eHealth and mHealth for maternal and child health, best practices and challenges

Digital Health for Rural Communities: Potential, Trends and Challenges, ITU, 17 September 2010

Dr. Garrett Mehl, Department of Reproductive Health and Research, World Health Organization, Geneva
Too many children die every year...

- 9 million children less than five years old die each year
- About 48% of all child deaths occur in Africa and 27% in South-east Asia
- More than 50% of all child deaths are concentrated in just six countries: India, Nigeria, DR Congo, Pakistan, China and Ethiopia


Source: Cynthia Boschi Pinto, WHO
Solutions exist: Most under-five deaths are preventable by known, affordable, low-technology interventions

**PREVENTIVE INTERVENTIONS**
- Skilled care at birth
- Postnatal care for all newborns
- Early initiation of breastfeeding
- Exclusive breastfeeding: 6 mo
- Complementary feeding
- Immunization
- Insecticide treated bednets

**TREATMENT INTERVENTIONS**
- Neonatal resuscitation
- Extra care of LBW babies
- Treatment of neonatal sepsis
- ORT and zinc for diarrhoea
- Antibiotics for dysentery
- Antibiotics for pneumonia
- Anti-malarials

Source: Cynthia Boschi Pinto, WHO

Monday, 4 October 2010
Every Minute

380
Women become pregnant

190
Women face an unplanned or unwanted pregnancy

110
Women experience a pregnancy-related complication

40
Women have an unsafe abortion

5
Babies are born dead

5
Newborns die

1
Woman dies

Source: Department of Making Pregnancy Safer, WHO
Services are Not Universally Available or Used

- >200 million pregnancies per year globally, and up to 50% are unplanned
- 530,000 maternal deaths/year; 99% occur in developing countries
- > 35% of women receive no antenatal care
- ~ 50% of births attended by unskilled provider
- ~ 70% receive no postpartum/newborn care

Source: Patricia Gomez, ACCESS Program/Jhpiego
Principles of intervention delivery

Home/Community  1st level facility  Hospital

Number of pregnant women, newborn and child seen

Specialised care

Equipment, supplies, case management skills

Source: Patricia Gomez, ACCESS Program/Jhpiego
Continuum of Care

Family Planning Services
Care During Pregnancy
Prevention of Unsafe Abortion
Care of Mother and Newborn around Birth
Care for Postpartum Mother
Care for Newborn
Care During Infancy and Childhood
Continuum of Care strengthened by eHealth

Adolescence  
Before Pregnancy  
Pregnancy  
Birth  
Postnatal (mother)  
Postnatal (newborn)  
Maternal health  
Infancy  
Childhood

Outreach Worker  
Transport  
Primary Facility  
Tertiary Facility

Monday, 4 October 2010
Survey results: Common mHealth Strategies

- Data Collection
- Disease Surveillance
- Provider point of care support
- Electronic medical records
- Health provider tele-guidance
- Emergency response
- Remote monitoring & diagnostics
- Client reminders
- Patient tele-counseling/helpline
- Treatment compliance
- Prevention & Promotion
- Conditional Cash Transfers

Source: G. Mehl, WHO
mHealth Best Practices

Need to be:

• Evidence-based, and based on expert opinion with demonstrated impact
• Easily taught to various categories of providers
• Feasible in low-resource settings
• Affordable
• Sustainable
• Scalable for greatest impact
• Integrated within current practices
• Comprehensive and standardised
What effects would they have?

- Morbidity, Mortality
- Disease Incidence and Prevalence
- Accessibility, Availability, Affordability
- Efficacy, Effectiveness
- Efficiency, Cost-effectiveness
- Quality, Coverage, Performance
- Sustainability, Scalability
- Equity, Health Outcome
ChildCount+ Overview

Client → Outreach Worker → Primary Facility → Tertiary Facility

SMS → Reports
• Register Every Child U5 and Pregnant Mothers
• Register all Births and Pregnancies
• Record Deaths (and aborted pregnancies)
• Nutrition Screening (MUAC) Every 90 Days
• Screen for Malaria, Diarrhea
• Insure full immunization schedules

Source: Matt Berg, Earth Institute
Child Registrations

95% of Children

Source: Matt Berg, Earth Institute
### Anyiko: Carolyne Ateka

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Each month, each CHW is provided a printed list of all their registered children and pregnant mothers.
Nutrition Screening

Source: Matt Berg, Earth Institute
**Malnutrition Report**

**MUAC +28 105 E V D**

**CODE Patient ID MUAC (mm) Edema (E/N) Symptoms**

- **V = Vomiting**, **F = Fever**, **D = Diarrhea**
- **A = Appetite Loss**, **CG = Chronic Cough**
- **CF = Confusion**, **NR = Non Responsive**
- **CV = Convulsions**, **UF = Unable to Feed**

**MUAC> Child +28 Fatimata Diallo F/13M has SAM+. Please bring child in for IMMEDIATE inpatient care.**

Source: Matt Berg, Earth Institute
SMS Health Reports

Source: Matt Berg, Earth Institute
CC+ facilitates:

- Immediate feedback to CHWs, guiding their action
- Reinforced learning (esp. for newer health workers)
- Increased accountability (CHW team manager can monitor CHWs' performance; CHWs also receive reports compiling data on all of their patients, helps them to keep track of how they're doing, where they need to follow up, etc.)
- Improved tracking of health and disease patterns
- Informed resource allocations
- Measure of effectiveness (when conducted with good monitoring and evaluation)
- Reduced loss to follow-up (through alerts, reminders)
Identifying mHealth Solutions to Address Health Service and Knowledge Gaps

- 100% All women with sexually transmitted disease/reproductive tract infection
- 50% Symptomatic
- 35% Seek treatment
- 30% Go to health unit
- 6% Treated correctly
- 4% Compliant
- 3% Treatment effective
- 1% Partner treated

mHealth solutions
- Screening
- Information
- Incentive
- Quality of care
- Reminders
- Education

Sana

Client

Outreach Worker

Tertiary Facility

OpenMRS

Primary Facility
Sana - Diagnostic Tool

- a Smart-phone based system that supports audio, images, location-based data, text, and video and data to aid in patient diagnosis.
- Algorithmic approach (using standardized medical algorithms)
- Using Sana, medical information is uploaded by a health worker to OpenMRS for a doctor to review. After reviewing the case, doctors can notify the health worker of the diagnosis or advice by sending results to the Sana app.
- Software is downloaded to the phone so decision support is available even when connection is poor or non-existent.
- Doctors also have the ability to build customized procedures for nurses and organizations to use.
- Procedures are step-by-step workflows.
Sana Infrastructure

- The complete Sana system consists of at least one (in most instances several) phones and a web-connected server. The server runs the medical records system of choice, such as OpenMRS, and the Sana Dispatch Server program.

Nurse collects and uploads data  
Doctor grabs case from queue and reviews it  
Sana informs nurse of diagnosis result
Possible mHealth Best Practices

Package of services

- **Registration** with unique ID
- Comprehensive *tracing system*, esp. to address problems of loss-to-followup.
- **Health reports** on specific topics
- **Rapid response time**: immediate response with guidance on what to do
- **Rapid diagnostic test reports** -- e.g., malaria - based on test results, instant guidance to health worker on what to do, and tracking of malaria among population.
- **Provider Action Reminder** - child’s CHW receives a text message requesting follow-up visit next day.
- **Follow-up alerts** -- reminders to CHWs, to patients
- Linkage to expert systems for diagnostic assistance
- Linkage to Electronic Medical Records Systems
- **Two way data flow** -- CHW to Health system and back.
Current and Future Challenges

- Moving from Pilot to Large Scale Project
- Moving from single-focus projects to comprehensive solutions
- Integrating with Ministry of Health MHIS and reporting systems
- Demonstrating impact - agreement on common indicators and goals (New initiatives on impact assessment)
- Common Registration and Unique Patient Identifiers across projects
- Common Data formats
- Identifying models for sustainability
- Developing client focused systems for Illiterate Populations
- Patient Privacy
- Linkages with mBanking
Thanks.

For More Information:

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