

# Tanzania supply chains and UAVs

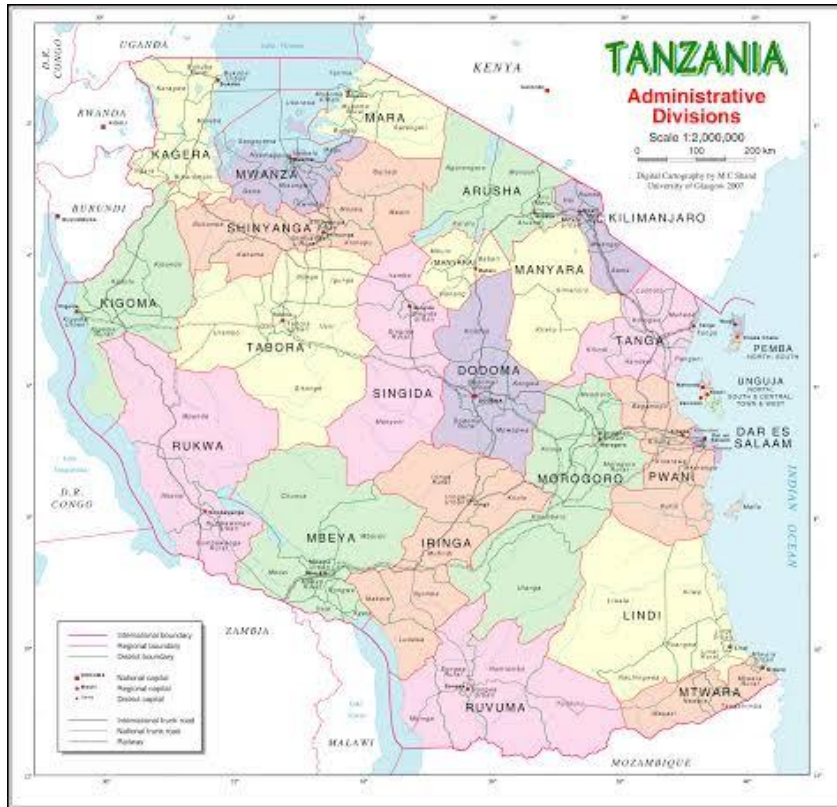
Prepared for Animal Dynamics

**Update December 2019**

# Included in this presentation

- Overview of major stakeholders in the Tanzania public sector supply chain
- Flows of commodities in the Tanzania public sector supply chain
- Major supply chain interventions that will affect the supply chain
- Current supply chain bottlenecks and challenges, highlighting those that may benefit from UAV implementation
- Considerations for UAVs

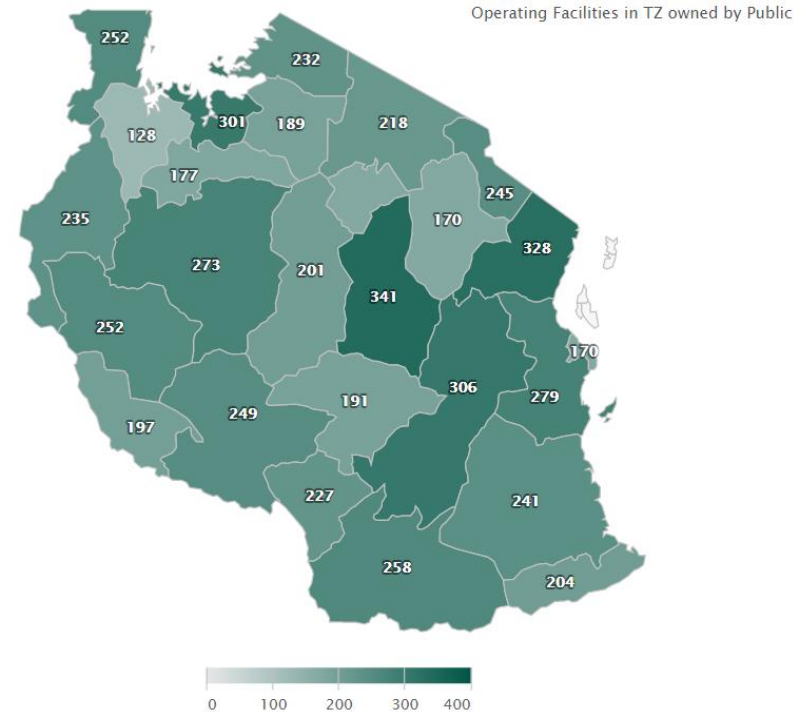
# Quick glance at health organizational levels – public sector



- 26 regions
- 168 districts; almost equate to council level, but some districts have 2 councils; 185 councils

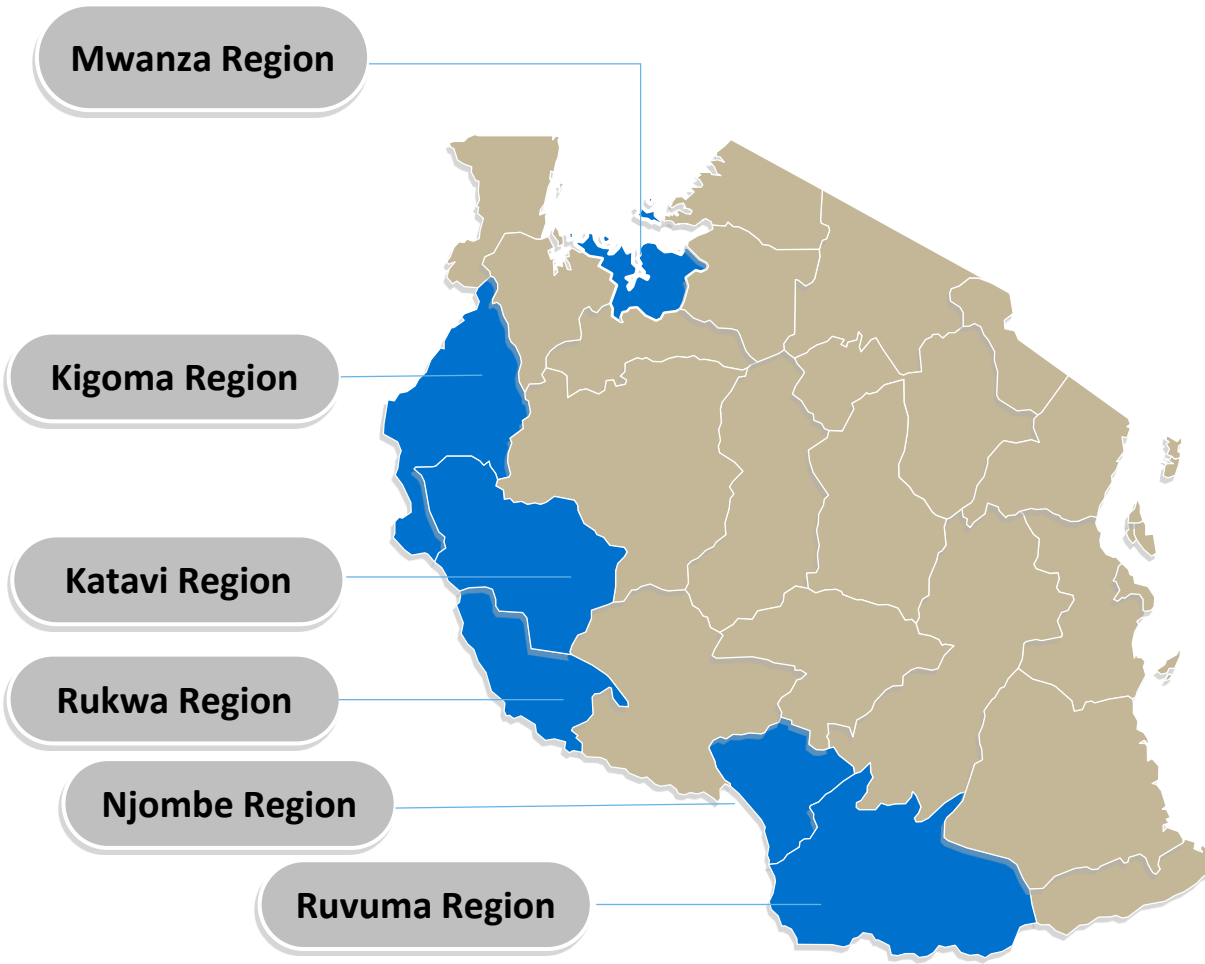


Operating Health Facilities Distribution in Tanzania



- Hospitals: 120
- Health centers: 708
- Dispensaries: 5,074

# Particularly challenging geographical areas



Why are these regions challenging?

- Include health facilities on islands in Lake Tanganyika, Nyasa, and Victoria
- Fewer roads, including all weather roads (difficulties in rainy season)
- Geographically large, with health facilities scattered
- Mountainous terrain
- Distance from point of resupply

# MAJOR STAKEHOLDERS IN TANZANIA PUBLIC SECTOR SUPPLY CHAIN



# Major stakeholders in TZ supply chains



Government of Tanzania

**msd**  
medical stores department

Parastatal entity responsible for procurement, storage, and distribution to all public sector facilities in the country

Ministry of Health,  
Community  
Development, Gender,  
Elderly, and Children

Responsible for policy setting and strategy; Pharmaceutical Services Unit (PSU) - Stewards of the public sector supply chain and responsible for overall commodity availability

President's Office –  
Regional  
Administration and  
Local Government

Responsible for implementation of policies and strategies as designed by the MOHCDGEC; District hospitals, health centers, and dispensaries and staff

## Donors/Funders

- Global Fund
- UNICEF
- Global Drug Facility
- USAID
- DFID
- UNFPA

## Implementing partners

- JSI
- GHSC-TA-TZ
- USG Implementing partners

# Major stakeholders in TZ supply chains - MSD

- Medical Stores Department (*msd*) – the parastatal entity responsible for procurement, storage, and distribution to all public sector facilities in the country
- Responsible for routine orders, emergency orders for all pharmaceuticals, medical + laboratory supplies
- Operates 1 central warehouse, 8 zonal stores, and 2 sales points (2 more sales points are in development)
- Completes direct delivery from zonal store to health facilities
- Technically under the Ministry of Health, Community Development, Gender, Elderly and Children (MOHCDGEC), but operates with its own board of directors

Strategic locations of MSD zones and Sales Points



# Major stakeholders in TZ supply chains - MOHCDGEC

- Ministry of Health, Community Development, Gender, Elderly, and Children
- Overall responsibility for policy setting and strategy
- Pharmaceutical Services Unit (PSU) - Stewards of the public sector supply chain and responsible for overall commodity availability
- Vertical programs (National AIDS Control Program, National Tuberculosis and Leprosy Program, National Malaria Control Program, Reproductive and Child Health Services, Diagnostic Services Section, National Blood Transfusion Programs, Immunization and Vaccine Division)
- Logistics Management Services
- Regional and referral hospitals



# Major stakeholders in TZ supply chains – PO-RALG

- President's Office of Regional Administration and Local Government
- Responsible for implementation of policies and strategies as designed by the MOHCDGEC
- District hospitals, health centers, and dispensaries and staff (including regional and district pharmacists and laboratory personnel)

# FLOWS OF COMMODITIES



# Several flows of commodities in TZ

- Routine orders, through the Integrated Logistics System (ILS)
  - Variation for tuberculosis (TB)
- Emergency orders (outside of routine orders)
- Vaccines
- Blood for transfusion – samples for testing and whole blood for transfusion
- Laboratory samples (blood for viral load testing, sputum samples for TB, dried blood spots for early infant diagnosis of HIV, samples for biopsy testing, etc)
- Short shelf life laboratory reagents

Annual estimated transport costs are included for Ukerewe district (Mwanza region), 37 facilities, includes 6 islands in lake Victoria.

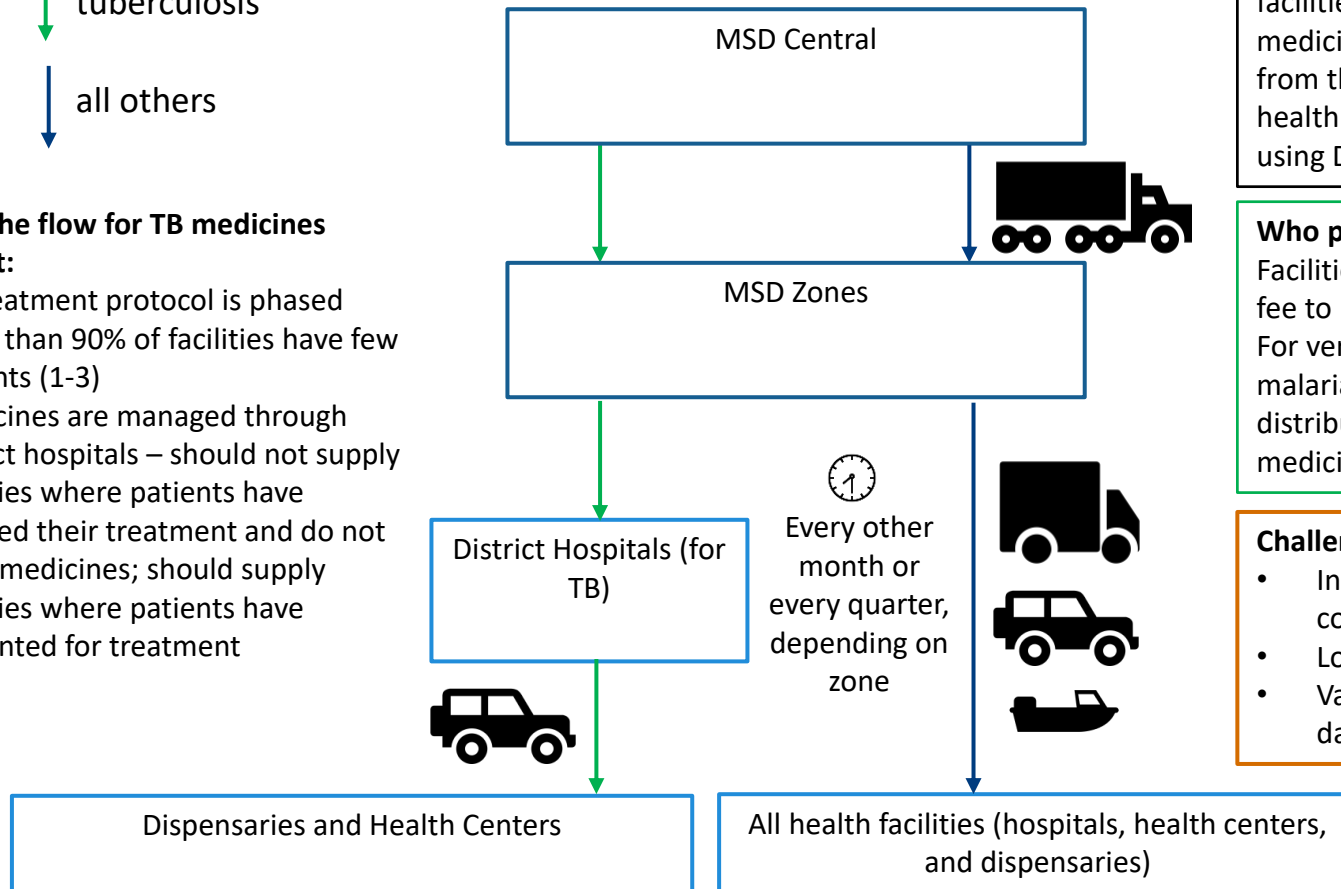


# Routine distribution: Integrated Logistics system

↓ tuberculosis  
↓ all others

## Why is the flow for TB medicines different:

- TB treatment protocol is phased
- More than 90% of facilities have few patients (1-3)
- Medicines are managed through district hospitals – should not supply facilities where patients have finished their treatment and do not need medicines; should supply facilities where patients have presented for treatment



**Who does:**  
MSD distributes directly to facilities; except for TBL medicines which are picked up from the district hospital by health facility staff or distributed using DMO vehicle

**Who pays:**  
Facilities pay a flat rate delivery fee to MSD (MSD paid by MOH)  
For vertical program items (ARVs, malaria, etc), donors pay MSD a distribution fee (% value of the medicines supplied)

**Challenges:**

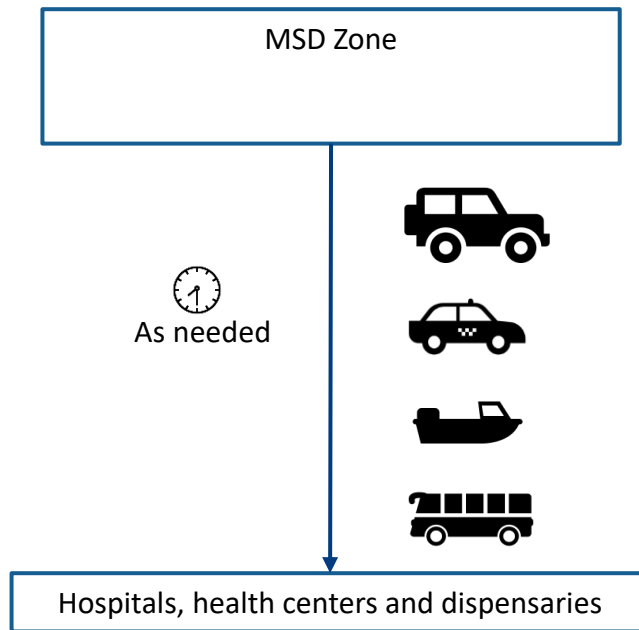
- Insufficient funding for all commodities
- Long lead times
- Variable data quality; limited data use

Sample costs for Ukerewe district/year  
Tshs 11,783,351  
\$5,123.20  
Depreciation, insurance maintenance not included

Note: When MSD is out of stock, facilities can procure commodities through Prime Vendor. Distribution is done in a variety of ways through Prime Vendor up to the district level and facilities or Councils deliver the last leg.



# Emergency orders



**Who does:**  
Usually the health facility comes to collect. May use a facility or district vehicle, public transport, or taxi/hired vehicle

**Who pays:**  
Facility or council budgets; MSD does not have incentive to start assuming these charges as facilities cover the transport costs of the goods

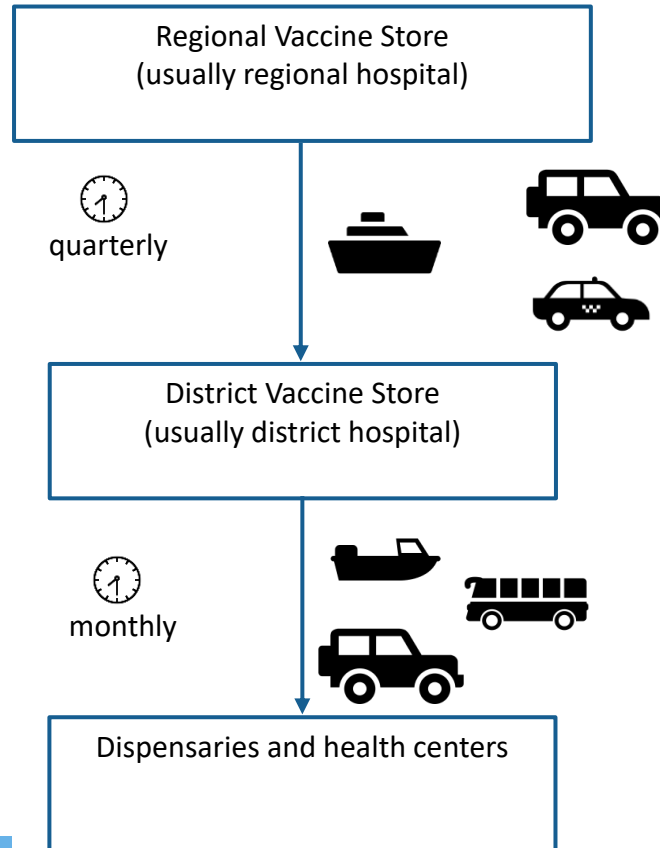
**Challenges:**

- Staff spending time away from the facilities
- Unexpected expenses that may not be budgeted for
- Facility vehicle (ambulance) sometimes is used.

Sample costs for Ukerewe district/year  
Tshs 11,431,640  
USD 4,970.28



# Vaccines



In cases of emergencies at the district level, the district vaccine officer may travel to regional store using public transport

For emergencies at the health facility level, the health facility staff travel to the District Vaccine Store (usually public transport) with a cold box to pick up the vaccine

## Who does:

From Region to district is done by the Regional Immunization and Vaccine Officer; From District to facility is done by the District Immunization and Vaccine Officer. In both levels, a landcruiser or Double cabin pickup is used.

## Who pays:

Regional Medical Office pays for distribution from Region to District; District pays for the distribution from district to facilities

## Challenges:

- Cold chain items

Sample costs for Ukerewe district/year  
Tshs 38,073,200  
\$16,553.57

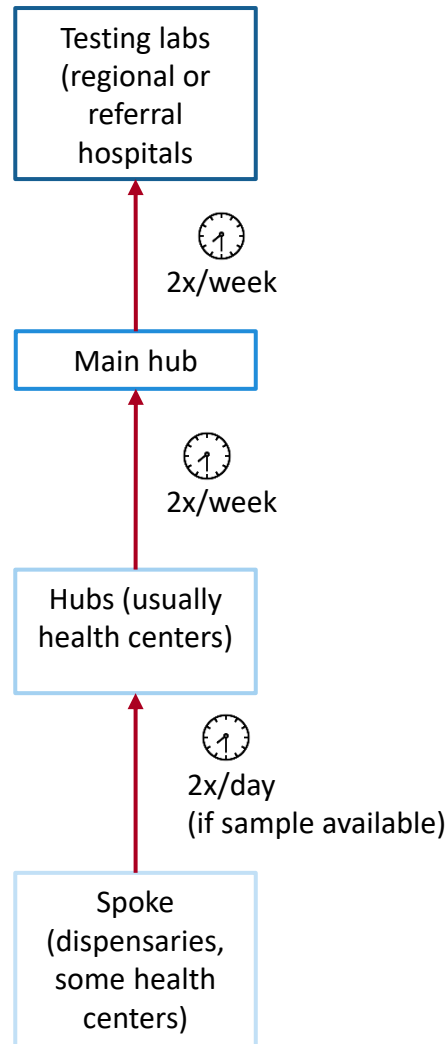
# Lab sample transport

## Samples:

HIV viral load, DBS,  
hematology, chemistry,  
sputum samples for TB testing,  
histology samples

Each hub: 50-100  
samples/week

In some cases, POSTA does the  
collection of samples from health  
facilities and deliver lab results  
back. POSTA is contracted by  
implementing partners to do the  
pickup and delivery of results



## Who does:

Mix of drop off and pickup –  
sometimes facility staff drop off  
samples; sometimes higher facilities  
pick up; sometimes 3<sup>rd</sup> parties (i.e.  
POSTA) collect samples

## Challenges:

- Extremely short timelines: samples must be processed less than 5 hours after collection; samples need to reach testing lab less than 5 days after collection
- Non-standardized processes: pickup vs drop off
- Unknown turnaround time: unclear how delivery of results is done nor the turnaround time for producing results

# Blood for transfusion: samples for testing and whole blood for transfusion

## Notes on blood samples for testing:

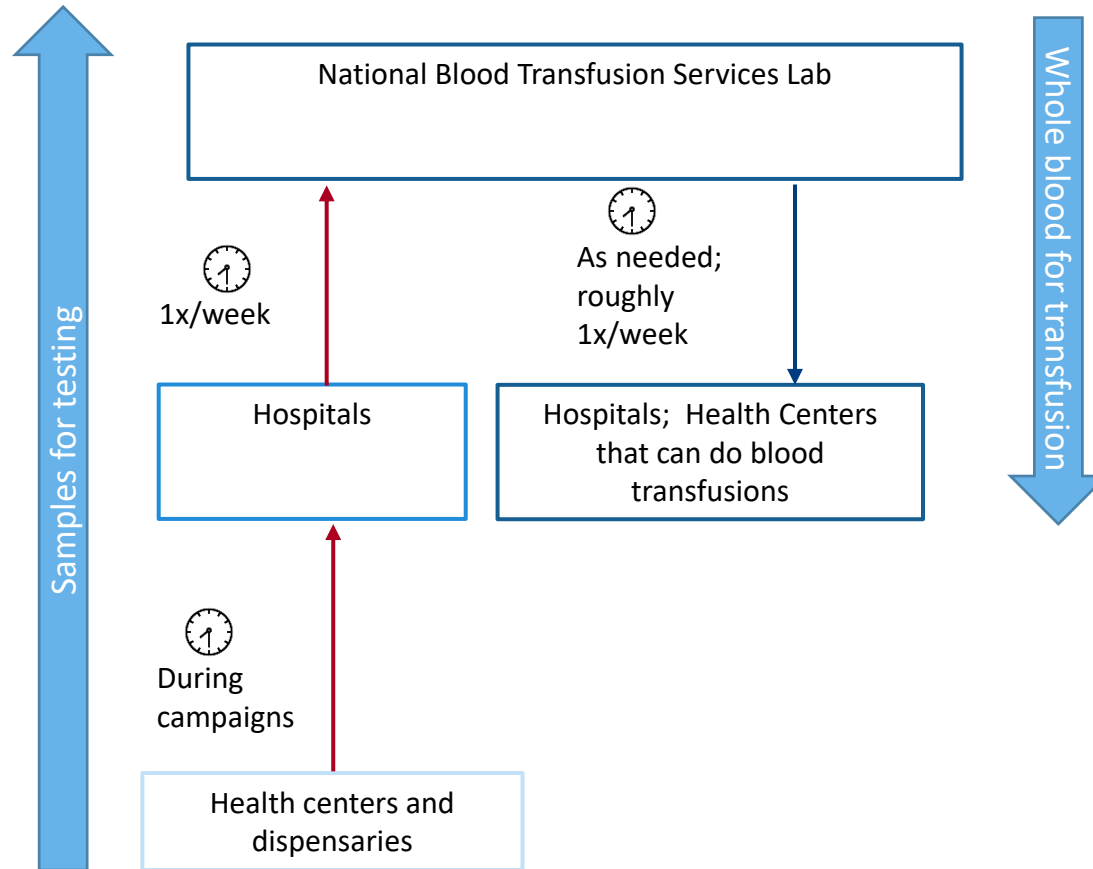
- 30-50 samples/ week;
- During donation campaigns (done quarterly): more than 150 samples/week
- Packaging and barcoding of samples done at District Hospital
- Blood from where the sample was taken is held at the hospital/ health center until the results are returned

**Who does:**  
Health facility workers

**Who pays:**  
Districts/  
councils

### Challenges:

- Staff away from facilities;
- Frequent transport



## Notes on whole blood for transfusion:

- Is sent for rare blood types or any case where the blood type needed is not available at the facility

**Who does:**  
Health facility workers or transporters

**Who pays:**  
NBTS; or  
Transporters do it for free

### Challenges:

- Immediately needed

Sample costs for Ukerewe district/year  
Tshs. 50,472,000  
\$21,944.35

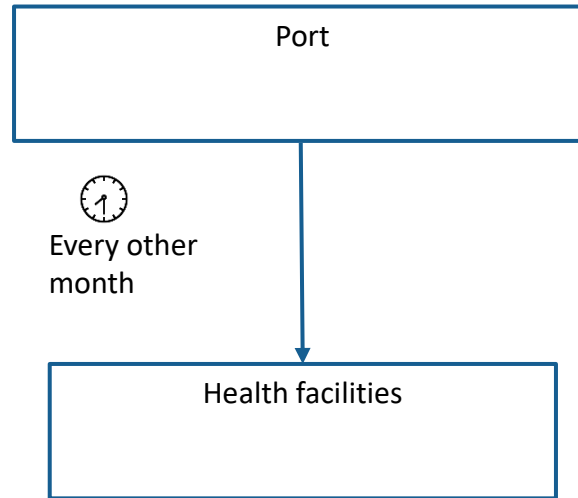




# Short shelf life lab commodities

## Notes:

- Short shelf life commodities are 3-6 months (from time of manufacture)
- Primarily laboratory reagents (e.g. viral load reagents and controls)



## Who does:

Third party distributor, who collects from the port and distributes directly to health facilities

## Who pays:

MOHCDGEC

## Challenges:

- Extremely short timelines

**CURRENT SUPPLY  
CHAIN  
INTERVENTIONS  
RELEVANT TO UAV  
IMPLEMENTATION**



# System Redesign

- The Integrated Logistics System was redesigned. Major changes include:
  - Inclusion of multiple commodity streams in one reporting and distribution system
  - reporting by facilities monthly (from quarterly)
  - resupply bi-monthly (from quarterly)
  - reduction of minimum/maximum stock levels at MSD and facility levels
  - MSD must process orders, pick, pack and deliver in ~20 days (from ~60 days) → may represent an opportunity for UAVs (particularly the truck/UAV hybrid distribution model)
- Redesigned system rolled out in Mwanza; plan to complete implementation by mid/late 2020

# Emergency Supply Chains

- The Tanzania Emergency Supply Chain Operations Guidelines were completed
  - Priority hazards include : Ebola & Marburg, Cholera, Viral Hemorrhagic Fevers, Aflatoxicosis and Mass Causality Injuries
  - Includes procedures for storing, moving, and tracking commodities from origin to destination in public health emergencies
- No mention of UAVs but may be worth exploring

# eLMIS

- The electronic logistics management information system (eLMIS) supports the collection, management, and use of critical supply chain data (including consumption and stock on hand and days out of stock)
- Includes data across vertical programs, essential medicines, and selected laboratory supplies – enabling uniform data capture in one system
- Directly interfaces with MSD's Enterprise Resource Planning (ERP) system
- Supported by the Logistics Management Services (LMS)
- Currently undergoing a transformation from a data base to a decision support system – to be able to predict stockouts before they happen (potential application of UAVs)

# Laboratory Optimization

- This year, a laboratory diagnostic network optimization activity for HIV early infant diagnosis and HIV Viral Load (HVL) testing was completed.
- Sample referral paths were created from sample collection sites (i.e., spokes), through one of 309 sample processing sites (i.e., hubs) to testing laboratories.
- Significant cost savings can be realized by improving sample referral paths (i.e., routing and mode of transportation) to better utilize existing capacity.
- The activity evaluated the cost of sample transport from the sample collection site to the sample processing site to the testing laboratory → it is more cost effective for hubs to pick-up samples from spokes (i.e., sample pick-up) than for spokes to drop-off samples at hubs (i.e., sample drop-off)
- Potential application of UAVs in laboratory sample pick up (and results drop off?)

# SUPPLY CHAIN BOTTLENECKS AND CHALLENGES



# Bottlenecks and challenges: Health products still not available whenever they are needed

- Financing – insufficient funding for full supply of commodities
- Data visibility and quality – orders based on data that may be of questionable quality; also due to staff capacity/motivation
- Lead times – long resupply intervals and lead times
- Coordination and planning - Lack of adhering to a coordinated plan and timeframe for rolling out the revised system; suboptimal communication and coordination between MSD, PORALG, and PSU on supply chain activities can lead to inefficient use of resources and a lack of a holistic response.



# UAV CONSIDERATIONS



# UAV considerations

- Product groups/segments –routine orders, emergency orders (or a subset of emergency orders – life saving commodities), lab sample transport, outbreaks, blood, vaccines
- Geographic considerations – an initial pilot with Wingcopter was in Ukerewe District (islands in Lake Victoria); in other areas, terrain difficult, especially in rainy season
- Truck/UAV hybrid distribution model – may be worth mapping the distance from facilities from an all-weather road
- Overall, MSD will be interested in implementing UAVs if they are cheaper (while maintaining effectiveness)
- When moving forward with implementation, may consider establishing a steering committee with representatives from key supply chain stakeholders

**THANK YOU**

