Mobile Global Health Initiatives

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Information Pyramid

(Ideal v/s Actual needs a separate discussion)
Global Health Environment

- Exchange of lab information using data standards (vocabularies)
- Managing the creation, distribution and use of scientific knowledge
- Access electronic health records as data source for surveillance
- Managing the creation of large-linked datasets

Public health services

- Modeling the information environment to support decision making
- Integrating disparate sources of data through novel methods
- Helping evolution of information infrastructures
- Workforce development and informatics capacity building
- Bridging knowledge from different domains

Public health services

Laboratory practice

Epidemic investigation

Surveillance

Organization and systems

Public health workforce

Organizational capacity

INFORMATION-DRIVEN ACTIVITIES

Global Health
&
Major Data Collection Activities
Mobile Global Health Initiatives

- Public Health Data Collection
  - Surveys
    - (Regular/Irregular Short/Extended)
  - Surveillance/Laboratory
    - (Routine/Syndromic; Active/Passive)
Global Health Landscape

Example of Health Information Systems In Developing Countries

Appropriateness of SMS Application Development Depends on Host Country Capacity & Public Health Purpose
PH Surveillance Data Gathering

THAILAND
THAILAND
THAILAND
THAILAND
THAILAND
THAILAND

(Hospital Logbooks)
Tier 1

Data Collection

TUC-IEIP
Pneumonia Surveillance Tool

Data Transfer
THAILAND

Texting4Health: Using SMS to Motivate Behavior Change
Stanford University, Palo Alto, California - February 29, 2008
Global Health and SMS Application Areas

TRACnet
Background - Rwanda

- ~9.3 million, size of Maryland
  - most densely populated country in Africa
- Three tiered health system with 400 facilities
  - (4 reference hospitals, 30 district hospitals, 366 health facilities)
- 41,000 people on ART (antiretroviral therapy)
- 156 health facilities offering ART
  - (supported by PEPFAR IP’s, GFATM and PIH)

Content source: Kariisa, Eddie. 2007
TRACnet & Public Health Purpose

- Designed to support the monitoring of the national HIV/AIDS program
  - Direct response to shortcomings with the routine Health Information System
  - Health Information System was unable to produce program monitoring data in a timely manner

Content source: Kariisa, Eddie. 2007
TRACnet & Public Health Purpose

- **Partners:**
  - CDC, Treatment and Research AIDS Center (TRAC-Rwanda), National AIDS Commission, Rwanda Information Technology Authority (RITA), Voxiva Inc., Columbia University

Content source: Kariisa, Eddie. 2007
Approach

- Two servers hosted at a local ISP
  - One phone server has voice response system that is accessed through 2 E1 lines (which allows up to 8 simultaneous calls)
  - One web server

- Reverse billing mechanism
  - Toll free number was set up to allow registered users to access phone server at no cost

Content source: Kariisa, Eddie. 2007
HOW TRACnet WORKS?

TRACnet allows users to:
- **Collect** real-time information from the field via web, phone, mobile application.
- **View**, analyze and map the data in real-time to make more informed decisions.
- **Communicate** and send alerts and information back out to the field in a timely and systematic way.

Content source: Kariisa, Eddie. 2007
Developing a Framework for Mobile Computing in Global Health

Principles & Approaches
Mobile Global Health Initiative

- Principles in a broader context
  - Standardization of Health Metrics (HMN)
  - Standardization of Approaches
  - Integration of SMS within the broader public health information systems / enterprise health information architecture
Health Metrics Network (HMN)

- HMN is the first global health alliance
  - focuses on strengthening health information and statistical systems rather than on a specific disease

- HMN brings together
  - producers and users of health information in support of country-led efforts to strengthen their health information systems

Phase 1
Coordination, Leadership & Assessment
- Coordinate Stakeholders
- Assessment
- Gap Analysis

Phase 2
Planning and Priority Setting
- Vision
- Priorities & Costs
- Strategic Plan
- Implementation Plan

Phase 3
Implementation
- Partner M&E & Research
- Information Services
- Common Data Warehouse
- Data Collection Forms & Methods
- Resources
- Processes
- Policy

Phase 4
Evaluation
- Secure Funding

PART 2. FRAMEWORK COMPONENTS AND STANDARDS

2.1 HIS resources
   2.1.1 Information policies
   2.1.2 Financial resources
   2.1.3 Human resources
   2.1.4 Information and communications technology
   2.1.5 Coordination and leadership

2.2 Indicators
   2.2.1 Domains of health information
   2.2.2 Defining core indicators
   2.2.3 Linking indicators with data-collection strategies

2.3 Data sources
   2.3.1 Census
   2.3.2 Vital registration
   2.3.3 Population-based surveys and surveillance
   2.3.4 Health and disease records
   2.3.5 Service records
   2.3.6 Administrative records
   2.3.7 Linking indicators and data sources


Special emphasis
SMS –based data collection approaches

Texting4Health: Using SMS to Motivate Behavior Change
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2.4 Data management
   2.4.1 Data collection
   2.4.2 The metadata dictionary
   2.4.3 Data storage
   2.4.4 Data analysis and presentation
   2.4.5 Data distribution
   2.4.6 Data warehouse implementation
   2.4.7 Integrating vertical systems
   2.4.8 Standards of data quality

2.5 Information products
   2.5.1 Converting data to information
   2.5.2 Converting information to knowledge

2.6 Dissemination and use
   2.6.1 Institutionalizing information use and demand
   2.6.2 Packaging and communicating information for decision-making
   2.6.3 Use of information for decision-making

SMS Applications in Global Health
SMS Applications in GH

- Emergency Response
  - During the recent earthquake in Rwanda, general information alerts on *what to do during a tremor* were broadcast by SMS
SMS Applications in GH

- Program reporting/monitoring systems
  - Automated SMS reminders for report submission
    - to program administrators
  - Broadcast messages related to program or product
    - to patients, physicians, and health workers
SMS Applications in GH

Patient monitoring systems
  - Patient reminders
    - treatment related reminders
    - upcoming or missed
  - Information dissemination
    - upcoming public health campaign in a given area
Key Challenges
Mobile Global Health Initiatives

- Key Challenges
  - Limited message length (160 characters)
  - Bi-directional communication
    - Assurance of transmission and receipt of SMS data (crucial to public health)
    - SMS best works as a unidirectional tool in public health settings
Observations

- Bidirectional information flow
  - SMS based bidirectional information flow is hard to implement
  - Need for dedicated infrastructure
    - Human capacity tasked with responding to SMS queries
    - Automated systems (standard queries with a set of predefined responses)
Observations

- Successful SMS adoption in global health depends on transmitting and receiving **simple, brief, and actionable information**
  - SMS is not an appropriate technology to disseminate complex health information
Key Points

- Application of SMS in global health needs
  - *Standardization of approaches*: Standardize instruments and vocabularies
  - *(Electronic) Data Integration*: Create a common HIS framework and infrastructure to integrate SMS with existing enterprise systems
  - *Human capacity building*: Develop professional training to build informatics capacity to sustain SMS-based technical approach
Integration of SMS derived data with existing enterprise-level health information systems is critical to the long-term success of mobile computing in PH.