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

Date	Topic
Jan 7, 2015	Overview
Jan 14, 2015	Surveillance
Jan 21, 2015	Tracking
Jan 28, 2015	Medical records
Feb 4, 2015	Logistics
Feb 11, 2015	Patient support
Feb 18, 2015	Treatment support
Feb 25, 2015	Health worker support
Mar 4, 2015	Behavior change
Mar 11, 2015	Computing and Global Health Panel

Community Health Workers

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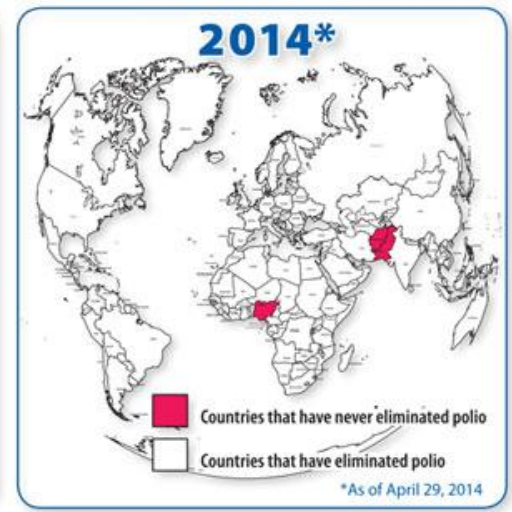 - Non-salaried
  - Incentive payments
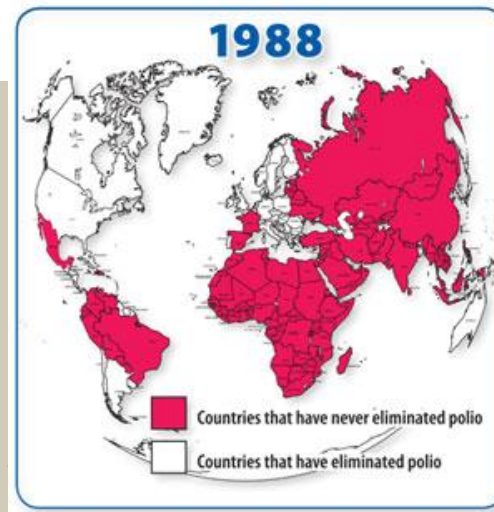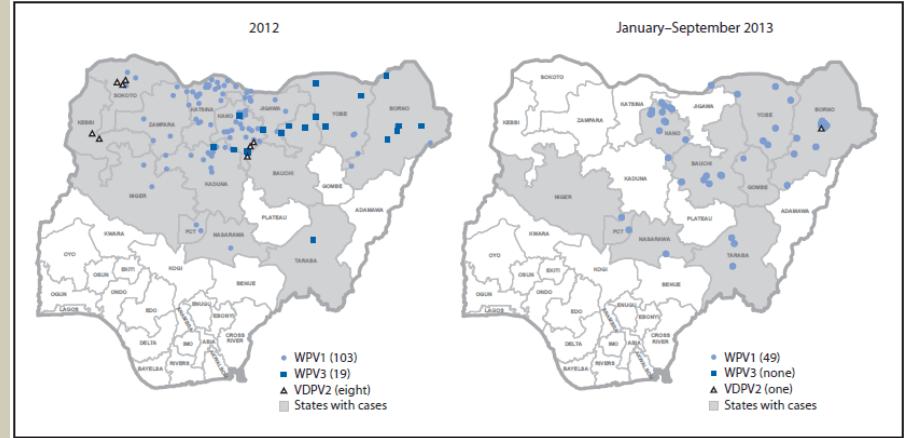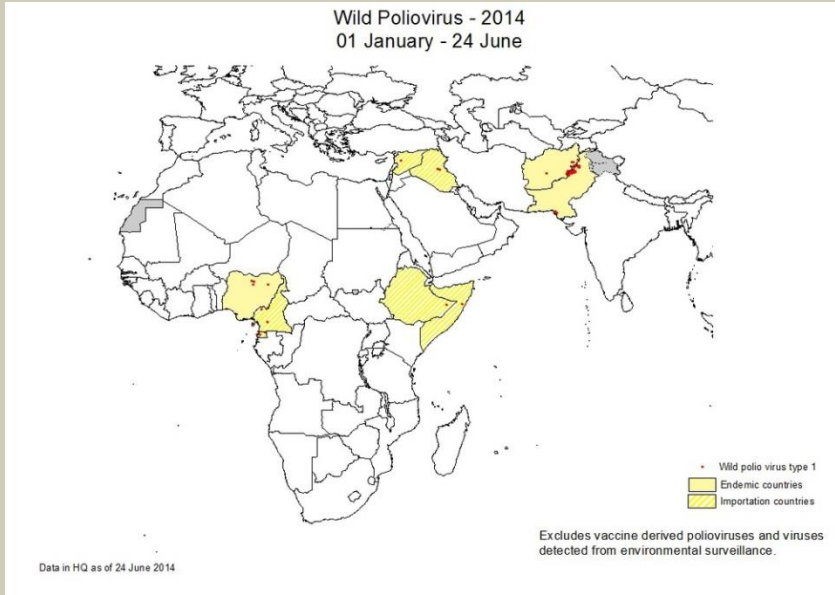 - Limited medical responsibilities

Worker tracking

- Nigeria
- Pakistan

Polio

Wild Poliovirus - 2014
01 January - 24 June

Wild polio virus type 1
Endemic countries
Importation countries

Excludes vaccine derived polioviruses and viruses detected from environmental surveillance.

Data in HQ as of 24 June 2014

2012

January–September 2013

WPV1 (103)
WPV3 (19)
VDPV2 (eight)
States with cases

WPV1 (49)
WPV3 (none)
VDPV (one)
States with cases

Polio cases
1988: 350,000
2013: 416

1988

2014*

Countries that have never eliminated polio
Countries that have eliminated polio

Countries that have never eliminated polio
Countries that have eliminated polio

*As of April 29, 2014

2/25/2015   University of
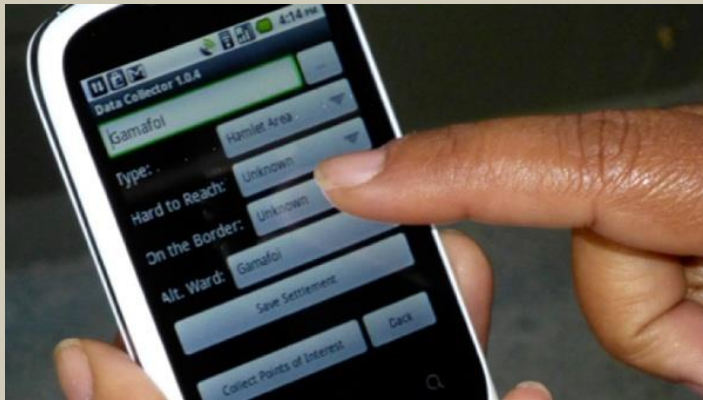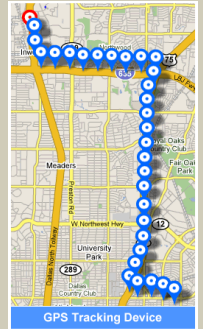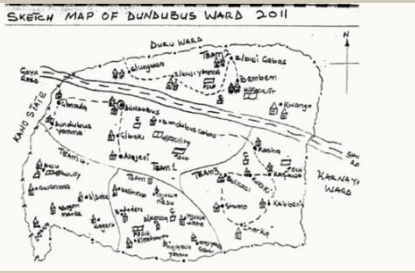
Polio Immunization Campaigns
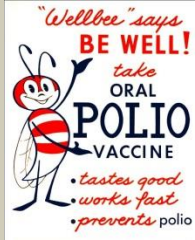
- IPV: 2, 4, 6, months, 6 years
- OPV: 3 Months

- Polio outreach campaigns
  - Vaccinators go door to door
- Polio surveillance
  - Tracking cases of Acute Flaccid Paralysis (AFP)
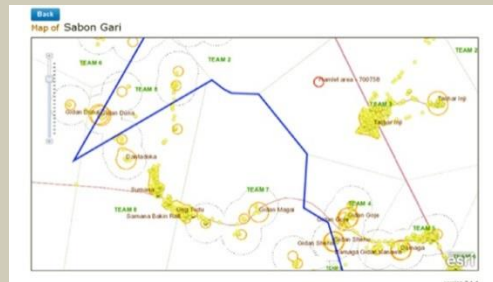
Tracking Immunization workers

- 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
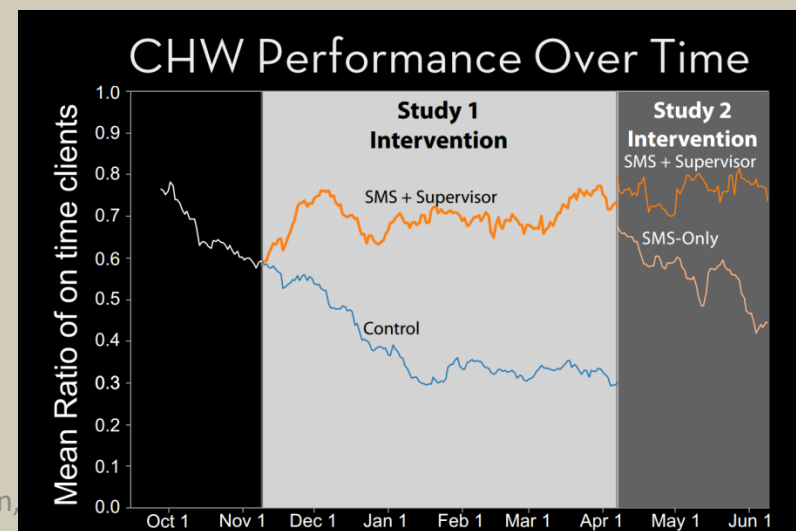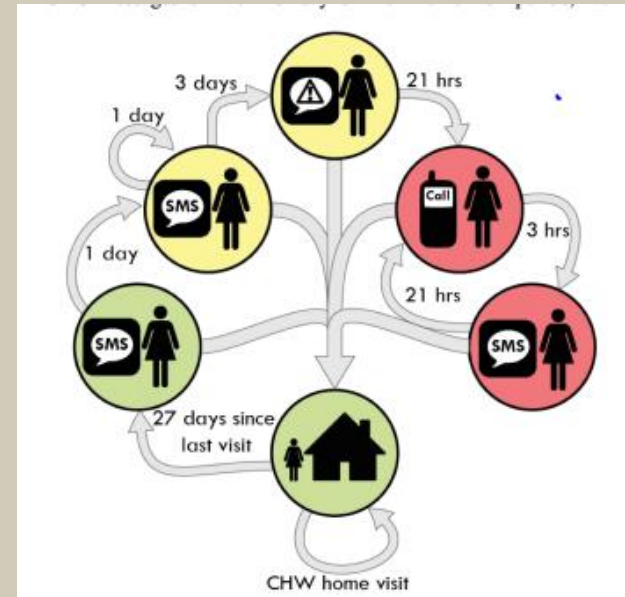
Health worker feedback systems

- Messages sent to CHWs to incentivize good performance
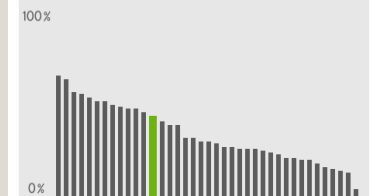

Individual feedback

मेरा प्रदर्शन
अगस्त

42%

24 मेसे 10 लभार्थीयों का गृह भ्रमण कीय है

Peer comparison

मेरा वीजीट प्रदर्शन
अगस्त

100%

0%

मैं: 42%
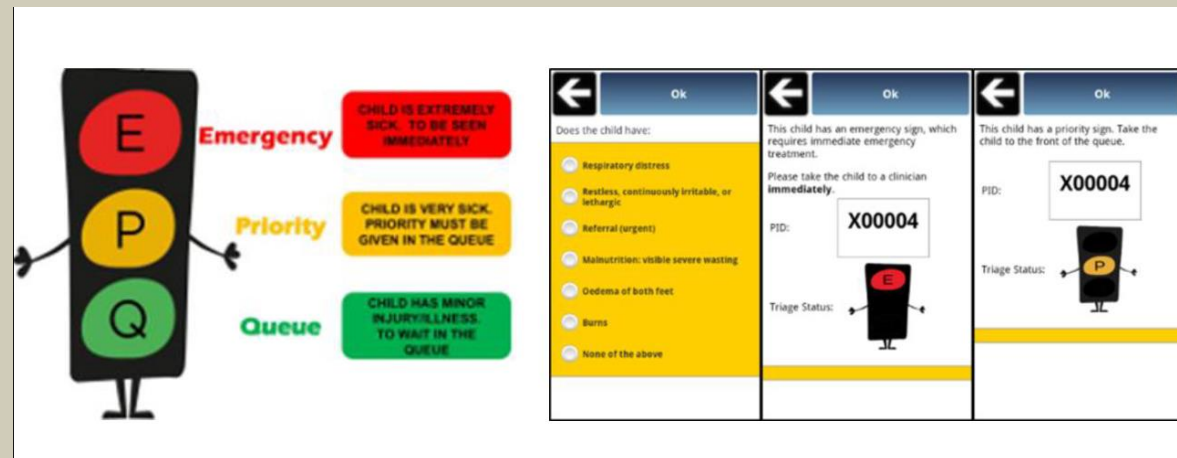24 मेसे 10 लभार्थीयों का गृह भ्रमण कीय है

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

EMERGENCY TRIAGE ASSESSMENT AND TREATMENT (ETAT)

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!

Mahantesh, Soukhya Project

Mobile technology provides support services for domestic violence prevention and response in India

Commcare Deployments

mCENAS!

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

COMMCARE FOR ANTENATAL CARE SERVICES IN NIGERIA

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

A community health worker decision support system in Mozambique

Dimagi

Mobile midwife project

- UW, PATH, ARTH Collaboration

Project background

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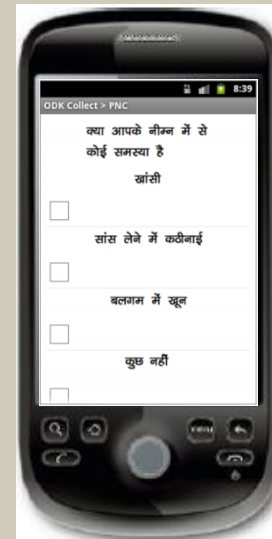
Formative Work

- 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
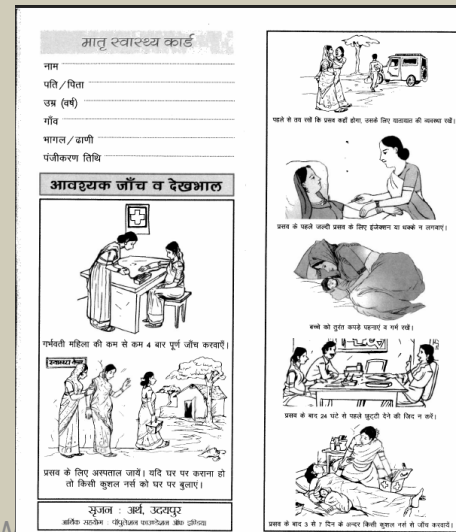
Deployment

- 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

User:
admin

Password:
district

- 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