



17th TechNet Conference

Panama City, Panama | October 16-19, 2023

Immunization Programmes That Leave No One Behind

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Keeping your cold chain cold: a focus on temperature monitoring

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October 18, 2023

Experience with RTM in Tanzania: practical lessons learned

Mtoroki Majaliwa, Tanzania Ministry of Health



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The Critical Role of End-to-End Visibility in the Cold Chain



- From manufacturing to the point of administration in health care facilities, the **journey of a vaccine through the cold chain is an intricate one**
- **Failure at any point** in this journey resulting from equipment failure, power outages, logistical breakdowns or incorrect storage can compromise vaccine potency, rendering them ineffective
- **End-to-end visibility allows for active response when risks arise** which is paramount in ensuring that vaccine potency is safeguarded

What follows:

- **Lessons learned** for sustaining RTM in facilities
- **Innovative** monitoring of **vaccine transport**

Expansion of RTMDs in Tanzania : **Visibility** into Nationwide **CCE Performance**

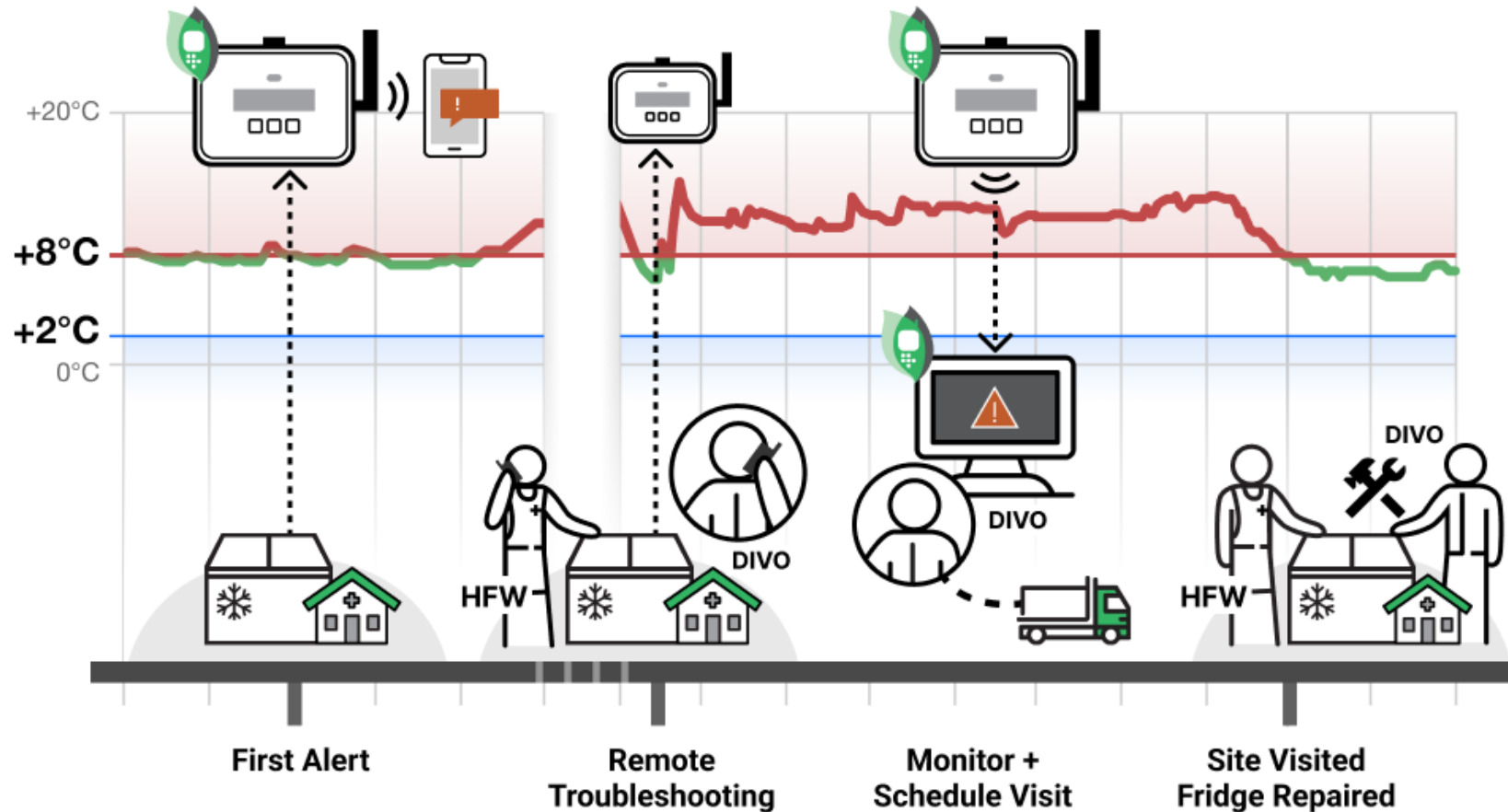


Tanzania has been using RTMDs since 2014, initially at Central, Regional and select District vaccine stores. Coverage has since been extended to include all district vaccine stores and many healthcare facilities, resulting in approximately **5,000 RTMDs in use across**

RTMDs provide **visibility into CCE performance** in real time. **Real-time alerts** via SMS alert health care workers when temperature excursions or power outages occur, allowing **rapid detection and resolution of issues**

Data yielded from RTMDs serve as invaluable data sources for analytics, empowering decision makers at all levels to make **informed decisions** to enhance CCE performance

Alerts + Data Visibility = Coordinated Action



Real story of a fridge repair in Tanzania

20 July - **Health Facility Worker** is receiving **high temperature alerts from RTM system**.

HFW calls the DIVO. Together on the phone they try to **troubleshoot the fridge**. **DIVO monitors the fridge remotely** on the RTM data dashboard for several days, but the problem persists. **DIVO schedules a facility visit**.

10 August - **DIVO visits the facility with the correct parts in hand** to replace a faulty component on the spot. **Fridge returns to safe temperatures**.

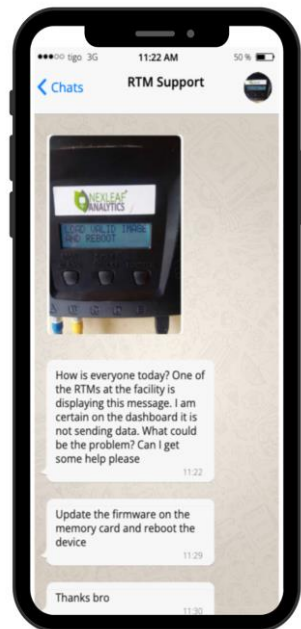
RTMD challenges : Tanzania context

- Tanzania's **variable telecommunications landscape** - many providers with different connectivity strength, not only **between regions** but even **within councils**
- Lack of **accountability** and **process** to pay recurring cost of data bundles
- New CCE with built in RTMDs→ removal of existing RTMDs
- High **staff turnover** + limited device **troubleshooting knowledge**
- **RTM Device issues** - defective sensors, chargers / batteries that need replacement

Adapting the Innovation to the Context → Recipe for Success



Improved **coordination and engagement with the Ministry and PORALG**: Regional & Council Health Management Teams helped plan RTM fixes at their own levels → further strengthening of skills



Peer-to-peer learning through **WhatsApp**: a valuable method for building confidence in troubleshooting devices and facilitating long-term knowledge retention



Getting out of the classroom and into the health facility: On-the-job training builds Health Care Worker confidence whilst sharpening skills to troubleshoot devices.

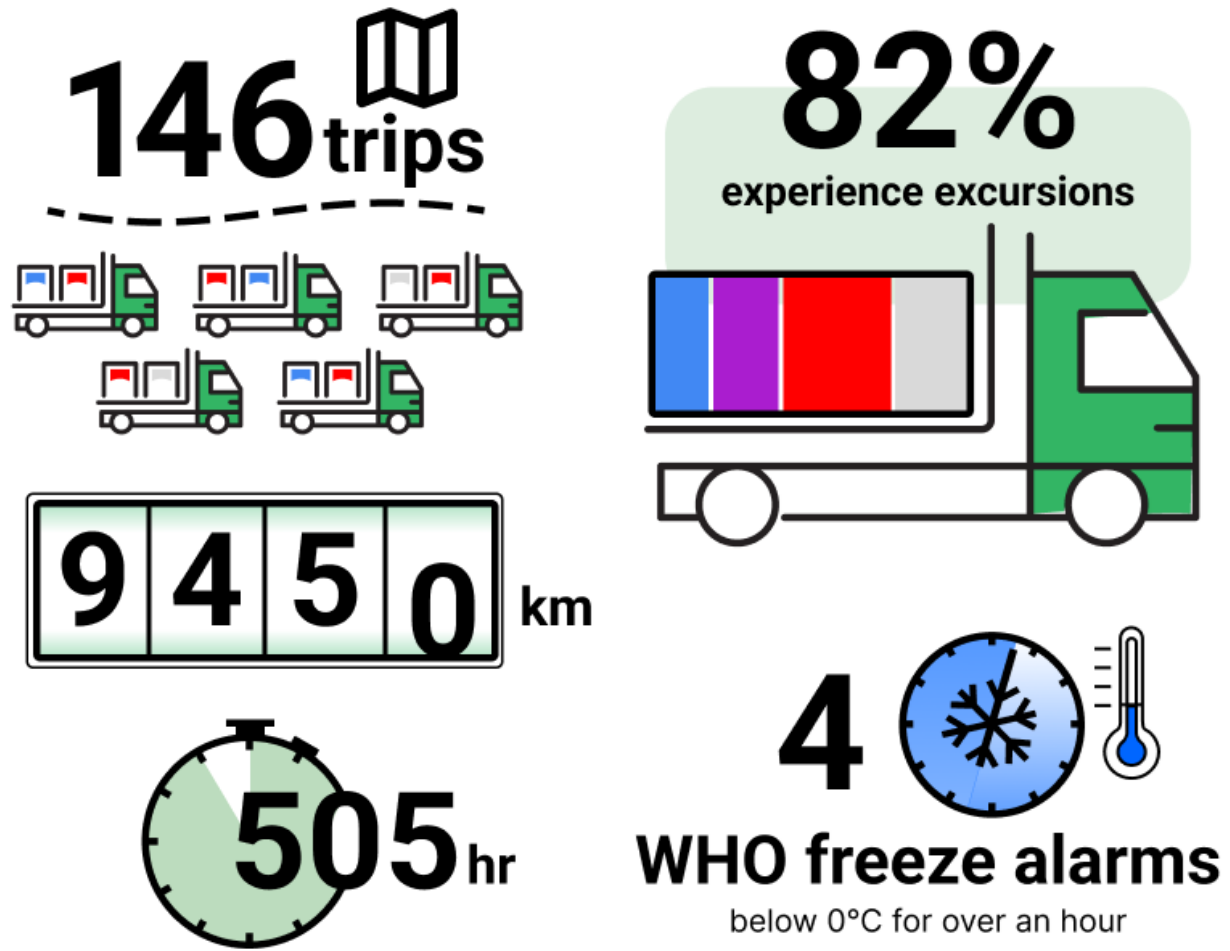
Global SIMs have played a pivotal role in addressing RTM challenges. They offer the capability to seamlessly switch between local service providers, **automatically** a provider with the strongest signal in the area. They also facilitate **centralized management of SIM cards** and configuration of **data plans**.

Bringing real-time visibility to vaccine transportation

- **Ten district** councils in **Mwanza and Geita**
- Rural and urban areas + hard-to-reach areas → **diverse routes with different conditions**
- **RIVOs, DIVOs & assistants** trained on the **Transport RTM Device** and **smartphone App** and used them during vaccine distributions from **June 2022-March 2023**
- A **WhatsApp group** was created to **foster knowledge exchange** among RIVOs and DIVOs

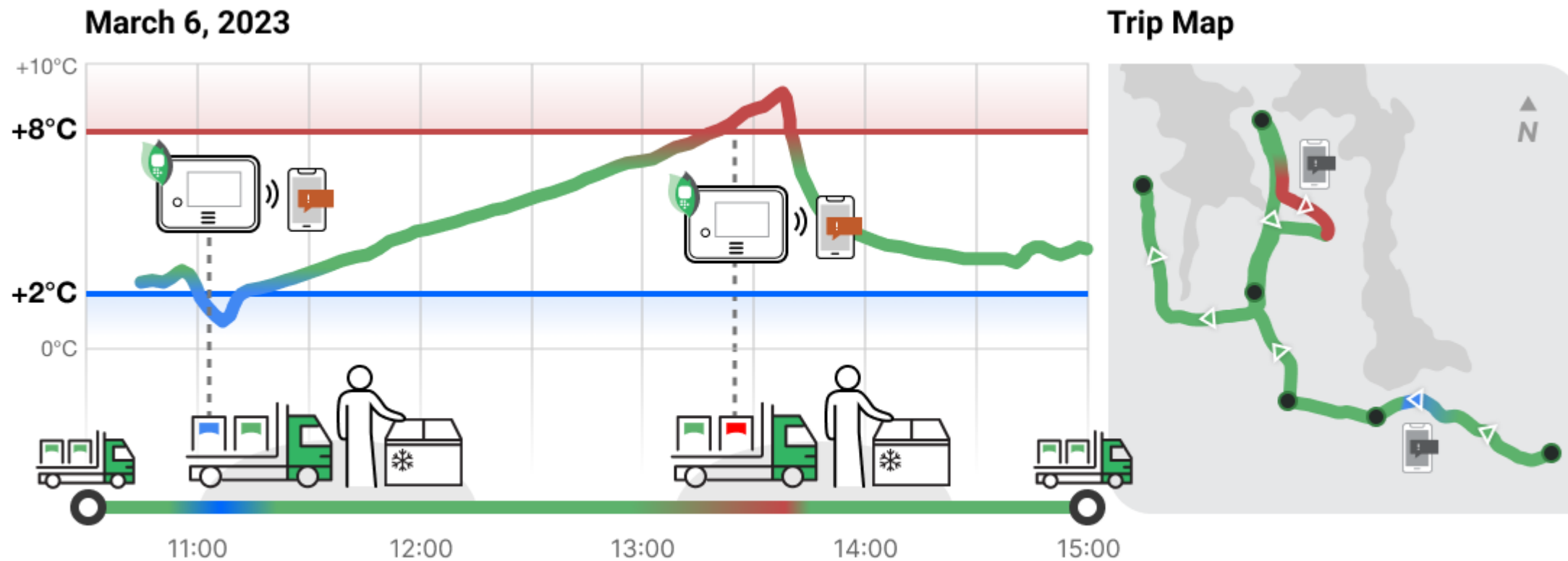


Statistics from the largest Vaccine Transport dataset of its kind



- **First-of-its-kind** in scale and scope of **visibility** into the condition of vaccines **during transportation**
- A **single freezing** event can **destroy** freeze-sensitive vaccines in just **one hour**
- Data shed light on **SOPs and packing procedures** that need modification / improvement
- **Alerts** → **action...**

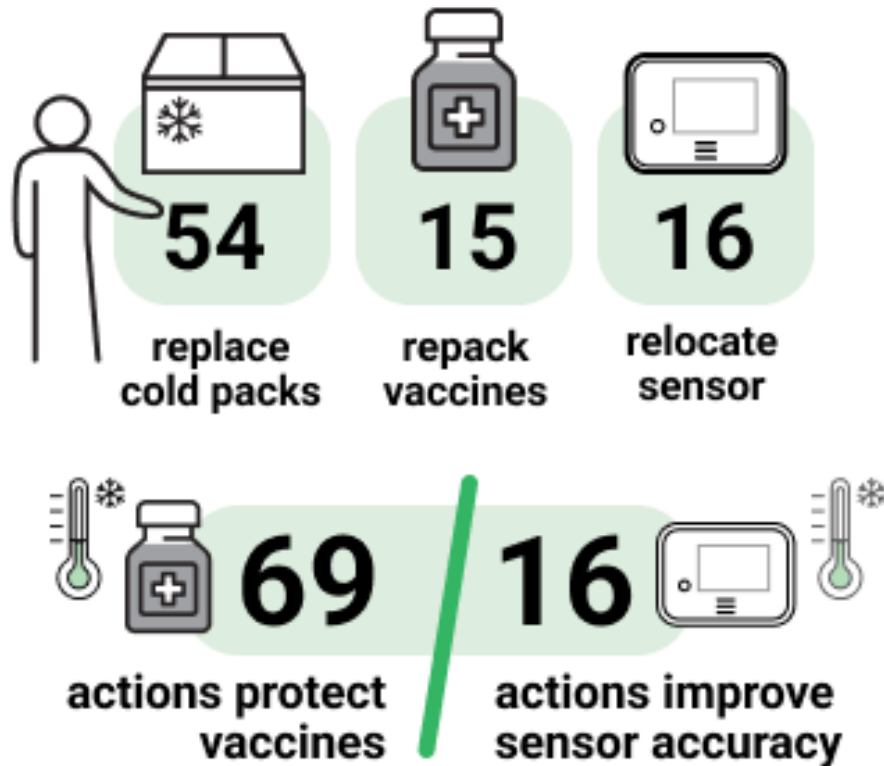
Alerts → Action



Real data from a distribution trip in Tanzania

The power of **visibility**: Translating alerts to action

85 actions



SOP Improvements

Transportation data used in district-level Impact Team meetings **resulted in proactive health system actions**, including:

- Streamlining distribution by limiting facilities visited in a day
- Requesting distribution vehicles during the cooler morning hours
- Opting for closed-roof vehicles whenever feasible for enhanced distribution conditions.

Transportation data from the pilot also led to **broader health system action**, including identification for the need of **Standard Operating Procedures for Vaccine Packing** in the country.

Thank you

Parsyl: Strengthening Vaccine Cold Chain in Several Countries To Support Equitable Global Vaccine Distribution

Dr. Amy Lo Ndiaye, Ministry of Health Senegal

Souleymane Sawadogo, Parsyl



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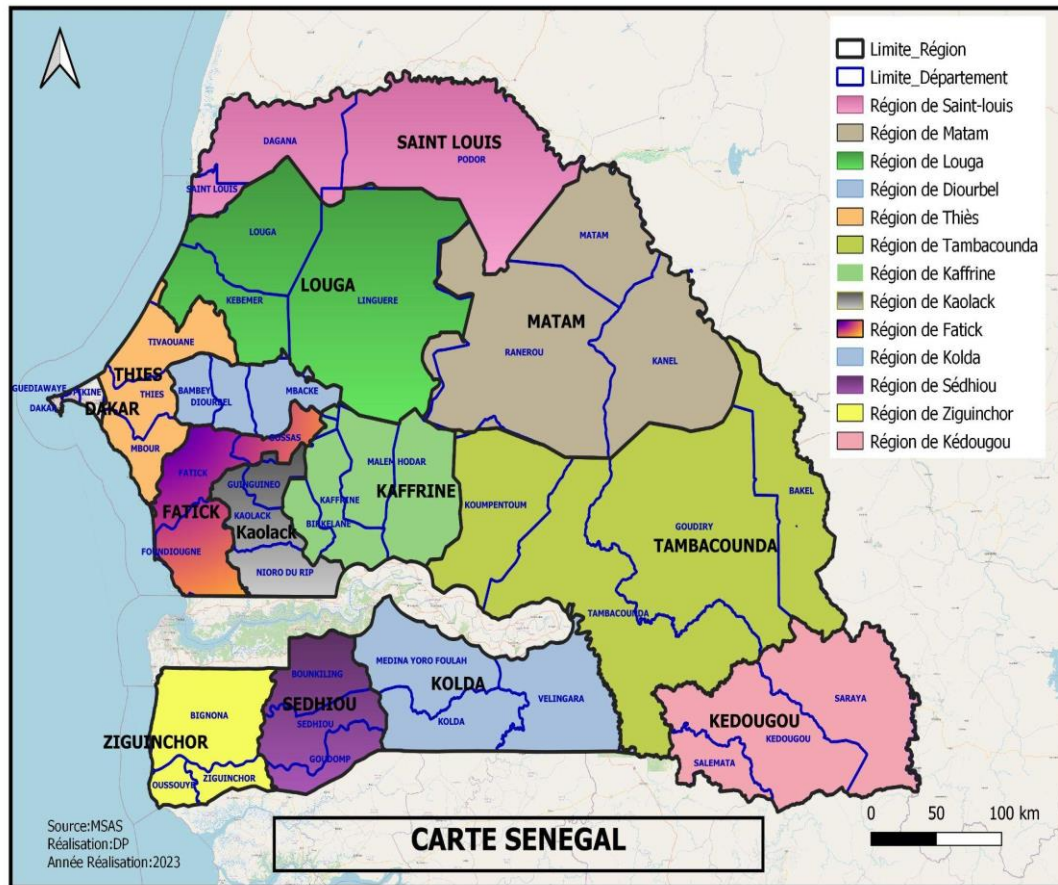
Strengthening the Cold Chain in Senegal to Promote Equitable Distribution of Quality Vaccines with the Innovative Remote Temperature Monitoring System (Parsyl)

1. Introduction
2. Supply Chain Overview
3. Objectives
4. Project Deployment
5. Implementation
6. Results

Introduction

- Temperature monitoring in the vaccine supply chain is one of the evaluation criteria for Effective Vaccine Management (EVM).
- Remote temperature monitoring devices should be used to ensure:
 - ✓ **Best practices for vaccine storage and transportation at all levels.**
 - ✓ **Real-time temperature data availability enables effective and swift actions to reduce vaccine losses and optimize cold chain utilization.**
- Senegal/Gavi has introduced an innovative technology for remote temperature monitoring of vaccine storage and transportation at all levels of the supply chain as part of its INFUSE program.

Senegal Supply Chain Overview



Senegal, a West African country, consists of:

- 14 Regional Health Directorates
- 79 Health Districts
- Approximately 1957 public and private health facilities

The vaccine supply chain in Senegal is organized using two models:

- **Push Model:** This involves the distribution of vaccines from the central depot to regional depots.
- **Pull Model:** It encompasses the flow of vaccines between regions and districts, as well as between districts and healthcare posts.
- Additionally, there is an ongoing testing of a supply chain modeling project called "OPTIVACC" aimed at optimizing the vaccine supply chain in Senegal.

General objective

Improve the storage and transportation conditions of EPI vaccines in Senegal at all levels of the supply chain

Specific objectives

1

Determine the extent and conditions under which temperature variations occur throughout the supply chain.

2

Evaluate the performance of the equipment used with a focus on strengthening the cold chain.

3

Develop a greater awareness among supply chain actors regarding the sensitivity of vaccines to temperature during storage and transportation.

4

Evaluate current practices and, if necessary, update the national policy related to vaccine storage and transportation.

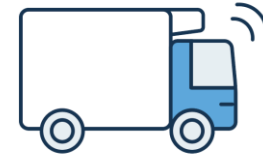
Implementation of the remote temperature monitoring project at all levels of Senegal's supply chain.

Coordination mechanism



- GTNL at the national level,
- ECR at the regional level (DRS),
- ECD at the district level (DS).

Logistics



- Trek Pro
- Passport/Gateway
- Trek Tab
- Android/iPhone
- Tablet
- Computer

Capacity building for key stakeholders



- EPI Team,
- ECR (Regional Coordinators),
- ECD (District Coordinators),
- Nurses, Nurse Assistants, Storekeepers.



Financial resources

- Gavi HSS Fund,
- Health Development Committee,
- Support from the U.S. Department,
- Parsyl,
- WHO (World Health Organization),
- UNICEF.

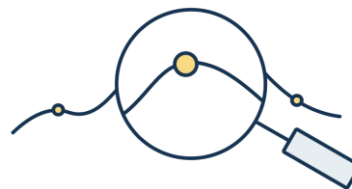
Implementation of the remote temperature monitoring project at all levels of Senegal's supply chain

Information systems



- Mobile and web platform,
- Monthly reports from the DS and NC (Health Districts and National Coordinators),
- Monthly program newsletter.

Monitoring & Evaluation



In the context of monitoring and evaluation:

- Coordination meeting with GNTL (National Logistics Working Group),
- Coordination meeting with ECR (Regional Coordinators) and ECD (District Coordinators),
- Formative supervisions,
- Mid-term evaluation,
- External evaluation,
- Quarterly and annual review.

Implementation results

- Remote temperature monitoring at all levels of the supply chain.
- Easy integration of the device into the routine of EPI
- The solution induces a positive change in behavior among agents regarding temperature monitoring.
- All temperature data from the country's cold chain in one place (Parsyl platform).
- A reduction in losses of closed vials is reported with the use of the solution.

Challenges in implementation

- Slow or lack of internet connectivity in certain locations;
- Low robustness of first-generation devices, leading to demotivation among some users;
- Suspension of monitoring activities due to the pandemic;
- Refrigerator breakdowns (CDF PIS) before the MEO CCEOP;
- Underutilization of transport treks by users;
- Information retention strike preventing data transfer.



The vision for the future

- Equip more health posts with Passports.
- Interoperability with the DHIS2 platform.

Thank you

Integrating Cold Chain Equipment Temperature Monitoring: Moving Beyond Technology and Data in Three Kenyan Counties

Yasmin Chandani, CEO, inSupply Health Ltd

Janet Makena MLE Advisor, inSupply Health

Amos Chweya, Senior Technical Immunization Advisor
JSI - Kenya



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Presentation Outline

- Background
- Overview
- Results and successes
- Challenges
- Lessons Learnt

Background



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Background

In Kenya, CCE performance improvements are hampered by limited temperature data capture and visibility end-to-end, the lack of standard analytics and visuals, and fragmented dashboards, impeding sub-national managers' ability to use data to inform actions.

In partnership with Ministry of Health and New Horizons, our goal was to **improve and standardize** vaccine cold chain temperature monitoring processes and **increase data use to inform operations and management actions** at all levels for vaccine management.

Overview



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This work utilized four key approaches and was piloted in 3 Kenyan counties

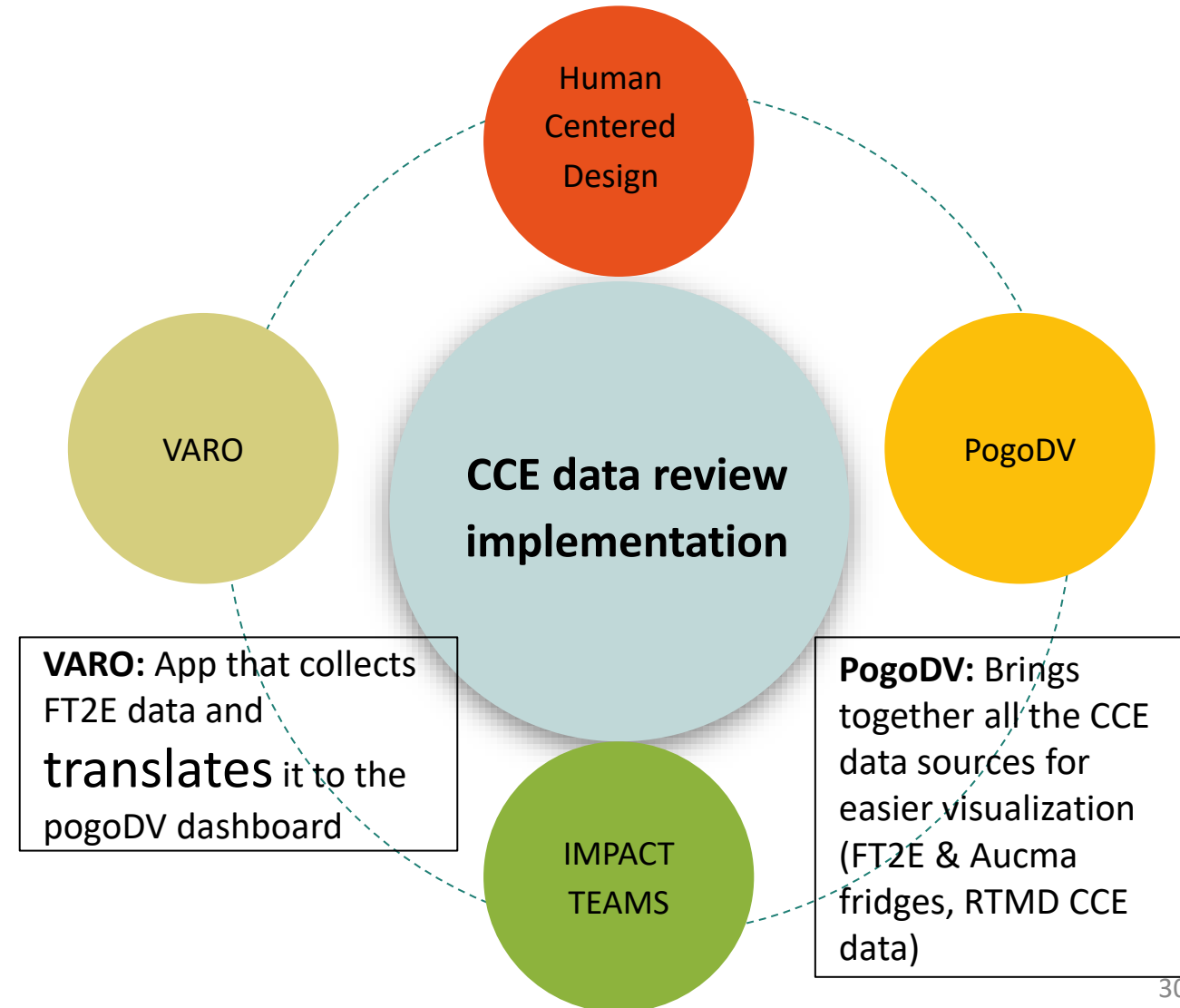
Human-Centered Design (HCD): seeks to understand the experiences and pain-points of users and co-creates innovative solutions with them

VARO: Mobile app enabling rapid capture and transmission of 30DTR logger data.

PogoDV dashboard: visualized CCE data using these KPIs as identified by HCD

- Reporting Rates
- # of heat/freeze alarms
- CCE uptime

IMPACT Teams: multidisciplinary teams that utilize data to improve performance and strengthen the supply chain



Overview of the IMPACT Teams Approach on which this work was anchored

IMPACT Teams is a system of **interconnected teams** made up of **people across functions and disciplines** who meet routinely and are:

- Trained to set targets for supply chain KPIs, and use action-oriented dashboards.
- Encouraged to follow a structured, problem-solving process.
- Empowered to use their data for actions and decisions to improve the performance of their supply chain.

We added CCE performance monitoring as an additional focus in **17 IMPACT Teams** across **26 sub-counties** and **3 counties**. IMPACT teams received integration support from October 2020-Nov 2021

Health workers in **308 facilities** received OTG cables and were trained using a cascade model of training reinforced through IMPACT teams.



Results/Successes

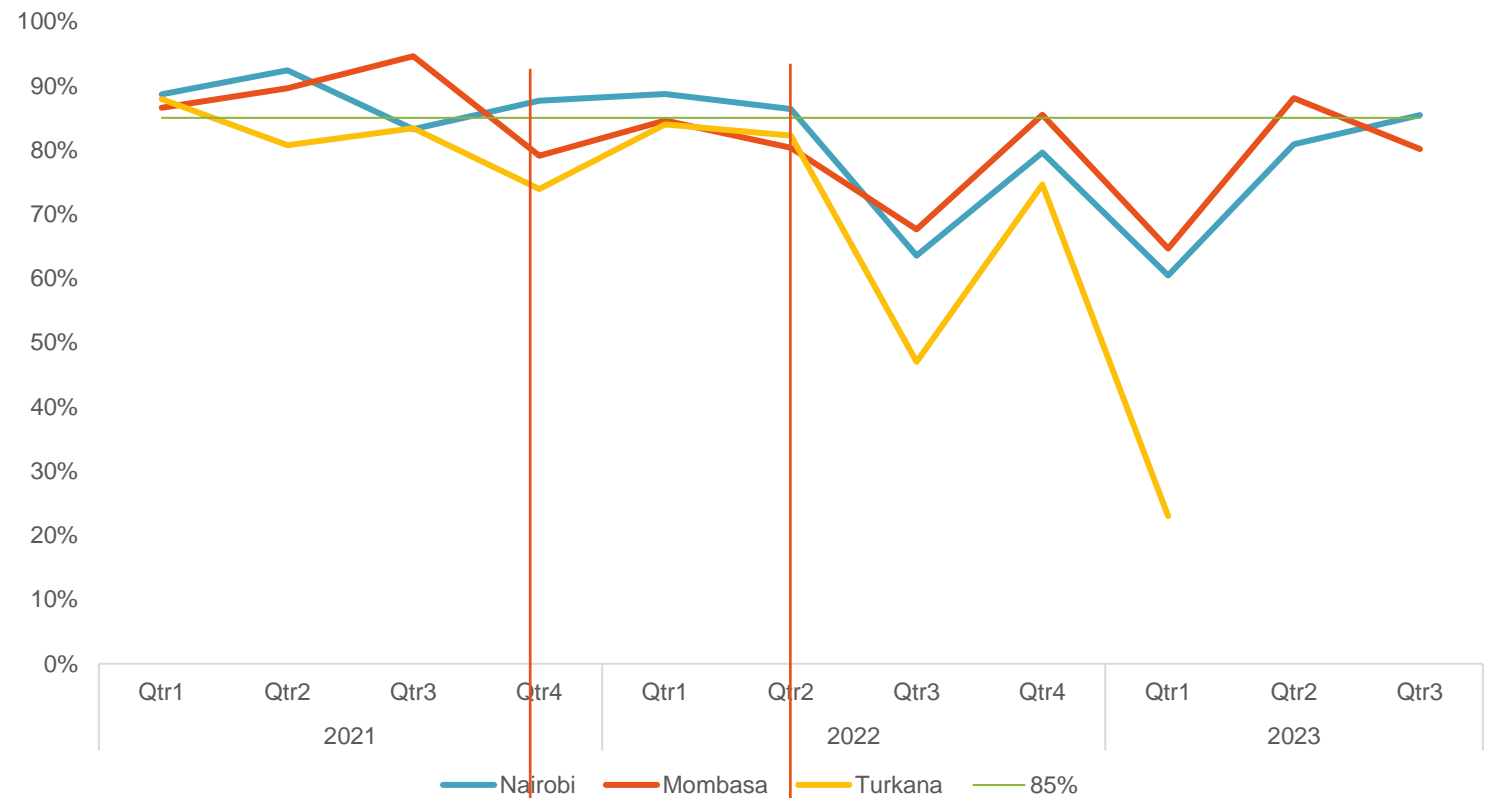


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People and Processes are critical for the adoption and use of data and technology....

- IMPACT Teams that were more mature and consistent in monitoring supply chain performance and taking action, also excelled in integrating the CCE data review
- Nairobi County (most mature) maintained over 85% reporting rates during the project support period, and above 60% reporting after support ended
- Turkana County had the lowest reporting rates and face significant HR constraints, outbreaks and security issues, all of which undermine the ability to hold routine meetings (which were the triggers for change)

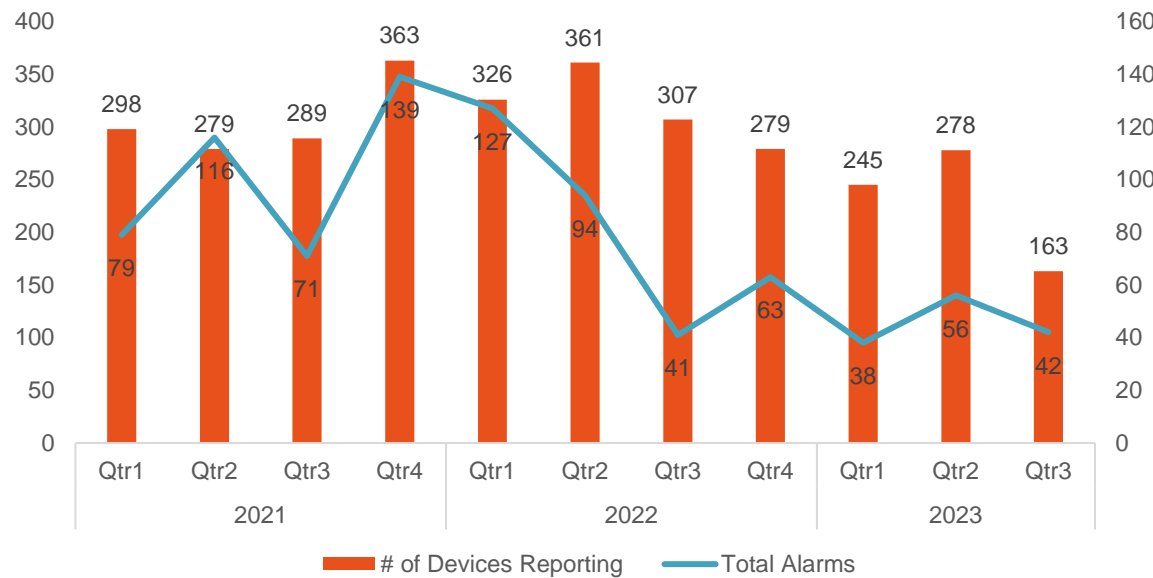
Reporting Rates Trends for three counties (Jan 2021 - Aug 2023)



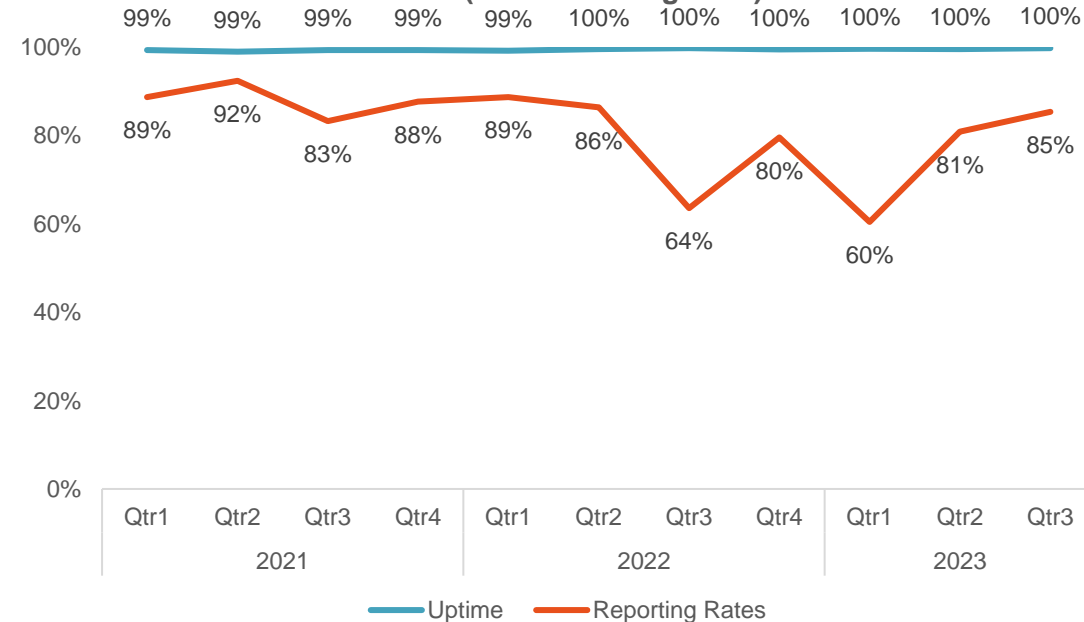
Phased IMPACT team transition to MOH, partners

IMPACT Teams maintained improved performance beyond our project support...

Trends of Devices reporting vs. alarms - Nairobi county (Jan 2021 - Aug 2023)



Trends of fridge uptime vs reporting rates for Nairobi County (Jan 2021 - Aug 2023)



- As teams addressed the CCE performance issues that were being identified, we saw a reduction in the number of heat and freeze alarms reported by facilities even as the number of devices reporting remained relatively high
- The CCEs within Nairobi County reported optimal functionality over time as seen by the >99% uptime trends
- Recent reductions in reporting rates are likely due to large numbers of FT2Es expiries

Successes

- Improved capture and greater end-to-end visibility of CCE temperature monitoring data;
- Co-created visuals are easy to interpret and can inform actions by managers at sub-national levels
- PogoDV enables triangulation of CCE temperature monitoring data with supply chain data to undertake root cause analysis.
- 102 private facilities purchased their own OTG cables, signed up for VARO and routinely submitted reports.
- Routine monitoring provided visibility of expired FT2Es
- Improved performance of CCE KPIs: increased reporting rates, reductions in temperature alarms.

Challenges



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Challenges

- Staff turnover affected reporting; need to retrain new health workers on reporting through VARO.
- Expired/broken-down FT2Es in some facilities affected affected submission of VARO reports and data visibility of CCE
- CCE data still sits in different dashboards (associated with device manufacturers), which makes it hard for managers at all levels to effectively monitor performance.

Lessons Learnt/ Opportunities



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Lessons Learnt/ future opportunities

- Need to standardize and integrate the CCE data from different temperature monitoring devices (remote temperature monitoring devices and FT2Es) in one dashboard to enable easy access to managers at all levels to strengthen and scale the monitoring and use of CCE data for decision-making across levels.
- Leverage existing visuals and analytics, co-created by users, to facilitate ease of use, actions and decisions
- Strengthen the linkage of CCE temperature monitoring data to equipment maintenance and use of predictive analytics to better plan and prepare for future equipment maintenance needs.

Thank you

Unlocking the Value of CCE Data

Brian Pal, New Horizons



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We have a challenge

Data is most useful as part of a full picture for people who need to make real choices

- **CCE performance data are most useful:**
 - Integrated together into Country systems/dashboards
 - Reviewed in the context of other EPI program data and insights
- **This need for better CCE data integration has continually surfaced in Country and stakeholder conversations, and it is solvable!**



The role of New Horizons

- **New Horizons is a nonprofit technology development group**
- **We identify and address technical gaps, especially where the lack of a business case limits important progress**
- **Example:**
 - Varo app – Access and share 30DTR data while promoting Country data sovereignty



Imagine a world

Countries

- Complete immunization picture leads to higher CCE uptime and immunization coverage
- Data sovereignty achieved

Funding/Procurement

- Robust CCE and monitoring options + high uptime

Suppliers

- Country integrations support a business case

Regulators

- Specs informed by data
- Performance gaps addressed

**Success means
this working for
all stakeholder
groups**



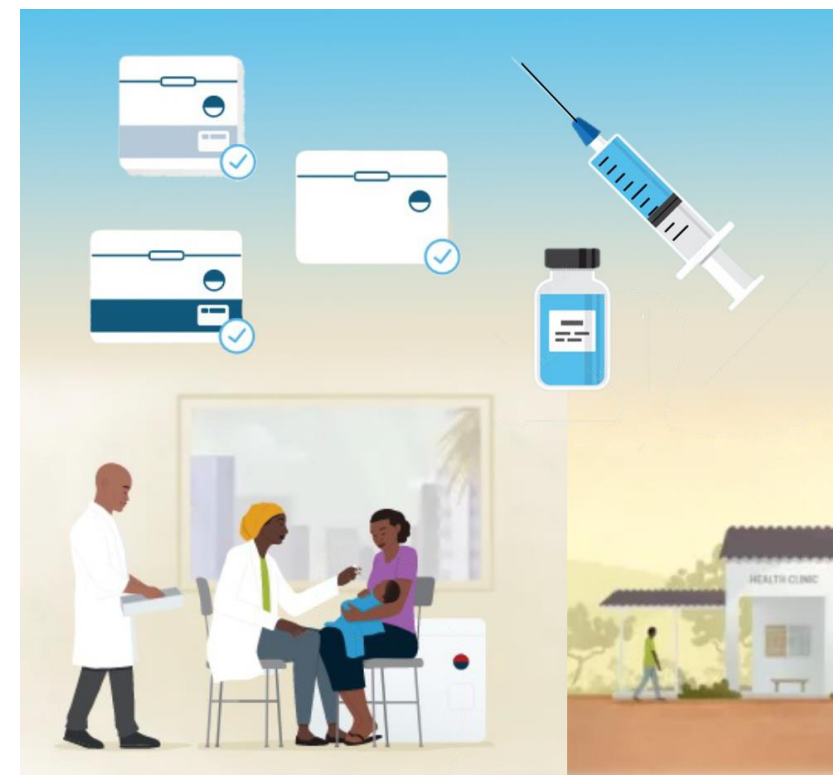
Alignment and balance

- **While we are talking about technical solutions, the primary problems aren't technical!**
- **This is a solvable problem if we:**
 - Prioritize Country needs
 - Acknowledge that Suppliers must have a business case
- **The hard part is to avoid putting the entire burden on a single stakeholder group**
 - Trust and compromise are required



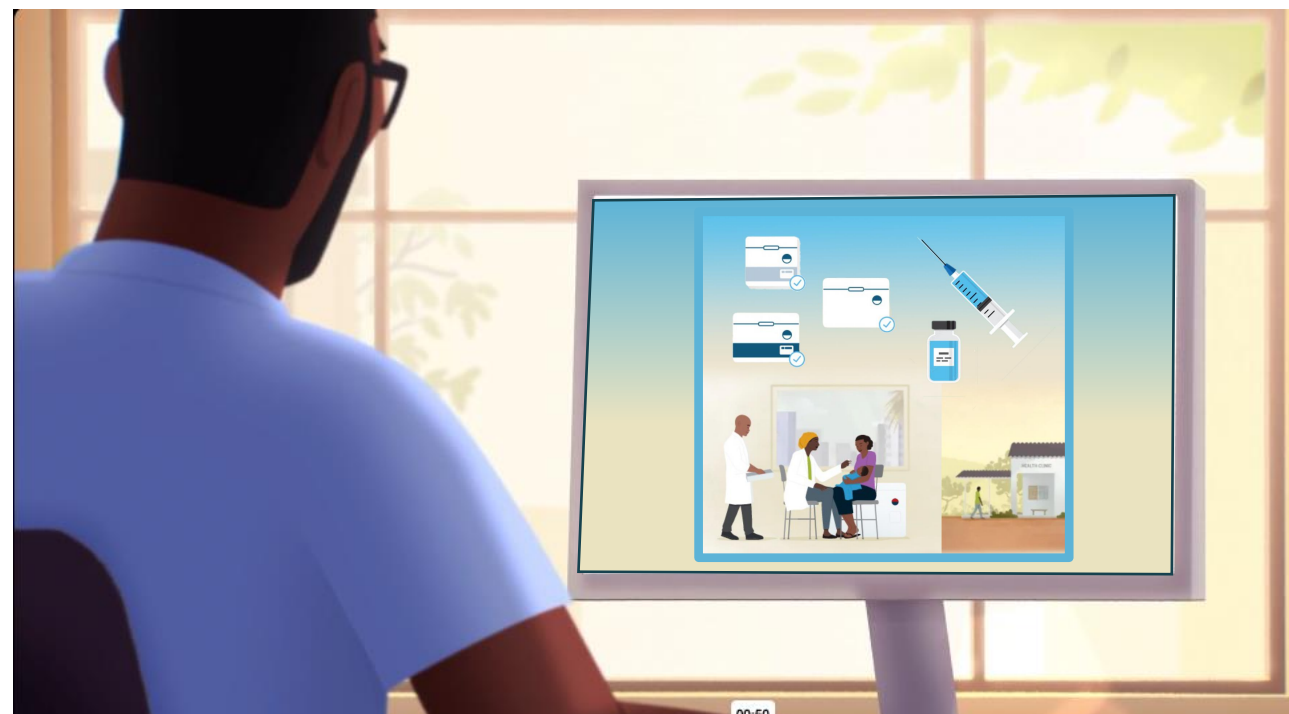
What it will take to solve

- **Support robust Country CCE dashboards / eLMIS**
 - Implement Country data platforms where a complete picture of status can exist
- **Route all CCE data to these Country systems**
 - Provide a pattern for efficient data integrations
 - ✓ Countries control their data
 - ✓ Supplier integration challenge is addressed once and for all
 - Suppliers integrate with this pattern
- **Align incentives for viability**
 - Demonstrate that suppliers can have a sound business case while integrating with Country systems
 - Pay for monitoring based on data delivery
 - Address CCE performance challenges collaboratively



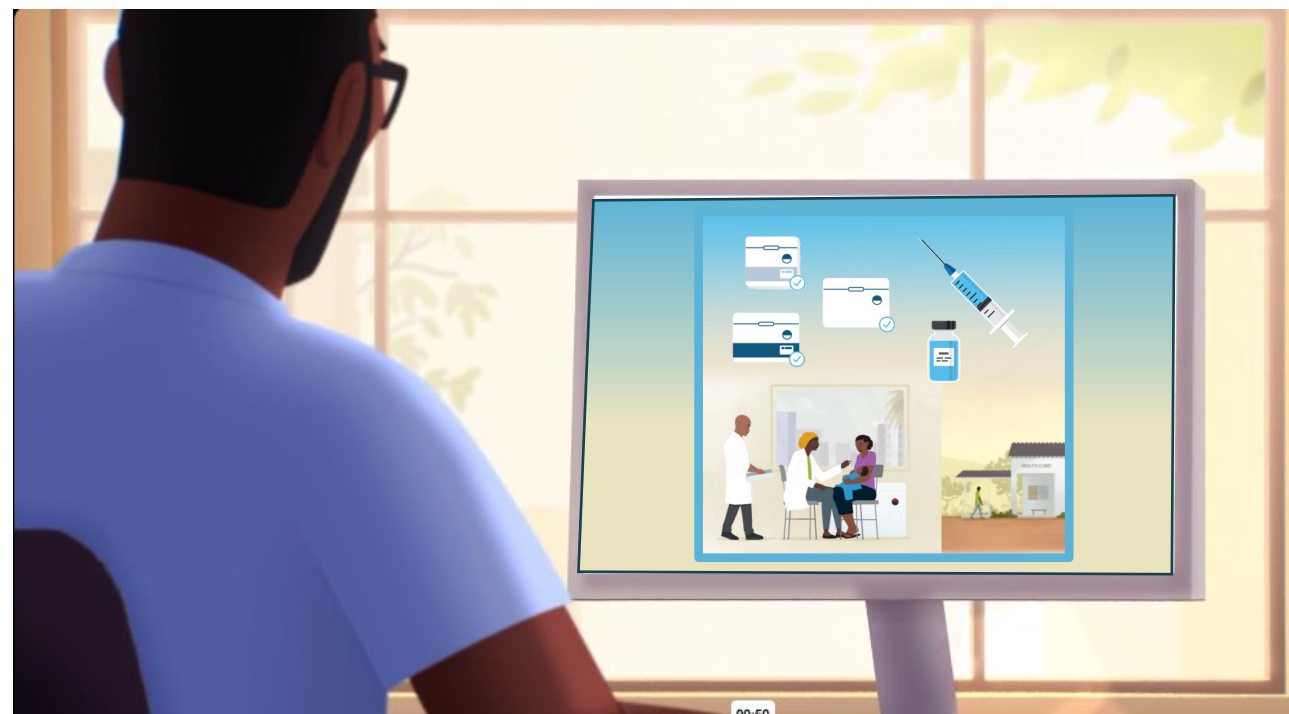
The necessary pieces exist

- **We can unlock the value of CCE data by mobilizing the right resources**
 - People
 - Funding
 - Technology
 - Processes – data review



The necessary pieces exist

- **We can unlock the value of CCE data by mobilizing the right resources**
 - People
 - Funding
 - Technology
 - Processes – data review
- **And the people who can make this happen are in this room!**





Thank You!