

Title: Strengthening Uganda's National Cold Chain Inventory Data System

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15TH GLOBAL HEALTH SUPPLY CHAIN SUMMIT

For over 10 years, Uganda relied on a partially updated cold chain inventory with a comprehensive update conducted in 2011. This incomplete and fragmented National Cold Chain inventory data significantly impacted on Planning for Cold Chain equipment needs, monitoring of CCE functionality, quantification and tracking of spare parts for CCE repair and maintenance activities.

Intervention

In 2020, Ministry of Health with support from PATH and partners piloted an android based Cold Chain Information System (CCIS) application built on the Open Data Kit (ODK-X) platform. The positive outcomes of the pilot led to its approval and subsequently a national scale up in June 2022.

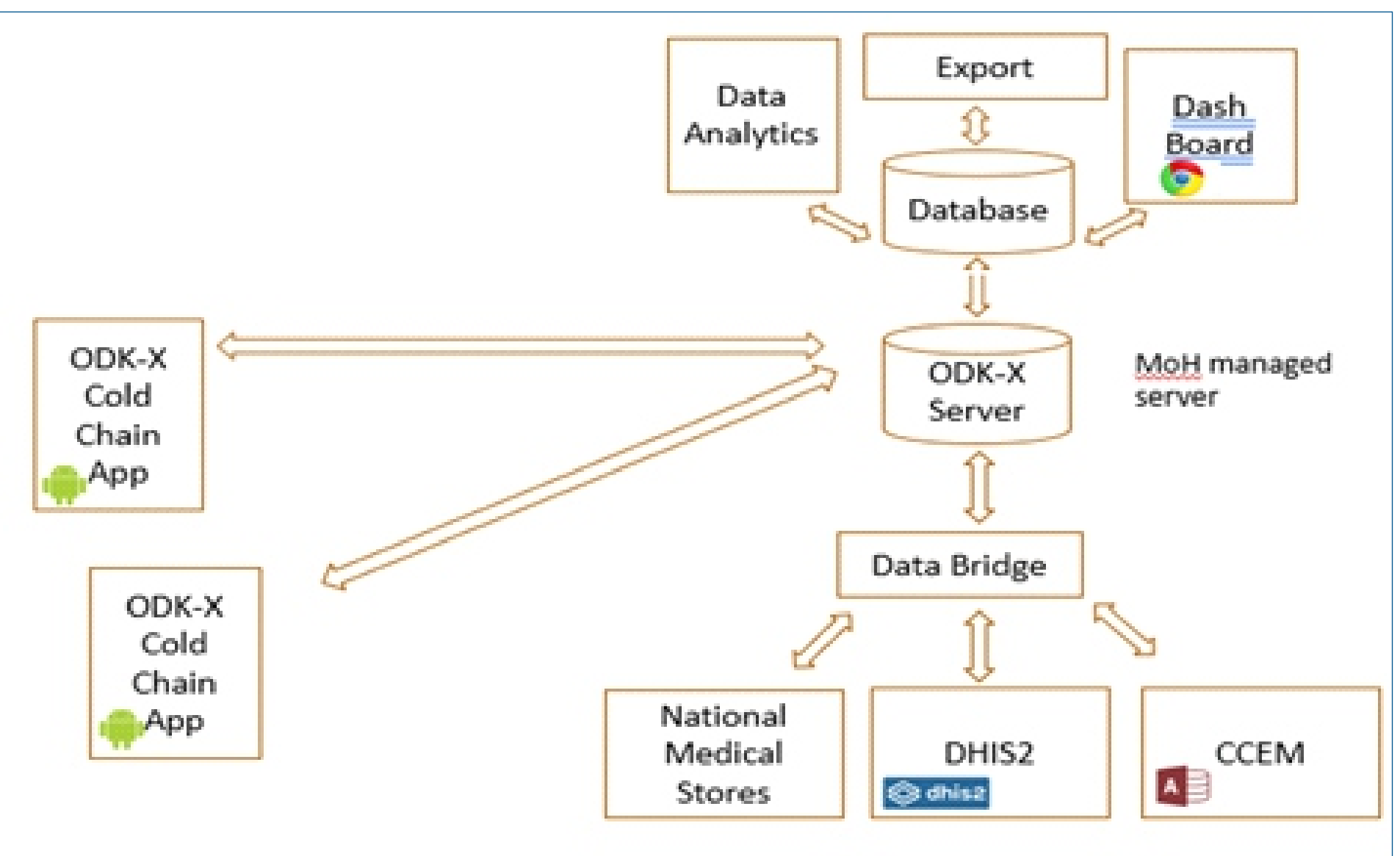
Challenges to Address

- Conducting annual national inventory update is very costly (\$100,000 - \$200,000).
- The country relied on outdated CCE inventory records of close to 10yrs back.
- The Ministry of Health-UNEPI required updated CCE inventories for procurement planning and improved maintenance response time.

Configuration

The CCIS application is a mobile-based digital tool developed by the University of Washington (UW), in collaboration with PATH and built on the ODK-X open-source platform. It is designed to integrate with existing health information systems (e.g., District Health Information Software 2 [DHIS2], Open Health Information Exchange [OpenHIE], and electronic logistics information management system [eLIMS]).

System Configuration

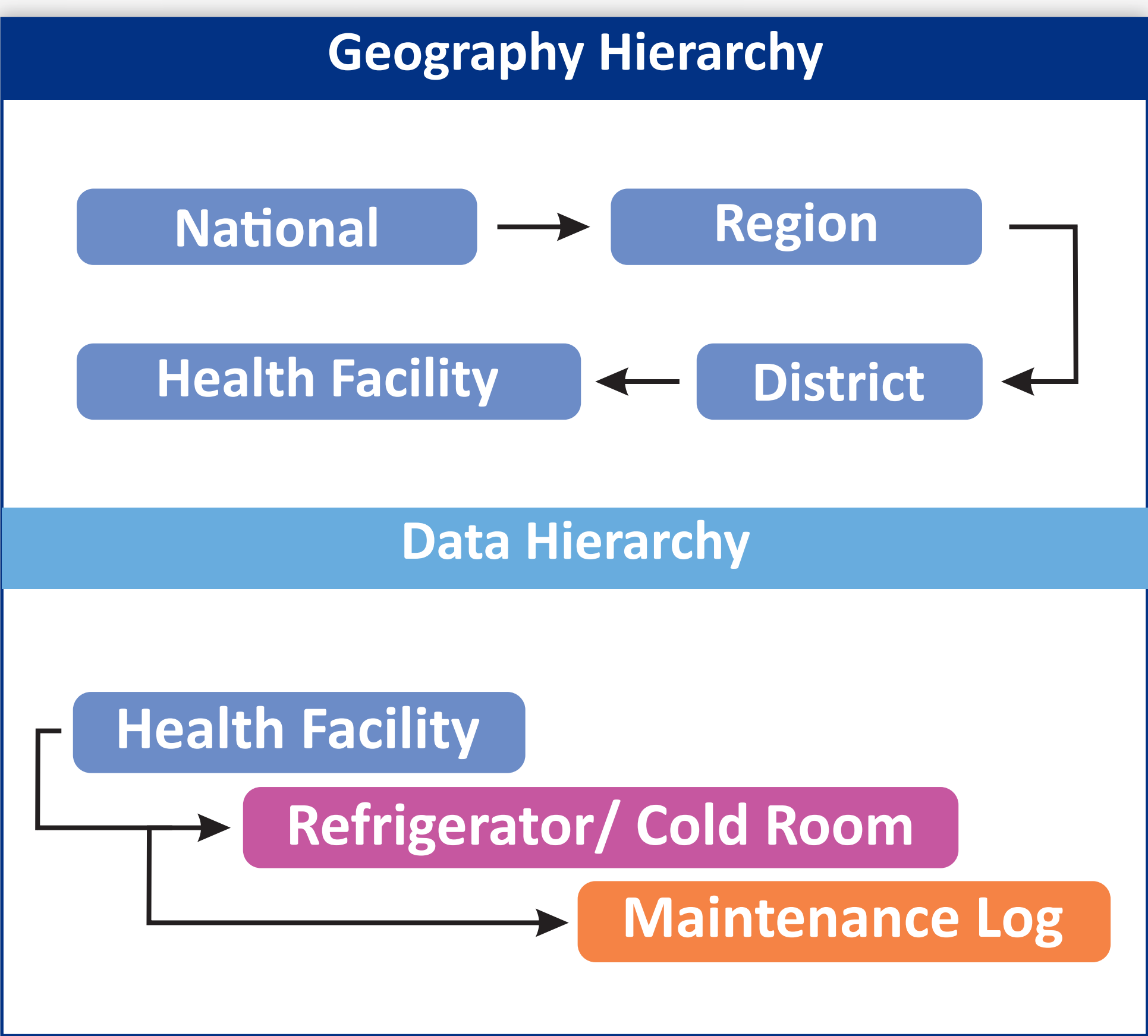


ODK-X Cold Chain Application Structure

It is primarily structured to capture CCE Inventory data, temperature data and maintenance records.

- App built on top of the ODK-X platform; i)
- Combination of ODK Survey and ODK Tables ii)
- Written in Java Script.

- The CCE data for refrigerators/cold rooms was derived from the CCEM tool.
- The health facilities data was obtained from DHIS2 master list.



ODK-X Tables	
BUWAMA UGANDA/SOUTH CENTRAL/MPIGI DISTRICT/BUWAMA TOWN COUNCIL	
Basic Facility Information	
Primary Facility ID: Vi3ibjRtMzU	Catchment Population: 17300
Secondary Facility ID: 4699-0001	Ownership: Gov
Facility Level: Hciii	Authority: Moh
Contact Name: NANTONGO MARGARET	Facility Status: Functional
Contact Name: NANTONGO MARGARET	
Figure 1	
Refrigerator Basic Facility Information	
Facility: BUWAMA	Manufacturer: Vestfrost
Year Installed: 2011	Model ID: MK 074
Status: functioning	Serial Number: 20104738484
Use Status: Installed in Use	Catalog ID: E375M
Reason Not Working:	Voltage Regulator? Not Applicable
Service Priority:	Temperature Monitoring Device? Not Applicable
Date Service:	
Figure 2	

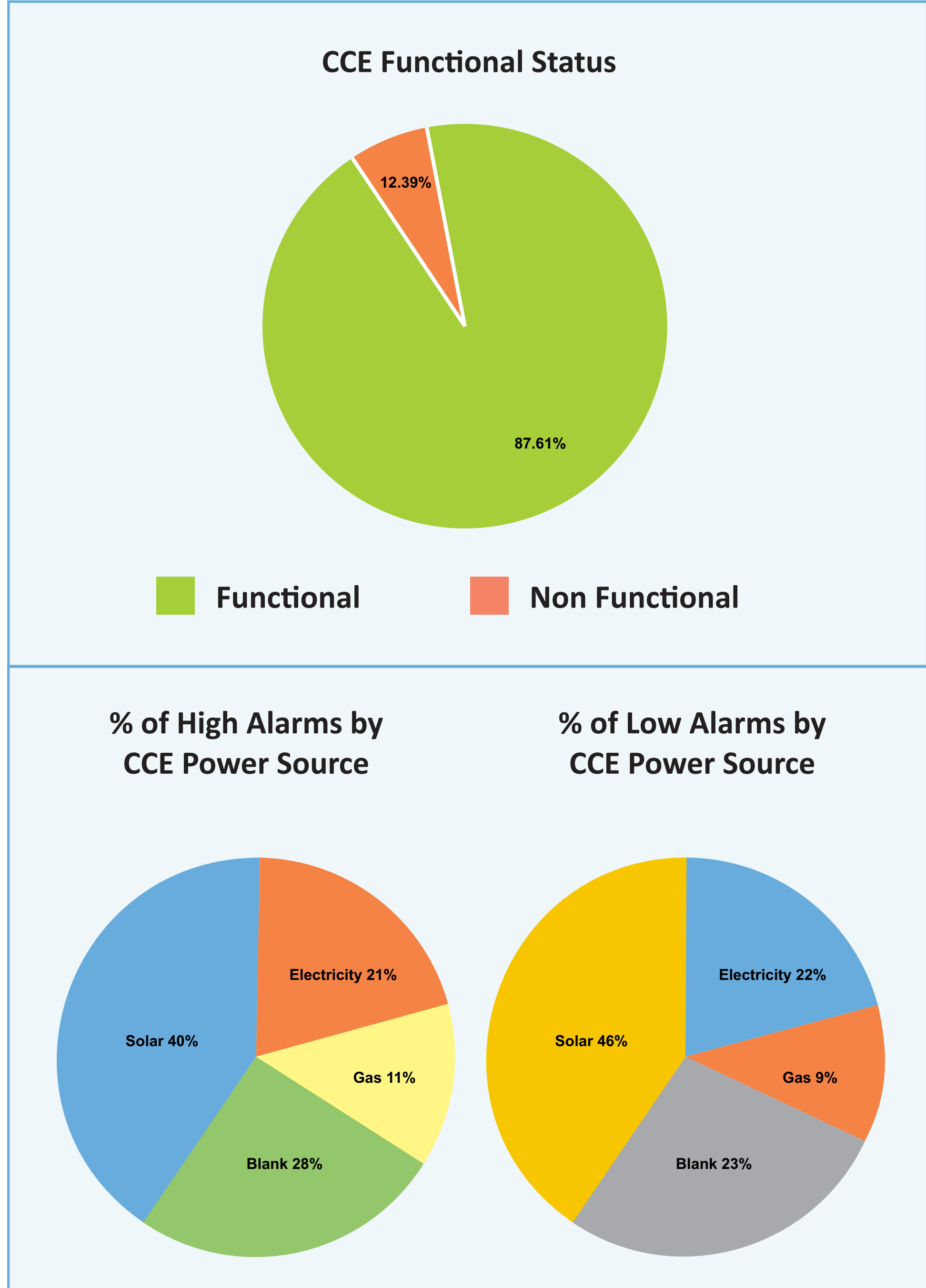
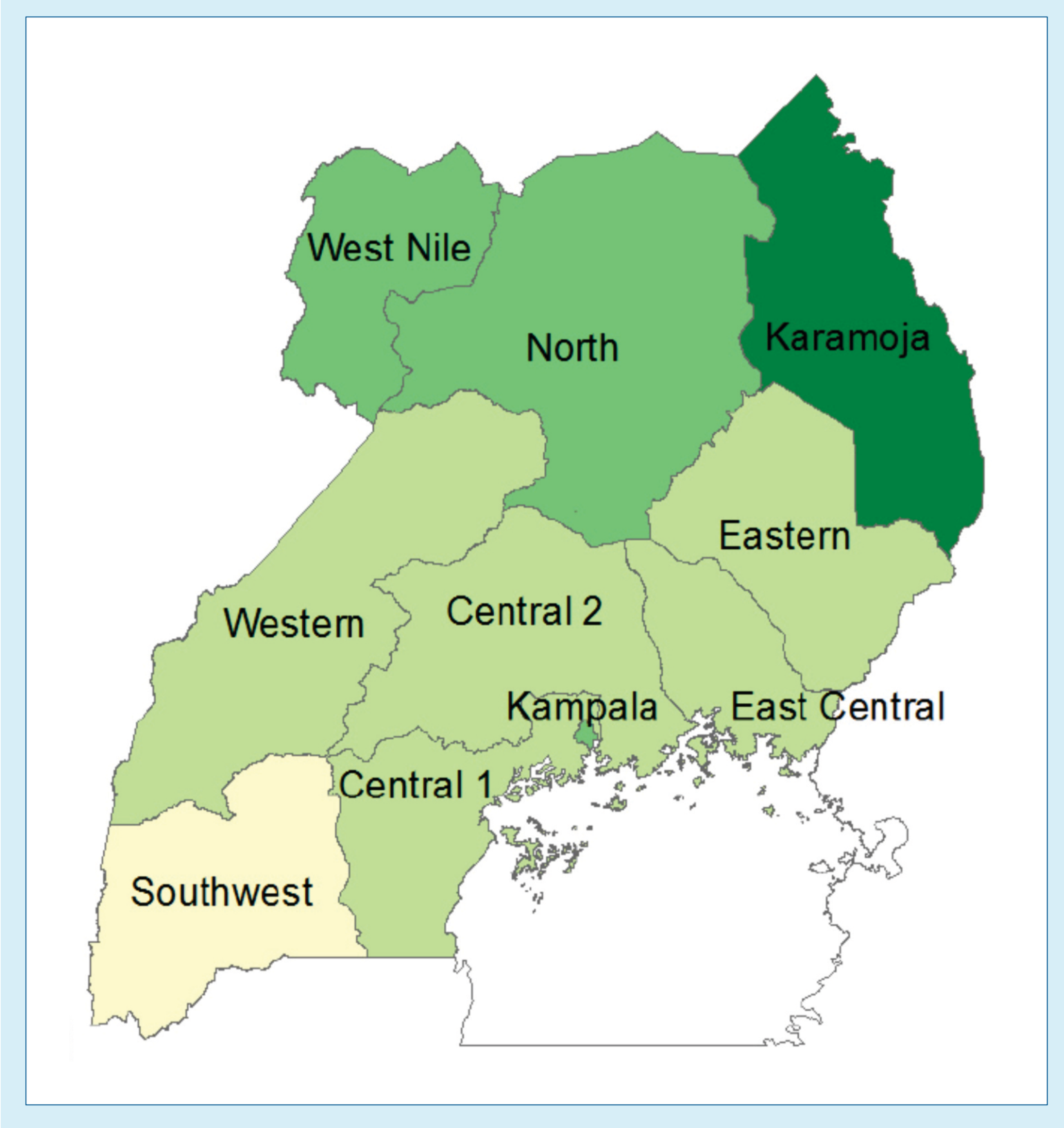
Figure 1: Example of health facility information page in the ODK-X Cold Chain Inventory System. **Figure 2:** Basic refrigerator information page in the ODK-X Cold Chain Inventory System.

Implementation

In January 2022, UNEPI, NMS, PATH, and UW led training workshops for all 160+ national- and district-level cold chain technicians (DCCTs). The workshops covered basic use, data collection and transmission processes, and review of the dashboard. Android phones were provided to all participants. NMS and UW configured NMS servers to host and manage the data, ensuring local data ownership.

Results

To date (Nov 2022), CCE functionality is at 87.61% (8031), 12.39% of refrigerators indicating maintenance needs required, 8031 Health Facilities updated, 750 temperature records and 211 maintenance records were entered for the month of November.



Outcome

- National level UNEPI and NMS staff are using the CCIS data daily for overall cold chain inventory management and procurement analysis and planning as well as reporting to key Ministry of Health bodies (such as the vaccine management committees) on the overall status or health of the Uganda cold chain.
- NMS staff at the National are using the data to prioritize maintenance and repair activities and resources. The warranty data captured with the app will enable better accountability and provide the basis for warranty claims on spare parts and repair.
- District level technicians are using the data for tracking and documenting cold chain equipment availability and functionality.