WHO mHealth and ICT Framework for RMNCH v5.8

The “WHO mHealth Framework for RMNCH” describes the potential value of mHealth solutions in strengthening health systems across the reproductive, maternal, neonatal, and child health (RMNCH) continuum. The framework combines metrics describing health system functions and needs, as well as the ICT and mHealth strategies used to address those needs. In doing so, the framework provides a comprehensive overview of missions and goals of existing and proposed ICT and mHealth projects across the RMNCH continuum.

In brief, the RMNCH continuum profiles the stages of life for women ages 15-49 years, and their children. The health system functions describe the provision of essential interventions that include preventive and curative care along the RMNCH continuum for improved maternal and child health outcomes. Health system needs outlines the mechanisms that allow access to and delivery of appropriate health services to be provided to mothers and children. Some mechanisms, such as communication tools, are cross-cutting and apply across the continuum, while others, such as timely and complete coverage of vaccinations, apply to specific stages within the continuum. The 10 domains of ICT and mHealth functions include broad categories that encompass many subfunctions. These domains, and some representative ICT and mHealth projects are described in detail below.

This Framework reflects the refinement and consolidation of concepts described in a number of technical documents and illustrative diagrams representing a range of stakeholders. It attempts to resolve the multiple perspectives of innovation in the mHealth and ICT space. It also works to ensure that the concepts are aligned with frameworks proposed by the UN EWEC IWG mHealth Catalytic Grant projects, the guidance of WHO and other H4+ Agencies, GSMA, the mHealth Alliance, the Partnership for Maternal, Newborn, and Child Health (PMNCH), and leading academic research institutions; and is consistent with technical concepts used in the PMNCH Essential Interventions Report, Commodities and Guidelines for Reproductive, Maternal, Newborn and Child Health, and WHO Monitoring the Building Blocks of Health Systems. This framework is a work in progress, with subsequent revisions and additions released as future versions. We welcome the input of other stakeholders to ensure it’s relevance and value to the health, mHealth, and ICT communities working to improve the health of women and children globally.

The framework reflects concepts presented in the following documents:
(will be added)

Illustrative mHealth and ICT solutions across the RMNCH continuum
This document refers to the “WHO mHealth framework for RMNCH” and details illustrative mHealth and ICT solutions across the continuum of care, grouping them by their **mHealth functions and strategies**, which variously contribute toward health systems achieving goals.

**Health System Goal: Enumeration of clients and service equity**

**Strategy 1: Registration & vital events tracking**

*Description:*

Pregnancy and birth registration systems that allow the identification and enumeration of all eligible mothers and children from the target population so that they can receive timely care and to understand and overcome disparities in health outcomes. Enumeration also allows the identification of clients from disadvantaged segments to promote equity in the provision of health services. Tracking of vital events (birth and deaths) allows for up to date registries.

*Examples of mHealth solutions:*

- Structured forms for data collection
- Unique identifiers
- Electronic forms in support of verbal autopsy
- Systems in support of electronic birth registration

*Examples of mHealth strategies in use:*

MCTS (e.g., e-Mamta), MOH Rwanda, Childcount, UNICEF mobile birth registration

*UN EWEC IWG mHealth case example:*

**Ministry of Health of Rwanda** is training community health workers to use mHealth applications to monitor and promote maternal and neonatal health, identify potential risks, and promote antenatal care at health center facilities. The mHealth applications in use are “RapidSMS,” which helps track pregnant women, and mUbuzima, which is used to collect and report information which feeds into progress in achieving MDG indicators at the community level.

**Health System Goal: Continuity of care**

**Strategy 2: Electronic health records**

*Description:*

Health services provided by health workers recorded electronically to create up-to-date medical histories of patients, allowing health workers to make more informed clinical decisions. This includes prenatal records, infant growth monitoring, vaccine records etc.

*Examples of mHealth solutions:*

- Client medical profiles
- Timelines of patient-specific medical events
- Mechanisms to store and retrieve client health data on phones
**Examples of mHealth strategies in use:** Project Optimize, OpenMRS, Interactive Research and Development - Interactive Alerts for Vaccination Coverage

**UN EWEC IWG mHealth case example:**
D-tree uses an interactive mobile version of the government approved treatment guidelines to support health workers to treat acutely malnourished children. The application takes frontline health workers step by step through the guidelines using data from past and current visits collected through the application to determine the child’s progress and treatment. The software captures the data as it is entered into the application, providing an added benefit to health service administrators who have real-time access to program data.

**Health System Goal:** **Accountability for health services**
**Strategy 3. Scheduling & reminders**

**Description:**
Helps keep health workers and patients informed of upcoming or due services, providers patients with reminders to adhere to treatment, and promotes accountability and follow-up among providers. This includes scheduling ANC and PNC visits, reminders about upcoming vaccinations or for adherence to medication regimens, and follow up on medical procedures such as sterilization or IUD insertion.

**Examples of mHealth tools:**
- Provider or client reminders in the form of SMS messages
- Provider or client reminders in the form of IVR pre-recorded audio messages
- Lists of clients due or overdue for services
- Alerts for providers indicating an overdue or not-completed health event
- Provider workplans and scheduling tools

**Examples of mHealth strategies in use:** Wel-Tel, IRD Interactive Alerts, Grameen Foundation MOTECH

**UN EWEC IWG mHealth case example:**
Interactive Research and Development (IRD), Pakistan’s Interactive Alerts application utilizes SMS reminders to patients and caregivers, radio-frequency identification tag stickers for immunization cards, and an innovative lottery system of conditional cash transfers to increase coverage of vaccines in support of the government’s Expanded Program on Immunization.

**Health System Goal:** **Increased safety and quality of care**
**Strategy 4. Decision support**

**Description:**
Decision support tools and systems that are automated and algorithm- or rule-based. They enable the health provider to follow clinical guidelines and provide quality care to patients.
Decision support tools may be used to identify and prioritize high-risk clients for health care where resources may be limited.

**Examples of mHealth tools:**
- protocols
- checklists
- algorithms
- electronic forms

**Examples of mHealth strategies in use:** e-IMCI, mCheck, mLearning, risk profiling, D-Tree, Dimagi CommCare

**UN EWEC IWG mHealth case example:**
Dimagi’s CommCare platform provides an integrated system of tools including registration forms, checklists, danger sign monitoring, and educational prompts with audio, image, and video clips to help ASHAs to deliver health information and services in the community.

**Health System Goal:** *Knowledge and access to information*

**Strategy 5. Client education & behaviour change communication (BCC)**

**Description:**
Targeted, timely, health education and actionable health information either through text messaging, IVR, and/or educational videos that engages multiple actors (woman, husband, family, community) and potentially increases health service utilization. This includes motivational electronic education materials shared by health workers during client visits.

**Examples of mHealth solutions:**
- SMS messages exchanged between clients and health workers, either unidirectionally or interactively
- IVR
- Phone calls
- Motivational videos and testimonials
- Health quizzes and games for clients

**Examples of mHealth strategies in use:** MAMA, Text4Baby, Grameen MOTECH, mDhil
- Cell-Life - PMTCT adherence and information to clients
- Grameen -MOTECH - information during pregnancy to client; information about ANC needs of client for HW
- Wel-Tel - for HIV ARV adherence
- MAMA
- m4RH - SMS messages sent by clients for family planning information generating automated responses

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**UN EWEC IWG mHealth case example:**

MAMA/Cell-Life’s MAMA SMS Service provides messages to support women living with HIV and HIV-negative women in their journey to motherhood with pregnancy, postnatal and baby care information. MAMA SMS Service provides the support to help keep women healthy throughout their pregnancy and encourage adherence to PMTCT programmes where necessary.

**UN EWEC IWG mHealth case example:**

Grameen Mobile Technology for Community Health Worker Initiative (MOTECH), in partnership with the Ghana Health Service, is supporting women and Community Health Nurses by delivering time-specific information to women about pregnancy, child well-care practices, and appointments while supporting electronic records systems for the nurses to reinforce timely delivery of care.

**Health System Goal: Skilled health workforce**

**Strategy 6. Provider training and service updates:**

**Description:** Educational videos, informational messages and interactive exercises through a mobile phone interface that allow health workers to get up-to-date clinical training, provider updates and continuing education.

**Examples of mHealth solutions:**

- SMS messages
- Pre-recorded audio through IVR
- Pre-recorded videos
- Phone-based video conferencing and remote lectures
- Educational health quizzes and games for providers

**Examples of mHealth strategies in use:**

- eMocha -- Android system for health worker on-demand training
- DTree
- BBC mKanji
- Intel Skool
- AMREF rural nurse training solution

**Health System Goal: Access to commodities & health staff**

**Strategy 7. Commodity and human resource management**

**Description:** Tools to track and manage human resources, stocks and supplies to allow continued access to health personnel, medicines and medical technology. This includes the use of reporting systems to manage human resources, SMS and other technology to prevent fraud (e.g., due to the sale of counterfeit medication), reporting on commodities to provide visibility of supplies across facilities, and communication approaches to request new commodities.
Examples of mHealth solutions:
- Stock out reports using SMS
- Supply chain management (e.g., scanning barcodes on supplies such as vaccine vials)
- Mobilization of emergency care personnel (e.g., for management of obstetric emergencies)
- Supervisor-level workforce management tools

Examples of mHealth strategies in use:
- SMS for Life, mPedigree, Sproxil, RapidSMS, 108 Ambulance service, mCare Bangladesh

UN EWEC IWG mHealth case example:
Novartis has developed the SMS for Life initiative, which tracks weekly stock levels of key anti-malarial medicines in health facilities in remote locations in Africa to reduce stock-outs. The initiative provides (a) current and historical data on stock levels at the health facility and district level; (b) Google mapping of district health facilities with stock level overlays and stock-out alerts; (c) SMS messaging statistics; and (d) usage statistics. SMS for Life is being deployed in regions of Tanzania, Kenya, Ghana, and Cameroon.

Health System Goal: Reduce financial and motivational barriers
Strategy 8. Health financing & incentives:
Description: Tools to provide incentives for provision of care, decrease financial barriers to care for either patients or providers, and to incentivize service utilization by clients. This includes incentives to clients for utilizing particular areas of health services (e.g., institutional deliveries or vaccines), vouchers to subsidize health services, universal health insurance schemes and mobile banking for access to resources for health services.

Examples of mHealth solutions:
- Financial incentives and conditional cash transfers via mobile money
- Reimbursement of, or provision of phone minutes and data plans
- Phones provided to health workers or clients
- Mobile vouchers for family planning methods

Examples of mHealth strategies in use:
- m-Pesa - financial transfers (pay for performance,
- Interactive Research and Development - Interactive Alerts for Vaccination Coverage

Health System Goal: Connected health system
Strategy 9. Communication and telemedicine
Description: Communication and remote diagnostics between health providers and other health system components to coordinate care and provide expert assistance for health staff. This includes Closed User Group networks (Ghana Medical Association and Vodafone)

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partnership in Ghana), remote expert assistance for providers, rapid communication of test results and diagnostic information for prompt care (e.g. CHAI-SMART), and referrals.

*Examples of mHealth solutions:*
- SMS messages
- Phone calls
- Emails
- Closed user groups
- Notification of new data uploads (e.g., lab results available)
- Hotlines (communication with expert)

*Examples of mHealth strategies in use:* Switchboard Health (Ghana, Liberia, Tanzania), CHAI SMART

**UN EWEC IWG mHealth case example:**
The Clinton Health Access Initiative (CHAI), the Federal Ministry of Health (FMOH) of Nigeria, and Hewlett Packard have partnered on the SMS Printers to Accelerate Return of Test Results for Early Infant Diagnosis of HIV/AIDS program (SMART), which seeks to reduce the turnaround time for infant HIV test results using SMS printers. A printer enabled with SMS technology transfers the HIV test results from the lab instantaneously to the health facility where the blood sample was collected, thereby allowing HIV-positive infants to begin life-saving antiretrovirals sooner than if paper-based result delivery systems were used.

**Health System Goal:** *Up-to-date national health information*

**Strategy 10. Real-time indicator reporting**

*Description:* Tools to calculate and report on specific indicators from electronically collected data, reflecting health system, health worker and technology performance, vital events and disease statistics, and aggregate reports at the district, local, state or national level for access by supervisors, policy-makers and other stakeholders. The focus is on developing an integrated view of health service data which contributes to a national health information system.

*Examples of mHealth strategies in use:*
DHIS2, and many mHealth and ICT solutions which are interoperable with existing health information systems (e.g., Childcount+, Cell Preven for monitoring and managing sexually transmitted infections (STIs) among sex workers).

*Examples of mHealth solutions:*
- Predefined reports
- Health Management Information Systems (HMIS)
For more information:
HRP Innovations Catalyst
Department of Reproductive Health and Research
World Health Organization
Geneva, Switzerland
http://who.int/reproductivehealth/innovations

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