African Health Information Exchange

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www.github.com/jembi
www.jembi.org
Overview

- **South African Context**
  - Population Health
  - Governance
    - HNSF, eHealth Strategy, POPI
    - Provincial and National Departments of Health
  - National Health Information Systems
    - NHLS
    - TIER.NET
    - MomConnect
    - DHIS1.4 and DHIS2
    - HPRS
Overview

● Western Cape Province
  ○ Provincial Health Data Centre
  ○ Master Patient Index

● African Health Information Exchange
  ○ Single Patient Viewer
  ○ TIER.Net integration with NHLS
  ○ Community interoperability
South Africa - Context

- Population: 56 Million
- Annual Births: 1 Million
- HIV Prevalence: 12.2%
- 80% of population rely on public health services
- Approx. 4000 Public PHC Facilities
- Approx. 400 Public Hospitals
- Most facilities have paper based information systems
- Connectivity challenges
Health Normative Standards Framework

- Patient-centric HIE, unique patient identifier and shared health record
- Maturity levels based on paper and electronic records
- International standards (IHE, ISO, HL7 etc) - Adopt, adapt and develop
- Enterprise Architecture required to extend HNSF for a particular implementation
National Health Information Systems
Health Population Registration System (HPRS)

- South African Master Patient Index
- PIX/PDQ interfaces
- Online/Offline functionality
- Installed in ~3200 facilities by end March 2018
- Local VMs, central server
District Health Information System

- First country to implement DHIS 1.4 nationally in the late 1990s
- Upgraded to DHIS2 Web
- Focused on aggregate data and routine data
- National and Provincial Indicators and Master Facility List
MomConnect

- National Maternal Health digital health program
- Provides stage-based informational SMS messaging to pregnant women and mothers, and access to a helpdesk
- Over 1.7 million mothers registered over 3 years (50% coverage)
- Infrastructure based on HNSF and OpenHIE architecture
National Health Laboratory Systems

- NHLS has a unique repository of laboratory information
- The data is representative of pathology information for +/- 80% of the South African population
- 265 sites across South Africa
- Single Laboratory System
- Single Data Warehouse
- Process +/- 300 million raw data records per month
TIER.Net

- HIV and TB management System
- Back office, offline
- Data cascades up the organisation unit hierarchy to provincial level
- Pushes data into DHIS2 at district level
- Expanded into Maternal and Child Health
Western Cape Province
Health Information Systems
Western Cape Overview

- 1 of 9 Provinces
- Population: 6.5 Million
- Provincial Data Centre hosting electronic Health Information Systems
- Central Master Patient Index - Clinicom: 9 digit numeric patient identifier with paper folder filing position integrated
- High WAN coverage
PHDC - High Level Data Load and Architecture

- Large hybrid data warehouse containing patient level data
  - Demographic
  - Episode
  - Encounter
  - Drugs
  - Laboratory
- Data linked by Clinicom Number
- Batch and Transactional data ETL
- Data available for patient care, public health decision making and research
AHIE Overview

- 3 Year Grant from Bill and Melinda Gates Foundation
- Expanding the Western Cape Provincial Health Data Model
- Develop and promote interoperability between National information systems as well as disparate provincial, district and metro systems
- Integrate Community data
- FHIR and HL7 interfaces to central Health Exchange
- Rollout of Health Population Registration System
AHIE Partners

- Bill and Melinda Gates Foundation
- University Of Cape Town - Centre for Infectious Disease and Epidemiological Research
- Jembi Health Systems
- National Health Laboratory Services
- National Department of Health
- Council For Scientific and Industrial Research
Single Patient Viewer

- Web-based viewer of any linked electronic patient database
- Shows:
  - Patient demographics
  - Patient encounters with the health system
  - Patient health episodes
  - Lab results
  - Prescriptions history
- Graphical Viewer displays episodes in visual format
- FHIR resources
Open Local Health Information Mediator

Polls central service for lab data when connectivity using FHIR

Pulls into holding database at facility level

Application reads holding database and lab results put into patient files
Observations are a central element in healthcare, used to support diagnosis, monitor progress, determine baselines and patterns and even capture demographic characteristics. Most observations are simple name/value pair assertions with some metadata, but some observations group other observations together logically, or even are multi-component observations. Note that the DiagnosticReport resource provides a clinical or workflow context for a set of observations and the Observation resource is referenced by DiagnosticReport to represent lab, imaging, and other clinical and diagnostic data to form a complete report.
Community Interoperability

- **Catch and Match**
  - Community Health Workers with mobile devices visit households and refer patients to health facilities
  - Data is submitted to HIE, individual is matched to Master Patient Index
  - Community systems are updated with the Health Identifier and CHWs are prompted to close the referral loop
Thank You!