The Cold Chain Information System (CCIS) model in Laos

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Background: how CCIS was born in Lao PDR

- **Temperature monitoring:** Unreliable, poor scoring in EVM assessments
  - **30 DTR** were provided as solution by WHO and UNICEF
- **No cold chain inventory**: Repairs delayed; Parts not available;
- **Stock balance** of health centers/district not known at one level up of supply chain
- **Multi tasking health workers**: Too many forms to fill; too many roles to play

CCIS was designed as cross cutting solution. Piloted at 20 sites and expanded to all provinces; parallel system/software design

  CCIS understood as contributing to Health System Strengthening

CCIS : Cold Chain Information System

CCIS DATA FLOWS

- **Monthly coded SMS reports:**
  - Fridge Status
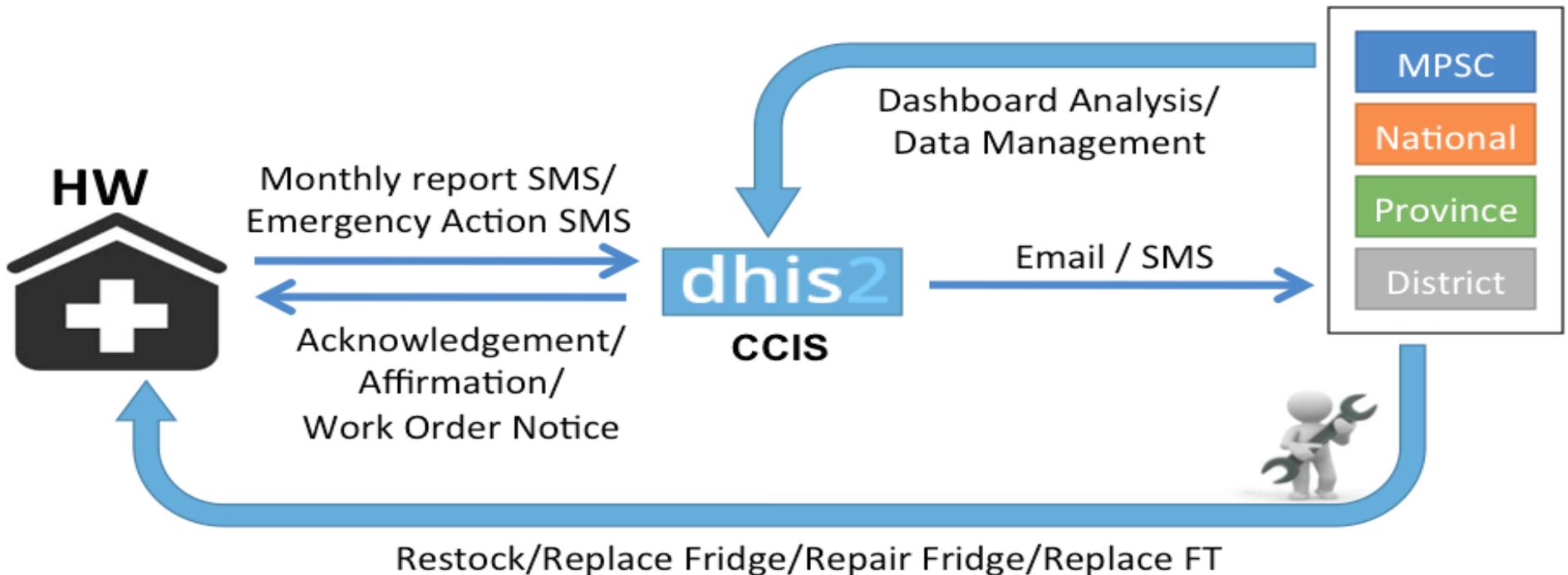 - Stock Data
- **Emergency SMS reports:**
  - Fridge Failures
  - Stock outs
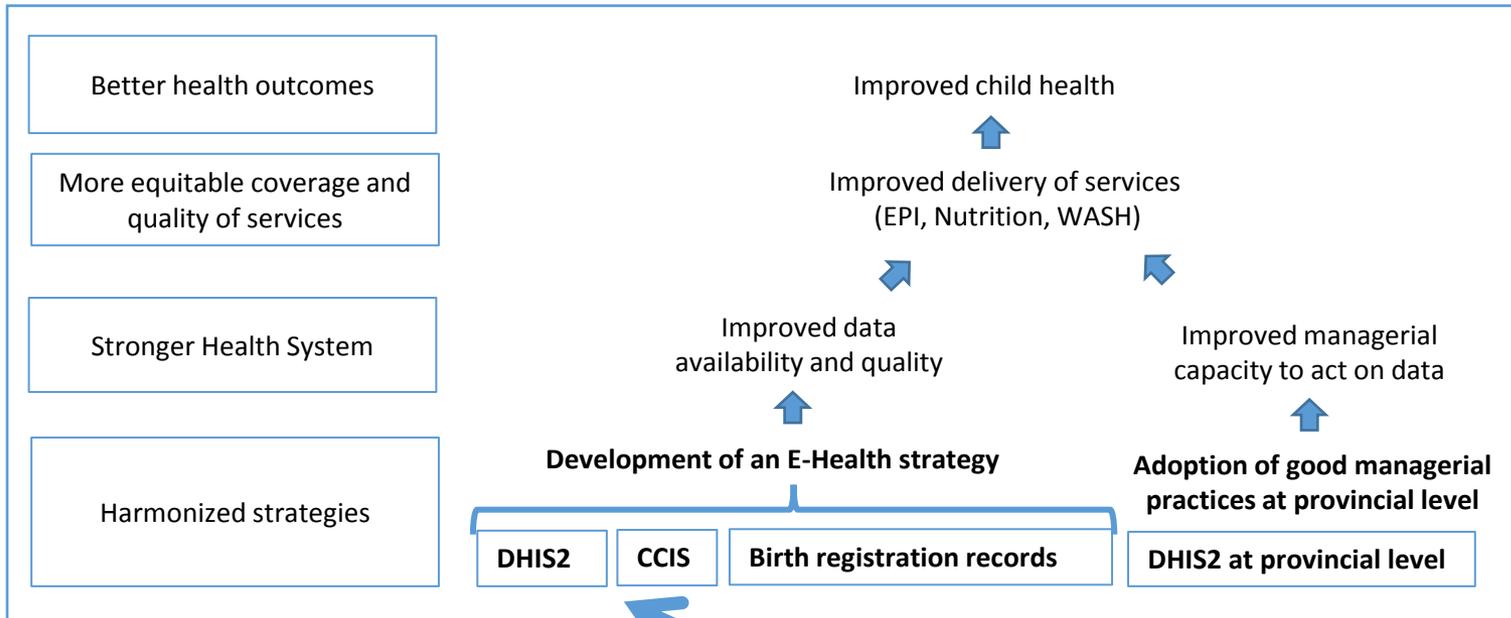 - FT Low Battery

- **Monthly Notices:**
  - District summary SMS
  - Provincial summary PDF via email
  - National summary PDF via email
- **Dashboard interactions:**
  - Custom dashboards
  - Data management and updates

Health System Strengthening, eHealth and DHIS2 with CCIS

Better health outcomes

More equitable coverage and quality of services

Stronger Health System

Harmonized strategies

Improved child health

Improved delivery of services
(EPI, Nutrition, WASH)

Improved data availability and quality

Improved managerial capacity to act on data

Development of an E-Health strategy

Adoption of good managerial practices at provincial level

DHIS2	**CCIS**	**Birth registration records**

DHIS2 at provincial level

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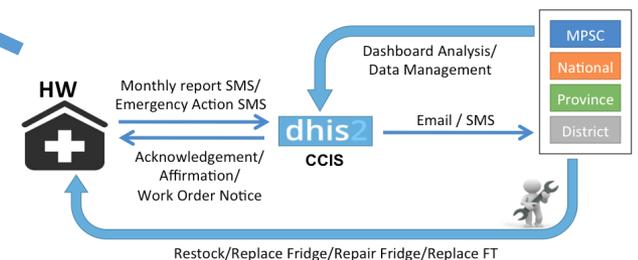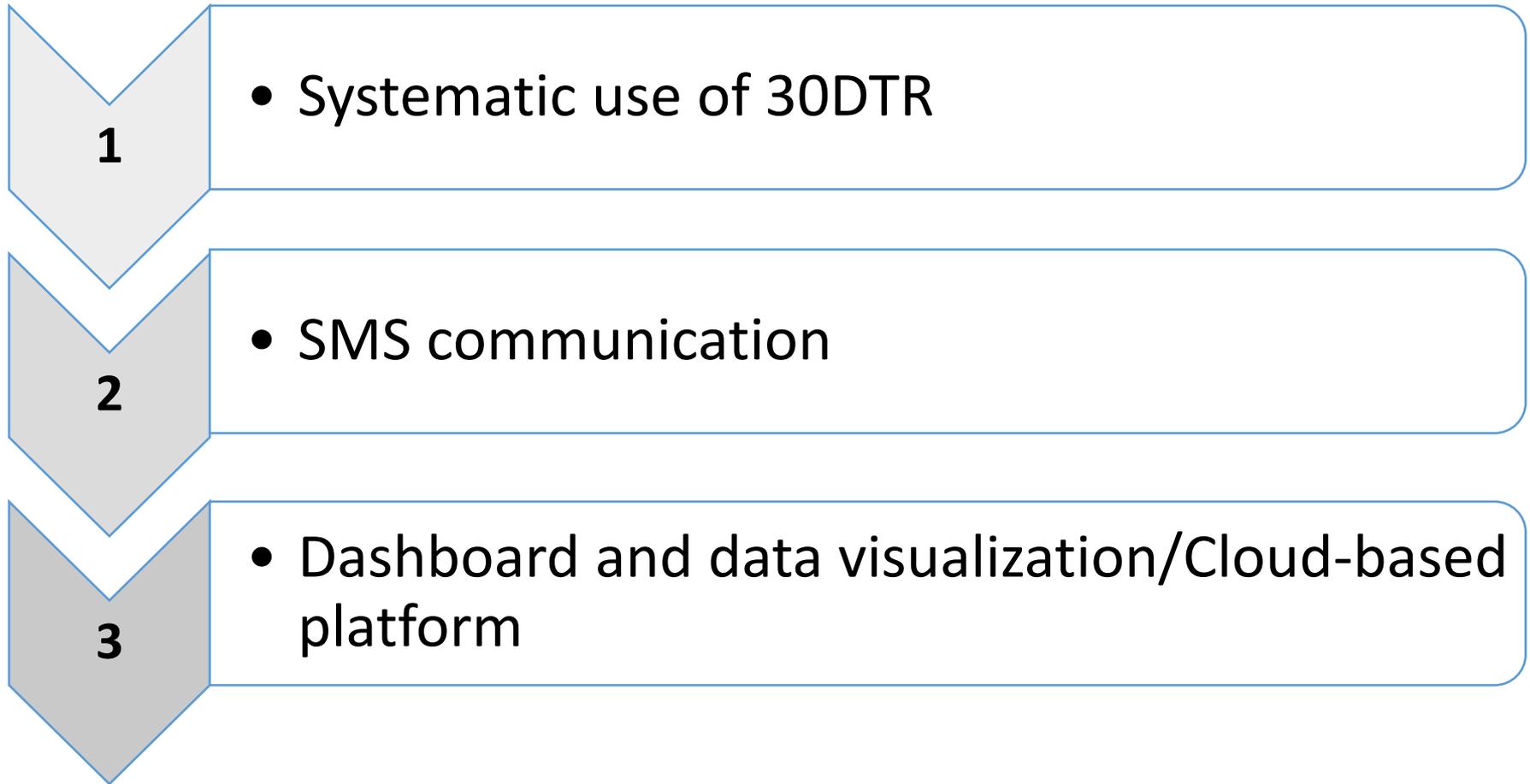 - Data management and updates

HW

Monthly report SMS/
Emergency Action SMS

Acknowledgement/
Affirmation/
Work Order Notice

dhis2
CCIS

Dashboard Analysis/
Data Management

Email / SMS

MPSC
National
Province
District

Restock/Replace Fridge/Repair Fridge/Replace FT

Linkages with EVM IP

- Establishing cold chain inventories: vaccine storage capacities; Information on PQS compliance
- Evidence based temperature monitoring : records of alarms maintained and linked to refrigerators as reference
- Stock levels maintained : prevention of stock outs
- Timely repairs of refrigerators

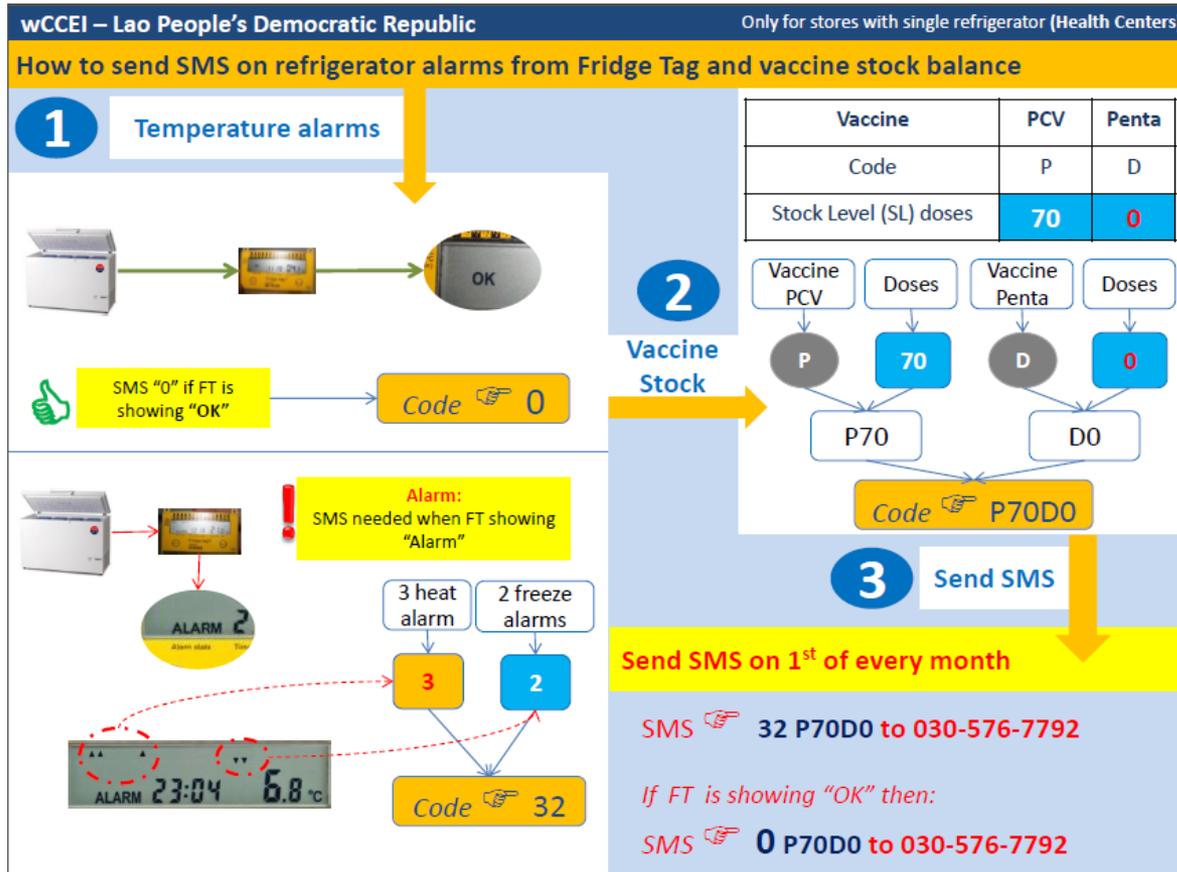# Cold Chain Information System in Laos (CCIS), a 3-steps system

1
- Systematic use of 30DTR

2
- SMS communication

3
- Dashboard and data visualization/Cloud-based platform

The Laos Model: 30DTR + SMS + System

Systematic use of 30DTR

> Health workers trained to interpret 30 DTR and correctly fill in the temperature chart
> Health workers trained in corrective actions at the health facility in case of alarms
> Supportive supervision including 30 DTR review
> Clear escalation procedure (through SMS)

The Laos Model: 30DTR + SMS + System

SMS communication (data input to system by health workers)

wCCEI – Lao People's Democratic Republic   Only for stores with single refrigerator (Health Centers)

How to send SMS on refrigerator alarms from Fridge Tag and vaccine stock balance

1 Temperature alarms

OK

👍 SMS "0" if FT is showing "OK" → Code ☞ 0

Vaccine	PCV	Penta
Code	P	D
Stock Level (SL) doses	70	0

2 Vaccine Stock

Vaccine PCV → P   Doses → 70   Vaccine Penta → D   Doses → 0

P70   D0

Code ☞ P70D0

Alarm: SMS needed when FT showing "Alarm"

ALARM 2

3 heat alarm → 3   2 freeze alarms → 2

ALARM 23:04 6.8 °C

Code ☞ 32

3 Send SMS

Send SMS on 1st of every month

SMS ☞ **32 P70D0** to 030-576-7792

If FT is showing "OK" then:

SMS ☞ **0 P70D0** to 030-576-7792

Limited communication burden on health workers
Focus on few indicators

1 monthly SMS , indicating in machine-readable-code:

- Number of alarms
- Stock levels

➕ Alarms SMS

➡ Low cost and simple

The Laos Model: 30DTR + SMS + System

SMS communication (information for user and decision makers)

- System generated acknowledgement of data received
- Automatic sharing of alarms with technicians at province level
- Automatic update of database, functionality of refrigerators
- Automatic sharing of stock balances and remaining stock requirements with one level up of supply chain

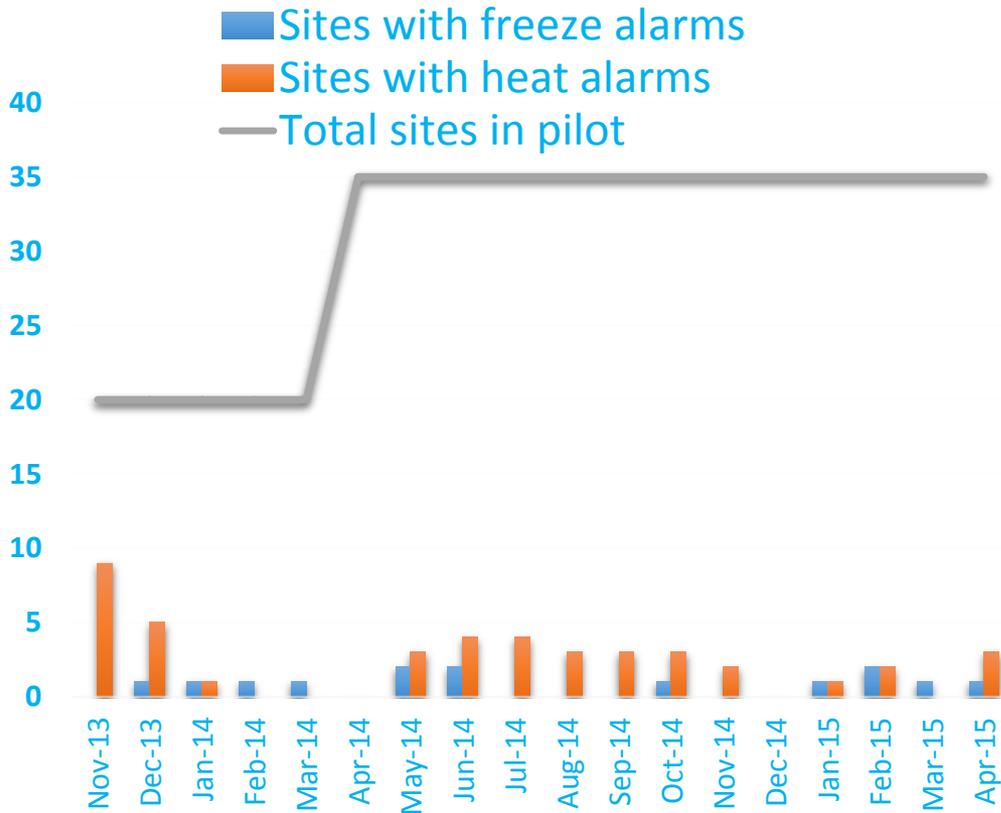# Dashboard and data visualization/Cloud-based platform

System to be linked to the DHIS2 CC module
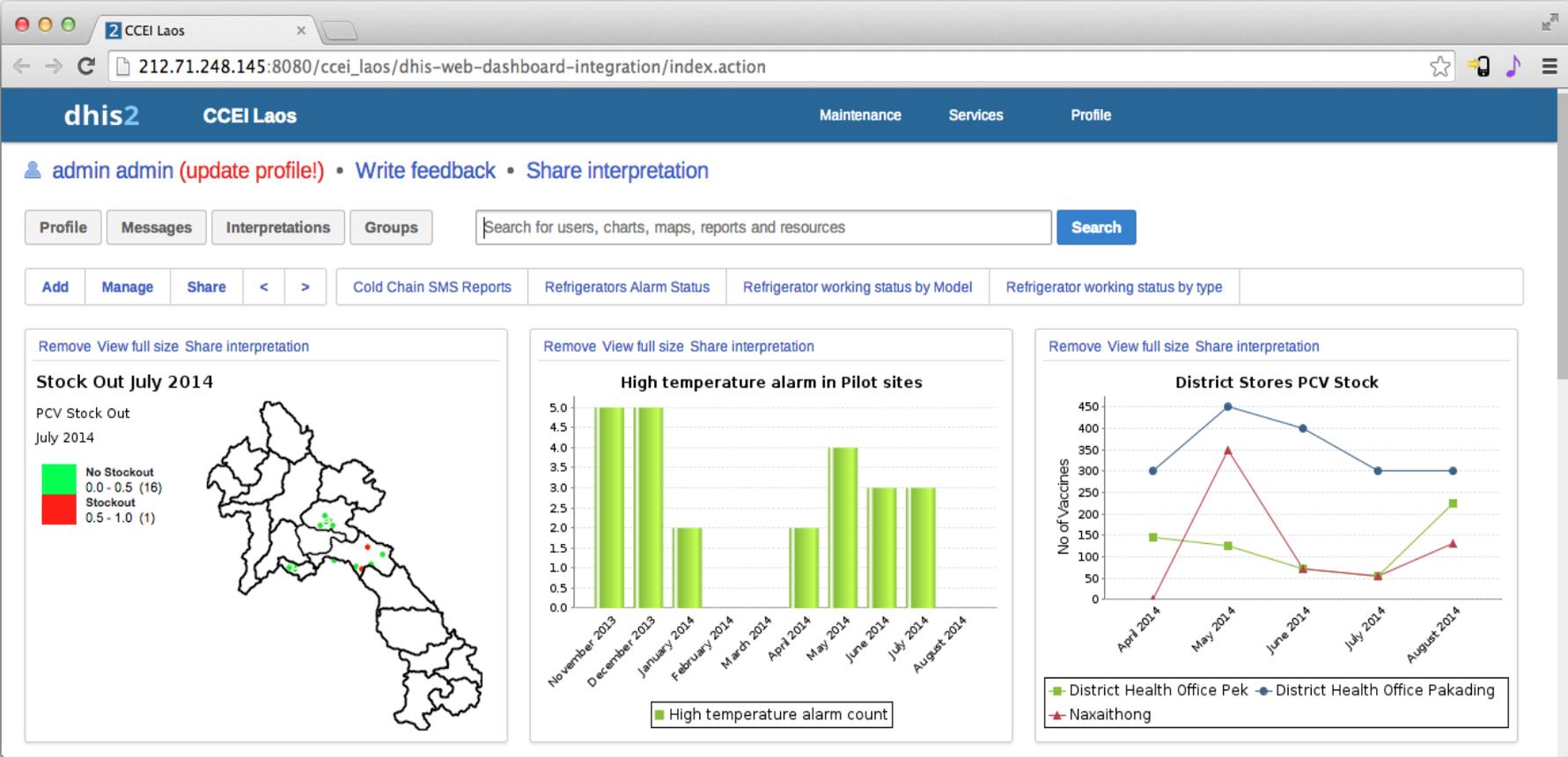
The Laos Model: 30DTR + SMS + System

Facts from pilot data

Reporting of alarms using SMS: downward trend of alarms

Legend:
- Sites with freeze alarms
- Sites with heat alarms
- Total sites in pilot

- Most heat alarms were due to prolong power failure or refrigerator under preventive maintenance
- Persistent reporting of freeze alarm
- Supervisors alerted to do shake test
- 100% compliance of sites sending SMS

	Nov 2013-Mar 2014	Apr 2014 – Feb 2015	Mar 2015 – Apr 2015
Total Sites	20	35	40
Total sites responded	100	324	80
Completeness %	100%	84.15%	100%

The Laos Model: 30DTR + SMS + System

Main Challenges

Currently customization of the SMS-based system into DHIS2 is proving challenging

Suggestion: advocate with DHIS2 for them to create more open protocols and work on customization and fill the gap.

➢ Training of health workers (one to one)
➢ Development of training material (using ICT)
➢ Language issues
➢ Systems compatibility/Integration with DHIS2

The Laos Model: 30DTR + SMS + System

Lessons learnt

- 30 DTR a total success
- Piloting in small scale very useful in learning challenges and gives time to prepare for nation wide expansion
- Careful selection of technology: Not an easy option especially when we do not want to create software parallel reporting stream

The Laos Model: 30DTR + SMS + System

Objective:
An affordable and reliable Cold Chain System and no child missed out

Thank you