



Addressing the needs in terms of geographic information and GIS capacities to support HIV/AIDS monitoring, evaluation and response in Malawi

REACH Trust
Lilongwe, Malawi, 7th of September 2007



Welcoming Note

**Ministry of Health
Malawi**

Introduction of the participants

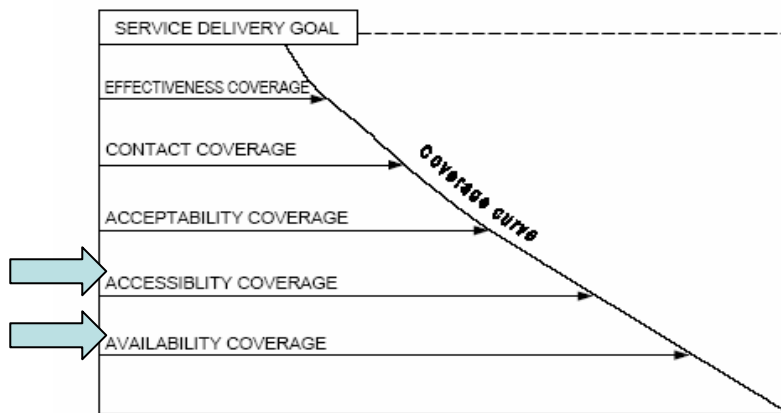
- Name
- Function
- Institution

Agenda

13.00	Introduction <ul style="list-style-type: none">- Welcoming and introduction of the participants.- Presentation of the context, objectives and expected outcomes for the meeting	MOH, WHO
13.30	What is needed ? <ul style="list-style-type: none">- by the MOH, including the HIV/Mal/TB assessment plan- for the Equity project- potential additional needs in terms of geographic information and GIS capacities to support HIV/AIDS monitoring, evaluation and response	MOH, WHO and participants
14.00	What do we have at disposal ? <ul style="list-style-type: none">- Outcome of the GIS capacity and data availability report- Update and complement of information by the participants	WHO and participants
14.30	<i>Coffee</i>	
14.45	How could we fill the gaps ? <ul style="list-style-type: none">- proposition of collaborative process- Discussion	WHO and participants
15.30	Creating an health facility registry for Malawi <ul style="list-style-type: none">- presentation of the situation- the Signature Domain- discussion	WHO, MOH and all the participants
16.30	Next steps and conclusion	
17.00	Closure	

Context of the project

"Promoting equity and a health systems approach towards treatment access and responses to HIV and AIDS in Southern Africa: a joint project for World Health Organization (WHO), REACH Trust Malawi / Southern African network on Equity in Health (EQUINET)"



Source: Tanahashi, T, 1978

MEASURING AVAILABILITY AND ACCESSIBILITY COVERAGE. RESULTS OF THE GIS CAPACITY AND DATA AVAILABILITY ANALYSIS: MALAWI

PROMOTING AN EQUITY AND HEALTH SYSTEMS APPROACH TOWARDS TREATMENT ACCESS AND RESPONSES TO HIV AND AIDS IN SOUTHERN AFRICA: A JOINT PROJECT BETWEEN WHO, REACH TRUST MALAWI AND SOUTHERN AFRICAN NETWORK ON EQUITY IN HEALTH

1. Introduction and Objectives

As part of the equity project there is coverage offered by the AST case del procedures and data that needs to be accessible coverage highlighted the Information System (GIS) to measure a

The villages of Malawi to take sub involved in a preliminary analysis of an delivery system conducted in July 2006.

The objective of this report is to present recommendations based on:

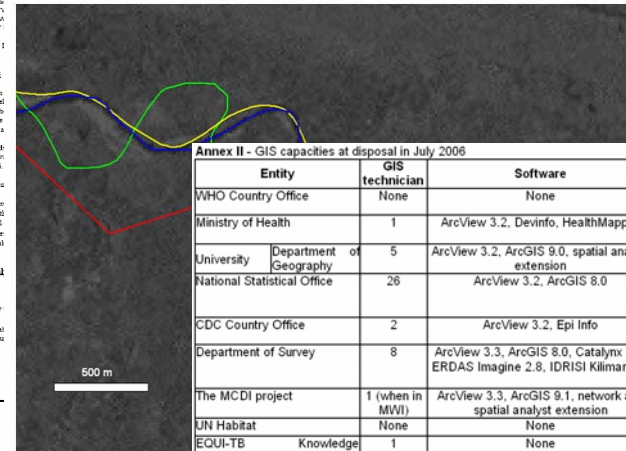
- Establishing operational team perform the technical work as it
- Improving the quality and level
- Exploiting the possibility of a component of the country health

2. Process followed for the goal

2.1 Data

Two types of information are generally:

- the size of the population,
- the quantity of resources (total number of health facilities, and equipment, etc).



Annex II - GIS capacities at disposal in July 2006

Entity	GIS technician	Software	Special Hardware	Nbr of GPS
WHO Country Office	None	None	None	None
Ministry of Health	1	ArcView 3.2, Devinfo, HealthMapper	A0 plotter	37 (one for each district)
University Department of Geography	5	ArcView 3.2, ArcGIS 9.0, spatial analyst extension	None	None
National Statistical Office	26	ArcView 3.2, ArcGIS 8.0	A0 plotter, 3 A0 digitizing table, 1 A4 scanner	30
CDC Country Office	2	ArcView 3.2, Epi Info	None	None
Department of Survey	8	ArcView 3.3, ArcGIS 8.0, Catalyx 1.2, ERDAS Imagine 2.8, IDRISI Kilimanjaro	2 A0 plotter, 2 A0 Digitizing table, 1 A0 Scanner	3 (Leica) + 2 hand holds
The MCDI project	1 (when in MWI)	ArcView 3.3, ArcGIS 9.1, network and spatial analyst extension	None	10
UN Habitat	None	None	None	None
EQUI-TB Programme Knowledge	1	None	None	1
Lighthouse	1	ArcView 3.1, network analyst extension	None	1
	45	9 different software	3 large size plotter, 5 large size digitizing tables, 1 big size scanner	82
Total				

+ Visit in April 2007

Objectives of the meeting

Addressing the needs in terms of geographic information and GIS capacities to support **HIV/AIDS monitoring, evaluation and response in Malawi**

- ➔ **Data (GIS layers)**
- ➔ **Resources (skills, material,..)**
- ➔ **Standards (codes, metadata,...)**
- ➔ **Processes (data collection, analysis,...)**
- ➔ **Networking !!!**

Expected Outcomes

- 1. Establish or strengthen the connection between the main Institutions collecting/using Geographic information and Geographical Information System (GIS) of use in public health**
- 2. Improve the quality and level of completeness of the already existing GIS data and associated information in order to first answer the needs from the different partners involved in HIV/AIDS monitoring, evaluation and response in Malawi**
- 3. Establish a link between this work, the geographic component of the Malawi Health Facility Registry and the Health Management Information System (HMIS)**



Going beyond HIV/AIDS

Session 1: What is needed ?

Objective: Make sure that we have a clear pictures of the needs in terms of geographic information and GIS capacities to support HIV/AIDS monitoring, evaluation and response in Zambia

Content:

1. Needs of the MOH
2. Needs of WHO for the Equity project
3. Potential additional needs for other institutions

Expected outcomes: Descriptions of the needs

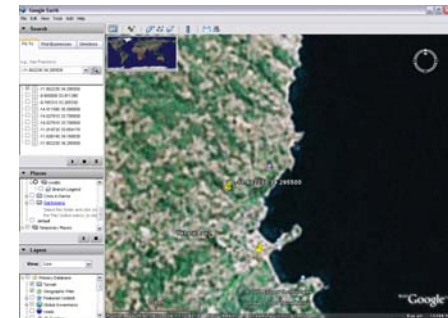
Time at disposal: 30 minutes



Needs of Malawi's Ministry of Health: Geographic Information and GIS capacities



Patrick Naphini
HMIU, MoH



GIS Needs of MoH

- ❖ **SWAp M&E Framework has one key indicator requiring the use of GIS:**
 - % of population residing within 5 km of a health facility**
- ❖ **This is to be reported by every district annually**
- ❖ **In order to be able to report, capacity for GIS mapping will need to be built in the districts**

GIS Needs of MoH (contd.)

- **HMIU charged with the responsibility for equity monitoring**
- **Quality implies that care will be allocated according to need; priority will be given to those who will derive the most benefit.**
- **If the goal is the elimination of disparities in care, then we must begin to *routinely* monitor the care provided to vulnerable and most needy groups for suboptimal care.**
- **GIS could be used to collect data on equity disaggregates**

Other potential applications

- **Planning** of facilities, infrastructure and equipment
- **Human resource planning-** especially identifying and deploying hard-to-reach facilities
- **Policy Decisions:** eg **Resource allocation formula**
- **Informing Decision Makers-** especially on EHP coverage by identifying gaps in services and geographic patterns for access to different service elements

What's currently available

GEOGRAPHIC DATA:

- Point data that refers to health facility location
- Polygon data which refers to catchment areas for health facilities

CATEGORY OF LAYERS:

- Public health facilities layer (includes all MoH and CHAM facilities-collected in 2002)
- Private health facilities layer (includes non-MoH service providers – including NGO such as MACRO- collected in 2004) – needs thorough cleaning and updating as it falls short of expectations)

NEEDS AT THE HEADQUARTERS

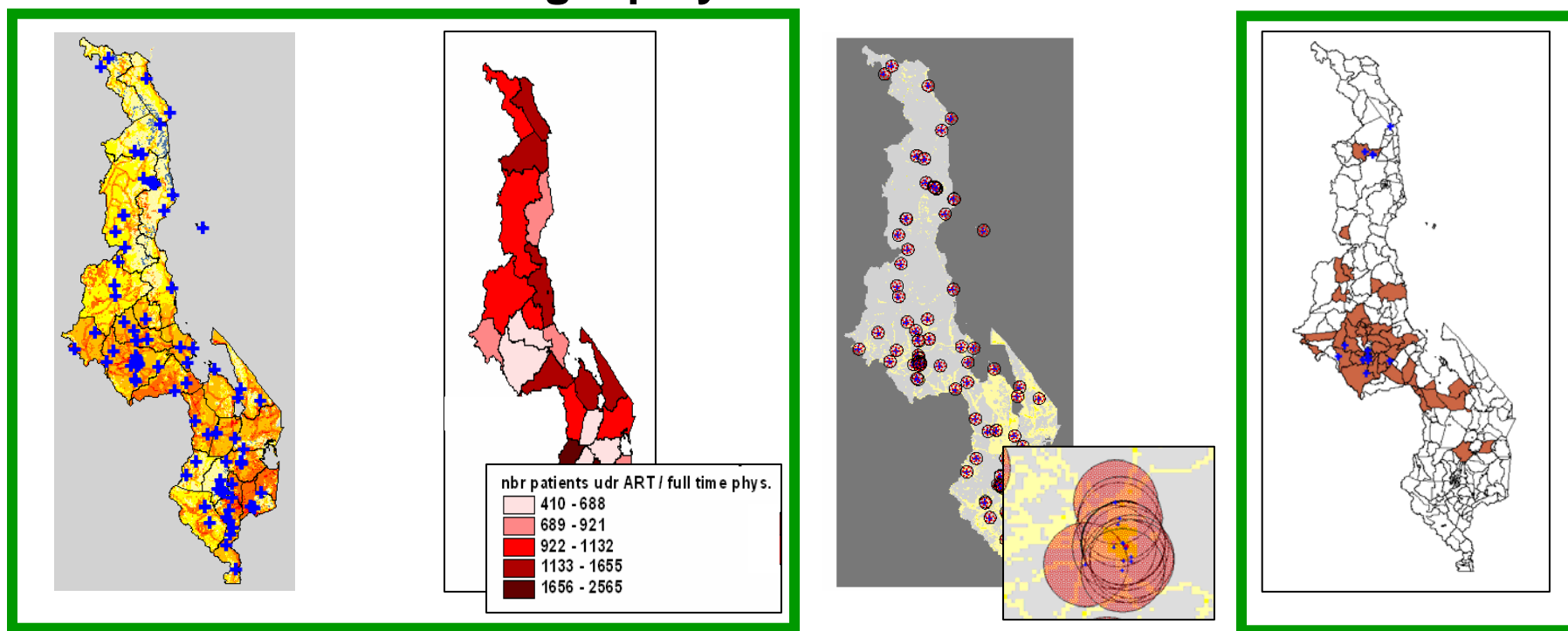
- **HR**: one officer totally dedicated to GIS applications with one assistant
- **HR capacity development**: Advanced training for the officer and basic training for the assistant. Appropriate training courses will need to be identified and funding mobilized.
- **Networking**: both within and outside country.
- **Equipment**: hardware including spares, printers, software, etc
- **Spatial Databases**: electronic; and linked to Government and other websites

NEEDS AT THE DISTRICTS

- **Training of Asst. Statisticians**
- **Hardware and software**
- **Supervision and on-the-job mentoring**

Needs of WHO for the equity project

1. Measuring availability and accessibility coverage
2. Measuring equity in access to HIV/AIDS care

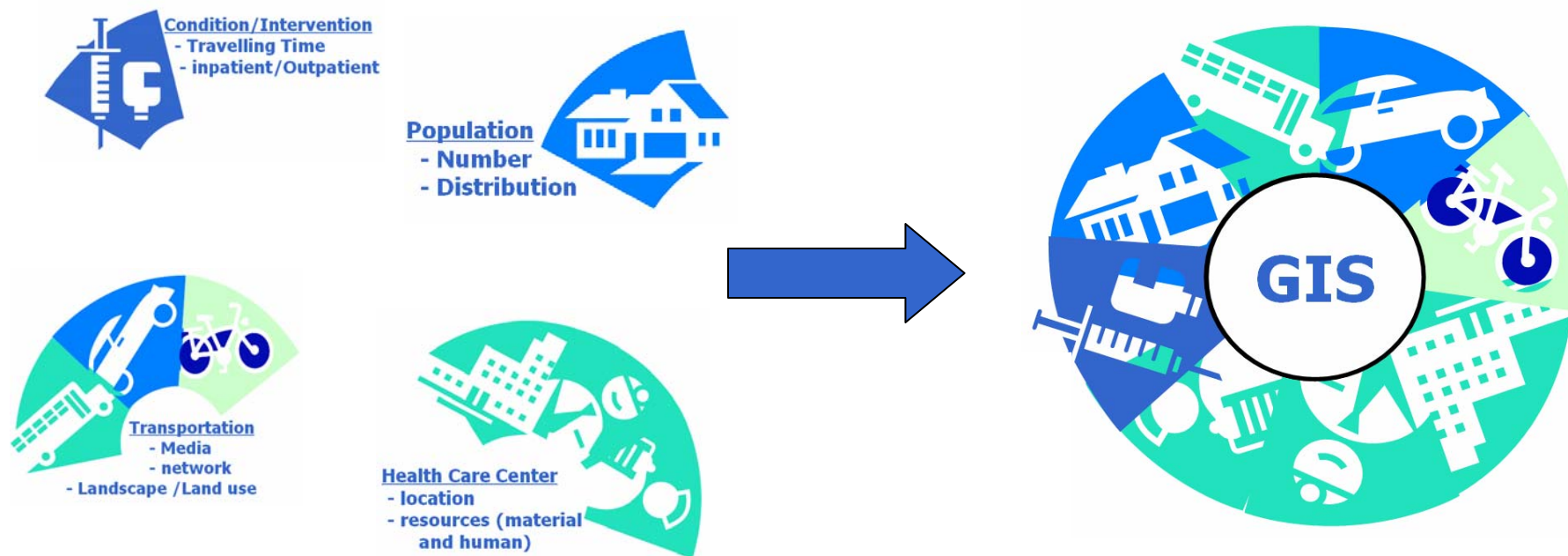


➔ Not easy to assess availability, accessibility nor equity in access

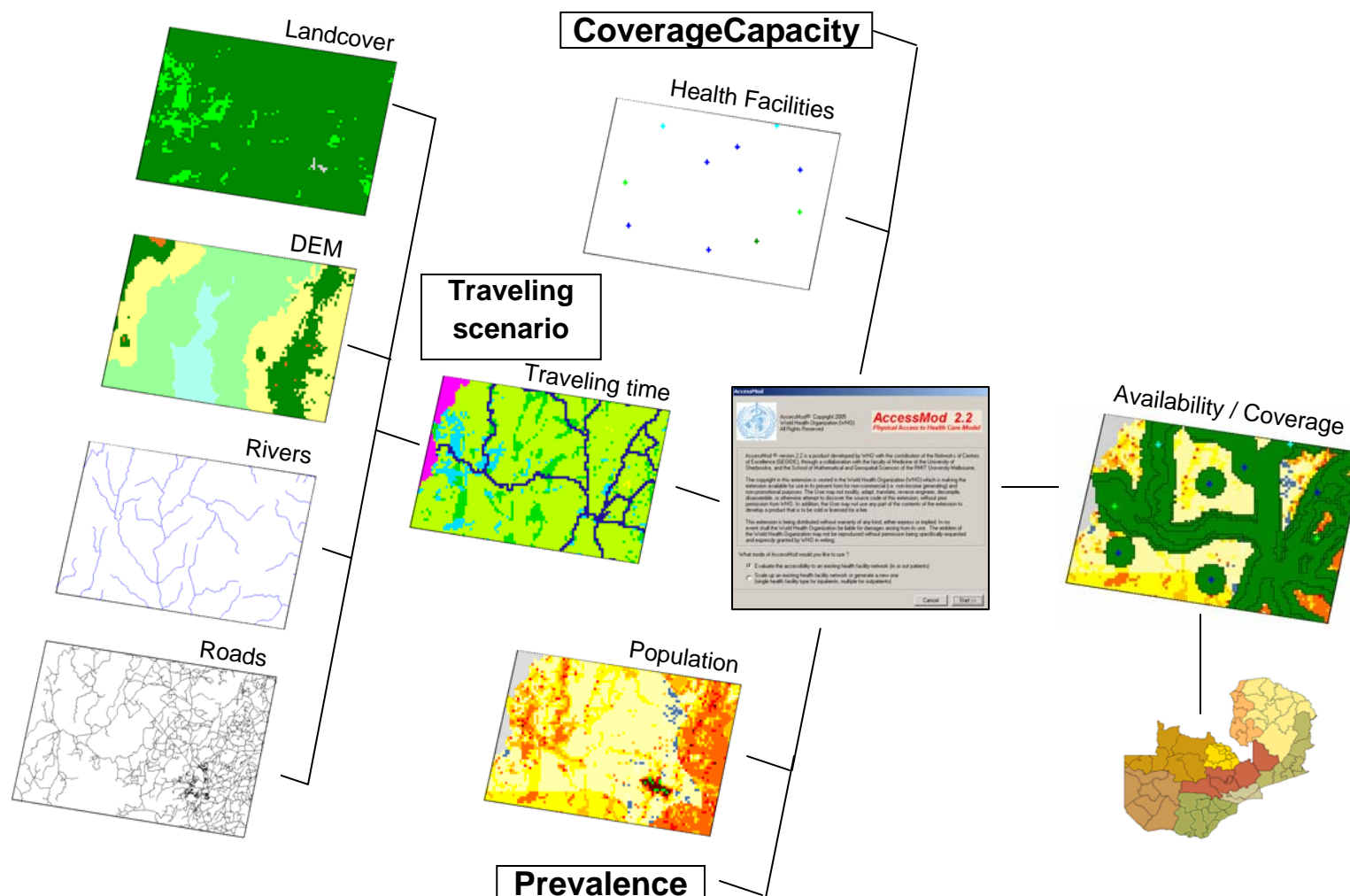
➔ need to take the demand (patients) and offer (care delivery) into account

Needs of WHO for the equity project

1. Measuring availability and accessibility coverage
2. Measuring equity in access to HIV/AIDS care



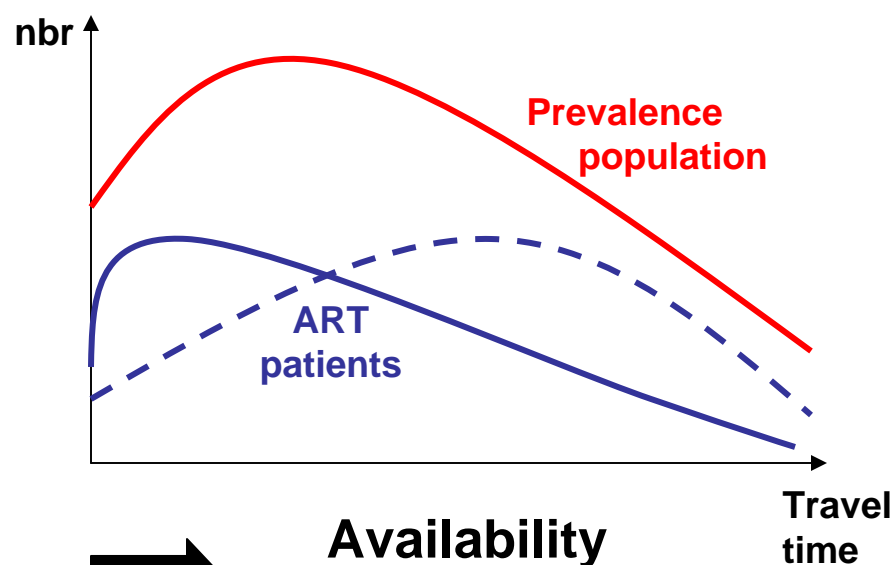
Needs of WHO for the equity project



Needs of WHO for the equity project

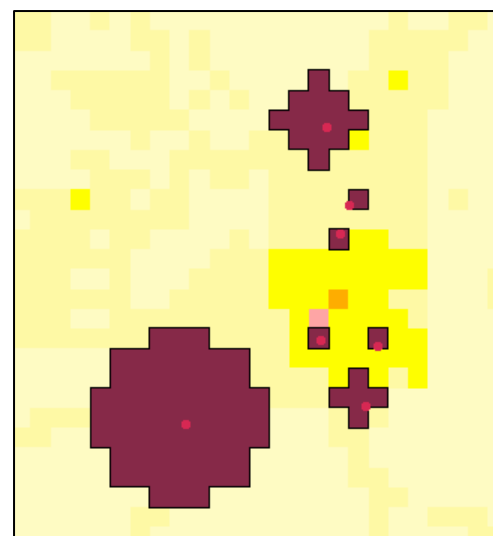
➔ Propose to add two indicators through this approach

Spatial distribution of the prevalence population and the ART patient compare to the location of the ART sites



➔ Availability
Accessibility

Percentage of the population in needs located within 1 hour of travel of the nearest ART site taking into account the patient coverage capacity of each site.



Correct for the overlap

Take the offer and the demand into account

➔ Coverage

Potential other needs

- *Intensifying Prevention of HIV*
- *Expanding Treatment, Care and Support*
- *Location of the different partners activities*
- *Extension of the catchment areas linked to the partner's activities*
- *Resource mapping for all the activities listed here*
- *Mitigating the Socio-economic impact of HIV and AIDS*
- *Decentralising the Response and mainstreaming HIV and AIDS*
- *Monitoring of the Multi-Sectoral Response*
- *Integrating Advocacy and Coordination of the Multi-Sectoral Response*
- *Mapping indicators*

Summary of the needs (data)

GIS Layer	MOH	WHO (Equity)	NAC	UNAIDS	CDC	REACH Trust	
Health facility location		X					
Population distribution		X					
Roads		X					
Rivers		X					
Administrative boundaries (Provinces, districts, constituencies, wards)		X					
Statistical units (Census CSA, EA)		X					
Health districts							
Neighborhood health area							
Landcover		X					
Altitude		X					
Prevalence distribution		X					
Health facility coverage capacity		X					
Traveling scenario		X					
....							

Summary of the needs (resources)

- 1. Skills: data collection, data extraction (quality), cleaning, analysis and modeling**
- 2. Software: - for AccessMod: ArcView 3.x + Spatial Analyst extension
- for the treatment of satellite images**
- 3. Hardware: - GPS devices (maybe)
- computer running the GIS application**

Session 2: What do we have at disposal ?

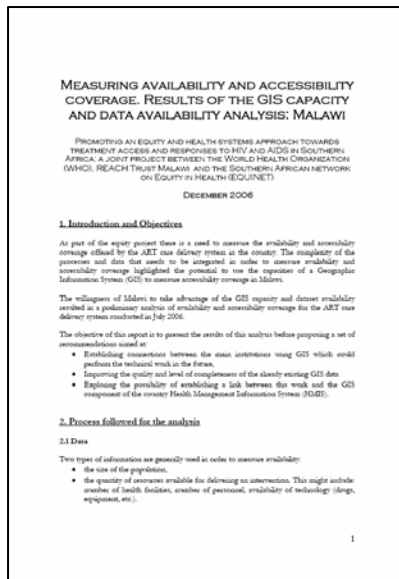
Objective: Identify the GIS data and capacities currently available

Content: 1. Outcome of the GIS capacity and data availability analysis performed in July 2006 and the visit that followed in April 2007
2. Update and complement of information by the participants

Expected outcomes: List of the available data, capacities and resources. Identification of the gaps in terms of data and resources

Time at disposal: 30 minutes

GIS capacity and data availability report



The report look at 4 aspects in relation with the equity project:

- Availability of the data necessary for the application of AccessMod (population, health facilities, altitude, landcover, roads, rivers, administrative boundaries, schools)
- Level of completeness and compatibility
- GIS capacities (skills and software)
- GIS working connections between the visited institutions

➡ The list of institutions visited/contacted is reported on page 3 of the report

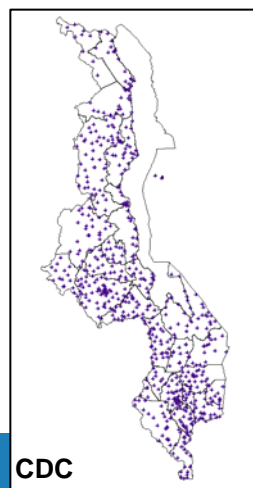
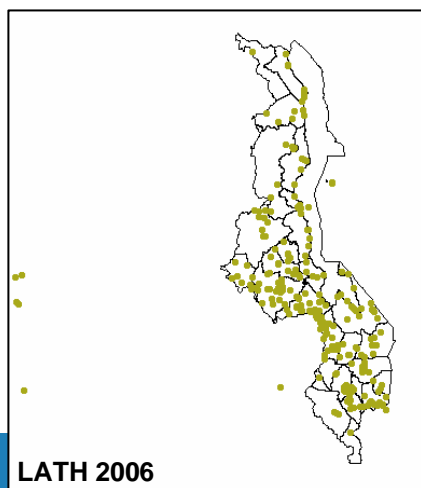
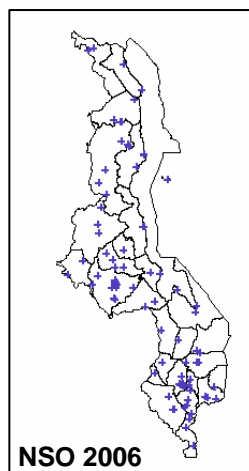
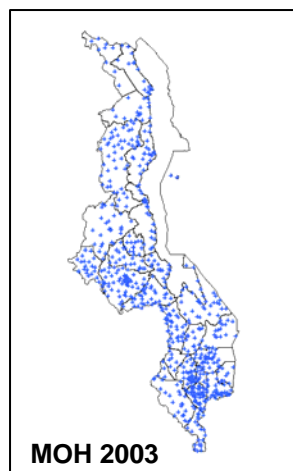
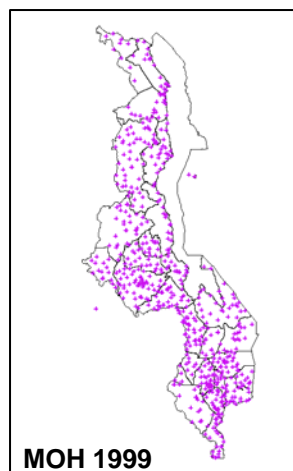
➡ The level of compatibility of the GIS layers has been estimated using satellite images

➡ Completed by a visit in April 2007

GIS capacity and data availability report

Data (page 7-17+visit)

Location of the health facilities



Source: Multiple (MOH, CDC, LATH, NSO)

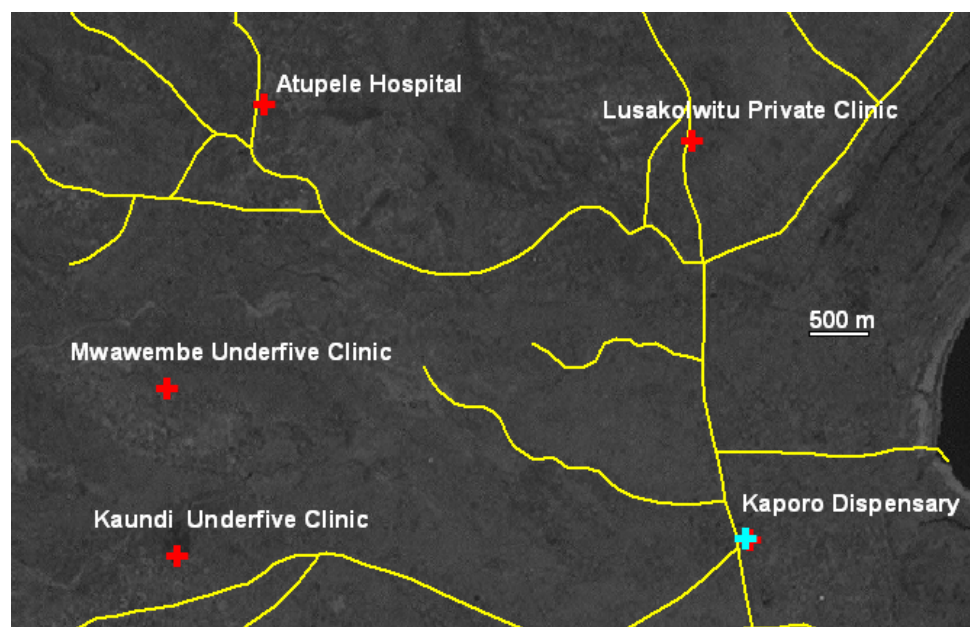
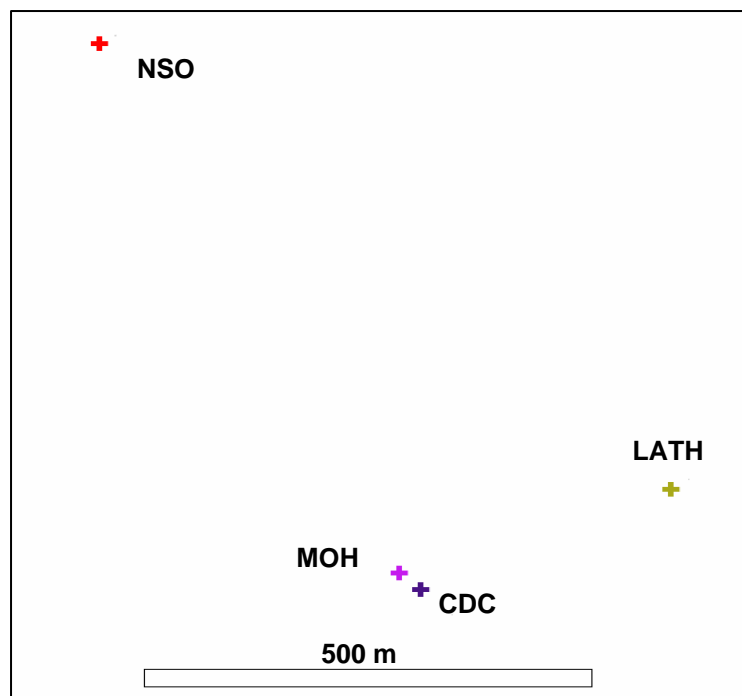


- First round with GPS coordinates finalized in 1999 (MHO): 767 facilities
- MOH-JICA Census (02-03: 721)
- Other data sources:
 - NSO (2006, ?)
 - LATH (2006, 446, 377 mapped)
 - CDC (?, 669)
 - ...

GIS capacity and data availability report

Data (page 7-17+visit)

Location of the health facilities



- ➔ Clean and merge the different existing datasets
- ➔ Initiate an updating process taking advantage of existing data collection exercises

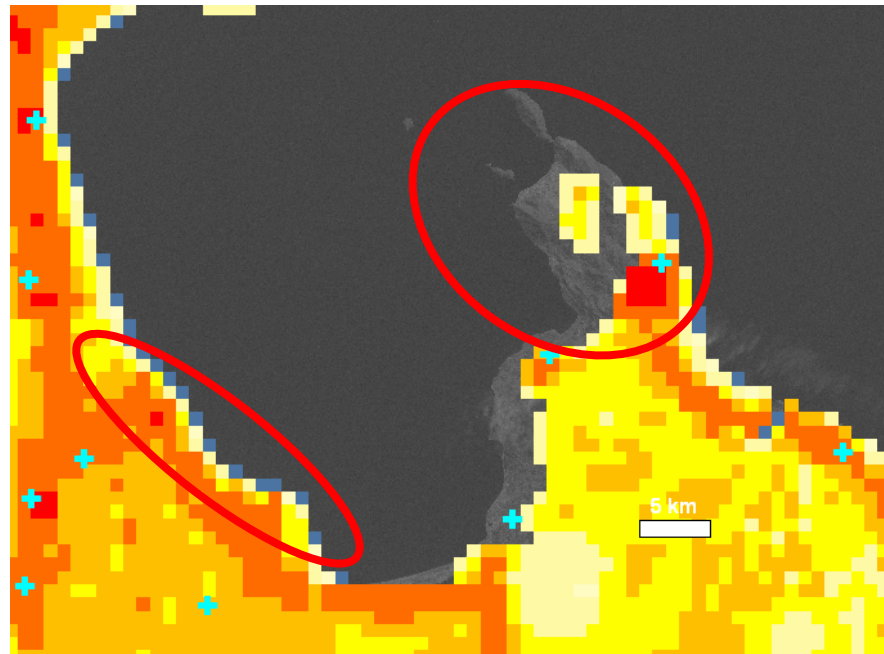
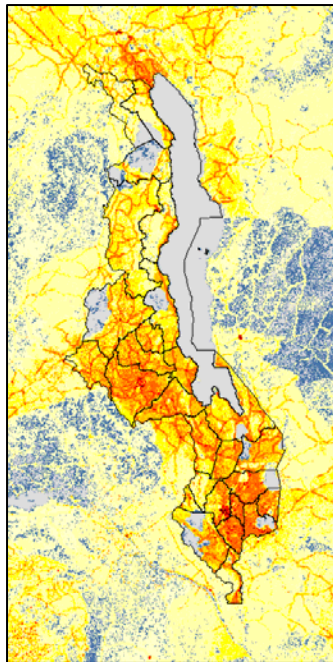
GIS capacity and data availability report

Data (page 7-17)

Population

Last Census: 1998 ➡ down to the numeration Area (EA) level.

Other source: Landscan



➡ Need to create a new grid

➡ 2008 Census ?

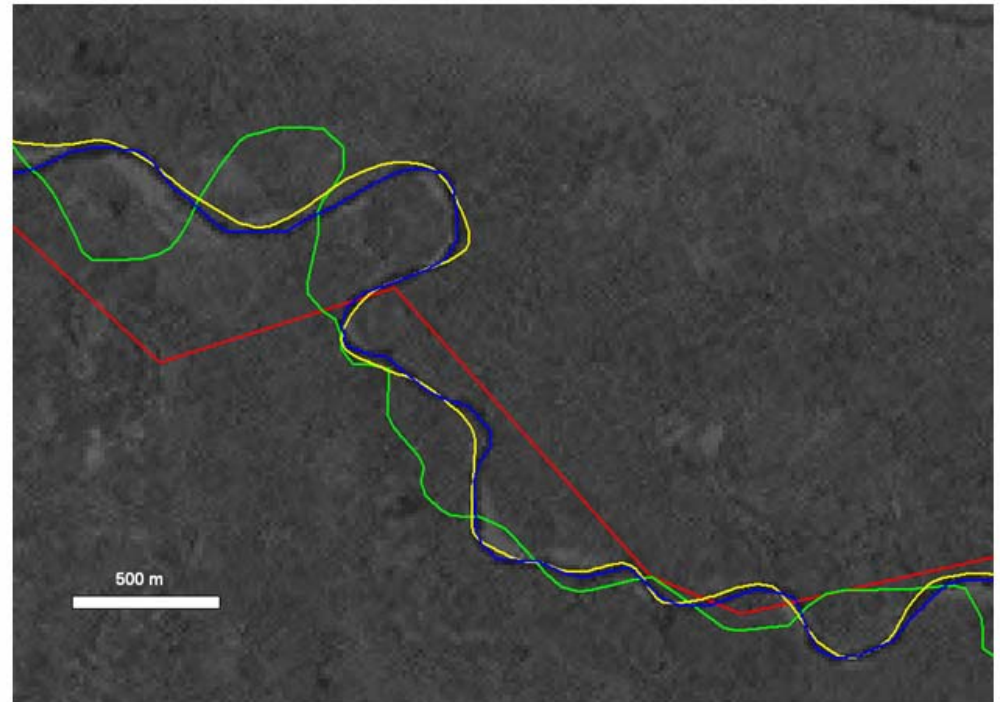
GIS capacity and data availability report

Data (page 7-17)

Roads (NSO, Survey Dep., GI)



Rivers (NSO, Survey Dep., GI)

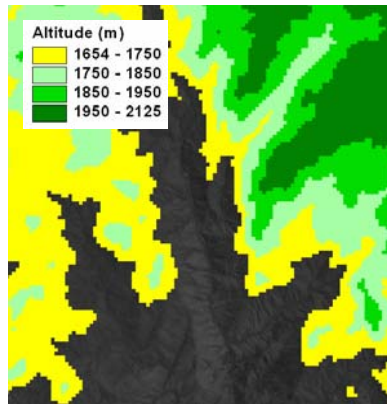
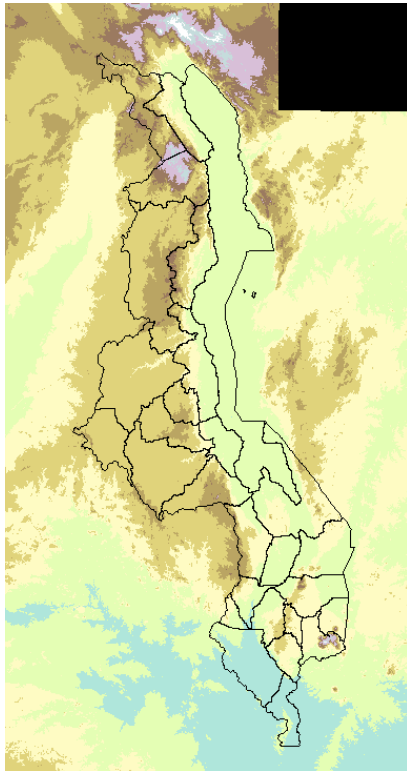


➔ Important differences that could lead to errors when performing spatial analysis or spatial modeling

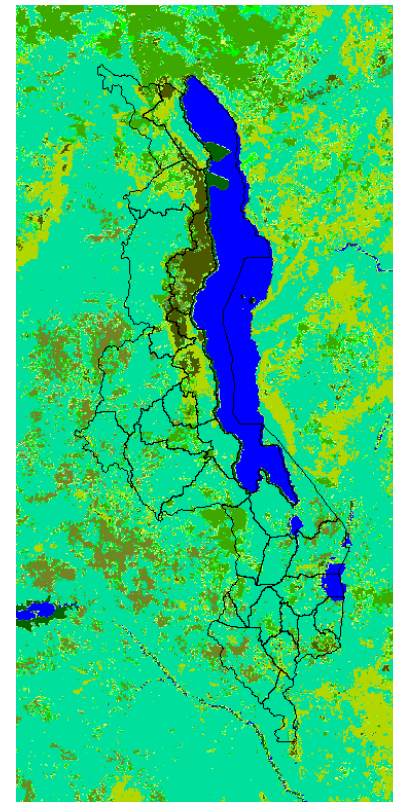
GIS capacity and data availability report

Data (page 7-17)

Altitude (Survey Dept.,
SRTM 90,
GTOPO30)



Landcover (Landscan,
Dept of Forestry ?)

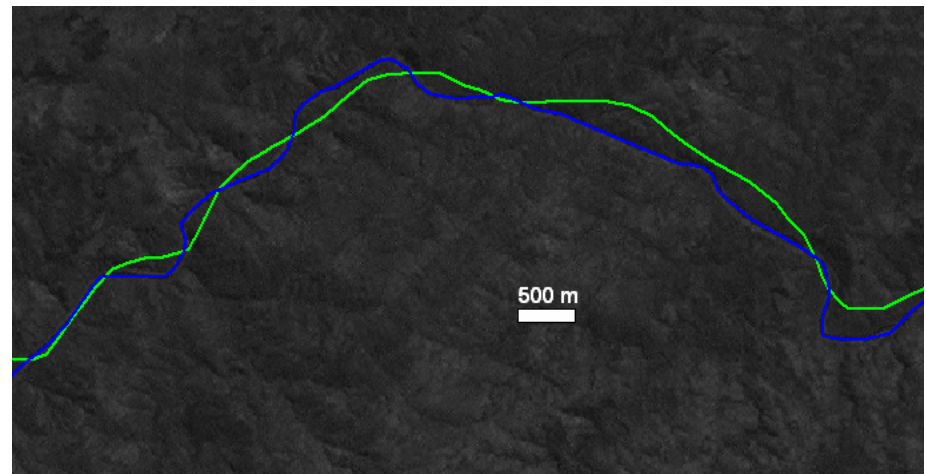
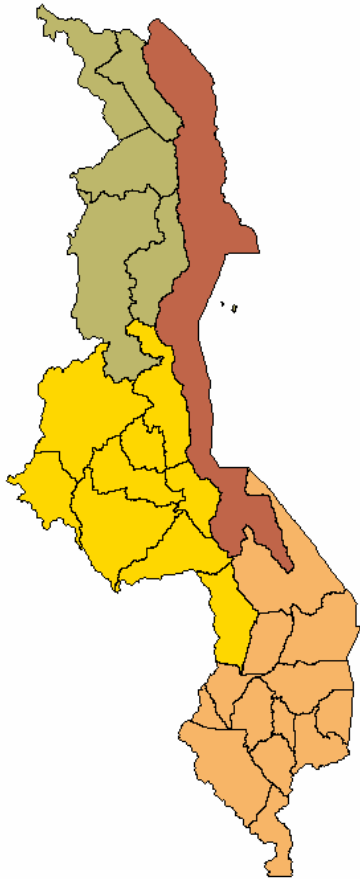


➔ Both based on satellite images

GIS capacity and data availability report

Data (page 7-17)

Administrative Boundaries (Survey Dpt.)



GIS capacity and data availability report

GIS Capacities (page 23)

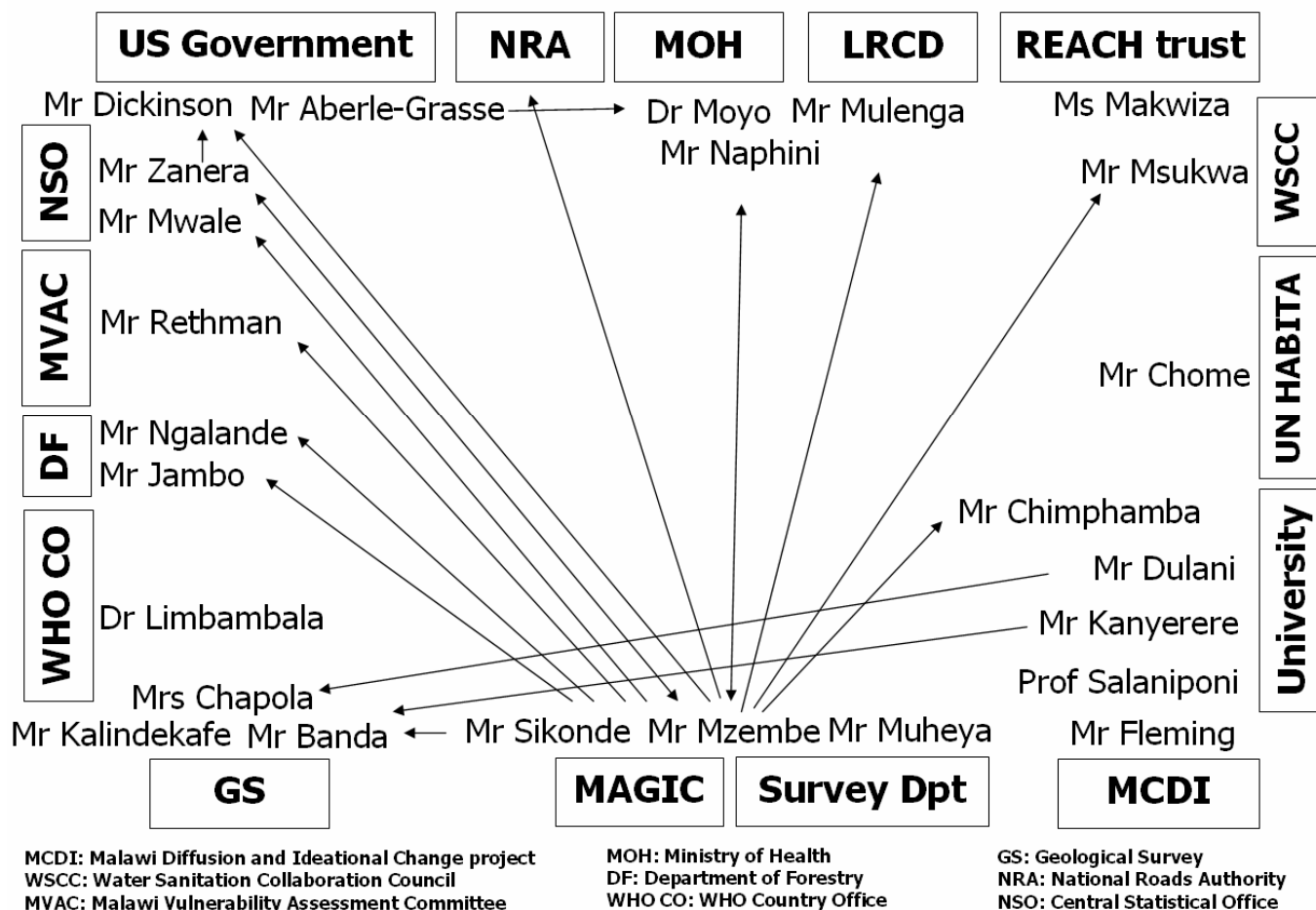
Annex II - GIS capacities at disposal in July 2006

Entity		GIS technician	Software	Special Hardware	Nbr of GPS
WHO Country Office		None	None	None	None
Ministry of Health		1	ArcView 3.2, Devinfo, HealthMapper	A0 plotter	37 (one for each district)
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The MCDI project		1 (when in MWI)	ArcView 3.3, ArcGIS 9.1, network and spatial analyst extension	None	10
UN Habitat		None	None	None	None
EQUI-TB Programme	Knowledge	1	None	None	1
Lighthouse		1	ArcView 3.1, network analyst extension	None	1
Total		45	9 different software	3 large size plotter, 5 large size digitizing tables, 1 big size scanner	82

GIS capacity and data availability report

GIS Working connections (page 6)

Who works with whom ?



GIS capacity and data availability report and visit - Conclusions

- **Existence of an important capacity, in terms of skills, hardware and software in the country**
- **Several layers of good quality that might just need to be updated or integrated. Different situation with the health facilities**
- **Larger number of GIS stakeholders in the country with very limited communication or even working relationship leading to:**
 - **Duplication of efforts and lost opportunities**
 - **Difficulties to make data compatible (coding scheme, time component, lack of data collection protocols and standards,..)**
 - **Large park of specific hardware (e.g. large size printer) which is not frequently used**

➔ Leveraging the existing capacity and data and improving the working connection between the stakeholders would benefit all and improve decision making

Session 2: Discussion

Update and complement of information by the participants regarding:

- **The existence of other potential source of GIS layer and/or GIS capacities**
- **Issues that would not be addressed in the report**

➔ Identification of the gaps

Identification of the gaps (data)

Layer	Have it ?	Suitable ?	Missing ?	Updating process ?	Resources ?
Health facility location	Yes	TBC	?	?	?
Population distribution	Yes	No	Accuracy	2008 census ? Settlements ?	?
Roads	Yes	Yes	?	Road/Survey dept ?	?
Rivers	Yes	TBC	?	Survey dept ?	?
Administrative boundaries	Yes	TBC	Nothing	Yes	?
Landcover	Yes	Maybe	?	?	?
Altitude	Yes	TBC	Nothing	Not needed	?
Coverage Capacity	TBC	?	?	?	?
Traveling scenario	TBC	?	?	?	?
Prevalence	Yes	?	?	?	?

Session 3: How could we fill the gaps ?

Objective: Discuss a proposition for filling the gaps

Content: 1. Presentation of the proposition for the equity project
2. Discussion on how this could be extended to the other needs and possibly other interventions

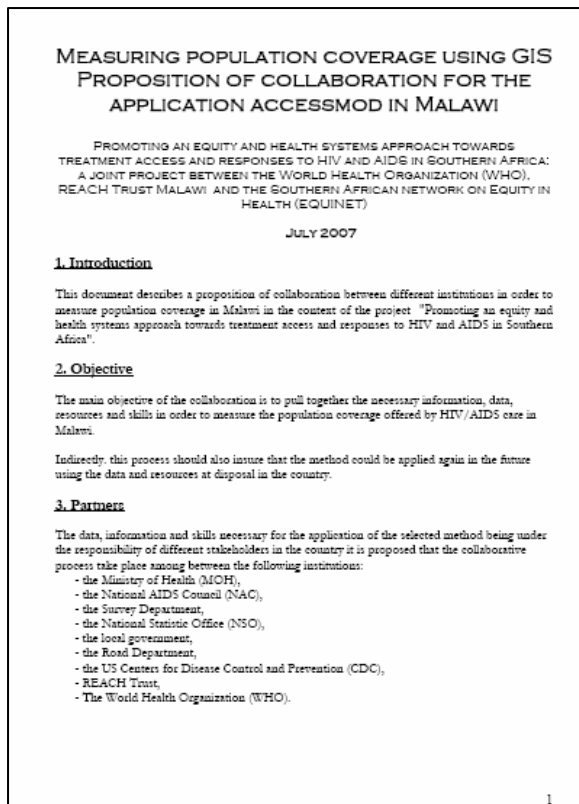
Expected outcomes: possible technical process

Time at disposal: 45 minutes

Session 3: How could we fill the gaps ?

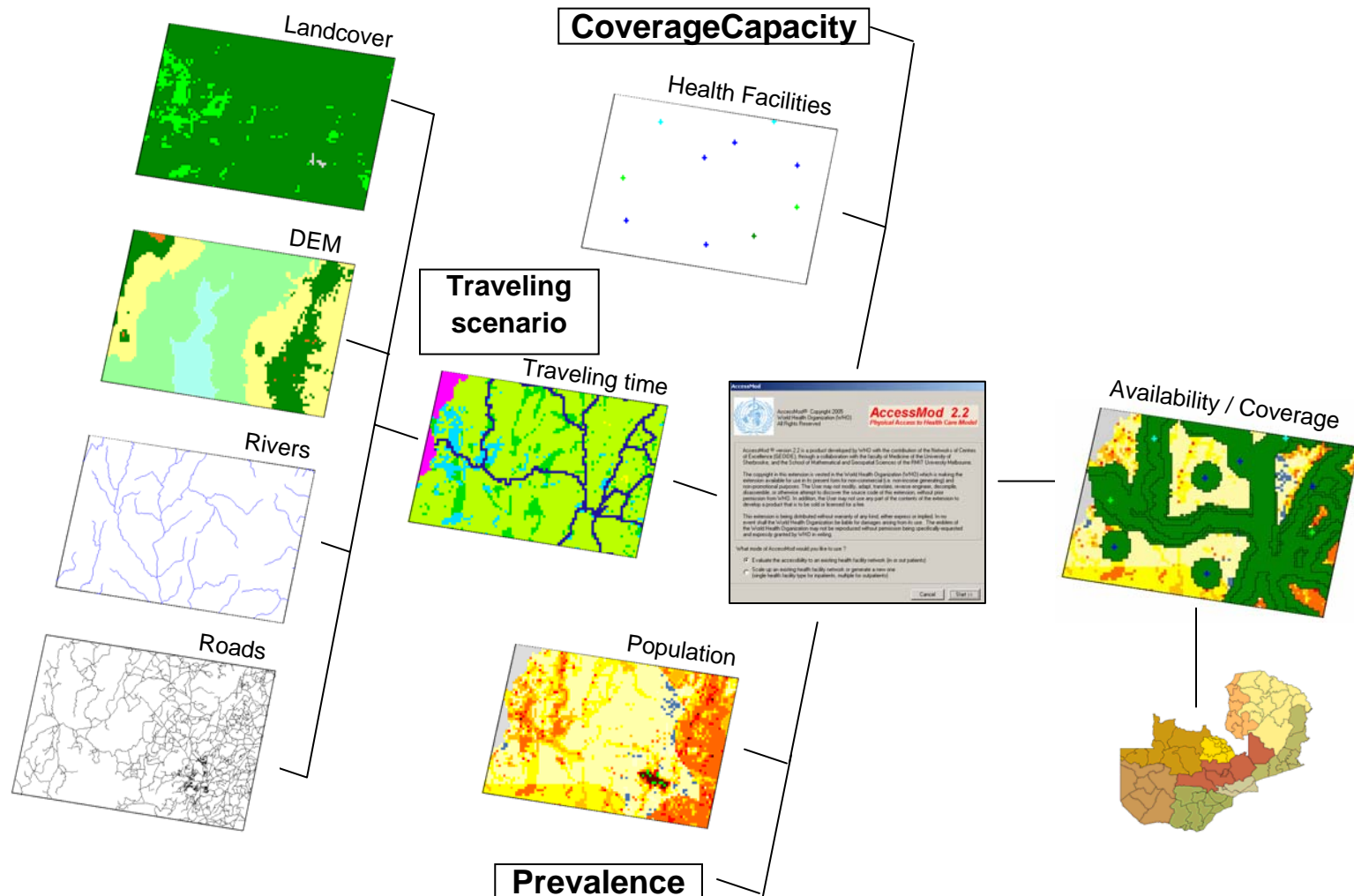
➡ Start small to demonstrate the benefit of working together

➡ Extend the approach to a larger group afterwards

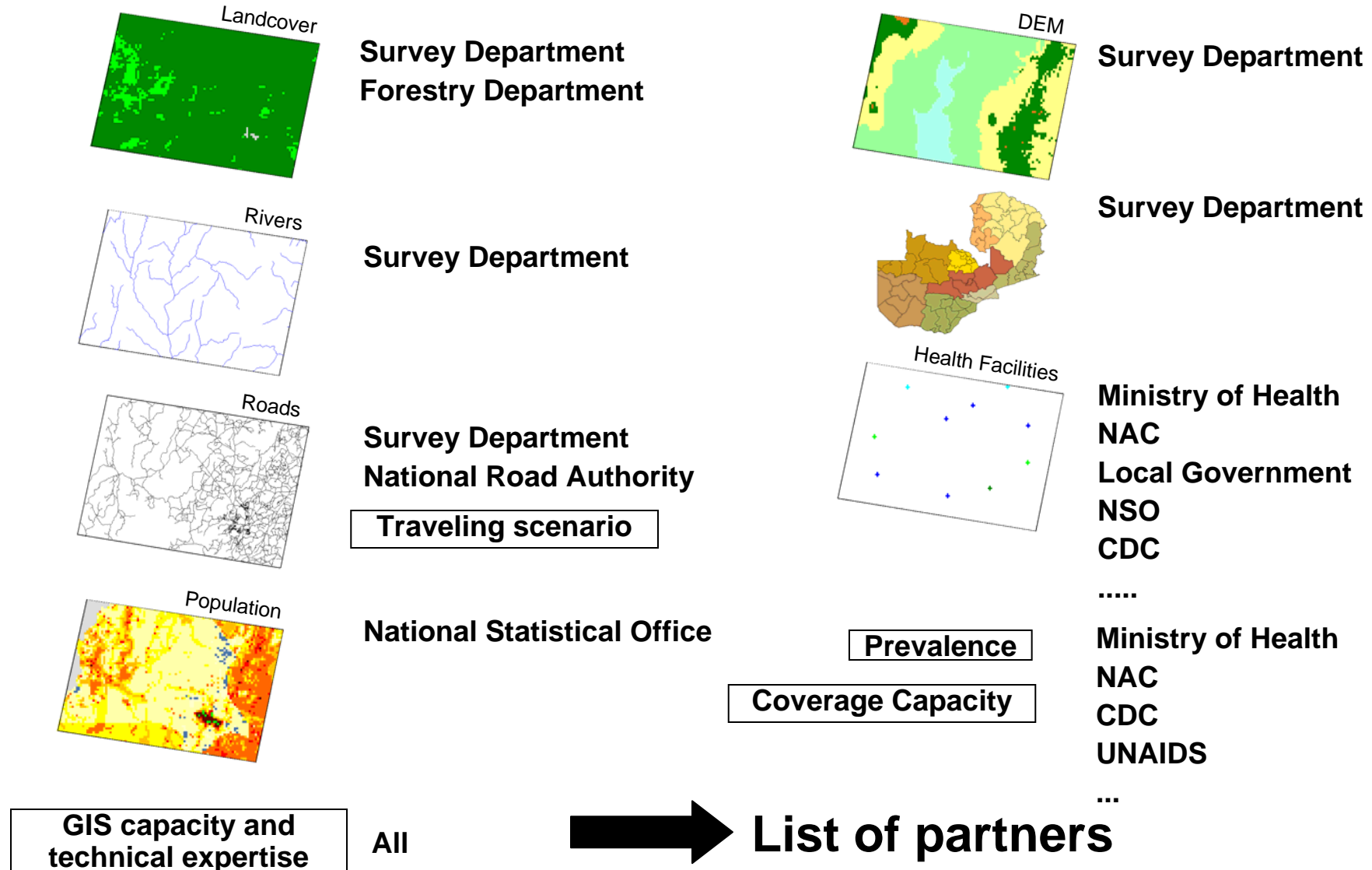


➡ Proposed collaborative process in order to apply GIS based methods to measure availability and accessibility in the context of the equity project

Session 3: How could we fill the gaps ?



Session 3: How could we fill the gaps ?



Session 3: How could we fill the gaps ?

Benefits

- **Public Health Institutions (MOH, NAC,...):** improved data set and new set of outputs for decision making and research
- **NSO, Survey Department, NRA :** Add value to their data and demonstrate their importance in public health
- **WHO:** answer the need of the Equity project
- **All:** example of integrated approach that demonstrate how working together can help solve a problem
 - ➔ **Reduction of the duplication of efforts**
 - ➔ **Resonance at the policy level**
 - ➔ **Donors more likely to provide funds**

Going beyond the equity project

This process could serve as the basis for revitalizing the National Spatial Data Infrastructure (NSDI*) process in Malawi and demonstrate that the health sector should be part of this process

- ➔ Building an NSDI to solve a problem (purpose)**
- ➔ Improve data compatibility (interoperability) between sources through the use of commonly agreed standards and protocols**
- ➔ Develop processes that insure a regular update of the core layers (health facilities, roads, rivers,.....)**

*** Technology, policies, standards, human resources, and related activities necessary to acquire, process, distribute, use, maintain, and preserve spatial data**

The Example of Zambia

Addressing the needs in terms of geographic information and GIS capacities to support HIV/AIDS monitoring, evaluation, and response in Zambia

Meeting organized by the Ministry of Health, with the support of WHO, EC2LP, and CDC International Base/Lusaka, Zambia, 15th of April 2007

Agenda

8:30	Registration	
9:00	Introduction (Chis in: Mr. DIE Chin'ombwe)	MOH, WHO
	- Welcome note by the Ministry of Health (20 min.)	
	- Introduction of the participants (10 min.)	
	- Overview of the meeting objectives, the structure + agenda items (20 min.)	
9:30	Why is it needed? (Chis in: Dr. Benson)	MOH, WHO and participants
	- Why HIV/AIDS? (Dr. Benson, 10 min.)	
	- Why do we need GIS? (Dr. Benson, 10 min.)	
	- Why do we need GIS to support HIV/AIDS monitoring, evaluation and response? (All participants, 10 min.)	
10:15	What do we have and what do we need? (Chis in: Mr. Menno)	WHO and participants
	- Overview of the GIS capacity and data availability report (20 min.)	
	- Update and requirements of information by the participants (All participants, 10 min.)	
11:00	Coffee	
11:15	How would we fill the gaps? (Chis in: Dr. Benson)	WHO and participants
	- Presentation of the proposed activities (20 min.)	
	- Discussion (All participants, 40 min.)	
12:30	Lunch / poster	
14:00	Workshop agenda: the creation of an HIV rSTI for Zambia (Chis in: Dr. Menno)	WHO, Survey Department, ZAGIS and participants
	- Review a Spatial Data Infrastructure (SDI) or a Spatial Information Infrastructure (SII) (20 min., 10 min.)	
	- Experience of the Survey Department in building a SDI (20 min., 10 min.)	
	- ZAGIS (20 min., 10 min.)	
	- Discussion and sharing of experience (All participants, 10 min.)	
15:00	Coffee	
15:15	Operationalization of the GIS Infrastructure for HIV/AIDS (Chis in: Dr. Benson)	All the participants
	- Minutes and the work of the working group	
	- Roles and responsibilities	
	- Activities (road and institutional)	
	- Time Frame	
16:30	Workshop and conclusion (Chis in: Mr. DIE Chin'ombwe)	MOH
17:00	Closure	

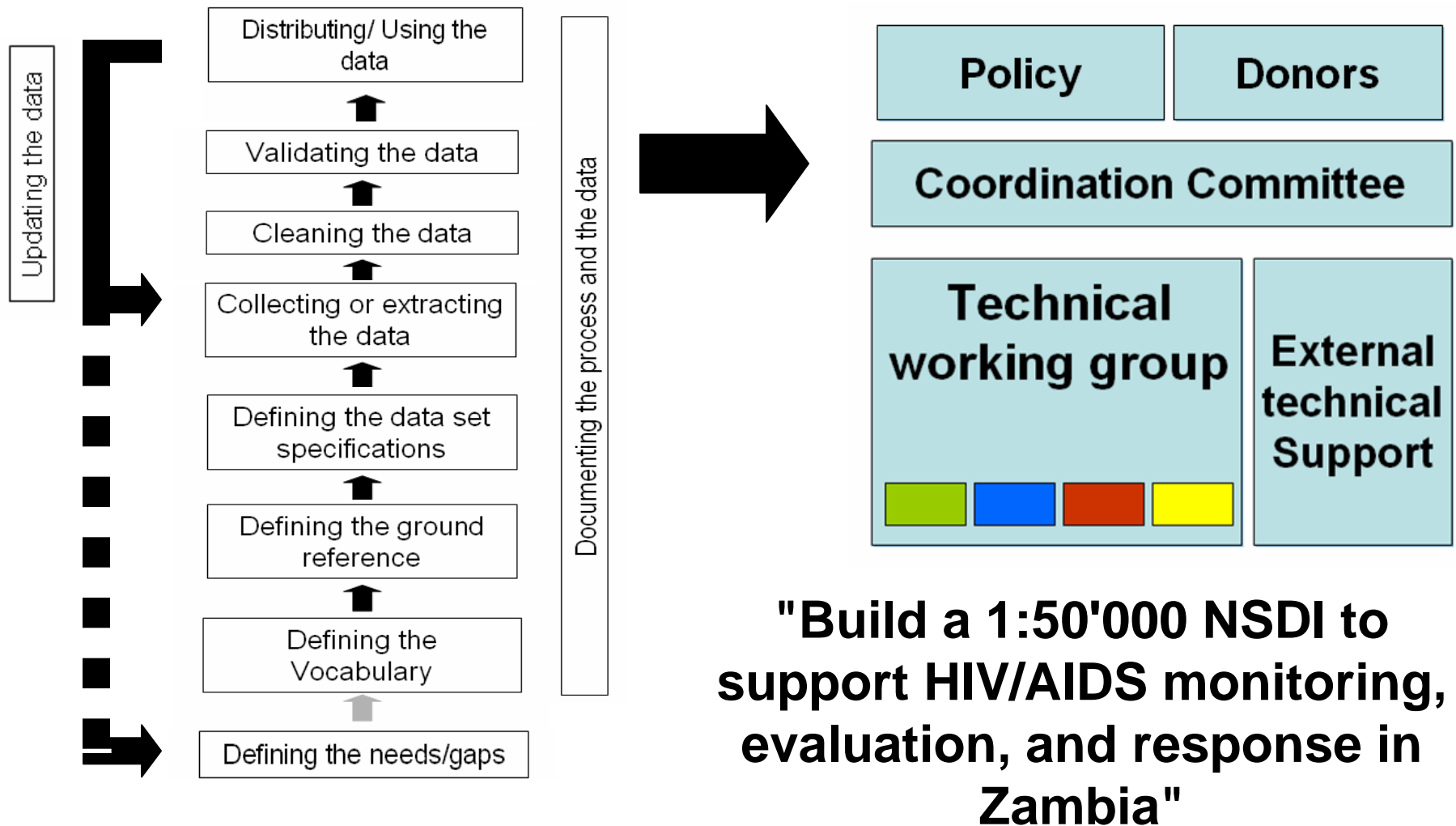
Invited representative from 28 institutions:

CDC
 DFID
 Electoral Commission of Zambia
 ESRI
 EUROGI
 Google
 HSSP
 ITC/GSDI
 JICA
 Lusaka District Health Office
 Lusaka Provincial Health Office
 MACEPA
 Ministry of Health
 National HIV/AIDS Council
 REACH Trust
 Roads Department
 School of Medicine (CONTRAST)

Survey Department
 UNAIDS
 UNDP
 UNECA
 University of Zambia
 USAID
 WB
 World Health Organization

37 participants

The Example of Zambia



The Example of Zambia

Coordination Committee

Focal point: MOH – NAC
+ HSSP – CDC – CHESSORE - WHO

External
technical
support

WHO
....

Technical Committee



MACEPA
CHESSORE
CSO
Survey Dept.
CONTRAST
UNZA
NMCC
CDC

NAC
MOH
Elec. Com.
ZAGIS
Lusaka PHO
WHO CO

Session 4: Creating an health facility registry for Malawi

Objective: Discuss how we could create such registry and insure its maintenance and update

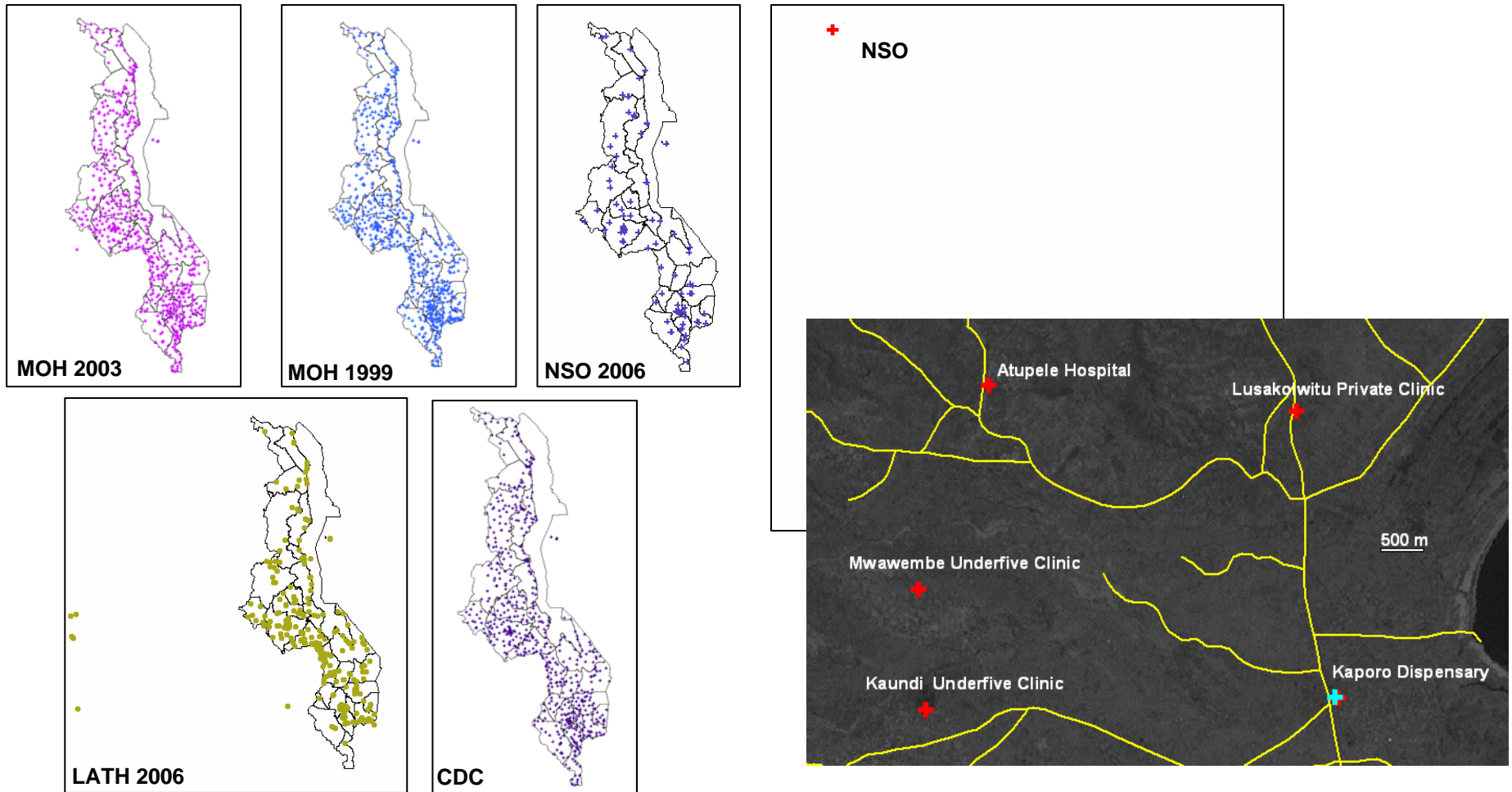
Content:

- 1. Presentation of the situation**
- 2. Example of process**
- 3. Discussion**

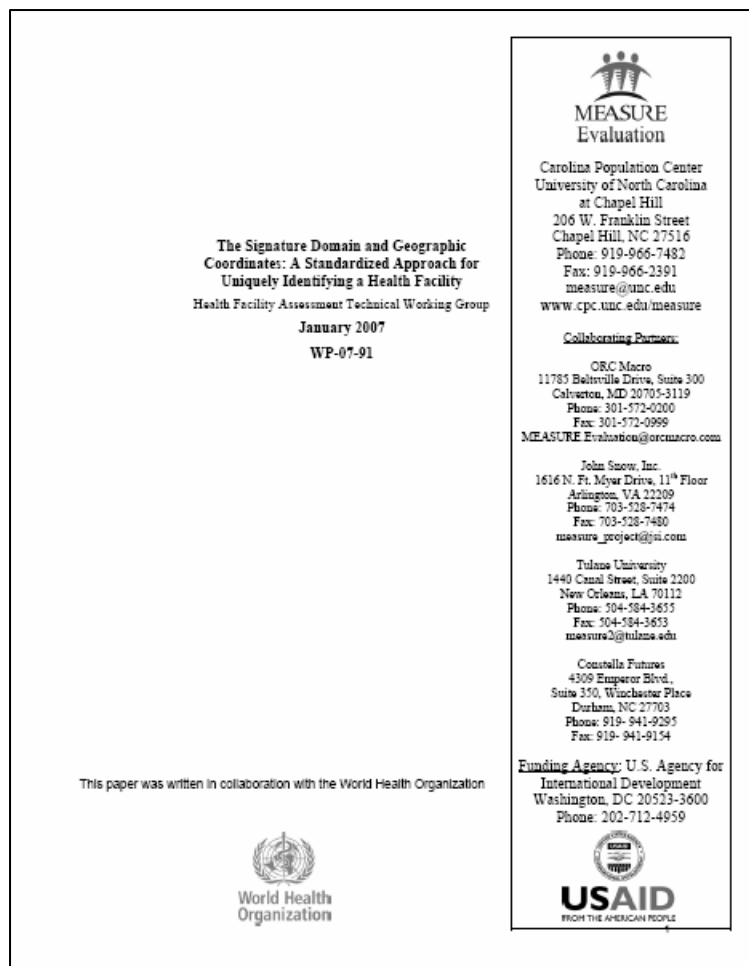
Expected outcomes: Development of the process

Time at disposal: 60 minutes

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The Signature Domain

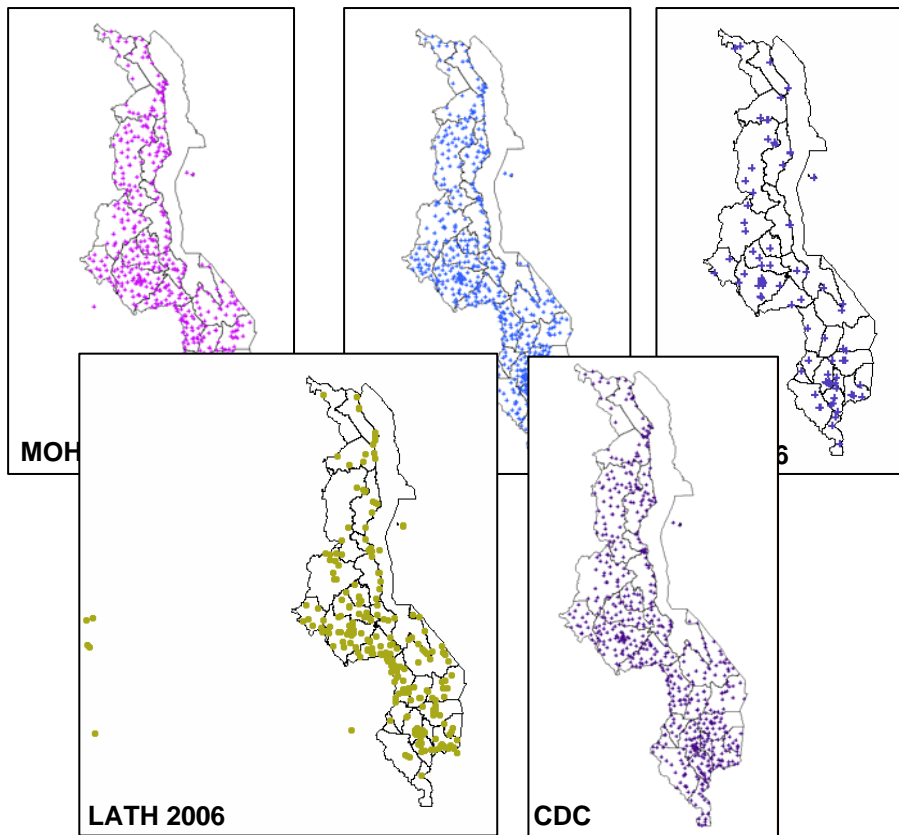
Set of fields to be attached to each facility:

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

+ time stamp

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Possible process



MEASURE Evaluation
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 University of North Carolina
 at Chapel Hill
 206 W. Franklin Street
 Chapel Hill, NC 27516
 Phone: 919-966-7402
 Fax: 919-966-3391
 measure@unc.edu
 www.cpc.unc.edu/measure

The Signature Domain and Geographic Coordinates: A Standardized Approach for Uniquely Identifying a Health Facility
 Health Facility Assessment Technical Working Group
 January 2007
 WP-07-01

Collaborating Partners:
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 Washington, DC 20523-3600
 Phone: 202-712-4959

This paper was written in collaboration with the World Health Organization

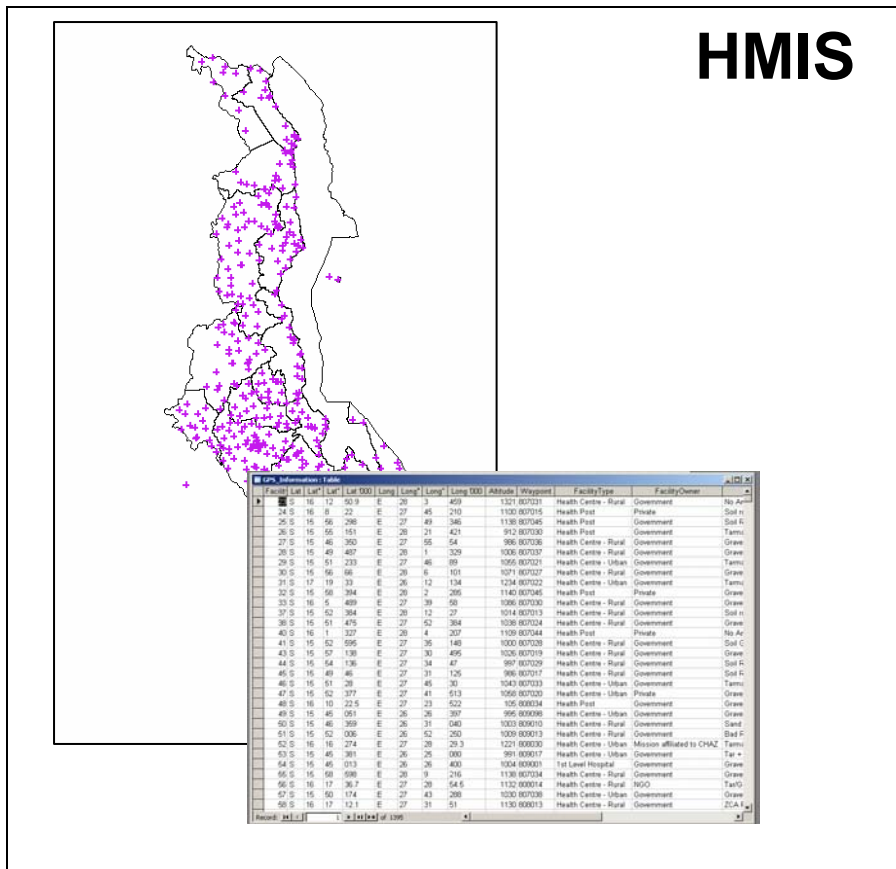
World Health Organization

USAID
 From the evidence to impact

- Most recent data
- Establish a coding scheme

Merge + cleaning

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Updating mechanism

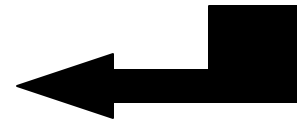
MOH: quarterly report (GPS in each district)

NAC

Local government

...

! Agreed data collection protocol



+ Data dissemination mechanism

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Benefits

- One unique centralized up-to-date data set of quality used by all the institutions
 - Reduction of the duplication of efforts
 - Allows data integration from different source
 - Strengthen the HMIS
 - Facilitate and support data collection at the health facility level