Health Facility Registry / Master Facility List

Dr Steeve Ebener
ADB Consultant

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Objective of the session

A Health Facility Registry/Master Facility List is an important resource for a national health information system.

This session describes the **content**, governance, architecture, and standards required behind such a registry as a guide to developing countries.

Acknowledgements

Presentation based on:

- AeHIN hour on Health Facility Registry (Scott Teesdale - June 28, 2013)
- Master Facility List (MFL) Resource Package the DHS Program is developing the in coordination with various other experts in the field
- IHE IT Infrastructure Technical Framework Supplement – Care Services Discovery (CSD)
- OpenHIE Health Facility Registry Implementation Guide

Personal experience supporting the development and/or using these registries/lists in different countries

What is a Health Facility Registry/Master Facility List?

Requires to first answer another question:

What is an health facility?

Medline Plus: *Places that provide health care. They include hospitals, clinics, outpatient care centers, and specialized care centers, such as birthing centers and psychiatric care centers.*

Health authority Abu Dhabi: *Standalone building with inpatient services for 24 hours use or longer by patients in the treatment of diseases, injuries, deformities, abnormal physical or mental status, maternity cases, nurseries and dispensaries.*

Free dictionary: *Building where medicine is practiced.*

DOH Philippines: *A building or physical structure providing health care.*

Wikipedia: *in general, any location at which medicine is practiced regularly.*

What is a Health Facility Registry/Master Facility List?

Health services, health care and medicine

Health services (WHO): *Health services include all services dealing with the diagnosis and treatment of disease, or the promotion, maintenance and restoration of health. They include personal and non-personal health services*.

Health care (Wikipedia): *Diagnosis, treatment, and prevention of disease, illness, injury, and other physical and mental impairments in human beings*

Medicine (Collins English Dictionary): *the science of preventing, diagnosing, alleviating, or curing disease*

➡ Should include laboratories and other diagnosis facilities

➡ Pharmacies?

What is a Health Facility Registry/Master Facility List?

Registry:

*A place or office where registers or records are kept (*Online Oxford dictionary:

Health Facility Registry (HFR): *The authoritative, standardized, complete and up-to-date list of health facilities*

➡️ Serve as the bridge between health facility based statistics/information

Master facility list (MFL): A standardized, complete listing of health facilities in a country that is comprised of a set of identification items for each facility (signature domain) and basic information on the service capacity of each facility (service domain)[1]

➡️ Tends to already contain certain statistics/information

➡️ In both cases: a database

[1] WHO (2015): Guidelines for Data Management Standards in Routine Health Information Systems

Why is it important to develop and maintain such a registry?
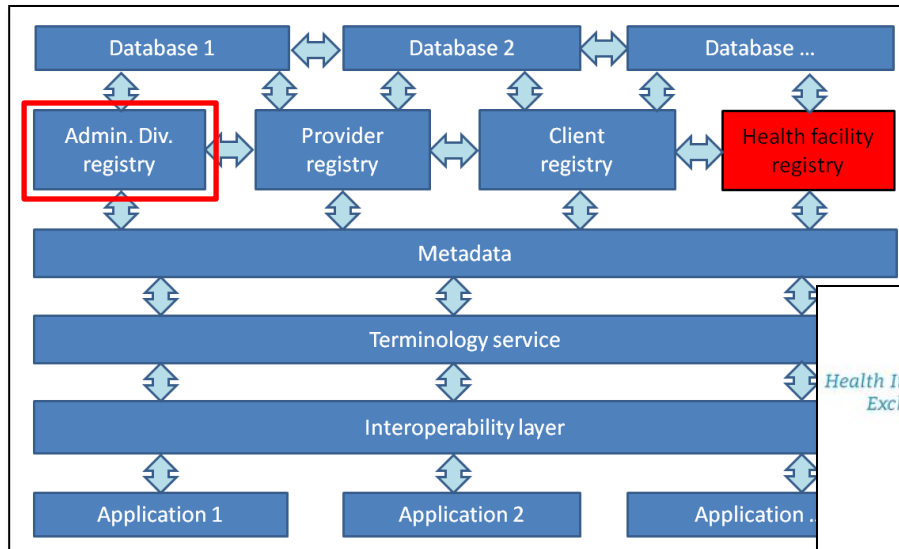
Among other things:

- Improves record keeping by improving transparency and reporting efficiency;
- Facilitate **data compatibility** and **system interoperability** not only within health but among sectors;
- Minimizes duplicate reporting and federate the information system;
- Provides the denominator for data collection (including for sampling), monitoring an evaluation;
- helps promote better analysis and synthesis of data to improve decision making and health system functioning;
- Support disaster management and disease surveillance;
- If georeferenced serve as the entry point for the use of geography and Geographic information System (GIS)

➡ Improve care, ensure reliable referrals and support better planning,…

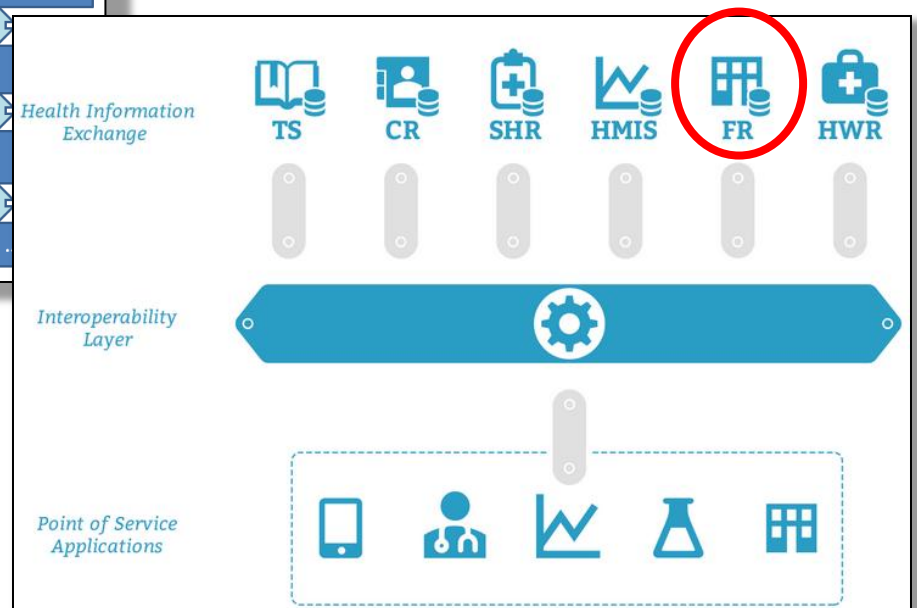➡ A key pillar of any health information system

Why is it important to develop and maintain such a registry?

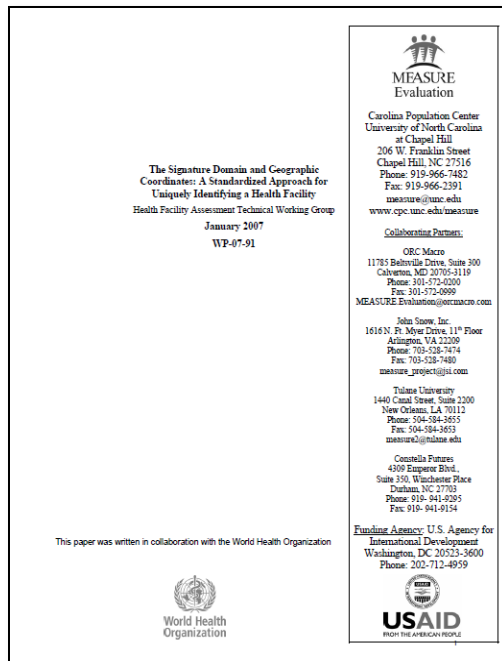➡ Critical component of Health Information Exchange (HIE)

PHIE

OpenHIE

What is the content of a health facility registry?

The signature domain (2007)[1]

MEASURE Evaluation

Carolina Population Center
University of North Carolina
at Chapel Hill
206 W. Franklin Street
Chapel Hill, NC 27516
Phone: 919-966-7482
Fax: 919-966-2391
measure@unc.edu
www.cpc.unc.edu/measure

The Signature Domain and Geographic
Coordinates: A Standardized Approach for
Uniquely Identifying a Health Facility

Health Facility Assessment Technical Working Group

January 2007
WP-07-91

Collaborating Partners:

ORC Macro
11785 Beltsville Drive, Suite 300
Calverton, MD 20705-3119
Phone: 301-572-0200
Fax: 301-572-0999
MEASURE.Evaluation@orcmacro.com

John Snow, Inc.
1616 N. Ft. Myer Drive, 11th Floor
Arlington, VA 22209
Phone: 703-528-7474
Fax: 703-528-7480
measure_project@jsi.com

Tulane University
1440 Canal Street, Suite 2200
New Orleans, LA 70112
Phone: 504-584-3655
Fax: 504-584-3653
measure2@tulane.edu

Constella Futures
4309 Emperor Blvd.,
Suite 350, Winchester Place
Durham, NC 27703
Phone: 919- 941-9295
Fax: 919- 941-9154

Funding Agency: U.S. Agency for
International Development
Washington, DC 20523-3600
Phone: 202-712-4959

This paper was written in collaboration with the World Health Organization

World Health Organization

USAID
FROM THE AMERICAN PEOPLE

- date of the survey
- health facility country registry code
- health facility survey identification (ID)
- health facility name
- health facility contact information
  - postal address (street number, city, postal code, other; in some circumstances, a facility may have some but not all of the postal address elements and in these cases the elements that are present should be recorded; if the facility has no postal address at all, this element would be omitted)
  - main telephone number
  - main fax number
  - main e-mail address
  - name of the director
  - director's telephone phone number
- facility's geographic administrative unit (at least first and second level)
- GPS coordinates (latitude, longitude waypoint ID)

Good practice would be to have only one coding scheme

Actually needs to be captured for each field together with the source

Direct link with the administrative divisions registry

➡ Core fields allowing to uniquely identify, locate and contact each facility

[1] http://www.cpc.unc.edu/measure/publications/wp-07-91/at_download/document

What is the content of a health facility registry?

IHE IT Infrastructure Technical Framework Supplement (2014)[1]
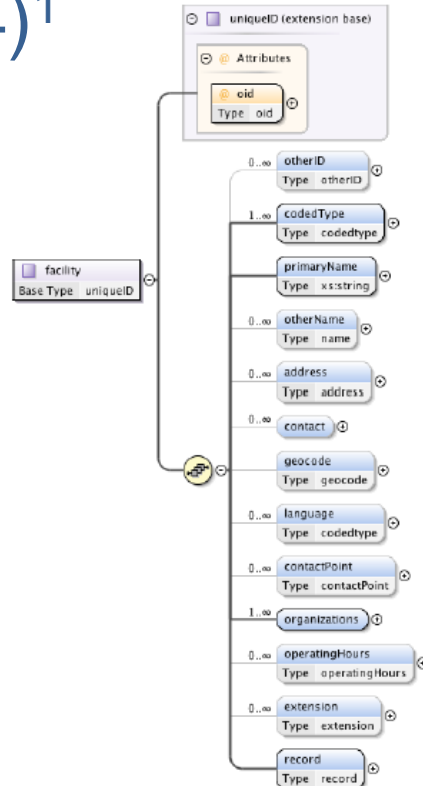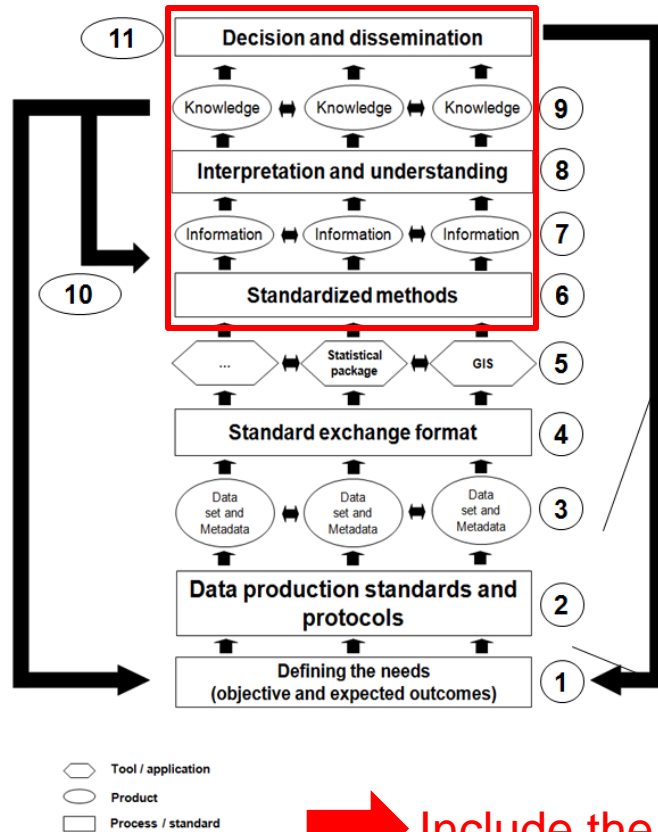

Figure Y.1-2: Facility Logical Model

- Similarities with the signature domain
- Additional fields:
  - Other facility name (previous name)
  - Operating hours
  - Services
  - …
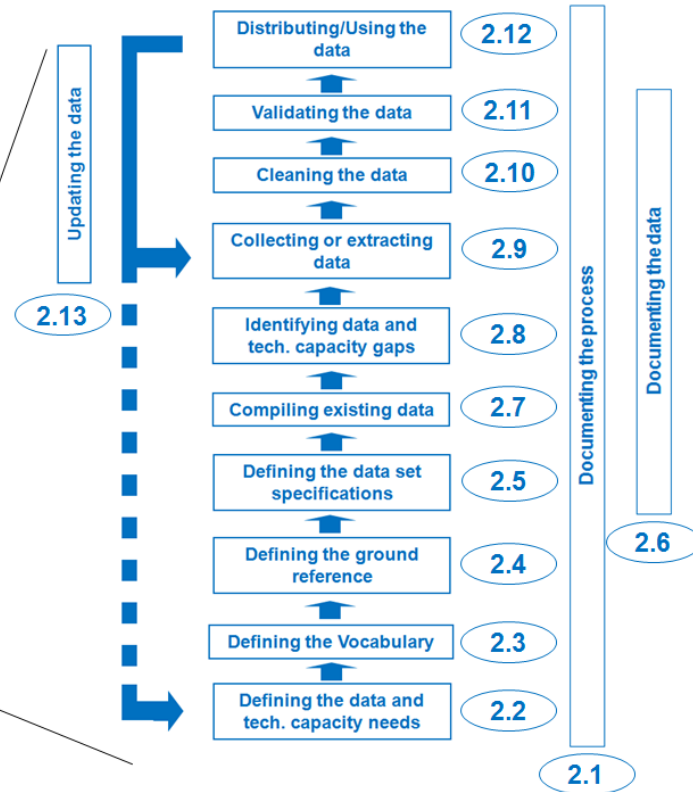- Closer to the definition of a Master Facility List (MFL).

[1] http://www.ihe.net/uploadedFiles/Documents/ITI/IHE_ITI_Suppl_CSD.pdf

The data management process behind a health facility registry

Include the analytical and decisional layers compare to the EA framework

The data management process behind a health facility registry

Defining the ground reference

➡ Ground "truthing" for the health facility location

➡ Measure accuracy

The data management process behind a health facility registry

Defining the data set specifications

Geographic location

➤ Coordinate System

➤ Spatial resolution

➤ Scale of work

➤ Maximum horizontal error

Other fields

➤ Data format (text, integer,..)

➤ Field size

VRAM implementation in Kosovo

Ground reference

2009 Orthophotos purchased by the Kosovo Cadastral Agency (KCA) for the Ministry of Agriculture, Forestry, and Rural Development (MAFRD).
Resolution: 40 cm
Maximum horizontal error: below the centimeter

Dataset specifications

The following dataset specifications have been used in the context of the implementation of the VRAM process in Kosovo.

Projected Coordinate System: ETRS_1989_Kosovo_Grid (KOSOVA REF01)

- Projection: Gauss_Kruger
- False_Easting: 7500000.00000000
- False_Northing: 0.00000000
- Central_Meridian: 21.00000000
- Scale_Factor: 0.99990000
- Latitude_Of_Origin: 0.00000000
- Linear Unit: Meter

- Geographic Coordinate System: GCS_ETRS_1989
- Angular Unit: Degree (0.017453292519943299)
- Prime Meridian: Greenwich (0.000000000000000000000)
- Datum: D_ETRS_1989
  - Spheroid: GRS_1980
  - Semimajor Axis: 6378137.000000000000000
  - Semiminor Axis: 6356752.314140356100000
  - Inverse Flattening: 298.257222101000020000

Extent of the study area: The territory of Kosovo has been considered as a closed system in the context of the pilot project.

Would any data required to go beyond these limits for the flood hazard analysis, the following extent would then apply according to KOSOVA REF01 (decimal degrees in between brackets for information)
- West Bound Longitude: 7416799.8327 (19.97447750° E)
- East Bound Longitude: 4793079.789 (21.80581227° E)
- South Bound Latitude: 7366693.2898 (41.83630858° N)
- North Bound Latitude: 4683269.515 (43.27237164° N)

Spatial resolution, scale of work and maximum horizontal error:
- Scale of work : 1:50,000
- Spatial resolution (cell size): 25 meters
- Maximum horizontal error: 12.5 meters

Scale	Corresponding horizontal accuracy (m)
1:25'000	12.7
1:50'000	25.4
1:100'000	50.8
1:250'000	127
1:500'000	254
1:1'000'000	508

The data management process behind a health facility registry

Defining the data set specifications

Choosing an appropriate coding scheme

01.01.1990-14.03.1991	
Tororo	UGA993

15.03.1991-20.03.1997	
Tororo	UGA999
Pallisa	UGA040

Tororo hospital: UGA993001

➤ Do not include other "objects" in your coding scheme

➤ Capture these "objects" as separated fields in your registry

21.03.1997-30.06.2005		01.07.2005-06.06.2007	
Tororo	UGA045	Butaleja	UGA071
		Tororo	UGA090

The data management process behind a health facility registry

Defining the data set specifications

Choosing an appropriate coding scheme

- Avoid long codes

  1483373538011 98976578393

- Don't put "0" in front of the sequence

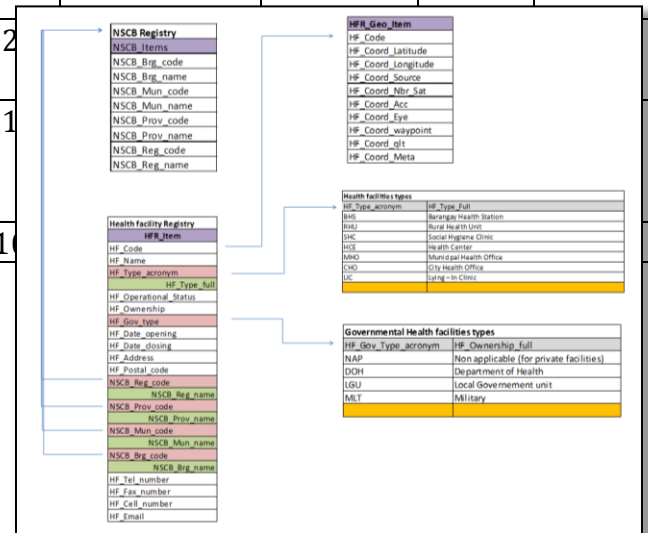 08365222 ➡️ The "0" disappears in some software starting with excel

The data management process behind a health facility registry

Defining the data set specifications

➡ Data dictionary

#	Field	Definition	Format	Size	Mandatory for adding a new record	Need source tag	Need time tag	Public
1	Health Facility Code	Unique official identifier of the health facility	Varchar	19	Yes (automatic)			
2	Health Facility Name	Official or business name of the health facility.	Varchar	150	Yes	Yes	Yes	Yes
3	Health Facility Type	Primary type of the health facility spelt in full	Varchar	2				
4	Ownership Major Classification	Classification according to major ownership spelt in full	Varchar	1				
5	Address: # and Street Name	Street number and name	Varchar	10				

- Might require a data model in case the information is to be distributed between different tables
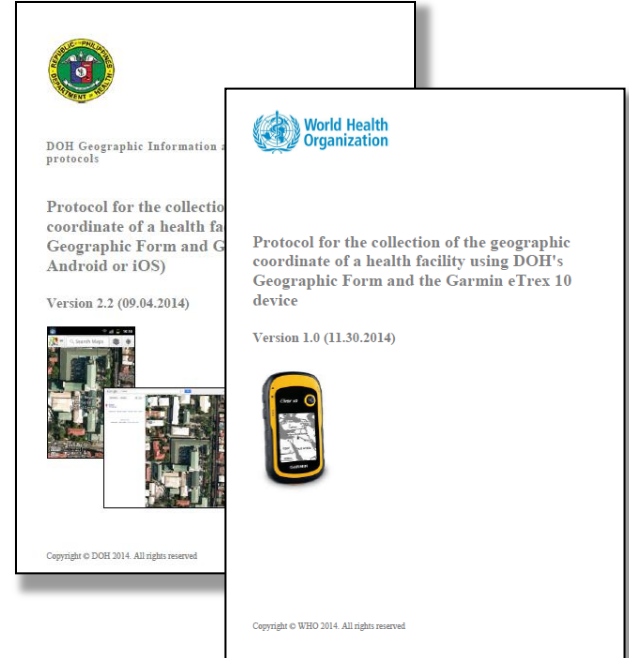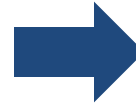- Remember that it is easier to aggregate than desegregate field content…

The data management process behind a health facility registry

Collecting or extracting the data

Example: GPS reading

At the equator: 360 º ➡ 40'075 km

1 º ≈ 111'320 m

➡ If you only capture 1 digit (i.e 120.9)

➡ Error can be up to 11'132 m

➡ If you only capture 2 digits (i.e 120.93)

➡ Error can be up to 1'113 m

➡ 3 digits (i.e 120.937)   : 111 m

➡ 4 digits (i.e 120.9376)   : 11 m

➡ 5 digits (i.e 120.93761)   : 1 m   **Recommended**

DOH Geographic Information protocols

Protocol for the collection coordinate of a health fa Geographic Form and G Android or iOS)

Version 2.2 (09.04.2014)

World Health Organization

Protocol for the collection of the geographic coordinate of a health facility using DOH's Geographic Form and the Garmin eTrex 10 device

Version 1.0 (11.30.2014)

Importance of standards based data collection protocols

Collect information once, use it many times !!!

AeHIN

GAIA GEOSYSTEMS
"ONE PLANET, ONE SYSTEM"

The data management process behind a health facility registry

Cleaning the data	Validating the data

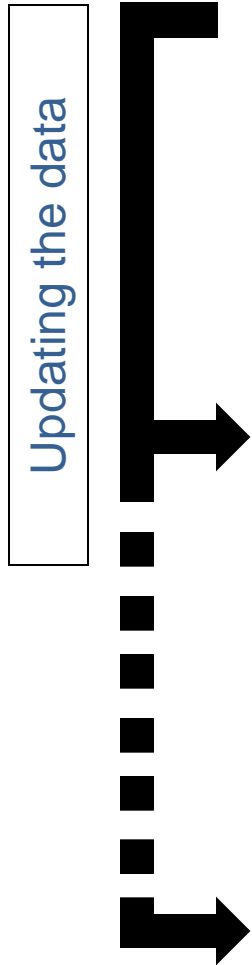The better the data collection process, the less data cleaning/validating is needed

➡️ Importance of:
- defining and applying standards and protocols from the beginning;
- carefully selecting and training the person in charge of data collection and update.

➡️ Some check can be done during the data collection itself (Geographic coordinates)

The data management process behind a health facility registry

Documenting the process

➡️ To allow for all stakeholder to be able applying the same process

➡️ Protocols

Documenting the data

➡️ For users to ensure that the data is appropriate for their own purpose

➡️ Metadata

"Data about the data"

➡️ Mostly collected through the source and time stamp fields in the registry

The data management process behind a health facility registry

Updating the data

A registry is like a picture

By the time you look at it things have already changed

➜ Needs to be regularly updated in order to be representative the situation and therefore support informed decision

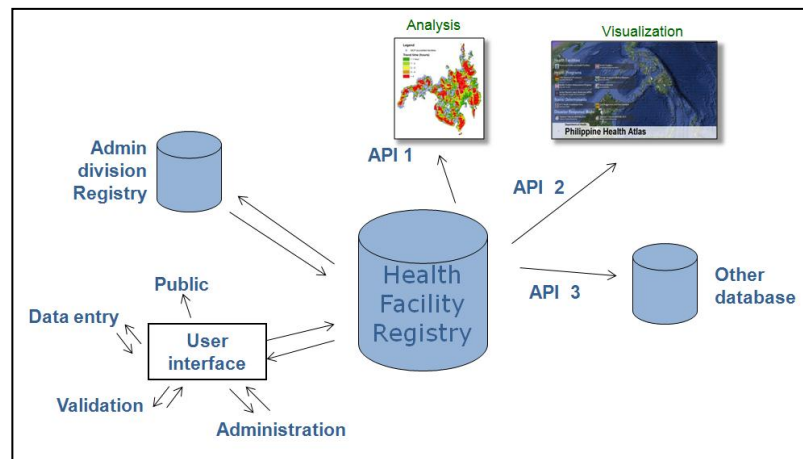➜ An updating mechanisms has to be put in place and implemented at least once a year.

The IT Infrastructure behind a health facility registry

Excel/ Access file

Health Facility Code Short	Facility Name	Health Facility Type	Ownership Major Classification	Region Name
11822	SAN FABIAN MAIN HEALTH CENTER	Barangay Health Station	Government	REGION I (ILOCOS REGION)
1052	CAROSUCAN SUR BARANGAY HEALTH STATION	Barangay Health Station	Government	REGION I (ILOCOS REGION)
5134	CAROSUCAN NORTE BARANGAY HEALTH STATION	Barangay Health Station	Government	REGION I (ILOCOS REGION)
5261	BARO BARANGAY HEALTH STATION	Barangay Health Station	Government	REGION I (ILOCOS REGION)
1118	INLAMBO BARANGAY HEALTH STATION	Barangay Health Station	Government	REGION I (ILOCOS REGION)
1152	LAOAG BARANGAY HEALTH STATION	Barangay Health Station	Government	REGION I (ILOCOS REGION)
1160	LAWAK BARANGAY HEALTH STATION	Barangay Health Station	Government	REGION I (ILOCOS REGION)
1117	INAMOTAN BARANGAY HEALTH STATION	Barangay Health Station	Government	REGION I (ILOCOS REGION)
1716	CABUGAO RURAL HEALTH UNIT	Rural Health Unit	Government	REGION I (ILOCOS REGION)
1267	PRIMICIAS BARANGAY HEALTH STATION	Barangay Health Station	Government	REGION I (ILOCOS REGION)
7143	SAGPATAN BARANGAY HEALTH STATION	Barangay Health Station	Government	REGION I (ILOCOS REGION)
3644	BINDAY BARANGAY HEALTH STATION	Barangay Health Station	Government	REGION I (ILOCOS REGION)
1223	ORTIZ BARANGAY HEALTH STATION	Barangay Health Station	Government	REGION I (ILOCOS REGION)
3374	WESTERN PANGASINAN DISTRICT HOSPITAL	Level 1	Government	REGION I (ILOCOS REGION)
3708	POTOTAN BARANGAY HEALTH STATION	Barangay Health Station	Government	REGION I (ILOCOS REGION)
4379	LAOAC MAIN HEALTH CENTER	Barangay Health Station	Government	REGION I (ILOCOS REGION)
4423	POBLACION BARANGAY HEALTH STATION	Barangay Health Station	Government	REGION I (ILOCOS REGION)
475	DASOL COMMUNITY HOSPITAL	Level 1	Government	REGION I (ILOCOS REGION)
1360	TAY-AC BARANGAY HEALTH STATION	Barangay Health Station	Government	REGION I (ILOCOS REGION)
5619	NAGYUBUYUBAN BARNGAY HEALTH STATION	Barangay Health Station	Government	REGION I (ILOCOS REGION)
3093	MALICLICO BARANGAY HEALTH STATION	Barangay Health Station	Government	REGION I (ILOCOS REGION)

Online system

- Service oriented
- Flexible (expandable)
- "Work on paper " first
- Multiple APIs for maximum interoperability

The governance behind a health facility registry?

Governance can be defined as the system in which the organization or corporation is directed and controlled. It defines who is in charge of the organization, the mission and vision, and delineates the organizational structure including the levels of authority and responsibility [1]

When it comes to a health facility registry this should at least cover:

- Stakeholders
- Leadership
- Policies
- Sustainability

[1] Ronald V. Buci (2014): Medicine and Business, a Practitioner's Guide, Springer

The governance behind a health facility registry?

Stakeholders

A person with an interest or concern in something, especially a business [1]

Engaging all relevant stakeholders early in the process is key to development and sustainability of the HFR. These should include, but not be limited to:

- Main "clients" and potential internal data providers (planning, surveillance, emergency management,..);
- Technical units (IT, data management)
- Potential external data providers (NGOs, LGA,…)
- Funding agencies

[1] http://www.oxforddictionaries.com/us/definition/american_english/stakeholder

The governance behind a health facility registry?

Leadership

Ability to create an environment based on guidance, respect, and empowerment of the people to act consistently in the direction of the mission of the organization. [1]

The guidelines currently under development by DHS suggests to look into:

- A strong leader or champion that has decision-making power or authority to establish a HFR;
- A steering committee that is responsible for the oversight of the process and decision making around requirements.

[1] Ronald V. Buci (2014): Medicine and Business, a Practitioner's Guide, Springer

The governance behind a health facility registry?

Policies

A course or principle of action adopted or proposed by a government, party, business, or individual [1]

Several policies are needed to ensure for the HFR to be established, sustained and used:

- HFR policy defining roles, responsibilities (accountability), oversights, revision, funding,…
- Data sharing policy (open data as much as possible);
- Policy enforcing the use of the HFR (especially unique ID) as the unique authoritative source for HF level data collection, reporting, monitoring,…

[1] http://www.oxforddictionaries.com/us/definition/american_english/policy?q=policies

The governance behind a health facility registry?

Sustainability

Ability to be maintained at a certain rate or level [1]

➡️ Institutionalization

= Stakeholders + Leadership + Policies

+ Resources ⟨ Human / Financial

[1] http://www.oxforddictionaries.com/us/definition/american_english/sustainable

Where to start?

OpenHIE Health Facility Registry Implementation Guide

Last Updated: February 2015

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Stakeholders & Motivations	Document Specifications	Set Up Initial Instance	Iteration and Testing	Scale	Ongoing Support

Step 1: Identify Stakeholders and Motivations
- 1.1: Identify Stakeholders and Existing Systems
- 1.2: Explore Opportunities and Challenges

Step 2: Document Specifications and Requirements
- 2.1: Collect Existing Metadata and Facility Lists
- 2.2: Document Data Specifications
- 2.3: Document User Stories

Step 3: Carry Out Specifications and Identify Gaps
- 3.1: Implement the Facility Registry Specifications
- 3.2: Identify and Prioritize Incomplete User Stories

Step 4: Iterative Development and User Testing
- 4.1: Agile and Iterative Development
- 4.2: User Testing
- 4.3: Collect, Reconcile and Upload Facility Data

Step 5: Scale-Up
- 5.1: Confirm User Roles and Responsibilities
- 5.2: User Training
- 5.3: Critical Integrations

Step 6: Ongoing Support
- 6.1: Operations Support
- 6.2: Developer Support
- 6.3: Integration Support
- 6.4: Data Support
- 6.5: Help Desk Support

Establish a steering committee

Develop/strengthen the technical capacity

https://docs.google.com/document/d/1KaUPHQRiZ9hQ59Irp56oKayvVZbkWngTYkI2AZdafhw/edit

Summary

- A health facility registry is critical to an integrated and interoperable health information system;
- "The purpose of a health facility registry is to act as the central authority to collect, store and distribute an up to date and standardized set of facility data" (OpenHIE)
- "Everything Should Be Made as Simple as Possible, But Not Simpler"(Albert Einstein);
- Second most easiest registry to develop after the administrative divisions registry;
- Key to involve all stakeholders right from the beginning and keep them engaged through the steering committee
- Content, content, content,…
- Importance to follow the all data management chain when developing the content

Summary

- Use standards and protocols to ensure the quality of the content (collect information once, used it many time);
- Be careful when deciding on the coding scheme;
- Remember it is easier to aggregate than desegregate field content when developing the data dictionary;
- Don't forget to capture the source and time stamp for each field in the registry (metadata);
- Chose and train carefully the people in charge of data collection and update;
- Update the content of the registry regularly;
- Make things work on paper first and then use technology to make the all process faster through an online system;
- Establish a proper governance structure to ensure for the registry to answer all stakeholder's needs

Summary

- Develop and implement the necessary policies to ensure for the registry to be established, sustained and used;
- Share the content of the registry as openly as possible. This will allow for the biggest return on investment;
- Above all, aim right from the beginning at institutionalizing the registry to ensure its sustainability and this by securing enough financial resources and investing in human capacities;

➡ Follow a process