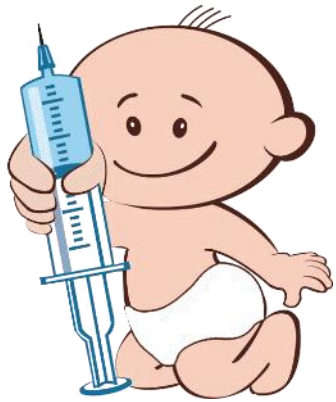




TechNet-21



**TECHNET WEBINAR SERIES ON TEMPERATURE
MONITORING:
KEEPING A COLD CHAIN COLD**

**Where are we with temperature
monitoring of cold chain?**

Ranjit Dhiman, UNICEF
Jalia Nanfuka, GAVI
Wendy Prosser, JSI
15:00 CET, November 11th, 2021

WELCOME!



TechNet-21



WHAT is temperature monitoring?



Monitor temperature of vaccine from point of entry in country to point of administration

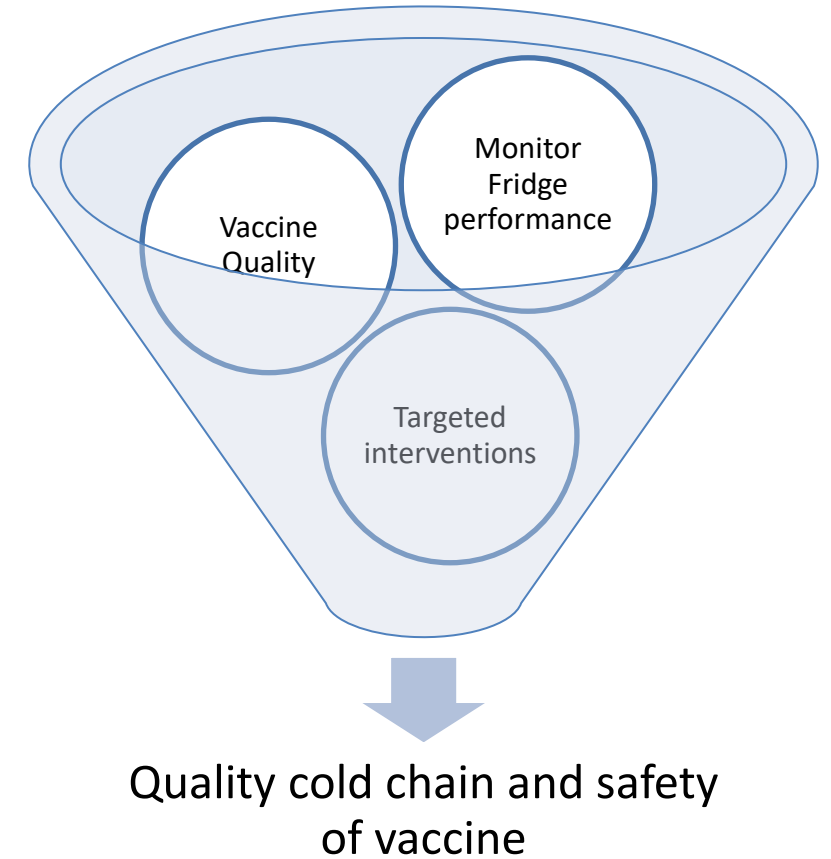
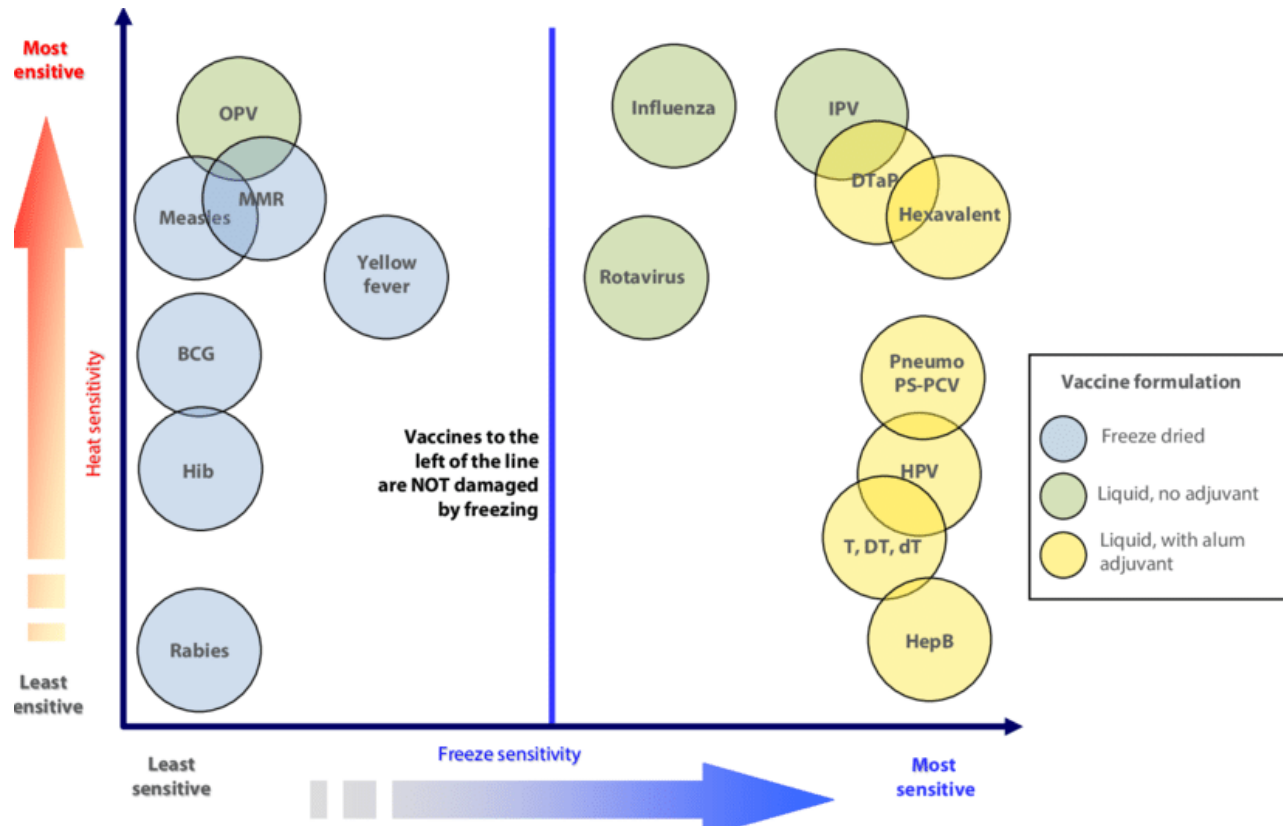
Monitor cold rooms, cold boxes, refrigerators, and vaccine carriers

Using the DATA for decision making on two fronts:

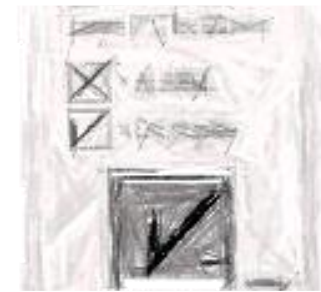
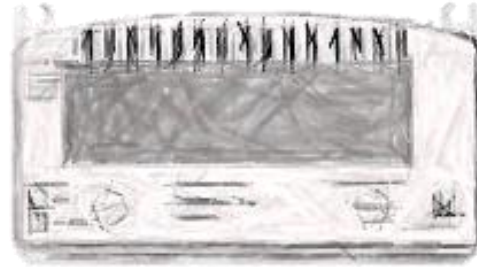
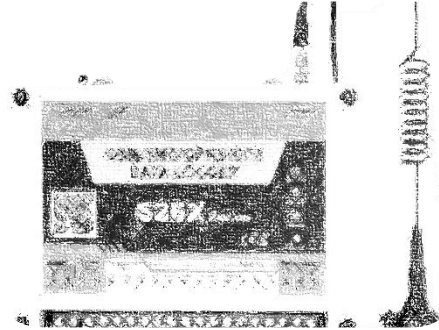
- IS VACCINE OK? *Do I need to intervene to check the quality?*
- IS FRIDGE OK? *What intervention is needed if **not**?*



WHY is temperature monitoring important?



HOW to monitor temperature?



Using Central
temperature
monitoring
systems for cold
rooms

Using RTM
devices for cold
rooms and
refrigerators

Using 30 DTR for
refrigerators

Using freeze
indicators for
shipments

Using VVM on
vaccine vials

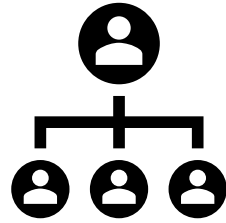
Who monitors and why?



Health workers at
national and
subnational level
And frontline
vaccinators



Routine monitoring and
recording – During storage
and transportation : flag for
intervention



Supply Chain
Managers



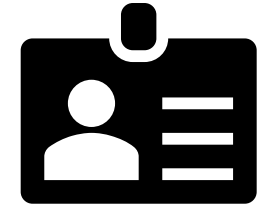
Quality assurance,
intervention management



Cold Chain
Technicians



Repair and maintenance



PQS Secretariat &
CCE
Manufacturers

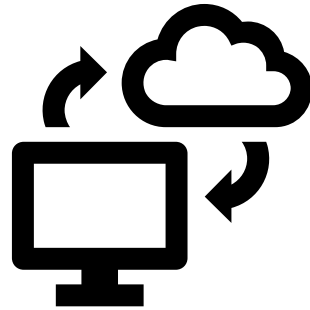


Repairs/ Warranty
management
Monitor Product
performance for
improvements

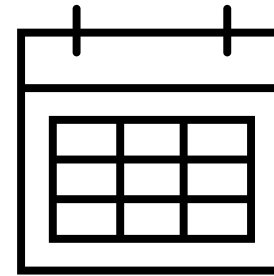
WHEN to monitor?



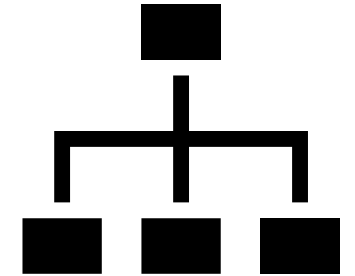
Twice daily: Routine manual recording of every CCE storing the vaccine



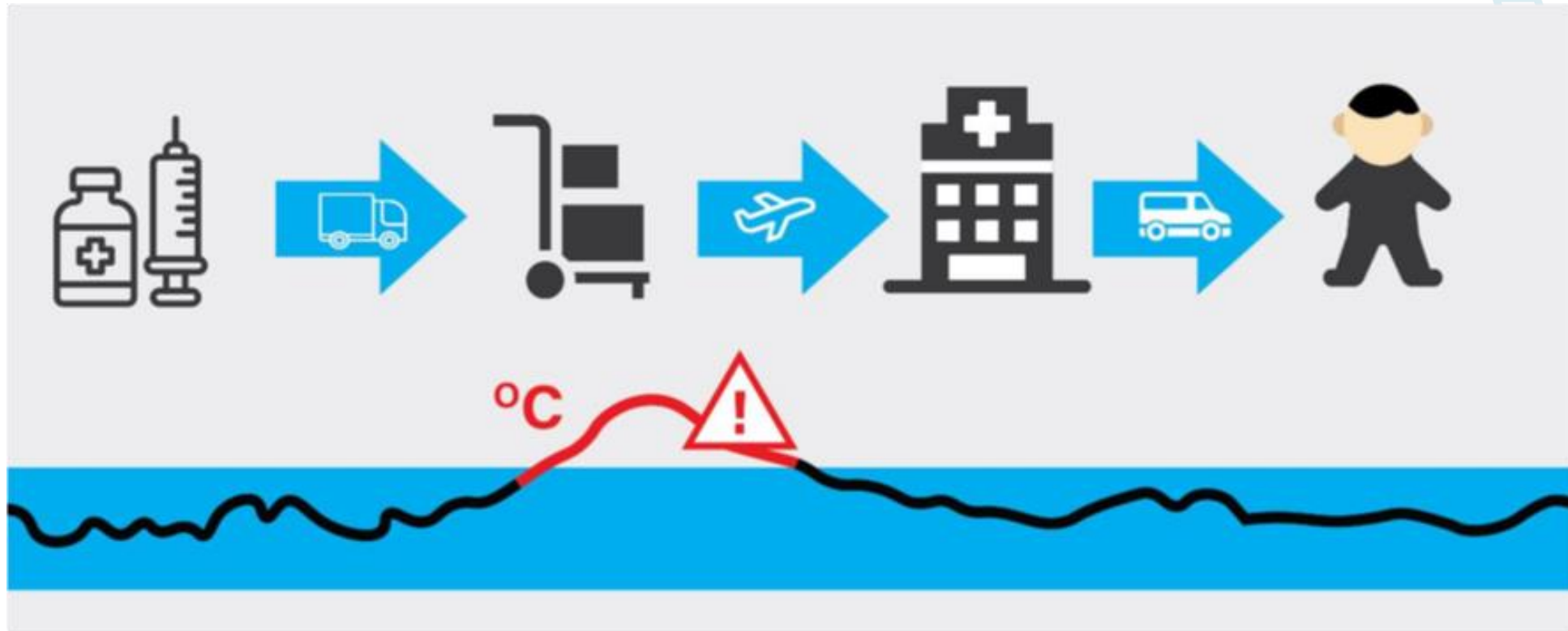
Auto readings every hour by central/RTM devices



Daily and weekly review by supervisors



Daily monitoring of RTMD dashboard by supply chain managers/CCE technicians

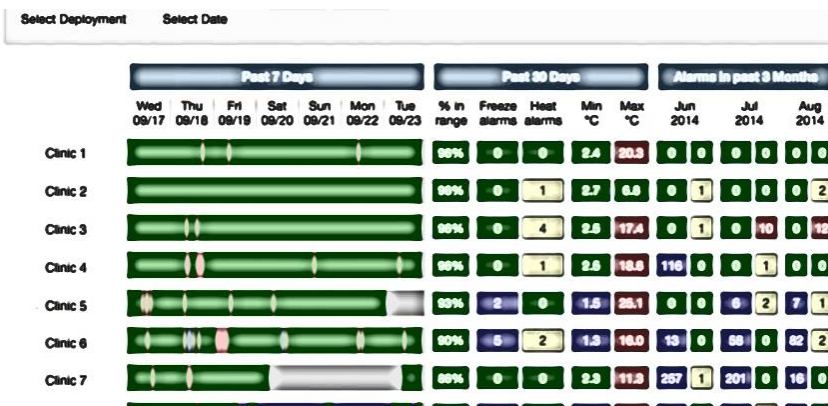


HOW DO TEMPERATURE MONITORING SYSTEMS DIFFER BY SUPPLY CHAIN LEVEL AND SHIPMENTS?

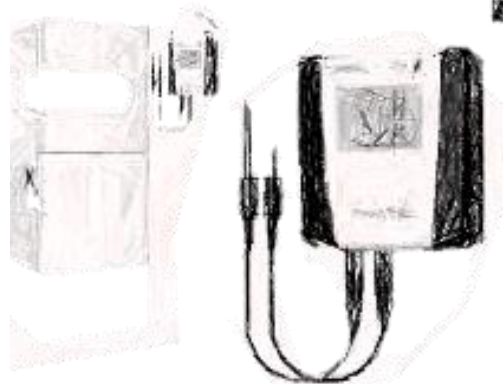
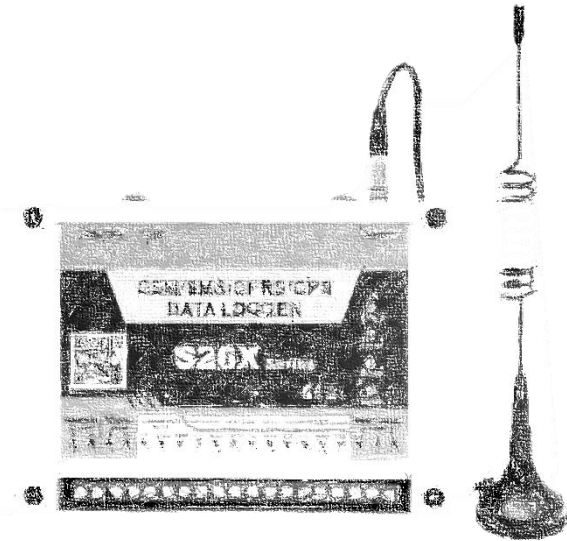
Central temperature monitoring systems



- Designed for cold rooms
- Multiple sensors to monitor hot and cold spots
- Continuous monitoring – Software enabled, local and remote access
- Built in Alarms – Audible and SMS
- Dashboard access for monitoring multiple devices

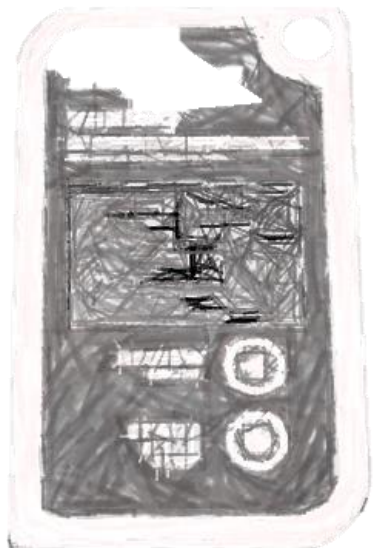
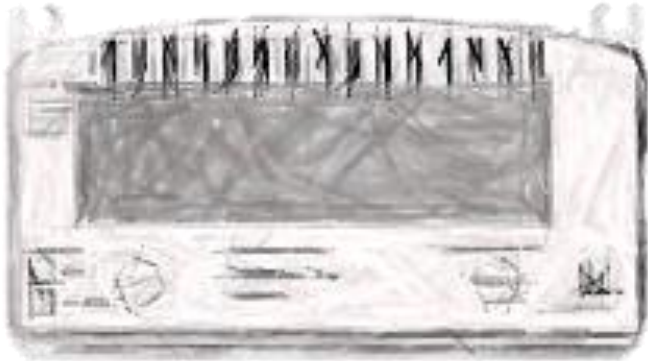


Remote temperature monitoring devices



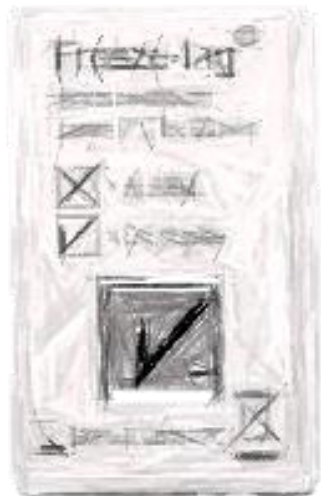
- Designed for refrigerators
- Single or multiple sensors [Single device for multiple fridges]
- Remote access – connected through SIM cards or WIFI
- Dashboard access for monitoring multiple devices

30 Day Temperature Recorders



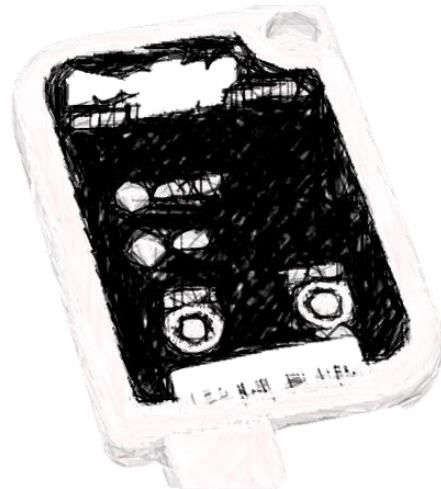
- Designed for monitoring single refrigerator
- Digital device: shows current temperature for daily monitoring
- Visual indicator for alarming excursions (or OK) for past 30 days on device screen
- May have Data downloadable on computer or smart phone through USB (past 60 days)

Shipping indicators

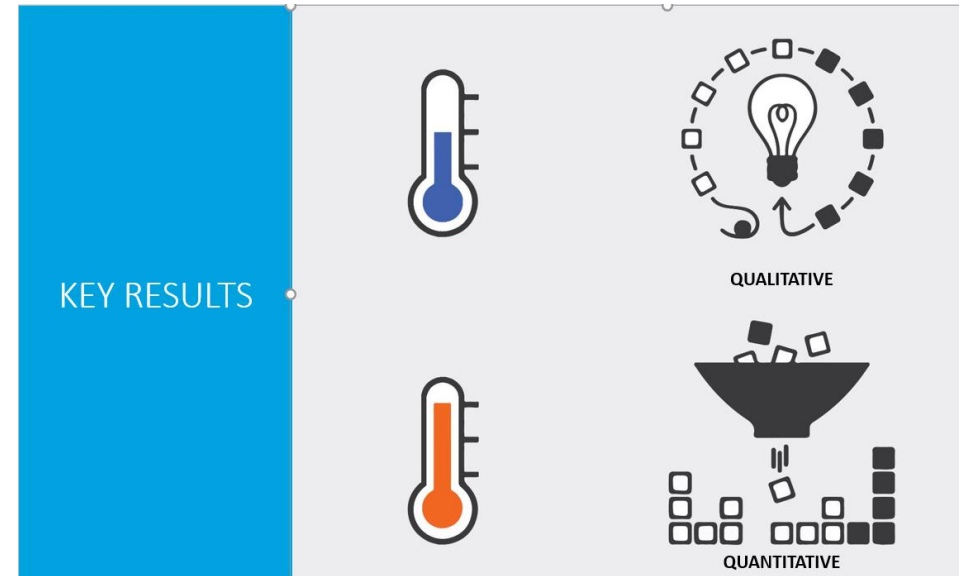




- Single use 10 days shipment monitors – Often used for shipments from manufacturer to point of entry in country
- Freeze indicators – Shows if device has been exposed to alarming freezing temperature

User programmable data loggers



Data loggers for Conducting temperature monitoring studies



Same study locations for both seasons	Safe temperature	Exposure to low risk temperature		Exposure to high risk temperature	
	WHO-recommended Between +2°C and +8°C	Between -0.5°C and +2°C	Between +8°C and +15°C	Freezing risk Below -0.5°C	Heat risk Above +15°C
 Summer 2019 (n=38,811 hours)	96.9%	1.24%	1.84%	0%	0.03%
 Winter 2019-20 (n=45, 256 hours)	99.2%	0.69%	0.08%	0.01%	0%

What are the existing TMS systems for various supply chain levels?



The screenshot shows the WHO website interface. At the top, there is a navigation bar with the WHO logo and the text 'World Health Organization'. To the right of the logo, there are language options: عربي, 中文, English, Français, Русский, and Español. Below the language options is a search bar with a 'Search' button. The main content area is divided into a left sidebar and a main content area. The sidebar contains a list of navigation links: Home, About WHO, Countries, Health topics, Publications, Data and statistics, Programmes and projects, PQS Catalogue, Prequalified devices and equipment, Prequalified Vaccines, and Accredited Laboratories. The main content area displays the 'Product List' for 'E006: Temperature monitoring devices'. It includes a breadcrumb trail: 'PQS Catalogue > Prequalified Devices and Equipment > Product List'. The title 'E006: Temperature monitoring devices' is prominently displayed. Below the title, there is a paragraph describing the products in this category, which relate to thermometers, freeze indicators, temperature recorders, alarm systems, event loggers, and remote communication devices for monitoring temperatures at all levels of the cold chain. A list of prequalified products is provided below, along with links to relevant PQS data sheets. A section for manufacturers wishing to prequalify products in this category provides contact information for the PQS Secretariat (pqsinfo@who.int) and a link to the 'Guidelines for manufacturers of temperature monitoring devices'. A search section at the bottom of the main content area provides links for searching products and accessing guidelines, performance specifications, and verification protocols.

All WHO pre-qualified devices are listed on WHO PQS catalogue, accessible to all on WHO website

https://apps.who.int/immunization_standards/vaccine_quality/pqs_catalogue/categorypage.aspx?id_cat=35



CHALLENGES AND WAY FORWARD



Ongoing challenges in temperature monitoring 1/2



- Increasing investments in CCE & vaccines with varied focus on monitoring performance of CCE deployed
 - Since 2017, >65K ILRs & SDDs have been procured via CCEOP
 - >25K units procured between January and October 2021 by UNICEF SD for the covid response
 - Lack of systematic CCE temperature & performance monitoring and data feedback loops limits use of data for decision making



Under-utilization of available TMS (30 DTRs and RTMDs) for decision making

- Limited access and use of the features by health workers & managers
- Limited documentation of action taken based on temperature alarms

Ongoing challenges in temperature monitoring 2/2



- Separate RTM data platforms exist in countries limiting ability to comprehensively assess performance of CCE
 - Lack of integration of data that already exists from 30 DTRs or RTM platforms in existing LMIS/eLMIS systems or other readily available performance tools



- RTM systems developing at a fast pace, but its use is very limited
 - Access to data is a challenge in some countries
 - Health care worker capabilities to use the data is often limited as well
 - High costs for data and portal subscriptions create barriers for widespread uptake

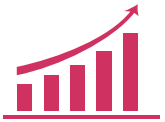
Opportunities available with potential to benefit country immunization programmes



- Improved shelf life of devices e.g. extended 30 DTRs to ease replenishment; but challenges remain on data use



- New innovations in the pipeline to support CCE equipment monitoring e.g. Equipment Monitoring Systems (EMS) offering more advanced performance monitoring capabilities beyond temperature data



- Increased investments in RTMDs in the pandemic context expanding data available to support decision making on maintenance



- Potential for more predictive analytics for cold chain maintenance using data from TMS



The way forward

- Upcoming webinar sessions:
 - Nov 18:** Data at your fingertips: how to best use your 30DTR data - focused session on 30DTRs and country success stories
 - Nov 25:** RTMDs: How to get the most out of your real-time temperature monitoring data - Focused session on RTMDs and country success stories
 - Dec 2:** Focused session on EMS: the future of temperature monitoring
 - Dec 9:** Connecting the dots: Using CCE temperature monitoring data to improve cold chain systems and maintenance practices
- Resource bank at TechNet on TMS ([Temperature monitoring - TechNet-21](#))
- A report on this webinar series

Q+A

- Questions?



Ranjit Dhiman, UNICEF



Jalia Nanfuka, GAVI



Wendy Prosser, JSI

