



**GLOBAL
HEALTH**
SUPPLY CHAIN SUMMIT

Using Data to Keep Vaccines Cold



Mercy Lutukai
JSI/inSupply
Regional Technical Advisor

2018 Global Health Supply Chain Summit
Lusaka, Zambia



Problem Statement



Vaccination success depends on a well-managed cold chain that keeps vaccines within the WHO-recommended temperature range of 2°C to 8°C to ensure product quality and potency – from the time the vaccine is manufactured to when it is administered.



**GLOBAL
HEALTH**
SUPPLY CHAIN SUMMIT

Study Overview

GOAL

To assess whether the temperature monitoring (RTM) devices and a structured approach for action oriented data use will facilitate better vaccine management.

OBJECTIVE

- To determine the frequency of vaccine exposure to temperatures outside the recommended storage range of 2°C to 8°C.
- To identify specific levels in the vaccine storage systems where temperature problems are occurring.
- To improve the transmission, visibility, analysis, and use of cold chain data by responsible decision makers and personnel.

KEY PERFORMANCE INDICATORS

- Percentage uptime (percentage of total time a CCE spent in the range of 2°C to 8°C).
- Field Holdover time (The average amount of time a deployed vaccine CCE maintains safe temperatures after a power outage)
- Number of excursions (High or low temperatures outside of the acceptable range of 2°C to 8°C)

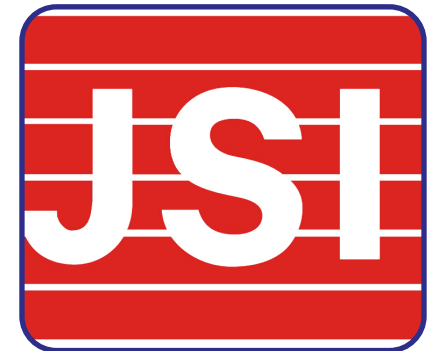
OTHER INDICATORS

- Reporting rates.
- Vaccine coverage rates.
- Vaccine wastage rates (open vial for BCG, Penta and Measles)
- Stock status (Months of stock for BCG, Penta and Measles)

STUDY LOCATIONS



Partners



- Funders of RTM study

National Level:

- Led on implementation of the study

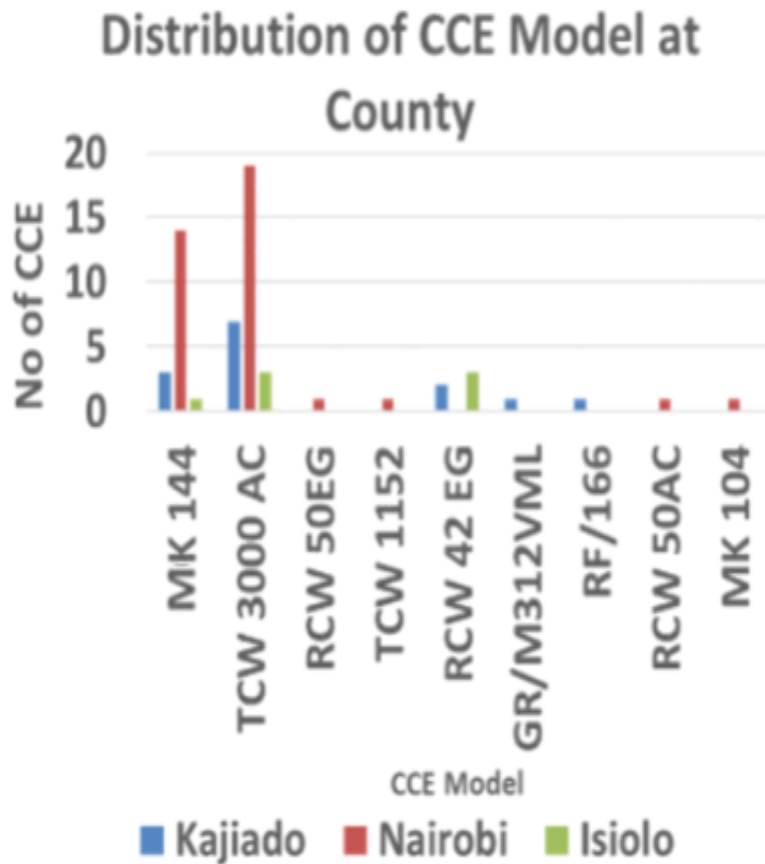
County Level:

- Recipients of RTM (CT5)
- Implementers of IMPACT Teams
- Provided feedback on study

- Technology (CT 5) Providers
- RTM dashboard managers/RTM data analysts
- Tracked response and provided feedback on CT5 performance to partners (MOH National and county and inSupply)

- Monitored RTM data and general data use for decision making at all levels.
- Initiators of structured approach for data use (IMPACT Teams)
- Tracked study progress and report

Distribution and age of CCE in study sites

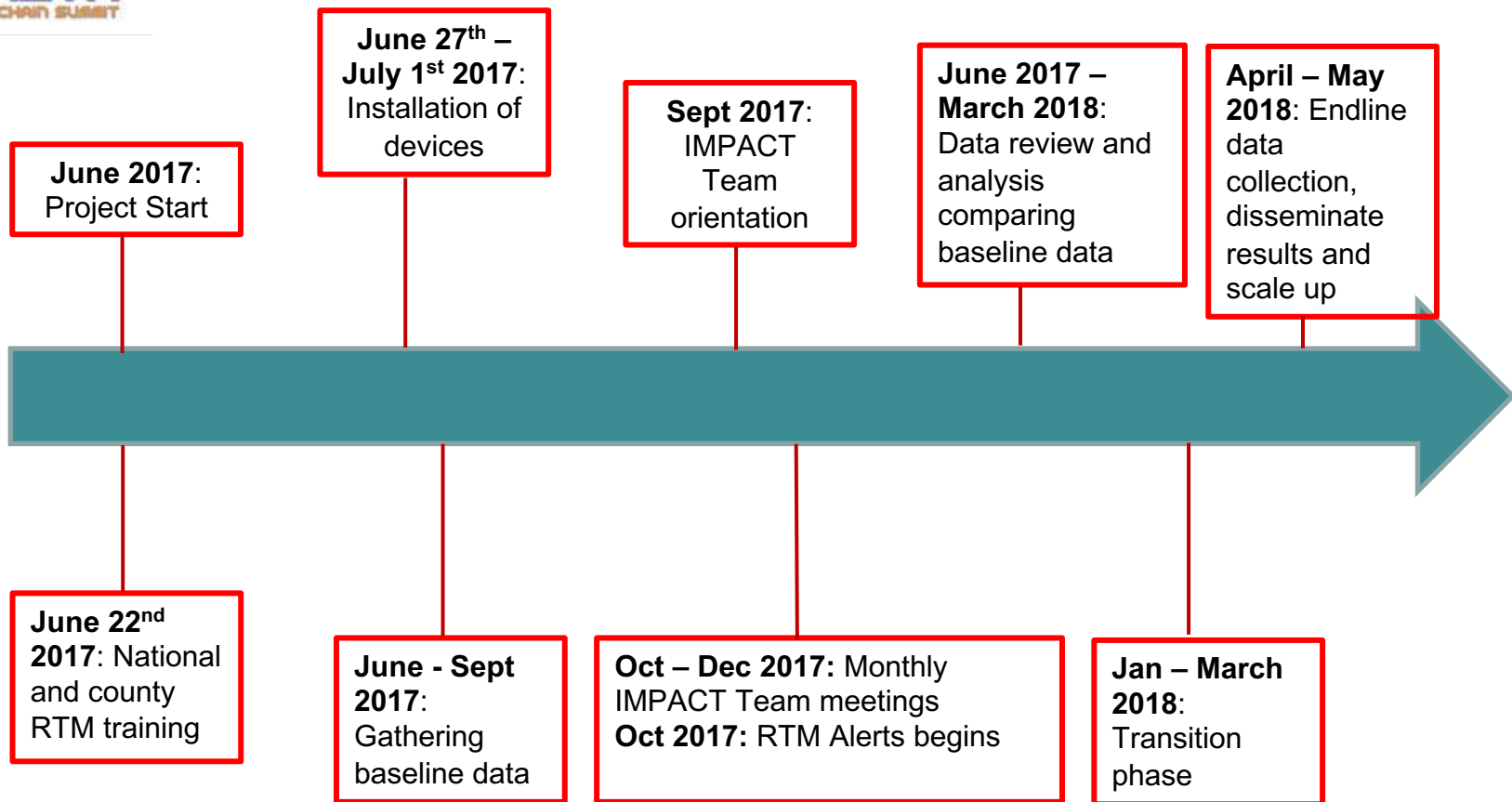


CCE Model	Age(years)	WHO PQS	Due for Replacement	Status
MK144	<5	Y	N	Functional
TCW 3000 AC	5 to 10	Y	N	Functional
RCW 50EG	5 to 10	Y	N	Functional
TCW 1152	>10	Y	Y	Functional
RCW 42 EG	>10	N	Y	Functional
GR/M312VML	not known	N	Y	Functional
RF/166	not known	N	Y	Functional
RCW 50AC	not known	Y	N	Functional
MK 104	not known	N	Y	Functional



**GLOBAL
HEALTH**
SUPPLY CHAIN SUMMIT

Timeline



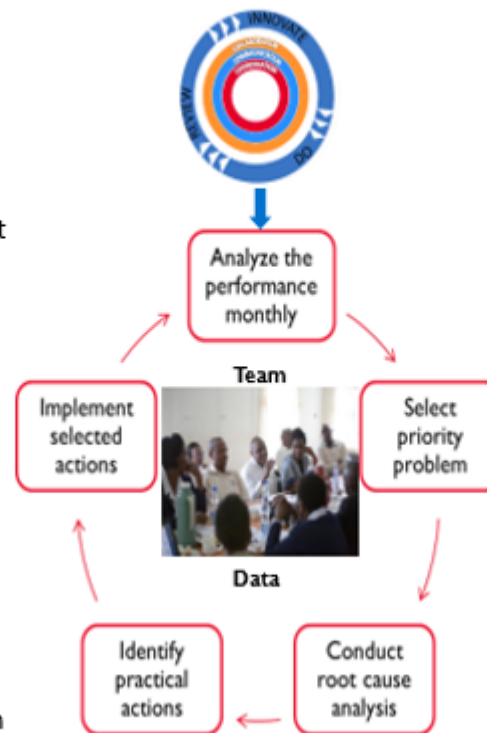
Approach: IMPACT Teams and ColdTrace

RTM device (ColdTrace-CT5) and a Structured Approach for Action Oriented Data Use (IMPACT teams network approach) to facilitate better Vaccine Management

IMPACT Teams provide a structured and rigorous process for supply chain problem-solving

A system of interconnected teams, made up of people across functions and disciplines who meet routinely and are:

- Health facility and sub-county vaccine store nurses, EPI coordinators and METs trained to develop, interpret and set targets for immunization indicators
- Use Indicator Tracking Tool (ITT) and ColdTrace dashboard during data review (IMPACT Team) meetings
- Encouraged to follow a structured problem-solving process
- Empowered to use their data for operational and strategic decisions with the ultimate goal of improving the performance of supply chain



ColdTrace: The Technology

ColdTrace is a low-cost remote temperature monitoring (RTM) system for refrigerators that are used to store vaccines and other temperature-sensitive products.



ColdTrace has 3 core components:

1. The ColdTrace sensor unite, which sends alert via SMS (text message) and email when fridge temperatures get too hot or too cold (SMS Alerts)
2. A secure web-based dashboard that allows remote access to real time temperatures and provides customizable analytics and report generating tools to track equipment performance (Dashboard)
3. Standard Operating Procedure documents (SOPs) for Nurses maintenance technicians, regional supervisors and ministries of health.

Design: Non-randomized, pre/post test design using Quantitative and Qualitative Data

1

PROJECT SETUP

Installed **59** RTM devices at **18** Sub county (SC) vaccine stores & 18 Health Facilities to monitor refrigerator performance.

- Installation checklist
- Documented handover and installation of devices
- Conducted training of SCPHNs, SCMETs and SC vaccine store nurses
 - Device installation
 - Data review processes

2

DATA COLLECTION

Quantitative data

RTM data: continuous temperature and power availability data

Interviewed county & sub county levels.

Qualitative data

Key informant designations: EPI logisticians, METs/bio technicians, Health Facility-In-Charges, Sub-County Depot Managers (SCDM), HRIO

End line questionnaire comprised:

- Knowledge about the effect of heating and freezing on vaccines
- Knowledge and perceptions of the causes of heating and freezing events
- Recognition of damaged vaccines and the current procedures in managing heat/freeze events and affected stock
- Perceived barriers and problems respondents currently face in managing and responding to temperature excursions.

3

DATA SOURCES

- Stakeholder interviews
- RTM device data (Coldtrace dashboard)
- DHIS 2
- Process documentation log

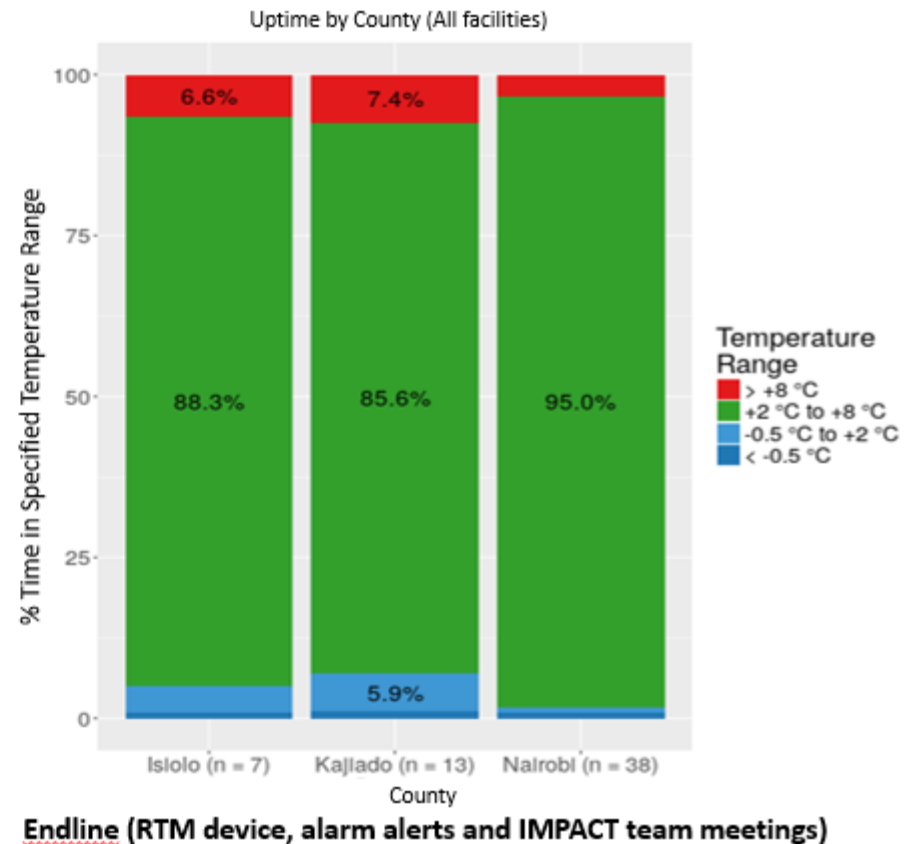
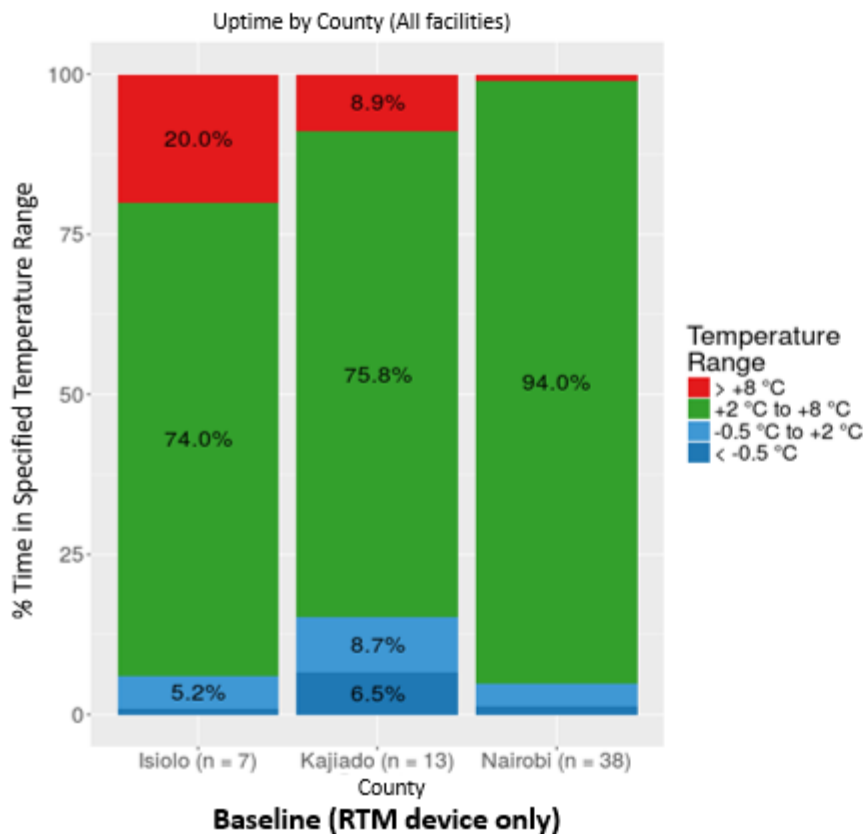
RESULTS

Used qualitative data (interviews, process documentation logs) and quantitative data (coldtrace, DHIS) to derive findings.



Overall increase in uptime

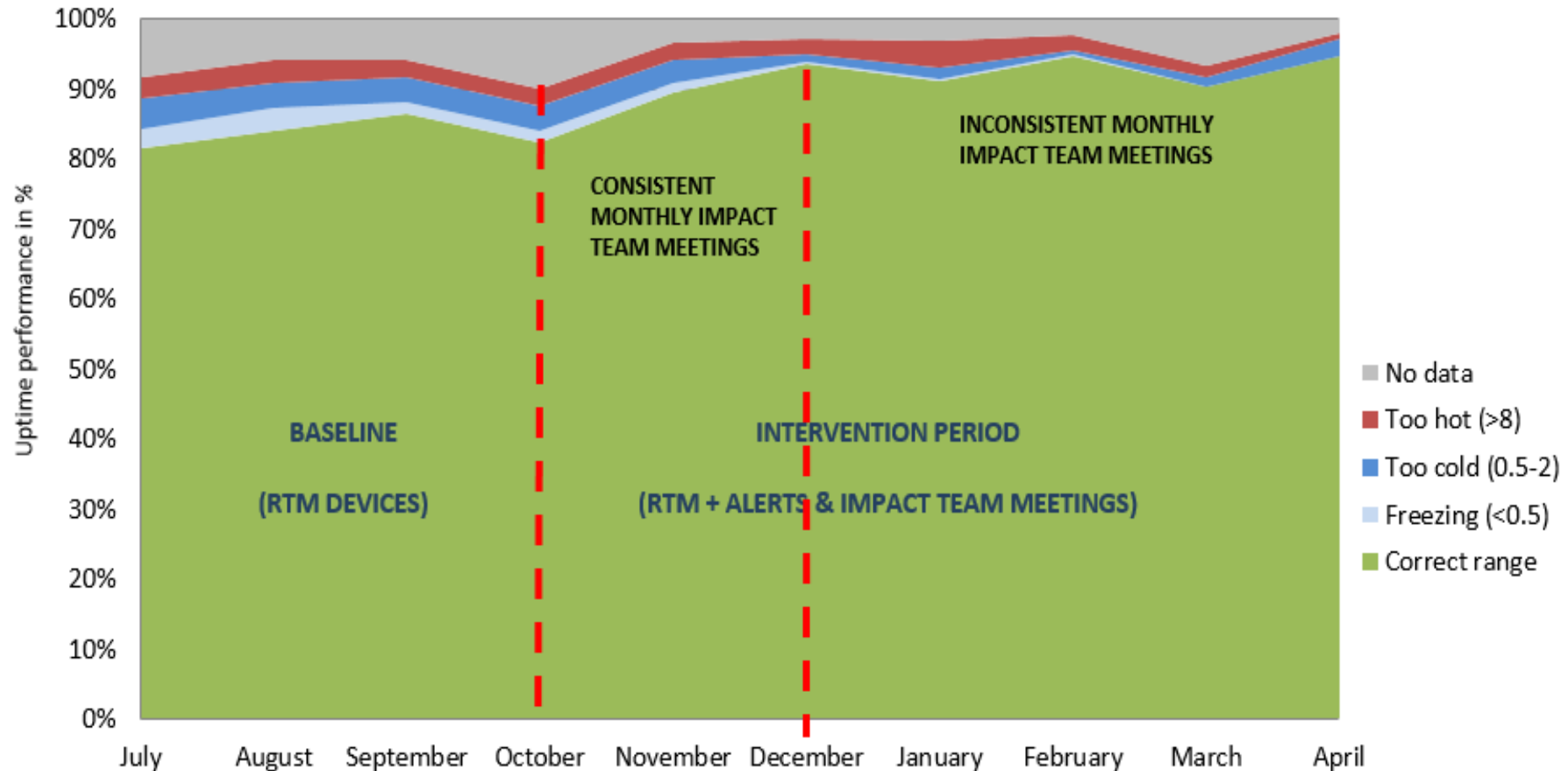
Uptime Performance at Baseline and Endline





**GLOBAL
HEALTH**
SUPPLY CHAIN SUMMIT

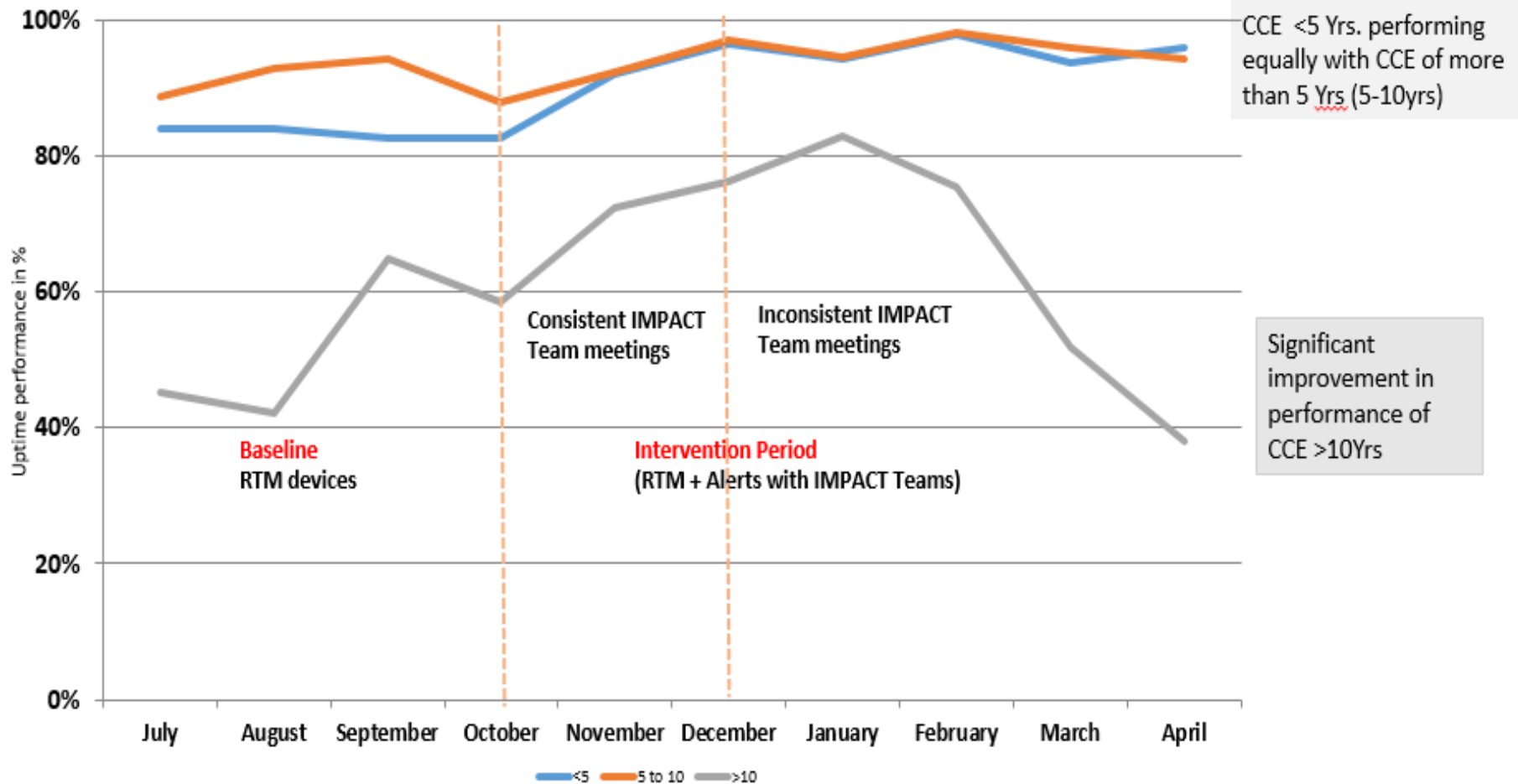
Overall increase in uptime, most significant following IMPACT team intervention





**GLOBAL
HEALTH**
SUPPLY CHAIN SUMMIT

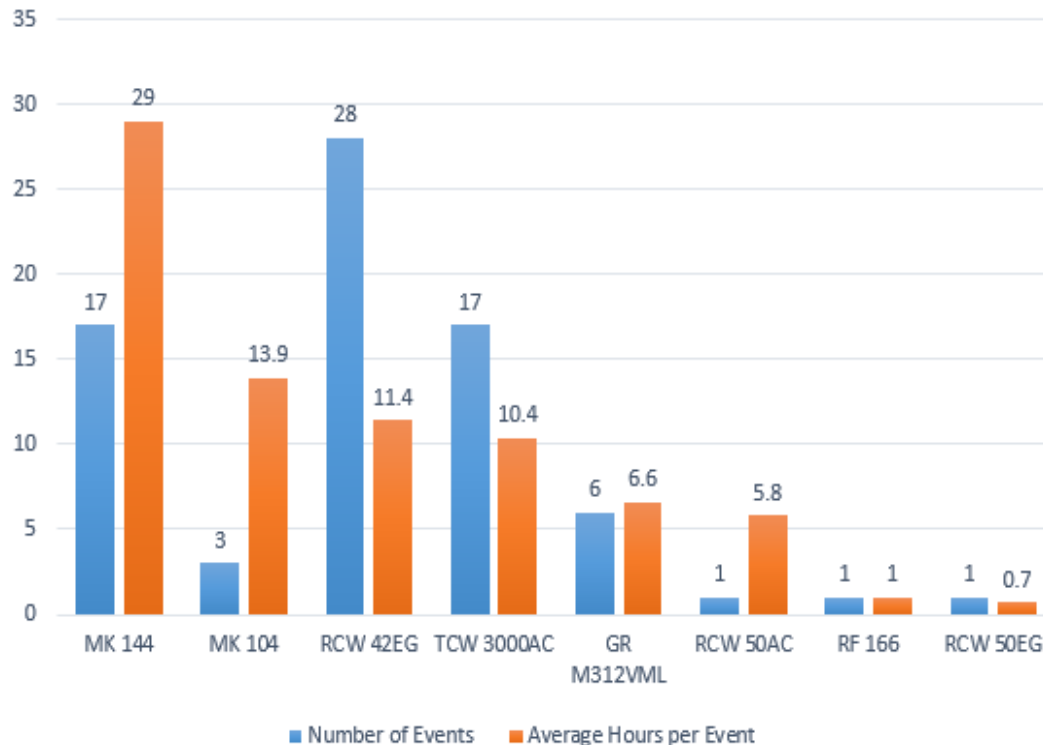
IMPACT teams result in greatest improvement in uptime for oldest equipment



Field holdover time

CCE Performance in the event of a Power Failure (Power Outages) is dependent on CCE model.

CCE Model Field Holdover Time



The MK144 recorded highest mean field holdover time of 29 hours indicating that in the event of a power failure, this model was able to maintain a temperature between 2°C-8°C for a longer period of time. . The next closest were three models that recorded a similar mean field holdover time – the MK104 (14 hours), the RCW 42EG (11 hours), and the TCW 3000AC (10 hours).

CCE Model	Age of Model (years)
MK 144	<5
MK 104	Unknown
RCW 42EG	>10
TCW 3000AC	5 – 10
GR M312VML	Unknown
RCW 50AC	Unknown
RF 166	Unknown
RCW 50EG	5 – 10



IMPACT Teams & ColdTrace for informed decision making

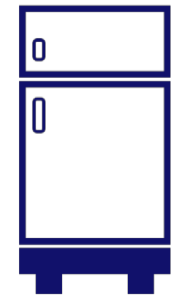
Isiolo County, Kinna Health Centre:

- Data from power profile exposed the power availability in the area as a challenge . The frequent power outages convinced the NVIP team and County to replace it with a solar refrigerator



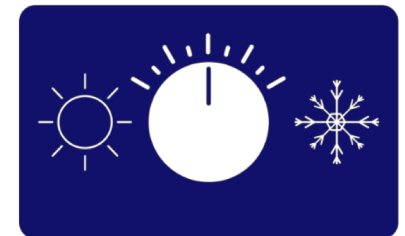
Kajiado County, St Mary's Hospital:

- Erratic performance of a domestic refrigerator informed the NVIP team to offer a PQS refrigerator to the facility.



Nairobi County, Dagoretti Sub County:

- Dagoretti Sub County Store, an older model (TCW 1152) thermostat was replaced twice but it was still freezing. The National technician tried different thermostat until it worked successfully.

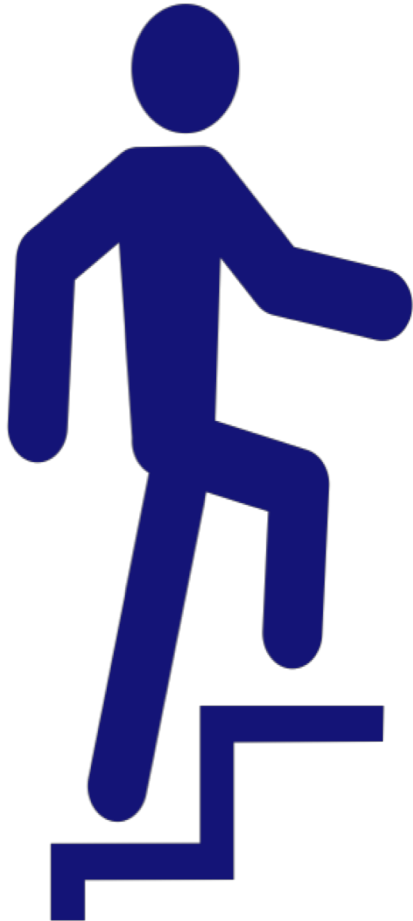


Lessons Learned



- Combination of technology and increased human capacity improves vaccine management outcomes
- RTM devices triggered remedial action more quickly than previous process
- IMPACT Teams supported effective behavior change in response to those triggers
- Despite a large upfront investment (\$100,000), the potential savings from protecting vaccines far outweigh the costs: potentially saved \$85,000 worth of vaccines every month (~ 17% of the total value of vaccines in fridges)

Next Steps



JSI/inSupply continues providing the counties:

- Monthly ITT for data review of immunization indicators at health facility in-charges meetings.
- Virtual technical support to help interpret data and guide data review meetings (IMPACT Teams Network Approach)
- Conducting a prospective analyses on remote temperature monitoring (RTM) data to inform the design of a post market surveillance framework in support of the PMM team



inSupply Health

inSupply Health, an affiliate of **JSI Research & Training Institute, Inc.**, is an independent supply chain advisory firm based in East Africa that provides our clients with customized guidance on supply chain management and design.



We specialize in



Developing supply chain maturity strategies



Building organizational capacity for supply chains



Designing and implementing **data-driven, optimized** supply chain systems



Forecasting health commodity needs



Thanks to our generous sponsors

