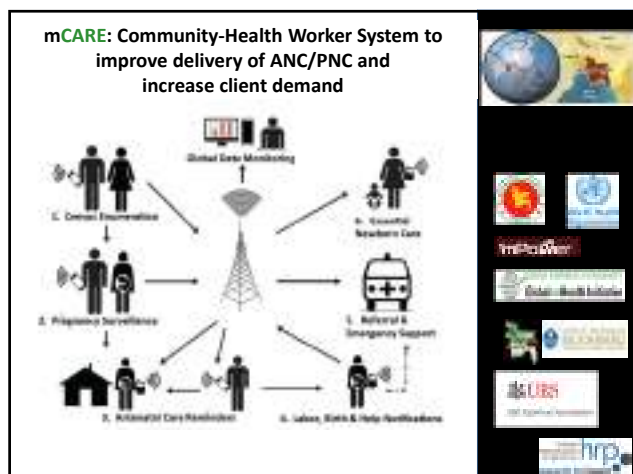
Multiple **DAYS** spent **EACH WEEK** aggregating data.
FIVE layers of aggregation occur before data is digitized.



ANC / PNC Rates Very Low

Figure 2 Utilization of Maternal Health Services, 2004-2011

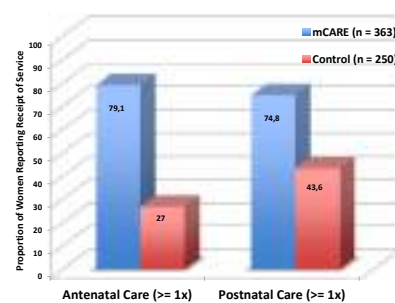




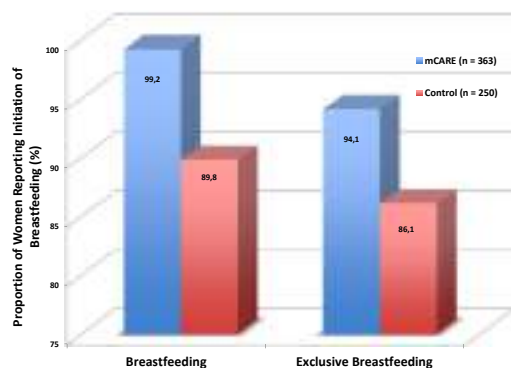
Constraints – targeted solutions

- No Denominators
- Unsystematic Surveillance
- Missed opportunity for early ANC
- **No scheduled reminders for ANC/PNC**
- Data on service utilization not verifiable
- Lack of Systematic M/E procedures
- Timeliness of ANC/ENC and Referral a challenge

Result: mCARE Tripled ANC and Doubled PNC in Rural Bangladesh



mCARE showed 10% Increase in Breastfeeding and 8% Increase in Exclusive Breastfeeding



Constraints – targeted solutions

- No Denominators
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- Missed opportunity for early ANC
- No scheduled reminders for ANC/PNC
- Data on services utilization not verifiable
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Client-driven, SMS-based, direct-to-server “short-code” notification



mTikka
Harnessing a Mobile System to Achieve Universal Vaccination

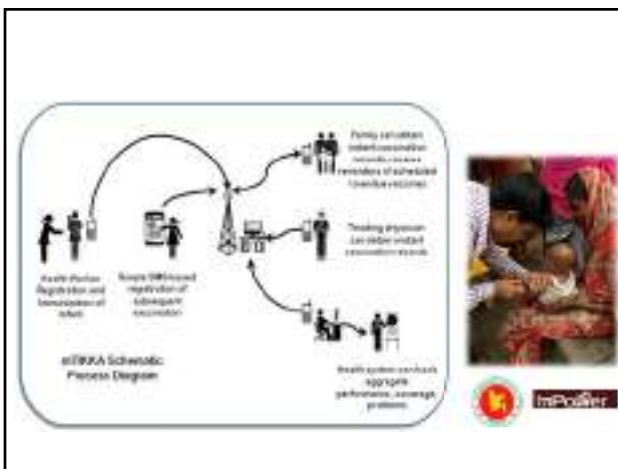


Global Health Initiative

Bill & Melinda Gates Foundation

mPower

59



mTikka improves vaccination COVERAGE

| Vaccination status by type | Intervention: Rural | | | Control: Rural | | | DID and OR (with 95% CI) |
|--------------------------------------|---------------------|----------------|----------------------|------------------|----------------|------------------------|--------------------------|
| | Baseline (n=131) | Endline (n=69) | Difference (95% CI) | Baseline (n=126) | Endline (n=67) | Difference (95% CI) | |
| Fully vaccinated (BCG + Penta3 + MR) | 58.9 | 76.8 | 19.8* (5.7, 31.9) | 65.9 | 55.2 | -10.7* (-25.2, 3.9) | 29.5 3.8* (1.5, 9.2) |
| Vaccination status by type | Intervention: Urban | | | Control: Urban | | | |
| | (n=150) | (n=98) | | (n=110) | (n=112) | | |
| Fully vaccinated (BCG + Penta3 + MR) | 40.7 | 57.1 | 16.5* (3.9, 29.0) | 44.5 | 33.9 | -10.6* (-23.4, 2.2) | 27.1 3.0* (1.4, 6.4) |

Vaccination coverage (in %) among infants over 298 days in intervention and control areas with difference-in-difference (DID) and logistic model odds ratio (OR)

Ref: Uddin et al. (2015) Vaccine

mTikka improves TIMELY vaccination

| Vaccination status | Mother's recall | | Vaccination card | |
|---|-------------------|------------------------|-------------------|------------------------|
| | Control n = 59 | Intervention n = 59 | Control n = 59 | Intervention n = 59 |
| Fully vaccinated by 3 months of age (BCG + Penta3 + OPV3) | 6.8% | 22% | 5.1% | 25.4% |

Vaccination coverage (in %) among infants by 3 months of age in intervention and control areas, by mother's recall or vaccination card data.

Ref: Vasudevan et al. (2015) Manuscript in preparation

Globally, similar Frontline Health Worker solutions have evolved.

Few to none are Enterprise-Grade.

National Health Information System Requirements



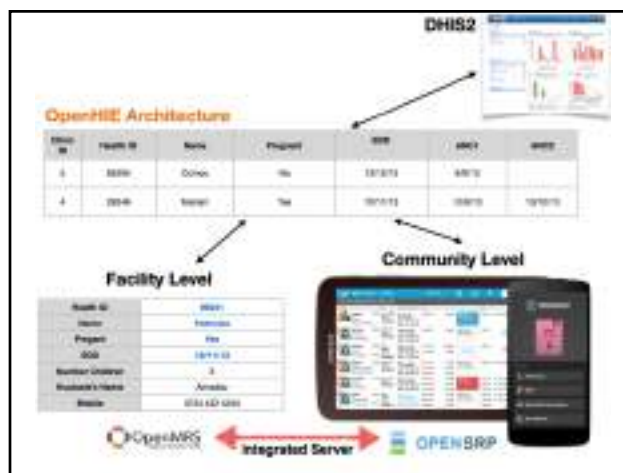
SmartRegister.org



Open Smart Register Platform (OpenSRP)



The Smart Register is meant to look familiar, similarly laid out as the Health Worker's traditional paper register





What have we learned ?



Keep it simple.





mHealth is **interdisciplinary** and
requires **mixed methods**

Iterative development, rapid
evaluation and rigorous
measurement are all needed



Measuring impact is essential part of scaling up and should **NOT** be an afterthought, or relegated to “budgetary leftovers”.

On the Horizon... a new WHO M&E Workbook...



Develop Common Indicators and Measurement Standards for mHealth Projects



Agarwal et al. mHS 2013



BMJ **mERA:**
mHealth **E**valuation, **R**eporting and **A**ssessment Guidelines

WHO mTAG / JHU-Gmi complement to PRISMA / CONSORT

A pragmatic approach that promotes high-quality reporting of mHealth innovation research, across varied study designs to facilitate evidence synthesis and development of guidance

- **Domain 1:** Research Methodology Reporting
- **Domain 2:** Essential mHealth (Technology, Functionality, Delivery) Reporting

| Domain | Description | No. |
|------------|--|-----|
| Domain 1.1 | General Reporting and Methodology Criteria | 23 |
| Domain 1.2 | Quantitative Criteria | 4 |
| Domain 1.3 | Qualitative Criteria | 3 |
| Domain 2 | mHealth Criteria | 14 |

Global Mobile Health Challenge

equator

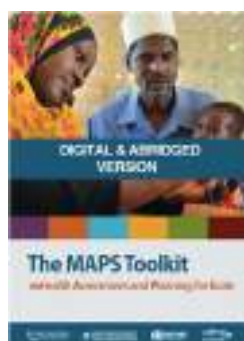
Building for SCALE is **not simple or cheap**. Most “**pilots**” were not built to scale.

The M.A.P.S. Tool

mHealth Assessment and Planning for Scale




- To **assess** scalability by reviewing key considerations and activities
- To **plan** for future activities after identifying areas of weakness
- To **improve** on progress through scale



<http://tinyurl.com/WHO-MAPS>


Axes of scale with corresponding domains





□ Each axis has a scorecard

□ Users add up the scores for each SAQ and calculate the “axis score”

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Summary Scorecard


□ Allow users to identify areas requiring attention

□ Can be used to assess progress over time

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Simplicity may be the key to **initial** scale-up and integration.

On the Horizon...

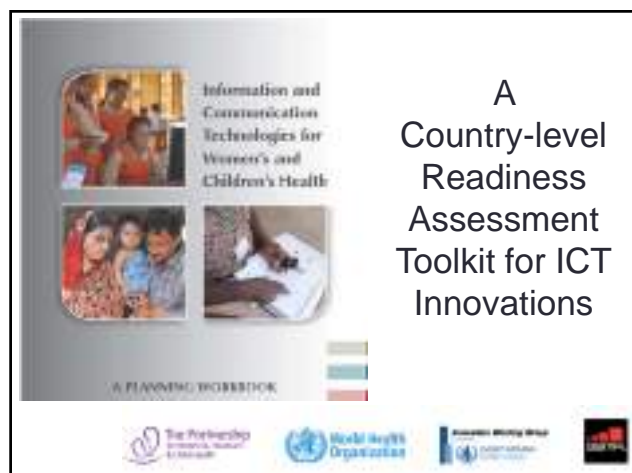


Mobile Technology in Support of Frontline Health Workers

A comprehensive overview of the landscape, knowledge gaps and future directions

PAULA MELINDA GAFRIEL

Engage **Government** from
the **beginning** of the
innovation cycle .





Learn from each other's successes and **failures**. Build on other's work, not **recreating** the 'wheel'.



mHealthEvidence.org / mHealthKnowledge.org

Table 3. Theme-specific analysis and research recommendations

| Theme | Findings | Recommendations |
|--|---|--|
| Theme 1: mHealth and Personal Networks | Study findings on personal networks to health care workers (HCWs) and community health workers (CHWs) are mixed. Some studies show positive impacts on patient adherence, while others show no impact or even negative impacts. | 1. Continue to explore the role of personal networks in health care delivery, particularly in low-resource settings. 2. Develop strategies to support HCWs and CHWs in leveraging their personal networks for patient education and behavior change. 3. Conduct research to evaluate the impact of personal networks on patient adherence and health outcomes. |
| Theme 2: mHealth for the Elderly | Study findings on mHealth for the elderly are mixed. Some studies show positive impacts on medication adherence and health outcomes, while others show no impact or even negative impacts. | 1. Continue to explore the role of mHealth for the elderly, particularly in low-resource settings. 2. Develop strategies to support the elderly in using mHealth technologies. 3. Conduct research to evaluate the impact of mHealth on the elderly's health outcomes. |
| Theme 3: mHealth for the Youthful | Study findings on mHealth for the youthful are mixed. Some studies show positive impacts on medication adherence and health outcomes, while others show no impact or even negative impacts. | 1. Continue to explore the role of mHealth for the youthful, particularly in low-resource settings. 2. Develop strategies to support the youthful in using mHealth technologies. 3. Conduct research to evaluate the impact of mHealth on the youthful's health outcomes. |

| Topic | Priorities | Research |
|--|---|--|
| Topic 1: Health Care for People Living with HIV/AIDS | Mobile testing should be integrated into structured care programs under the guidance of implementation science to increase engagement with structured care activities (SCAs). Mobile testing should be integrated into structured programs on immunization schedules for children and may be particularly helpful in mobile communities or refugee camp settings (RSC). | Underpin implementation science by optimal testing of mobile messages to reduce existing barriers to care: demand creation, cost-effectiveness, integration into the health system, and adequate supply of quality maternal health services (R). Underpin implementation science by optimal testing of mobile messages to increase the uptake of programs on immunization schedules of their infants and children to ensure demand creation, cost-effectiveness, integration into the health system, and adequate supply and access to child immunization services (R). Parent studies should evaluate the effectiveness of mobile programs such as: home-based or health extension to under-5 population (e.g., immunization rates, RSC, test and treat (T&T)). Parent is longitudinal cohort study to evaluate the efficacy of home-based, test-and-treat and other high-quality mobile programming on: uptake, sustainability and child health outcomes (RVC and value proposition with an emphasis on decreased HIV incidence? RVC). Parent is additional research to determine actual acceptance of the intervention (parental education, and behavior, parental motivation, and/or health system) results to provide effect on RVC, RVC. Parent is ongoing implementation science to test many other related sustainability and implementation science (R). |
| Topic 2: Health Care for People Living with HIV/AIDS | Provide access to and encourage utilization rates of to gain exposure to limited high-quality educational, media programming and to increase rates of utilization (RVC). | Parent is longitudinal cohort study to evaluate the efficacy of home-based, test-and-treat and other high-quality mobile programming on: uptake, sustainability and child health outcomes (RVC and value proposition with an emphasis on decreased HIV incidence? RVC). Parent is additional research to determine actual acceptance of the intervention (parental education, and behavior, parental motivation, and/or health system) results to provide effect on RVC, RVC. Parent is ongoing implementation science to test many other related sustainability and implementation science (R). |
| Topic 3: Health Care for People Living with HIV/AIDS | Integrate educational and physical activities related to health systems and address effective care for related diseases and family well-being (RVC). | Parent is longitudinal cohort study to evaluate the efficacy of home-based, test-and-treat and other high-quality mobile programming on: uptake, sustainability and child health outcomes (RVC and value proposition with an emphasis on decreased HIV incidence? RVC). Parent is additional research to determine actual acceptance of the intervention (parental education, and behavior, parental motivation, and/or health system) results to provide effect on RVC, RVC. Parent is ongoing implementation science to test many other related sustainability and implementation science (R). |

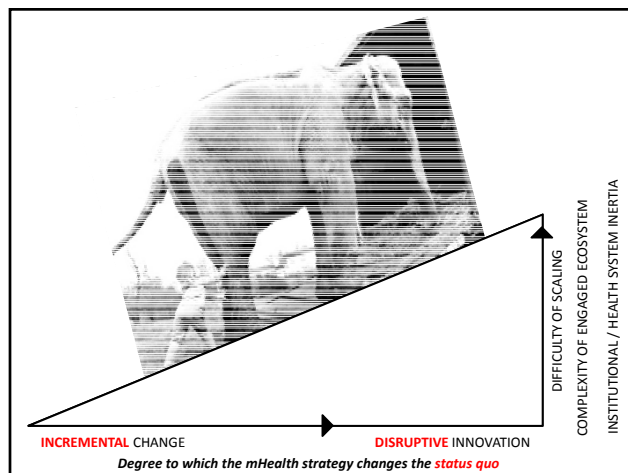
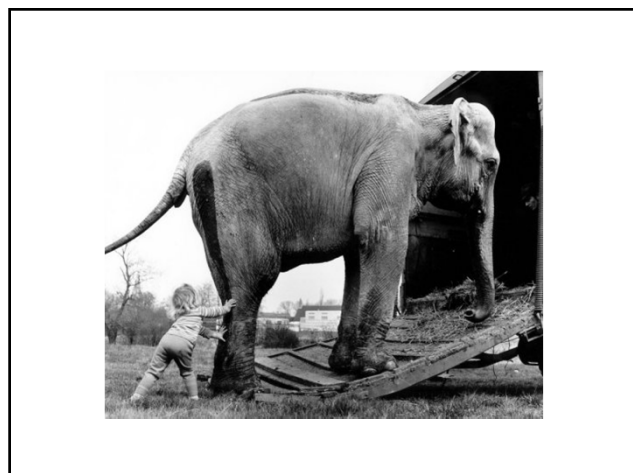


CaringCrowd
Where public health comes together



\$10,000 - \$150,000 Seed funding
"All or nothing" model
Gift IDC (10%) Negotiated

caringcrowd.com



Draw inspiration from Botswana and Bangladesh to
Baltimore to understand what is m.....**POSSIBLE**





Thank you.

<http://tinyurl.com/mpossible-video>



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 jhumhealth

www.jhumhealth.org