

Geo-enabling Health Information Systems

UNICEF East Asia Pacific Regional Office, supported by TechNet-21, invites you to:

Learn how to geo-enable health information systems and programmes

Join us for a bi-weekly web-series starting **19 June 2024**

Demonstrate the potential of geospatial data and technologies in public health

Introduce HIS geo-enabling framework and its implementation in countries

Provide knowledge and resources to implement the HIS geo-enabling framework



Go to <https://tn21.org/UNICEF-EAPRO>
or Scan QR Code to Register

Ongoing registration

Joining any one session also permitted

6 Modules of around 2 hours each

Certificates provided on completion by UNICEF & MORU

Workshop Objectives

Disseminate operational guidance materials that can assist countries in implementing the geo-enablement process for health programs in general and the development and implementation of micro plans in particular

More specifically:

- Demonstrate the potential of geospatial data and technologies in public health
- Introduce the HIS geo-enabling framework and its implementation in countries
- Transfer knowledge, expertise and resources that will allow participants to implement the HIS geo-enabling framework in their respective country

➡ At the end of this workshop, it is expected that the participants will have a better understanding of what geospatial data and technologies can bring to public health programs and how to geo-enable their health information system in a sustainable way to benefit from this type of data and technologies

➡ This is not a GIS training

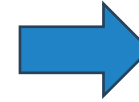
The collage features several key documents and images:

- Ending Preventable Maternal Mortality (EPMM):** A report by the World Health Organization (WHO) titled "A RENEWED FOCUS FOR IMPROVING MATERNAL AND NEWBORN HEALTH AND WELLBEING". It includes a cover image of a pregnant woman and a healthcare worker.
- Proposing standardised geographical indicators of physical access to emergency obstetric and newborn care in low-income and middle-income countries:** A technical paper by Helen Mwanza, Kate Hargreaves, Michael Bhat, and others, published by the World Health Organization.
- Implementation Support Guide: Development of a National Geospatial Community Health Worker Master List Hosted in a Registry:** A guide published by the Health Systems Foundation, UNICEF, and the Ministry of Health of Ethiopia.
- Enabled Planning Handbook:** A handbook for health systems planning, published by the Health Systems Foundation, UNICEF, and the Ministry of Health of Ethiopia.
- Guidance on the Use of Geospatial Data and Technologies in Immunization Programs:** A guidance document published by Gavi, the African Union, and UNICEF, focusing on overview and managerial considerations for in-country strengthening.

The collage also includes various images of healthcare workers, pregnant women, and maps, illustrating the themes of maternal and newborn health, geospatial data, and community health worker training.



PRESENTATIONS



 NATIONAL_GUIDES



Session 1: The geographic dimension and the potential of geospatial data and technologies in public health



Recording module 2: <https://youtu.be/oqOC8064buE>

Example of data specifications	
Georeferenced master lists	
File format	English and/or language (200606)
Language	986 Loc
Data coverage	Covers the minimum set of data elements included in the corresponding master list data dictionary
Metadata	Contains the minimum set of fields included in the corresponding master list template
Geographic coordinate system	<ul style="list-style-type: none"> Geographic Coordinate System: GCS_WGS_1984 Angular Unit: Degree (314743.262128943) Prime Meridian: Greenwich (0) Datum: WGS_1984 Spheroid: WGS_1984 Semimajor Axis: 6378137.0 Semiminor Axis: 6356583.8147499 Inverse Flattening: 298.257223563
Accounting ledger master lists	
Financial accuracy	16 meters
Temporal accuracy	month 1 (2003)
Temporal coverage	Days older than 1 year should be avoided
Completeness	All the currently active records are included in the list
Source	A unique ID available for all the data elements included in the list
Data element	All records
Implications	Not applicable
Comments	<ul style="list-style-type: none"> Geographic coordinate system Geographic coordinate system data elements were constructed from the options included in the corresponding client ledger file (i.e. South Africa's ID) associated master administrative unit name)

HIS geo-enabling: Guidance on the establishment of a common geo-registry for the simultaneous hosting, maintenance, update and sharing of lists as well as associated hierarchies and spatial data

Version 2.

Part 2 - Implementing the geospatial data management cycle: 2.1 Documenting the process and defining the data needs

Version 1.2 (last update: 18.05.2020)

Journal of Management Inquiry 22(1) 3-14
© The Author(s) 2013
Reprints and permissions: sagepub.com/journalsPermissions.nav
DOI: 10.1177/1056492613505111

in collaboration and with the support of

Questions and knowledge sharing during the modules?

<https://tinyurl.com/3999y744>



Please post your questions in the Zoom Q&A (not the chat)

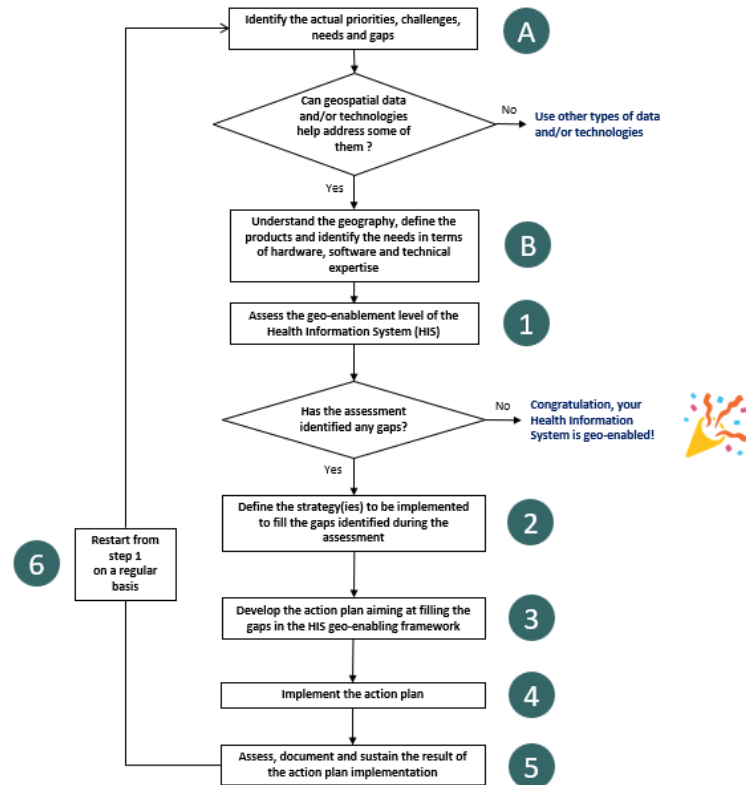
You can also ask questions using this short Google form (between modules for example)

You can share any resource or experience you see relevant to the participants in the chat

We will also be using the chat to share information

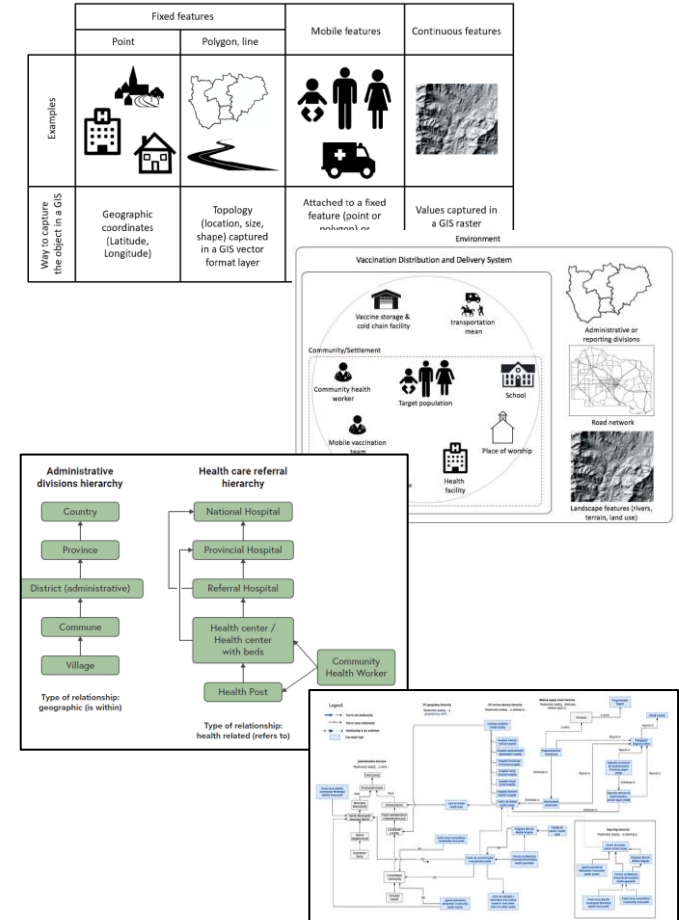
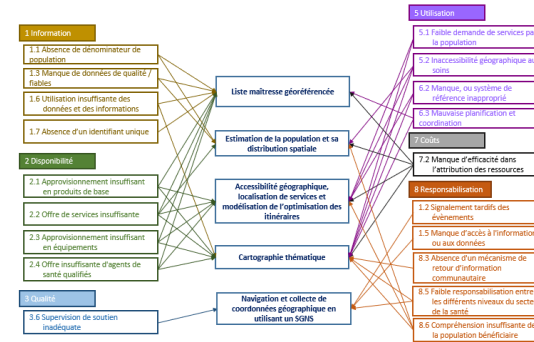
We will answer them as much as possible during the modules

Recap of Module 2



Priority	Nbr of mention
Disease elimination and control	41
Strengthen the health information system	14

Challenge	Nbr of mention
Improve access to health	25
Disease surveillance and	25
Mortality reduction (MNI)	23
Digitalization of the health	22
Disease mapping/spatial	21
Case detection and mana	19
Disease prevention	19
Other	19



In-country implementation of the HIS geo-enabling framework

Result of the HIS geo-enablement level assessment (priorities and challenges)

Understand the geography of the program or intervention

Geo-enabling the Health Information System, programs or interventions training workshop for Asia Pacific

...and beyond

Module 3

Schedule - Module 3

- 15 min - Recap of Module 2 and agenda of Module 3
- 30 min - **Session 7:** Result of the geographic features identification performed by the participants
- 30 min - **Session 8:** Define the purpose, audience, content and format of the final products
- 15 min – **Session 9:** Identify needed hardware, software and technical expertise
- 20 min – **Session 10:** Assess the geo-enablement level of the HIS, program or intervention
- 30 min – **Session 11:** Result of the HIS geo-enablement level assessment for Asia and Pacific (9 elements of the HIS geo-enabling framework)

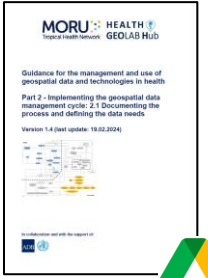
➡ Products and assessment of the current HIS geo-enablement level in countries

Geo-enabling the Health Information System, programs or interventions training workshop for Asia Pacific

...and beyond

Session 7: Result of the geographic features identification performed by the participants

Understanding the geography – Geographic features



	Fixed features		Mobile features	Continuous features
	Point	Polygon, line		
Examples				
Way to capture the object in a GIS	Geographic coordinates (Latitude, Longitude)	Topology (location, size, shape) captured in a GIS vector format layer	Attached to a fixed feature (point or polygon) or geographic coordinate taken at a given time	Values captured in a GIS raster format layer

➡ Geographic feature = Naturally and artificially-created features on the earth (e.g. house, road, health facility, river, etc.)

Understanding the geography – Identifying the geographic features

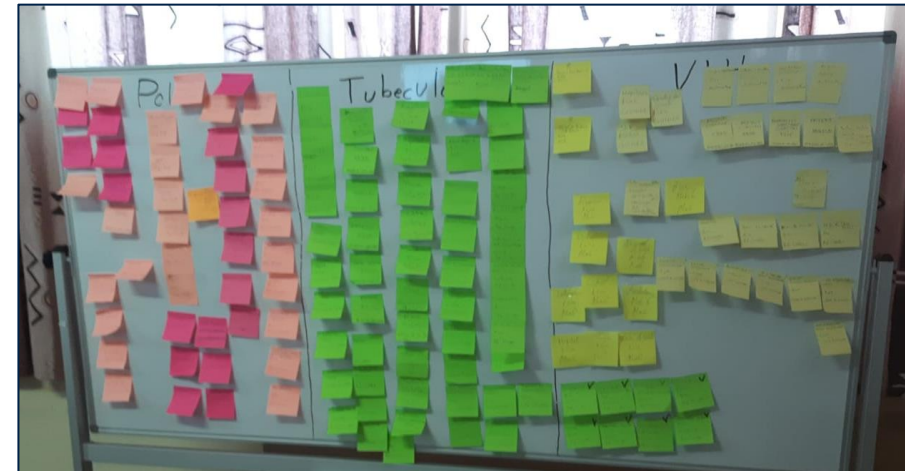
1. Participants identifying geographic features (1 feature per post it, one color per program)



2. Participants placing the post its on a board (one color per program)



3. All the post it submitted by the participants



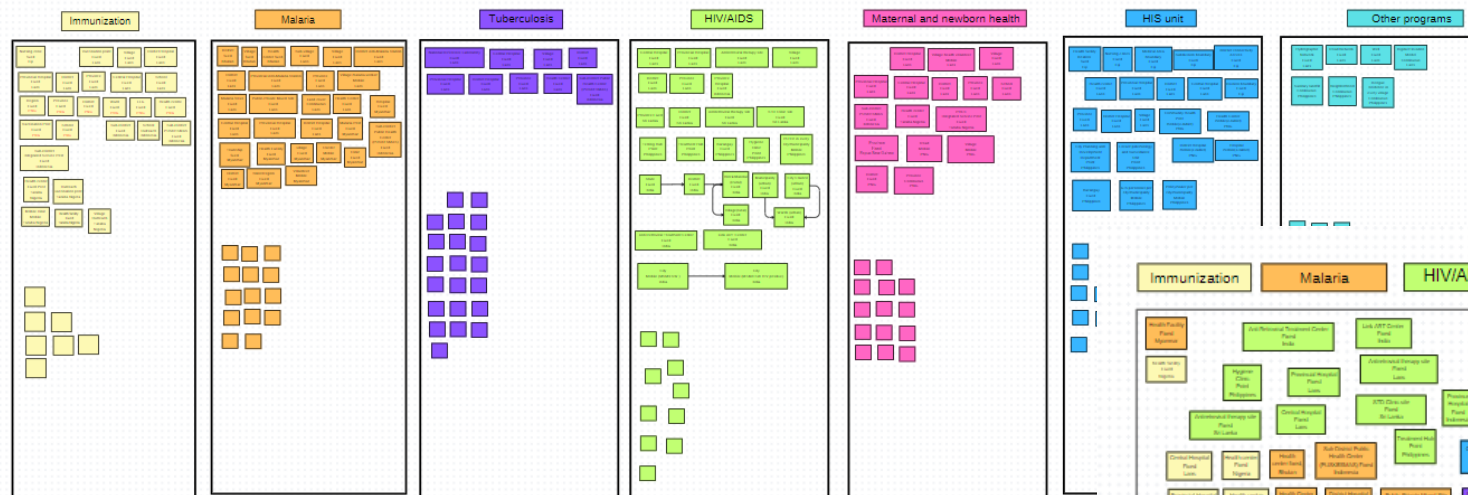
4. Post it re-arranged by type of geographic feature



➡ Defines the ecosystem and demonstrates that most geographic features are in common to all programs

Identifying the geographic features - Exercise

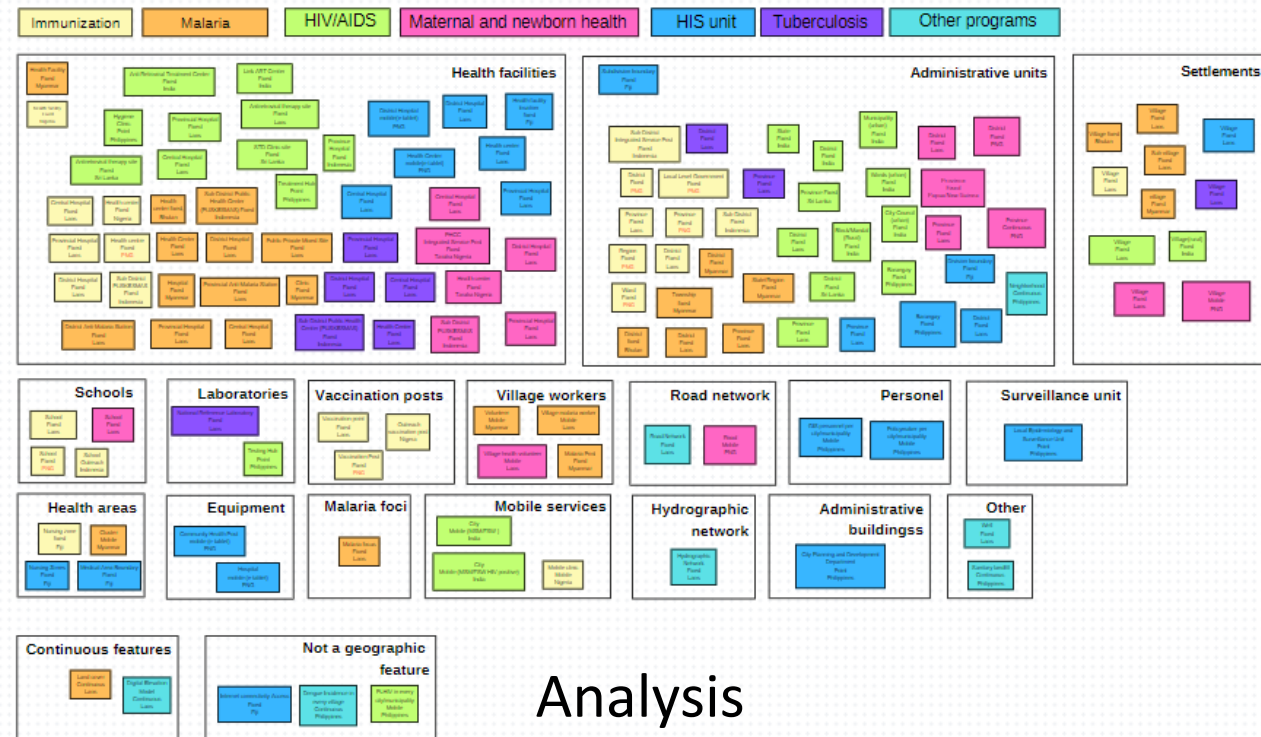
Identification of the geographic features core to each program



Exercise



<https://tinyurl.com/5c9p2day>



Analysis

Identifying the geographic features – Result of the exercise

	Fixed features		Mobile features	Continuous features
	Point	Polygon, line		
Examples	<ul style="list-style-type: none"> • Health facilities • Settlements • Laboratories • Schools • Vaccination posts • Surveillance units • Malaria foci • Administrative buildings • Wells 	<ul style="list-style-type: none"> • Administrative units • Health areas • Hydrographic network • Road network 	<ul style="list-style-type: none"> • Health personnel • Administrative personnel • Mobile services • Equipment 	<ul style="list-style-type: none"> • Altitude (DEM) • Land cover
Way to capture the object in a GIS	Geographic coordinates (Latitude, Longitude)	Topology (location, size, shape) captured in a GIS vector format layer	Attached to a fixed feature (point or polygon) or geographic coordinate taken at a given time	Values captured in a GIS raster format layer

The geographic features for which you want to prioritize the establishment, maintenance and regular update of a master list

➡ Session 13

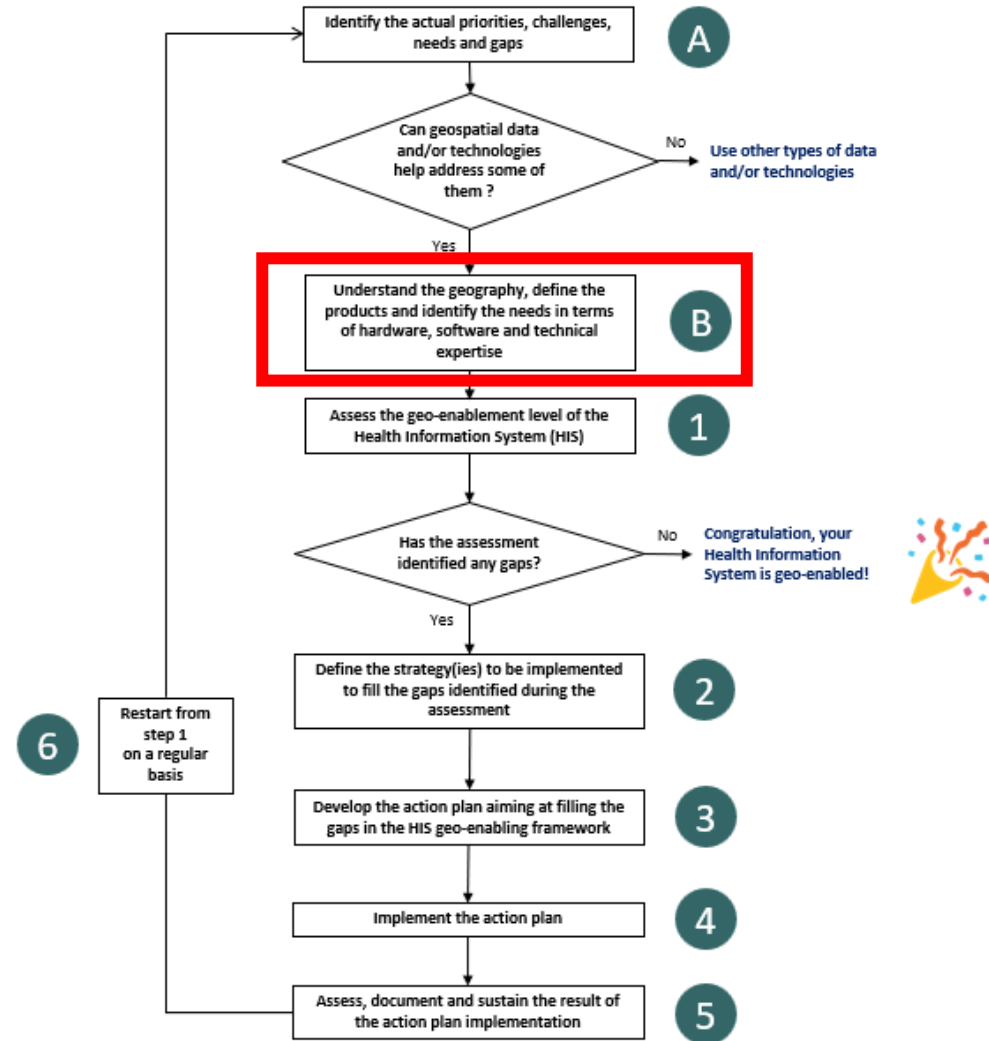
Geo-enabling the Health Information System, programs or interventions training workshop for Asia Pacific

...and beyond

Session 8: Define the purpose, audience, content and format of the final products

HIS Geo-enabling framework implementation process

Step B : Understand the geography, define the products and identify the needs



Potential of geospatial data and technologies in public health

Health system challenges (WHO classification)

1 Information

1.1 Lack of population denominator

1.2 Late reporting of events

1.3 Lack of quality/reliable data

1.5 Lack of access to information or data

1.6 Insufficient utilization of data and information

1.7 Lack of a unique identifier

2 Availability

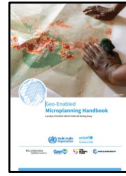
2.1 Insufficient supply of commodities

2.2 Insufficient supply of services

2.3 Insufficient supply of equipment

2.4 Insufficient supply of qualified health workers

1



2



Applications of geospatial data and technologies

Georeferenced Master Lists

Population estimation and spatial distribution

Geographic accessibility, service localization, and route optimization modeling

Thematic mapping

Navigation, tracking and geographic coordinates collection using a GNSS

3 Quality

3.6 Inadequate supportive supervision

5 Utilization

5.1 Low demand for services

5.2 Geographic inaccessibility

6 Efficiency

6.2 Lack of or inappropriate referrals

6.3 Poor planning and coordination

6.4 Delayed provision of care

6.5 Inadequate access to transportation

7 Costs

7.2 Lack of effective resource allocation

8 Accountability

8.3 Absence of a Community feedback mechanism

8.5 Poor accountability between the levels of the health sector

8.6 Inadequate understanding of the beneficiary population

Products

1. <https://drive.google.com/file/d/1jj779zww4herWOESAd9mXqVE1YfQeHtH/view?usp=sharing>

2. <https://www.gavi.org/news/document-library/leveraging-geospatial-technologies-and-data-strengthen-immunisation>

Products purpose, audience, content and format

The following is to be defined for each product:

Purpose:

- What is the product going to be used for?
- What is/are the message/s that the product is meant to convey?
- When and where will the product be used?

Audience

- Who will be using the product?
- Is this product meant for internal use or for public consumption?
- Is the audience familiar with the topic covered by the product?

Content

- What data and/or information needs to be included in the product?
- Should the data and/or information be presented in a particular way?

Format (medium)

- How will the product reach the audience?
- Does the product need to be of a particular size?
- Is there a need for the the audience need to zoom on the map?

Georeferenced master list

Purpose:

- Ensure data quality across the 6 dimensions of data quality and this for both statistical and spatial data
- Reduce duplication of efforts and therefore cost by maintaining only one list instead of several ones
- Support data interoperability and collaboration across partners as well as promote innovation and data use.
- Provide the denominator for the implementation of any programs or intervention

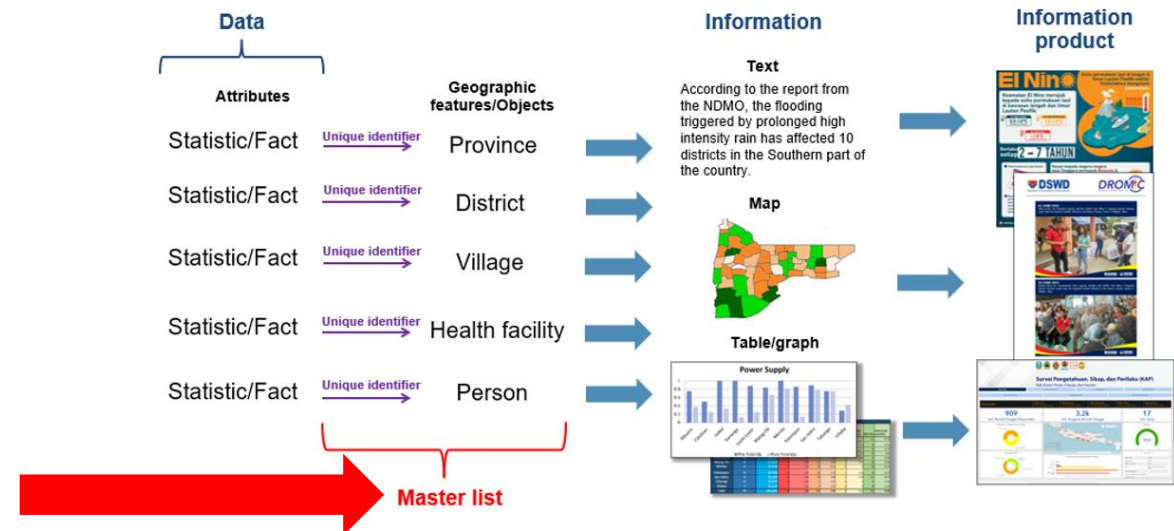
Audience:

- All the stakeholders and this across levels (central to the lowest administrative level in the country)



➡ Starting point for the creation of any information and/or information product

➡ Fundamental and foundational!



Georeferenced master list

Content

The information that allows to do the following for each of the records in the master list:

- Uniquely identify (unique identifier, name)
- Classify (type, ownership,...)
- Locate (address, administrative division, geographic coordinates)
- When it applies, contact (head name, phone number, email address,...)

Example for health facilities

Unique ID	Health facility name
HF0013	San Juan Referral Hospital

Health facility type	Owernship
Referral Hospital	Government

Address	Province code	Province Name	Latitude	Longitude
20, St Andreas Street	TLK01	Andustar	14.412830	121.033090

Head name	Head position	Phone number
Horm Mada	Director	+99 97 11477917



- Data elements
- Data dictionary
- Classification tables (types, ownership)
- Coding scheme
- Naming convention



To be defined through a collaborative process involving all the stakeholders who will generate, manage and/or use the content of the master list



Session 13 for more details

Georeferenced master list

Format (medium)

HF_ID	HF_NAME_EN	OP_NAME	HF_TYPE_EN	HF_OWN	LAT	LONG
HF000062	Ywar Thar	2001-07-27	Sub Rural Health Center	Public (MOH)	16.8	96.15
HF002135	Zee Pin Hla	1998-03-27	Sub Rural Health Center	Public (MOH)	21.9769	96.0869
HF004754	Myo Thit	1972-04-29	Sub Rural Health Center	Public (MOH)	19.7475	96.115
HF003336	Ya Thit	1983-07-01	Sub Rural Health Center	Public (MOH)	16.8906	97.6333
HF003302	Let Wea	2005-06-17	Sub Rural Health Center	Public (MOH)	17.3433	96.4981
HF000008	Let Pan Taw	1934-06-15	Rural Health Center	Public (MOH)	12.4394	98.6003
HF002212	Mei Ni ma Kone	1969-06-06	Sub Rural Health Center	Public (MOH)	16.4847	97.6258

- A master list is typically stored in a spreadsheet in which each row is a record and each column contains one data element
- Ideally accompanied by a summarized version of the data dictionary (data catalogue), including classification tables when applicable, as well as the metadata

Depending on internet connectivity and the need to use master lists in different information systems or applications, versions of the master list can be shared as a standalone spreadsheet file containing multiple worksheets (e.g. MS Excel), through a registry or a Common Geo-Registry (CGR)

In any case, these master lists should be hosted, maintained and regularly updated either in a set of registries (one geographic feature by registry) or a CGR

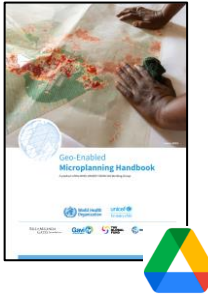
Data element	Description
HF_ID	Health facility unique identifier
HF_NAME_EN	Health facility complete name (English)
OP_DATE	Health facility opening date
HF_TYPE_EN	Health facility type (English)
HF_OWN	Health facility ownership
LAT	Latitude of the health facility
LONG	Longitude of the health facility

Title:	Health Facility Master List for Tolkien Province
Originator:	Department of Health (DOH)
Publication date:	January 2025
Abstract:	This dataset is the official master list of health facilities for Tolkien Province
Process:	This dataset has been generated by combining different sources of information that are validated by the DOH. The geographic coordinates present different level of accuracy depending on the data collection method used.
Progress:	Ongoing (updated regularly)
Access constraints:	The access to this data is limited to the participants attending the Introduction to geospatial data management and technologies for Malaria Programs training workshop.
Use constraints:	The use of this data is limited to the participants attending the Introduction to geospatial data management and technologies for Malaria Programs training workshop.
Disclaimer:	This dataset is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the data lies with the user. In no event shall the Department of Health be liable for damages arising from its use.
Primary Contact	
Contact Name	Ariela Antonio
Organization	DOH
Contact Telephone number:	877-0000
Contact Fax Number:	NA
Contact Email Address:	a.antonio@doh.gov



➡ Session 19

Population estimation and spatial distribution



Purpose:

- Provide highly accurate, disaggregated information regarding the size and locations of the program or intervention's target populations
- Accurately and inclusively estimating remote, displaced or marginalized communities
- Capture population changes over time



Serve as both data inputs and data products depending on the program or intervention.

Examples:

- Population distribution at the individual or settlement level might be used as origins or destinations in models of geographic accessibility, service location or route optimization.
- Population estimates at the individual or settlement level might be used for weighting and normalization, while population distribution may be used as origins.
- Generate population denominators (total number and divided by age and sex)
- Visualize population distribution, count, and density in thematic maps, including age and sex
- Summarize and visualize population distribution, count, and density by health facility, administrative area or other catchment areas.

Audience

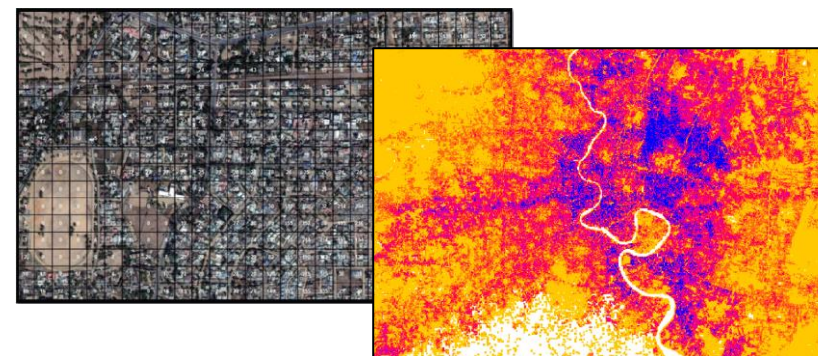
- Any health program or intervention within the health sector and their partners

Population estimation and spatial distribution

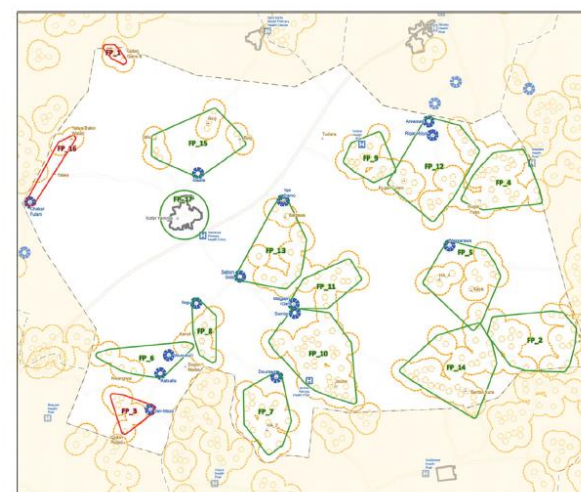
Content and format

There are three types of population estimate and spatial distribution data products:

1. **GIS layers** containing the spatial distribution of the target population (gridded raster format and vector layers).
2. **Tables** containing the total or percentage of a target population for a selected level of disaggregation (e.g. administrative unit, health division, health or catchment area, travel time,...).
3. **Graphs and charts** allow for easier data visualization or analysis (e.g. trend analysis)



Gridded
raster
format



Vector
layer

Ward: Gadanya
LGA: Bagwai
State: Kano

Targeted pop: 3644
Total pop: 21399
Total # of Fixed Posts (FPs): 5.0

Area Name	Target Pop	Total Pop	# FP Days
FP_1	53	311	0.5
FP_2	204	1200	1.5
FP_3	86	470	0.5
FP_4	296	1741	2.5
FP_5	175	1029	1.5
FP_6	109	623	1
FP_7	130	764	1
FP_8	116	682	1
FP_9	258	1470	2
FP_10	420	2500	3.5
FP_11	111	652	1
FP_12	249	1464	2
FP_13	171	1005	1.5
FP_14	355	2088	3
FP_15	203	1178	1.5
FP_16	17	99	0
FP_17	709	4125	4
Total	3644	21399	28



Production date: 8/5/2017

Geographic accessibility



Purpose:

- Assess the coverage level of an existing health service delivery network, for example, measuring the percentage of population located within one hour of a type of health facility (accessibility analysis)
- Optimize the spatial distribution of services, including re-allocating personnel and resources (existing or planned)
- Measure potential improvements in population coverage from proposed interventions, such as adding service delivery points (scaling up)
- Estimate the shortest travel time between the different levels of the health service delivery network (referral)

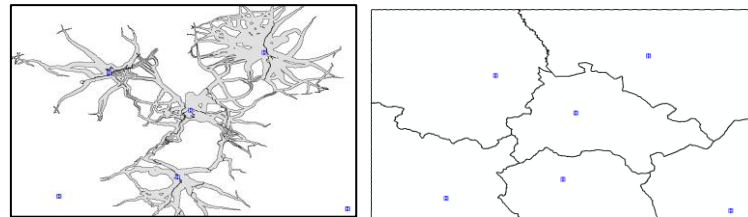
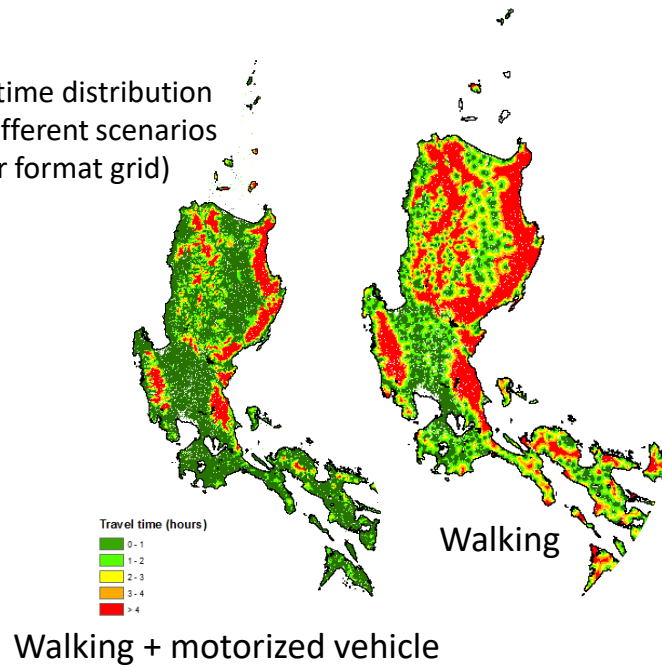
Audience

- Any program or intervention willing to:
 - Estimate how geographically accessible specific services are to the population
 - Optimize the geographic distribution of services
 - Scale up the current health service delivery network to improve population coverage
 - Estimate referral travel time between health facilities

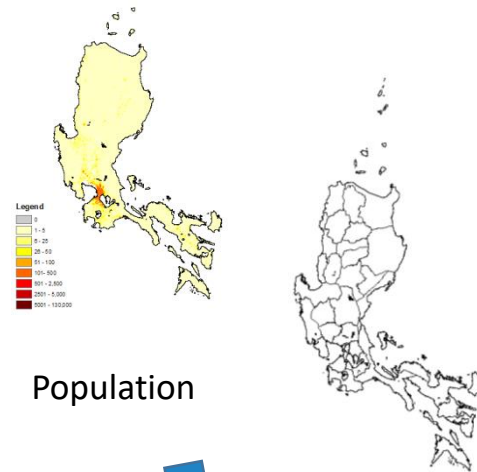
Geographic accessibility

Content and format (geographic accessibility)

1. Travel time distribution grid for different scenarios (raster format grid)



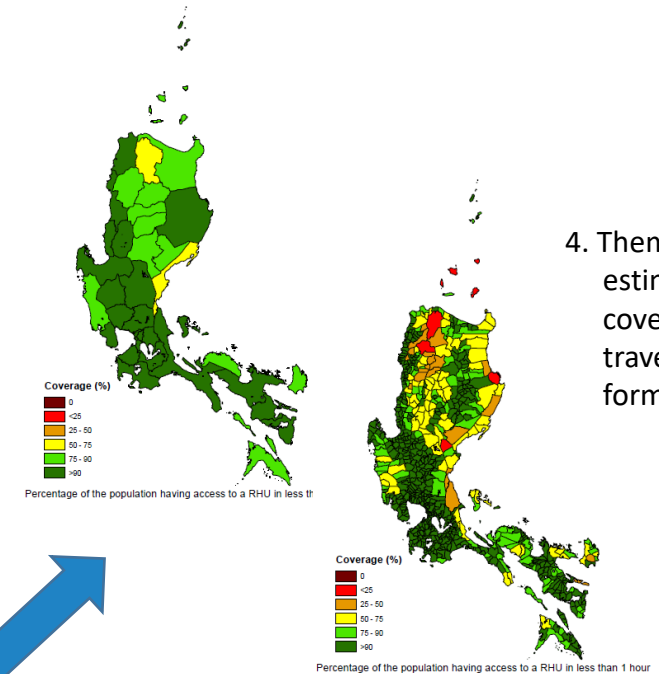
2. Modelled catchment areas and proximity basins



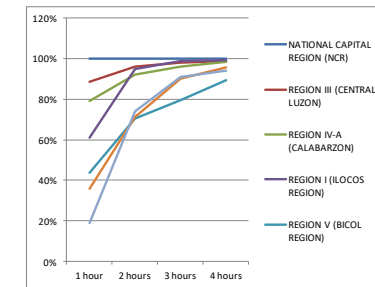
Region Name	1 hour	2 hours	3 hours	4 hours
NATIONAL CAPITAL REGION (NCR)	100%	100%	100%	100%
REGION III (CENTRAL LUZON)	89%	96%	98%	99%
REGION IV-A (CALABARZON)	79%	92%	96%	99%
REGION I (ILOCOS REGION)	61%	95%	99%	99%
REGION V (BICOL REGION)	44%	71%	80%	89%
CORDILLERA ADMINISTRATIVE REGION (CAR)	36%	71%	90%	96%
REGION II (CAGAYAN VALLEY)	19%	74%	91%	94%

3. Tables providing estimated population coverage for different travel times

Philippines



4. Thematic maps of estimated population coverage for different travel time (vector format)



5. Graphs showing the evolution of population coverage for different travel time

Geographic accessibility

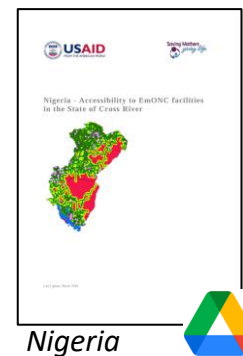
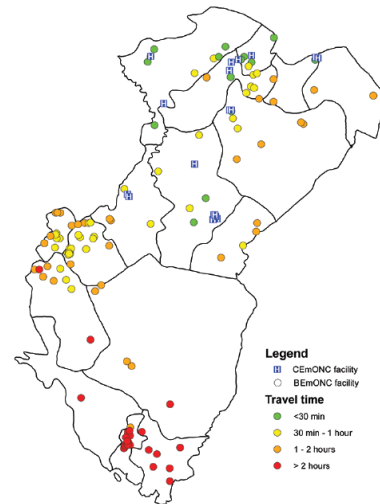
Content and format

Referral analysis

From health facility ID	From health facility name	To health facility ID	To health facility name	Distance (km)	Travel time (min)
1095	AWUKAM CLINIC	1097	BENSON CLINIC	2	1
1097	BENSON CLINIC	1117	EYO MEDICAL CENTER	32	21
1117	EYO MEDICAL CENTER	1097	BENSON CLINIC	32	23
1452	MATERNITY HOSP MONIAYA	1152	OMEGA CLINIC	31	24
1152	OMEGA CLINIC	1452	MATERNITY HOSP MONIAYA	31	26
1426	SACRED HEART HOSPITAL	1452	MATERNITY HOSP MONIAYA	57	51

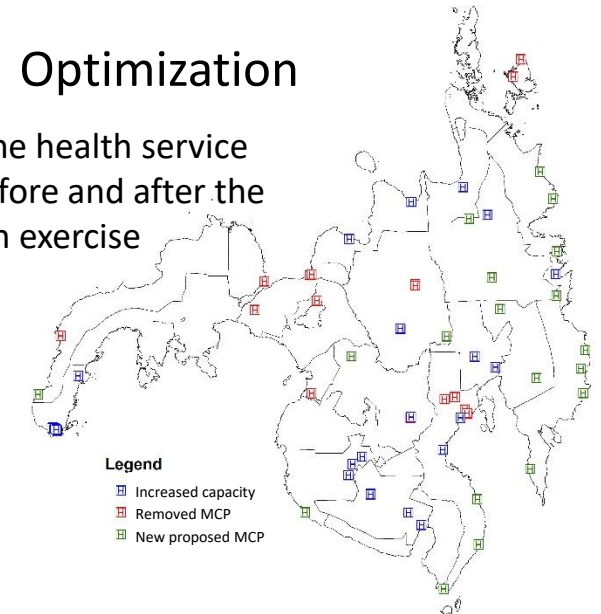
1. Table containing the travel time and distance between the different levels of the health service delivery network

2. Maps showing the spatial distribution of travel time between different types of health facilities



Optimization

1. Maps showing the health service delivery network before and after the optimization exercise



2. Table showing the change in population coverage obtained through the optimization

Before: 82.1%
After: 87.7%

PSSC	Province name	Accessibility coverage	Geographic coverage	Gain in accessibility coverage compare to the existing network	Gain in geographic coverage compare to the existing network
097200000	Zamboanga del Norte	66.2%	63.0%	3.3%	3.2%
097300000	Zamboanga del Sur	90.1%	84.5%	1.3%	5.3%
098800000	Zamboanga Sibugay	85.7%	73.6%	0.7%	2.9%
101300000	Bukidnon	87.5%	86.2%	1.4%	-0.3%
101800000	Camarines	99.7%	99.5%	0.3%	0.0%
103500000	Lanao del Norte	81.0%	80.7%	0.8%	0.3%
104200000	Misamis Occidental	84.9%	82.5%	1.3%	-0.4%
104300000	Misamis Oriental	94.8%	93.4%	1.6%	0.4%
112300000	Davao del Norte	96.2%	95.3%	0.6%	0.7%
112400000	Davao del Sur	89.7%	83.5%	10.1%	12.3%
112500000	Davao Oriental	79.4%	75.7%	3.4%	34.5%
118200000	Compostela Valley	92.4%	89.4%	2.0%	14.6%
124700000	Cotabato (North Cotabato)	85.2%	83.6%	1.0%	-1.0%
126300000	South Cotabato	85.7%	83.2%	0.5%	-1.0%
126500000	Sultan Kudarat	86.6%	82.9%	1.3%	8.8%
128000000	Sarangani	65.3%	61.1%	1.7%	0.2%
129800000	Cotabato City (not a province)	100.0%	100.0%	0.0%	0.0%
153600000	Lunao del Sur	81.3%	79.8%	1.7%	0.7%
153800000	Maguindanao	84.3%	83.2%	0.4%	-0.7%
160200000	Agusan del Norte	90.4%	89.5%	0.7%	5.8%
160300000	Agusan del Sur	68.2%	65.1%	0.9%	17.5%
166700000	Surigao del Norte	97.2%	96.4%	0.6%	-1.1%
166800000	Surigao del Sur	86.9%	83.4%	1.1%	27.3%
168500000	Mindanao Islands	82.3%	81.3%	1.4%	0.0%
Study area		85.5%	82.1%	2.1%	5.6%

http://pdf.usaid.gov/pdf_docs/pa00mdwb.pdf

http://www.healthgeolab.net/KNOW_REP/PHL_MCP_Mindanao_report_201013.pdf

Geographic accessibility

Content and format (scaling up)

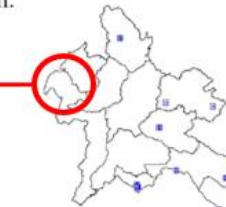
1. Table containing the population coverage estimate for the different scaling up scenarios that have been tested

Province name	Geographical coverage before the scaling-up (%)	Geographical coverage after applying the first scenario (%)	Geographical coverage after applying the second scenario (%)
Attapu	0.0	81.0	87.5
Bokeo	0.0	79.6	56.0
Bolikhamxai	44.5	96.8	98.8
Champasak	22.3	95.6	98.5
Houaphan	9.9	70.5	78.8
Khammouan	22.0	98.1	99.7
Louang-Namtha	0.0	68.8	74.4
Louangphabang	0.3	76.4	83.5
Oudomxai	0.0	58.9	71.9
Phongsali	31.0	76.2	89.5
Salavan	6.9	96.1	99.5
Savannakhet	11.4	97.6	99.6
Xekong	0.0	87.7	94.1
Vientiane	48.2	93.9	98.5
Vientiane Capital	99.2	100.0	100.0
Xaignabouli	0.0	90.6	92.0
Xiangkhouang	31.8	97.1	98.7
National	23.5	89.8	92.9

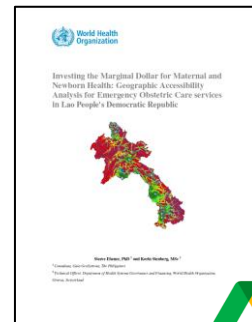
- Scenario 1: expanding the existing network of EmONC facilities (18 facilities) to 83 facilities per the national EmONC improvement plan and the staffing capacity of these facilities to be able to service all births for households located within 2 hours of travel time.



- Scenario 2: establishing an MWH near each of the existing 18 EmONC facilities and modelling the capacity that would be required to accommodate all women living between 2 and 6 hours of travel time from these facilities to access these homes prior to giving birth.

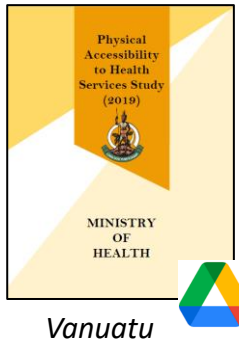
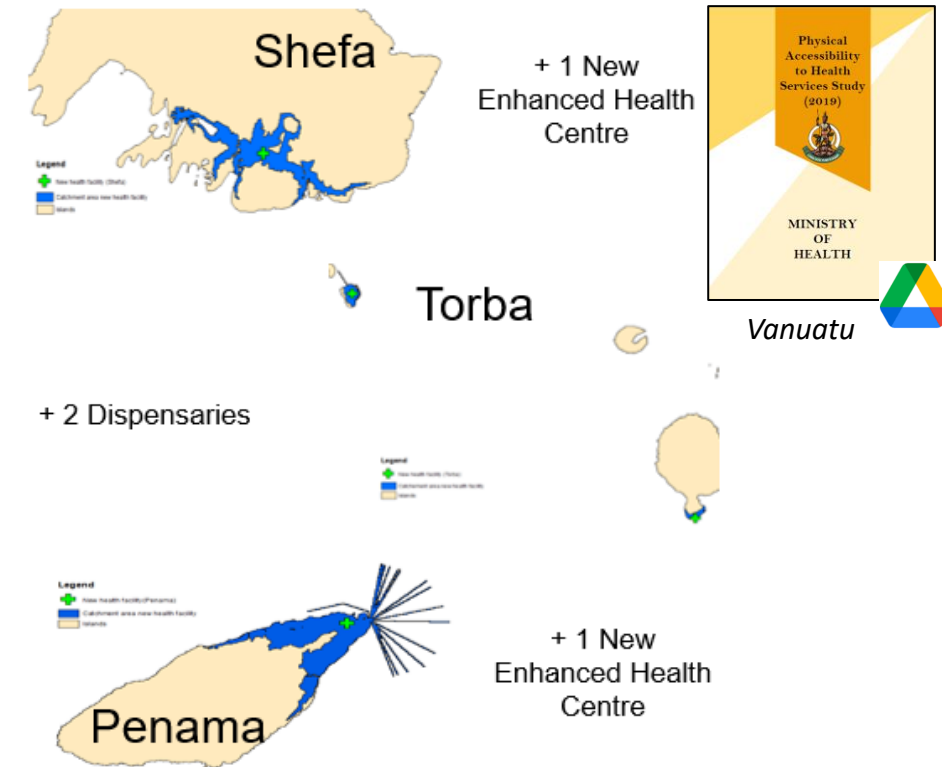


Lao PDR



2. Maps presenting the spatial distribution of the health facilities for the different scenarios

Province	Before (%)	After (%)
Shefa	78.6	85.1
Torba	73.7	80.5
Penama	72.3	92.6



<http://apps.who.int/iris/bitstream/10665/250273/1/WHO-HIS-HGF-GIS-2016.4-eng.pdf>

https://healthgeolab.net/KNOW_REP/Acc_Analysis_VUT_050224_FINAL.pdf

Route optimization

Purpose:

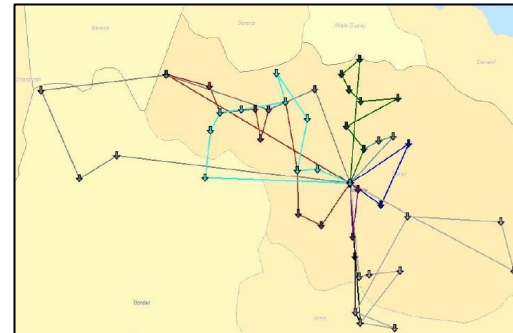
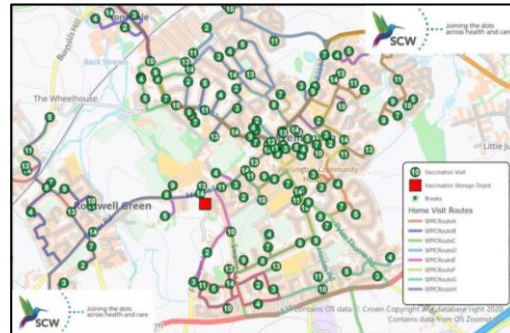
- Identify the most effective routes for routine operations along a transportation network, for instance transporting vaccines between warehouses and vaccination sites.
- Optimize the placement of resources along a new service delivery network established to respond to an emergency or to implement a new program (e.g. warehouses, cold chain facilities)

Audience

- Any program or intervention willing to:
 - Identify the most effective routes for routine operations
 - Optimize the placement of resources along a new service delivery network

Content and format

- Map presenting the optimized (most effective) route along the transportation network
- Table listing each stop and the travel time between them along the optimized route



Quantity: 4842/5000				
Start-time: 08:30:00 End-time: 17:13:47.724				
Travel-km: 473.392 Travel-time: 06:53:46.498				
#	ID	Name	address	arrival-time
1	Stop141	Wood Cafe	28 Ty-fry ...	08:30:58...
2	Stop94	Fox Fruit ...	35 Pettycr...	09:58:29...
3	Stop128	Green N...	89 Marsh...	10:44:43...
4	Stop122	Evans Fa...	33 Claud...	11:11:57...
5	Stop50	White Mo...	22 St Ald...	11:23:06...
6	Stop9	Davies L...	68 Elmle...	11:35:58...
7	Stop80	James H...	60 Villag...	12:10:28...
8	Stop52	Shaw Fru...	63 Chard...	12:29:33...
9	Stop60	Robertso...	55 High ...	12:56:35...
10	Stop16	Robertso...	4 Bakers ...	13:27:23...
11	Stop40	Kennedy ...	2 Greenf...	14:16:29...
12	Stop46	Evans An...	27 Clos ...	15:46:48...



Thematic mapping

Purpose:

- Convey information about topics or themes in visual form (e.g. visualize the spatial distribution of a target population or available health services)

➡ Use in almost all the other applications

Audience

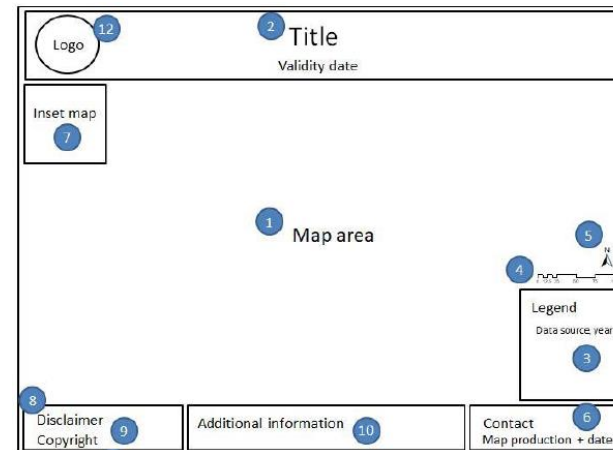
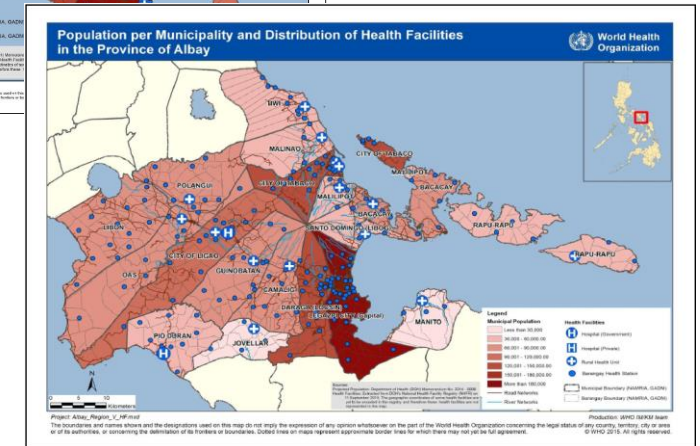
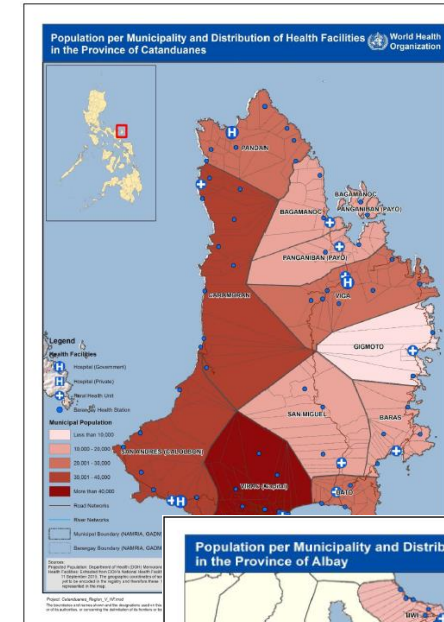
- Any health program or intervention within the health sector and their partners

Content

- Geospatial and statistical data and other information useful to the map users

➡ Ideally organized according to a predefined template

1



1 http://www.healthgeolab.net/DOCUMENTS/Guide_HGLC_Part2_6_1.pdf

Thematic mapping

Format (medium)

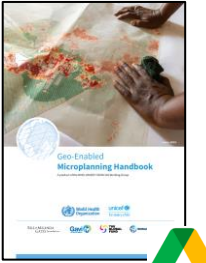
The format for saving and sharing thematic maps depends on the map's purpose and the target audience's capacities:

- Paper: A printed version of the map is useful when devices or onternet access are not available to view a digital version, such as during fieldwork, or when it is more practical for teams to discuss a large-size map on a wall or table.
- Digital: Digital files are useful for sharing and saving thematic maps. PDF is the preferred file format for digital thematic maps, as the format enables any vector data on the maps to retain clarity and detail while zooming in or out, and because the files are often easier to print. Teams may also wish to export JPEG files of thematic maps for use in reports or sharing on social media.
- Web-based: Depending on technology used and access, dynamic versions of thematic maps can be shared in the form of webmaps. These webmaps may exist as standalone products or a dashboard component. Webmaps can be designed to allow users to turn layers on and off, change symbology colours and edit map data. They can also allow users to easily select and view particular districts or catchment areas within a larger map.



Thematic mapping

Purpose, content and audience to support microplanning



Annex H



Phase in the generic microplanning process	Thematic map purpose	Thematic map Content		Thematic map audience
		Geospatial data	Statistical data and information	
1. Determine target population and its current service coverage	Support the identification of target population's spatial distribution, including high-risk groups and individuals	a. Spatial distribution of the target population b. Boundaries of administrative units c. Service delivery points d. Catchment areas e. Transportation network f. Barriers to movement (e.g. rivers) g. Difficult-to-access areas	a. Recent target population statistics down to the subnational level appropriate for microplanning b. Target population by catchment area c. Percentage of uncovered target population down to the subnational level appropriate for microplanning d. Unique identifier and/or name of the service delivery point	Planners, programme managers and major stakeholders
2. Estimate the service delivery requirements	Support the estimation of the volume of service required to cover the target population	a. Spatial distribution of the target population b. Boundaries of administrative units c. Service delivery points and other infrastructures (e.g. warehouse, cold chain storage, waste disposal sites, etc.) d. Catchment areas e. Transportation network	a. Target population by catchment area or service delivery point delivery b. Capacity of each service delivery point and other infrastructures	
3. Plan for commodities and equipment storage				
4. Identify and manage human resources	Provide a visual representation of the spatial distribution of existing human resources	a. Service delivery point b. Boundaries of administrative units c. Catchment areas d. Road network	Number of staff by type at the service delivery point	
5. Plan service delivery	Support service delivery through implementing the microplan	a. Spatial distribution of the target population b. Boundaries of administrative units c. Service delivery points and other infrastructures (e.g. warehouse, cold chain storage, waste disposal sites) d. Catchment areas e. Transportation network f. Barriers to movement (e.g. rivers) g. Area at risk (security, natural hazard)	a. Target population by catchment area or service delivery point delivery b. Capacity of each service delivery point and other infrastructures c. Travel time/distance between storage facility and service delivery point and/or between fixed and outreach service delivery points	

6. Generate demand and ensure communications	Generate demand and ensure communications	a. Boundaries of administrative units b. Service delivery points c. Catchment area	a. Target population by administrative unit or catchment area b. Disease incidence	Communities, influencers and stakeholders
7. Support and monitor implementation	Ensure an effective microplan implementation	a. Boundaries of administrative units b. Location of the service delivery points c. Catchment areas d. Extent of the area of responsibility e. Road network f. Points of interest	a. Target population by catchment area or service delivery point delivery b. Travel time/distance between fixed and outreach service delivery points	Microplan implementers in the field (district/health facility teams)
		a. Boundaries of administrative units b. Service delivery points c. Extent of the area of responsibility	Percentage of program implementation (coverage) by implementation unit	Planners, programme managers and major stakeholders
8. Re-evaluate the microplan	Support the re-evaluation of the microplan	Use of all the maps created for phases 1 to 7	Number of staff by type at the service delivery point	



Large number of different thematic maps possible for just one kind of intervention

Navigation, tracking and geographic coordinates collection using a Global Navigation Satellite System (GNSS)

	Navigation	Tracking	Geographic coordinates collection
Purpose	<ul style="list-style-type: none"> Reach a given location using the most effective path 	<ul style="list-style-type: none"> Remotely monitor in near real time the exact location of assets, vehicles, or people, providing up-to-date information for informed decision-making Identify gaps in service delivery (e.g. vaccination) 	<ul style="list-style-type: none"> Collect the accurate location of geographic features for use in a GIS software or for navigation
Audience	<ul style="list-style-type: none"> Any program needing to navigate to specific locations for the implementation of an intervention (service delivery, emergency response,...) 	<ul style="list-style-type: none"> Any program needing to visually monitor the locations visited during field data collection as well as mobile service or commodities delivery 	<ul style="list-style-type: none"> Any program needing the accurate location of specific geographic features Entity in charge of the maintenance of a point type geographic feature master list (e.g. health facilities)
Content	<ul style="list-style-type: none"> Map containing the current location of the person/vehicle, the location of the place to reach and the path to reach it depending on the transportation media overlayed on a basemap 	<ul style="list-style-type: none"> Geographic coordinates (latitude/longitude) of the asset captured at a regular time interval overlayed on a basemap (e.g. satellite imagery) or program specific spatial data (e.g. location of the households to be visited) 	<ul style="list-style-type: none"> Geographic coordinates (latitude/longitude)
Format	<ul style="list-style-type: none"> Offline or online navigation app 	<ul style="list-style-type: none"> Table containing the geographic coordinates captured during tracking Static or dynamic map showing the track of the monitored asset 	<ul style="list-style-type: none"> Table containing the geographic coordinates, ideally with the unique identifier and name of the geographic feature coming from the corresponding master list as well as the indication of the data collection method that has been used

Short break



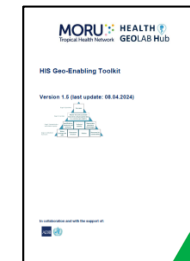
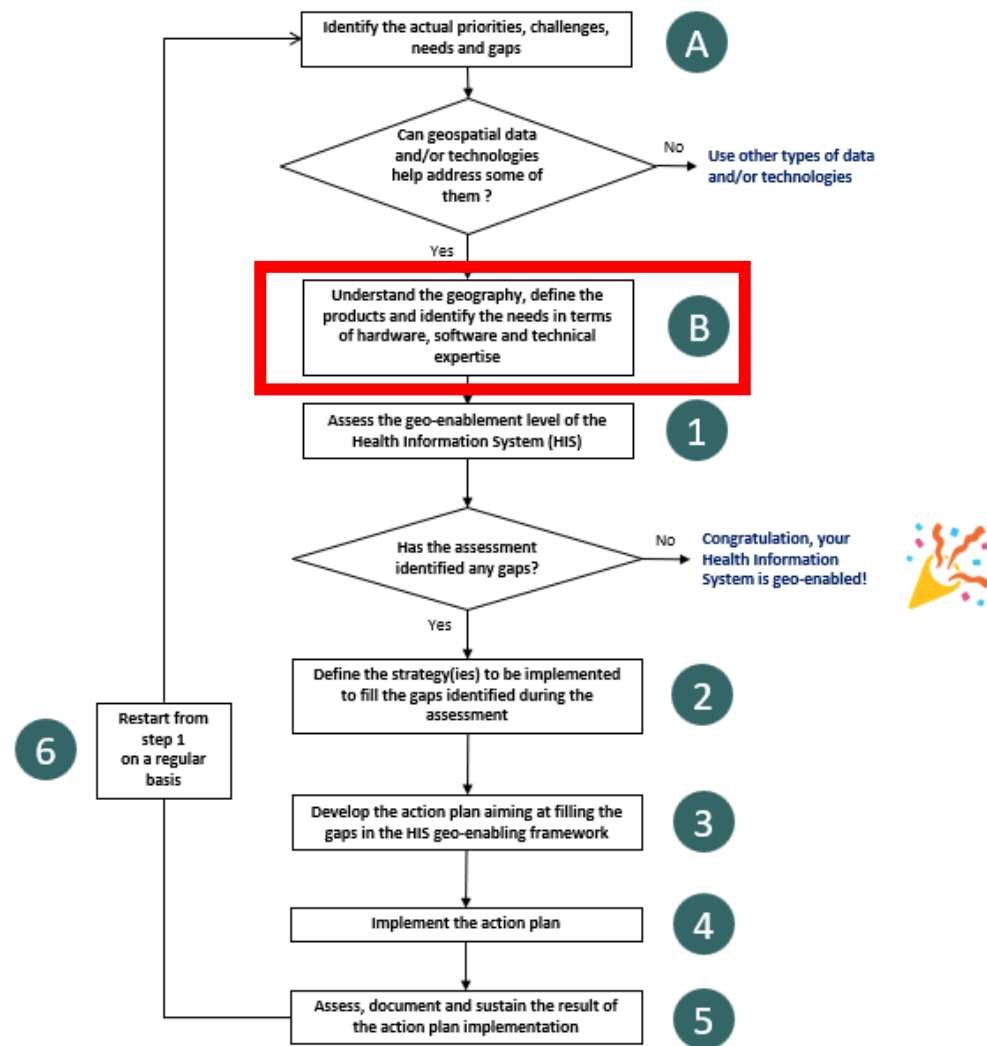
Geo-enabling the Health Information System, programs or interventions training workshop for Asia Pacific

...and beyond

Session 9: Identify needed hardware, software and technical expertise

HIS Geo-enabling framework implementation process

Step B : Identify needed hardware, software and technical expertise

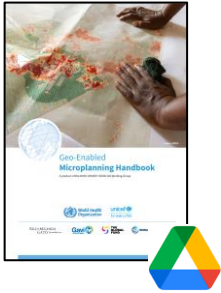


Hardware and software

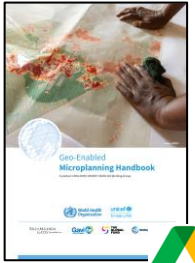
The decision on acquiring specific equipment (hardware and software) will depend on the products to be generated and be influenced by the context and availability of resources

Hardware

- Laptop or desktop computer: Computers should be powerful enough to run selected GIS software programs. The choice between laptop or desktop depends on use and context. When opting for a laptop, it may be helpful to have an external keyboard, mouse and screen.
- Monitor (large-size or dual screen): While not mandatory, a large-size monitor (above 21 inches/50 centimetres) or dual monitor setup can improve efficiency and map visibility for teams.
- External hard drive: Hard drives safely back up GIS data files and store large-size files not accessible through the Internet.
- Online workspace: An online workspace, such as Google Drive or Dropbox, is useful when working collaboratively, especially in the absence of an internal private network.
- Internet access: A stable broadband Internet connection is required to access online workspaces, registries or Common Geo-registry and online resources, as well as to display and share collected data and thematic maps such as webmaps or basemaps (e.g satellite imagery).
- Printer or plotter: Small printers are useful across all applications, while large printers or plotters are particularly beneficial for producing large thematic maps. In addition to purchasing printers, consider renting a printer or printing maps at a print shop.
- GNSS-enabled devices: These devices are used to navigate, track and collect geographic coordinates in the field



Hardware and software



	Georeferenced master lists	Population estimates and spatial distribution	Geographic accessibility, service location and route optimization models	Thematic maps
Hardware				
GNSS-enabled device (handheld device, tablet or smartphone with GNSS receiver)	To collect geographic coordinates in the field if needed	NA	NA	NA
Laptop or desktop computer	To perform the operations linked to each specific application (visualize, edit, analyse, model, generate products)			
Large size screen or dual screen setting	To perform the operations linked to each specific application more comfortably			
Small size printer	To generate small size paper copies of the generated products			
Large size printer or plotter	NA	NA	NA	To print large size maps
External hard drive	To safeguard the work done on the computer or collecting large size files that are not accessible through the internet			
Online workspace	To work collaboratively on the application when needed			
Internet connection	To access the online workspace, the geo-registry or data	To access online data or resources used to estimate and/or spatially distributed population	To access online data or resources to implement the model	To access online basemaps and/or share dynamic thematic maps online

Annex H

Annex H: Hardware and software technical specifications

Hardware

GNSS-enabled devices: While handheld global navigation satellite system (GNSS)-enabled devices (e.g. Garmin devices) are still used in some contexts, tablets and smartphones equipped with a GNSS receiver have become the primary tools for collecting geographic coordinates in the field. GNSS devices do not require Internet connection to function. GNSS-enabled smartphones are generally cheaper and more user friendly than other GNSS handheld devices, and can be used for other purposes, such as collecting additional data and for calls or SMS messaging.

As the quality of a GNSS receiver can vary from one tablet/smartphone to another, it is important that the data collectors use the same device (brand and model). Data collectors should also check that the GNSS receiver is functioning properly by collecting a set of geographic coordinates near an easily recognisable landmark, and verifying if the coordinates match those shown on satellite imagery (e.g. in Google Maps) [12].

Ensure that the application used on the tablet/smartphone can:

- be set according to defined data specifications
- provide coordinate readings with at least five digits after the decimal point
- display the number of received satellite signals
- show the instrumental horizontal accuracy [12].

Additional considerations for GNSS-enabled devices:

- accessibility: tablets tend to be more accessible to use for individuals with visual impairment and with touch-screen registration
- cameras: it is recommended for tablets or smartphones to be equipped with a 5-megapixel camera, especially if data collection will involve barcoding or scanning of QR codes for vaccine lot numbers.

Laptop or desktop computer: The choice between the two options depends mainly on use and context. For example, a laptop may be appropriate if there is a need to move around with the computer or if frequent power outages are an issue. It is important to ensure that the selected computer meets the minimum specifications recommended for the software programmes that will be used, particularly for the GIS programmes.

Additional considerations for computer usage include the following.

- if planning to use laptops outdoors and in inclement weather, consider devices that have a bright screen or are dust- and water-proof
- desktops should allow an attached uninterruptible power supply unit, to enable continued work during power outages
- when choosing a laptop, it may be helpful to have an external keyboard, mouse and screen/monitor.

Large-size monitor or dual monitor set up: While not mandatory, the use of a large-size computer monitor (above 21 inches/53 centimetres) or dual monitor set up can significantly improve efficiency and visibility for team discussions. Large monitors or dual monitor setups are especially helpful when working on multiple programmes in parallel, or when dealing with large datasets and masterlists.

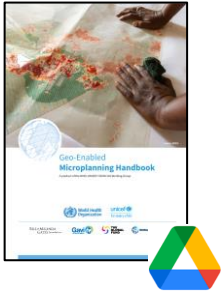
Printer or plotter: While small printers (A4/A3) are useful across all applications, large printers or plotters (A2 to A0) are beneficial when there is a need to print large-size thematic maps. Plotters create drawings using pens (output similar to that of a vector graphic), while printers print text and images (output format in the form of pixels). Colour inkjet printers are generally preferred over plotters as they are cheaper and faster. In addition to purchasing printers, consider renting a printer or printing maps at a print shop. Print shops are particularly economical in the case of plotters, which may only be needed occasionally. If bringing or purchasing printers, it is important to consider what types of ink and paper are easiest to find locally.

External hard drive: The microplanning process can generate a significant volume of computer files, which should be safeguarded in an external hard drive to protect from a computer crash or corruption. In addition, an external drive allows for easy transfer of large data files from one computer to another. When possible, consider having an additional external drive to perform a double backup. Drives should provide 1TB of storage capacity and USB 2.0 transfer rates at a minimum.

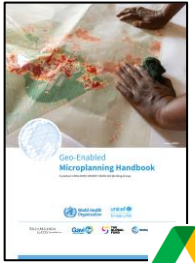
Hardware and software

Software

- Desktop GIS software: While a variety of desktop GIS software exist, QGIS (open source) and ArcMap or ArcGIS Pro (proprietary) are the most commonly used.
- Online GIS solutions: Online GIS solutions such as ArcGIS Online (proprietary) or GeoNode (open source) can provide much of the same core functionality as desktop GIS software but are usually offering fewer extra features.
- Online mapping tools: These mapping tools are different from online GIS solutions, have a more limited analytical capabilities, and are primarily used to generate and share online thematic maps (e.g. Google Map).
- GIS extensions and external tools: Some processes may require the use of GIS extensions, which provide additional functions or tools.
- Registry: An IT solution that allows storing, managing, validating, updating and sharing the master list and associated geospatial data for a specific geographic object.
- Common Geo-Registry (CGR): A geo-registry is an IT solution that allows for the simultaneous hosting, management, updating and sharing of all master lists, geospatial data and associated hierarchies. This kind of IT solutions ensures that all stakeholders across sectors use and maintain the same geography over time.
- Field data collection app: These apps help collect data during field visits, such as geographic coordinates or population statistics.
- Spreadsheet software: Spreadsheets manage data and information in tabular form and can generate tables and graphs to support different data products.



Hardware and software



	Georeferenced master lists	Population estimates and spatial distribution	Geographic accessibility, service location and route optimization models	Thematic maps
Software				
Desktop GIS programme	To visualize and edit the geometry of the geographic objects stored in the lists	To perform the analysis or implement the model	To generate the thematic maps	To print large size maps
Online GIS programme or thematic mapping tools	NA	NA	NA	To develop and share dynamic versions of the thematic maps
GIS-based extension or stand alone tools	NA	To perform the analysis or implement the model in case not readily available in the desktop GIS software		To generate a high volume of thematic maps if the functionality is not readily available in the desktop GIS software
Geo-registry and common geo-registry	To host, maintain, regularly update and share the master lists as well as associated hierarchies and geospatial data	NA	NA	NA
Spreadsheet software	To work on the master lists outside a geo-registry (e.g. cleaning of data collected in the field before upload)	To generate tables and graphs presenting the result of the application		To prepare the business data or information to be included on the thematic map
Field data collection app	To collect data in the field including geographic coordinates to improve the quality of the master list content	To collect population related statistics in the field	To collect information allowing to calibrate the model	NA

Software

Desktop GIS software programs: While a variety of desktop GIS software programs are available on the market, the most commonly used are QGIS (open-source) and ArcMap (proprietary). Software choice should be driven by functionality, and by the technical and financial context. This assessment should take into consideration the capacities of the organization leading the microplan development and those of a health information system that may be integrated. When considering programs, it is important to note the following:

- while geospatial data can easily be used in any GIS software program, the software project files used by various GIS programs are not interchangeable. For example, a QGIS .qgs project file can not be opened in ArcGIS, and QGIS cannot open an ArcGIS Pro aprx file. However, both systems are generally able to use the same data type inputs and data type outputs
- some GIS software programs, such as ArcGIS Desktop, are part of an ecosystem of geo-enabled solutions that allow data to easily pass from desktop to mobile to online mapping solutions.

Some private companies have established specific programs that allow public health institutions to access their technology free of charge over a given time period or at a highly discounted price³⁹. Depending on the context, it may be appropriate to use a combination of proprietary and open-source software (e.g. proprietary at the national level and open-source at the subnational level).

Note:

For a catalogue of relevant GIS applications that have been vetted for digital maturity-based licence, open-source, flexibility, and adaptability, please consult the Digital Square Digital Public Goods catalogue⁴⁰.

Online GIS programs: While not as fast or offering as many features as desktop GIS programs, online GIS programs such as ArcGIS Online (proprietary) or GeoNode (open-source) can provide much of the same core functionality, including editing, spatial analysis, model application and thematic map creation. Online GIS programs can also provide a convenient bridge between the desktop and mobile working environments. These online GIS programs are either deployed on the cloud or on a local server, each of them coming with a cost.

GIS extensions and external tools: Some processes may require the use of GIS extensions, which are additional functions or tools needed to operationalize the four applications covered in this handbook. These tools may not be readily available in GIS software (desktop or online) and may need customization and packaging in order to be used. Additional functionalities are often available as extensions (e.g. ArcGIS spatial analyst extension), standalone tools that run on a desktop (e.g. AccessMod⁴¹) or as online environments (e.g. MapBox isochrone API⁴²).

Online mapping tools: Different from online GIS programs, online mapping tools often have limited analytical capabilities and are primarily used to generate and share online thematic maps. Some of these tools limit the number of geographic objects that can be displayed (e.g. Google Maps). However, others provide greater functionality, allowing elaborate thematic maps with multiple layers to be rendered (e.g. ArcGIS Online). Some online database management systems also provide advanced thematic mapping capabilities (e.g. DHIS2).

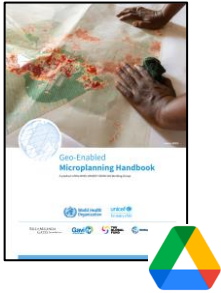
39. Esri health and human services grant program: <https://bit.ly/2PysU11>
40. <https://digitalsquare.org/global-goods-guidebook>
41. www.accessmod.org
42. <https://docs.mapbox.com/playground/isochrone/>

Geo-enabled Microplanning Handbook 173

Note: Additional needs in terms of hardware and software might surface at a later stage in the process

Technical expertise

Geo-enabling the HIS or a specific program/intervention requires specific skills and expertise. Determining them should start from this step in the process and potentially be revised as applications of geospatial data and technologies are being implemented



At least one individual presenting the following overarching expertise is needed independently from what is being implemented:

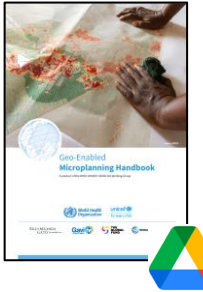
- Supervise the implementation of the application(s)
- Support the use of the hardware and software specific to each application
- Develop or contextualize guidelines and standard operating procedures (SOPs)
- Train people

The technical staff to support the in-country work should themselves have, or have the capacity to learn the following technical skills, depending on the application of geospatial data and technologies being used during the implementation of the geo-enabling process:

- Use of the hardware and software specific to each application
- Manage data across the geospatial data management cycle (Module 4)
- Collect data in the field (e.g. geographic coordinates)
- Conduct spatial analysis and/or apply spatial models
- Create thematic maps.

Last but not least, those meant to use the resulting products should have the necessary skills to understand and interpret their content.


Technical expertise




Expected skill level needed to operationalize geospatial data and technologies at central and subnational (district) levels

		Georeferenced master lists	Geographic accessibility, service location and route optimization models	Population estimates and spatial distribution	Thematic maps
Use of hardware and software specific to each application	National	High	High	High	High
	District	Low to moderate	Low	Low	Moderate
Manage data across the geospatial data management cycle	National	High	High	High	High
	District	High	High	High	High
Collect data in the field	National	High	Low	Moderate	Not applicable
	District	High	High	High	High
Extract geospatial data from basemaps	National	High	Low	Not applicable	Not applicable
	District	Moderate	Not applicable	Not applicable	Not applicable
Conduct spatial analysis and/or apply spatial models	National	Not applicable	High	High	Not applicable
	District	Not applicable	Low	Low	Not applicable
Generate information products (maps, tables, graphs)	Central	Not applicable	High	High	High
	District	Not applicable	Low	Low	Moderate
Understand and interpret the content of thematic maps	Central	Not applicable	Not applicable	Not applicable	High
	District	Not applicable	Not applicable	Not applicable	High

Technical expertise







SECTION: Annex C:

Terms of reference

Annex C1: Generic terms of reference for technical expert overseeing geo-enablement

Annex C

Programme Designer	GIS Technical Staff
	

Purpose
The [name of the programme] is responsible for the [description of the programme]. The [name of the programme] is using a digital microplan to support the implementation of the [name of the intervention]. Recognizing the importance of geography to ensure that the population targeted by this intervention has equitable access to the services it provides, the [name of the programme] has decided to geo-enable the digital microplan in question.

Main responsibilities
The main responsibility of the incumbent will be to support the geo-enablement of the digital microplan implemented by the [name of the programme] and used to [description of the intervention].


Description of duties
Working under the supervision of the head of the [name of the programme] and in close collaboration with all the stakeholders involved in the planning and implementation of the digital microplan, the incumbent will be in charge of providing the necessary technical support to the [name of the programme] regarding the geo-enablement of its digital microplan including:


- engagement with national and international partners regarding the geo-enablement
- assessment of the current level of geo-enablement of the microplanning process
- development of the workplan for the geo-enablement component of the microplan
- development of the necessary guidelines and SOPs, including those meant to ensure data quality
- selection, training and technical support of the local technical staff
- implementation of the workplan, including field data collection
- sustainability of what has been established.

Expected deliverables

- report presenting the result of the assessment
- workplan, including timeline and budget for the geo-enablement component of the microplan
- guidelines and SOPs to ensure the quality of the work and address the gaps identified during the assessment
- selection of the local technical staff
- training material
- report and technical summary, including lessons learned and recommendations for how to expand nationally (in the case of a pilot) and sustain what has been established.

Geo-enabled Microplanning Handbook
162





Appendix J. Generic Terms of Reference (TOR) for the position of geospatial data manager/GIS technician

1. Background
The Ministry of Health (MoH) has embarked in a process aiming at geo-enabling its Health Information System (HIS) in order for the all Ministry to share the same geography and therefore benefit from the visualization and analytical power that GIS technology offers.
In this context, the MOH is looking for a data manager/GIS technician in order to be in the position to provide technical support in the areas of geospatial data management and GIS services during the geo-enabling process.

2. Main responsibilities
The main responsibilities of the incumbent will be to provide technical support in the areas of geospatial data management and GIS services in line with the guidelines, standards, and protocols identified/defined as part of the activities of the TWG on geospatial data management and GIS services.

3. Description of duties
Working under the supervision of head of the MoH HIS unit and in close collaboration with the TWG Members, the incumbent will be in charge of:

- Providing geospatial data management and GIS technical support to the Department of Public Health in a first phase and then to the entire MoH;
- Developing, maintaining, updating and sharing the master lists for the geographic objects core to public health (health facilities, communities/settlements and administrative divisions);
- Supporting the definition of guidelines, standards and protocols aiming at improving the availability, quality (completeness, uniqueness, timeliness, validity, accuracy and consistency) and accessibility of geospatial data;
- Supporting the implementation of the guidelines, standards, protocols and master lists in all the information systems across the MoH;
- Generating GIS based data products to support decision making.

4. Expected deliverables

- Authoritative, standardized, complete, up-to-date and uniquely coded master lists of health facilities, communities/settlements and administrative divisions in the country;
- Guidelines, standards and protocols endorsed by the TWG on geospatial data management and GIS;
- Geo-enable Health Information System (HIS);
- Data products (table, graphs and maps) as per the established SOPs

5. Required qualifications

a. Education:

- University degree with a background in data management and/or GIS or enough professional experience in data management and/or the use of GIS to be considered as equivalent;
- Background in public health

b. Skills:

- Good knowledge in the use of ArcView, ArcGIS or other GIS software as well as MS Office suite,
- Demonstrable skills in relation to data standardization and data management;
- Ability to work harmoniously as part of a team.

c. Experience:

- At least one experience working in a GIS related project;
- Experience in the area of Public Health would be seen as an advantage;

d. Languages:

- National language: Proficient
- English would be seen as an advantage

76

Examples of Terms of Reference for the technical expert to oversee the geo-enablement (left) and for the position of geospatial data manager/GIS technician within a Ministry of Health (right)

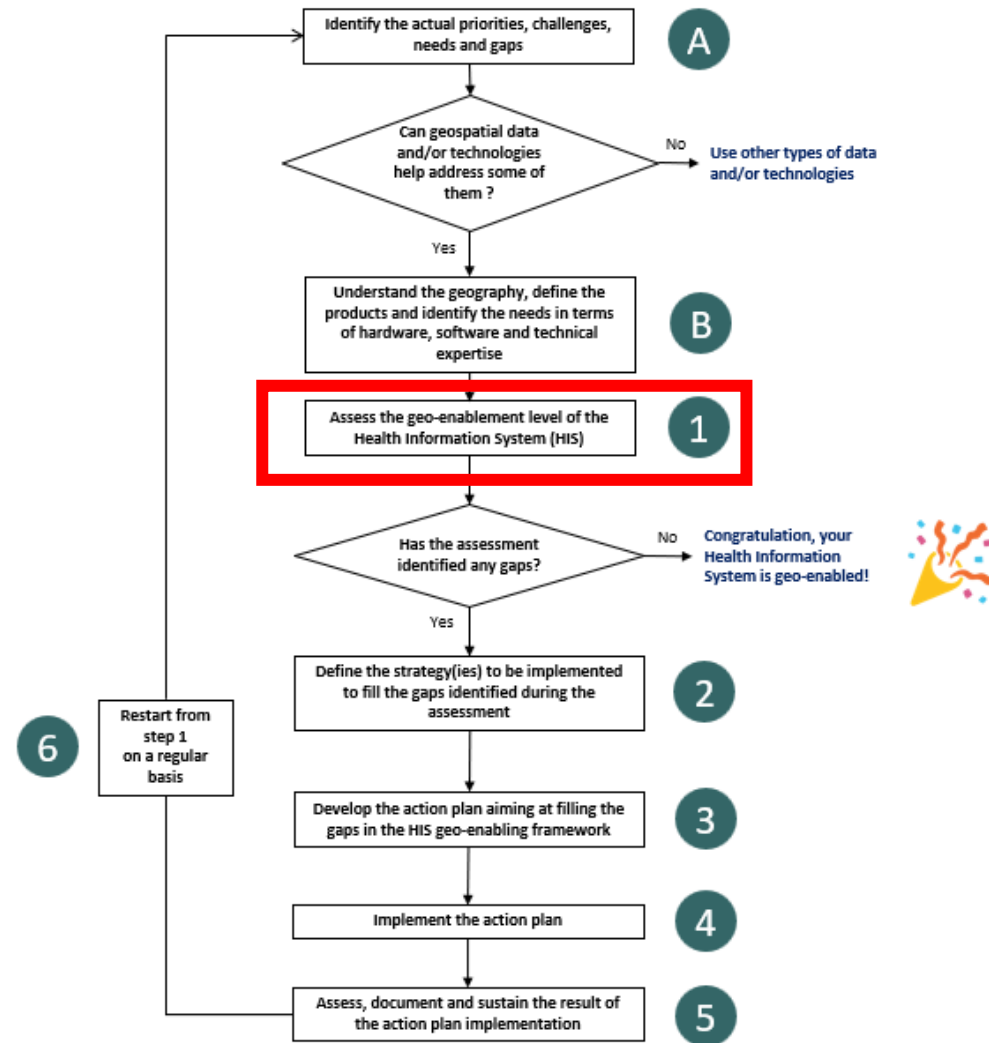
Geo-enabling the Health Information System, programs or interventions training workshop for Asia Pacific

...and beyond

Session 10: Assess the geo-enablement level of the HIS, program or intervention

HIS Geo-enabling framework implementation process

Step 1 : Assess the level of geo-enablement of the health information system



HIS Geo-enabling framework implementation process

Step 1 : Assess the level of geo-enablement of the health information system

Assessing the level of geo-enablement of the HIS is the foundation of the overall HIS geo-enabling process. It is therefore critical to conduct such assessment with the utmost care and level of details, especially if it is being conducted for the first time. Not conducting such an assessment might result in wrong assumptions and therefore loss of time and resources



➡ This step allows to have a clear view of the gaps that exist against the benchmarks that must be met for the HIS to be considered geo-enabled

Element of the framework	Objective	Benchmarks
1. Vision, strategy, and action plan	A vision, a strategy and an action plan have been defined and are implemented to support the geo-enablement of the HIS	1.1 The MOH has a vision, strategy, and plans regarding the management and use of geospatial data and technologies. 1.2 Each key program has a vision, strategy and action plan regarding the management and use of geospatial data and technologies
2. Governance structure	A governance structure supporting the vision, strategy and action plan has been established and is operational	2.1. The MOH has established a governance structure to handle issues pertaining to the management and use of geospatial data and technologies. 2.2. All the health program and the stakeholders involved in the management and use of geospatial data and technologies in health are part of the governance structure. 2.3 The MOH is on board of the National Spatial Data Infrastructure (NSDI).
3. Technical capacity	The central units of the Ministry of Health as well as the main health programs have sufficient technical capacity to manage and use geospatial data and technologies	3.1. The MOH has a central level geospatial data management unit with enough technical capacity to: a) ensure guardianship over the defined guidelines, standards and protocols; b) support the development, maintenance, regular update and sharing of the master lists for the geographic objects core to public health; c) support the implementation of the guidelines, standards, protocols, and master lists across all health programs and information systems; and d) providing services to the HIS unit and beyond if needed. 3.2 The key health programs have enough technical capacity to support the implementation of their activities with the support of the central level unit
4. Data specifications, standards and protocols	All programs use the same data specifications, standards and protocols to ensure geospatial data quality	4.1. The NSDI has defined the geospatial data and technologies related specifications, standards and protocols that should be used by all governmental agencies. 4.2. The MOH is using the geospatial data and technologies related specifications, standards and protocols across all key health programs.

Element of the framework	Objective	Benchmarks
5. Master lists and common geo-registry	The Ministry of Health has quality master lists and associated GIS layers for the geographic objects key to public health	5.1. The MOH has a complete, up-to-date, uniquely coded, and geo-referenced (for point type objects) master list for each geographic object key to public health (health facilities, administrative divisions and villages, reporting divisions). 5.2. The government maintains, regularly updates, and share shapefiles containing the boundaries of the administrative and health reporting divisions. 5.3 These master lists and associated spatial data are simultaneously hosted, maintained, regularly updated, and shared using a Common Geo-Registry. 5.4. All the master lists, and especially their officially recognized codes, are being integrated in all the information systems and used for data collection, reporting, and monitoring across all health programs.
6. Appropriate geospatial technologies	The central unit of the Ministry of Health as well as the main health programs have access to the necessary and appropriate geospatial technologies	6.1. The central level geospatial data management and technologies unit has access to the necessary and appropriate geospatial technologies (GNSS, GIS) to support its mandate. 6.2 The key health programs have access to the necessary and appropriate geospatial technologies (GNSS, GIS) to support the implementation of their activities
7. Documented use cases	The benefits of managing and using geospatial data and technologies are recognized by all programs and use cases demonstrating this are documented	7.1. Geospatial data and technologies are recognized as important and their full potential is being used to support the implementation of key health programs towards reaching SDG 3. 7.2 Use cases supporting decision making and/or planning are documented and available.
8. Policies supporting the geo-enabling process	The necessary policies to support the geo-enablement of the Health Information System have been defined and are being applied	8.1. A policy/Policies enforcing the following has/have been released: a) The mandate over the guardianship on geospatial data specifications, standards, and protocols as well as over the development, maintenance, update, and sharing of master lists for the geographic objects core to public health using a common geo-registry. b) The use of the developed specifications, standards, protocols, and master lists by all the stakeholders in the health sector.
9. Resource for sustainability	The financial resources necessary to ensure the sustainability of geo-enablement exist in the long term	9.1. The central level geospatial data management and technologies unit has the necessary financial resources to ensure the long-term sustainability of its activities linked to the geo-enablement of the HIS. 9.2 The key health programs have the necessary financial resources to ensure the long-term sustainability of their activities

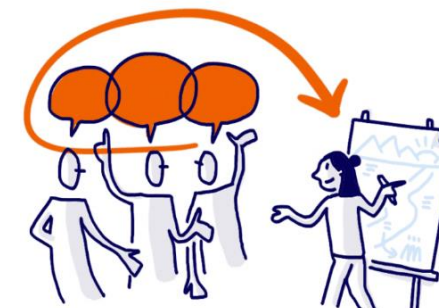
➡ The absence of any gap would signify that your health information system is geo-enabled!

HIS Geo-enabling framework implementation process

Step 1 : Assess the level of geo-enablement of the health information system

The assessment can be conducted in different ways depending on the context and resources at disposal, among which we can mention:

1. By the Ministry of Health (self-assessment). It is recommended to then organize a workshop grouping all the concerned programs/units to validate the result of the assessment.
2. Facilitated on site by an external party through separated one on one interviews with each program/unit. This approach might require a cross-validation exercise to take place depending on the answers provided for the cross-cutting elements of the framework
3. Facilitated on site during a workshop grouping all the programs/units. This approach presents the advantage of allowing to directly clarify and cross-validate information during the workshop



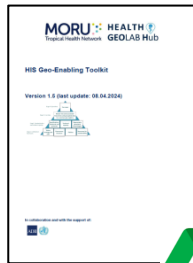
HIS Geo-enabling framework implementation process

Step 1 : Assess the level of geo-enablement of the health information system

Ideally, the assessment should at least cover the following Key Health Programs (KHPs) as being the main potential users of geospatial data and technologies:

- Health Information System (HIS): Natural guardian of the national level geospatial data management and technologies unit.
- Planning: Physical accessibility to health care is an important component of UHC which depends on the spatial distribution of the population in need, the spatial distribution of services that are being provided, and the environment that the patients have to cross to reach them.
- Communicable diseases: Being able to contextualize cases in both time and space is key to surveillance, monitoring, and elimination of communicable diseases.
- Immunization: Base microplanning maps are essential to ensure that all the targeted population is covered during an immunization campaign.
- Emergency management: Geospatial data and technologies are critical instruments across the whole emergency management cycle (mitigation/preparedness, response, recovery)

The assessment also represents an opportunity to inform the Ministry of Health and its partners about recent developments in the field of geospatial data and technologies and to illustrate how they are being used to support public health programs

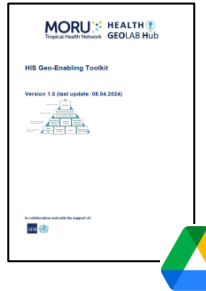


HIS Geo-enabling framework implementation process

Step 1 : Assess the level of geo-enablement of the health information system

The quick geo-enabling level assessment questionnaire is used as the starting point for this exercise.

It is organized according to the 9 elements of the HIS geo-enabling framework.



Annex 2 - HIS geo-enabling quick assessment questionnaire

Introduction

The aim of this questionnaire is to obtain a picture of the situation in your department/unit regarding its geo-enablement level.

This information will be used as baseline for the development of the action plan.

Please take the time to browse the glossary before completing the questionnaire: <https://tinyurl.com/tavfcdjx>

Respondent contact information

Full Name of the respondent: _____

Function/position of the respondent: _____

Full name of the institution: _____

Full name of the department/unit: _____

Address: _____

City/Town: _____

State/Province: _____

Country: _____

Email address: _____

Phone number: _____

Priorities and challenges

This section aims at capturing the current priorities and challenges of your department/unit/programme

Question 1: What are the 3 main priorities, objectives, targets or goals that drive the current agenda of your programme/unit (example: eliminating malaria by 2030)?

Priority 1: _____

Priority 2: _____

Priority 3: _____

Question 2: What are the current main challenges encountered by your programme/unit when it comes to supporting its operations? Please select all that apply

<input type="checkbox"/> Lack of population denominator	<input type="checkbox"/> Inadequate supportive supervision
<input type="checkbox"/> Delayed reporting of events	<input type="checkbox"/> Low demand for services
<input type="checkbox"/> Lack of quality/reliable data	<input type="checkbox"/> Geographic inaccessibility
<input type="checkbox"/> Lack of access to information or data	<input type="checkbox"/> Lack of or inappropriate referrals
<input type="checkbox"/> Insufficient utilization of data and information	<input type="checkbox"/> Poor planning and coordination
<input type="checkbox"/> Lack of unique identifier	<input type="checkbox"/> Lack of effective resource allocation
<input type="checkbox"/> Insufficient supply of commodity	<input type="checkbox"/> Absence of community feedback mechanisms
<input type="checkbox"/> Insufficient supply of services	<input type="checkbox"/> Poor accountability between the levels of the health sector
<input type="checkbox"/> Insufficient supply of equipment	<input type="checkbox"/> Inadequate understanding of beneficiary population
<input type="checkbox"/> Insufficient supply of qualified health workers	<input type="checkbox"/> Other (please specify): _____

Current level of geo-enablement of your programme/unit

This section aims at capturing the current geo-enablement level in your programme/unit and this across specific elements of the HIS geo-enabling framework

Question 3 - Vision, strategy, plan: What is the current situation in your programme/unit when it comes to vision, strategy and plan for the management and use of geospatial data and technologies? Choose the option that applies

☐ The programme/unit has not defined/developed its vision, strategy and action plan regarding the management and use of geospatial data and technologies

☐ The programme/unit is in the process of defining/developing its vision, strategy and action plan concerning the management and use of geospatial data and technologies

☐ The programme/unit has developed its vision, strategy and action plan regarding the management and use of geospatial data and technologies but they have not been approved yet

☐ The programme/unit has developed its vision, strategy and action plan regarding the management and use of geospatial data and technologies, they have been approved but they have not yet been implemented

☐ The programme/unit has developed its vision, strategy and action plan regarding the management and use of geospatial data and technologies and they are implemented

☐ I don't know

Question 7 - Financial resources: What is the current situation in your programme/unit when it comes to financial resources to support the management and use of geospatial data and technologies? Choose the option that applies

☐ The programme/unit has no financial resources to support the management of the use of geospatial data and technologies and no requests for funds have been made

☐ The programme/unit has no financial resources to support the management of the use of geospatial data and technologies but a request for funds has been made (internal and/or external)

☐ The programme/unit has some financial resources but these are not sufficient to ensure the long-term sustainability of its activities related to the management and use of geospatial data and

☐ A request for internal or external funds has been made to ensure the long-term sustainability of activities related to the management and use of geospatial data and technologies, it has not yet

☐ An internal or external funding request has been made to ensure the long-term sustainability of activities related to the management and use of geospatial data and technologies, it has been

☐ The management and use of geospatial data and technologies is part of the regular programme/unit budget

☐ I don't know

Other important elements of the HIS geo-enabling framework

This section aims at capturing the current situation regarding other important cross-programmes elements of the HIS geo-enabling framework

Question 8 - Vision, strategy, plan: What is the current situation in the MOH when it comes to vision, strategy and plan for the management and use of geospatial data and technologies? Choose the option that applies

☐ The MOH has not defined/developed its vision, strategy and action plan regarding the management and use of geospatial data and technologies

☐ The MOH is in the process of defining/developing its vision, strategy and action plan concerning the management and use of geospatial data and technologies

☐ The MOH has developed its vision, strategy and action plan regarding the management and use of geospatial data and technologies but they have not been approved yet

☐ The MOH has developed its vision, strategy and action plan regarding the management and use of geospatial data and technologies, they have been approved but they have not yet been

☐ The MOH has developed its vision, strategy and action plan regarding the management and use of geospatial data and technologies and they are implemented

☐ I don't know

Question 4 - Use cases: What is the current situation in your programme/unit when it comes to the implementation and documentation of use cases related to the management and use of geospatial data and technologies (e.g. accessibility to health care analysis, geo-enabled microplan,...)? Choose the option that applies

☐ The programme/unit fail to recognize the importance of geospatial data and technologies

☐ The programme/unit recognizes the importance of geospatial data and technologies but is not using them

☐ The programme/unit recognizes the importance of geospatial data and technologies and use them but do not have documented use cases

☐ The programme/unit recognizes the importance of geospatial data and technologies, utilize them, and have documented use cases

☐ I don't know

Question 5 - Technical capacity: What is the current situation when it comes to the technical capacity needed for your programme/unit to manage and use geospatial data and technologies? Choose the option that applies

☐ The programme/unit does not have technical capacity for the management and use of geospatial data and technologies

☐ The programme/unit has technical capacity but it is not sufficient to implement its activities

☐ The programme/unit is currently strengthening its technical capacity to be able to implement its activities

☐ The programme/unit has such technical capacity and it is sufficient to implement its activities

☐ I don't know

Question 6 - Geospatial technologies: What is the current situation in your programme/unit when it comes to the geospatial technologies (e.g.: GNSS enabled devices, GIS software,...) needed by your programme/unit to support its activities? Choose the option that applies

☐ The programme/unit does not have the geospatial technologies necessary to support the implementation of its activities

☐ The programme/unit has some geospatial technologies but they are not sufficient to implement its activities

☐ The programme/unit is in the process of acquiring the geospatial technologies needed to implement its activities

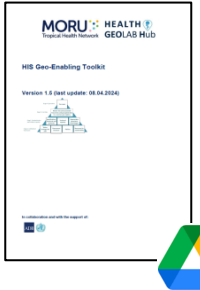
☐ The programme/unit has the geospatial technologies necessary to implement its activities

☐ I don't know

Implementing this questionnaire before any on site workshop does also provide an opportunity to introduce the HIS geo-enabling specific terminology

HIS Geo-enabling framework implementation process

Step 1 : Assess the level of geo-enablement of the health information system



Quick HIS geo-enabling assessment survey

Introduction

The aim of this questionnaire is to obtain a picture of the situation in your department/unit regarding its geo-enablement level.

This information will be used as baseline for the development of the action plan.

Please take the time to browse the glossary before completing the questionnaire:
<https://tinyurl.com/tavfcdjx>

Respondent contact information

Full Name of the respondent: _____

Function/position of the respondent: _____

Full name of the institution: _____

Full name of the department/unit: _____

Address: _____

City/Town: _____

State/Province: _____

Country: _____

Email address: _____

Phone number: _____

Priorities and challenges

This section aims at capturing the current priorities and challenges of your department/unit/programme

Question 1: What are the 3 main priorities, objectives, targets or goals that drive the current agenda of your programme/unit (example: eliminating malaria by 2030)?

Priority 1: _____

Priority 2: _____

Priority 3: _____

Question 2: What are the current main challenges encountered by your programme/unit when it comes to supporting its operations? Please select all that apply

☐ Lack of population denominator

☐ Inadequate supportive supervision

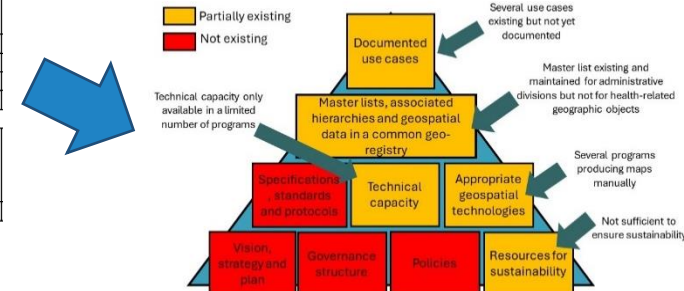


Question 3 - Vision, strategy, plan	Question 4 - Use cases	Question 5 - Technical capacity	Question 6 - Geospatial technologies	Question 7 - Financial resources	Question 8 - Vision, strategy, plan	Question 9 - Governance	Question 10 - Master lists and associated spatial data	Question 11 - Common Geo-registry (CGR)	Question 12 - Specifications, standards, Standard Operating Procedures (SOP)	Question 13 - Policies
The programme/unit has not defined/developed its vision, strategy and action plan regarding the management and use of geospatial data and technologies	The programme/unit recognizes the importance of geospatial data and technologies but fail to use them	The programme/unit does not have technical capacity for the management and use of geospatial data and technologies	The programme/unit does not have the geospatial technologies necessary to support the implementation of its activities	The programme/unit has no financial resources to support the management of the use of geospatial data and technologies and no requests for funds have been made	The MOH is in the process of defining/developing its vision, strategy and action plan concerning the management and use of geospatial data and technologies	A governance structure is in the process of being established	Health facilities, Settlements, Administrative units	The Ministry of Health does not have access to a CGR or a set of individual registers fulfilling the functions of an CGR	Specifications, standards and protocols are in the process of being defined by certain programs or the entity in charge of the SIS	The policy(ies) required to support HIS geo-activation is/are under development
The programme/unit has developed its vision, strategy and action plan regarding the management and use of geospatial data and technologies but they have not been approved yet	The programme/unit recognizes the importance of geospatial data and technologies but fail to use them	The programme/unit has technical capacity but it is not sufficient to implement its activities	The programme/unit is in the process of acquiring the geospatial technologies needed to implement its activities	The programme/unit has no financial resources to support the management of the use of geospatial data and technologies and no requests for funds have been made	The MOH has developed its vision, strategy and action plan regarding the management and use of geospatial data and technologies but they have not been approved yet	A governance structure exists but is not operational at this time, which concerns the management and use of geospatial data and technologies	Health facilities, Settlements, Administrative units	The most appropriate IT solution(s) has/have been selected	Certain programs have defined specifications, standards and protocols but they have not yet been documented and/or approved by all programs	The policy(ies) necessary to support geo-activation of the HIS is/are applied
The programme/unit has not defined/developed its vision, strategy and action plan regarding the management and use of geospatial data and technologies	The programme/unit recognizes the importance of geospatial data and technologies and use them but do not have documented use cases	The programme/unit has technical capacity but it is not sufficient to implement its activities	The programme/unit has some geospatial technologies but they are not sufficient to implement its activities	The programme/unit has no financial resources to support the management of the use of geospatial data and technologies and no requests for funds have been made	The MOH has not defined/developed its vision, strategy and action plan regarding the management and use of geospatial data and technologies	No governance structure has been established	Settlements	The Ministry of Health does not have access to a CGR or a set of individual registers fulfilling the functions of an CGR	No data specifications, standards and protocols have been defined	No policy exists



Technical capacity	HIS Malaria TB HIV	The programme/unit does not have technical capacity for the management and use of geospatial data and technologies	The programme/unit has technical capacity but it is not sufficient to implement its activities	The programme/unit is currently strengthening its technical capacity to be able to implement its activities	The programme/unit has such technical capacity and it is sufficient to implement its activities
Governance mechanism		No governance structure has been established	A governance structure is in the process of being established	A governance structure exists but is not operational at this time	A governance structure exists and is operational but not all health stakeholders are involved

Unit specific or cross-program indicators



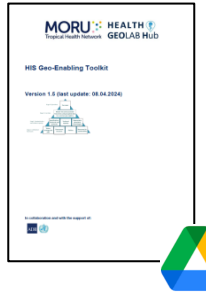
Summary picture



To be included in the report capturing the result of the assessment

HIS Geo-enabling framework implementation process

Step 1 : Assess the level of geo-enablement of the health information system



Quick HIS geo-enabling assessment survey

Introduction

The aim of this questionnaire is to obtain a picture of the situation in your department/unit regarding its geo-enablement level.

This information will be used as baseline for the development of the action plan.

Please take the time to browse the glossary before completing the questionnaire:
<https://tinyurl.com/tavfodjx>

Respondent contact information

Full Name of the respondent: _____

Function/position of the respondent: _____

Full name of the institution: _____

Full name of the department/unit: _____

Address: _____

City/Town: _____

State/Province: _____

Country: _____

Email address: _____

Phone number: _____

Priorities and challenges

This section aims at capturing the current priorities and challenges of your department/unit/programme

Question 1: What are the 3 main priorities, objectives, targets or goals that drive the current agenda of your programme/unit (example: eliminating malaria by 2030)?

Priority 1: _____

Priority 2: _____

Priority 3: _____

Question 2: What are the current main challenges encountered by your programme/unit when it comes to supporting its operations? Please select all that apply

☐ Lack of population denominator ☐ Inadequate supportive supervision



Priorities of each program/department/unit

Elimination of EMTCT by 2026

Reach zero indigenous Malaria

Develop the digital health policy

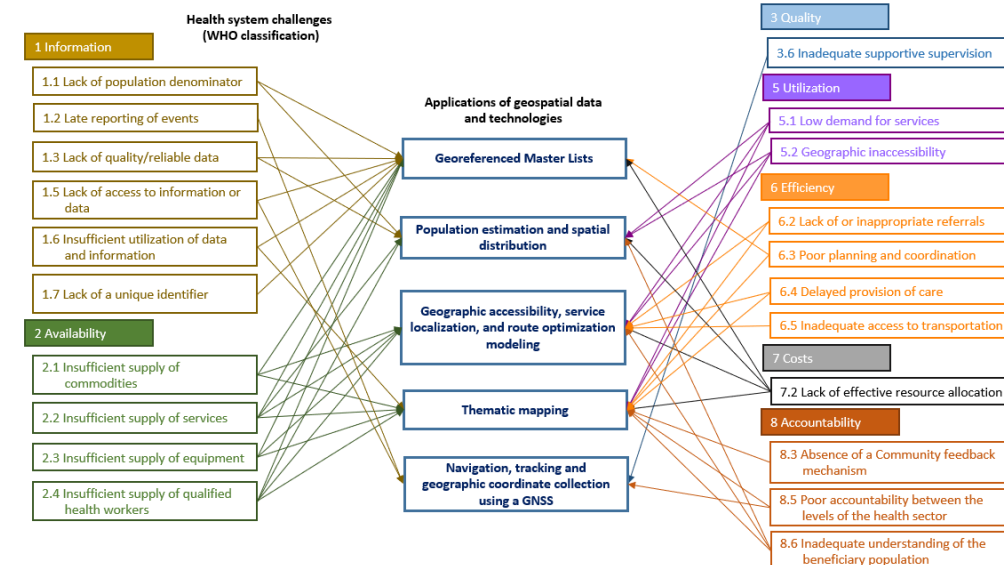
Strengthen case management and surveillance



Identify the priorities having a strong geographic dimension



Current challenges that could be addressed through applications of geospatial data and technologies



HIS Geo-enabling framework implementation process

Step 1 : Assess the level of geo-enablement of the health information system

To have a complete picture of the situation, it is also important to collect the information and documents listed here on the right as well as conduct a desktop review to collect as much information as possible regarding the situation observed in the country across the 9 elements of the framework

Examples of documents to be identified

Framework element	Information and documents to be collected
1. Vision, strategy(ies), and action plan	<ul style="list-style-type: none"> Myanmar National Health Plan 2017-2021⁵ Cambodia Health Information System master plan 2016-2020⁶
2. Governance structure	<ul style="list-style-type: none"> Example of TOR for the establishment of a TWG on the management and use of geospatial data and technologies in the health sector⁷
3. Technical capacity	<ul style="list-style-type: none"> Generic TOR for the position of geospatial data manager/GIS technician (Annex J in [1])
4. Data specifications, standards, and protocols	<ul style="list-style-type: none"> Geospatial data management guideline for the Ministry of Health of Cambodia⁸ Health GeoLab guidance documents⁹
5. Master list and common geo-registry	<ul style="list-style-type: none"> Guidance on the establishment of a common geo-registry for the simultaneous hosting, maintenance, update, and sharing of master lists core to public health [8] Master Facility List Resource Package: guidance for countries wanting to strengthen their MFL [9]
6. Geospatial technologies	<ul style="list-style-type: none"> Health GeoLab starter kit for ArcMap, ArcGIS Online, and Survey123⁷
7. Use cases (applications)	<ul style="list-style-type: none"> Health GeoLab knowledge repository¹⁰

Might provide some important additional background information including identifying some additional MOH programs/units to be involved in the geo-enablement process

Framework element	Information and documents to be collected
1. Vision, strategy(ies), and action plan	<ul style="list-style-type: none"> A copy of the existing MOH vision, strategy(ies), and/or action plan pertaining HIS geo-enabling and/or the management and use of geospatial data and technologies A copy of the current national health plan/strategy with a clear definition of the current public priorities A copy of the current key health programs specific plan/strategy
2. Governance structure	<ul style="list-style-type: none"> Document describing the structure, role, members, and mode of operation of the established governance structure Existence of a National Spatial Data Infrastructure (NSDI) in the country and information about it (governmental entity in charge, members, objectives, activities, etc.)
3. Technical capacity	<ul style="list-style-type: none"> Information about the central level Geospatial Data and Technologies Unit (location in the MOH organogram, composition, etc.) Information about the latest training received by MOH staffs (date, venue, content, name of the institution who conducted the training, etc.)
4. Data specifications, standards and protocols	<ul style="list-style-type: none"> A copy of the existing document(s) containing the specifications, standards, and protocols used by the MOH
5. Master list and common geo-registry	<ul style="list-style-type: none"> Structure of different coding schemes used in the MOH and in the master lists Description of the updating mechanism for each master list Availability of a shapefiles for the administrative divisions and this across time Availability of a shapefiles for the reporting divisions and this across time Information about the platform used as common geo-registry for the simultaneous storage, management, validation, updating, and sharing of the different master lists if any (software used, entity in charge, etc.)
6. Geospatial technologies	<ul style="list-style-type: none"> Date of purchase of the GNSS enabled device. Are they functional?
7. Use cases (applications)	<ul style="list-style-type: none"> The already documented use case (pager, report, etc.) Description of ongoing projects containing a geospatial data and technologies component
8. Policy	<ul style="list-style-type: none"> A copy of the existing policy(ies)
9. Resource for sustainability	<ul style="list-style-type: none"> A copy of existing workplan, proposal submitted to donor, budget, etc. List of development partners interested in or already contributing to strengthening the management and use of geospatial data and technologies in the country



HIS geo-enabling technical support to French-speaking African countries

Activity supported by the Global Fund and implemented in collaboration with the University of Geneva and the University Amadou Mahtar MBOW (UAM) of Dakar to help countries geo-enable their Health Information System (HIS)

Enquête pré-atelier sur l'état de géo-activation de votre département/unité

Atelier sur la géo-activation du Système d'Information Sanitaire (SIS) et l'utilisation des Systèmes d'Information Géographique (SIG) en Afrique francophone

steeve.ebener@gmail.com [Switch account](#)

Not shared

Introduction

La présente enquête a pour objectif d'obtenir une première image de la situation dans votre département/unité en ce qui concerne son niveau de géo-activation.

Ces informations serviront à orienter les discussions pendant l'atelier ainsi que le soutien technique qui sera fourni après l'atelier.

Merci de prendre le temps de parcourir le glossaire avant de remplir le questionnaire: <https://bit.ly/3Rt4t05>

N'hésitez pas à contacter Nicolas Ray (nicolas.ray@unige.ch) si vous avez des questions concernant l'enquête.

Next

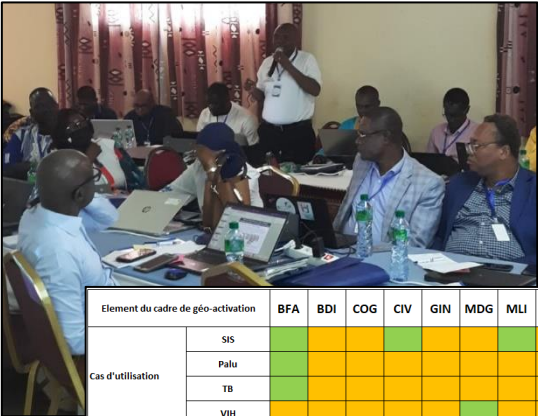
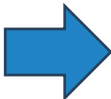
Page 1 of 4

Clear form

Never submit passwords through Google Forms.

This content is neither created nor endorsed by Google. [Report Abuse](#) · [Terms of Service](#) · [Privacy Policy](#)

Google Forms



Element du cadre de géo-activation		BFA	BDI	COG	CIV	GIN	MDG	MLI	CAF	COD	SEN	TGO
Cas d'utilisation	SIS											
	Palu											
	TB											
	VIH											
Listes maîtresses, données géospatiales et												
Registre Géographique Commun (RGC)												
Spécifications des données, normes et protocoles												
Capacité technique	SIS											
	Palu											
	TB											
	VIH											
Technologies	SIS											
	Palu											
	TB											
	VIH											



Congo Brazzaville- Géo-activation du SIS

Abdoul, ~Aliou, ~Dr, ~kivoueleth, ~Rabi,...

Abdoul (BFA)
merci d'utiliser ce lien pour rejoindre la reunion
<https://meet.google.com/qpo-veqm-yvb>

Merci

10:54 pm

Abdoul (BFA)
Re-bonjour Congo,
Je tiens à exprimer ma gratitude pour l'organisation de cette réunion qui sera bénéfique pour notre progression collective.
Je m'excuse d'avoir effectué plusieurs rappels, particulièrement alors que vous travaillez hors ligne avant de pouvoir téléverser vos données dans le gabarit en ligne.
Pour les prochaines étapes de cette réunion, je

MDG Gabarit_plan-action_géo-activation SIS_FR

File Edit View Insert Format Data Tools Help

100%

1 Pays: Madagascar

2

3 Vision à court/long terme

4 D'ici 2030, les données, technologies et services géospatiaux nécessaires seront disponibles, de qualité et accessibles de manière coordonnée pour soutenir la mise en œuvre du Plan Stratégique de Renforcement du Système d'Information Sanitaire (PSRIS) 2023-2027 visant à atteindre "un système d'information sanitaire performant pour la promotion de la santé pour tous et le bien-être de la population Malagasy"

5

6 Objectifs du plan d'action

7 1- Combler les lacunes identifiées au niveau central pendant l'évaluation du niveau de maturité actuelle de géo-activation du SIS au travers de ses 9 éléments

8 2- Démontrer les avantages de la géo-activation du SIS à travers de l'implémentation d'un projet pilote

9 3- Développer un plan d'action commun pour tout financement pour l'extension spatiale du projet pilote au reste du pays, l'institutionnalisation des capacités techniques qui ont

10

11 Période de mise en œuvre

12 Chef de projet

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

37

38

39

40

41

42

43

44

45

46

47

48

49

50

51

52

53

54

55

56

57

58

59

60

61

62

63

64

65

66

67

68

69

70

71

72

73

74

75

76

77

78

79

80

81

82

83

84

85

86

87

88

89

90

91

92

93

94

95

96

97

98

99

100

101

102

103

104

105

106

107

108

109

110

111

112

113

114

115

116

117

118

119

120

121

122

123

124

125

126

127

128

129

130

131

132

133

134

135

136

137

138

139

140

141

142

143

144

145

146

147

148

149

150

151

152

153

154

155

156

157

158

159

160

161

162

163

164

165

166

167

168

169

170

171

172

173

174

175

176

177

178

179

180

181

182

183

184

185

186

187

188

189

190

191

192

193

194

195

196

197

198

199

200

201

202

203

204

205

206

207

208

209

210

211

212

213

214

215

216

217

218

219

220

221

222

223

224

225

226

227

228

229

230

231

232

233

234

235

236

237

238

239

240

241

242

243

244

245

246

247

248

249

250

251

252

253

254

255

256

257

258

259

260

261

262

263

264

265

266

267

268

269

270

271

272

273

274

275

276

277

278

279

280

281

282

283

284

285

286

287

288

289

290

291

292

293

294

295

296

297

298

299

300

301

302

303

304

305

306

307

308

309

310

311

312

313

314

315

316

317

318

319

320

321

322

323

324

325

326

327

328

329

330

331

332

333

334

335

336

337

338

339

340

341

342

343

344

345

346

347

348

349

350

351

352

353

354

355

356

357

358

359

360

361

362

363

364

365

366

367

368

369

370

371

372

373

374

375

376

377

378

379

380

381

382

383

384

385

386

387

388

389

390

391

392

393

394

395

396

397

398

399

400

401

402

403

404

405

406

407

408

409

410

411

412

413

414

415

416

417

418

419

420

421

422

423

424

425

426

427

428

429

430

431

432

433

434

435

436

437

438

439

440

441

442

443

444

445

446

447

448

449

450

451

452

453

454

455

456

457

458

459

460

461

462

463

464

465

466

467

468

469

470

471

472

473

474

475

476

477

478

479

480

481

482

483

484

485

486

487

488

489

490

491

492

493

494

495

496

497

498

499

500

501

502

503

504

505

506

507

508

509

510

511

512

513

514

515

516

517

518

519

520

521

522

523

524

525

526

527

528

529

530

531

532

533

534

535

536

537

538

539

540

541

542

543

544

545

546

547

548

549

550

551

552

553

554

555

556

557

558

559

560

561

562

563

564

565

566

567

568

569

570

571

572

573

574

575

576

577

578

579

580

581

582

583

584

585

586

587

588

589

590

591

592

593

594

595

596

597

598

599

600

601

602

603

604

605

606

607

608

609

610

611

612

613

614

615

616

617

618

619

620

621

622

623

624

625

626

627

628

629

630

631

632

633

634

635

636

637

638

639

640

641

642

643

644

645

646

647

648

649

650

651

652

653

654

655

656

657

658

659

660

661

662

663

664

665

666

667

668

669

670

671

672

673

674

675

676

677

678

679

680

681

682

683

684

685

686

687

688

689

690

691

692

693

694

695

696

697

698

699

700

701

702

703

704

705

706

707

708

709

710

711

712

713

714

715

716

717

718

719

720

721

722

723

724

725

726

727

728

729

730

731

732

733

734

735

736

737

738

739

740

741

742

743

744

745

746

747

748

749

750

751

752

753

754

755

756

757

758

759

760

761

762

763

764

765

766

767

768

769

770

771

772

773

774

775

776

777

778

779

780

781

782

783

784

785

786

787

788

789

790

791

792

793

794

795

796

797

798

799

800

801

802

803

804

805

806

807

808

809

810

811

812

813

814

815

816

817

818

819

820

821

822

823

824

825

826

827

828

829

830

831

832

833

834

835

836

837

838

839

840

841

842

843

844

845

846

847

848

849

850

851

852

853

854

855

856

857

858

859

860

861

862

863

864

865

866

867

868

869

870

871

872

873

874

875

876

877

878

879

880

881

882

883

884

885

886

887

888

889

890

891

892

893

894

895

896

897

898

899

900

901

902

903

904

905

906

907

908

909

910

911

912

913

914

915

916

917

918

919

920

921

922

923

924

925

926

927

928

929

930

931

932

933

934

935

936

937

938

939

940

941

942

943

944

945

946

947

948

949

950

951

952

953

954

955

956

957

958

959

960

961

962

963

964

965

966

967

968

969

970

971

972

973

974

975

976

977

978

979

980

981

982

983

984

985

986

987

988

989

990

991

992

993

994

995

996

997

998

999

1000

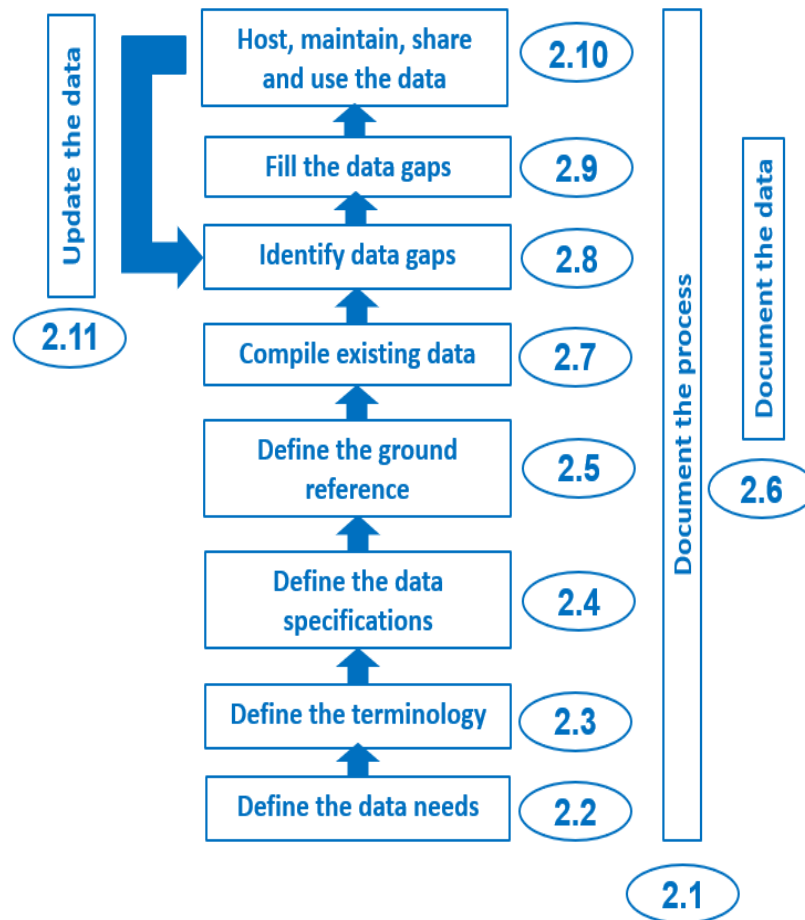
Pre-workshop survey to assess the current level of geo-enablement across Malaria, TB and HIV programs as well as the unit in charge of the Health Information System (HIS)

Workshop (Saly – Senegal, 6-10 November 2023) attended by 55 participants from 11 countries to take them through the HIS geo-enabling concept and process, finalize the assessment and strengthen their technical capacity

Post-workshop technical support provided to 10 countries to help them develop an action plan aiming at filling the gaps identified during the assessment

Geo-enabling a program or an intervention

Additional task: Assessing the availability, quality, and accessibility of the data needed to generate the products that have been defined during step B



➔ Geospatial data management cycle

➔ Topic of Module 4

Geo-enabling the Health Information System, programs or interventions training workshop for Asia Pacific

...and beyond

Session 11: Result of the HIS geo-enablement level assessment for Asia and Pacific (9 elements of the HIS geo-enabling framework)

HIS geo-enablement level assessment questionnaire – Part 2

Quick HIS geo-enabling assessment survey

Introduction

The aim of this questionnaire is to obtain a picture of the situation in your department/unit regarding its geo-enablement level.

This information will be used as baseline for the development of the action plan.

Please take the time to browse the glossary of terms before completing the questionnaire: <https://tinyurl.com/tavfcdjx>

Respondent contact information

Full Name of the respondent: _____
Function/position of the respondent: _____
Full name of the institution: _____
Full name of the department: _____
Address: _____
City/Town: _____
State/Province: _____
Country: _____
Email address: _____
Phone number: _____

Priorities and challenges

This section aims at capturing the main priorities and challenges of the department/unit/programme.

Question 1: What are the 3 main priorities of the department/unit/programme? (example: e.g. lack of population data, lack of technical capacity, lack of appropriate geospatial technologies, etc.)

Priority 1: _____
Priority 2: _____
Priority 3: _____

Question 2: What are the 3 main challenges of the department/unit/programme? (example: e.g. lack of population data, lack of technical capacity, lack of appropriate geospatial technologies, etc.)

☐ Lack of population data

Asia Pacific HIS geo-enablement level questionnaire for Ministry of Health programs

Introduction

The aim of this questionnaire is to obtain a picture of the situation in countries when it comes to the management and use of geospatial data and technologies (GIS, Global Navigation Satellite System, Remote Sensing) in public health and the level of geo-enablement of the Health Information System (HIS).

This questionnaire is addressed to health programs/units/departments of Ministries of Health across **Asia Pacific** using or interested in using this kind of data and technologies to support their interventions.

The result obtained through this exercise will be presented during the forthcoming HIS geo-enabling workshop organized by UNICEF for Asia Pacific (registration page: <https://bit.ly/3VnJwEZ>) and could be used as baseline for the development of an action plan aimed at addressing existing gaps.

Thanks to APMEN's support, support will be provided to up to 3 countries to develop such an action plan after the above-mentioned workshop.

Please take the time to browse the glossary of terms before completing the questionnaire: <https://tinyurl.com/tavfcdjx>

It is recommended to fill the questionnaire on a laptop or desktop computer due to the format of some of the questions.

Objective: Obtain a picture of the situation across MOH departments/units regarding their current geo-enablement level.

Eleven questions to assess the current situation across the 9 elements of the HIS geo-enabling framework

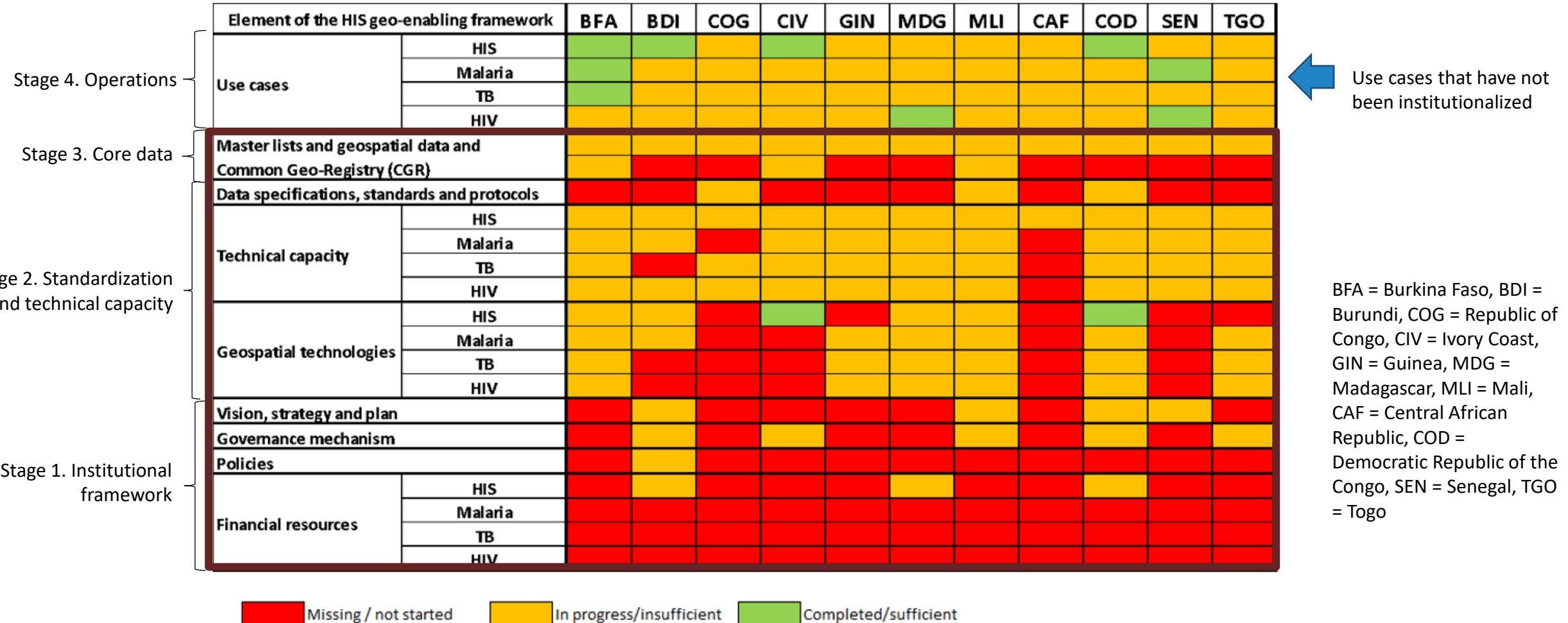
➡ Answers used as baseline for developing an action plan to fill identified gaps.

Ideally implemented across as many health programs as possible together with the unit in charge of the HIS/HMIS (e.g. malaria, TB and HIV elimination programs, EPI, MNH,...)



Example of result – African French speaking countries (Nov 2023)

Pre-workshop survey completed/adjusted during the workshop



➔ Important gaps for the elements guaranteeing the quality, effectiveness and long-term sustainability of data and information products and this across programs

Result of HIS geo-enablement level assessment – Asia Pacific

Respondents (16 countries)

MOH respondents by
country

Country name	Nbr of MOH respondents
Papua New Guinea	10
Pakistan	6
Indonesia	5
Timor-Leste	4
Afghanistan	2
Bhutan	2
Thailand	2
Bangladesh	1
Cambodia	1
China	1
Fiji	1
Malaysia	1
Philippines	1
Solomon Islands	1
Sri Lanka	1
Vanuatu	1

Total 40

Number of MOH programs

Country	HIS unit	Immunization	Malaria	Tuberculosis	HIV/AIDS	Maternal and New Born Health	Other	Total
Papua New Guinea							Population and family health, Performance, monitoring and research	5
Timor-Leste								4
Pakistan							National Institute of Health	4
Afghanistan								2
Bhutan								2
Thailand								2
Indonesia								2
Bangladesh								1
Cambodia								1
China								1
Fiji								1
Malaysia								1
Philippines								1
Solomon Islands								1
Sri Lanka								1
Vanuatu								1
Total	6	2	13	2	2	1	3	30

Result of HIS geo-enablement level assessment – Asia Pacific

Element of the HIS geo-enabling framework		AFG	BGD	BTN	CHN	FJI	IDN	KHM	LKA	MYS	PAK	PHL	PNG	SLB	THA	TLS	VUT
Use cases	HIS																
	Malaria																
	TB																
	EPI																
	HIV																
Master lists and geospatial data and Common Geo-Registry (CGR)																	
Data specifications, standards and protocols																	
Technical capacity	HIS																
	Malaria																
	TB																
	EPI																
	HIV																
Geospatial technologies	HIS																
	Malaria																
	TB																
	EPI																
	HIV																
Vision, strategy and plan	HIS																
	Malaria																
	TB																
	EPI																
	HIV																
Governance mechanism																	
Policies																	
Financial resources	HIS																
	Malaria																
	TB																
	EPI																
	HIV																

Summary table

AFG = Afghanistan, BGD = Bangladesh, BTN = Bhutan, CHN = China, FJI = Fiji, IDN = Indonesia, KHM = Cambodia, LKA = Sri Lanka, MYS = Malaysia, PAK = Pakistan, PHL = Philippines, PNG = Papua New Guinea, SLB = Solomon Islands, THA = Thailand, TLS = Timor-Leste, VUT = Vanuatu

No answer
 Missing / not started
 In progress/insufficient
 Completed/sufficient

Result of HIS geo-enablement level assessment – Asia Pacific

Country specific spreadsheet

	A	B	C	D	E	F	G	H
1	Framework element	Appropriate geospatial technologies						
2	Objective	The central unit of the Ministry of Health as well as the main health programs have access to the necessary and appropriate geospatial technologies						
3	Benchmark	The central level geospatial data management and technologies unit has access to the necessary and appropriate geospatial technologies (GNSS, GIS) to support its mandate	The key health programs have access to the necessary and appropriate geospatial technologies (GNSS, GIS) to support the implementation of their activities					
4								
5	Current situation							
6		Don't know	The programme/unit does not have the geospatial technologies necessary to support the implementation of its activities	The programme/unit has some geospatial technologies but they are not sufficient to implement its activities	The programme/unit is in the process of acquiring the geospatial technologies needed to implement its activities	The programme/unit has the geospatial technologies necessary to implement its activities		Comments
7								
8	Malaria Program							
9	Tuberculosis Program							
10	HIV Program							
11	Immunization							
12	Population and Family Health							
13	Performance monitoring and research							
14	Health Information System Management Unit							
15	National Capital District Provincial							
16								
17								
18								
19								

➡ This spreadsheet is used as the reference for the rest of the process aiming at developing the action plan

Result of HIS geo-enablement level assessment – Asia Pacific

Vision, strategy, plan: What is the current situation in the MOH when it comes to vision, strategy and plan for the management and use of geospatial data and technologies?

	Don't know	The programme/unit/MOH has not defined/developed its vision, strategy and action plan regarding the management and use of geospatial data and technologies	The programme/unit/MOH is in the process of defining/developing its vision, strategy and action plan concerning the management and use of geospatial data and technologies	The programme/unit/MOH has developed its vision, strategy and action plan regarding the management and use of geospatial data and technologies but they have not been approved yet	The programme/unit/MOH has developed its vision, strategy and action plan regarding the management and use of geospatial data and technologies, they have been approved but they have not yet been implemented	The programme/unit/MOH has developed its vision, strategy and action plan regarding the management and use of geospatial data and technologies and they are implemented
Ministry of Health	National Capital District Provincial Health Authority	Malaria, PMR	Population and family health, Immunization	Malaria	HIS unit	Population and family health

Use cases: What is the current situation in your programme/unit when it comes to the implementation and documentation of use cases related to the management and use of geospatial data and technologies (e.g. accessibility to health care analysis, geo-enabled microplan,...)?

	Don't know	The program/unit does not recognize the importance of geospatial data and technologies	The programme/unit recognizes the importance of geospatial data and technologies but is not using them	The programme/unit recognizes the importance of geospatial data and technologies and use them but do not have documented use cases	The programme/unit recognizes the importance of geospatial data and technologies, utilize them, and have documented use cases
Malaria Program					



Some work to be done to ensure that all the programs have the same understanding of the different elements of the HIS geo-enabling framework and for all the programs within the MOH to discuss to reach a consensus regarding the situation currently observed in the country

Selection of Asian Pacific countries to receive APMEN support to develop an action plan

Country name	Nbr of MOH programs having completed the questionnaire	Nbr of MOH participants to the first 2 modules	Local partners participating to the first 2 modules	Total
Papua New Guinea	5	8	1	14
Pakistan	4	2	1	7
Timor-Leste	4	1	1	6
Indonesia	2	3	1	6
Afghanistan	2	2	1	5
Bangladesh	1	3	1	5
Bhutan	2	1	1	4
Cambodia	1	2	1	4
Sri Lanka	1	3		4
Thailand	2		1	3
Fiji	1	1	1	3
Solomon Islands	1	1	1	3
Philippines	1		1	2
Vanuatu	1		1	2
China	1			1
Malaysia	1			1

Those who contributed to the survey and/or attended the training workshop (MOH and local partners) will be contacted to find out if they are:

1. Interested in receiving the support
2. Ready to be actively involved in the exercise (engage all key programs, complete the assessment and solve inconsistencies, develop the action plan)

➔ The final list of selected countries (up to 3) will be announced during the 4th module of the regional training (August 14)

Module 4 – Schedule and agenda

Schedule Module 4

14 August 2024 (Bangkok 12pm / Geneva 6am / Fiji 6pm)

15 min - Recap of Module 3 and agenda of Module 4

30 min – **Session 12:** Assess the availability, quality and accessibility of data and information: Introduction to the geospatial data management cycle

60 min - **Session 13:** Implement the geospatial data management cycle (define the terminology, data specifications and the ground reference)

15 min - **Session 14:** Implement the geospatial data management cycle (document the data)

45 min - **Session 15** Implement the geospatial data management cycle (compile existing data, identify and fill data gaps)



Geospatial data management cycle

**Thank you for your attention and
see you all again soon!**