The Global Health Barometer
*Secondary use of care data for monitoring and evaluation*

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Functionality

- Centralization of (aggregate) data from multiple sources in a **data warehouse**
- **Data-entry based on API (not via user interface)**
  - Receives data from source applications via http, https, smtp, sms... (electronic medical record, HR systems, lab systems...) in Clinix XML format
  - **Data extractors** must be developed in source application
    - Produced (aggregate) data must be recognizable by GHB
  - Includes **data transmission control mechanisms** (ACK messages)
    - Adapted to unreliable and intermittent connectivity
Functionality (2)

- **Data storage** according to generic data model
  - Based on **GEHR generic health information architecture**
    - **Records** (uid, site) => DHIS2 org/unit
    - **Transactions** (uid, type, date/time, author) => DHIS2 data set
    - **Items** (uid, type, value, editor, modifiers) => DHIS2 data element + category combo option
  - UIDs define acceptable information elements (Clinix)

- **Data visualization** through web interface
  - Collection of plug-ins (modules)
    - **Specialized presentation** of *predefined* transaction types, item types and indicators in GHB database
Functionality (3)

- Global health care provider registry
  - Registry of care providers with unique ID
  - Organized by country-specific administrative units
  - Provides an encrypted store and forward mechanism for inter-provider communication (PDF and Clinix format based)
    - Reference
    - Counter-reference
  - Provides a point-to-point XMPP chat service
    - Real-time provider communication
Functionality (4)

● Data export

  – To **DHIS2** in DXF2 format (uses DHIS2 https interface)
    ● Mapping of **GHB** record uids, transaction types and item types on **DHIS2** org/units, dataset uids and data element uids
    ● Re-aggregation of **GHB data** to match DHIS2 requirements
    ● Configurable periodicity
  – To **WHONet** data warehouse
    ● Antibiotics resistance data
Plugins

- Public sites summary (mainly OpenClinic today)
  - Core data volume indicators
  - GIS & GISMApp modules
  - Anonymous sites (only country & self-reported city)

- Project sites summary
  - Core data volume indicators with trend graphs
  - Site identification
  - HIS server information
  - Detailed volume data (table records) with trend graphs
  - Demographic data (gender / age distribution) with trend graphs
Plugins (2)

- Project summary (2)
  - Financial data (revenue per health service category)
  - Diagnostics
    - Incidences with trend graphs
    - Based on KPGS classification
  - Mortality (absolute and relative) with trend graphs
    - Based on KPGS classification
  - Human resources
Plugins (3)

- Project summary (3)
  - Bed occupancy with trend graphs
  - Vaccination follow-up
  - Patient ID card printing facility
Status

- 500+ hospitals in 70+ countries periodically send performance and activity data on a voluntary basis
  - Anonymous
  - Approximative geo-localization (country, nearby city)
  - 50 million+ health care services and associated information reported in 5 years

- 60 identified hospitals with close follow-up
  - DRC, Rwanda, Burundi, Senegal, Mali, Tanzania, Ethiopia, Congo Brazzaville, Gabon
Future planning

- **New plugins**
  - Clinical data quality indicators
    - Contra-indicated drug prescriptions (diagnostics, allergies)
    - Severe drug-drug interactions
    - Clinical pathway adherence (small peripheral facilities)
    - Quality of diagnostic reasoning (K4H)
  - Secure clinical mailer
  - Early warning module
    - Combining facility information with unlabeled health related big data (social media, RSS feeds...)
  - Health insurance coverage indicators
Future planning (2)

- New plugins (2)
  - Ambulance availability
  - Biomedical equipment status information
  - Patient satisfaction and QoL information
    - PSQ-18
    - SF-36

- Implementation of country instances

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Differences with DHIS2

- GHB provides no data-entry GUI (no user training)
- GHB focuses on data sources at district level or higher
- Generic database but predefined querying
  - Business specific preconfigured plugins
  - No user training
- GHB item types extractor/plugin dependent (mandatory GHB based standardisation => indicator harmonization)
- Mandatory use of international data standards
Demo

- [http://www.globalhealthbarometer.net](http://www.globalhealthbarometer.net)
- Login: chuk
- Password: alfa01