17th TechNet Conference

Panama City, Panama | October 16-19, 2023

Immunization Programmes That Leave No One Behind

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Procurement and Longevity of Cold Chain Equipment

Mohammed Pangani, Nexleaf Analytics

Phonespaseuth Ounaphom, Director General- Department of Hygiene and Health Promotion, Lao PDR

October 18, 2023

CCE Performance Gaps We Can See: an Exploration of RTM Data

Mohammed Pangani, Nexleaf Analytics

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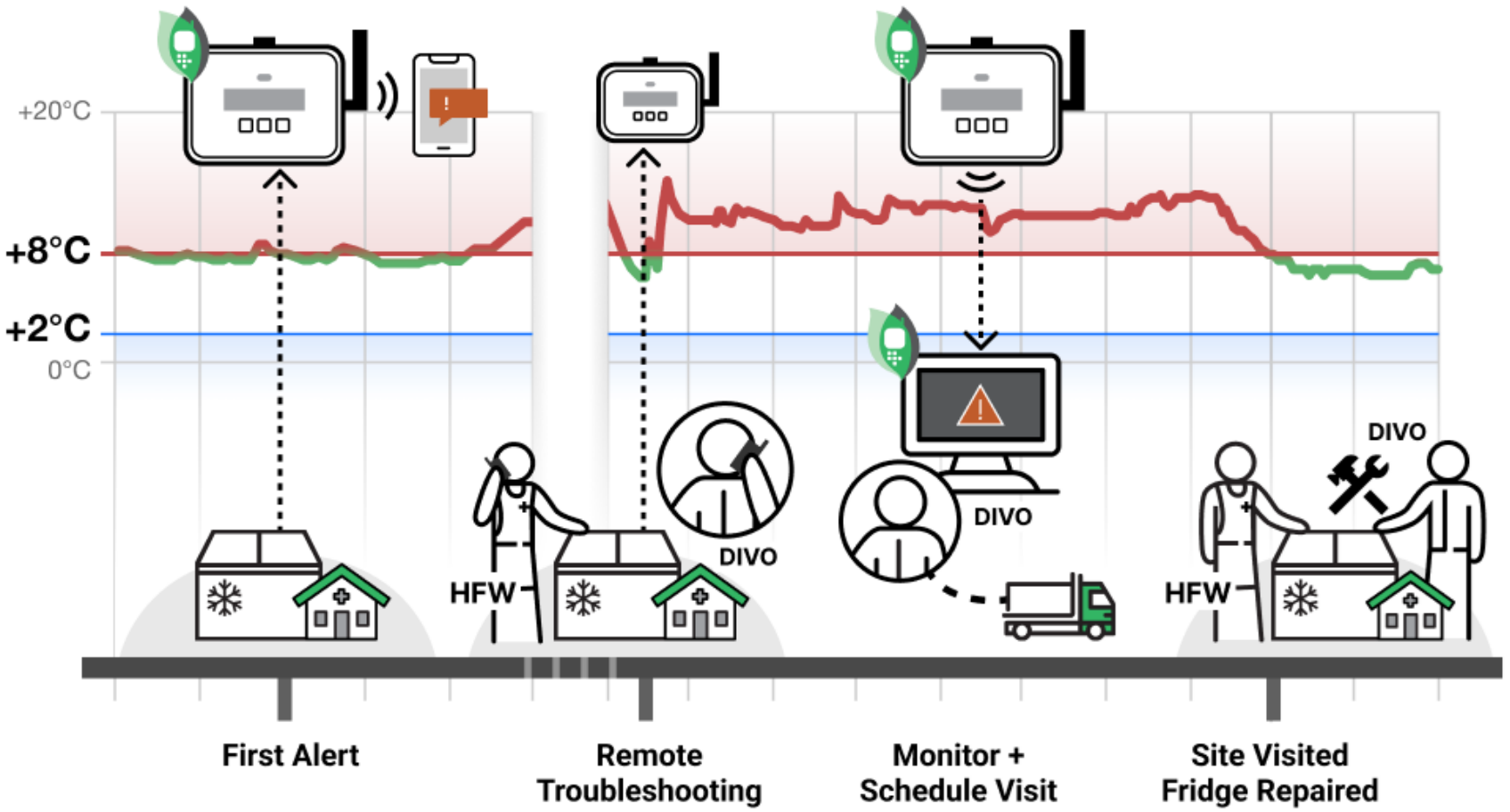
The Critical Role of End-to-End Visibility in the Cold Chain

- **Remote temperature monitoring (RTM) data from every link in the cold chain can protect vaccine potency and reduce / prevent temperature damage**

- **End-to-end visibility allows for personnel to respond when problems arise. From identifying a broken fridge to modifying a transport SOP that needs changing, real-time data gives countries the information they need to manage their cold chains.**

Alerts + Data Visibility →Coordinated Action

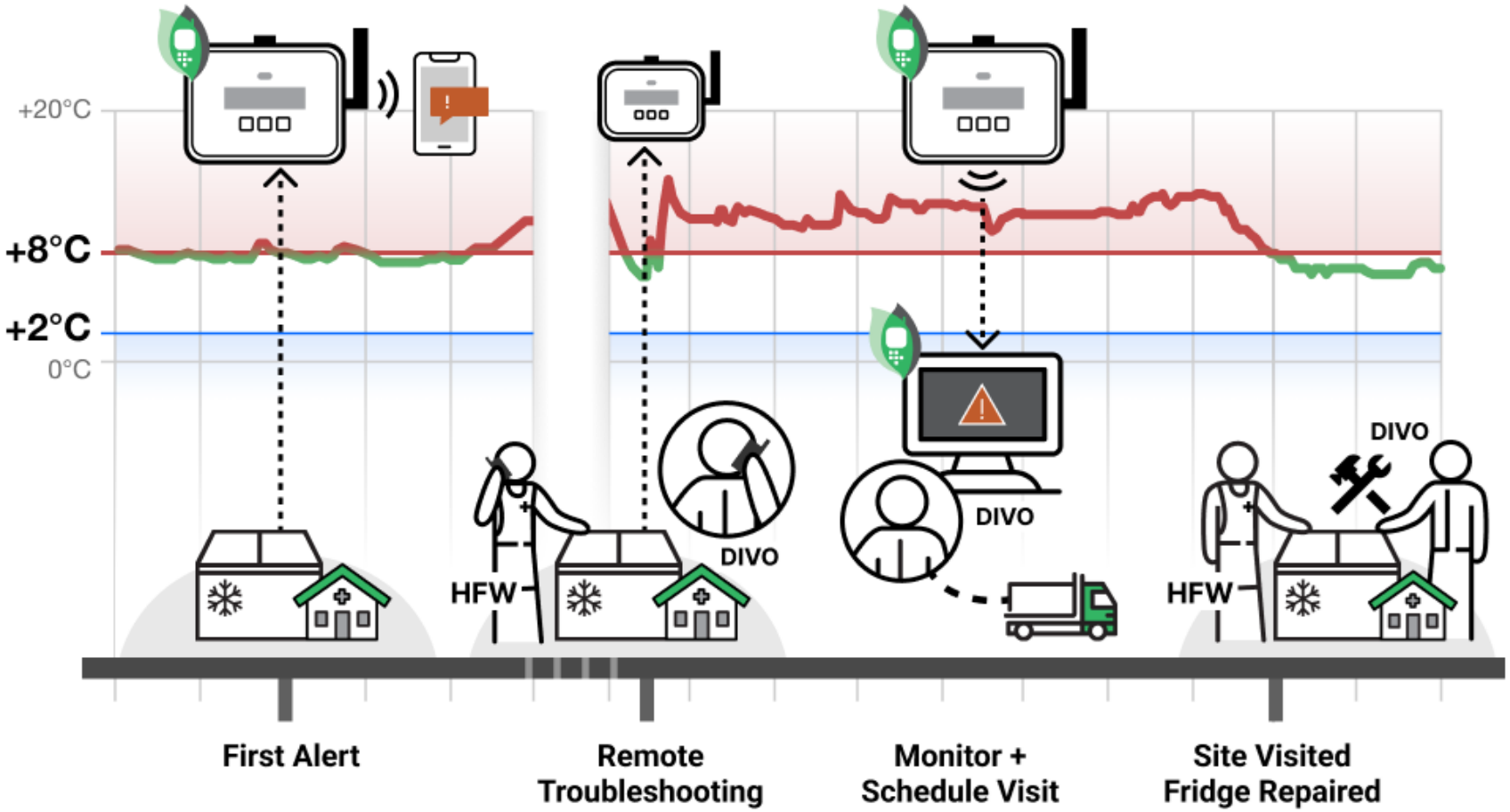


20 July - **Health Facility Worker** is receiving **high temperature alerts from RTM system.**

HFW calls the District Immunization Vaccine Officer (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.**

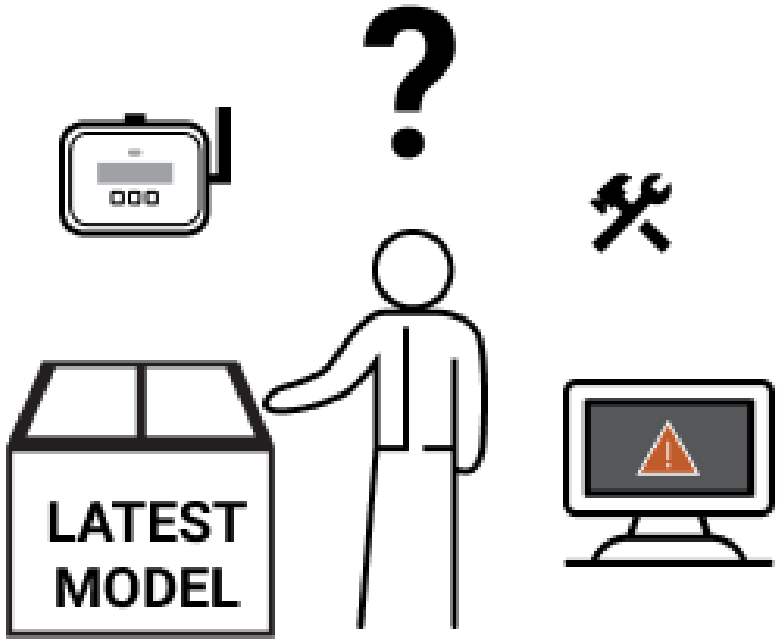
When Everything Goes Right :)



Circumstances for Success

- HFW received and understood RTM alerts and called the DIVO
- DIVO used the RTM dashboard & was already monitoring the fridge
- DIVO had some ideas for remote troubleshooting
- DIVO could make a special trip to the facility
- DIVO knew what to bring to fix likely problems with this CCE

When Everything Goes…

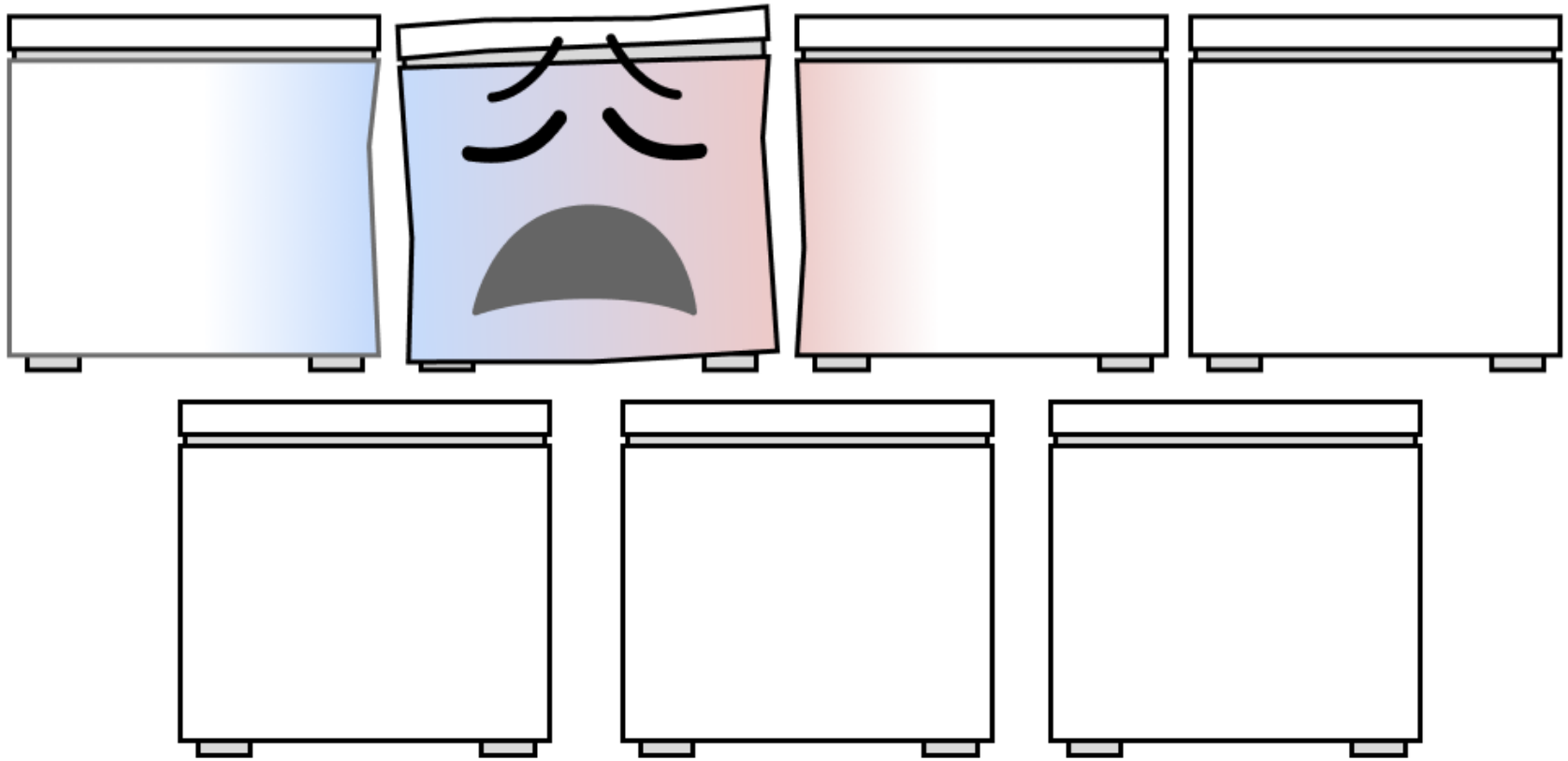


Circumstances for Continued Fridge Failure

- HFW is new and their phone number is not associated with the RTMD
- DIVO doesn't use the RTM dashboard
- DIVO / Technician isn't familiar with the make and model of the fridge
- District has no budget for travel
- DIVO / Technician lacks skills and/or spare parts to fix this CCE

...because data alone can not fix a failing fridge.

Of 8,106 CCE monitored, more than 1 in 7 experienced excursions every month for ≥12 months

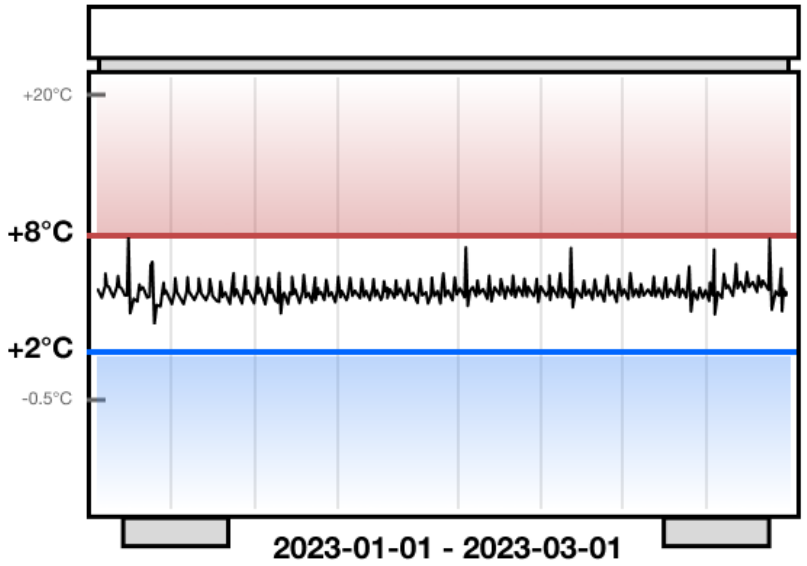


Two fridges. Same facility.

FRIDGE 1

Good Performance

Installed
2020

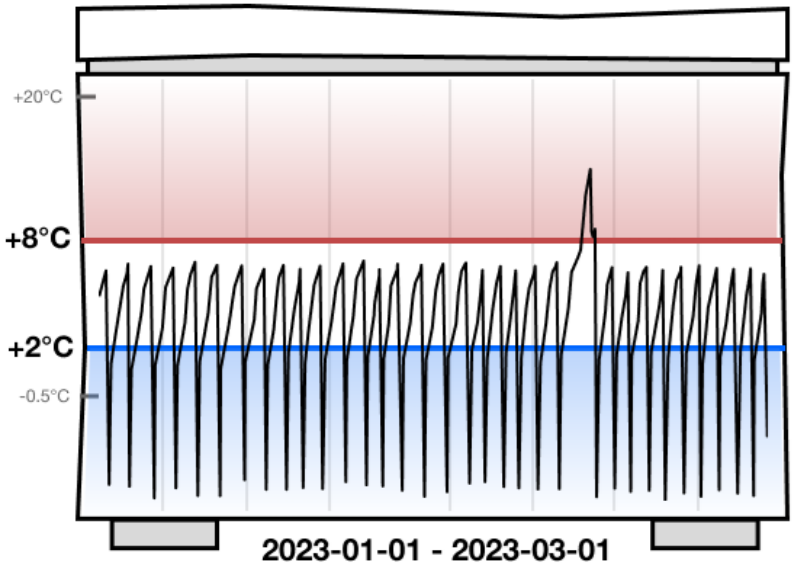


FRIDGE 2

Needs Maintenance

Installed
2020

19 WHO freeze alarms in 30 days



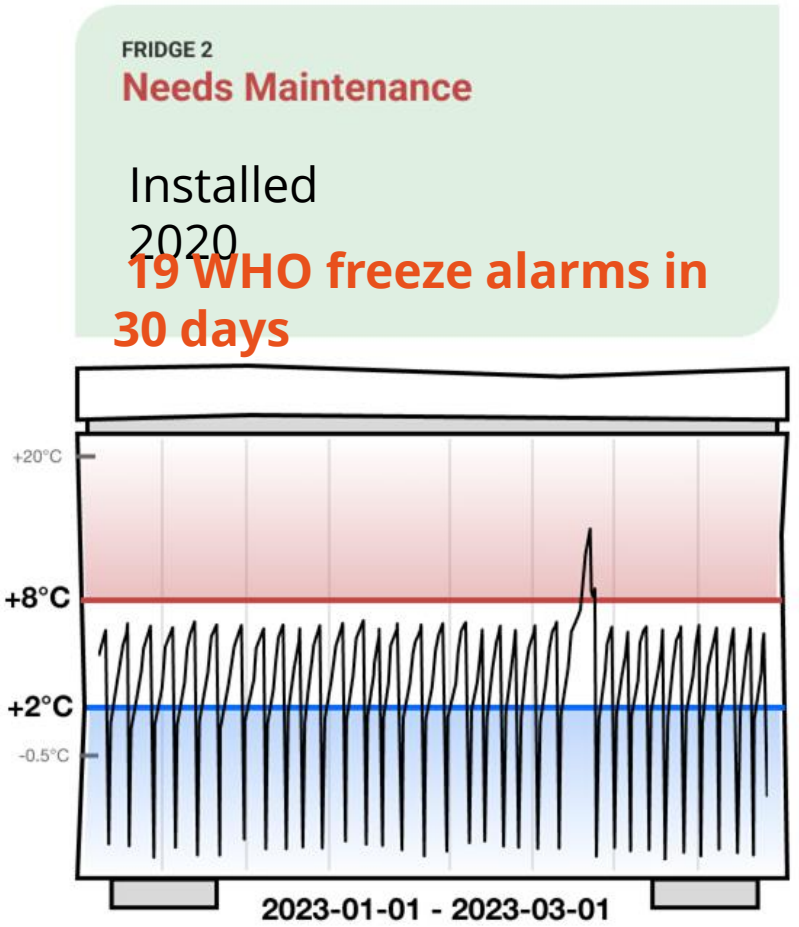
When RTM data shows a fridge that is failing for several months…

Potential Problems

- **RTM Sensor** is in the wrong place
- **Thermostat** needs adjusting
- **Broken CCE**

Other Obstacles

- Is anyone **reviewing the data?**
- Are technicians **familiar** with the make and model?
- Is there a way to redeem the **warranty /** follow up with **fridge manufacturer?**
- Is data on **past attempts to fix the fridge** collected anywhere?



Better data tools can help...

- Support and enable key CCE maintenance activities:
  - Reactive - know when a CCE fails + fix it
  - Preventative - based on manufacturer's scheduled recommendations
  - Predictive - based on usage, wear, history → mitigation before failure

- Support Ministry of Health:
  - Procurement - buy the best CCE for the context
  - Replacement - replace failing CCE instead of older fridges that still work
  - Staffing - ensure adequate technician coverage
  - Resource allocation - spare parts, transport, etc.

Additional data types can help…

- **Electrification data:**
  → How much consistent grid power a facility really has can help MoHs determine where to put solar resources
  → RTM systems can provide this data
- **VRS:**
  → a metric based on the math behind VVM stickers, VRS can help MoHs determine which fridges pose the biggest risk to vaccines cycling through
- **Transport monitoring:**

  → tech to support vaccine transport can improve SOPs and alert drivers to take steps to protect vaccines

Building a culture of data…

- **Curricula:**
  → **Coursework above and beyond short trainings to help vaccine workers develop skills to use data and manage CCE information systems**
  → **On-the-job training for health care workers on RTM / tech / data use**
- **EMS:**
  → **Ensure the latest PQS standards for built-in CCE data logging are able to be used by the country to improve cold chain performance**
- **Data-driven business cases:**
  → **Data gathered in and owned by the country can be used to tap resources to fix what's broken and enable specific, targeted investment**

Thank you

Experience sharing with the country-led service bundle for CCEOP implementation and cold chain strengthening in Lao PDR

Dr Phonepaseuth Ounaphom

Director General- Department of Hygiene and Health Promotion

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CCEOP Contracting and scope of work

Year 2021-2022

1. UNICEF Laos Office contracted Local Service Provider (LSP) for installation of **879 Sets** (under CCEOP), **788 additional CCEs (covid-19 support)** and 9 walk in cold rooms (Gavi HSS) nationwide in several phases during 2021-2022-2023 under overall supervision of NIP and MOH.
2. Throughout 2021, LSP mobilized human and material resources with the following instruments:
   i. Mapping all Health Centers using mobile application and listing of each Health Center with the delivered new CCE resources and related documented information
   ii. Translate all technical documentation provided by the Manufacturer from English into Lao Language for all CCEs: VLS204, 304, 404 and MK314
   iii. Establish step-by-step operational procedures for effective qualified installations including provision of earthing, power sockets, junction boxes, and proper electrification.
   iv. Provide training sessions to NIP Personnel in Vientiane and aired on-line to all provincial Health Technicians
3. Implementation delays due to COVID-19 lockdowns/restrictions imposed within the country

Achievements

CCEOP

- CCEOP Phase 1 complete (340 CCEs installed)
- New cold chain points established: 68
- Online dashboard for CCE delivery and installation
- Development of 4 training modules for different CCE models
- Post Installation Inspection (PII) phase 1 -94% user acceptance
- CCEOP Phase 2 ongoing with installation of 539 CCE
- 448 CCE installed (Current progress: 83%)

HSS

- Establishment of five regional cold chain hubs
- Recruitment and deployment of 5 cold chain technicians
- Hands on and on-site training of technical staff
- Cold chain technicians equipped with repair and maintenance toolkits
- Cold rooms installation: 100% (5/5)
- RTM installation: 100% (5/5)

Proportion of vaccine storage facilities with functional PQS CCE improved from 54% in 2020 to 82% in 2022 and is expected to achieve 100% by end of 2023

COVAX/COVID-19

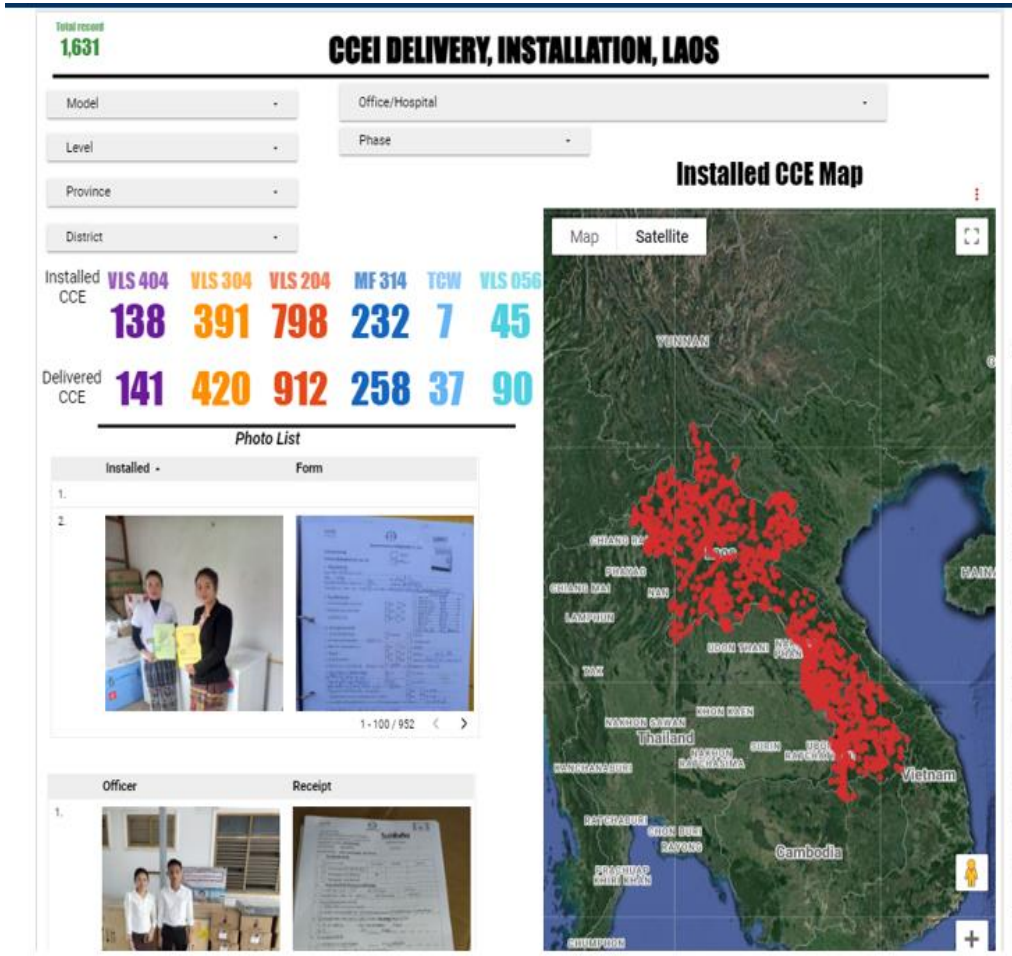
- Four walk in cold rooms(40 CBM) installed at central level
- Refurbishment of central vaccine store to accommodate new cold rooms
- CCE delivered: 788 (100%)
- CCE installed: 472 (60%)
- UCC delivered & Installed: 3 (100%)

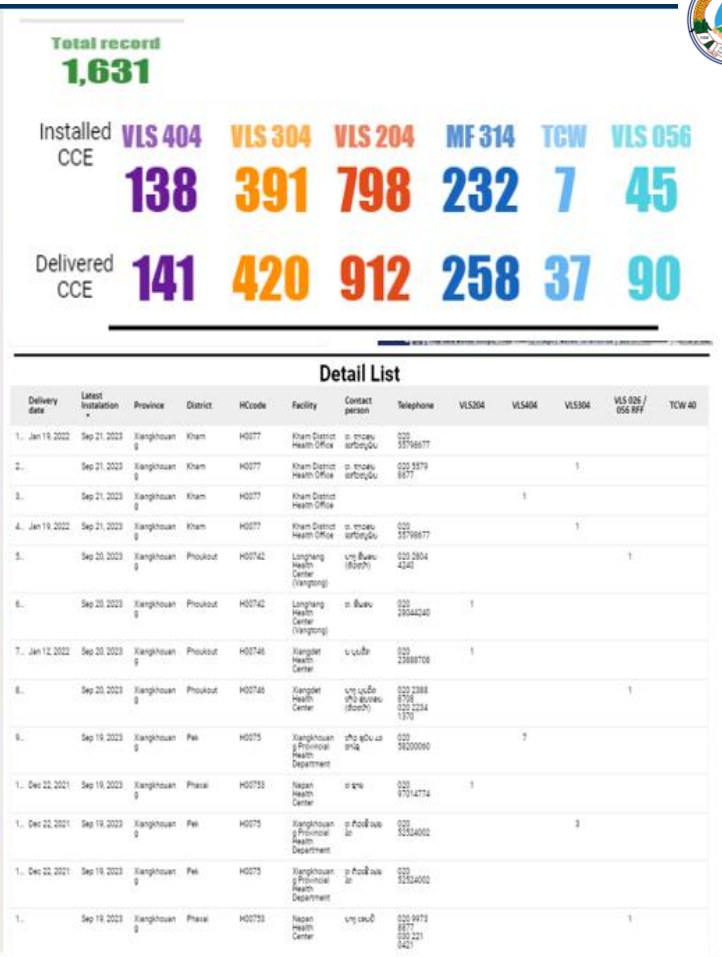
CCE delivery and installation dashboard

Allows NIP to monitor, verify and validate the delivery and installation progress reported by LSP

Allows tracking of installation progress based on need in priority districts and provinces

Allows inventory management and data is being imported from the open source google studio to IGA tool





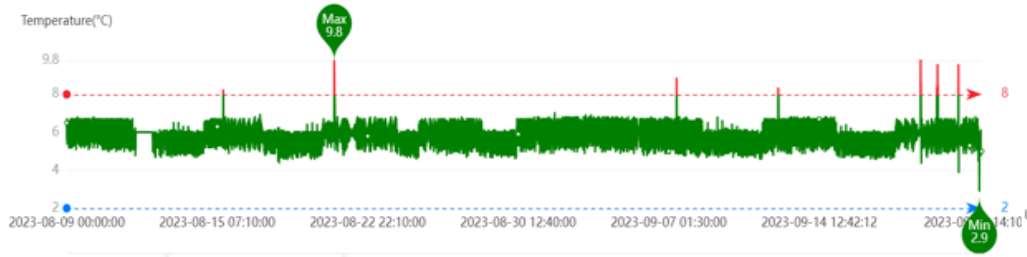
Continuous Remote Temperature Monitoring of cold rooms at regional hubs

Remote Temperature Monitoring Device Record August 9 – Sep 22, 2023 @ Provincial Store

LuangPrabang

Data Charts(2023-08-09 00:00:00-2023-09-22 14:10:00)

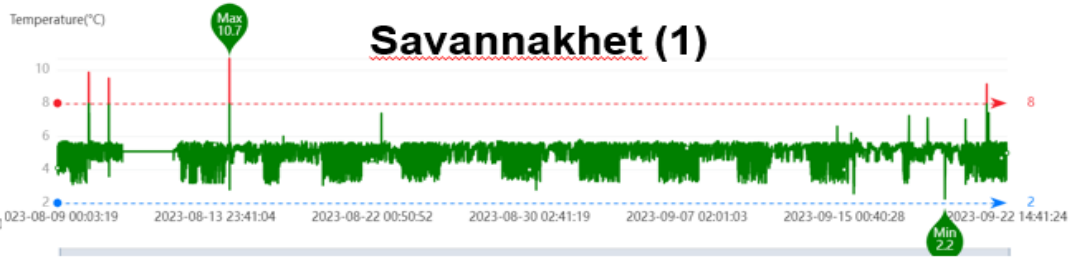
WIC-10-LPG-temp in 1(Max:2023-08-21 06:35:00,Min:2023-09-22 11:10:00)



Data Charts(2023-08-09 00:03:19-2023-09-22 14:41:24)

WIC-10-SVK-1-temp in 1(Max:2023-08-14 17:40:11,Min:2023-09-19 10:41:17)

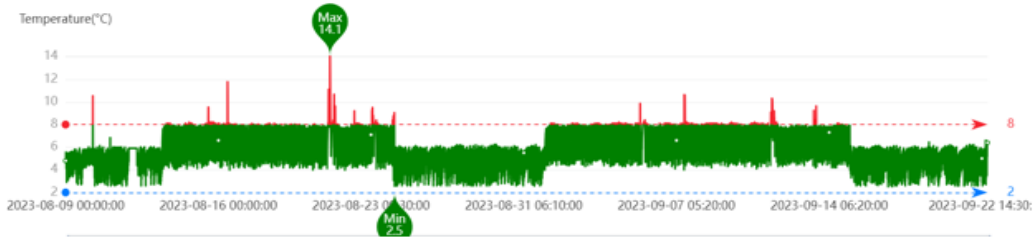
Savannakhet (1)



Oudomxay

Data Charts(2023-08-09 00:00:00-2023-09-22 14:30:00)

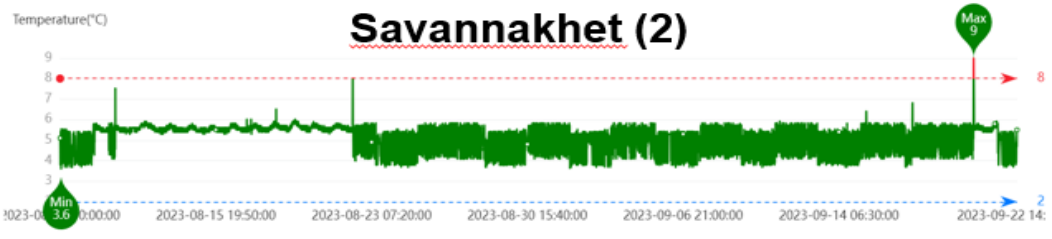
WIC-30-ODX-temp in 1(Max:2023-08-21 11:46:00,Min:2023-08-24 10:00:00)



Data Charts(2023-08-09 00:00:00-2023-09-22 14:40:00)

WIC-10-SVK-2-temp in 1(Max:2023-09-20 12:26:00,Min:2023-08-09 01:10:00)

Savannakhet (2)



Salavanh

Data Charts(2023-08-09 00:00:00-2023-09-22 14:40:00)

WIC-10-SLV-temp in 1(Max:2023-08-31 15:30:00,Min:2023-08-11 07:20:00)

VTE Capital

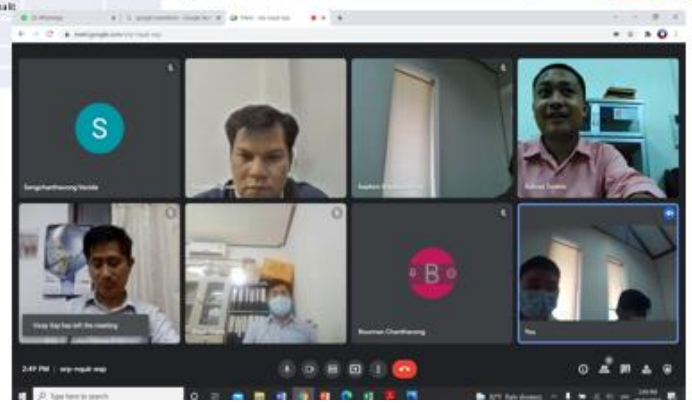
Data Charts(2023-08-09 00:00:00-2023-09-22 14:40:00)

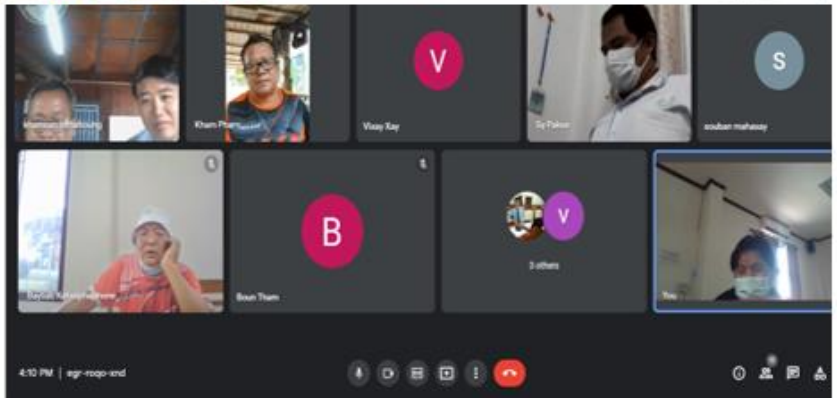
WIC-10-VTE-temp in 1(Max:2023-08-17 10:34:00,Min:2023-08-12 12:50:00)

On-line cold chain training during pandemic

No	Name and surname	Province	qty attent meeting
1	Mr. Ken	Borikhamxay	1
2	Mr. khamphan	Khammuan	1
3	Mr. Syphong Sayavong	Savanakhet	1
4	Dr. Khamsang		1
5	Dr. Sounun		1
6	Mr. Khampheud Xayphavong	Champasak	1
7	Dr. Baliep Ketsophaphone		1
8	Dr. kidsada		1
9	Mr. Syho Latsophar	Salavan	1
10	Dr. Soulikanh Phasaveang	Xekong	1
11	Dr. Bounun Chanthavong		1
12	Dr. Somphet Inthalat	Attapue	1
13	Dr. Kevang	Saysomboun	1
14	Dr. Vixai Sivilay	Vientiane province	1
15	Mrs Boulian		1
16	Dr. Tusher Yaithai	Xiengkhuang	1
17	Dr. Soubon Mahaxay		1
18	Dr. Tui Tanouxay	Huaphan	1
19	Dr. Amphai	Luangprabang	1
20	Dr. Syavat Nada	Sayabury	1
21	Dr. Houmpheang Yot ae phon	Udomxay	1
22	Mr. Bounleud	Phongsaly	1
23	Dr. Khamsan		1
24	Dr. Phaimany	Luangnamtha	1
25	Dr. Bounthanh Thamaleud	Borkeo	1
26	Mr. Anun savatchilang	Vientine capital	1
27	Dr. Panom		1
28	Dr. Kapkeo		1
29	Mr. Vilaxit		1
30	Mr. Somphong		1
31	Mr. SengLa		1
32	Miss vanida souvansilt		1
33	Mr.Thanrin		1
34	Mr. Soulikanh phoutthvong		1
35	Miss Duangvilay		1

1	Mr. Ken	Borikhamxay	1
2	Mr. khamphan	Khammuan	1
3	Mr. Syphong Sayavong	Savanakhet	
5	Mr. Khampheud Xayphavong	Champasak	1
	Dr. Baliep Ketsophaphone		1
6	Mr. Syho Latsophar	Salavan	1
	Mr. Saysomphone Phinesone		1
7	Dr. Soulikanh Phasaveang	Xekong	1
8	Dr. Somphet Inthalat	Attapue	1
9	Dr. Kevang	Saysomboun	
10	Dr. Vixai Sivilay	Vientiane province	1
	Mrs Boulian		1
11	Dr. Tusher Yaithai	Xiengkhuang	1
12	Dr. Tui Tanouxay	Huaphan	1
13	Dr. Amphai	Luangprabang	
14	Dr. Syavat Nada	Sayabury	1
15	Dr. Houmpheang Yot ae phon	Udomxay	1
16	Mr. Bounleud	Phongsaly	1
	Dr. Khamsan		1
17	Dr. Phaimany	Luangnamtha	1
18	Dr. Bounthanh Thamaleud	Borkeo	1
19	Mr. Anun savatchilang		1
20	Dr. Kapkeo		1
21	Mr. Vilaxit		1
22	Mr. Somphong		
23	Mr. SengLa	Vientine capital	1
24	Miss vanida souvansilt		
25	Mr. Soulikanh phoutthvong		1
26	Miss Duangvilay		

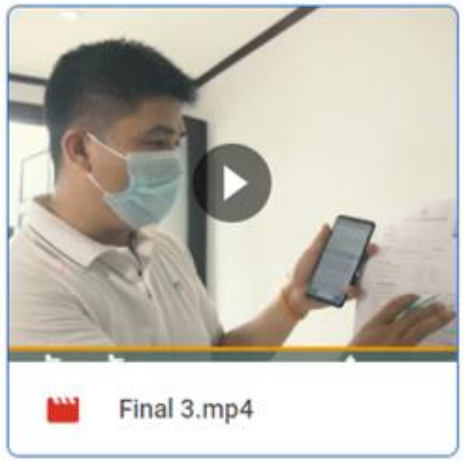




Translation of technical document for users

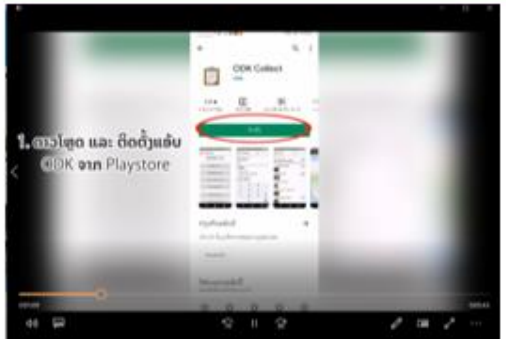
- **Cold Room** Installation and service SOP monthly, quarterly and annual check list maintenance Lao version manual
- **ILRs VLS204/304/404A** End-user manual and service Lao version manual
- **Deep freezer MF314** End-user manual and service Lao version manual
- **Presentation Training** ILRs AC 220V VLS204/304/404A and Solar RF026 installation and service maintenance
- **Form:** Cold room maintenance monthly report, Delivery order and Installation form, Q&A form
- **Lao instruction sticker** ''translation '' for(ILRs &DFs) 340+688 CCEs
- Hot line sticker for all 304+688 CCEs

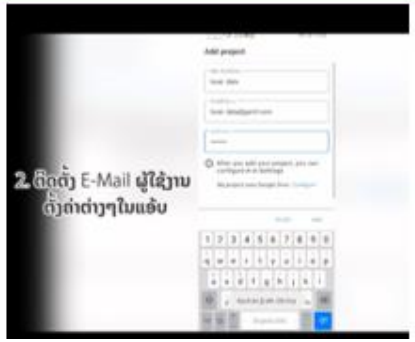
Training video: Installation of refrigerator & use of ODK app



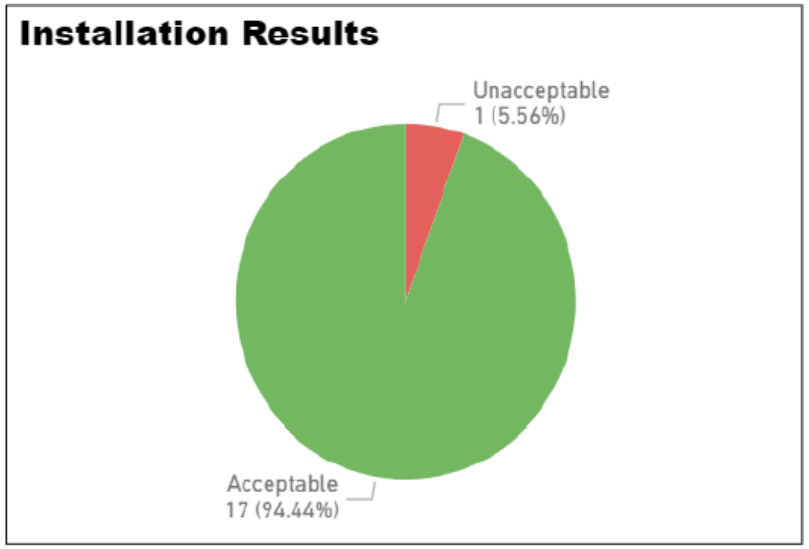
Video 1: Guide line how to install VLS204/304/404 refrigerators
Link: https://www.youtube.com/watch?v=q2-WHFIKLOs

Video 2: Guide line how to download ODK app and upload data into data base
Link: https://www.youtube.com/watch?v=hiOVSWE-rOU





CCEOP Phase 1 and Post Installation Inspection



- ***ACCEPTABLE 94%*** (17/18 units) of the equipment inspected ware considered acceptable in all key areas such as deployment, installation, functionality, temperature monitoring device, and training.
- ***UNACCEPTABLE: 6%*** (1/18 units) of the equipment inspected was considered unacceptable because the voltage regulator was not functioning at the time of inspection.

Challenges and lessons learnt

1. The Operational deployment plan (ODP) was changed from the initial ODP resulting in additional expenses on re-location of CCEs and transportation. This provision should be factored during contracting to avoid conflicts with LSP
2. Existing and new CCEs demanded proper earthing and electrical rehabilitation. Therefore, provision of earthing and other consumables was included. This is usually not factored in the CCEOP support planning.
3. Many health centers and districts are inaccessible during rainy season which lasts almost 5-6 months in Laos. The delivery and installations through LSP were planned accordingly to minimize the delays.
4. CCEI dashboard turned out to be a good tool for monitoring and validation of installations.
5. Cold Chain strengthening was also witnessed through EVM Assessment which was conducted in 2022.
6. To sustain the CCEOP investments, transition roadmap for CCE planning and maintenance is being developed.
7. With implementation of CCEOP phase 2 by Dec 2023, it is expected that all the HCs in the country will have a functional PQS CCE. The inventory of existing obsolete, CFC and non-reparable CCEs is being collected and will be decommissioned in 2024.

Thank You!

Speaker One, contact details

Speaker Two, contact details

Speaker Three, contact details

Speaker Four, contact details