

The Health Information Systems Programme (HISP)

Dealing with complexity in health information systems in developing countries

Outline

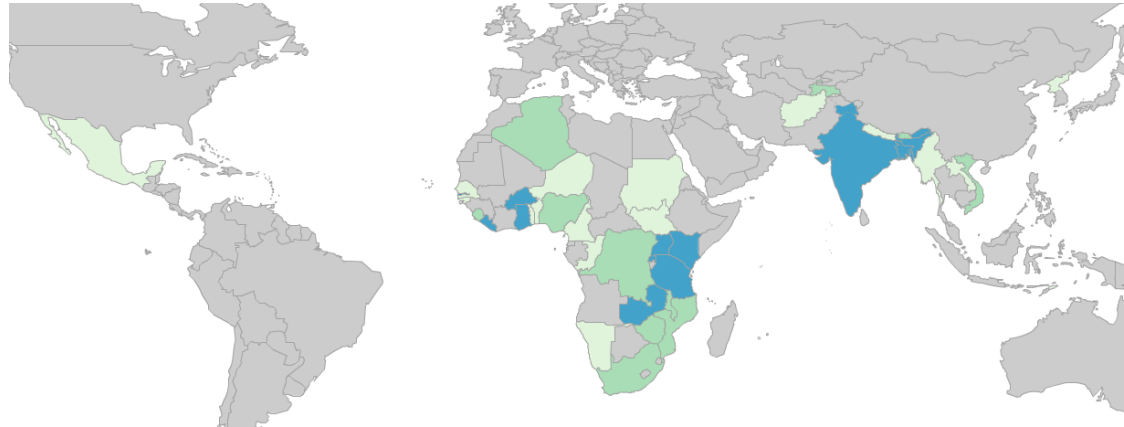
- What is HISP
- The evolving DHIS2 software
- Challenges with HIS in developing countries
- Complexity and strategies

HISP

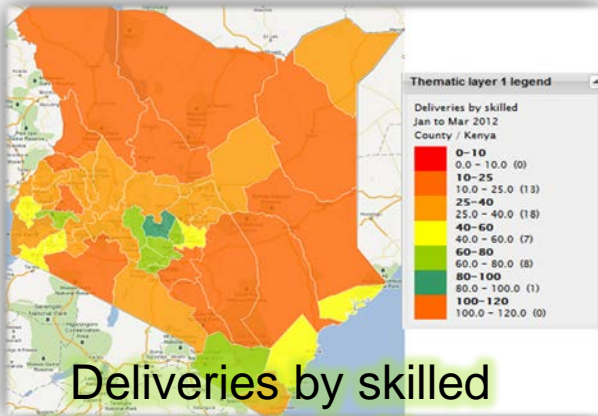
- HISP is a global network to strengthen Health Information Systems in Developing countries
- HISP at UiO is one of the leading members of this network and our contribution includes in-country capacity building, research, a PhD program, hosting the core development of the DHIS2 software and implementation support.
- We design, implement, and sustain Health Information Systems following a participatory approach to support local management of health care delivery and information flows

HISP at a glance

Global reach of activities
University of Oslo
Research, development,
implementation

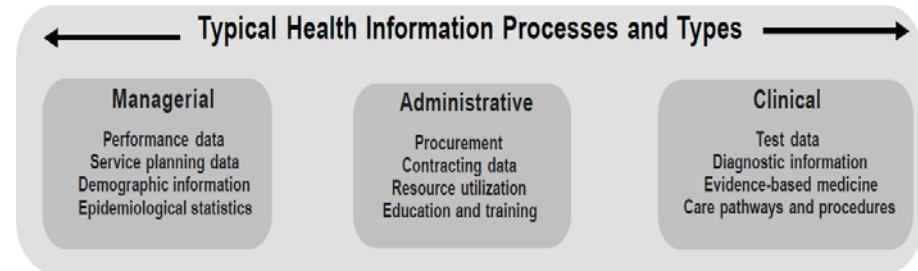


DHIS2, open source software



Deliveries by skilled
birth attendant, Kenya

Mostly routine health statistics (managerial and administrative). Moving into clinical data



Who gets sick?

Who gets sick?

with what?

where?

when?

why?

Note for later:
Being able to
answer ALL
questions is
important. How do
we collect the
information to do
that???



for whom?

where?

when?

why?

how much?

What health services exist?

DHIS2 www.dhis2.org

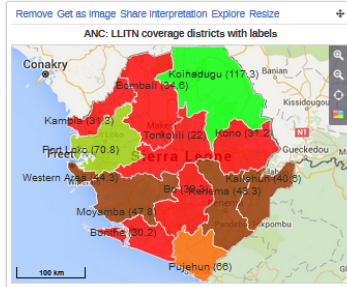
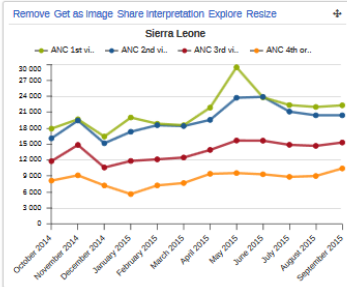
dhis2 DHIS 2 Demo - Sierra Leone

Apps Profile

John Traore • Write feedback • 10 unread messages • Share interpretation

Profile Messages Interpretations Search for users, charts, maps, reports and resources Search

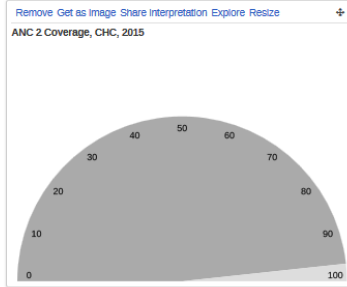
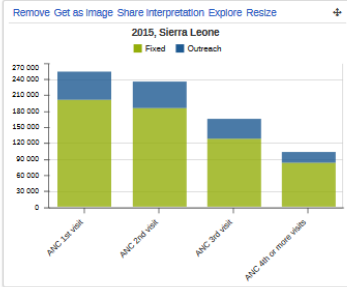
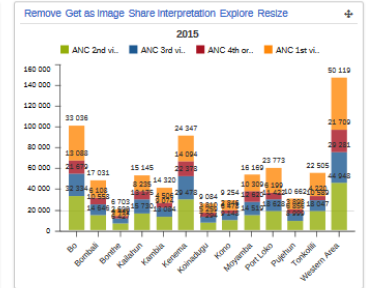
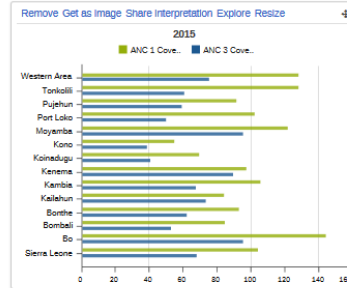
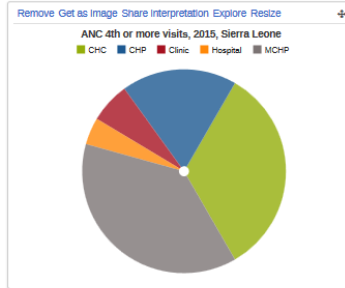
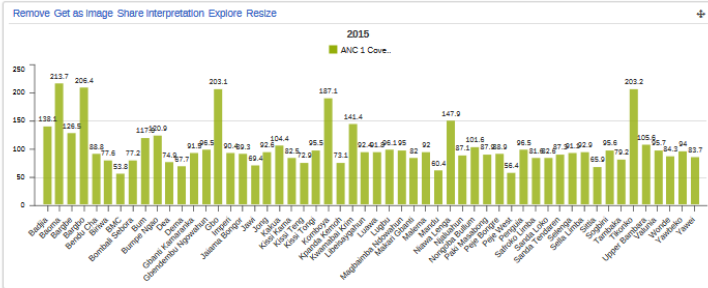
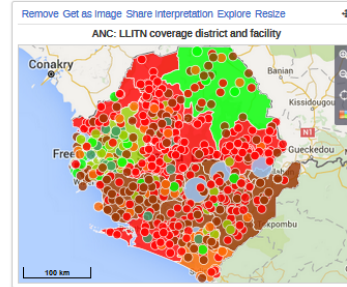
Add Manage Share < > Antenatal Care Delivery Disease Surveillance Immunization Immunization data Inpatient BMI, Weight and Height Inpatient Discharge Inpatient Morbidity Mortality Key Indicators Malnutrition Measles (user org unit) Mother and Child Health Nutrition Reporting Rates Reporting Reproductive



Remove Share interpretation Explore Resize

ANC: Coverages and reporting by orgunit last year

	2015		
	ANC 1 Coverage	ANC 3 Coverage	Reproductive Health
Sierra Leone	103.4	67.2	82.1
Bo	143.6	94.2	81
Bombali	83.6	52	87
Bonthe	91.6	61	60.3
Kailahun	83.2	72.4	95
Kamola	104.9	66.5	89
Kenema	96.3	88.5	94.1
Koinadugu	68.3	39.6	64.2
Kono	53.6	37.7	60.1
Moyamba	100.6	94.3	96.7
Port Loko	101.5	48.6	80.2
Pujehun	90.3	55.1	66.6



Remove

Messages

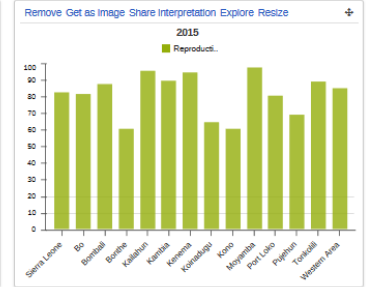
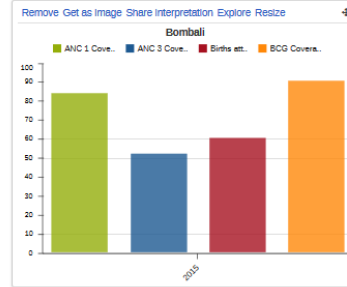
2015-03-02
Analytics table process failed

2015-02-12
Resource table process failed

Tom Wakiki 2014-08-19
Alerts as of 2014-08-19 09:49: High 12, Medium 0, Low 0

Tom Wakiki 2013-11-13
Alerts as of 2013-11-13 10:06: High 6, Medium 1, Low 0

John Traore 2013-11-11
Mortality data reporting



HIS in developing countries (understanding complexity)

- To efficiently use DHIS2, we need to know how health services are organized, and how data is treated
- How it is usually organized?
- Who are involved?
- What are the challenges?
- Related to Egil's session last week
 - What makes the Norwegian example complex?
 - What do you expect will be different in a developing country?
 - What do you expect will be the same, or similar?

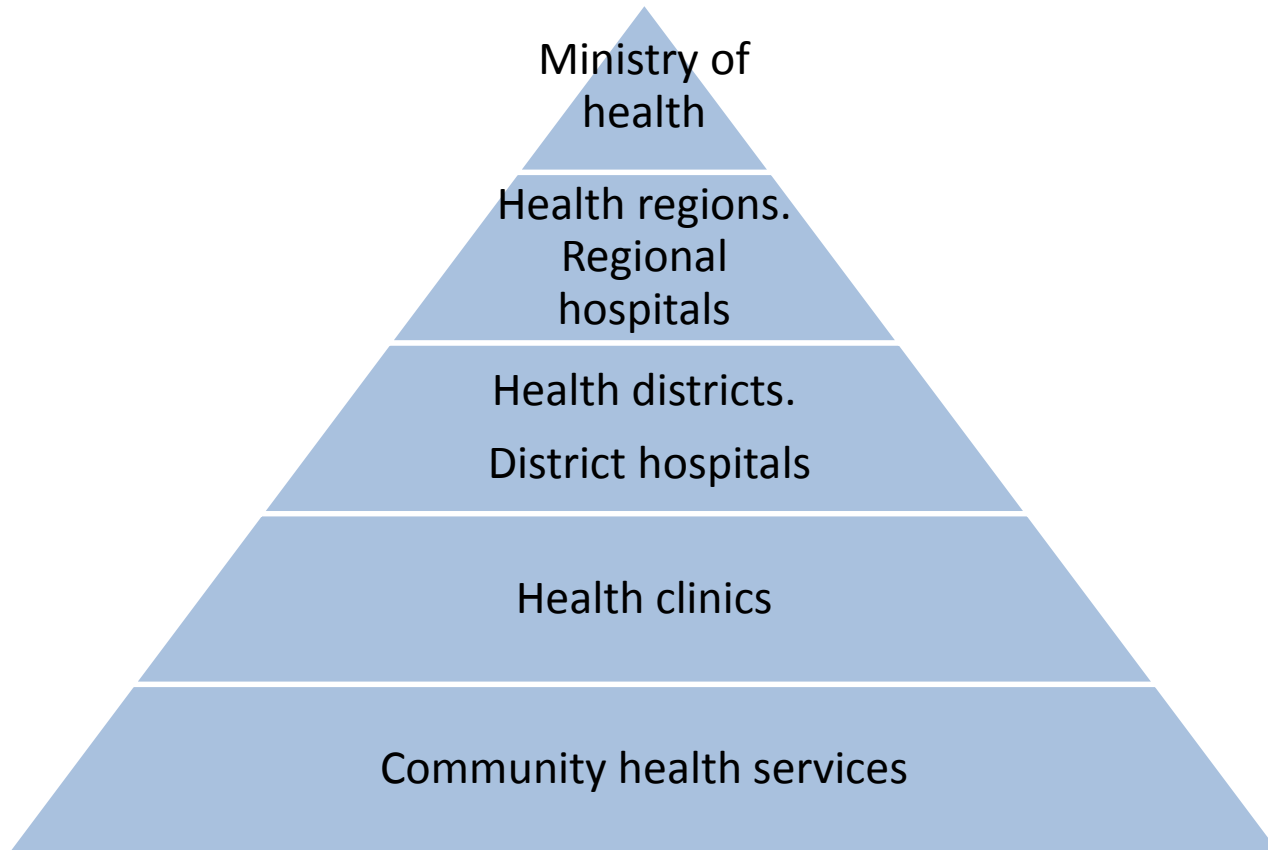
How is it organized?



PAHO/WHO

The International Conference on Primary Health Care at the Lenin Convention Center in Alma-Ata in September 1978.

Health is decentralized and hierarchical...



... and specialized

India: <http://www.mohfw.nic.in/index4.php?lang=1&level=0&linkid=316&lid=1610>

Ethiopia: <http://www.moh.gov.et/programsprojects>

Sierra Leone: http://health.gov.sl/?page_id=55

World Health Organization: <http://www.who.int/entity/en/>



"This is a second opinion. At first, I thought you had something else."

So this is a bit complex...

Challenge 1: Fragmentation

- Different health programs are organized, and funded, differently
- They have historically developed their own information systems
- To answer the questions in this slide, we need information from all :



- Adding to this is usually a split between public and private health providers

Typical organization structure of a HIS

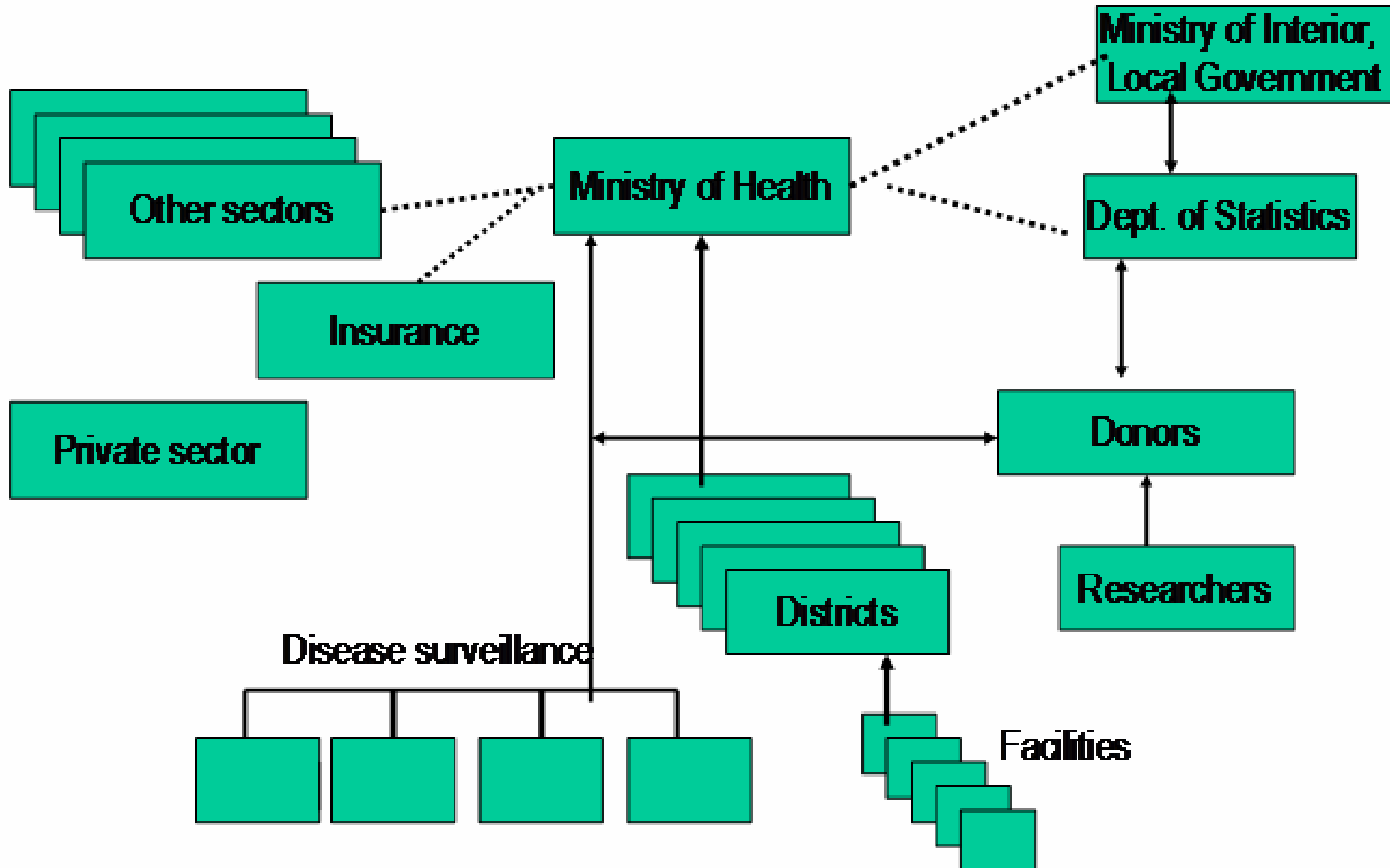


Illustration: why we need to include private sector data

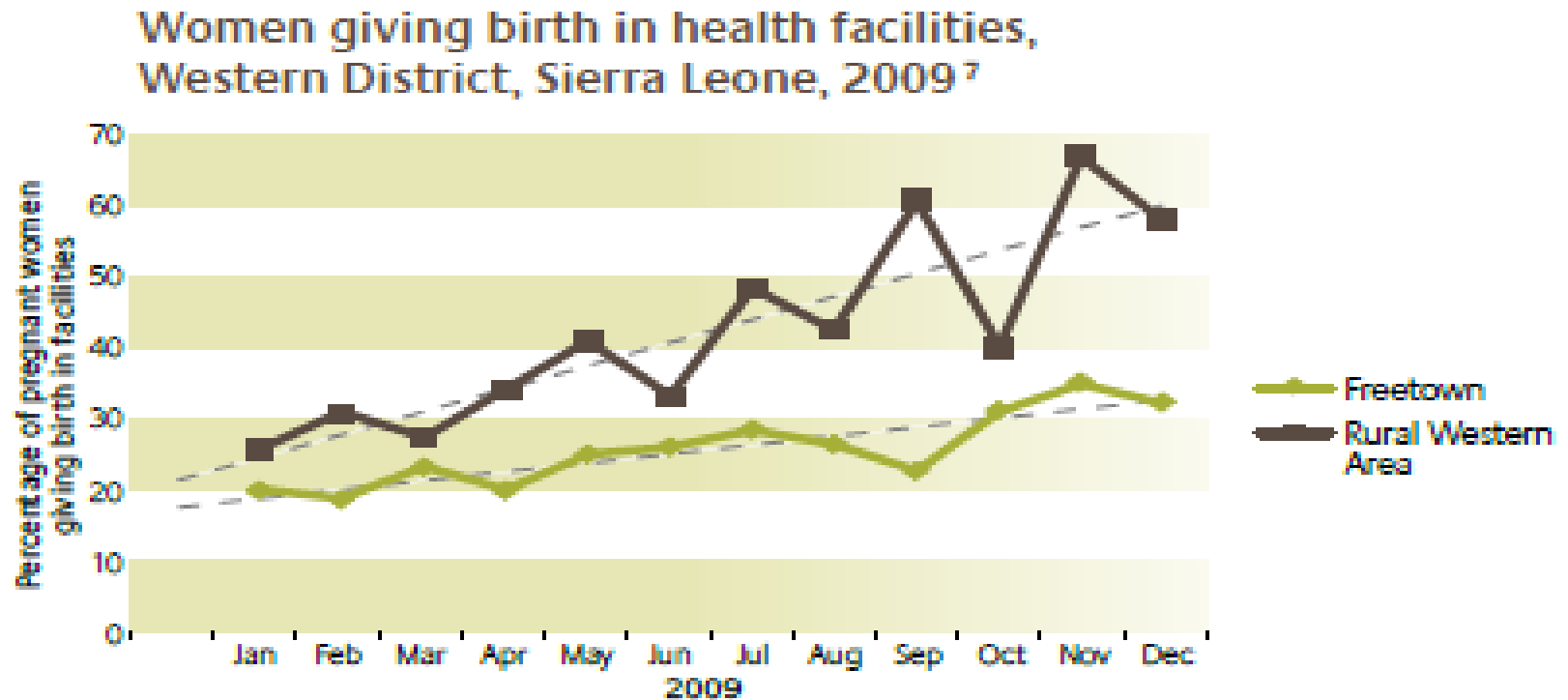


Figure 2: Increasing institutional delivery rates in Western Area, from the HMN Results Report (2010)

Fragmentation between:

- Managerial, administrative, clinical data
- Routine and non-routine data
- Public and private data
- Between health programs
- Between health-related domains
 - Human resources
 - Lab(s)
 - Radiology (x-rays)
 - Logistics
 - Warehouses
 - Finances, insurance, and referrals
- Not much different from situation in any country, including Norway

Challenge 2: Information use

- Well-known problem that too much data is collected
- "If I collect all this data, I must be doing my job well"
- But is the data relevant? Will it be used to make decisions?

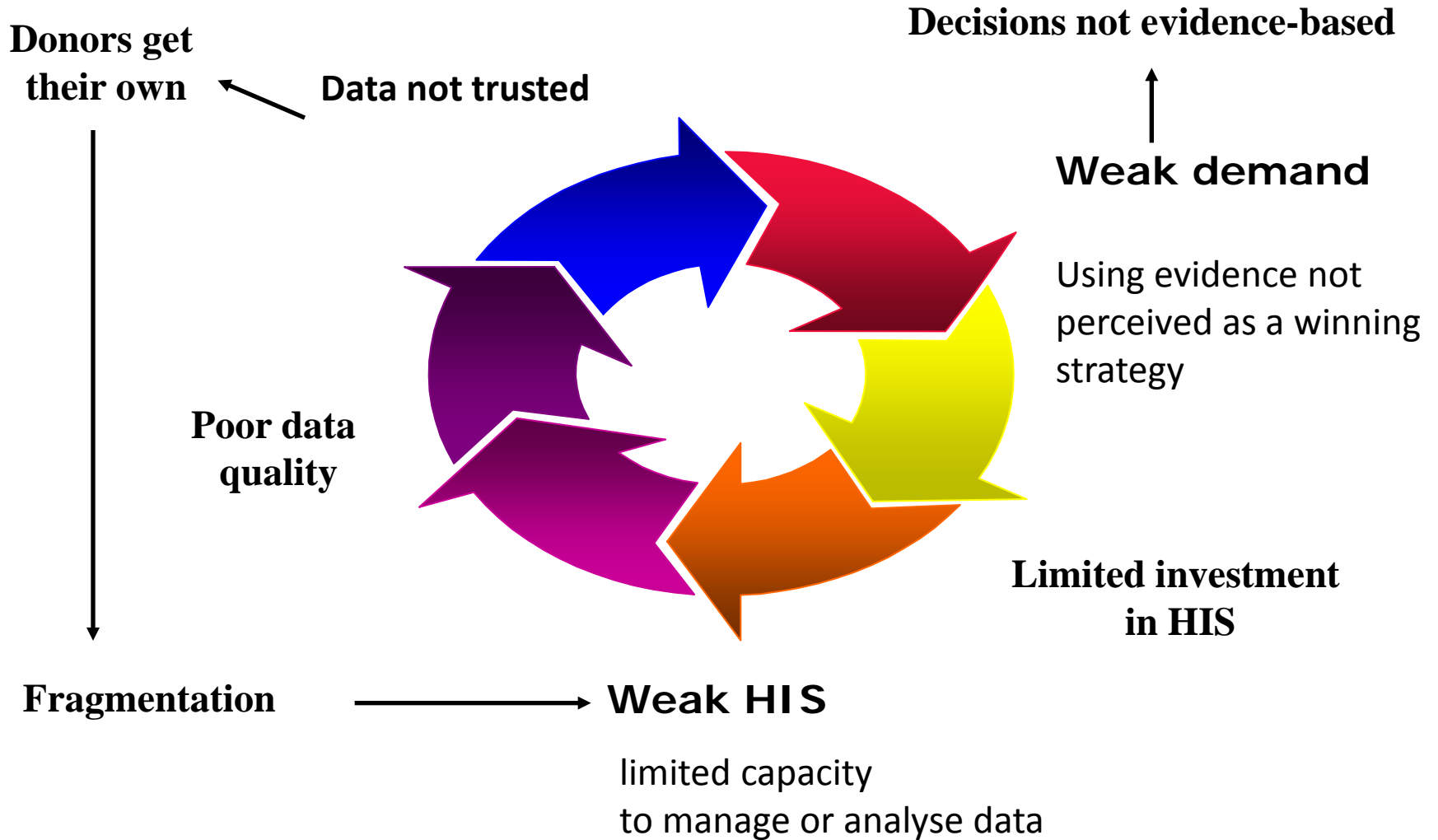
- Link to challenge 1: fragmentation;
 - Data-driven information systems become large and hard to integrate. Decision-driven systems focus on integrated data from the start.
 - If we address fragmentation, can our efforts be sustained? Are we solving a need?

- Little use of data will lead to poor data quality, pushing information system into vicious cycle of fragmentation





A vicious cycle



Summary of complexity in developing country HIS

- Multi-level fragmentation
- Many different actors. Also foreign actors, who wield control through standards and finances.
- Health is a changing environment, though with long historical institutions
- Little relevance of data leads to poor quality, little use, and vicious cycle of further fragmentation

How to deal with this complexity?

1. **Integration**: all data accessible from one place
2. Since health is decentralized and hierarchical: good **feedback** essential for working of system
3. Design for decisions. From data-led systems to **action-led**
4. **Capacity building** at all levels. Often by far the biggest cost of any information system.

Strategy: Data warehouse

 Sierra Leone HIS

[Maintenance](#) [Services](#) [Help](#) [Log out](#)

DHIS 2 Online

- HISP Homepage
- DHIS 2 Homepage
- DHIS 2 Issue Tracking

Dashboard

[Insert](#) [Close](#) [Clear](#)

Documents

[Computers for the DHIS](#) ✖

[District league tables, 2008](#) ✖

[Map of Sierra Leone](#) ✖

[New PHU RCH Indicators and Forms](#) ✖

[Salone HIS Bulletin, Issue 1](#) ✖

[Insert](#) [Close](#) [Clear](#)

Reports

[Feedback report](#) ✖

[Monthly update](#) ✖

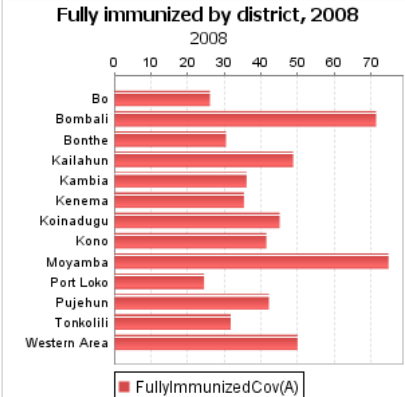
[Insert](#) [Close](#) [Clear](#)

Data mart exports

[Deliveries_Penta3](#) ✖

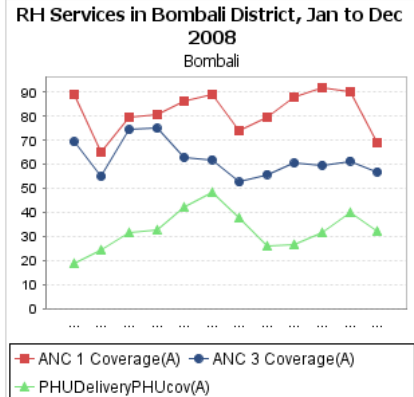
[MMRCScompleteness](#) ✖

Fully immunized by district, 2008



District	FullyImmunizedCov(A)
Bo	~28
Bombali	~68
Bonthe	~32
Kailahun	~48
Kambia	~35
Kenema	~38
Koinadugu	~45
Kono	~42
Moyamba	~65
Port Loko	~25
Pujehun	~40
Tonkolili	~30
Western Area	~50

RH Services in Bombali District, Jan to Dec 2008



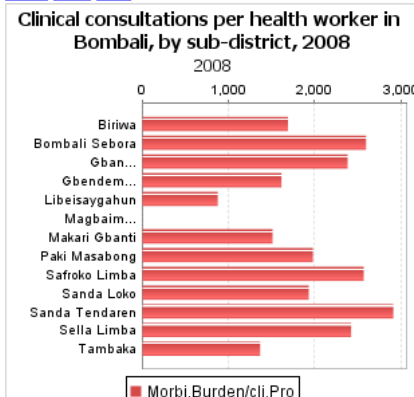
Month	ANC 1 Coverage (A)	ANC 3 Coverage (A)	PHU Delivery PHU cov (A)
Jan	~90	~70	~20
Feb	~65	~65	~25
Mar	~80	~75	~30
Apr	~85	~75	~35
May	~88	~65	~45
Jun	~75	~55	~35
Jul	~80	~60	~25
Aug	~90	~60	~30
Sep	~90	~60	~35
Oct	~90	~60	~40
Nov	~70	~55	~35
Dec	~70	~55	~30

ANC overview



Year	ANC 1 Coverage (A)	ANC 2 Coverage (A)	ANC IPT 2 Coverage	ANC TT2 coverage
2007	~75	~78	~70	~65
2008	~55	~58	~70	~65
2009	~1	~1	~45	~55

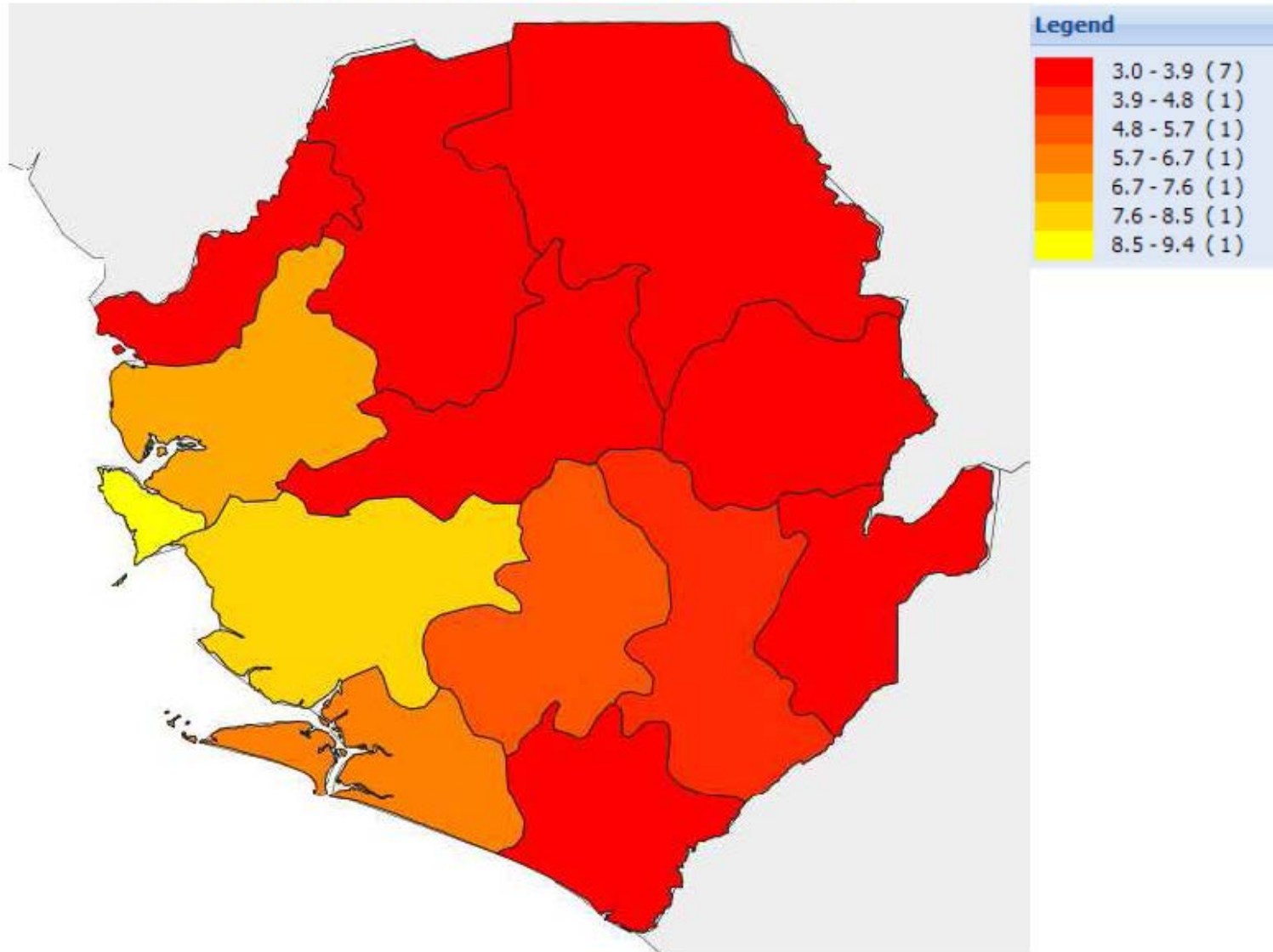
Clinical consultations per health worker in Bombali, by sub-district, 2008



Sub-district	Morbi.Burden/cli.Pro
Biriwa	~1,800
Bombali Sebora	~2,500
Gban...	~2,500
Gbendem...	~1,500
Libeisaygahun	~1,000
Magbaim...	~1,000
Makari Gbanti	~1,500
Paki Masabong	~2,000
Safroko Limba	~2,500
Sanda Loko	~2,000
Sanda Tendaren	~2,800
Sella Limba	~2,500
Tambaka	~1,500

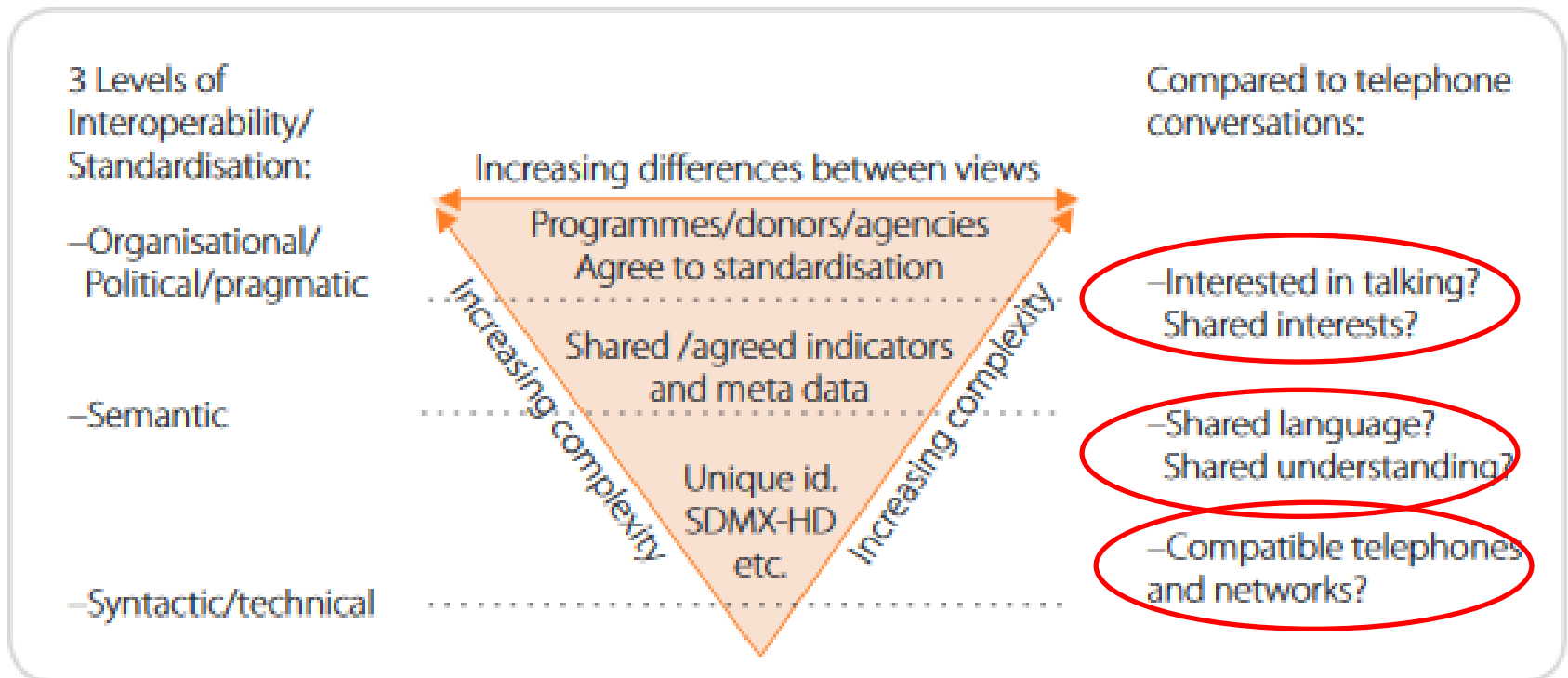
Integrate data

Clinical workers per 10,000 population

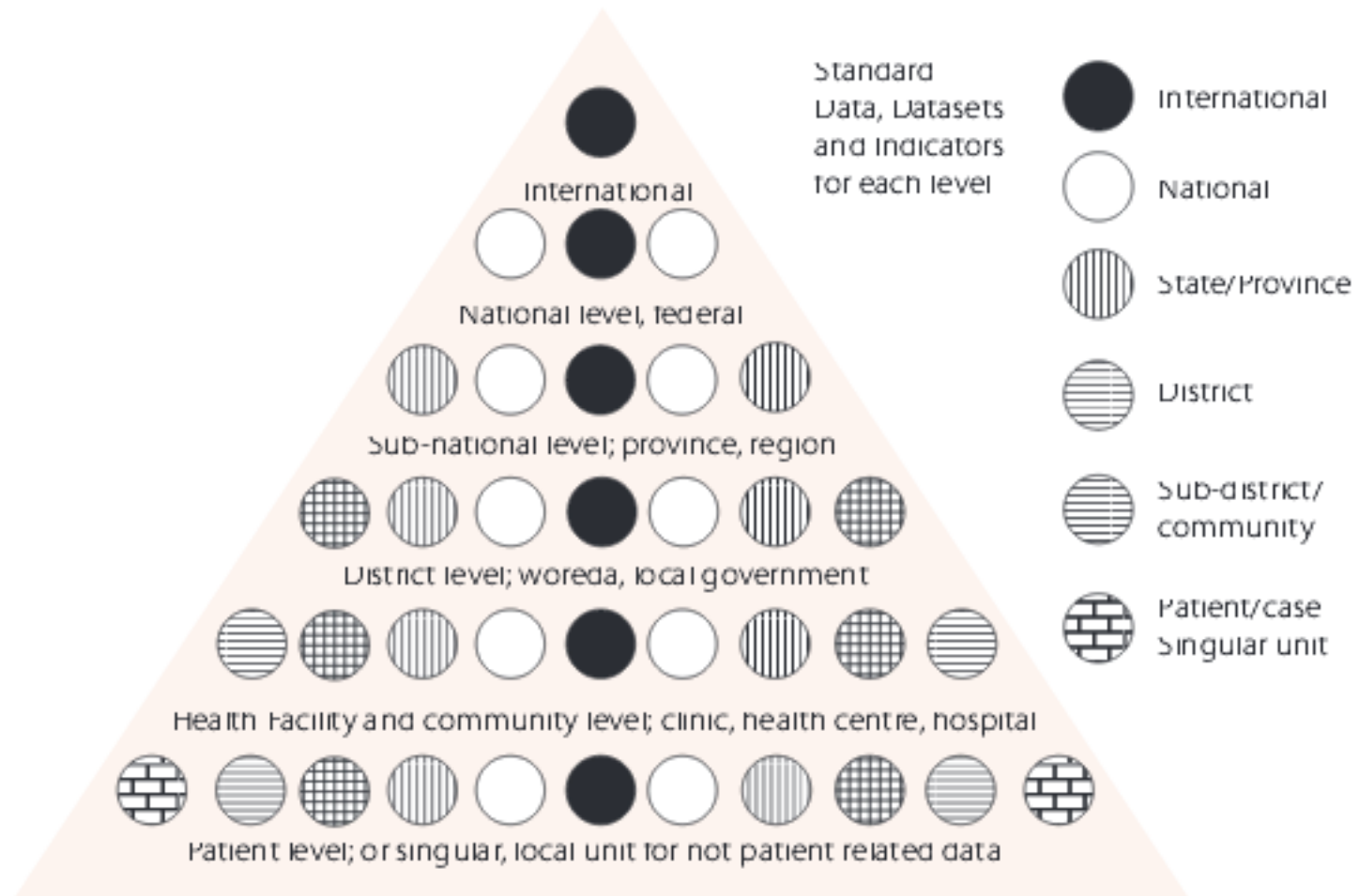


Strategies employed by HISP

- Approach integration (cultivating information infrastructures) at three levels:



Change from data-led to action-led HIS

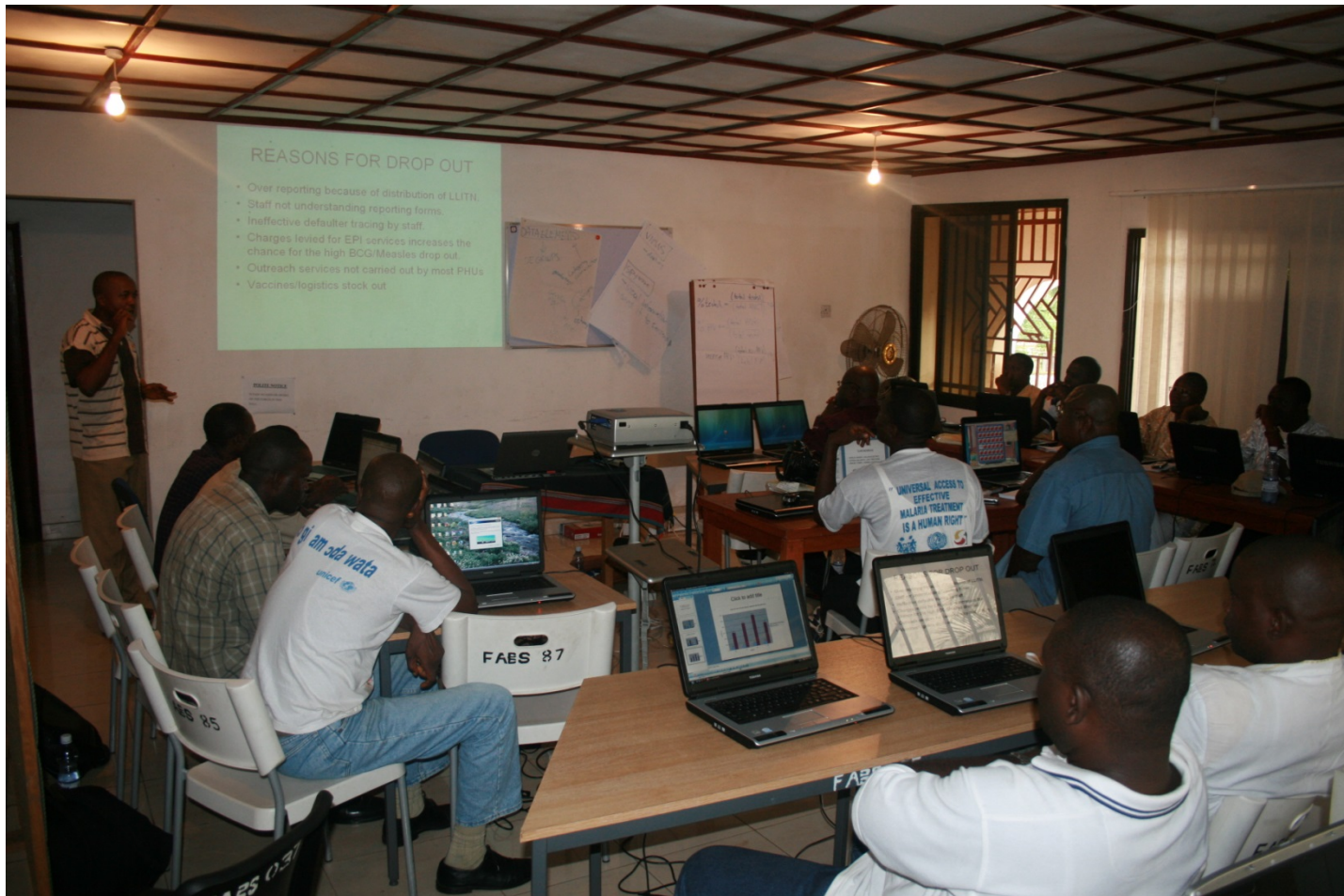


Strategy: Feedback, transparency and accountability

Chiefdoms	% Full Immunized 2nd Quarter	% PHU Delivery 2nd Quarter	% 3rd ANC Visit	% 2nd Dose of IPT	% MMRC Submitted	% Exclusive Breastfeeding at Penta3	Average Score	Ranking
Kongbora	98.2	45	170.9	96.6	86.6	93.3	5.3	1
Fakunya	124.3	62	154.3	86.2	100.0	48.1	5.0	2
Dasse	134.9	57	90.5	86.3	100.0	45.9	4.8	3
Kaiyamba	90.3	55	162.7	93.4	75.0	71.3	4.8	3
Timidale	140.3	46	106.8	91.7	91.7	33.0	4.8	3
Kowa	118.4	52	96.5	46.7	100.0	78.2	4.7	6
Lower Banta	88.3	48	201.6	120.8	100.0	35.6	4.7	6
Bagruwa	61.4	37	110.3	92.4	93.0	32.1	4.3	8
Kamaje	55.6	35	69.7	140.7	100.0	86.5	4.3	8
Kargboro	80.4	45	93.2	77.6	100.0	36.5	4.3	8
Kori	49.8	40	92.6	89.4	86.6	64.0	4.3	8
Ribbi	71.8	26	53.7	57.4	100.0	60.5	3.7	12
Upper Banta	61.1	29	68.0	101.2	77.8	38.6	3.7	12
Bumpeh	54.9	29	73.8	38.2	100.0	28.3	3.2	14
Total	91.4	43	114.3	32.4	93.6	20.8		



Strategy: Capacity building



What can we learn from HISP?

- Universal complexity of health sector
 - Fragmented by nature and history
- Technology does not solve non-technical problems
 - Relevance and quality of data?
- Technology does matter
 - As a tool for integration
 - Processing data, making charts, maps etc
 - Sharing data
- The importance of feedback, and use of data