INTEROPERABILITY SESSION

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PROGRAM

• Introduction, Challenges, Definitions
• Rwanda Health Enterprise Architecture initiative: Randy Wilson/MSH
• Joint Learning Network Open Health Data Dictionary and approach, Ghana - Nigeria experience on e-claims standards (Caren Althauser/PATH)
• Connecting Individual Medical records with Ministry of Finance, Mali experience (Ousman Ly/ANTIM Mali)
• A single taxonomy for RBF results – Antoine Legrand/BlueSquare
• SMW-HD in Liberia – Knut Staring/HISP
• Q&A – Moderator Jean Kagubare/MSH
• Working groups
• Working group presentations
WHAT ARE THE PROBLEMS WE’RE TRYING TO SOLVE?

• Take 3 minutes to note down a couple of ideas about why we need interoperability?
SOME OF THE PROBLEMS:

• Challenge of “stovepiped” systems – multiple platforms to maintain

• Parallel systems for RBF often mean duplication of data entry that is a burden on health workers

• Tradeoffs between “designer” vs. customized off-the-shelf (COTS) applications

• Patient level data increasingly computerized – need to avoid double entry yet maintain individual privacy
INTEROPERABILITY & INTEGRATION

• **Interoperability**: the ability to make systems and organizations work together (inter-operate)

• **Integration**: the process of linking together different computing systems and software applications physically or functionally, to act as a coordinated whole.

Rwanda Health Enterprise Architecture (RHEA) framework

Ministry of Health
- Facility Registry
- Provider Registry
- Client Registry
- Terminology Service

Other Ministry Systems
- National ID database
- Ubudehe Database
- National Census database 2012
- Civil Registration

Interoperability layer
Health Information Access Layer

External Health Information Sub-Systems
- **Individual Record Systems:**
  - OpenMRS
  - RapidSMS

- **Routine Aggregate Reporting Systems:**
  - HMIS
  - SISCom
  - TracNet
  - Mutuelle Indicator Database

- **Health Resource Systems:**
  - LMIS
  - PBF
  - Resource Tracking
  - DHSST
  - iHRIS
  - Blood Bank
  - Lab IS
  - Mutuelle Membership Database
HOW TO EXCHANGE DATA?

- **Coding standards**: Organisation Units, Data elements, Category Combo dimensions, Time dimensions (ISO), OpenHDD

- **Electronic registries**: Facility registry, Client registry, Provider registry, Terminology service

- **Data formats**: CSV, DFX 2 XML, HL7

- **Manual or automated export/import** - interface using API and Extract, Transform, Load (ETL) tools like Camel/Mule

- **Synch or Append** - How to deal with changes to historical data?
CODING

Facility Codes:
- Structured ‘01020612’ or ‘HC1234’
- Unstructured (UID): Hjw70lodtf2

RBF Indicator/Data Element Codes: beyond ICD-10, UNAIDS indicator registry

Time dimensions: ISO standard
- Yearly= 2014
- Quarterly= 2014Q1
- Monthly= 201404
- Daily= 20140412

Patient identifiers: National ID (in Rwanda only from age 16)
ELECTRONIC REGISTRIES

‘Glorified lookup tables’ – repositories of coding standards with an API so that systems can query and synchronize with them to keep updated

- **Facility Registry**: contains all health facilities public and private
- **Provider Registry**: unique identifiers for all health care workers
- **Client Registry**: unique identifiers for all patients
- **Terminology server**: tool for maintaining (“curating”) all standard codes (LOINCS, ICD-10, etc..)
RWANDA HEALTH FACILITY REGISTRY

Single source of all Health Facility Data Attributes – has web-service for subscriptions
HEALTH INFORMATION EXCHANGE (HIE)

Interoperability layer: uses Extract – Transform – Load (ETL) tools to move data between data collection systems, registries and shared data warehouses. Rwanda uses Mule & Camel to move data around

Interoperability profiles: Each connection needs to have a specific interoperability profile developed

Health Level 7 (HL7): messaging standard for patient data 4 message types: (Patient Admin, Orders, Results, Charges)
1 district in early implementation 1 district hospital and 12 health centers equipped (1 server, 7 PCs & Internet connection) and trained

**OpenMRS**: Individual medical records system currently covers HIV and ANC

**RapidSMS**: Mobile system for tracking pregnant women and young children’s health events (‘1000 days on 1000 hills’)

**Shared Health Records**: captures summary data for health events from OpenMRS, RapidSMS to be accessed across the network for patient roaming

**Health Information Exchange**: server that manages the interoperability layer

**Facility and Provider Registries**

**Central level infrastructure in place** at National Data Center (virtual servers on cloud infrastructure)
CHALLENGES

• Infrastructure: Electricity, Internet and computers

• Coordinating different software developers to create the interoperability profiles for their applications

• Change management:
  • Migrating health workers from using paper systems to direct entry – not through data clerks
  • Convincing authorities that electronic data is auditable and paper registers can be dropped (avoiding double work)

• Need to develop more system-generated decision support tools (lists of scheduled patients with specific red-flags or test requirements, etc..)
IMPLEMENTATION/FUNDING PARTNERS

Ministry of Health/Rwanda
Jembi Health Systems/Rwanda and South Africa
Regenstreif Institute - OpenMRS
Insteddd – Facility registry
IntraHealth – Provider registry
Partners in Health
OpenMRS
Millenium Villages Project
Mohawk University
CDC/PEPFAR HI-PPP - Funding