Computing and Global Health  
Lecture 8  
Health Worker Support  

Winter 2015  
Richard Anderson  

Today's topics  
• Health workers  
• Worker tracking and supervision  
• Worker support tools  
  – Commcare  
  – ARTH Case study  
• Security and Privacy discussion  

Readings and Assignments  
• Readings  
  – Commcare papers  
• Homework 7  
  – Paper prototype of IMCI Diarrhoea  
• Homework 8  
  – Open Data Kit  

Community Health Workers  
• Nurses  
  – Health system employees  
  – Medical training, high school + education  
  – Permanent, salaried positions  
  – Full medical responsibilities  
• Community Health Worker  
  – Members of community  
  – Non-salaried  
  – Incentive payments  
  – Limited medical responsibilities  

Worker tracking  
• Nigeria  
• Pakistan  

Polio  

Polio cases  
1988: 350,000  
2013: 416
Polio Immunization Campaigns

- IPV: 2, 4, 6, months, 6 years
- OPV: 3 Months
- Polio outreach campaigns
  - Vaccinators go door to door
- Polio surveillance
  - Tracking cases of Acute Flaccid Paralysis (AFP)

Tracking Immunization workers

- GPS Device tracks workers
  - Separate GPS tracking device
  - Android phone with GPS application
  - Data capture application recording locations

Nigeria

- Develop micro plans based on satellite imagery
- Record routes of workers
- Compare with satellite imagery to estimate coverage

Health worker tracking

- Logging use of application with timestamp
- Recording GPS coordinates
- Requiring photo of arrival
- Monitoring and attendance applications

Health worker work lists

- Immunization lists
  - List of kids with immunizations due
  - Follow up or missed immunizations
- Immunization record keeping
  - Centralized record keeping
  - Child card for immunizations, due dates based on birthday
  - Tally sheet

Health worker reminders

- Reminders for CHW household visits
  - Multiple programs require regular visits
  - Reminder message with escalating messages
- Reminder study, DeRenzi et al.
  - CommCare project
  - CHWs had phones
  - Response to reminders
    - Declined over time
    - Supervisor escalation helped
    - Just a threat!
  - Two way features important
Health worker feedback systems

- Messages sent to CHWs to incentivize good performance

Health worker support tools

- Vision
  - Mobile phone based application with a suite of tools to enhance the ability of health workers to do their jobs

D-Tree

- NGO Founded by Dr. Marc Mitchell
- Focus on improving care through developing clinical protocols
- Implement protocol on mobile device

Commcare

- Java application for mobile phones
  - Data collection
  - Client records
  - Back end: Commcare HQ

Commcare TB Referrals

- Increase referrals for TB testing
- Basic TB screening questions implemented on a mobile phone
  - Have you been coughing for more than two weeks?
  - Are you spitting up blood?
Commcare Deployments

Dimagi

Mobile midwife project

• UW, PATH, ARTH Collaboration

Project background

• Participant goals
  – ARTH
    • Mobile tool to support midwife household visits
  – UW
    • Validate an Android based tool in the field
  – PATH
    • Evaluate the feasibility of a smart phone platform for front line health workers

Formative Work

• Site visits to facility and homes
• Extensive office discussions for design

Application Design

• Mobile data collection to support PNC visits
  – Data collection
  – Protocol support
• Open Data Kit application
• Android phones deployed with nurse midwives
Deployment

• Action Research and Training for Health
• Two maternal health clinics for a population of 64,000
• Clinic and outreach services by two doctors and eight nurse midwives
• Post Natal Care (PNC) visits using ARTH protocol
  – Two visits
  – In clinic or home

Results

• Mixed results
• Technical challenges around data entry and synchronization on multiple phones
• Some of the nurses successfully used the devices
• Obstacle to integrating data entry with existing infrastructure
• Use of videos for education considered the most positive feature

DHIS2 Mobile

• Data reporting from mobile phone for DHIS2
• Large scale deployment in Indian state of Punjab (starting about 2010)
• Distribution of phones to 5,000 ANM (Auxiliary Nurse Midwife)
  – Nokia 2330, $40
  – Reporting application, but SMS not GPRS
  – Daily, Weekly, and Monthly reporting
  – Closed group calling an important feature

Background – Burden of disease and health domains

• Big three:
  – HIV, TB, Malaria
• Maternal and Child Health
• Immunization
• Reproductive Health
• Other infectious diseases
• Neglected Tropical Diseases

Disclaimers

• I’m not a security expert
• Slides put together for a brainstorming session
• Computer security questions for global health might, or might not be interesting
Health Systems

- Public health system
  - Hospital, Health Center, Health Post
  - Shortage of doctors
- Private facilities, pharmacies may have a role
- Some countries developing insurance schemes
- Donors, NGOs, Global organizations play a major role

Infrastructure

- Electricity, Internet, Cell phone
  - Highly variable
    - Urban infrastructure often good
    - Rural can have limited power and connectivity
  - Computing
  - Mobile phones
    - Widely available
      - Basic, Feature, Smartphone
      - Different ownership models
      - Costs variable

Privacy

- Health system less concerned/sensitive to privacy issues
- Expectations of privacy different
- Clinical studies often very strict on privacy
  - IRB Issues
  - Country oversight
- Country health data frameworks not as strict as HIPAA

Stigma

- Stigma around disease / condition is a great concern
- Levels of stigma vary, and often not understood
  - HIV, Tuberculosis, Malaria, Diabetes, Pregnancy, Family Planning, STDs, Mental Illness, Drug Use, Alcohol Use, Abortion, Immunization Status, Maternal health practices

ICT Applications

- Surveillance data reporting: DHIS2
- Medical record systems: OpenMRS
- Logistics management: OpenLMIS
- Data reporting: Open Data Kit
- Health worker support: CommCare

Processes

- Managing a register
  - National TB register
  - Immunizations
- Reporting diagnostics
  - Laboratory testing, reporting results
- Visit reminders
- Informational messages
- Counselling messages
Other issues

- Tracking identity
- Medication adherence
- Identification of counterfeit drugs
- Tracking health workers
  - Verification of attendance
- Household visits
  - Protecting privacy, geolocation

Next week

- Ed Jezierski
- Behavior change communication