

# Health Data Infrastructure, Architecture and Interoperability

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# Outline

- Organization of health services in Ghana
- Health services architecture of Ghana
- Data generation & sources
- Data flow in the health sector
- Snapshot of health information systems in Ghana
- Big data sources and emerging data trends in healthcare
- Challenges of health information systems
- Data infrastructure, architecture and interoperability
- Conclusion

# Policy Direction

## **Vision**

- All people in Ghana have timely access to high quality health services irrespective of ability to pay at the point of use

## **Goal**

- Increased access to essential quality health care and population-based services for all by 2030

## **Objectives**

1. Universal access to a better, efficiently managed, high quality primary health care system
2. reduce avoidable maternal, adolescent and child deaths and disabilities
3. Increase access to responsive clinical and public health emergencies

# WHAT THE FUTURE HOLDS



- **The VUCA World**
  - **Volatile**
  - **Uncertain**
  - **Complex**
  - **Ambiguous**
- **Technology moving very fast;  
Geopolitics greatest uncertainty**
- **Need Compass not Map; Culture  
& Values vs. Copy & Follow**

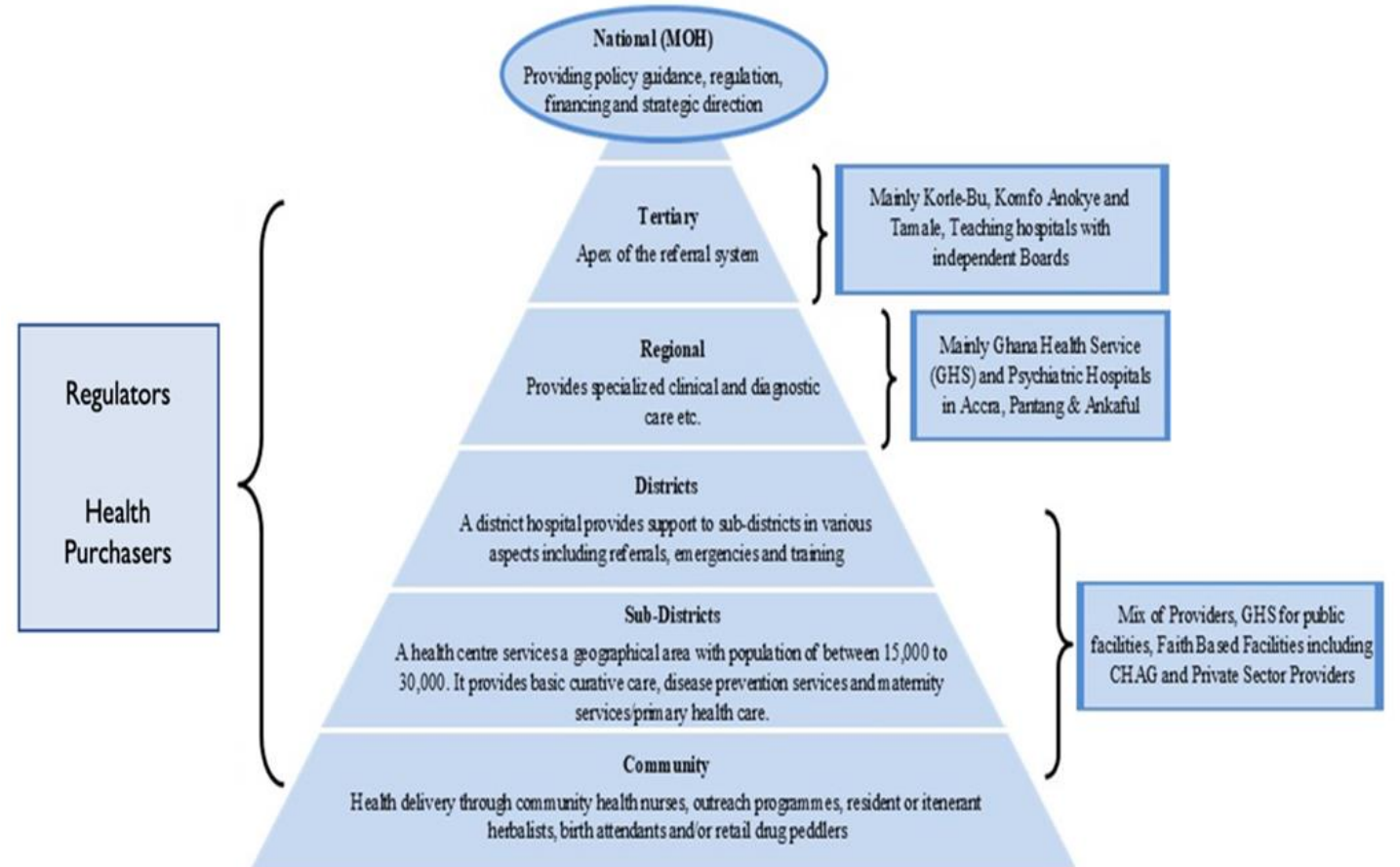
# Design Innovations

- 21<sup>st</sup> century is the Age of Design
- Design in 3 perspectives- Systems, Environment and Processes
- The Revolutions: Agriculture, Industrial, Computer and IoT
- Disruptive innovations- artificial intelligence, machine learning, genomics, personalized medicine
- Hospital redesign

# Organization of Health Services in Ghana

- Ghana's health sector is pluralistic, comprising public, private and quasi-government health providers
- Health services are organized at the primary, secondary and tertiary levels
- Operational at the national, regional, district and sub-district levels
- Service delivery is supported by agencies that provide training, regulation, purchasing of health services, and research services
- Routine administrative health service data collection is skewed towards health care delivery
- Health sector generates a lot of data, however, very little go into the indicators that are used to monitor the health service performance.

# Health services provision architecture of Ghana



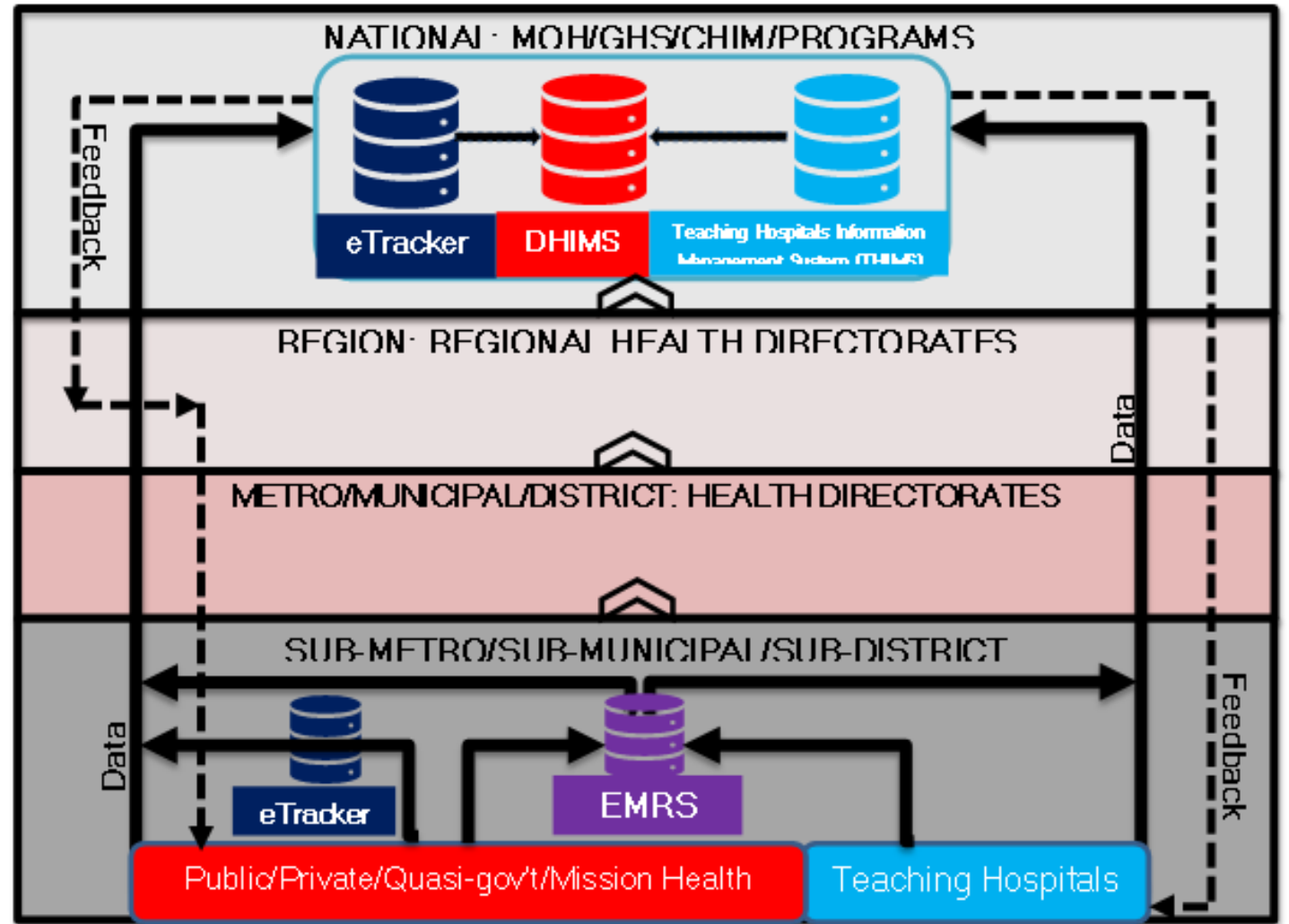


# Data Generation and Sources

- The country's health information system draw on multiple data sources such as population-based surveys, civil registration, and vital statistics.
- Currently, all healthcare facilities, both private and public report to agreed summarized format for reporting on specific services, programmes, and projects to DHIMS2
- Other data sources include, census, public health surveillance, health facility and community systems data which are derived from administrative and non-health sector data



# Data Flow in the Health Sector





# SNAPSHOT OF HEALTH INFORMATION SYSTEMS IN GHANA

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# District Health Information Management System (DHIMS2) platform

- District Health Information Management System (DHIMS2) platform is a web-based system that is used to facilitate the management of health care data from the districts.
- Facilities report through the Districts/Municipals/Sub-Metropolitan/Metropolitan Health Directorates in which they are located
- The challenge with this arrangement is the difficulty in getting all the Teaching Hospitals, Quasi-government facilities and some private hospitals to report through the platform.
- This leads to incompleteness in service delivery reports in districts with these facilities and affects health planning and response to critical health events in these districts, municipals, and metropolises



# Human Resource Information System (HRIS)

- This system is managed by the Human Resource Division of the Ghana Health Service.
- It is used to capture individual employee's data to facilitate promotions, transfers, and other human resource functions.
- Additionally, e-portal for recruitment has been deployed by the Ministry of Health (MOH) to ensure transparency and equity in the distribution of new staff.
- Also available is the workforce information management system for Ghana
- The Public Service Commission also maintains an electronic platform of health workers that facilitate human resource management in the public sector



# The Logistics Management Information System (LMIS)

- This is designed to collect, record, and report critical supply chain data.
- It has currently been deployed to a number of health facilities across the country.
- It provides decision-makers throughout the supply chain with accurate, timely, and appropriate data that include quantities, time, condition and cost.



# National Health Insurance Information Systems

- The NHIA utilizes its membership information systems to capture, store and use enrolment data
- The Scheme also has electronic claims management system (e-claims and claim-it) for managing its medical claims from service providers.
- These information systems provide useful indicators for tracking performance of the scheme and supporting decision making in the health sector.



# Regulators Information Systems

- Several regulatory agencies in the country also produce and maintain population-based data in the sector.
- Mostly, their systems capture information on health professionals, health service delivery environment, health insurance industry, licensing, foods and drugs.
- The regulatory agencies generate data on both public and private health facilities in the country through execution of their mandates
- Data from these regulatory institutions are useful for tracking standards and quality of health services delivery in the country

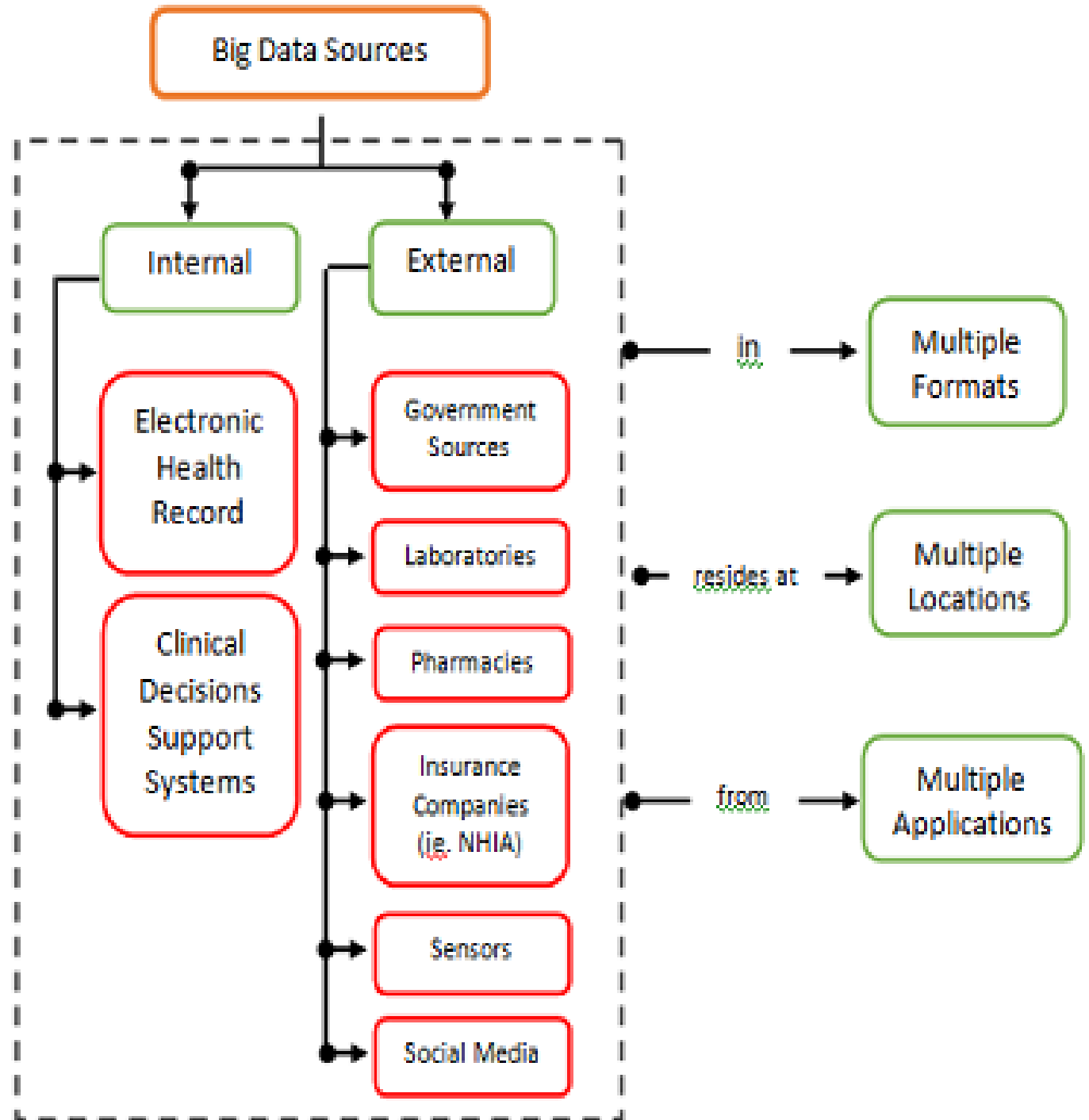


# Other Health Information Systems

- Civil Registration and Vital Statistics- The Births and Deaths Registry
- Population and Housing Census- The Ghana Statistical Service (GSS)
- Population-based Surveys- Collaborations (GSS, GHS)
  - Demographic and Health Surveys (DHS)
  - Multiple Indicator Cluster Survey (MICS).
  - Ghana Living Standard Survey (GLSS),
  - Maternal Health Survey (MHS)
  - Malaria Indicator Survey (MIS)
- Facility Surveys
  - Emergency Maternal, Obstetric and Neonatal Care (EMONC) Survey
  - Client satisfaction surveys
  - Tracer medicines availability surveys



# Big Data sources and emerging Data trends in healthcare





# Challenges of the health information systems

- Currently, most health information systems and data sources in the sector are largely unrelated or connected.
- Unwillingness of other agencies to share some health data for analysis and use
- Inconsistent data structures across agencies (e.g., relating to identity codes of facilities)
- Use of improvised software for health data management at regulatory institutions, training institutions and some service providing institutions



# Data Infrastructure, architecture and interoperability

- Ensure interoperability and harmonization of ICT platforms across health facilities
- Integrate ICT considerations in health infrastructure planning, development, and management
- Accelerate efforts to increase usage of electronic Medical Records by all facilities to manage patients' health care data.
- Improvement in human resources capacity to manage data in all facilities across the various levels
- Increase access to computers and/or internet to peripheral areas.
- Establish standards for data security (Data Protection Agency)



# Conclusion

- Different health information systems exist in the sector that can be leveraged to improve coordination and harmonization for effective use
- Need to invest more to improve the infrastructure as well as the policy landscape for integrating all health information systems to make data readily accessible for timely decision making

Thank you

