

## 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

Register by: 19 June 2024

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

# Workshop material

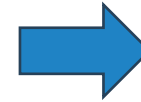


<https://bit.ly/4d2nfTS>



REFERENCE\_MATERIAL

PRESENTATIONS



BIBLIOGRAPHY

GIS\_SOFTWARES

HGL\_GUIDANCE

NATIONAL\_GUIDES



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

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

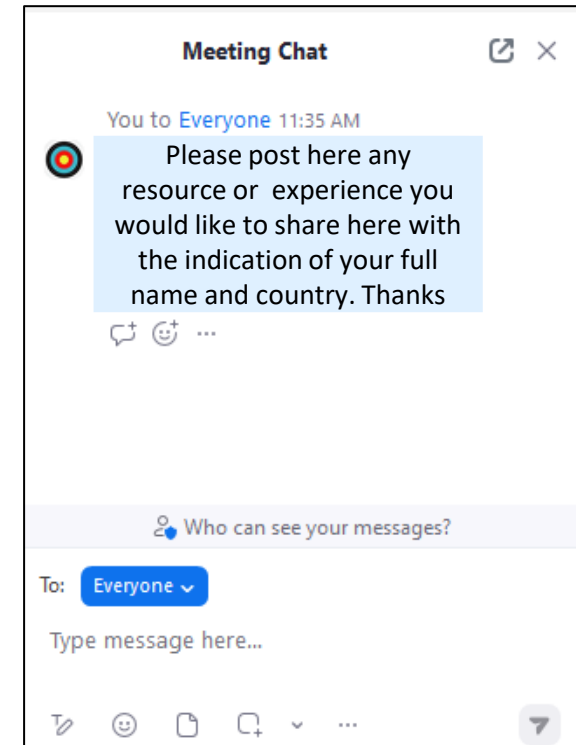
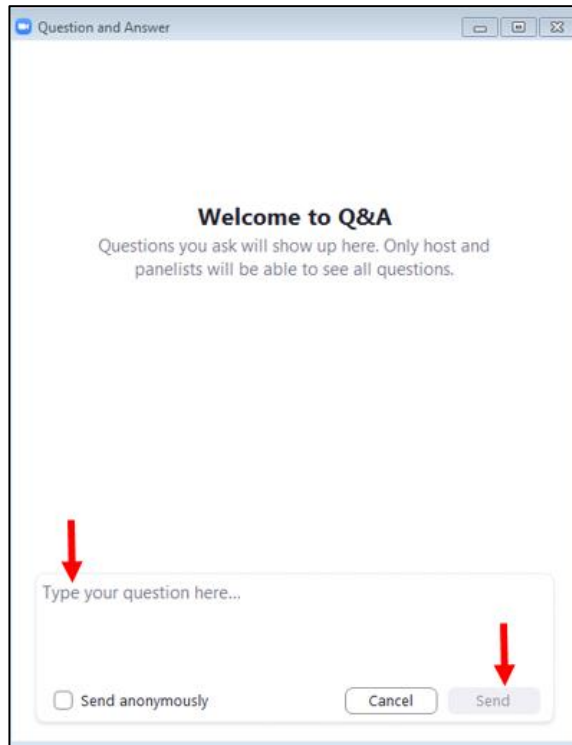


Glossary of terms: <https://bit.ly/37Wje0v>



# 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 answer them as much as possible during the modules

We will also be using the chat to share information

# HIS geo-enablement level assessment questionnaire – Asia Pacific



<https://tinyurl.com/4veevrkr>

**Deadline: July 12th**

- For participants from Ministry of Health programs/units of Asia Pacific: Complete the rapid HIS geo-enablement level assessment questionnaire if not already done (maximum 15 min)
- For other participants from Asia Pacific: Encourage your counterparts in the Ministry of Health to complete the questionnaire

➔ The more programs we have, the more concrete and useful the rest of the training will be and the higher the possibility for each country to develop an action plan

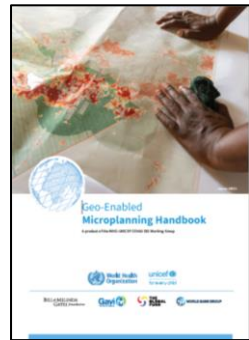
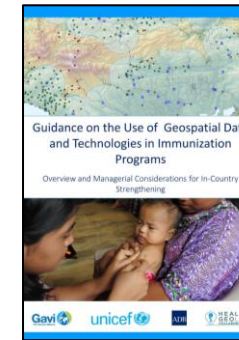
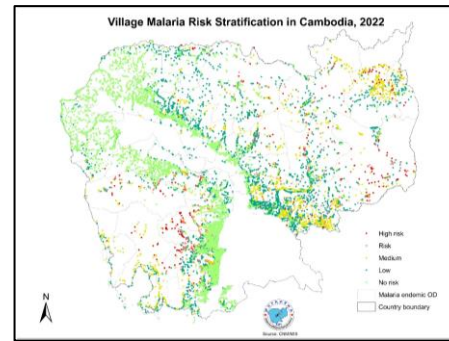
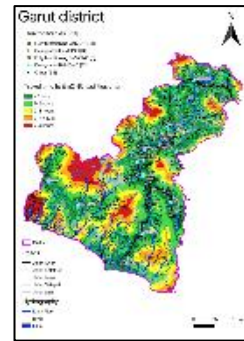
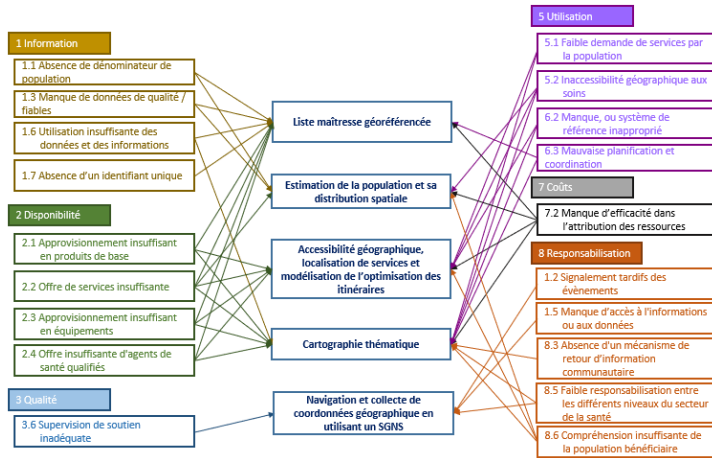
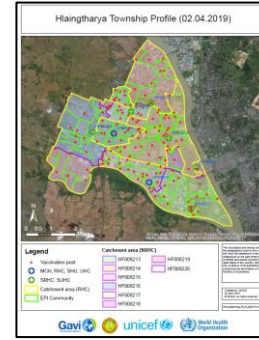
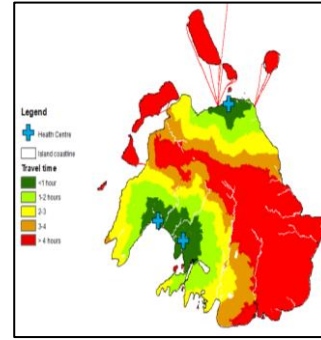
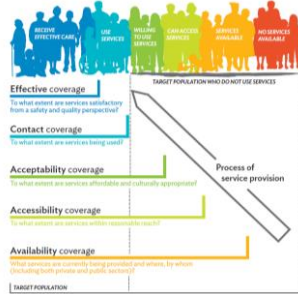
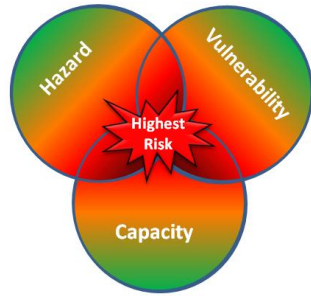
➔ Thanks to APMEN's support will be provided to up to 3 countries of **Asia Pacific** after the training workshop to develop an action plan aiming at filling the gaps identified during the assessment

# Programs/units having completed the questionnaire as of today

Country	HIS unit	Immunization	Malaria	Tuberculosis	HIV/AIDS	Maternal and New Born Health	Other
Papua New Guinea							Population and family health, Performance, monitoring and research
Timor-Leste							
Pakistan							National Institute of Health
Afghanistan							
Bhutan							
Thailand							
Bangladesh							
Cambodia							
China							
Fiji							
Indonesia							
Malaysia							
Philippines							
Solomon Island							
Sri Lanka							

➔ The number of programs/units having completed the questionnaire will be one of the criteria used for the selection of countries that will receive support to develop an action plan

# Recap of Module 1



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

Examples of application of geospatial data and technologies in public health

Introduction to the HIS geoenabling framework

Recording in English: <https://youtu.be/kyLvtGKA27Q>

Slides: <https://tinyurl.com/27nr542z>

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

*...and beyond*

## Module 2



# Agenda - Module 2

15 min - Recap of Module 1 and agenda of Module 2

30 min - **Session 4:** In-country implementation of the HIS geo-enabling framework

30 min - **Session 5:** Result of the HIS geo-enablement level assessment for Asia and Pacific (priorities and challenges)

30 min - **Session 6:** Understand the geography of the program or intervention

➔ Implementation of the HIS geo-enabling framework

➔ Around 2 hours including Q&A

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

*...and beyond*

## Session 4: In-country implementation of the HIS geo-enabling framework

# HIS Geo-enabling framework implementation process

To achieve the benchmarks of the HIS geo-enabling framework, it is necessary to follow a six-step process described in the HIS geo-enabling toolkit:

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

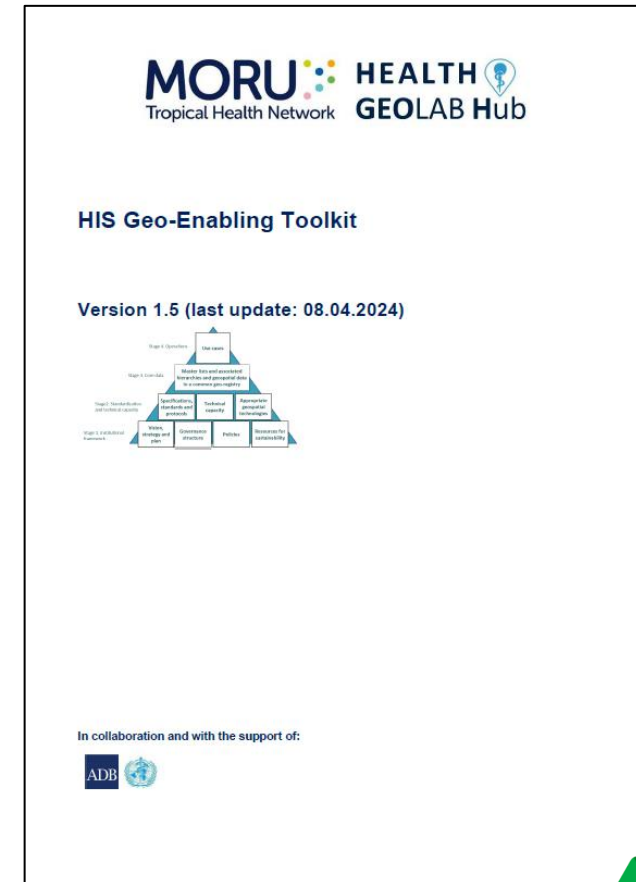
**Step 2** : Define the strategy(ies) to be implemented to fill the gaps identified during the assessment

**Step 3** : Develop the action plan aiming at filling the gaps in the HIS geo-enabling framework

**Step 4** : Implement the action plan

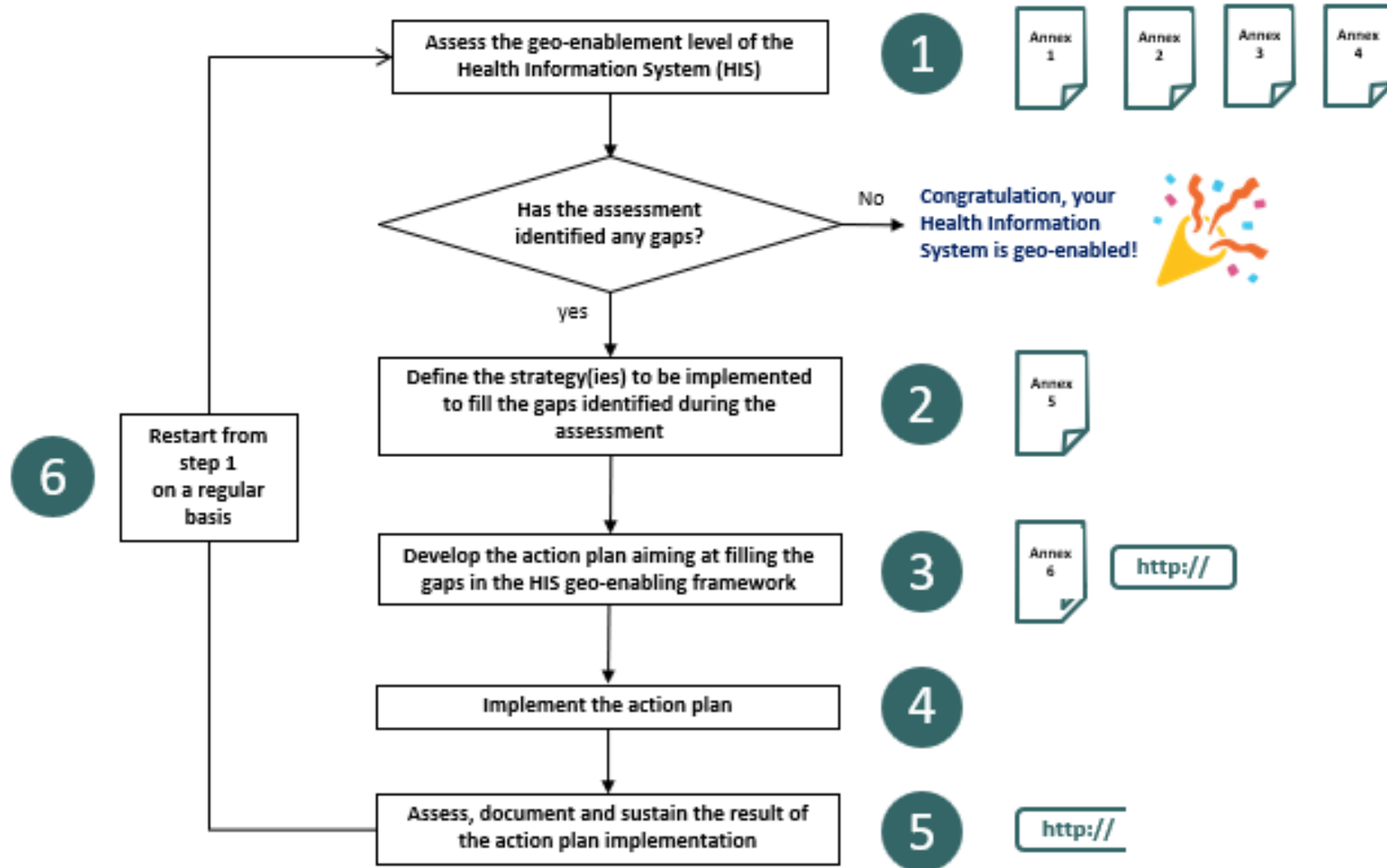
**Step 5** : Assess, document and sustain the result of the action plan implementation

**Step 6** : Restart from step 1 on a regular basis



[http://www.healthgeolab.net/DOCUMENTS/HIS\\_geo-enabling\\_toolkit.pdf](http://www.healthgeolab.net/DOCUMENTS/HIS_geo-enabling_toolkit.pdf)

# HIS Geo-enabling framework implementation process

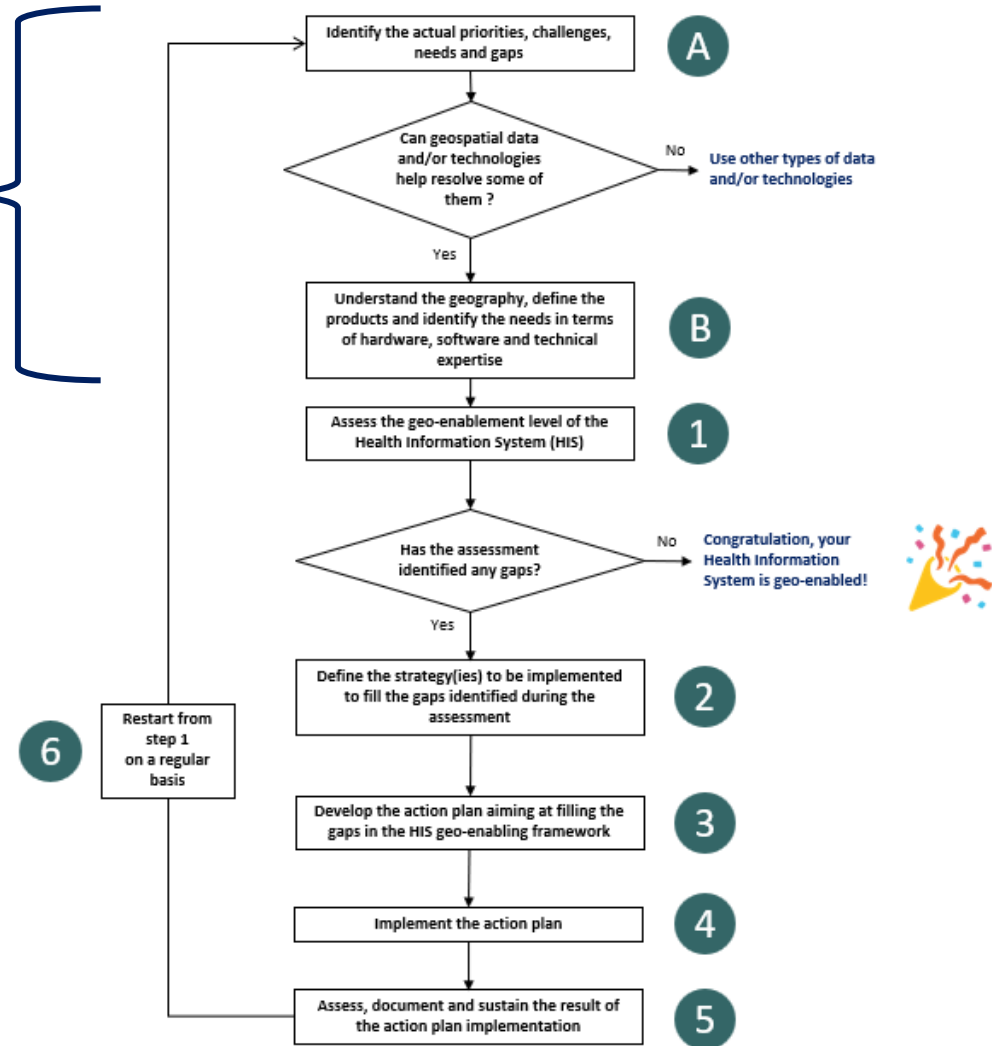


# HIS Geo-enabling framework implementation process

When geo-enabling is specific to a health program or intervention

Additional preliminary steps specific to the program or intervention

The loop returns to the stage of determining priorities, needs and gaps



➔ The process we will use as reference during the present training workshop



# HIS Geo-enabling framework implementation process

## Step A : Identify the actual priorities, challenges, needs and gaps

Objective: Identify and document the actual priorities, challenges and gaps that could be addressed using geospatial data and technologies


Expected deliverable: A list of priorities, challenges, needs and gaps that could be addressed using geospatial data and technologies

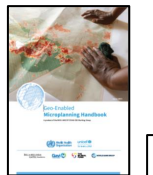
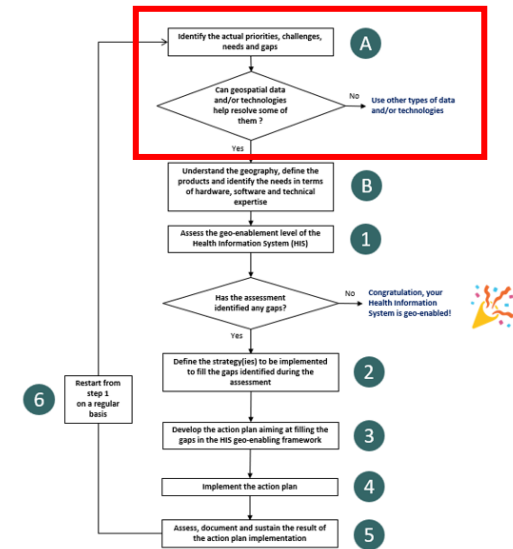
Estimated duration of implementation: 1-2 weeks depending on the approach being used

Volume of resources needed: limited

Person to be involved: Representatives from the key health program(s) to benefit from the geo-enablement (communicable diseases, planning, emergency management, immunization,...)

Supporting tool:

- a. First part of the quick HIS geo-enabling assessment questionnaire (Annex 2 in the HIS geo-enabling toolkit)  Completed by some of you for this training workshop
- b. Figure C and Table 1 of the geo-enabled microplanning handbook
- c. Figure 3 of GAVI's rapid guidance for investment planning on leveraging geospatial technologies and data to strengthen immunization programs
- a. Section 2.2.1 of UNICEF's guidance on the use of geospatial data and technologies in immunization programs



# HIS Geo-enabling framework implementation process

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

### Objective:

- Identify and document the geographic features that define the program or intervention's geography
- Define and document the products to be generated to support the programs or the intervention
- Identify and document the needs in terms of equipment and technical capacity to generate the products

Expected deliverable: Report documenting the geography, products and needs

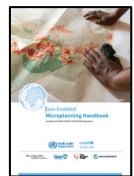
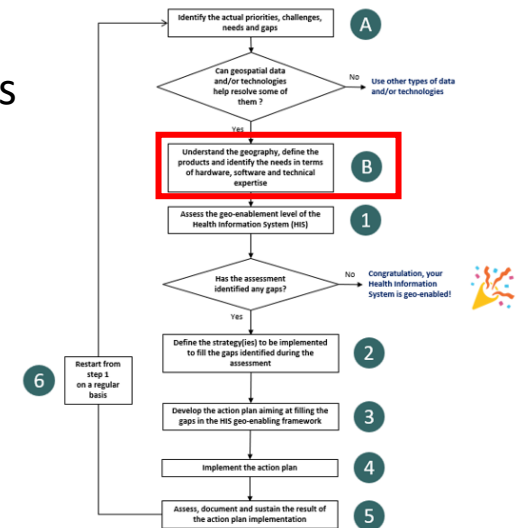
Estimated duration of implementation: 1-2 weeks

Volume of resources needed: limited

Person to be involved: Head of the geospatial data management and technology unit if any, representatives from the health information system unit and key health program(s) to benefit from the geo-enablement (communicable diseases, planning, emergency management, immunization,...)

### Supporting tool:

- a. Volume 2.1 of the Health GeoLab guidance for the management and use of geospatial data and technologies in health
- b. Section 1.2.1 of UNICEF's guidance on the use of geospatial data and technologies in immunization programs
- a. Sections 6.2 to 6.5 of the geo-enabled microplanning handbook



# HIS Geo-enabling framework implementation process

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

Objective: Identify and document the current situation and indirectly potential gaps across the nine (9) elements of the HIS geo-enabling framework

Expected deliverable: A report documenting the current situation

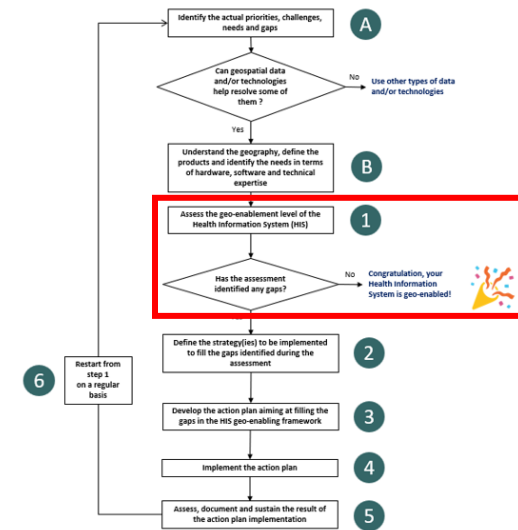
Estimated duration of implementation: 1-2 weeks

Volume of resources needed: Limited

Person to be involved: Head of the geospatial data management and technology unit if any, representatives from key health programs (health information system, communicable diseases, planning, emergency management, and immunization), development partners, external facilitator.

Supporting tool:

- HIS geo-enabling benchmarks (Annex 1 in the HIS Geo-enabling Toolkit)
- Quick HIS geo-enabling assessment questionnaire (Annex 2)
- Additional information and documents to be collected in complement to the quick assessment questionnaire (Annex 3)
- Resources illustrating the first 7 elements of the HIS geo-enabling framework (Annex 4)
- HIS geo-enablement assessment matrix template



*Note: When implemented in the context of a program or intervention, this step of the HIS geo-enabling framework process does also involve assessing the availability, quality, and accessibility of additional data needed to generate the products that have been defined during step B.*



# HIS Geo-enabling framework implementation process

## Step 2: Define the strategy(ies) to be implemented to fill the gaps identified during the assessment

Objective: Define the strategy(ies) to be implemented to fill each of the gaps identified during the assessment

Expected deliverable: document documenting the strategy(ies) to be implemented to address the gaps identified during the assessment.

Estimated duration of implementation: up to 1 week

Volume of resources needed: Limited

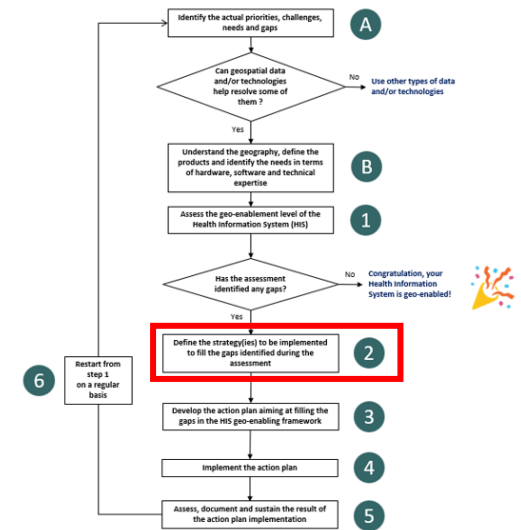
Person to be involved: Head of the geospatial data management and technology unit if any, representatives from key health programs (health information system, communicable diseases, planning, emergency management, immunization,...), development partners, external facilitator.

Supporting tools:

- Non exhaustive list of strategy(ies), recommended stakeholders to be involved, and implementation level aiming at filling the identified gaps (Annex 5 in the HIS geo-enabling toolkit)

➡ At the end of this second step, the Ministry of Health should have clear strategies to develop an action plan (Step 3).

➡ Session 20 in Module 6



# HIS Geo-enabling framework implementation process

## Step 3: Develop the action plan aiming at filling the gaps in the HIS geo-enabling framework

Objective: Obtain a budgeted action plan to implement the strategies identified during step 2.

Expected deliverable: HIS geo-enabling action plan


Estimated duration of implementation: 1 month

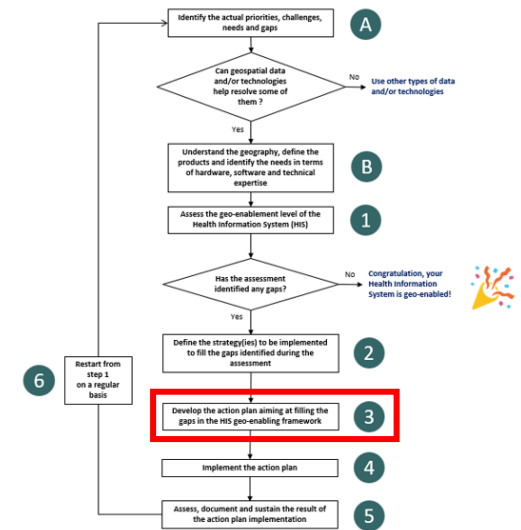
Volume of resources needed: Limited

Person to be involved: Head of the geospatial data management and technology unit if any, representatives from key health programs (health information system, communicable diseases, planning, emergency management, immunization,...), development partners, external facilitator.

Supporting tools:

- Non-exhaustive list of activities to be considered for implementation across the 9 elements of the HIS geo-enabling framework (URL in the HIS geo-enabling toolkit)
- Action plan template (URL in the HIS geo-enabling toolkit)
- Example of action plan (Annex 6 of the HIS geo-enabling toolkit)
- Cost and timeline drivers for activities aimed at strengthening the geo-enabling environment (GAVI's Leveraging Geospatial Technologies and Data to Strengthen Immunization Programmes: Rapid guidance for investment planning)

 Session 21 in Module 6



# HIS Geo-enabling framework implementation process

## Step 4: Implement the action plan

Objective: Complete the activities defined in the action plan

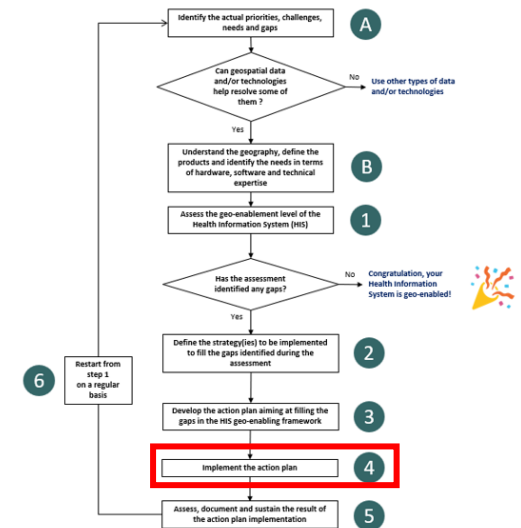
Expected deliverable: Those listed in the action plan

Estimated duration of implementation: 9-12 months

Volume of resources needed: Limited to significant depending on the activities included in the action plan

Person to be involved: All the parties involved in the implementation of the action plan

Supporting tools: None for this step



This step consists of implementing the activities included in the action plan if the necessary resources are available.

➔ If this is not the case, financial resources will first have to be leveraged

➔ Session 22 in Module 6

# HIS Geo-enabling framework implementation process

## Step 5: Assess, document and sustain the result of the action plan implementation

Objective: Evaluate, document, showcase and sustain the result of the action plan implementation

Expected deliverable: After action review report, implementation report, marketing material and sustainability plan

Estimated duration of implementation: 1 month

Volume of resources needed: Moderate

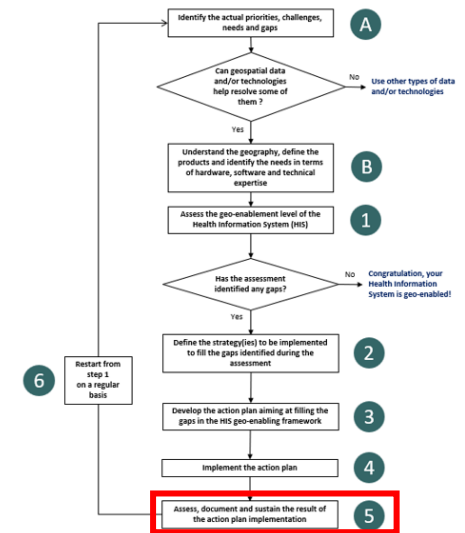
Person to be involved: All the parties involved in the implementation of the action plan

Supporting tools:

- After Action Review guides (URLs in the HIS geo-enabling toolkit)
- Section 6.8.4 of the geo-enabled microplanning handbook
- Example of story maps (URLs in the HIS geo-enabling toolkit)

➡ All these activities are important to ensure that what has been established during the implementation of the action plan continue beyond such implementation

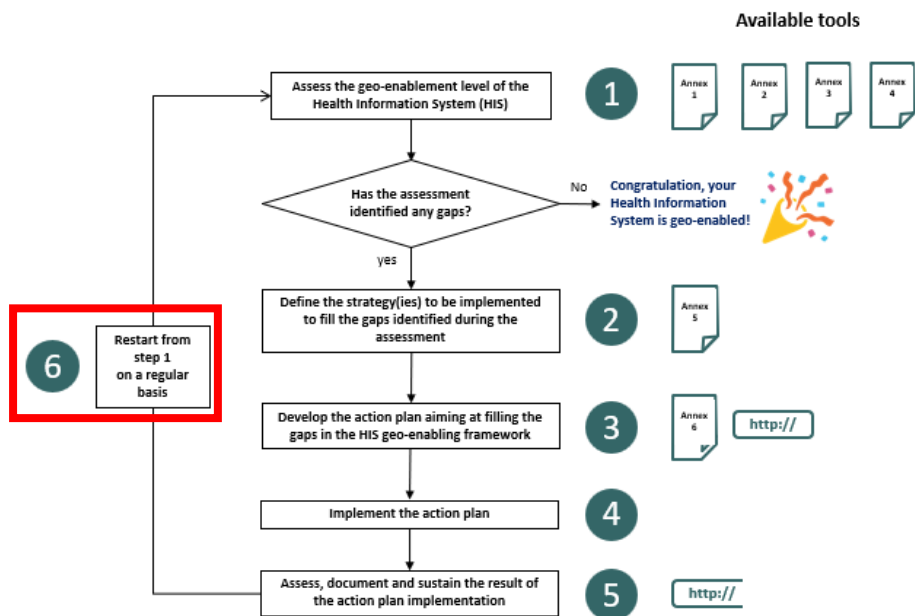
➡ Session 23 in Module 6



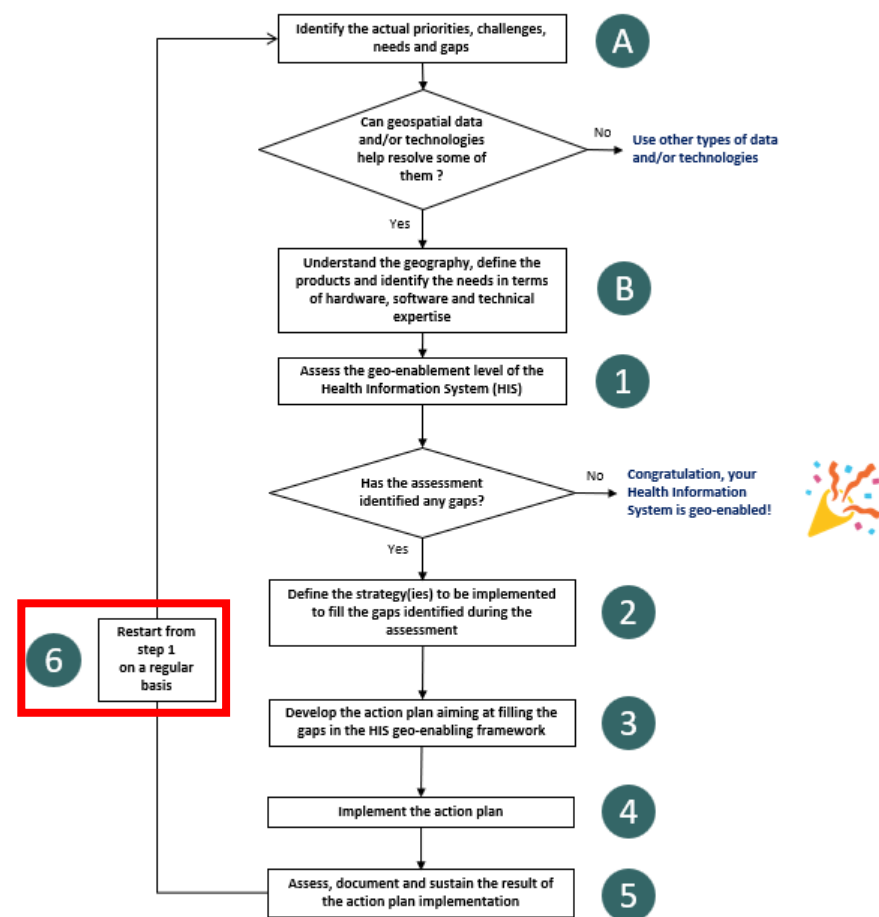
# HIS Geo-enabling framework implementation process

## Step 6: Restart from step 1 or A on a regular basis

### Geo-enabling the HIS



### Geo-enabling a program or intervention



# HIS Geo-enabling framework implementation process

## Step 6: Restart from step 1 or A on a regular basis

Objective: Ensure for the process to be implemented on a regular basis until the HIS has been geo-enabled and/or the program/intervention geo-enabled

Expected deliverable: Start of a new cycle of the HIS geo-enabling process

Estimated duration of implementation: 1 day

Volume of resources needed: Limited

Person to be involved: Head of the geospatial data management and technology unit if any, representatives from key health programs (health information system, communicable diseases, planning, emergency management, immunization,...), development partners

Supporting tools: None for this step

This step consists of repeatedly conducting the activities from step 1 to step 5 until the Health Information System is geo-enabled in a sustainable manner or from step A to 5 when it comes to a program or intervention.

This step also considers that several elements are meant to change over time including public health priorities, geospatial technologies, or even the strategy that the government follows regarding information management.

➔ It is important to regularly update the previous version of the assessment to have an updated picture of the geo-enablement level of the HIS, program or intervention, identify the gaps and aim at filling them

# Short break



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

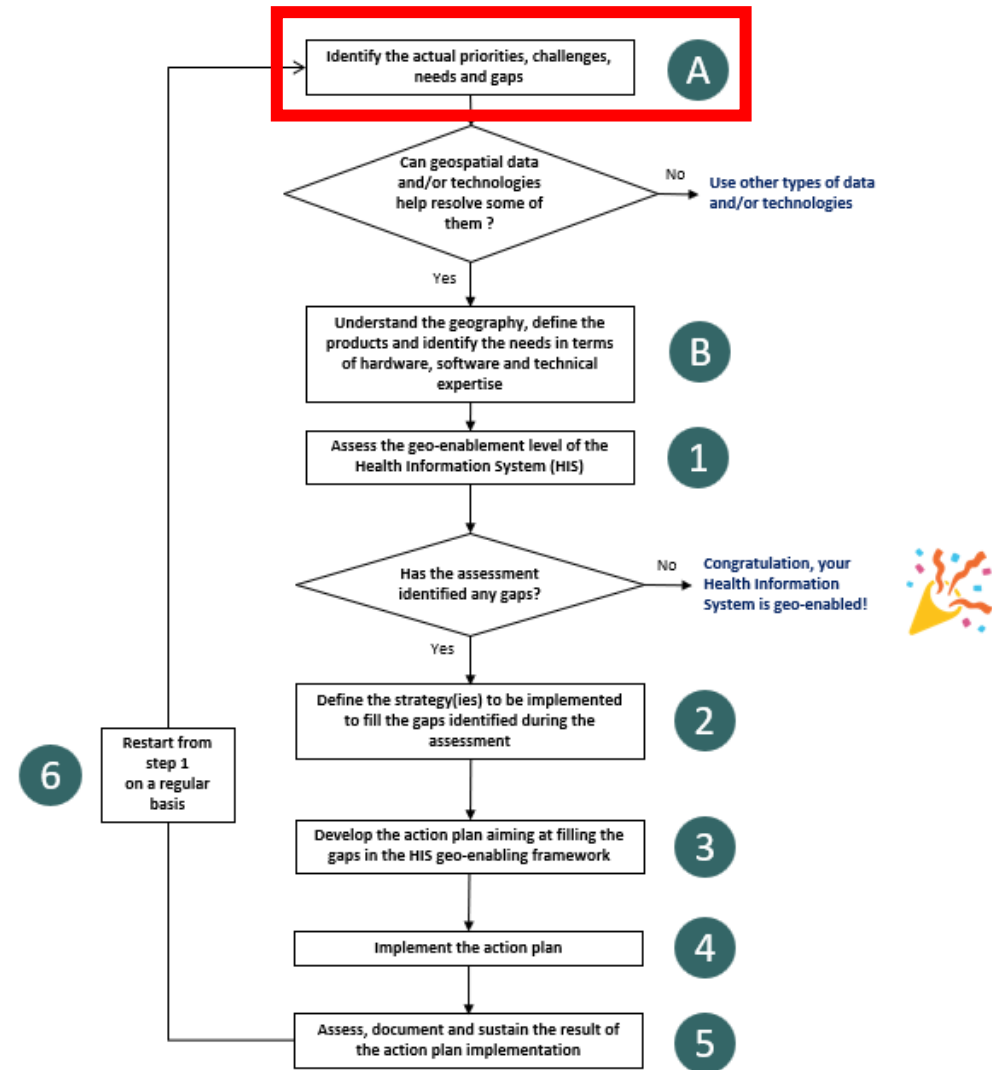
*...and beyond*

Session 5: Result of the HIS geo-enablement level assessment (priorities and challenges)



# HIS Geo-enabling framework implementation process

## Step A : Identify the actual priorities, challenges, needs and gaps



# HIS geo-enabling level assessment

**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 department/unit/programme

**Question 1:** What are the 3 main priorities, objectives or agenda of your programme/unit (example: elimination of malaria)?

Priority 1: \_\_\_\_\_  
 Priority 2: \_\_\_\_\_  
 Priority 3: \_\_\_\_\_

**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 high-level picture of the situation observed in different MOH programs/units regarding their current level of geo-enablement and this across the 9 elements of the HIS geo-enabling framework

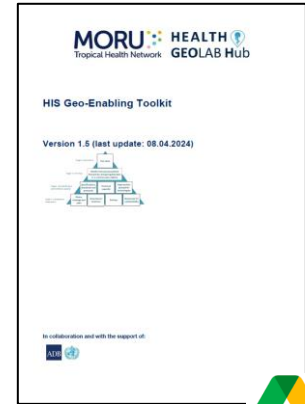
Two questions related to step A of the HIS geo-enabling implementation process :

1. What are the current program/unit priorities?
2. Which challenges are currently being faced by the program/unit?



Answers to these two questions can be used to identify if geospatial data and/or technologies can address some of the priorities and/or challenges

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



# Result of the geo-enablement level assessment for Asia and Pacific

36 Respondents

## By country

Country name	Nbr of answers
Papua New Guinea	9
Pakistan	6
Indonesia	4
Timor Leste	4
Afghanistan	2
Bhutan	2
Thailand	2
Bangladesh	1
Cambodia	1
Fiji	1
Malaysia	1
Philippines	1
Solomon Islands	1
Sri Lanka	1

## By program

Program	Nbr of answers
Malaria control program	17
HIS unit	5
Population and Family Health	5
HIV/AIDS control program	3
Expanded program on immunization	2
Tuberculosis control program	2
Monitoring and Evaluation	1
National Institute of Health	1

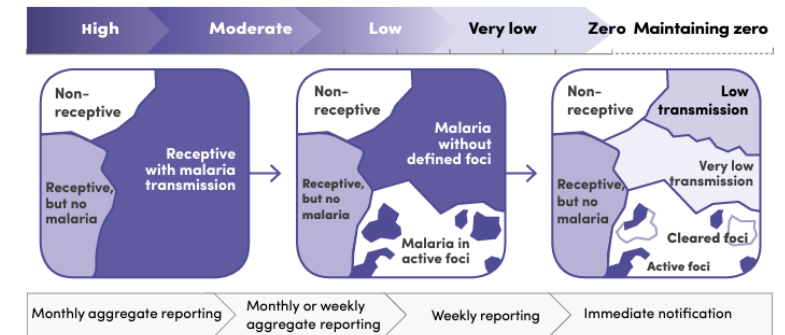
➔ Results mainly driven by the priorities and challenges of the malaria control programs at this stage

# Result of the geo-enablement level assessment for Asia and Pacific

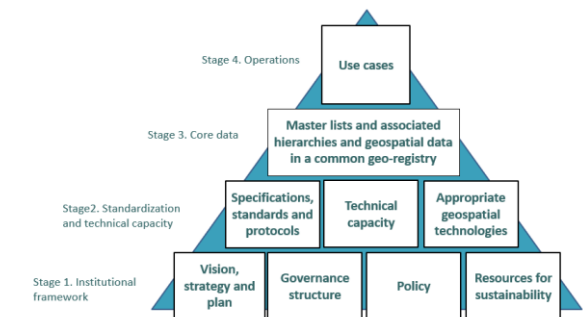
Question 1 - What are the 3 main priorities, objectives, targets or goals that drive the current agenda of your program/unit (example: eliminating malaria by 2030)?

Priority	Nbr of mention
Disease elimination and control	41
Strengthen the health information system	14
Improve access to health services	13
Disease surveillance and response	7
Mortality reduction (MNH, TB)	7
Digitalization of the health system	5
Disease mapping/spatial analysis	5
Case detection and management	5
Disease prevention	3
Other	8

➔ Disease surveillance, response, elimination and control



➔ Health information system digitalization and strengthening



➔ Accessibility to health services

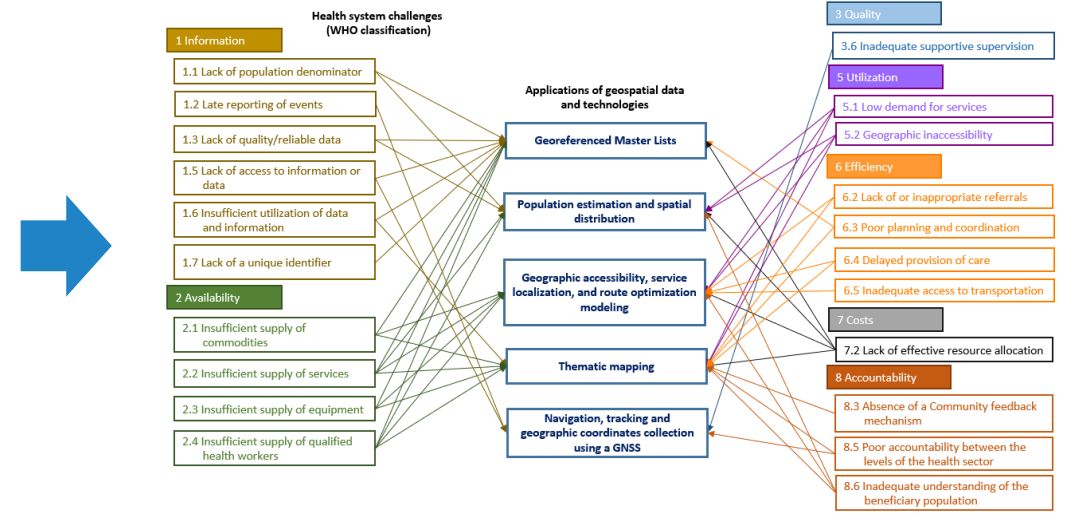


➔ Geography is present across all these priorities

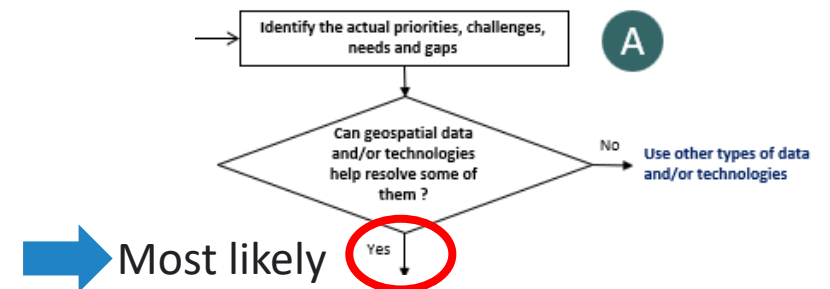
# Result of the geo-enablement level assessment for Asia and Pacific

Question 2 - What are the current main challenges encountered by your program/unit when it comes to supporting its operations?

Challenge	Nbr of mention
Delayed reporting of events	25
Geographic inaccessibility	25
Lack of quality/reliable data	23
Insufficient utilization of data and information	22
Absence of community feedback mechanisms	21
Insufficient supply of qualified health workers	19
Lack of effective resource allocation	19
Poor accountability between the levels of the health sector	19
Inadequate supportive supervision	16
Poor planning and coordination	15
Lack of access to information or data	14
Insufficient supply of equipment	14
Insufficient supply of services	14
Lack of population denominator	13
Lack of unique identifier	13
Inadequate understanding of beneficiary population	13
Lack of or inappropriate referrals	11
Insufficient supply of commodity	10
Low demand for services	7



Cover all the health system challenges that geospatial data and/or technologies can help address



# Microplanning challenges



Microplanning process phase	Common challenges to non-geo-enabled microplanning	Geospatial Data and Technology Solutions				
		Georeferenced master list	Population estimates and spatial distribution	Geographic accessibility, service location and route optimization models	Thematic maps	*GNSS navigation and tracking
1. Determine target population and its current service coverage	<ul style="list-style-type: none"> <li>○ Lack of population denominator</li> <li>○ Insufficient utilization of data and information</li> <li>○ Lack of unique identifier</li> <li>○ Geographic inaccessibility</li> <li>○ Lack of, or inappropriate, referral</li> <li>○ Inadequate understanding of beneficiary population</li> </ul>	✓	✓	✓	✓	
2. Estimate service delivery requirements	<ul style="list-style-type: none"> <li>○ Lack of population denominator</li> <li>○ Insufficient utilization of data and information</li> <li>○ Lack of unique identifier</li> </ul>	✓	✓	✓	✓	
3. Plan for commodities and equipment storage (e.g. vaccines, bed nets, etc.)	<ul style="list-style-type: none"> <li>○ Lack of population denominator</li> <li>○ Insufficient utilization of data and information</li> <li>○ Lack of unique identifier</li> <li>○ Insufficient commodity supply</li> <li>○ Insufficient equipment supply</li> </ul>	✓	✓	✓	✓	
4. Identify and manage human resources	<ul style="list-style-type: none"> <li>○ Lack of population denominator</li> <li>○ Insufficient utilization of data and information</li> <li>○ Lack of unique identifier</li> <li>○ Insufficient supply of qualified health workers</li> </ul>	✓	✓	✓	✓	

Microplanning process phase	Common challenges to non-geo-enabled microplanning	Geospatial Data and Technology Solutions				
		Georeferenced master list	Population estimates and spatial distribution	Geographic accessibility, service location and route optimization models	Thematic maps	*GNSS navigation and tracking
5. Plan service delivery, including preparation of an operational map, and identifying special activities for the hard-to-reach and problem areas	<ul style="list-style-type: none"> <li>○ Lack of population denominator</li> <li>○ Insufficient utilization of data and information</li> <li>○ Lack of unique identifier</li> <li>○ Insufficient supply of services</li> <li>○ Geographic inaccessibility</li> <li>○ Lack of appropriate referral</li> <li>○ Poor planning and coordination</li> <li>○ Lack of effective resource allocation</li> </ul>	✓	✓	✓	✓	
6. Generate demand and ensure communications, by collaborating with community stakeholders	<ul style="list-style-type: none"> <li>○ Insufficient utilization of data and information</li> <li>○ Low demand for services</li> <li>○ Absence of community feedback mechanisms</li> </ul>				✓	
7. Support and monitor implementation, and track defaulters	<ul style="list-style-type: none"> <li>○ Insufficient utilization of data and information</li> <li>○ Inadequate supportive supervision</li> <li>○ Poor accountability between the levels of the health sector</li> </ul>	✓			✓	✓
8. Re-evaluate the microplan	<ul style="list-style-type: none"> <li>○ Lack of quality/reliable data</li> <li>○ Insufficient utilization of data and information</li> </ul>	✓	✓	✓	✓	✓

# Immunization needs and gaps

- **Inefficient microplans and poor accountability of vaccination teams:** Mapping spatial location of immunization infrastructure, human resources, population distribution and geographic features at district or health area level, using GNSS enabled devices and the interpretation of satellite images, will lead to more efficient planning of outreach sessions based on distances, population in need and geographic barriers, and improved monitoring and accountability of immunization teams.
- **Inefficient use of vaccination resources (human resources, stocks, cold chain):** More geographically accurate maps of resources versus populations, together with spatial analysis of the barriers between supply and demand, can lead to better identification of gaps in the supply based on the distribution of demand for services.
- **Evidence of chronically missed communities:** demonstrated, for example, by pockets of disease despite reported high vaccination coverage. More efficient microplans and use of GNSS enabled devices and satellite images has demonstrated strong reduction of chronically missed communities in even hard-to-reach areas.
- **Poor quality of information on location of the target population:** improved spatial intelligence on location of settlements, hamlets and remote communities, as well as spatially disaggregated population products can provide better evidence for allocating resources at sub-district level and within health areas. Changes in population denominators can also be improved by capturing population dynamics due to growth and migratory flows using innovative spatial technologies (e.g., satellite night time lights and mobile phone records).
- **Lack of evidence on inequities of vaccination coverage at sub-national, sub-district or health area level to identify low performing areas:** Identification of spatial patterns in immunization coverage and application of geostatistical methods to identify significantly low performing areas can provide compelling evidence to prioritize intervention.
- **Lack of evidence on geographic barriers and limitations to accessibility and utilization of services:** Modelling of geographic accessibility to services including realistic travel times, geographic barriers and typical modes of transport can support better identification of inequities in service delivery and optimization of such delivery.
- **Poor understanding of geographic and socio-economic factors determining access to vaccination services, coverage and efficacy:** Spatial analysis and modelling techniques can shed light on the interplay between various factors in determining low immunization coverage, and highlight how this interplay can vary between regions of the same country (e.g. areas where geographic accessibility is the main limiting factor to achieving coverage, such as rural areas, versus areas where other factors such as poor economic conditions are the major driver of accessibility to services, such as urban slums).
- **Lack of evidence for assessing the impact of future or alternative delivery scenarios:** GIS offers powerful tools to model service delivery scenarios and optimize location of services and allocation of resources. For example, the accessibility to future or alternative facilities can be modeled with respect to the target population based on considerations of distances and transport options, supporting evidence-based decision-making on future investment of vaccination resources.
- **Need for evidence-based advocacy for program improvement and request for additional resources:** Maps, charts, and the growing ecosystem of interactive web-mapping tools provide powerful communication tools to bring the analytical insights behind maps to decision-makers and drive change.



Allows identifying if geospatial data and/or technologies can help addressing some of these challenges



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

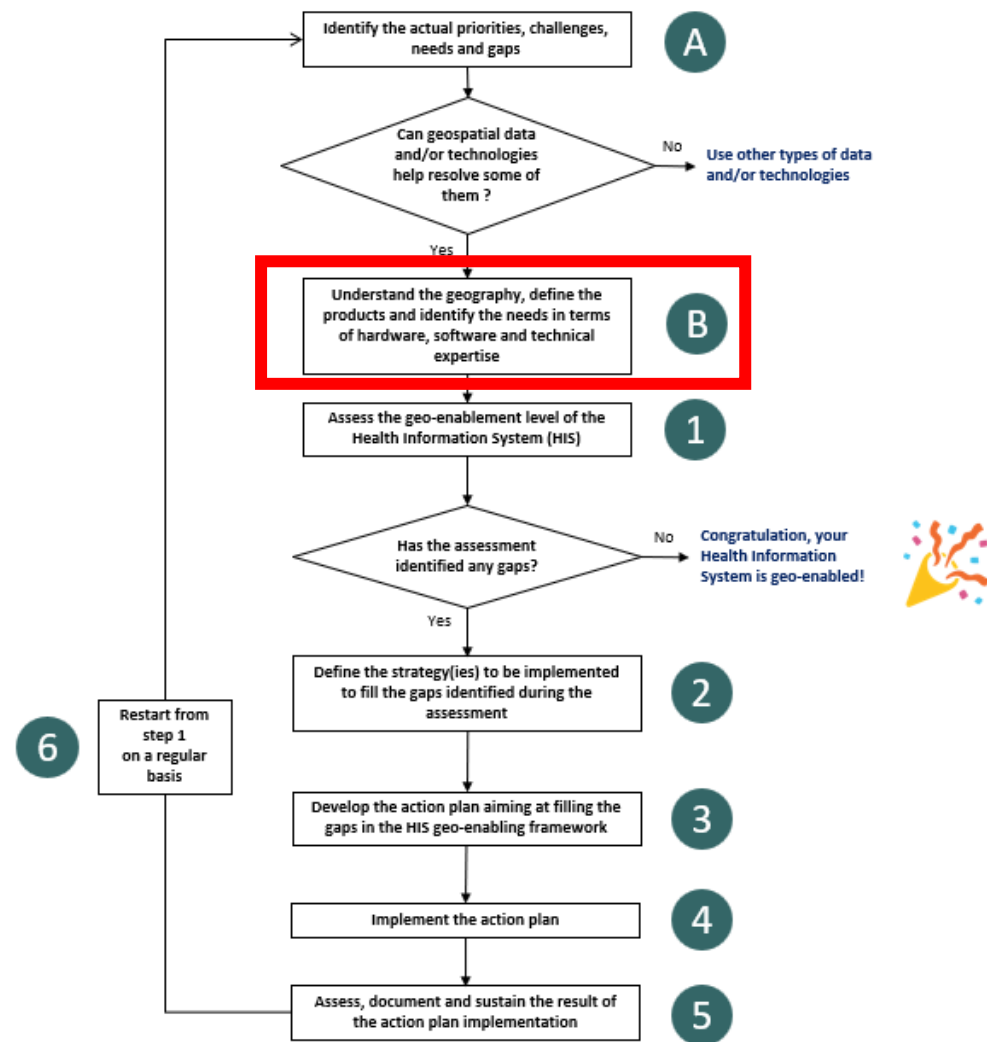
*...and beyond*

Session 6: Understand the geography of the program or intervention



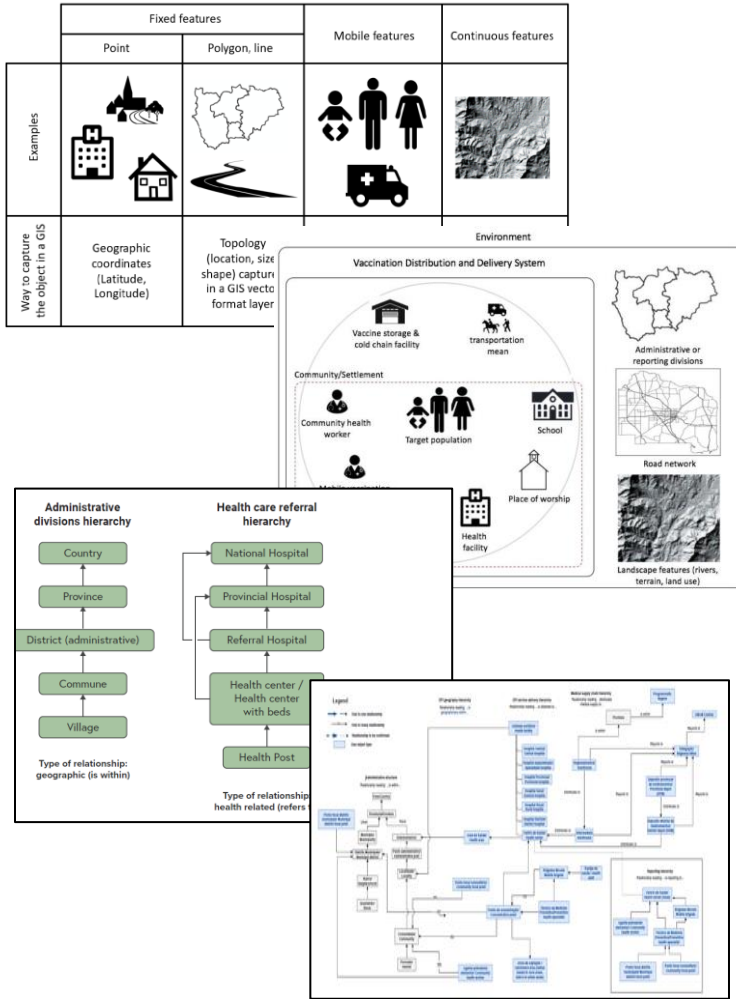
# HIS Geo-enabling framework implementation process

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

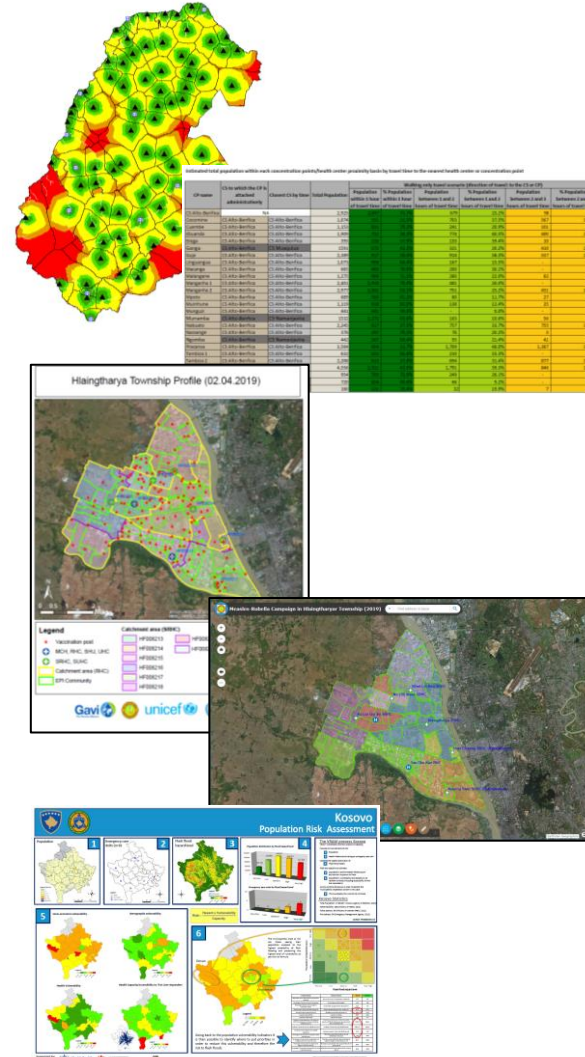


# HIS Geo-enabling framework implementation process

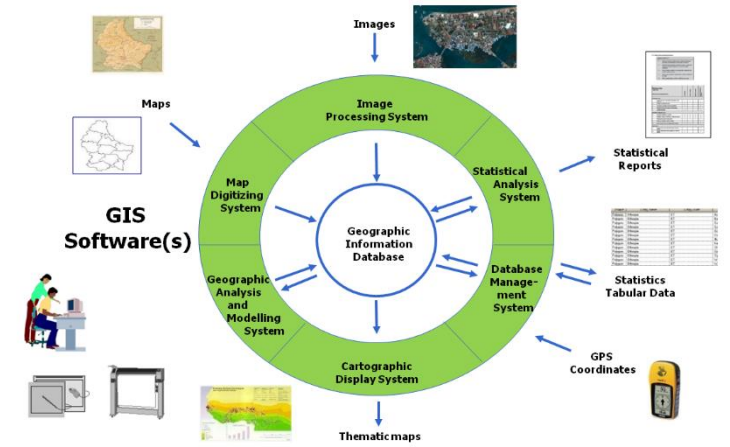
## Understand the geography



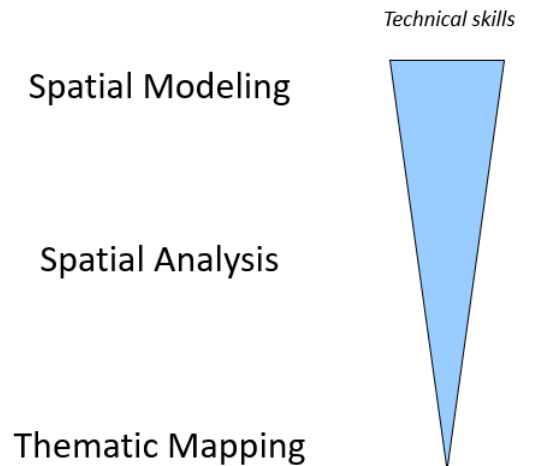
## Define the "geo" products



## Identify the needs in terms of hardware, software and technical expertise



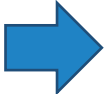




➔ Allow to define the data needs



# Understanding the geography

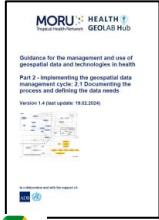
This understanding is achieved by identifying and documenting:

1. The program or **intervention strategy** (e.g., home vaccination)  Context
  2. The **geographic features** that are central to the implementation of the program or intervention (list of these features with their definition)  Eco-system
  3. The **relationships** that exist between these geographic features  Hierarchies
-  Data model

 Important to include all stakeholders involved in the planning and implementation of the program or intervention being geo-enabled

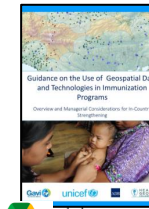
 This will directly influence the data needed to generate products

# Understanding the geography – Geographic features and objects

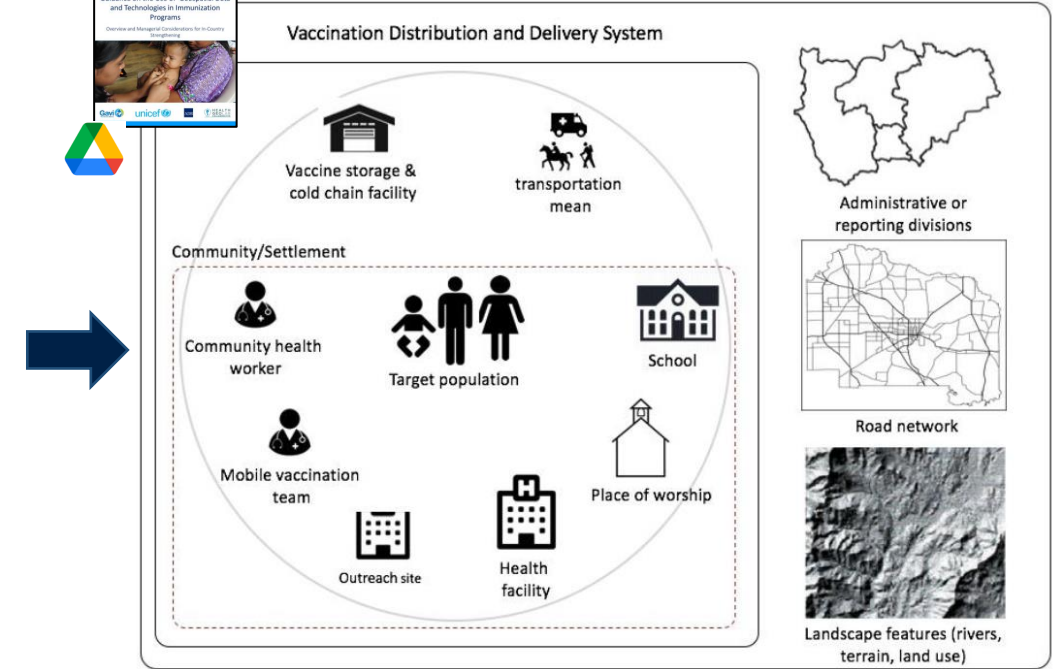


1

	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



2



- ➔ Geographic feature = Naturally and artificially-created features on the earth (e.g. house, road, health facility, river, etc.)
- ➔ Geographic object = Also called a geo-object, computer representation of a geographic feature (e.g. point, line, polygon)

1. [http://www.healthgeolab.net/DOCUMENTS/Guide\\_HGLC\\_Part2\\_1.pdf](http://www.healthgeolab.net/DOCUMENTS/Guide_HGLC_Part2_1.pdf)  
 2. <https://www.unicef.org/media/58181/file>

# Understanding the geography – Define each geographic feature

Example: What is a health facility?

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

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

Free dictionary: *Building where medicine is practiced.*

DOH Philippines: *A building or physical structure that has amenities, equipment and staffing for the delivery of health care services.*

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

➡ A building or a place/location are different concepts

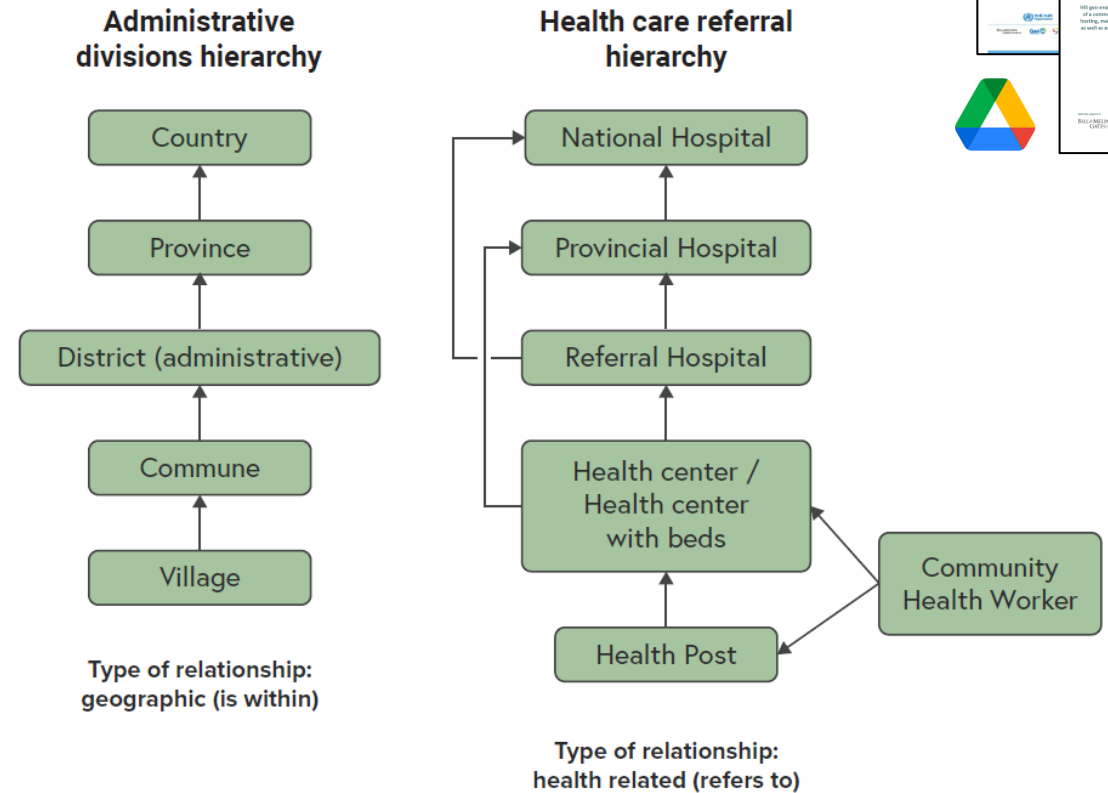
➡ Might need to define additional concepts (health care, medicine, service)

➡ The final definition will impact the next steps of the geo-enablement process

# Understanding the geography – Hierarchies

The relationship between geographic features can be of different types. For example:

1. Geographic (...is geographically located within..)
2. Health (...refers patients to...)
3. Administrative (...is administered by...,...is reporting to...)
4. Associative (...is part of...)



➔ Identifying and capturing these relationships in the form of hierarchies will influence the information that must be attached to each geographic feature to be in the position to recreate these hierarchies

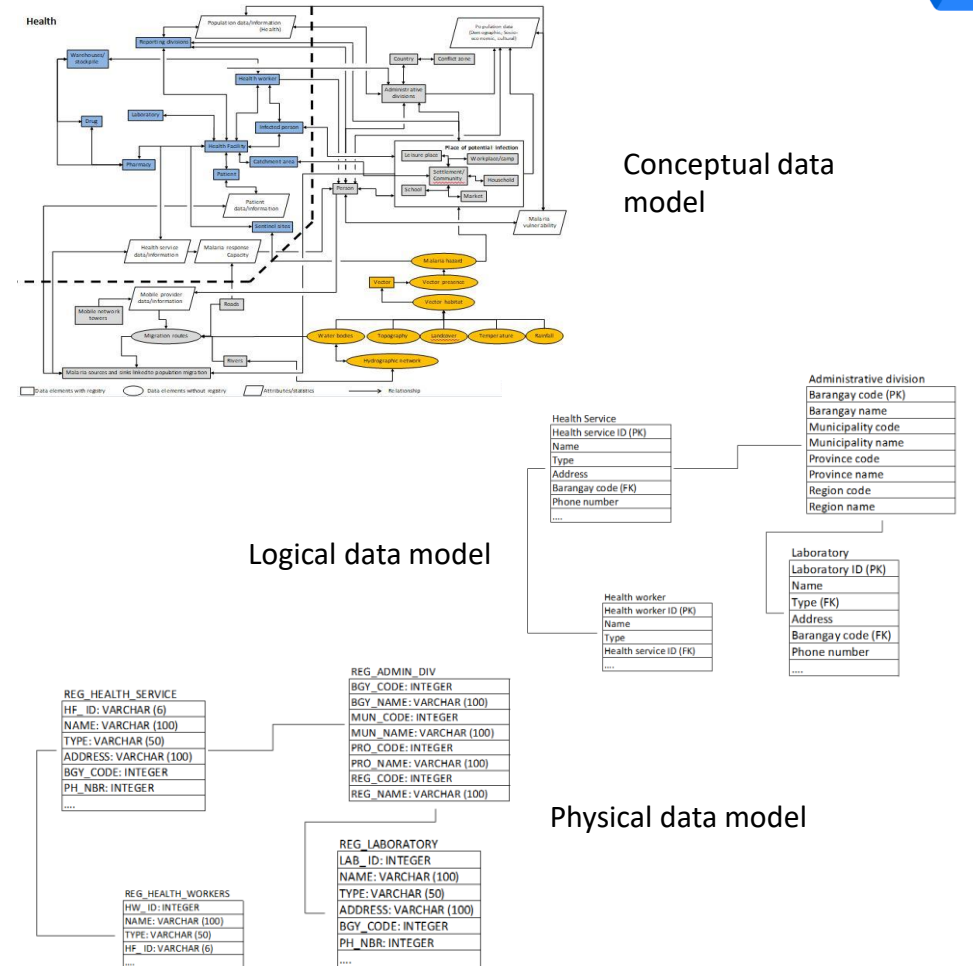
1. <https://drive.google.com/file/d/1jj779zww4herWOESAd9mXqVE1YfQeHtH/view?usp=sharing>  
2. [https://healthgeolab.net/DOCUMENTS/Guidance\\_Common\\_Geo-registry\\_Ve2.pdf](https://healthgeolab.net/DOCUMENTS/Guidance_Common_Geo-registry_Ve2.pdf)

# Understanding the geography – Data model

A data model is an abstract model that organizes and document the relationships that exists between geographic features and the data elements attached to each of them

Three (3) main levels of data model can be differentiated:

- 1. Conceptual data model** which captures all the identified geographic features and the relationships between all of them
- 2. Logical data model** which also captures the data elements associated to each geographic feature, without regard to how they will be physically implemented in the database
- 3. Physical data model** which captures how the model is being implemented in the information system

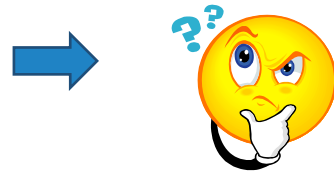
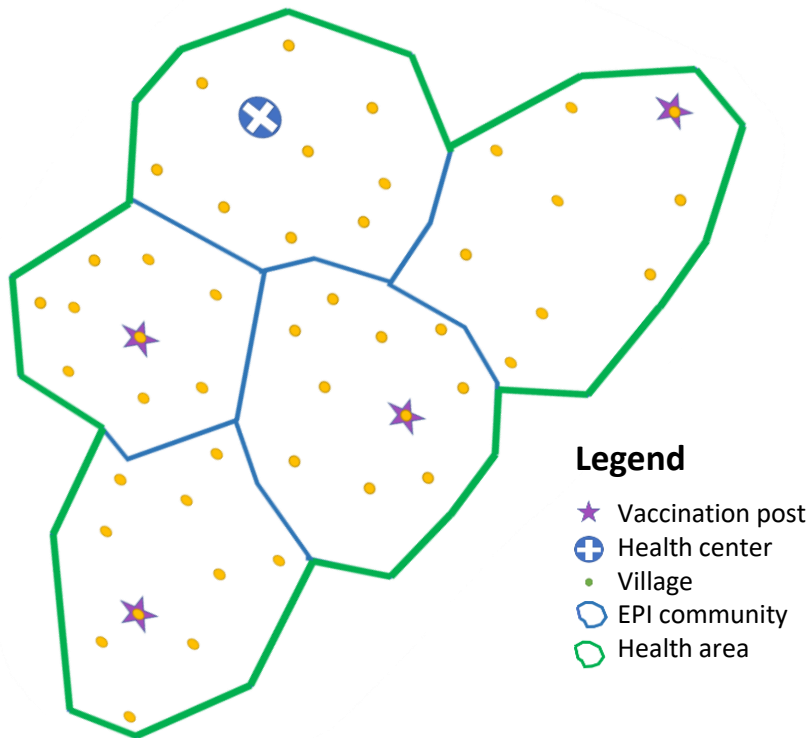


1 [http://www.healthgeolab.net/DOCUMENTS/Guide\\_HGLC\\_Part2\\_1.pdf](http://www.healthgeolab.net/DOCUMENTS/Guide_HGLC_Part2_1.pdf)

# Understanding the geography – Example (Myanmar)

Challenge: Microplanning not covering the whole target population

Immunization ecosystem



EPI community?

- ➡ Definition: Place where people live in community
- ➡ Required to define different types of EPI communities and population presence

EPI Communities type

EPI_T_EN	Definition (English)	Population status type (English)
Ward	4th level administrative divisions encountered in urban areas and officially recognized by the GAD	long term
Village	Long term settlement officially classified as village by the GAD	long term
Army	Settlement managed by the Ministry of Defense	short term, long term, seasonal
Camp	Settlement typically settled for displaced population (refugees or internally displaced population for example)	short term, long term
Workers settlement	Settlement setup by workers to live close to their place of work (plantation, factory, building site, mining site...)	short term, long term, seasonal
Other settlement	Any other inhabited place not covered by the other definitions	short term, long term, seasonal



Population presence classification

PS_T_EN	Definition (English)
Short term	Settlement setup for a period shorter than 1 year
Long term	Settlement setup for a period longer than 1 year
Seasonal	Settlement setup temporarily over the same period every year

➡ Helped identify communities that were not yet covered by vaccination campaigns



# Understanding the geography – Example (Mozambique)

Challenge: Microplanning form combining different types of geographic features that were not clearly defined (povoados, community)



**Passo 1.1a. Mapeamento das comunidades e Análise de acessibilidade para alcançar todas as comunidades**

Population #'s, identify 'high risk' populations, village or Health Facility names, health worker or village head names & contacts and vaccine delivery strategy per location

Data: \_\_\_\_\_

Distrito: \_\_\_\_\_

Unidade Sanitária: \_\_\_\_\_

Nome do Ponto focal de RED/REC da US: \_\_\_\_\_

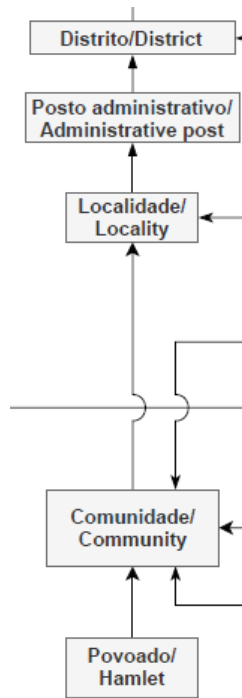
Sl. No	Nome do Ponto de Concentração	Nome dos Povoados	Existência de Comunidades de alto risco (difícil alcançar) Especificar a causa ou barreira (Ex. Rio sem ponte)	Distância da US para o Ponto de Concentração(km)	Distância do Povoado ao ponto de Concentração (km)	População Total	Líder do povoado		Ponto focal comunitário (para vacinação ou Voluntário)		Grupos alvos elegíveis para o ano					Estratégia de prestação de Serviços a usar (Fixa, Móvel, Avançada)
							Nome	Contacto	Nome	Contacto	Crianças menores de 1 ano	Crianças de 6 a 59 meses	Crianças de 12 a 59 anos	Mulheres grávidas previstas	Mulheres em idade fértil	
1																
2																

➔ Needed to get a clear definition for both of them and understand how they related to each other

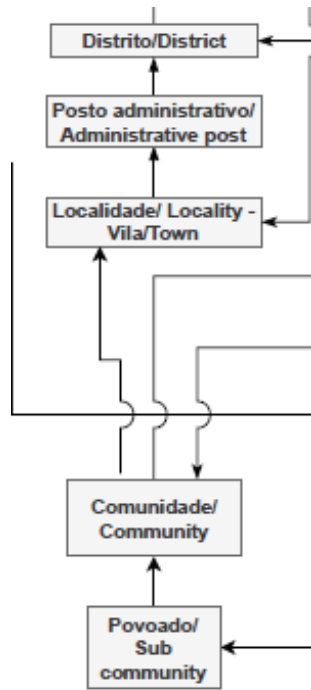
# Understanding the geography – Example (Mozambique)

Challenge: Microplanning form combining different types of geographic features that were not clearly defined (povoados, community)

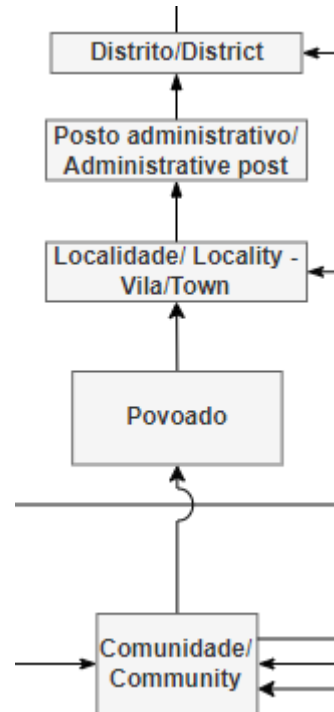
Aug 24, 2021



Sep 21, 2021



Oct 14, 2021



**Conclusion:**

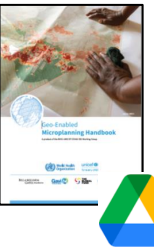
➔ Geographic feature without administrative role (only for statistical purpose)

➔ Unofficial geographic feature (no regulation in place)

➔ Recommendation made to the Ministry of Health to define and manage the micro-plan at the concentration point (vaccination post) level



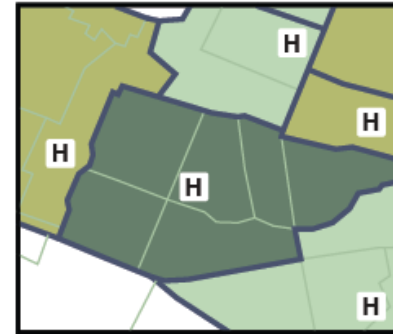
# Understanding the geography – Example (zone types)



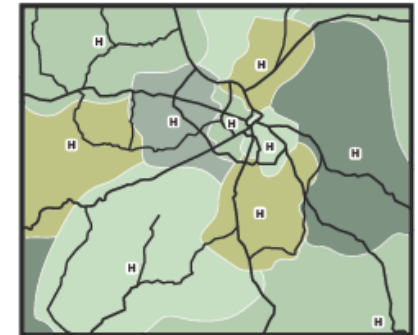
Challenge: Different understanding and use of the concept of catchment area

➔ Needed to come up with a common terminology

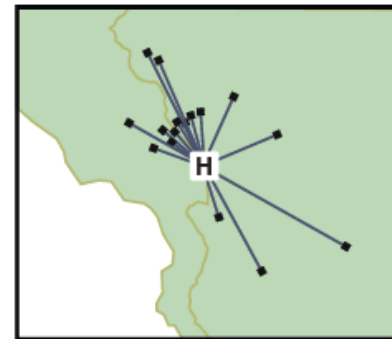
Type	Definition
Health area	Area around a health facility defined for purposes of cataloging, budgeting and health resource management
Proximity basin	An area around a service delivery point defined such that any location within this area is closer to that service delivery point than to any other service delivery point.
Catchment area	A geographical area delineated around an institution or business, such as a health facility, from where the population utilizes its services
Actual catchment area	Area around a service delivery point based on the location of the patient who received care at that service delivery point
Modeled catchment area	Catchment area modeled based on distance (buffer), travel time, population or a combination of these factors



Health areas



Proximity basin (travel time)



Actual catchment area



Modeled catchment area (distance)

# Understanding the geography – Process



1

Three (3) exercises:

1. Identify the geographic features specific to the program or intervention
2. Agree upon a definition for each of the geographic features identified during exercise 1
3. Capture the relationships between the geographic features identified during exercise 1 and defined during exercise 2

➔ Exercises ideally conducted (at least started) during a workshop attended by key representative from:

- The program or intervention being geo-enabled
- The main producers/consumers of geospatial data (HIS unit, communicable diseases, planning, immunization and emergency management) if the geo-enablement of the HIS is being performed

1 [http://www.healthgeolab.net/DOCUMENTS/Guide\\_HGLC\\_Part2\\_1.pdf](http://www.healthgeolab.net/DOCUMENTS/Guide_HGLC_Part2_1.pdf)

# Understanding the geography – Exercise 1 (cross-program)

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

# Understanding the geography – Exercise 1 (cross-program)

	Fixed features		Mobile features	Continuous features
	Point	Polygon, line		
Examples	<ul style="list-style-type: none"> <li>• Health facilities</li> <li>• Laboratories</li> <li>• Settlements</li> </ul>	<ul style="list-style-type: none"> <li>• Administrative units</li> <li>• Health districts</li> <li>• Health areas</li> <li>• Hydrographic network</li> <li>• Transportation network</li> </ul>	<ul style="list-style-type: none"> <li>• Patients</li> <li>• Health personnel</li> <li>• Mobile clinics</li> <li>• Ambulances</li> <li>• Equipment</li> <li>• Medicines</li> </ul>	<ul style="list-style-type: none"> <li>• Altitude</li> <li>• Land cover</li> </ul>
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

Often also provide the opportunity to clarify certain concepts or misunderstanding (e.g. data elements versus geographic features)

# Understanding the geography – Exercise 2 (cross-program)



First round during which each participant provide their own definition for the types of geographic features that are not already officially defined

Term	Definition	Consensus
		✓
		✗

First set of definitions



Additional rounds to address the geographic features for which there is no consensus

Term	Definition	Consensus

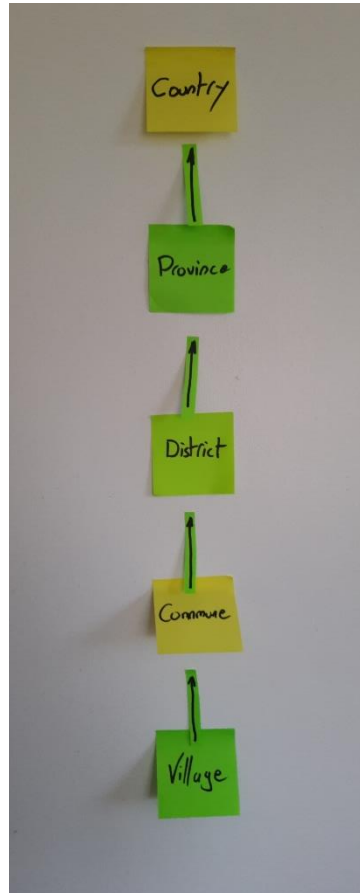
Full consensus

Final agreed upon definitions

Type of EPI community (English)	Type of EPI community (Myanmar language)	Definition (English)	Definition (Myanmar language)	Population's presence status options
Ward	ရွာနယ်	4th level administrative divisions encountered in urban areas and officially recognized by the General Administration Department (GAD)	မြို့နယ်အတွင်းရှိ ရွာနယ်များကို ရည်ညွှန်းသည်။	long term ✓
Village	ရွာ	long term settlement officially recognized by the General Administration Department (GAD)	မြို့နယ်အတွင်းရှိ ရွာများကို ရည်ညွှန်းသည်။	long term ✓
Army	တပ် (တပ်စခန်း)	settlement managed by the Ministry of Defense	တပ်မှူးခန်းမှ စီမံခန့်ခွဲသည့် ရွာများကို ရည်ညွှန်းသည်။	short term, long term, seasons ✓
Camp	ယခင်အစိုးရအစိုးရက ထူထောင်ခဲ့သည့် စခန်း	settlement typically built for displaced population (refugees or internally displaced population for example)	ပြည်ထောင်စုအတွင်းရှိ ရွာများကို ရည်ညွှန်းသည်။	short term, long term ✓
Workers settlement	အလုပ်သမားများအတွက် ဖန်တီးထားသည့် စခန်း	settlement setup by workers to live close to their place of work (plantation, factory, building site, mining site...)	အလုပ်သမားများအတွက် ဖန်တီးထားသည့် စခန်းများကို ရည်ညွှန်းသည်။	short term, long term, seasons ✓
Other settlement	အခြားအစိုးရမှ မထိန်းသိမ်းသည့် ရွာ	Any other inhabited place not covered by the other definitions	အခြားအစိုးရမှ မထိန်းသိမ်းသည့် ရွာများကို ရည်ညွှန်းသည်။	short term, long term, seasons ✓

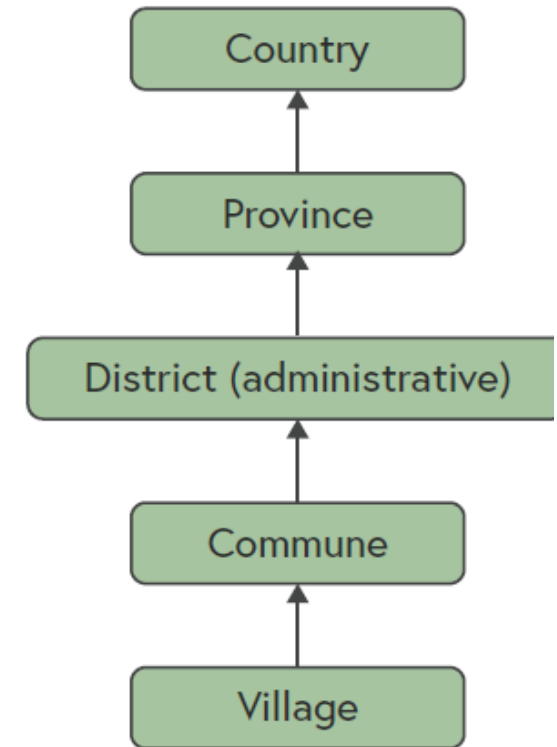
# Understanding the geography – Exercise 3 (cross-program)

Use the post its from exercise 1 to get the participants to organize them under the form of hierarchies



Capture the agreed upon hierarchies in an electronic format

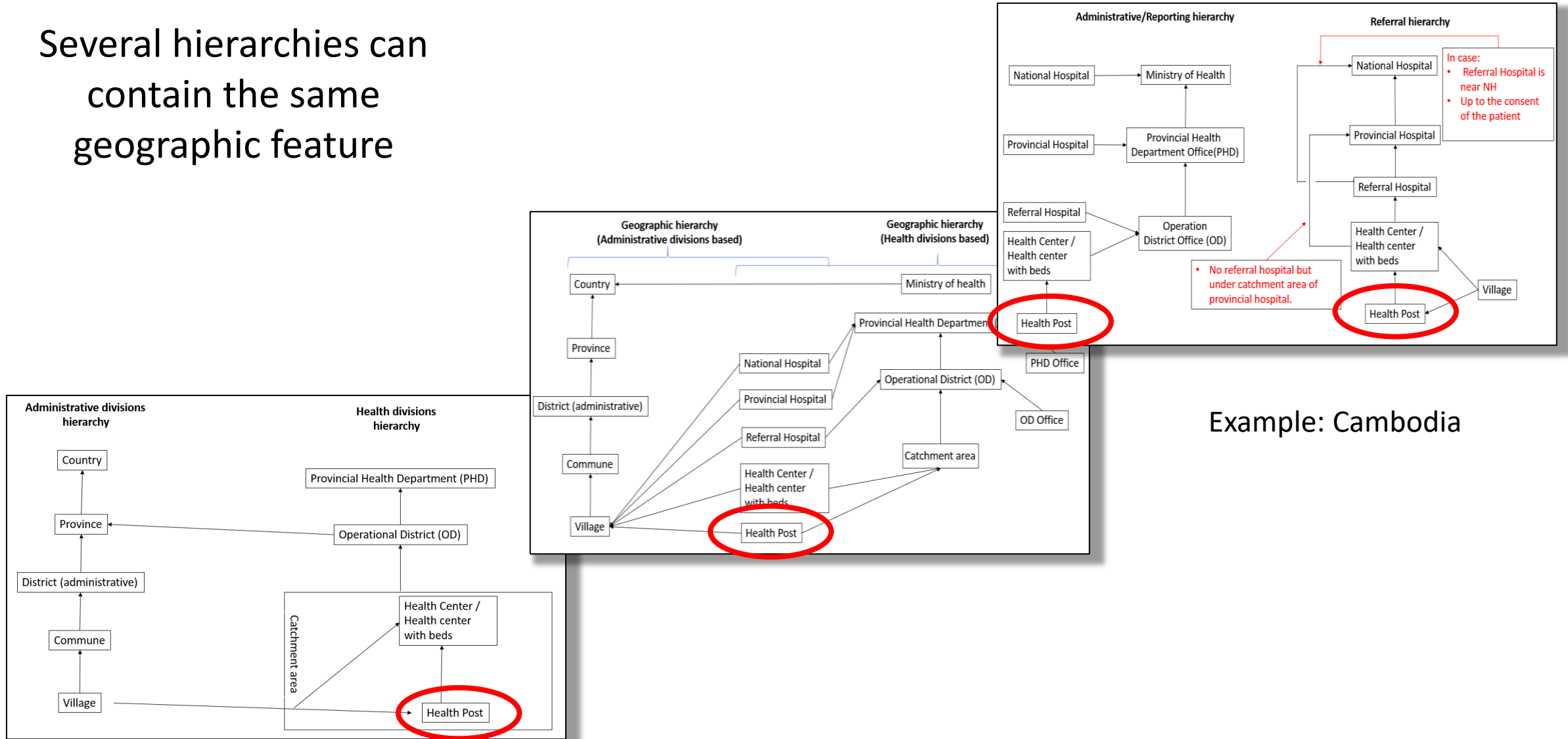
**Administrative divisions hierarchy**





# Understanding the geography – Exercise 3 (cross-program)

Several hierarchies can contain the same geographic feature



Example: Cambodia

# Module 3 – «Homework »

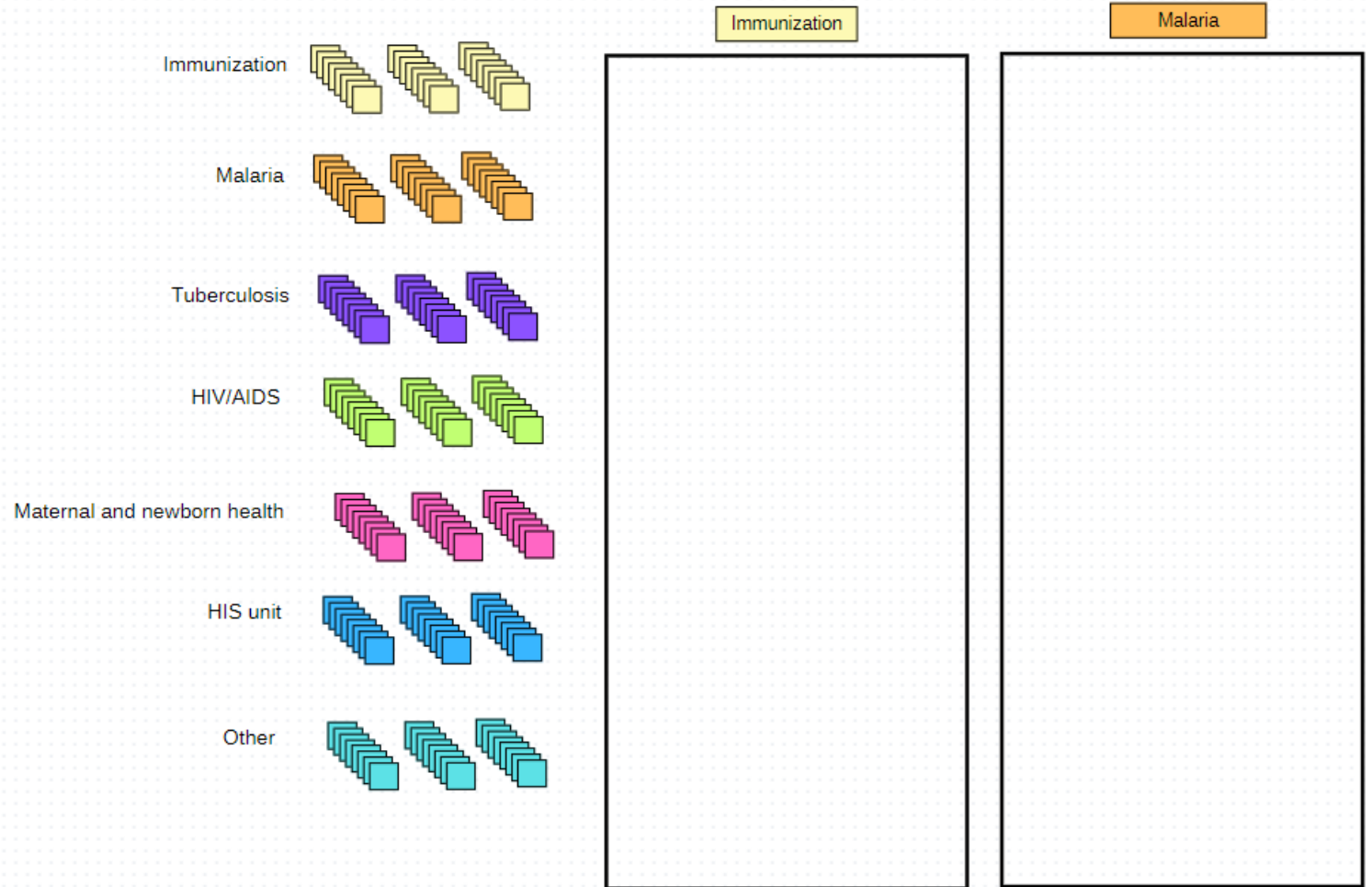
## Identification of the geographic features core to each program



Canva

<https://tinyurl.com/mw3jrsvw>

Deadline for  
completing the  
"homework: July 12th



# Module 3 – «Homework »

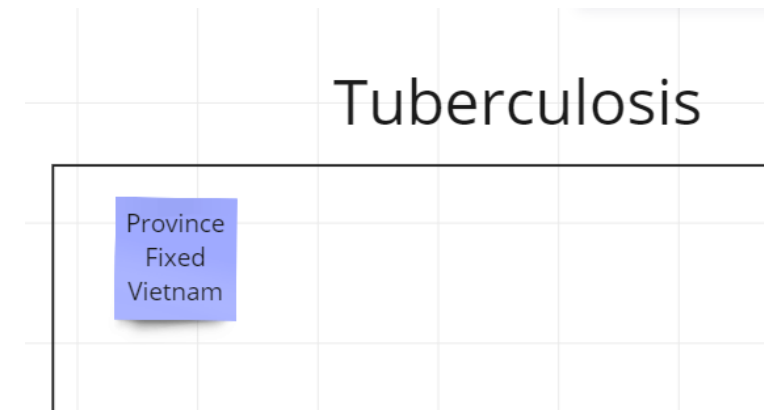
## Identification of the geographic features core to each program

Process:

1. Click on a post it of the color corresponding to your program (on the left)
2. On this post it, write:
  - The name of the geographic feature (one per post it)
  - The type of feature (fixed, mobile, continuous)
  - The name of your country

Province  
Fixed  
Vietnam

3. Place the post it on the frame corresponding to your program



4. Repeat steps 1 to 3 until you have covered all the geographic features you can think about

*Note: You can create more post it of a given color by clicking on one and then using the Ctrl-C and Ctrl-V combination on your keyboard*

# HIS geo-enablement level assessment questionnaire – Asia Pacific



<https://tinyurl.com/4veevrkr>

**Deadline: July 12th**

- For participants from Ministry of Health programs/units of Asia Pacific: Complete the rapid HIS geo-enablement level assessment questionnaire if not already done (maximum 15 min)
- For other participants from Asia Pacific: Encourage your counterparts in the Ministry of Health to complete the questionnaire

➔ The more programs we have, the more concrete and useful the rest of the training will be and the higher the possibility for each country to develop an action plan

➔ Thanks to APMEN's support will be provided to up to 3 countries of **Asia Pacific** after the training workshop to develop an action plan aiming at filling the gaps identified during the assessment

# Module 3 - Schedule

Schedule Module 3 17 July 2024 (Bangkok 12pm / Geneva 6am / Fiji 6pm)
15 min - Recap of Module 2 and agenda of Module 3
30 min - <b>Session 7:</b> Result of the geographic features identification performed by the participants
30 min - <b>Session 8:</b> Define the purpose, audience, content and format of the final products
15 min – <b>Session 9:</b> Identify needed hardware, software and technical expertise
20 min – <b>Session 10:</b> Assess the geo-enablement level of the HIS, program or intervention
30 min – <b>Session 11:</b> Result of the HIS geo-enablement level assessment for Asia and Pacific (9 elements of the HIS geo-enabling framework)

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