Agenda

- Welcome, Announcements, Introductions - Amanda BenDor
- Framing of data exchange challenges experienced during the Ebola response - Carl Leitner
- PEPFAR / DATIM investments in digital health infrastructure - Annah Ngaruro
- Patient Level Monitoring tools - Vlad Shioshvili
- GOFR - Emily Nicholson
Digital Square Announcements

● Digital Square Webinar: Global Goods Adaptation for COVID-19 Response
  ○ Monday, March 30th, 10am-noon EDT via Zoom. This webinar will feature demos of global goods that have adapted their software for the COVID-19 response. Register [here](#).
Introductions

**Carl Leitner, Technical Director, Digital Square.** Carl Leitner, PhD, brings more than 15 years of experience in informatics, information technology, software development, and education, including more than eight years designing and adapting open-source interoperable digital health systems in low-and middle-income countries.

**Annah Ngaruro, Director, Technology Solutions, ICF.** Annah is currently the DATIM Data exchange and Interoperability portfolio lead responsible for providing S/GAC PRIME with portfolio leadership and product ownership for the data exchange and interoperability portfolio within the DATIM ecosystem.

**Vlad Shioshvili, Technical Lead, ICF.** Vlad serves as the technical lead for PEPFAR/DATIM’s data exchange and interoperability activities since 2015, working on establishing DATIM data and metadata exchange platforms, working closely with OHIE.

**Emily Nicholson, Technical Advisor, IntraHealth International.** Emily manages multiple digital health projects at IntraHealth including the Open Client Registry, mHero and the Global Open Facility Registry (GOFR); her work has contributed to the evolution of health systems in Liberia, Sierra Leone, Tanzania, South Sudan and Uganda.
Data Exchange Challenges

Carl Leitner
Case reporting
- to district
- to national
- to regional
- to global

Contact tracing
- cross-platform
- cross-jurisdiction
- line lists

Care management
- at-risk populations
- immunocompromised

Supply Chain
- PPEs
- reagents / test kits
Three scenarios defined in terms of **Health Information Systems Interoperability Maturity Toolkit** and **HIS Stages of Continuous Improvement Toolkit**

**Standalone** - a standalone digital health system using a bespoke data model running on a low-powered and often disconnected device required to send a data extract. Requires precise definitions for native implementation of an indicator report, care guideline or case report.

**Integrated** - a digital health system that can share data using the HL7 FHIR data model and which offloads processing of FHIR resources to a locally available service using reusable software components. Requires profiled data models and computable assets.

**Exchanged** - a connected digital health system operating within a health information exchange that wants to contribute data to a longitudinal client record on which indicator calculations are performed, case reports are generated, and decision support services are provided. Requires profiled data models, computable assets and metadata registries and shared operational data.
OpenHIE Covid-19 Task Force

Terms of Reference (draft):
- Identifying and collating information relating to data standards and exchange relevant to the Covid-19 response
- Identifying gaps in and establishing standards for data exchange priorities
- Provide documentation and guidance (to both the global good community as well as proprietary software tools) to improve adherence to these standards
- Ensure that rapidly deployed solutions can be integrated into the national digital health architectures

Co-Chairs: Terry Cullen, Carl Leitner, +1

Logistics:
- wiki = coming soon
- discourse = coming soon

Outputs:
- HL7 FHIR profile / implementation guide for case reporting & contact tracing
- What do you need?
PEPFAR / DATIM
Investments in Digital Health Infrastructure

Annah Ngaruro
PEPFAR/DATIM Investments in Digital Health Infrastructure

- Over the last 15yrs, S/GAC has communicated its priorities consistent with enabling use of new and existing data from multiple sources (i.e., EMRs, EHRs, E-Registers, lab systems, etc.) and in a variety of formats (i.e., paper, import files, etc.) that necessitates investments in digital health infrastructure.
- Digital investments fall into a number of categories including standards, open source tools, communities of practice, and development of foundational technology infrastructure.
PEPFAR/DATIM Investments: Standards

- Supporting development of OpenHIE Reference Architecture: a reusable architectural framework that introduces a service oriented approach, maximally leverages health information standards, enables flexible implementation by country partners, and supports interchangeability of individual components.

- Adoption and use data exchange standards such ADX, FHIR, CSD, mCSD to store and transfer data between systems.
PEPFAR/DATIM Investments: Open Source Tools

- **Paper Tools**: like the PEPFAR/WHO MFL resource package, a free resource package to provide guidance for countries to establish or strengthen their Master Facility List (MFL) a key element of any electronic health system. [http://www.who.int/healthinfo/country_monitoring_evaluation/mfl/en/](http://www.who.int/healthinfo/country_monitoring_evaluation/mfl/en/)

- **Electronic Tools**:
  - OpenMRS: an application developed on a common framework which enables design of a customized medical records. [https://openmrs.org/](https://openmrs.org/)
  - DHIS2: an open source software platform for reporting, analysis and dissemination of data for all health programs. [https://www.dhis2.org/](https://www.dhis2.org/)
PEPFAR/DATIM Investments: Communities of Practice

- Groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly.

- https://wiki.ohie.org/display/SUB/PEPFAR+Data+Exchange+Implemen+Community
- https://ohie.org/duc/
PEPFAR/DATIM Investments: Foundational Technology Infrastructure

- Interoperability platform: a platform that allows disparate systems and devices to exchange and interpret data all while managing security, a single point of entry into an HIE, abstraction for simplicity of services applications and the HIE components as well as mechanisms for error management and tracking and also provides a view of metrics for monitoring the flow of messages through the HIE.

https://wiki.ohie.org/display/projects/DATIM4U+Technical+Overview+and+Purpose
PEPFAR/DATIM Investments: Foundational Technology Infrastructure

- Terminology Services: a platform to manage, map, publish, and share data definitions such as medical and indicator so as to provide a standardized set of terms that can be understood by multiple disparate systems.

- The DATIM ecosystem uses OCL is an open-source terminology service that will centrally store PEPFAR indicator and disaggregation definition, PEPFAR/MoH indicator mappings and associated calculations. OCL content/functionality can be accessed through using APIs.
PEPFAR/DATIM Investments: Foundational Technology Infrastructure

- Integration to reuse existing standardize tools like the already built WHO Metadata Package, a standardized set of indicators and associated DHIS2 dashboards. After mapping, the metadata package provides a standard set of dashboards and reports for health data reporting.
PEPFAR/DATIM Investments: Foundational Technology Infrastructure

- Global Goods: Are digital health tools that are adaptable to different countries and contexts and can be (1) a software tool, (2) a service or (3) content.
- Are typically free, open source, and have utility in several settings.
  - Global Open Facility Registry (GOFR) tool: a set of software tools that will identify and synthesize duplicate health facility records across multiple sources of data for the Global Open Facility Registry (GOFR) Core project.
  - Patient Level Monitoring (PLM) tools: A set of tools that implement a standards-based platform agnostic approach to leverage a ‘mine-able’ data set containing individual-level data that can support ever changing health programmatic decision criteria using primary data to help answer multiple health questions.
Patient Level Monitoring Tools

Vlad Shioshvili
Patient Level Monitoring tools

- In addition to PEPFAR’s contribution to the development of standards and tools like OCL, OpenHIM, DHIS2, GOFR, and so on, PEPFAR’s data exchange and interoperability group is working on a set of tools that allow integration of patient clinical data with health management information systems for health system monitoring using health information exchange.

- Tools are in a third iteration of a proof of concept phase, where number of improvements have been made. Toolset was created to be as generic as possible, and have been tested for HIV and family planning indicators.
PLM components

- A set of tools have been developed to address the needs.
- Developed as open source applications, with Global Goods guiding principles in mind.
- Relying on already existing, proven standards and platforms, such as OpenHIM for interoperability, OCL as the terminology service, FHIR for patient clinical data, ADX for aggregate data representation, etc.
- Toolset bridges the gap by introducing apps and process that do data transformation and integration of the above components:
  - mAtches for managing mappings
  - BundleMaker for FHIR resource transformation
  - FireEngine for data aggregation
  - OCL integration mediators
mAtches transformation
Applicability to COVID-19 Response

- As the amount of COVID-19 clinical data grows, faster and more flexible ways of getting it up to the aggregate level will be required;
- PLM tool-set can be adapted to COVID-19 use case to provide a way to connect point of service applications to health management information system for data analysis.
Global Open Facility Registry (GOFR)

Emily Nicholson
Master Facility Lists and Facility Registries

- **Master Facility List (MFL):** Complete, up-to-date, authoritative list of health facilities and associated data.

  The source of truth which must be
  - Validated
  - Continuously Updated
  - Accessible

- **Facility Registry (FR):** “a service, or software program that houses the MFL and makes it accessible to ministries, donors or implementing organizations that need information about the facilities.” - Master Facility List Resource Package
● Beta version of the Facility Reconciliation Tool, developed out of necessity during the Ebola Epidemic in West Africa
Current User Interface of GOFR
Features
## Uploaded Sources

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<th>Owner</th>
<th>Shared To</th>
<th>Created Time</th>
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<td></td>
<td>25th Feb 2020 8:51:36 pm</td>
</tr>
<tr>
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1-4 of 4  

**Export**  
**Delete**
## Facility Reconciliation

### Source 1 Reconciliation Status
- **Matched:** 15/20 (75%)
- **Unmatched:** 5/20 (25%)

### Source 1 Unmatched
- Northern
- Southern

### Source 2 Reconciliation Status
- **Matched:** 15/20 (75%)
- **Unmatched:** 5/20 (25%)

### Source 2 Unmatched
- Health Centre i
- Health Centre ii
- NGO Clinic

### Search
- **Source Location:**
  - Health Centre i
  - Health Centre ii

### Matched (15)

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<th>Source Location</th>
<th>Source 1 ID</th>
<th>Source 2 ID</th>
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<td></td>
<td></td>
</tr>
<tr>
<td>Health Centre ii</td>
<td>85</td>
<td>31</td>
<td>Coordinates missing, ID differ</td>
</tr>
</tbody>
</table>

### No Match (0)

### Ignored (0)

### Flagged (0)
Applicability to COVID-19 Response

- Rapid spread of COVID-19 creates urgent need for accurate understanding of locations of permanent facilities, makeshift hospitals and testing sites
- Ministries can deploy the GOFR tool to reconcile quickly changing lists of service delivery locations, increasing the speed with which testing and treatment are provided.
Save time. Improve accuracy. Compare data sets and create master lists of facilities for health, education, and agriculture applications.
Disclaimer

This is a demonstration site. Please do not upload or connect to sensitive data sources. Please also remove data sources once you are done testing. Data sources will be removed by the administrators as needed. Demo user is ‘demo’ and password is ‘demo’

AGREE TO ABOVE AND PROCEED TO DEMO

QUICK START GUIDE

This is a sandboxed demo site. Please use the demo responsibly.
Installation Options:

- DHIS2 app
- Docker
- Local installation
Thank you!