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

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<tr>
<th>Date</th>
<th>Topic</th>
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<tr>
<td>Jan 7, 2015</td>
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<td>Jan 14, 2015</td>
<td>Surveillance</td>
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<td>Jan 21, 2015</td>
<td>Tracking</td>
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<td>Medical records</td>
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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 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

Individual feedback

Peer comparison
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

**Better Health for Afghan Mothers and Children**
Using mobile phones to improve maternal, newborn and child health in Afghanistan

**Mobile HIV & Malaria Diagnosis and Reporting System**
Improve disease monitoring in Zimbabwe

**Mobilise**
Mobile technology provides support services for domestic violence prevention and response in India
Commcare Deployments

COMMCARE FOR ANTENATAL CARE SERVICES IN NIGERIA

Addressing barriers to sexual and reproductive health services for youth in Mozambique

INNOVATIONS AT SCALE FOR COMMUNITY ACCESS AND LASTING EFFECTS (inSCALE)

A community health worker decision support system in Mozambique
Anyone can use CommCare for **FREE** for up to 50 mobile workers. For additional questions, please see our FAQs.

<table>
<thead>
<tr>
<th>Software Plans</th>
<th>Community</th>
<th>Standard</th>
<th>Pro</th>
<th>Advanced</th>
<th>Enterprise</th>
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<tr>
<td>Pricing*</td>
<td>Free</td>
<td>$100/mo</td>
<td>$500/mo</td>
<td>$1,000/mo</td>
<td>Unlimited/Discounted Pricing</td>
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<td>Mobile Users</td>
<td>50</td>
<td>100</td>
<td>500</td>
<td>1,000</td>
<td>1,000</td>
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<td>Price per Additional Mobile User</td>
<td>1 USD/mo</td>
<td>1 USD/mo</td>
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<td>Unlimited/Discounted Pricing</td>
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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
Global health and Security and Privacy
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
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
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