

Digital Health

*CYSTINET-Africa: Cysticercosis/Taeniosis Conference 2019
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Outline

- Introduction
- Digital Health Journey in Tanzania
- Health information management e.g. DHIS2
- Achievements
- Important aspects of DH in the context of cysticercosis
- Challenges facing DH
- Emerging technologies in Healthcare



Introduction

- **Digital Health** = ICT + Health
- Digital health describes the general use of information and communications technologies **ICTs** (**digital, mobile and wireless**) for health (*to support the achievement of health objectives*) and is inclusive of both **mHealth and eHealth**. (WHO, 2016)
- Digital technologies are changing the healthcare sector at unprecedented pace.



Introduction ...

- **58.6m** estimated population of Tanzania, October 2019 (Worldometers)
- **78%** of households **owning a mobile phone** (NBS, 2018)
- **43.62m** mobile phone subscribers in Tanzania (TCRA, June 2018)
- **23.14m** were internet users, increase **social media use**
- **43%** Internet penetration in Tanzania in 2018
- **48.8%** of the mobile phone subscribers **using Internet**
- Rollout of National ICT Backbone (NICTBB)
- Rural electrification (REA) and rural network connectivity (UCSAF)



Digital Health as an enabler for transforming health systems

The WHO Health System Framework

System Building Blocks

SERVICE DELIVERY

HEALTH WORKFORCE

INFORMATION

**MEDICAL PRODUCTS,
VACCINES & TECHNOLOGIES**

FINANCING

LEADERSHIP / GOVERNANCE

**ACCESS
COVERAGE**

**QUALITY
SAFETY**

Overall Goals / Outcomes

**IMPROVED HEALTH
(level and equity)**

RESPONSIVENESS

**SOCIAL & FINANCIAL RISK
PROTECTION**

IMPROVED EFFICIENCY

Digitalisation of Health services should employ a **holistic approach**

System Building Blocks

SERVICE DELIVERY

HEALTH WORKFORCE

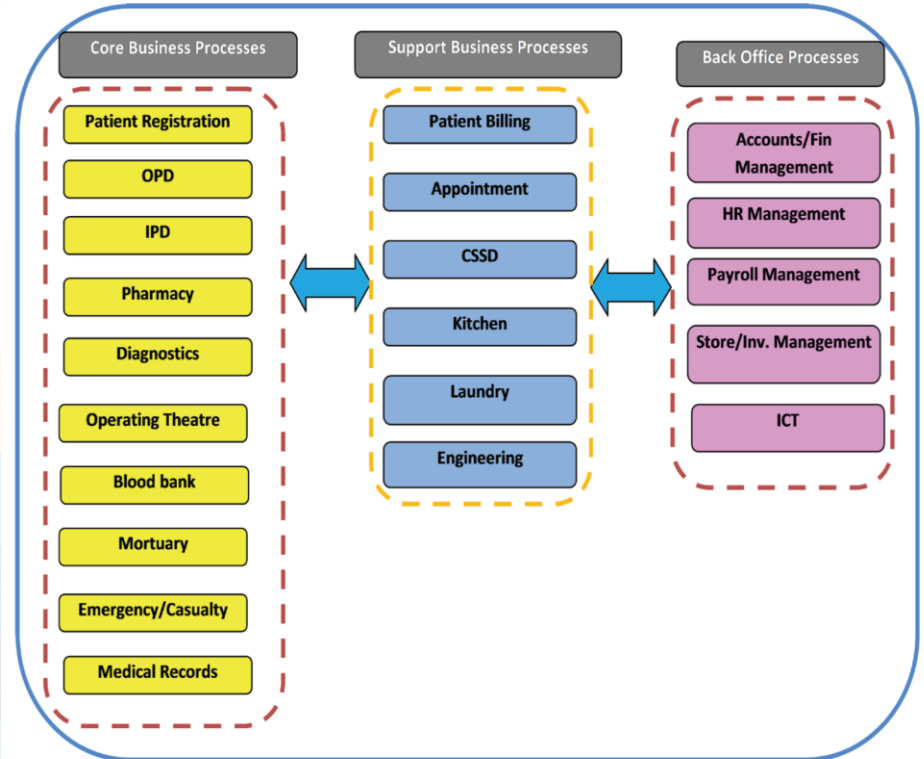
INFORMATION

**MEDICAL PRODUCTS,
VACCINES & TECHNOLOGIES**

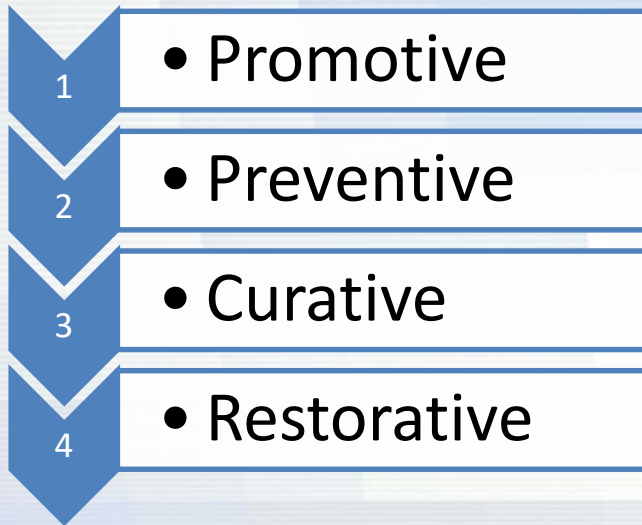
FINANCING

LEADERSHIP / GOVERNANCE

Health Facility Business Process Framework



Digital solutions for Health services delivery



I. Health system level

- ▶ Registration and vital events tracking
- ▶ Real-time indicator reporting
- ▶ Human resource management, accountability
- ▶ Electronic health records
- ▶ Supply chain management

II. Provider level

- ▶ Decision support
- ▶ Scheduling and reminders
- ▶ Provider training, service updates

III. Patient level

- ▶ Client education and self-efficacy
- ▶ Behaviour change communication
- ▶ Adherence to care
- ▶ Emergency services information

Improvements in:

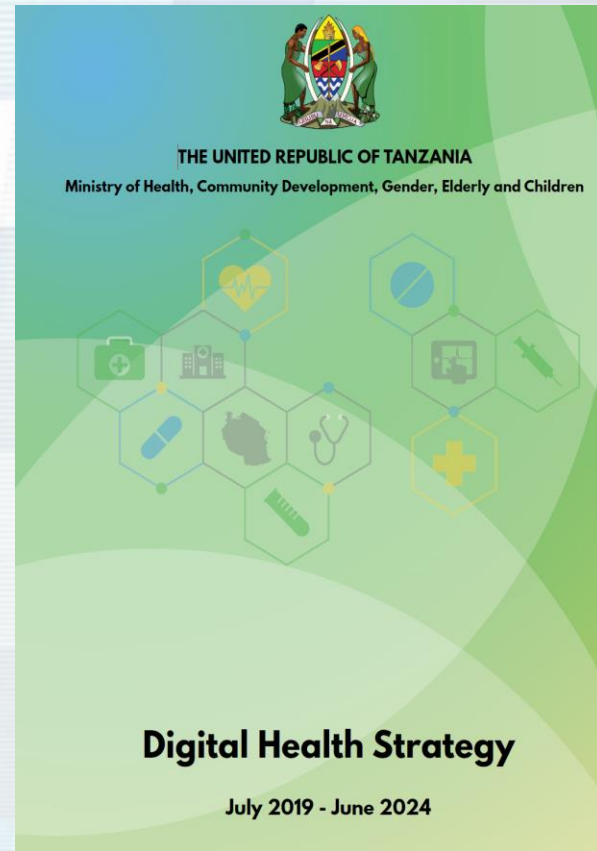
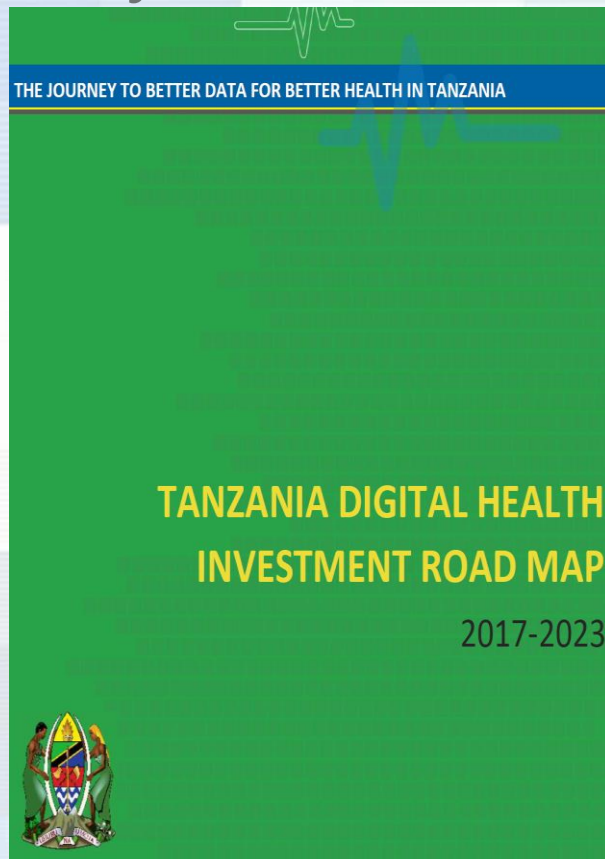
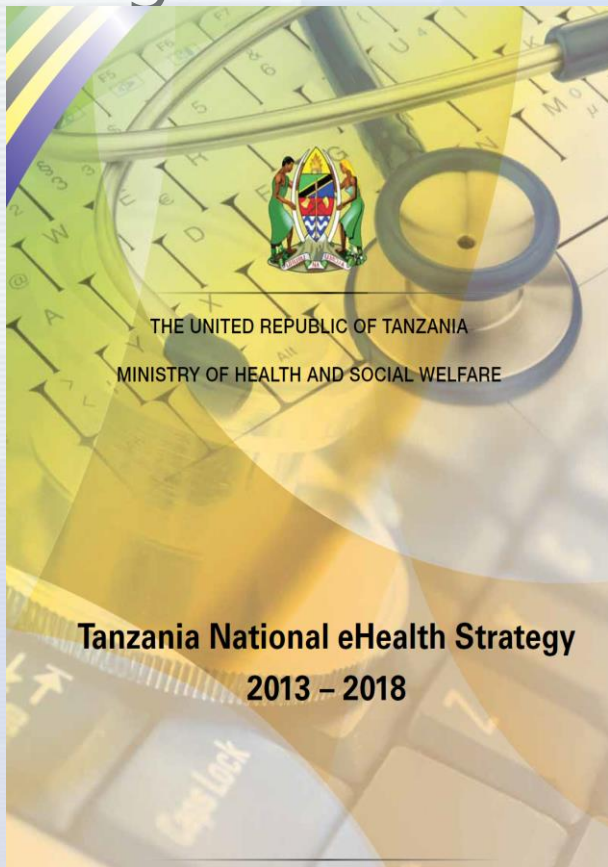
- **Costs**
- **Efficiency**
- **Quality**
- **Utilization**

Digital health functions and strategies

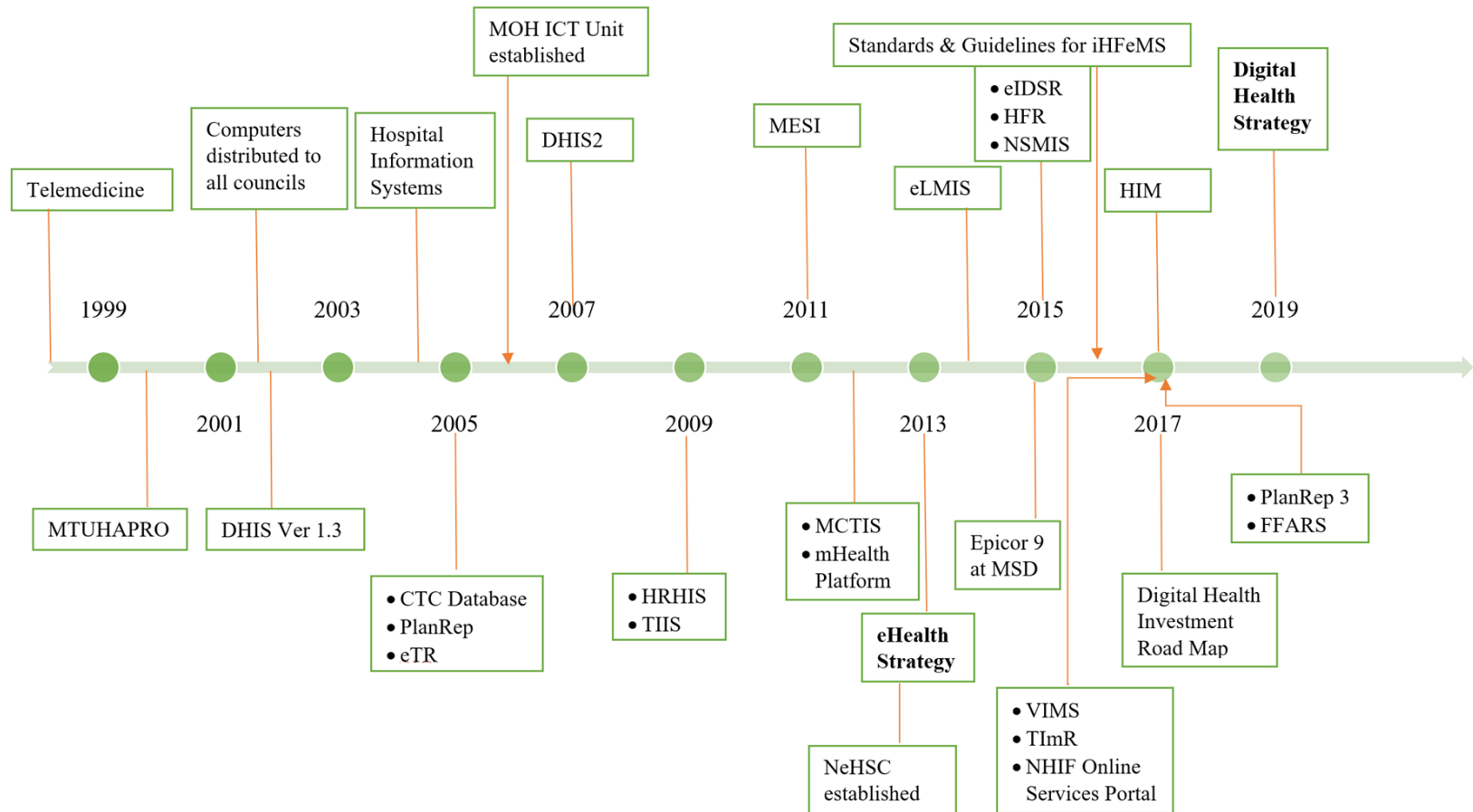
WHO, 2016



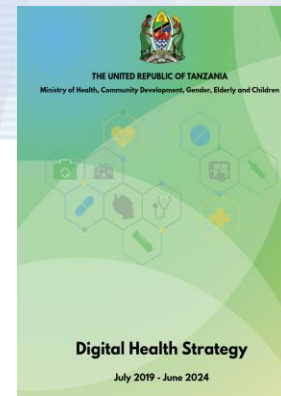
Digital Health Journey in Tanzania



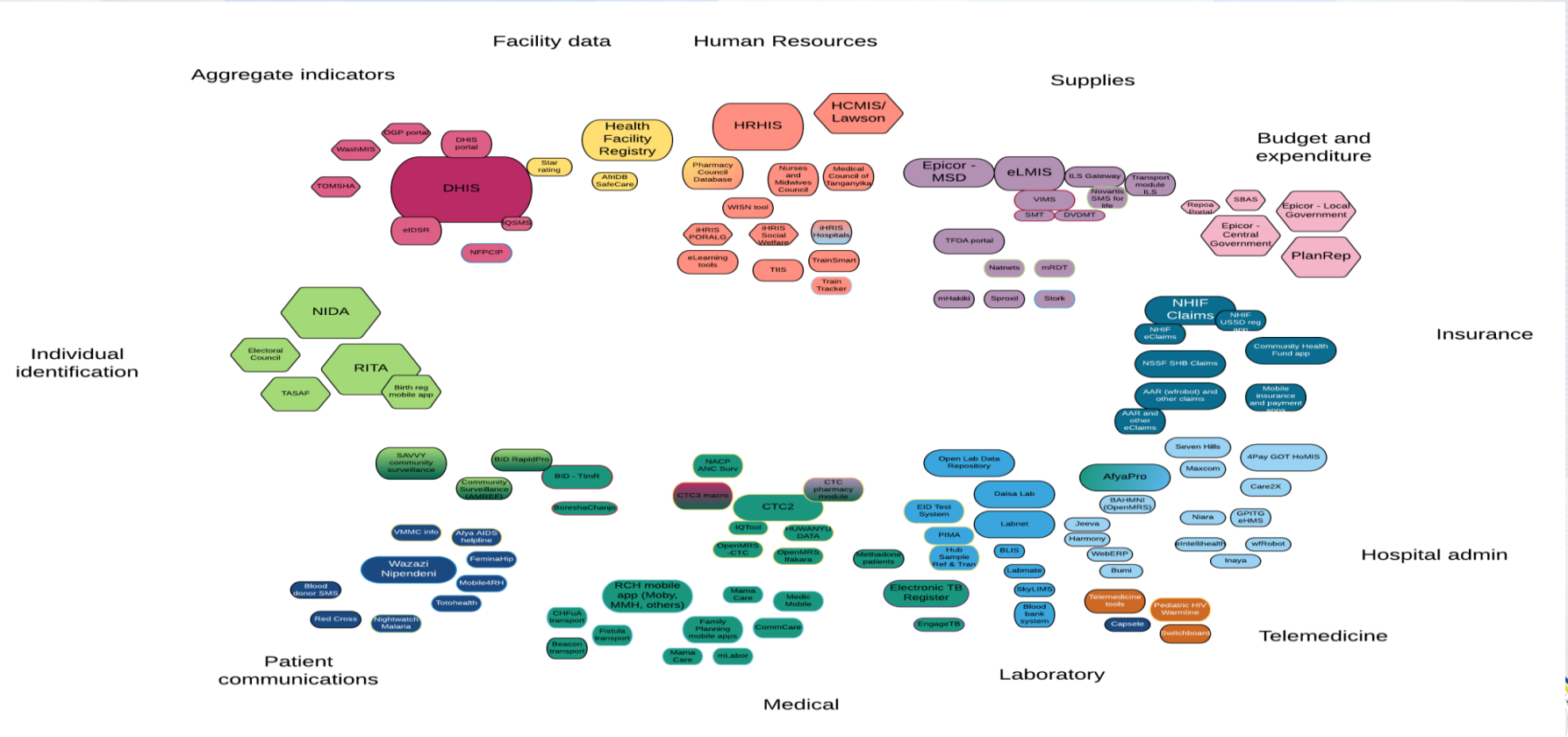
Digital Health Journey in Tanzania



Digital Health ...



Major HIS Data Management Systems in Tanzania



Source: DUP Assessment findings, 2016



Major HIS Data Management Systems

- Electronic Medical records (EMRs)
 - hospital systems, vertical programmes systems, mHealth
- DHIS 2 - (District Health Information Software version 2)
- eLMIS – Electronic Logistics Management System
 - VIMS – Vaccine Information Management System
 - TiMR -Tanzania Immunization Registry
- Telehealth platforms
 - Telemedicine
 - eLearning platforms
- EPICOR – integrated financial information management system
- PlanRep – Planning and Reporting
- FFARS – Facility Financial Accounting and Reporting System
- TIIS – Health Training Institution Information System
- HFR – Health Facility Registry or Master Facility List
- HRHIS – Human Resources for Health Information System

Tanzania HIE Conceptual Model

Interoperability layer components



Interoperability service layer



Other Institutions/ sectors Applications



Plan Rep



LGA Epicor



NHIF & CHF

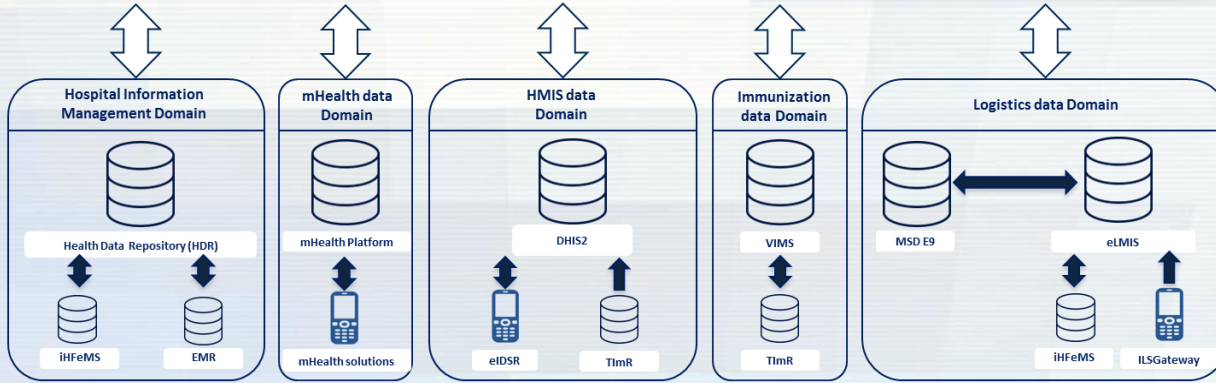


NIDA



RITA CRVS

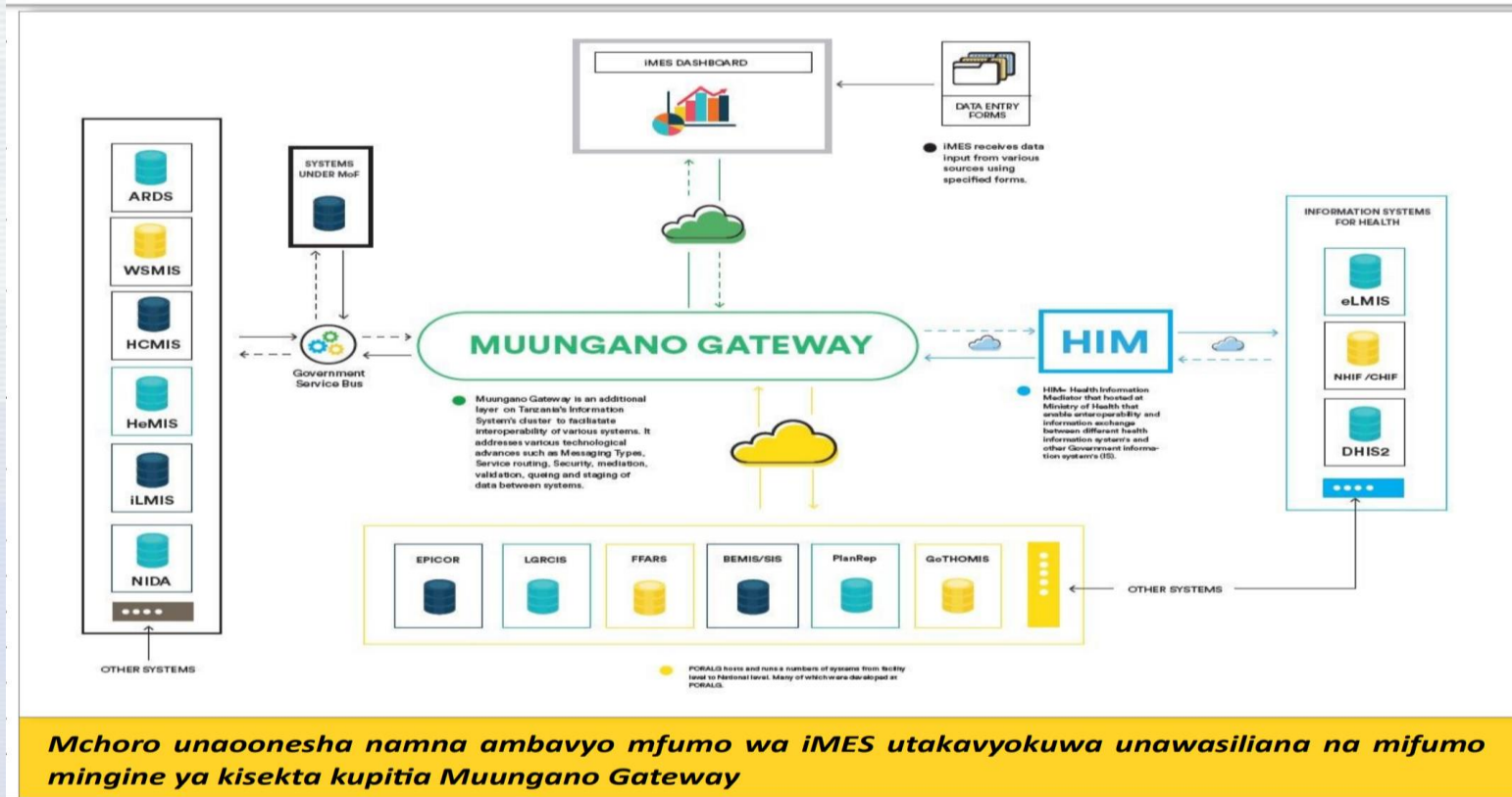
External System with Domain specific interoperability



Point of Service and Decision Support Applications



Integration between different systems



Mchoro unaoonesha namna ambavyo mfumo wa iMES utakavyokuwa unawasiliana na mifumo mingine ya kisekta kupitia Muungano Gateway

Global Digital Health Goods

- Digital tools adaptable to different countries and contexts
- There is an increasing support for global digital goods
- Open Source digital health software solutions e.g.
 - **DHIS2** – health information management (HIS) – individual/aggregated level data
 - OpenMRS – electronic medical records
 - iHRIS – human resources management
 - OpenIMIS – health insurance management
 - OpenHIM/OpenHIE – Information exchange / interoperability layer
 - OpenERP - inventory, billing, financial accounting
 - OpenELIS - laboratory management



DHIS 2 (Health Information System)

- DHIS is an open source software platform (web based system) for reporting, analysis and dissemination of data for all health programs, developed by the Health Information Systems Programme
- DHIS 2 is a tool for **collection, validation, analysis**, and **presentation** of aggregate and patient-based statistical data, tailored (but not limited) to integrated health information management activities.
- Data collection through data entry, import and export of data, aggregation and integration with other systems
- National data portal, <https://hmisportal.moh.go.tz/hmisportal/>





TANZANIA NATIONAL HEALTH PORTAL

MINISTRY OF HEALTH COMMUNITY DEVELOPMENT GENDER ELDERLY AND CHILDREN

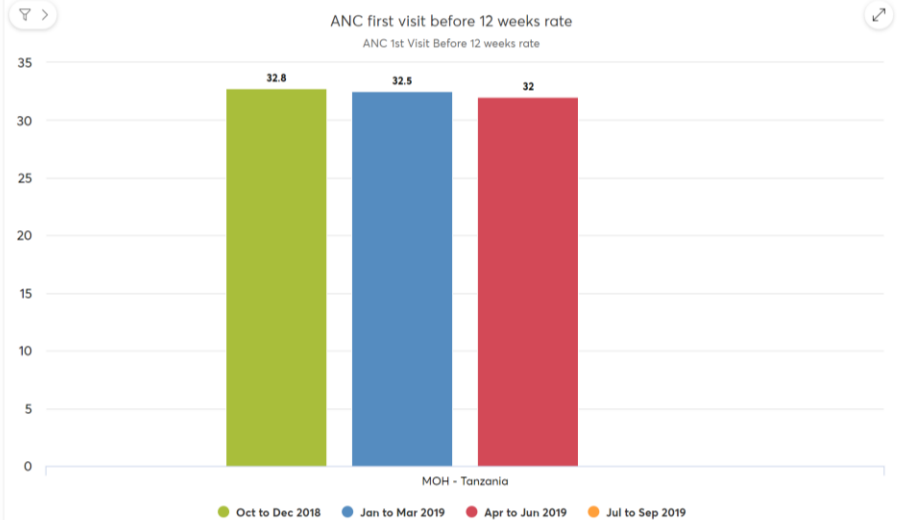
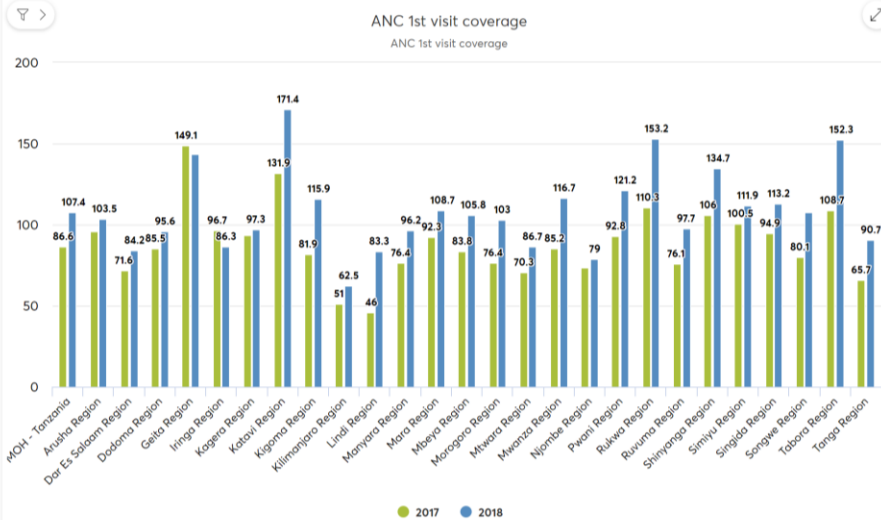
- Home
- Data statistics
- HMIS Library
- Updates
- Data on your view
- FAQs

Help/Feedback

GENERAL INFORMATION **RCHs** IVD HIV/AIDS EYE HEALTH MALARIA NUTRITION ORAL HEALTH TB&LEPROSY TRACER MEDICINE

- ANTENATAL CARE**
- LABOR&DELIVERY
- POSTNATAL CARE
- FAMILY PLANNING
- GBV & VAC

>















SAVE CHANGES

Currently editing

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There are no items

 Dashboard	 Maps	 Pivot Table	 Data Visualizer
 Event Visualizer	 Event Reports	 Data Entry	 Event Capture
 Tracker Capture	 Maintenance	 Scheduler	 System Settings

T SAVING

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Search apps



+ AutoTest OrgUnitOFPNej

+ Yangon

Data Entry ?

✘ AutoTest OrgUnitOFPNej - No Period Selected - No Data Element Selected

Organisation Unit

AutoTest OrgUnitOFPNej

Data Set

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Run validation

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Organisation Unit

Bahi Health Center

Data Set

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Period

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HMIS_Death Registry

HMIS_Huduma Baada ya Kujifungua (Postnatal)

HMIS_Idadi ya Watu (Population)

HMIS_Kliniki ya Wajawazito (ANC)

HMIS_Kutoka Wodi ya Wazazi (L&D)

HMIS_Magonjwa ya Kuhara (DTC)

HMIS_Tracer Medicine

HMIS_Ufuatiliaji wa Watoto (Child Health)

HMIS_Uzazi wa Mpango (FP)

HMIS_Wagonjwa wa Nje (OPD)

NACP_HIV Care -ART Reporting Form

NACP_HIV Care and Treatment (HCT)

NACP_PMTCT MC

NACP_PMTCT MC Quaterly

NACP_PMTCT PCR

NACP_Sexually Transmitted Infections (STI)

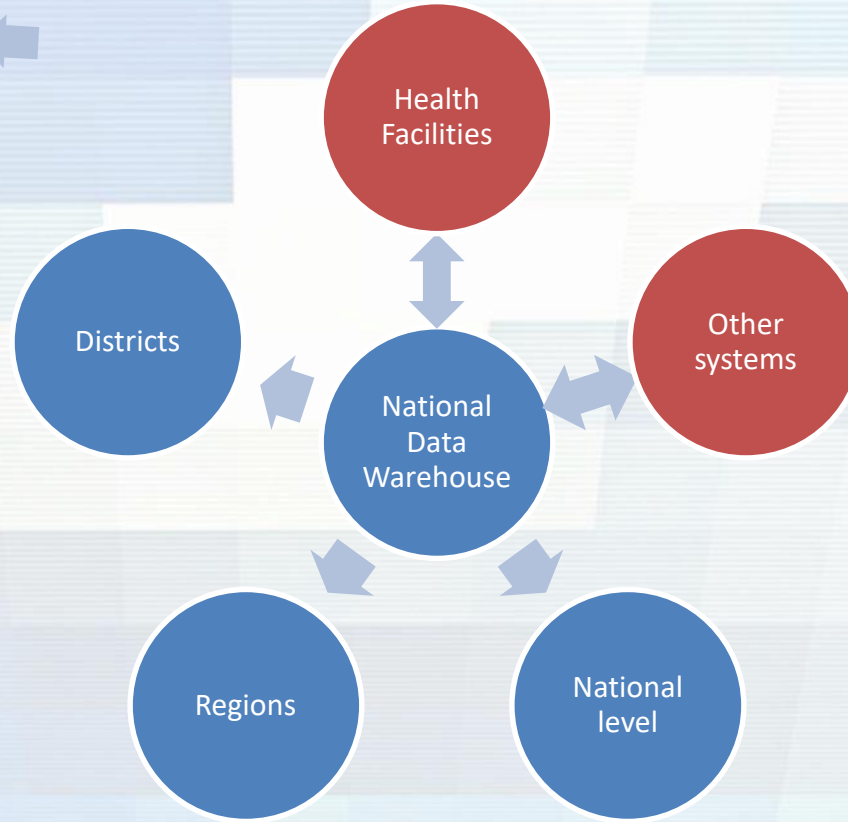
NMCP_National Malaria Control Programme

HMIS Data Flow

Data access



Data entry & access



Achievements influenced by DH

- The reported benefits include
 - increased revenue collection,
 - improved patients tracking,
 - improved health commodities supply chain management
 - improved quality of health services delivery,
 - improved communication among providers and clients,
 - improved planning and decision making



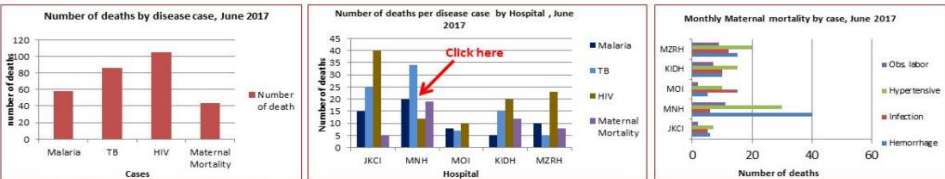
Today Wednesday June 7, 2017 | MNH-Jeeva Updated June 6, 2017 | MOI-MediPro May 30, 2017 | JKCI - Jeeva June 6, 2017 | KBIH - Care2X May 30, 2017

REPORTED MONTH **June 2017**

Monthly Bed Occupancy Rate

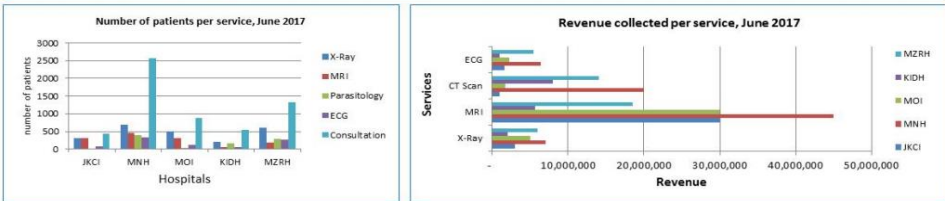


Death by Disease Case

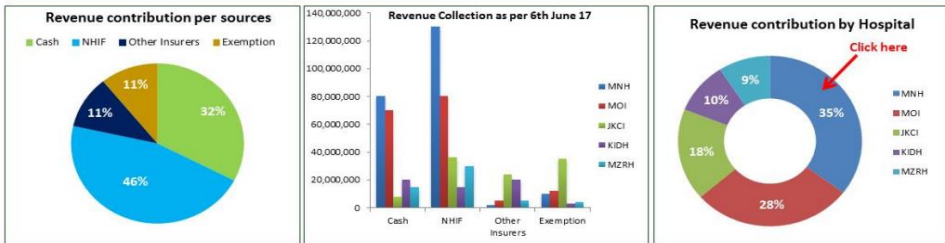


Note: Number of deaths reported from x number of hospitals

Patients Received Particular Service



Revenue Collection



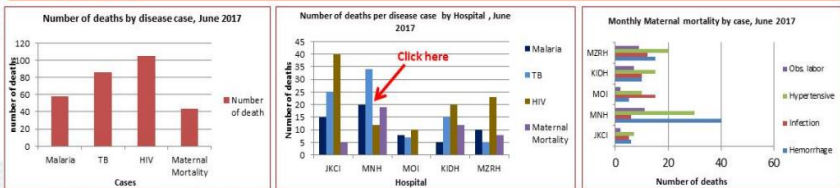
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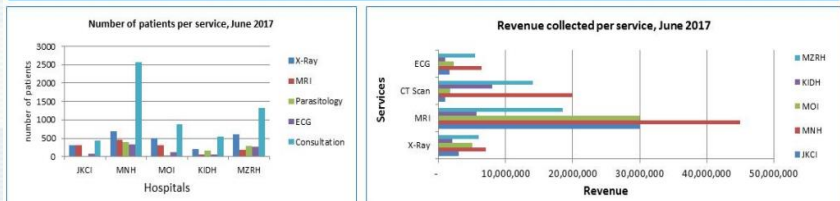


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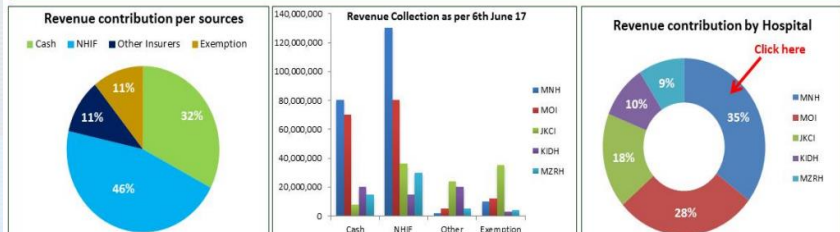
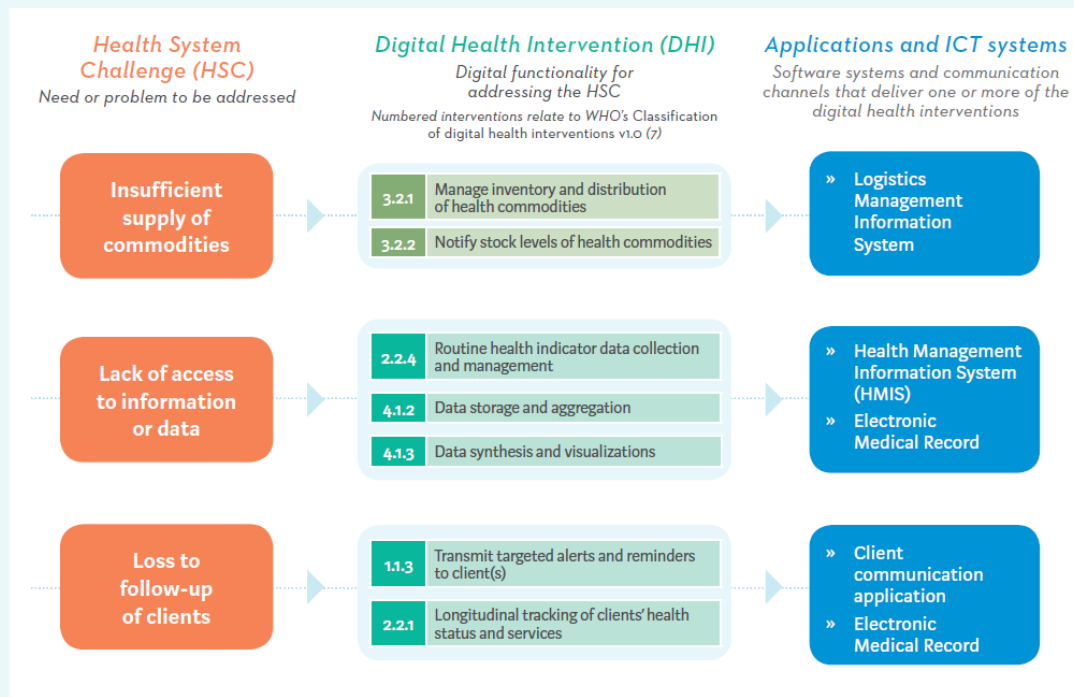


FIGURE 1.3 EXAMPLES OF HOW DIGITAL HEALTH INTERVENTIONS MAY ADDRESS HEALTH SYSTEM CHALLENGES, IMPLEMENTED THROUGH ICT SYSTEMS



As an example, digital applications and ICT systems (such as logistics management information systems) are implemented and apply digital health interventions (such as to notify stock levels of health commodities) to address health system challenges (such as insufficient supply of commodities) and achieve health objectives (maintain consistent availability of commodities).

Source: WHO, 2018 (13)

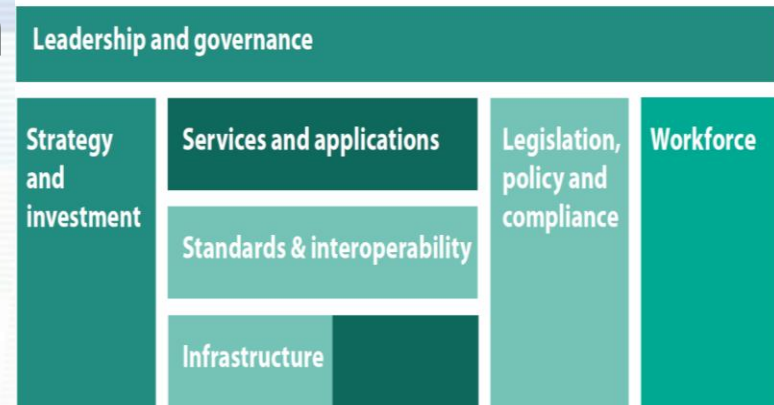


Challenges facing Digital Health

At different levels of the health system

- Inadequate leadership, governance and coordination
- Fragmented and uncoordinated business processes
- Fragmented ICT pilots and numerous HIS silos
- Inadequate sharing/exchange of health information across the sector
- Inexistence of common investment framework
- Lack of adequate and reliable ICT infrastructure e.g. power supply, internet
- Limited digital competencies among users

- A call for a **Holistic Approach** in planning, implementing the **digital health interventions**



Emerging Technologies in Healthcare

- Artificial intelligence including use Chatbots e.g. WeChat bots can book a doctor, make payment, etc.
- Algorithms to detect health risks, diagnosis and treat diseases
- Drones in Healthcare e.g. delivery of medical supplies (blood, vaccines, etc.)
- **eGames: Game**-based approaches (gamification) can provide ideal **strategies** for **health promotion, prevention**, and self-management of chronic conditions
- Targeting Individual or population health



Drone Technology is Poised to Revolutionize Healthcare

- Trials in Africa

Rwanda, Malawi, Ghana, Madagascar, Tanzania*

*New regulations requires permission and impose several restrictions

<https://www.thecitizen.co.tz/news/New-drone-operation-rules-to-take-effect-in-4-months/1840340-5270032-tt7r94z/index.html>



Emerging technologies ...

- Smart phones
- Sensors wearables e.g. watches
- Smart rooms
- Smart beds
- Smart cars, ambulances
- Smart pills
- Smart cards
- Smart doctors
- Smart *everything* - “Smart smart”



MEDICAL GRADE WEARABLES + PREDICTIVE DIAGNOSTICS = PROACTIVE HEALTH

Today

Reactive Health



1. Seek health services when feeling ill
2. Consumer sorts through different care options
3. Data is then captured to confirm diagnosis

Tomorrow

Proactive Health



1. Data is captured via medical-grade wearables
2. Care option reaches out if there is an anomaly and triages via tests/consultation to confirm whether a hospital visit is needed
3. Provider already has historical dataset of relevant biomarkers and genetic predispositions

CBINSIGHTS

Digital Health in Taeniosis/Cysticercosis

- Information exchange/sharing among actors/systems
- Capturing data related Taeniosis/Cysticercosis in EMR/DHIS2
- Tracking/ mapping/surveillance of free roaming pigs
- Mass education – use of digital technologies e.g. social media
- Availability and use of data from the systems at all levels e.g. community, HFs, Councils, to National
- Reaching the communities – digital contents, social media, mobile phones, etc.
- Healthcare providers – EMR with inbuilt decision support tools in identification, tracking and treatment of the diseases
- Machine learning /AI – enough/quality data quality?



9 Principles of Digital Development in DH



- Improved health system performance
- Better health outcomes
- Healthier populations



Asanteni Sana
Vielen Dank
Thank you for attention



Discussion

