Global Information Management System (GIMS)

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Overview:
Data collection, to analysis to effective decision making

- What is GIMS?
- GIMS and the bigger picture
  - Global health situation
  - WHO strategy for health information
- GIMS functionality and connectivity: GIMS Demo
- GIMS clients
  - JMP
  - GLASS
- Benefits and next steps
What is GIMS?
Context

- 2.5 billion people without basic sanitation, around 900 million people without proper water
- 1.2 billion people defecate in the open!

No surprise: diarrhoeal disease is the 2nd leading cause of death from infectious diseases, even before HIV/AIDS

Such deaths could be prevented, with good evidence based policies, but:
  - Difficult to relate improvements in service levels to the drivers
  - Missing links between service levels to other socio-economic indicators, like, burden of water-borne diseases, sustainability, climate resilience etc.
GIMS: Why another system?

- To strengthen the evidence base: filling gaps and links
  - Robust access estimates (use for JMP etc.)
  - Links between sanitation/water and health (disease)
  - Links between WatSan and environmental issues

- To measure progress of societies; link service levels to poverty, BoD, climate resilience etc: GHO integration

- Participatory estimation, capacity building:
  - Countries participate in the estimation
  - Cost-effective dynamic online data reconciliation
  - Strengthen coordination between stakeholders
  - Build capacity for countries to self monitor
GIMS...for a more robust estimate!

Nigeria: Rural access to improved drinking water sources

Year

% Coverage

New Trend

Old Trend

New

DHS 90

DHS 99

CLFS 2000

DHS 03

BL 08

NLSS 04

CWIQ 06

GHS 06

MICS 07


20 30 40 50
Scenario 2020: climate change
Resilience to increased rainfall

Vulnerability

High

Medium

Low

Adaptability

Utility managed piped water

Septic tanks

Protected wells (deep)

Protected springs

Rainwater collection

Protected wells (shallow)

Community managed piped water

Sewers

Improved pit latrines
GIMS for Vision 2020
GIMS: components

- A comprehensive data management system
  - Data collection
  - Data analysis
  - Data dissemination

- A dynamic data linking system

- A dynamic data sharing tool

- Web2.0 enabled
  - Participatory data collection, reconciliation etc.
Information flow between data source to GIMS (1)

- Users
- Internet
- OH SDMX Registry
- GIMS
- International
- National

- Agency A
- Agency B
- Agency C

- Region A1, Region A2, Region A3
- Region B1, Region B2, Region B3
- Region C1, Region C2, Region C3

Information flow from data source to GIMS.
Information flow between data source to GIMS (2)

Internet

users

OH SDMX Registry

International (GIMS)

National

Region A1
Region A2
Region A3
Region B1
Region B2
Region B3
Region C1
Region C2
Region C3
GIMS and the bigger picture:
The public health landscape

- A changing world: complex and crowded
- Everything is intimately interconnected
- Globalization has flattened the world and speeded up trade leading to:
  - increased movements of people
  - expansion of international trade
  - social and environmental changes
- Microbes are on the move…
- Health security is at stake
... crowded with problems – new and old

- Rapidly evolving threats posed by emerging pandemic and epidemic prone diseases (e.g. H1N1 2009, SARS 2003 & Avian Flu 2003-2008)

- Epidemic-prone diseases that are known risks (HIVAIDS, cholera, meningitis, yellow fever)

- Unexpected outbreaks of new or previously rare diseases (e.g. Ebola, West Nile fever in US)

- Accidental or intentional release of biological, chemical and/or nuclear agents

- Older problems that keep on getting bigger (e.g. tuberculosis)

- Endemic diseases that have been with us for thousands of years (malaria, leprosy, guinea worm, lymphatic filariasis, polio, onchocerciasis)
... compounded by

- Collapse of public health infrastructure
- Ineffective vector control programmes (Chikungunya)
- Development of antimicrobial resistance (XDR-TB)
- Increasing burden of chronic diseases due to our changing lifestyles
- Environment and climate change
Need for tools, methodologies & standards

that can define, collect and assemble data from:

- **Multi source**: integrate data from different sources using different data collection methodologies
- **Multi sector**: consolidate vital data from different sectors
- **Multi level**: disseminate data across different geographic levels

Remote field level

Country level

Regional level

Global level
Need for tools, methodologies & standards

- And that can analyse and communicate information rapidly and in meaningful ways as to assist in guiding effective response
Challenges in Information Management

- Fragmentation and duplication
- Lack of use of standards (case definitions, identifiers, geographic coding, data exchange)
- Uncoordinated approaches to data collection
- Data quality assessment and transparency: often weak
- Major data gaps remain
- Duplication of efforts/resources
- Data portability, use and decision making is hampered
WHO's Health Information Strategy

- Improve access to WHO's data
- Improve quality of data
- Leverage and connecting to existing database
- Address data gaps
- Build country capacity

Global Health Observatory
Monitoring the health situation and trends in the world

- Disease Outbreak Monitoring
- Equity Gauge
- Health MDGs
- PHC/health systems performance
- Africa
- Conflicts & Emergencies Tracking
- GIMS
- NCD & risk factors
- Mortality & disease burden
- Other regions
- World Health Statistics
- Integrated Country Health Profiles
What will GIMS not do

- Centralize all data production and dissemination.

- Control individual data producers:
  - statistical techniques for validating data
  - imputation of missing values
  - correction for bias, heterogeneity in the values of quantities of interest

- Over-ride existing legacy systems and databases

Instead

- preserve the independence of data producers while making data and metadata part of a coherent and seamless corporate system

- A constellation or federation of databases.
GIMS functionality and connectivity
GIMS started here…
GIMS demo released!

MONITORING PROGRESS OF THE SOCIETIES
An Introduction to Global Information Management System (GIMS)

INTRODUCTION

A staggering proportion of world population is without safe water or basic sanitation, it is therefore no surprise that diarrhoeal disease causes 5.0 million deaths per year, a leading cause second only to lower respiratory infections and ahead of HIV/AIDS. These preventable deaths can be minimized by providing information management on access to drinking water and sanitation by focusing resources on assisting the most vulnerable populations.

With the aim of improving the health status and livelihoods of these unfortunate billions, it is important to effectively capture the various monitoring activities currently undertaken at the global, regional and country level. Poor policies are not complete and effective without a proper measure of the real progress of the societies by linking increase in service levels, like access to water and sanitation to how that impacts decrease in poverty, decrease in burden of water borne diseases, increased preparedness for a climate change, etc. With this end in view, WHO plans to build a comprehensive global mechanism for linking and attributing, for simulation at global, regional and national levels to allow policy-makers to make informed decisions on water and sanitation infrastructure and service investment. This system is also designed to capture data across agencies around the world, to limit the burden of data collection on the primary data.

This Global Information Management System on Sanitation and Drinking-water (GIMS) will form an integral part of the World Health Organization’s (WHO) Global Health Observatory (GHO), which is designed to serve as the single authoritative access point for statistical data and metadata across WHO. It aims to cater all interested in health policies and programmes. Comprehensive water and sanitation data will be delivered to WHO by GIMS which in turn will be a model for other health areas to follow when developing their data repositories.
What's in GIMS Demo

- Compute WHO estimate (an online tool)
- Dynamically redefine estimate (country)
- Add missing/new data (Data entry)

A full Open Source standard based system
GIMS demo: dynamic charting

Algeria – Access to improved drinking water sources

Estimated coverage
Year  Total
1991  64.15%
1992  65.64%
1993  67.12%
1994  68.60%
1995  70.08%
1996  71.56%
1997  73.04%
1998  74.52%
1999  76.00%
2000  77.48%
2001  78.96%
2002  80.44%
2003  81.92%
2004  83.40%
2005  84.88%
2006  86.36%
2007  87.84%
2008  89.32%
GIMS Demo: adding country perspective
GIMS Demo: add new data
System Architecture

GHO Database

Water and Sanitation Reporting, Charting, Mapping and Analysis

Report & Charts Server

Data loader

Data files (Excel)

Data Migration

Data Staging

Map Server

GHO Database

Data Entry Form

Verify

Submit

Check Out (for edit)
Key Technologies Used

- Open Source and Open Standard and license free
- **Mondrian Olap Server**
  - Uses XMLA for data and query
- MySQL database (portable to most SQL databases)
- **Full Presentation Client GWT (Google Web Toolkit) with some Adobe Flex components**
- Jasper Reports (for PDF and Excel outputs)
Connectivity
Links to partner databases

- Poverty (World Bank)
- Financial (OECD)
- UN-Water "federated" database
- Climate change (WMO, UNEP, FAO, universities,..)
Sub-national monitoring: focused interventions
Interoperability

Links to country databases: health services

- Overlaying public health facilities, laboratories, stockpiles, schools, workplaces, to support response .. (targeting of drugs, equipment, surge capacity.)

- Infrastructures (roads, schools, airports, etc.)
Connectivity
Links to country databases: health services

- Overlaying public health facilities, laboratories, stockpiles, schools, workplaces, to support response.. (targeting of drugs, equipment, surge capacity.)
- Infrastructures (roads, schools, airports, etc.)
- Water point mapping
Integrating remotely sensed data for GIS analysis

- Data collection from earth observation satellites (10-35m² resolution)
  - Water quality data
  - Hydrological data
  - Land use
  - Risk assessment (catchment)
  - Risk assessment (water-related disease)
  - Trends

- Potential use of high resolution images (2m² resolution)
  - Validation of coverage data
  - Validation of access data
GIMS clients
GIMS in context of W&S Global Monitoring

**The tool**
- **Global Information Management System (GIMS)**
- **WHO/UNICEF Joint Monitoring Programme (JMP)**
- **UN-Water Global Annual Assessment (GLAAS)**

**The use of the tool**
- MDG monitoring
- Transparency, mutual accountability, aid prioritization and targeting

**Impact**
- Disease prevention, gender equity, poverty reduction, economic growth
- Increased service and coverage levels
- Increased sector and aid effectiveness

The use of the tool is expected to lead to improved sector and aid effectiveness, increased service and coverage levels, and disease prevention, gender equity, poverty reduction, and economic growth.
GIMS for JMP

Data reconciliation process

- Compare, understand, align data
- Infrastructure / service provision + other indicators (quality, sustainability...)

Data collection to reduce data gaps

- Access figures (use)
- Household Surveys, Censuses

Analysis of outcome of access to WATSAN

- Link between Access / Health
- Data
  - Cholera outbreaks, diarrhoeal diseases

- Nat. Health Statistics
- Nat. Statistics Offices
- Nat. Sector Agencies
What is GLAAS

GLAAS - A UN-Water initiative, led by the World Health Organization

- A key part of the monitoring framework for drinking-water and sanitation
  - complementing other UN/WB reports (JMP, WWDR, CSOs)
  - focusing on capacity of countries, with the support of donors, to meet WASH MDG targets

- And a key part of a political framework (GF4A) to accelerate progress towards achieving WASH targets
  - GLAAS will strengthen evidence-based policy-making
  - the report that informs the global High Level Meeting
Benefits and next steps
Benefits of GIMS

- **Comprehensive picture of the situation**
  - Dynamic linking of service levels to other indicators of progress
  - Assessing problems, resources and gaps
  - Guiding rational allocation of resources

- **Building country capacity for strengthening evidence base**
  - Provide standards-based platform for integrating, analysing and using country data
  - Participatory data gathering and analysis
  - Local ownership and institutional capacity building

- **Fostering a collaborative/open approach**
  - Collaborative community of practice (involving public, private, NGOs, civil society)
  - Accessible, shareable, transparent data
  - Open source tools
  - Leveraging collective investments and resources
Next steps

- **Incremental data collection (also through linkages)**
  - Phase 1: JMP data collection (starting year 1), survey and admin
  - Phase 2: GLAAS data collection (starting year 1), ODA data from OECD
  - Phase 3: Diarrheal Diseases data (starting year 2)
  - Phase 4: Climate Change data (starting year 2)
  - Phase 5: Remote sensing data (starting year 2), possible partner NOAA
  - Phase 6: Other data (poverty etc. starting year 3) IO partner and Closer links to regional and country databases/observatories

- **Expanding the partner network**

- **Project plan, roadmap and resource mobilisation**
THANK YOU

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