Vaccine Logistics Management Information System (vLMIS)

http://lmis.gov.pk

Networked Information Systems for Vaccine Logistics

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Country Overview

Total population: ~196 million

Size: 796,095 sq km

Administrative structure:

- 04 provinces
- 143 districts
- 04 Federally administrated regions

  (GB, AJ&K, FATA and ICT)

Pakistan

Challenges in EPI Supply Chain

- Fragmented EPI supply chain

  – No stock visibility in stores due to manual record keeping at all levels from federal to sub-district

  – No batch management based on FEFO and batch tracing and tracking

  – Limited cold chain assets data availability and cold chain capacity linkage with inventory and its working status

Challenges in EPI Supply Chain

- Lack of real time data visibility and data quality

    - Inaccurate immunization coverage data

    - Different vaccine wastage figures

    - Paper based system and HR capacity issues

    - Non dependable basis of forecasting and procurement of vaccine

Challenges in EPI Supply Chain

- No up-to-date cold chain inventory data

  - Fragmented antigen storage in the cold rooms

  - No real time storage capacity linkage with inventory

In a nutshell;

- No evidence based decision making

- Time lag in problem identification to correction of issue

- Lack of implementation of HR accountability at various levels of the EPI program

Inception of vLMIS

- Low measles vaccination coverage in Pakistan, leading to 25,859 cases and 570 deaths attributed to measles between January 2012 and mid-May 2013 *

  * http://reliefweb.int/disaster/ep-2012-000211-pak

- Federal government requested USAID for the inclusion of vaccine products in LMIS (www.lmis.gov.pk)

- vLMIS was conceived in June 2013 consultative meeting, where stakeholders from Federal EPI, Ministry, Regional/Provincial health departments, GAVI, DFID, BMGF, JICA, UNICEF and WHO gave inputs on the design

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Pakistan Placed High Emphasis on Public Health Supply Chains Since 2009

2014   **2011**   **2013**

LMIS evolved organically through single codebase

Contraceptive Logistics Management Information system (LMIS) **DB**

Contraceptive Warehouse Management System (cWMS) **DB**

TUBERCULOSIS Drug Management Information System (DMIS) **DB**

CONTRACEPTIVE LMIS & WMS (cLMIS) **DB**

VACCINE Logistics Management Information System (**vLMIS**) **DB**

Journey towards Comprehensive MIS

cLMIS with service & demographic indicators **DB**

vLMIS with demographic and service indicators **~ EPI MIS** **DB**

2010 **2011-12** → **2013- 14** → **2015** →

vLMIS is a comprehensive information management system

http://v.lmis.gov.pk
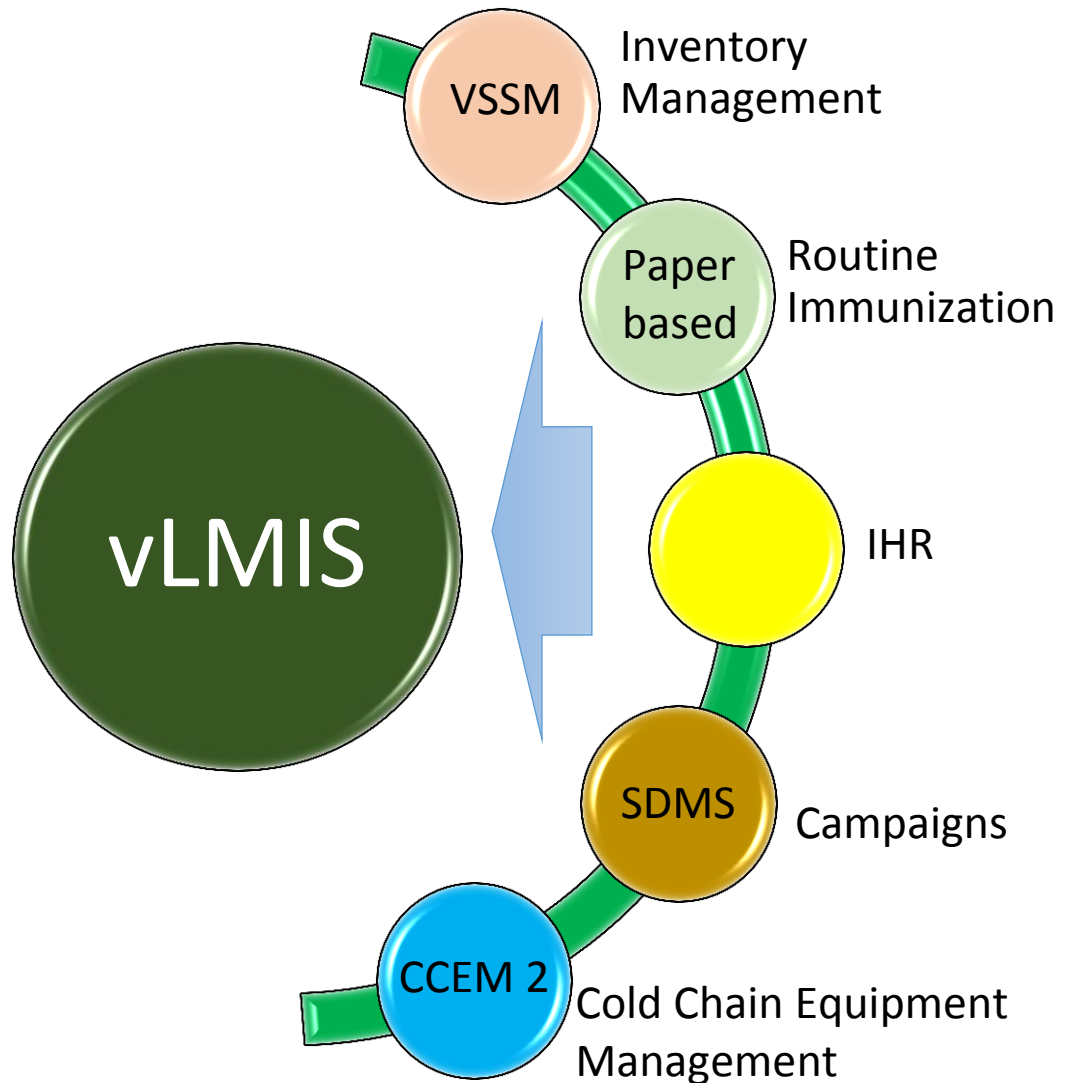
Vaccines Logistics – Four Data Streams

Stocks

Routine Immunization

Cold Chain

SIAs

Inventory Management

Consumption Reporting

CCEM

Consumption Reporting
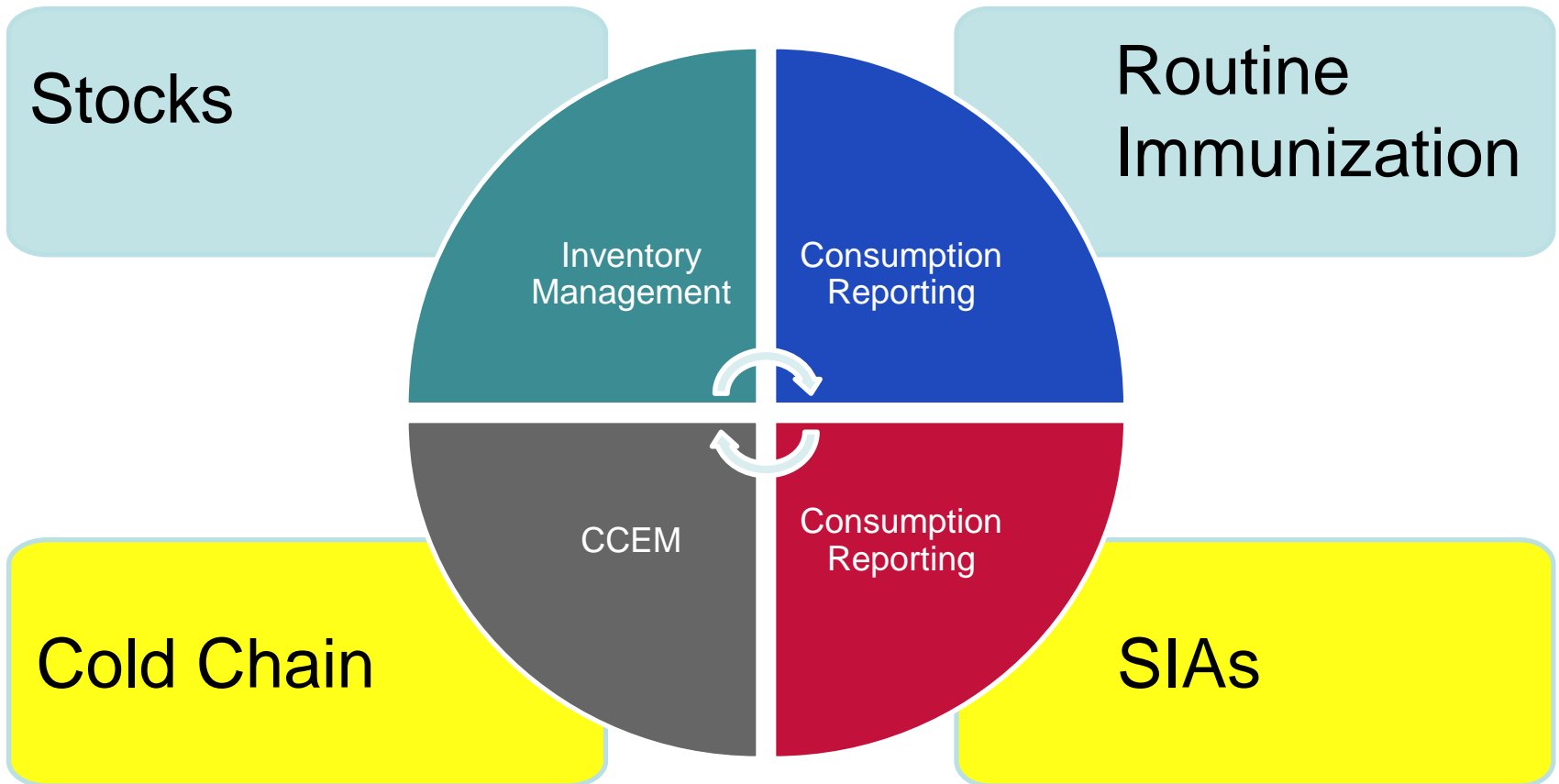
vLMIS is covering EPI functions through out supply chain

Federal EPI

Store:
- Inventory management,
- GS1 bar coding,

Procurement:
- Pipeline shipments

Other:
- Cold Chain Management
- Campaigns Management

04 data entry points

Provincial

Store:
- Inventory management,
- GS1 bar coding,

Other:
- Cold Chain Management
- Campaigns Management

04 DE points at each provincial level (20 DE points)

District EPI

Store:
- Inventory management,
- GS1 bar coding,

Other:
- Cold Chain Management
- Campaigns Data Entry

04 DE points at each District /Agency level (204 DE points)

UC

- Consumption Reporting
- Stock Position
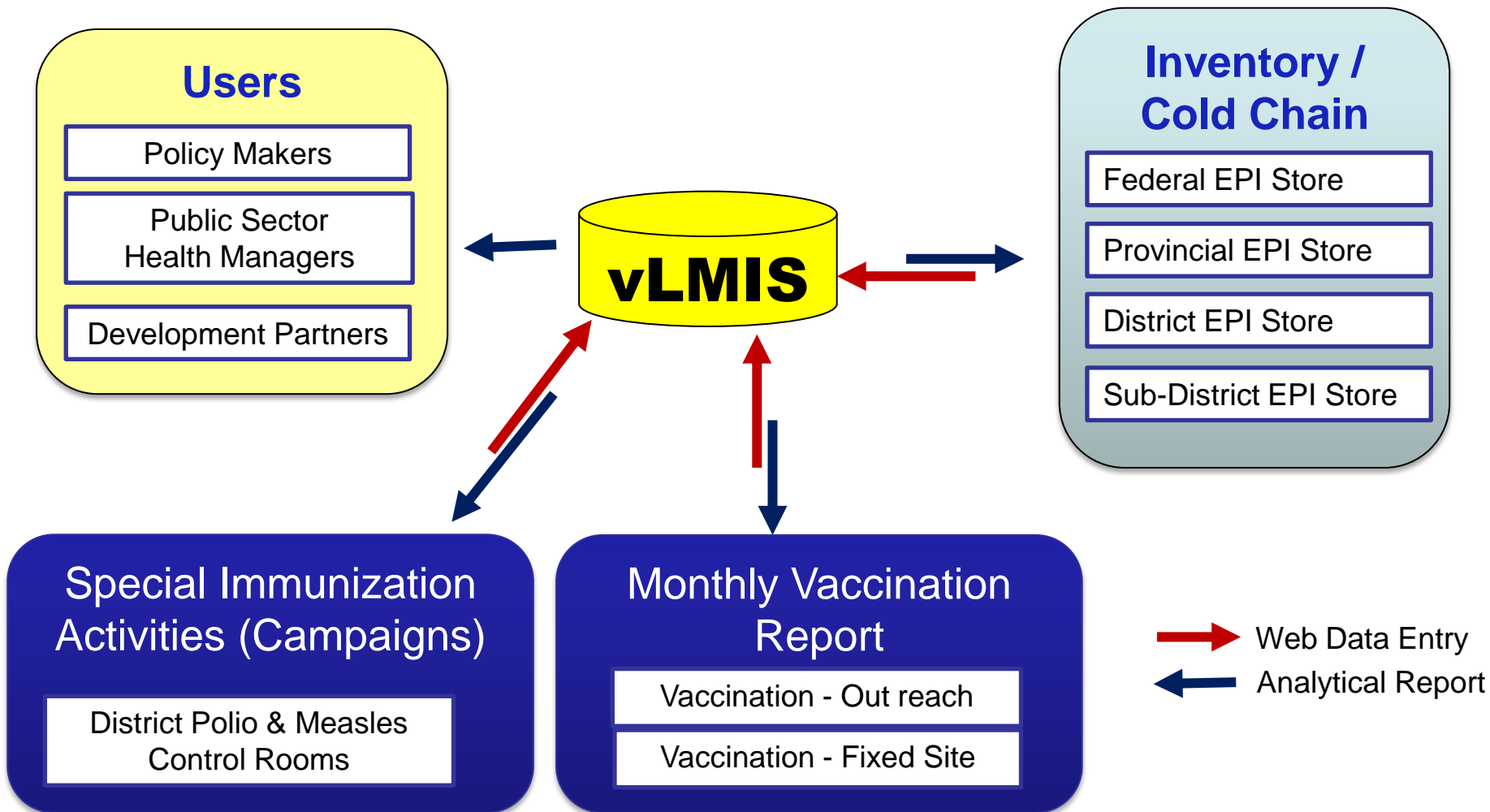- Wastages calculation
- Cold Chain Status Reporting

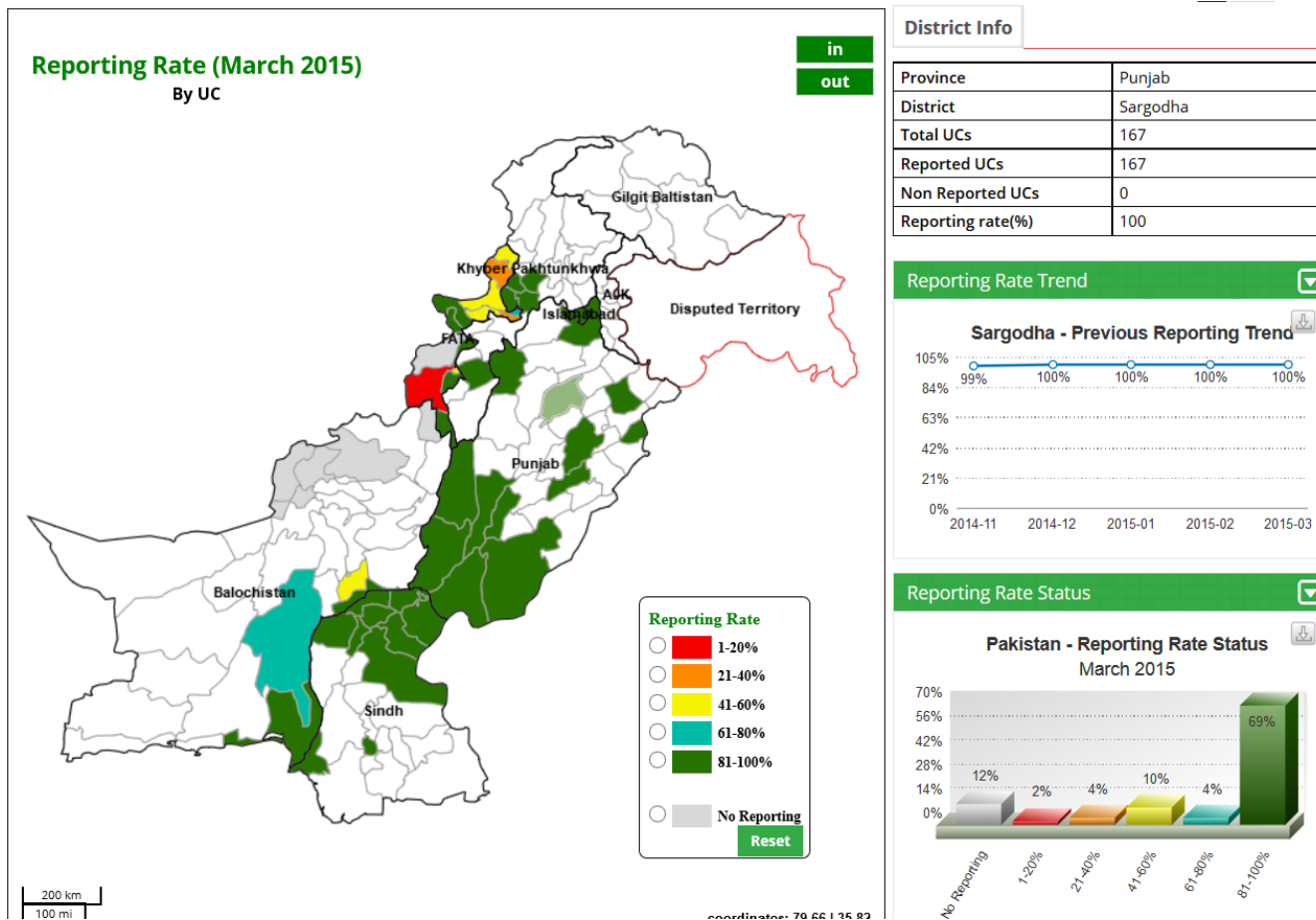**01 DE points at each UC Cluster level (550+ DE points)**

DE=data entry

vLMIS Data Flow

Users
- Policy Makers
- Public Sector Health Managers
- Development Partners

vLMIS

Inventory / Cold Chain
- Federal EPI Store
- Provincial EPI Store
- District EPI Store
- Sub-District EPI Store

Special Immunization Activities (Campaigns)
- District Polio & Measles Control Rooms

Monthly Vaccination Report
- Vaccination - Out reach
- Vaccination - Fixed Site

→ Web Data Entry
→ Analytical Report

Visualizing national picture at a glance

vLMIS is not just a software but a change agent to optimize governance and accountability

- vLMIS design, development, implementation and supportive supervision jointly

- More than 2,000 EPI staff were trained by project trained master trainers of the EPI

  - EPI store staff were trained on inventory management functions like stock receiving, storage, batch management (FEFO) and issuance

  - Vaccinators, computer operators and EPI Centers supervisors were trained as Cluster leads

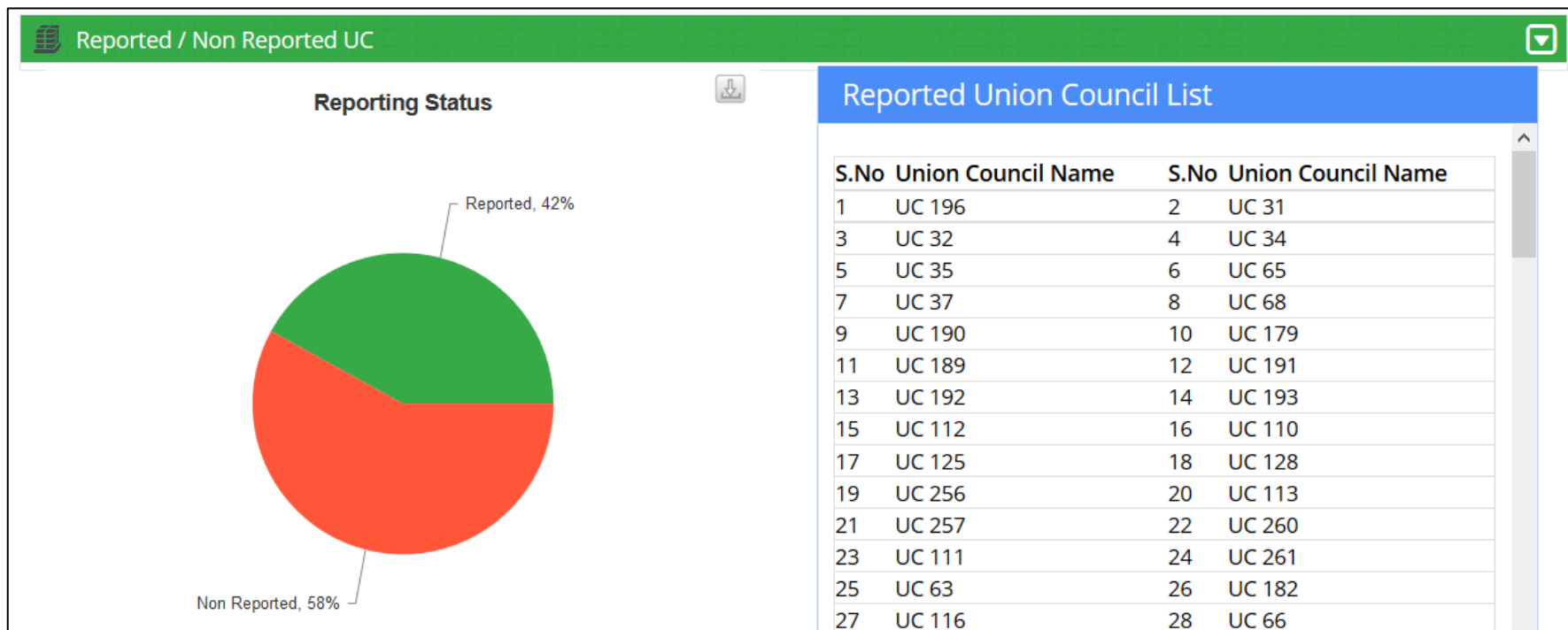- Computers, printers, UPS and internet dongles were provided in all EPI stores

Vaccine wastage trend at the Union Councils
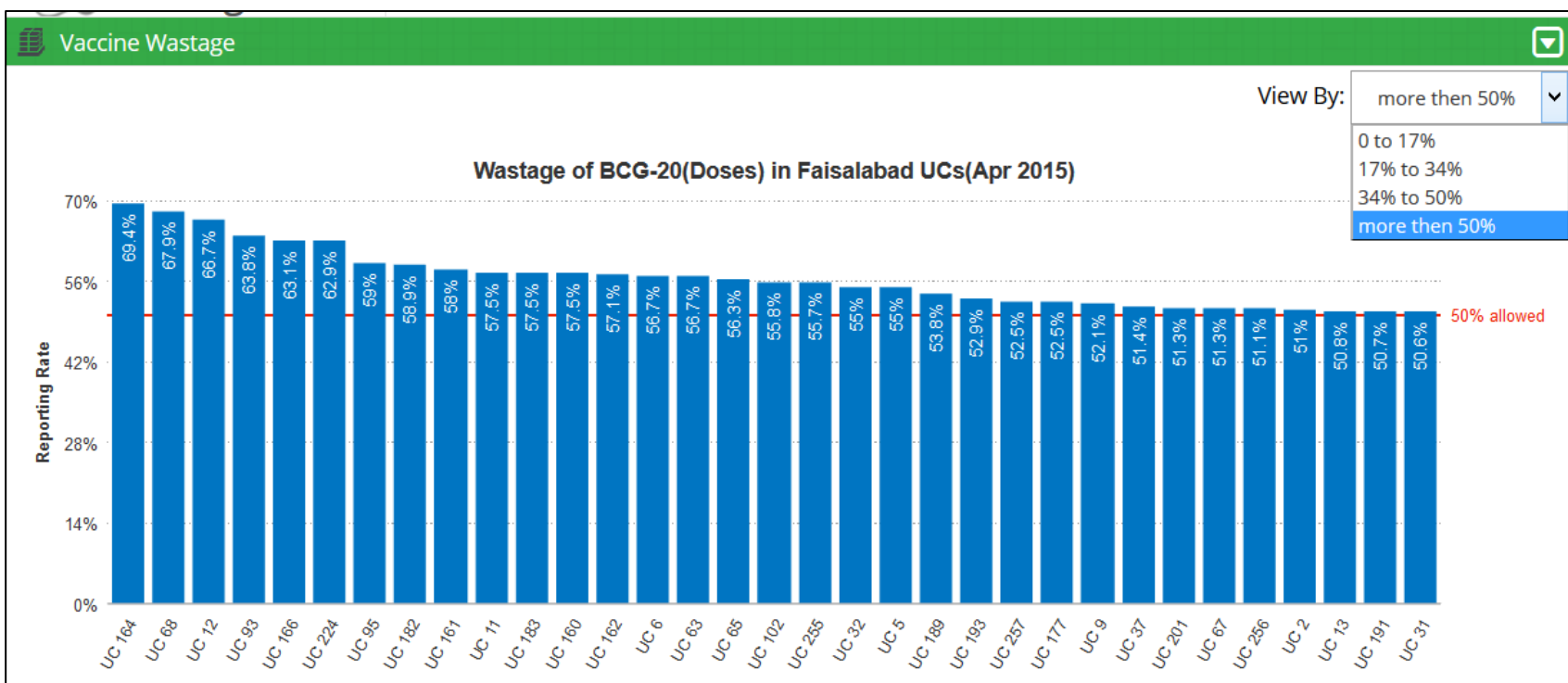
Reporting and non-reporting Union Councils

Strengthening Performance Accountability

Consumption Data Reporting Status (By UC) As on(April-2015)												
District	Total UCs	Nov-2014		Dec-2014		Jan-2015		Feb-2015		Mar-2015		Apr-2015	
		Reported UCs		Reported UCs		Reported UCs		Reported UCs		Reported UCs		Reported UCs	
Bahawalpur	108	108	100 %	107	99 %	103	95 %	104	96 %	102	94 %	99	92 %
Dera Ghazi Khan	59	59	100 %	59	100 %	59	100 %	59	100 %	59	100 %	0	0 %
Faisalabad	289	287	99 %	289	100 %	289	100 %	288	100 %	273	94 %	122	42 %
Gujranwala	195	194	99 %	194	99 %	194	99 %	194	99 %	193	99 %	104	53 %

| UC Name	Health Facility	Operator	Address	Phone
1/DNB	RHC Head Rajkan	Muhammad Boota	RHC Head Rajkan	0334-7095275
106/DB	BHU 106/DB	Shafqat Ali	THQ Yazman	0300-6835254
117/DB	BHU 113/DB	Shafqat Ali	THQ Yazman	0300-6835254
12 B/C	BHU 29/MC	Syed Zakir Ali	RHC Dera Bakha	0334-9683635

Stock level as per stock over/satisfactory/out status
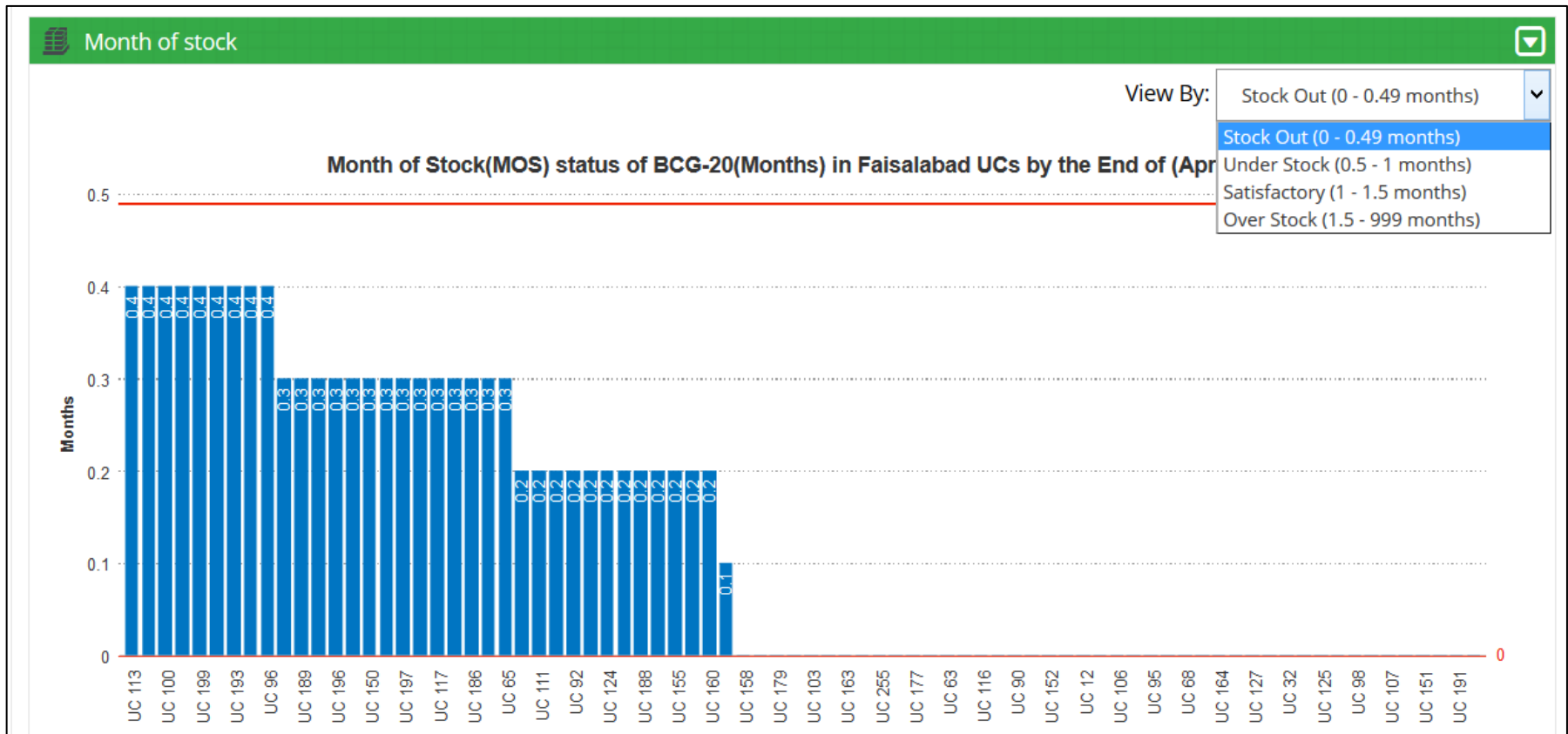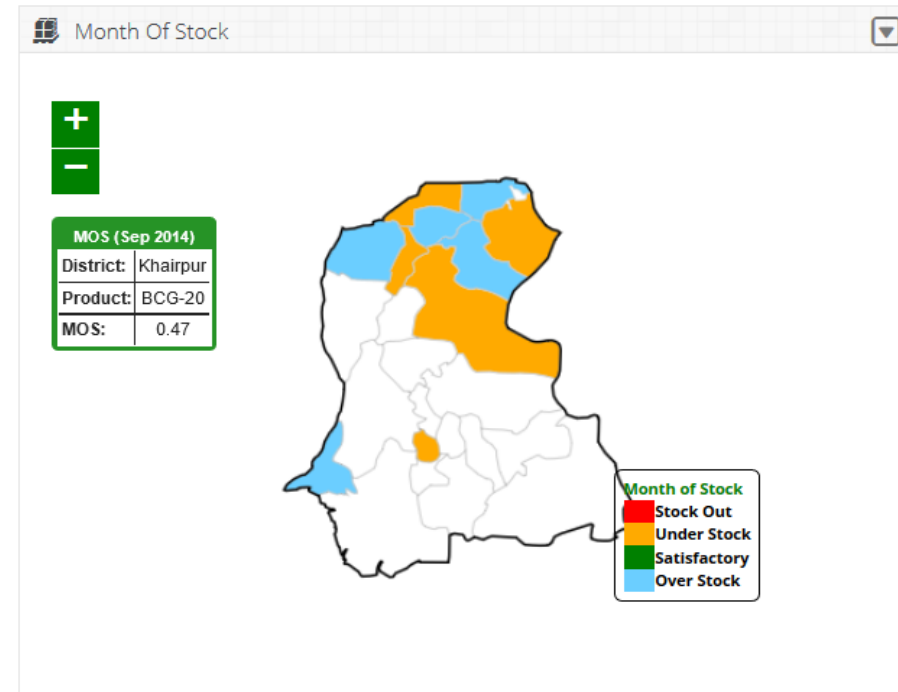
Tehsil wise vaccine's consumption in UCs
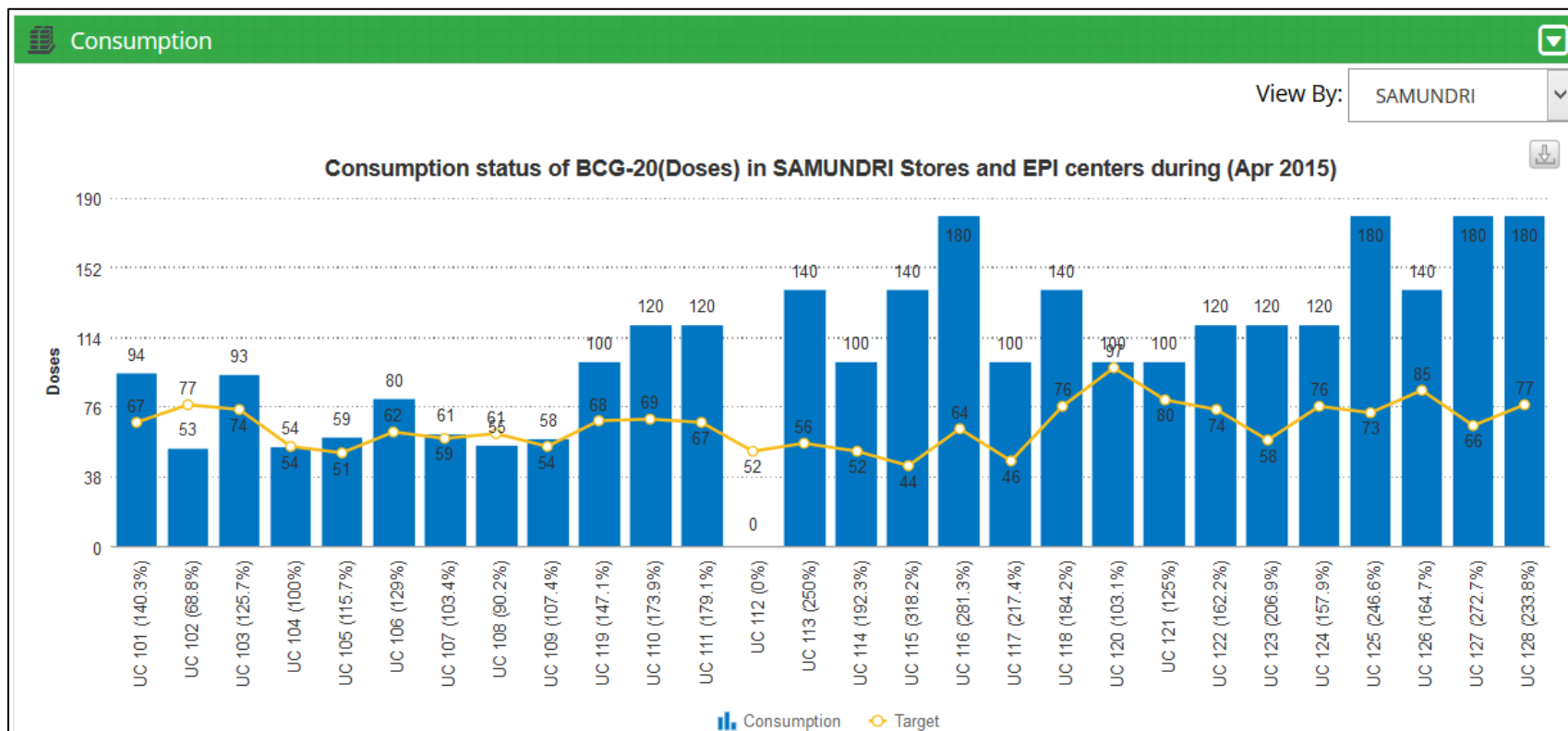
Stock position of district stores

Stock Status

Product wise Stock Status (Doses)

Vaccines	OB	Receive	Issue	CB
bOPV	14,392,360	1,000,000	42,000	15,350,360
BCG-20	1,115,760	209,280	169,740	1,155,300
Pentavalent-1	2,330,967	0	163,473	2,167,494
Pneumococcal-2 (PCV10)	2,103,242	0	161,714	1,941,528
Measles-10	3,225,730	0	131,510	3,094,220
TT-10	621,030	0	0	621,030

- **OB:** Opening Balance at the start of month (September, 2014)
- **CB:** Closing Balance at the end of month (September, 2014)
- **Receive:** Receive Balance during the month (September, 2014)
- **Issue:** Issue Balance during the month (September, 2014)

Month Of Stock

MOS (Sep 2014)

District:	Khairpur
Product:	BCG-20
MOS:	0.47

Month of Stock
- Stock Out
- Under Stock
- Satisfactory
- Over Stock

Cold Chain Capacity
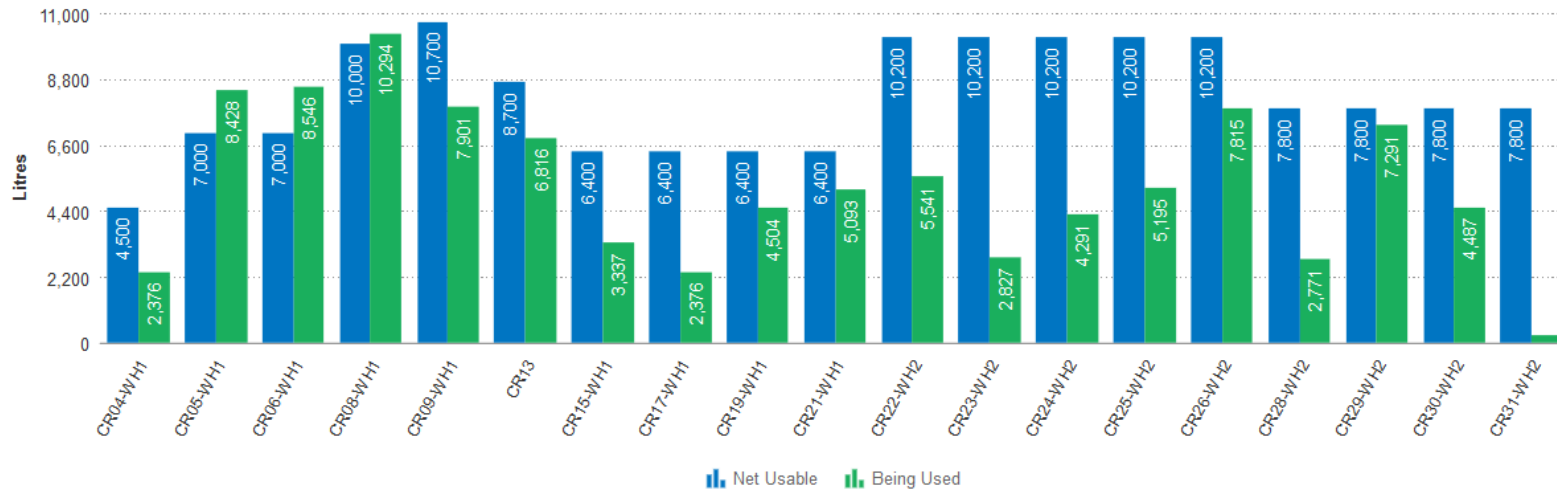
Antigen wise distribution

+2-8C Cold Rooms Capacity (In Litres)

Legend: Pentavalent-1, Measles-10, Measles-10 (Campaign), Pneumococcal-2 (PCV10), IPV (Campaign), TT-20, TT-20 (Campaign)
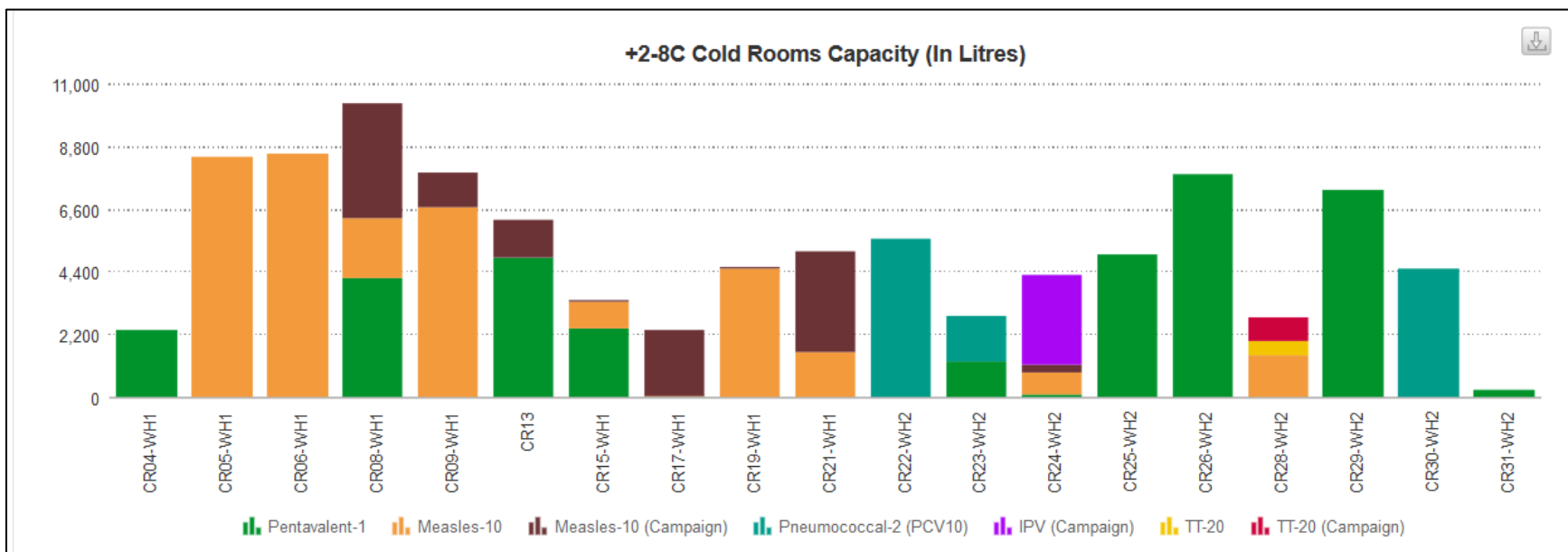
Cold chain capacity in liters in different districts

Cold Chain Capacity
ILR/Refrigerators

Cold Chain Capacity
- 1,808.68 - 3,387
- 3,387 - 4,966
- 4,966 - 6,545
- 6,545 - 8,123
- 8,123 - 9,702

Data Problem
No Data Available

Printed Date: 23/10/2014

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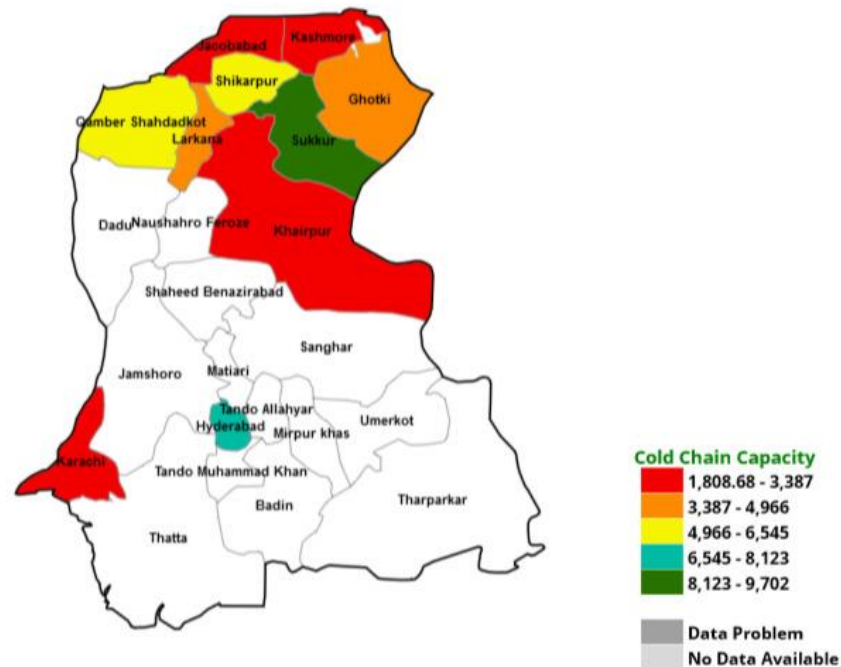
# Vaccine storage capacity w.r.t facility types
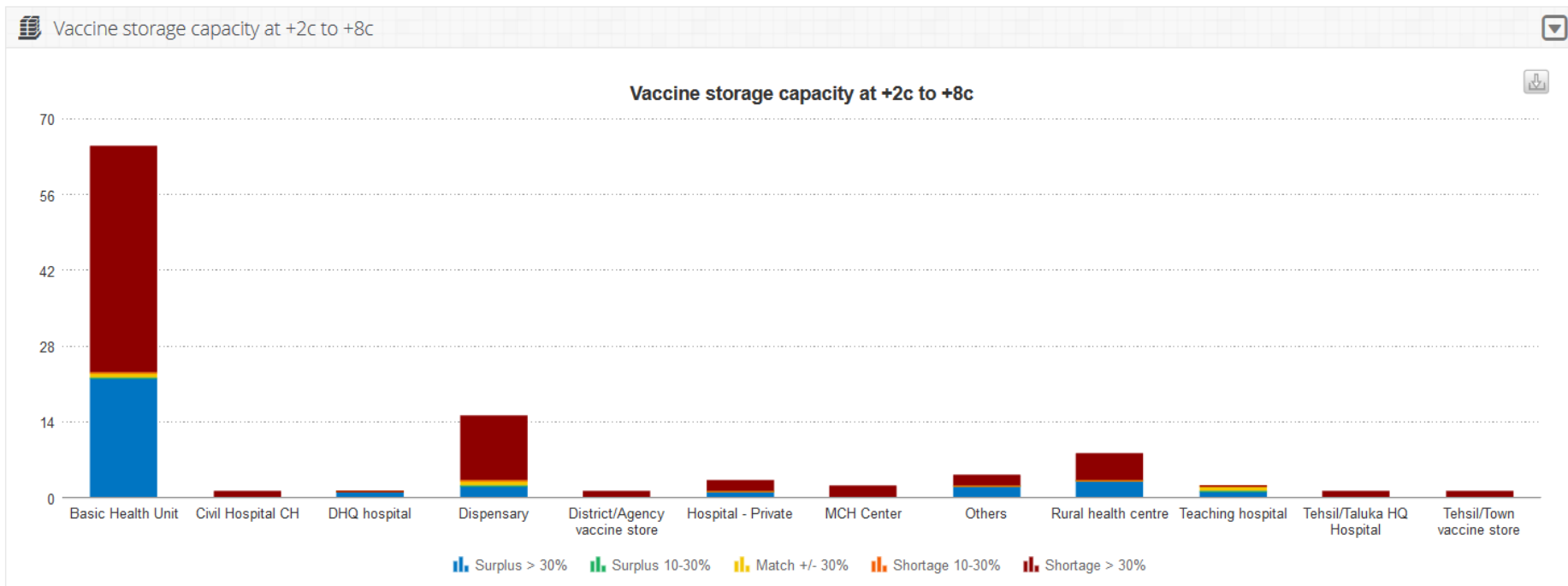
GS1 Bar coding

- Directorate Central Warehouse, Karachi is using pre-printed non-GS1 Bar codes for tracking contraceptive commodities since Aug 2012

- Logistics management information system (LMIS) is being used as a central database to store and share barcode information (batch number) for any particular product

- Vaccine and Contraceptive LMIS Release 2 was mandated with bar code tracking of commodities

- GS1 barcode Pilot is planned from Dec14 to May15
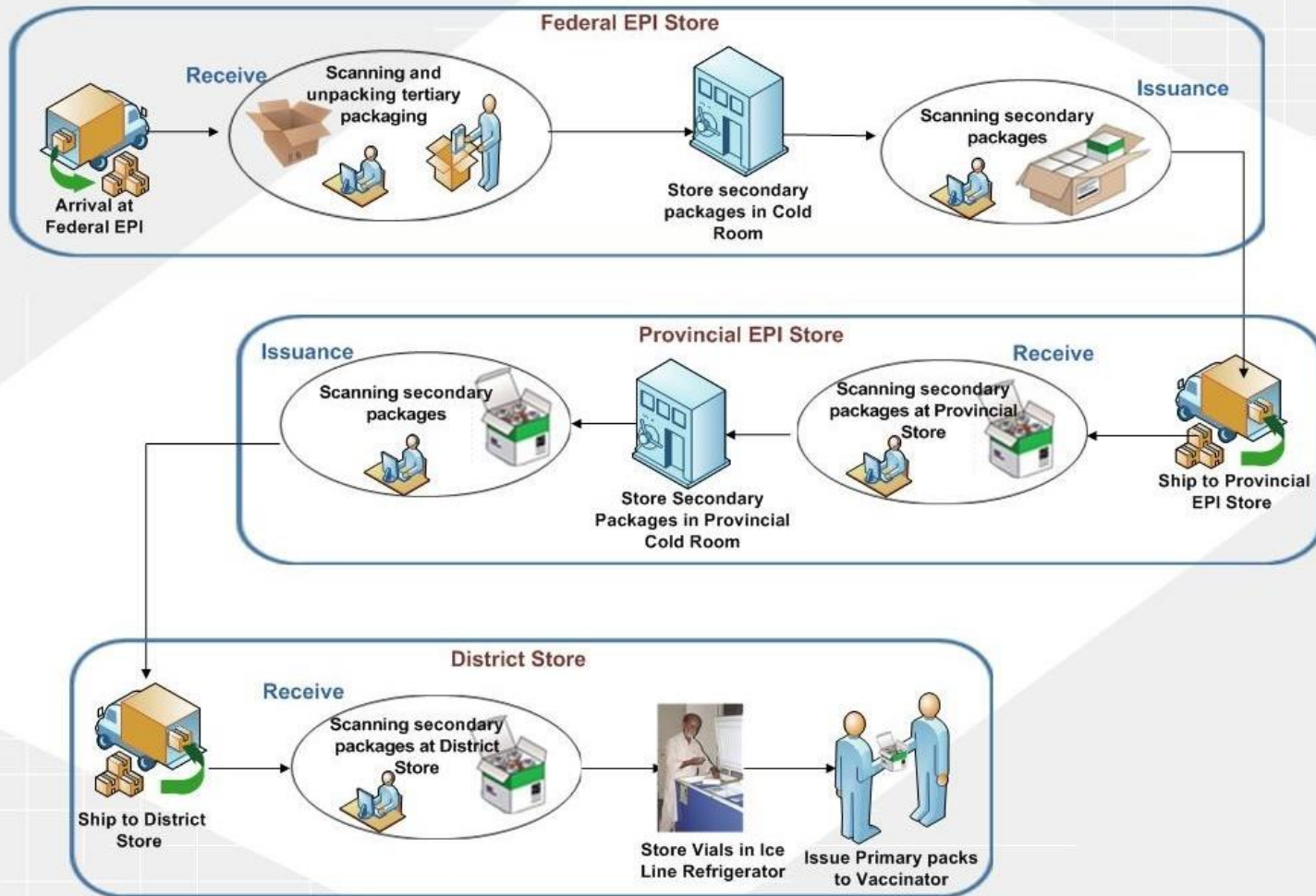
Pilot Products

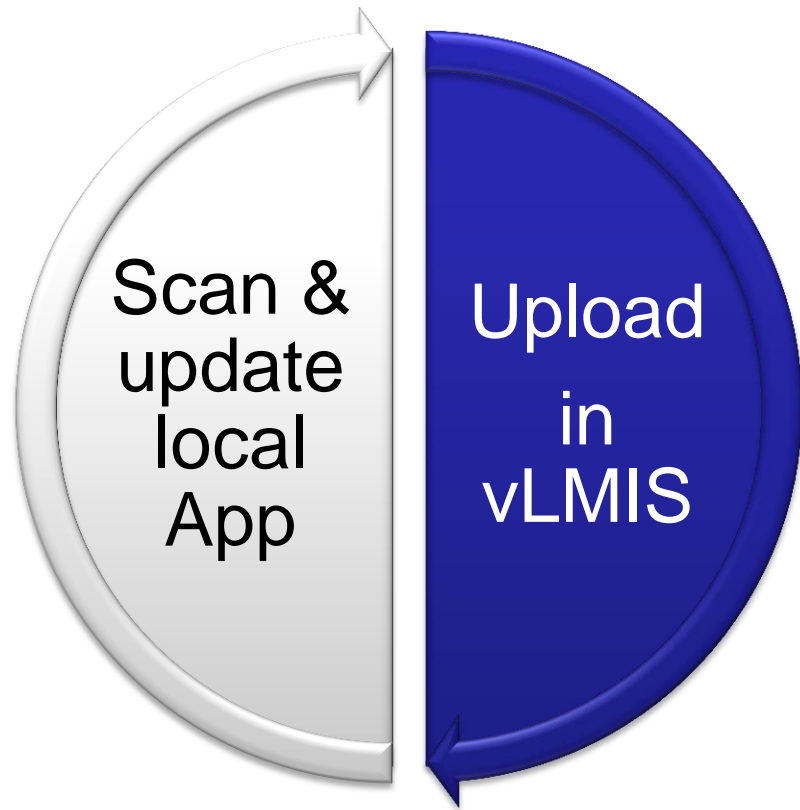**Vaccine (Measles & Tetanus Toxoid)**
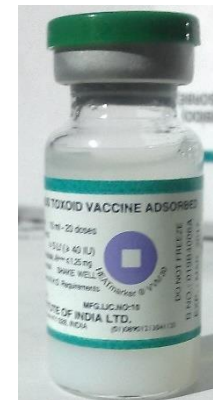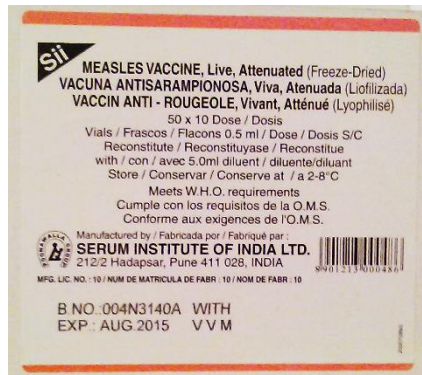
Vaccines Bar coding Process Diagram

Scanning Device & Concept

Scan & update local App

Upload in vLMIS

What have we learned WITH GS1 Bar Coding

- Bar code suitable for National & Provincial but not district level due to unavailability of barcode on **sub-secondary** package

Healthcare Product		
Primary packaging **(one vial)**		No Bar code
Sub-Secondary packaging **(multipack - 1 box of 50 vials each)**		No Bar code 50 Vials
Secondary packaging **(6 multipacks of 50 vials each)**		GS1-DataMatrix 300 Vials
Tertiary packaging – (4 multipacks **of secondary packaging)**		GS1-128

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Serialization and Delimiter Character

- For complete tracking of products, serialization is key to accuracy as it avoids double scanning and tracing of batches through out the supply chain

- GS1- DataMatrix from SII has no delimiter character while parsing scanned string to separate variable length serial number and the batch

GTIN :   (01) 08901213032357
EXP :   (17) 170300
B . NO : (10) 019B4006A
S . NO : (21) S9PC3GC42DDH5GNKG3VJ
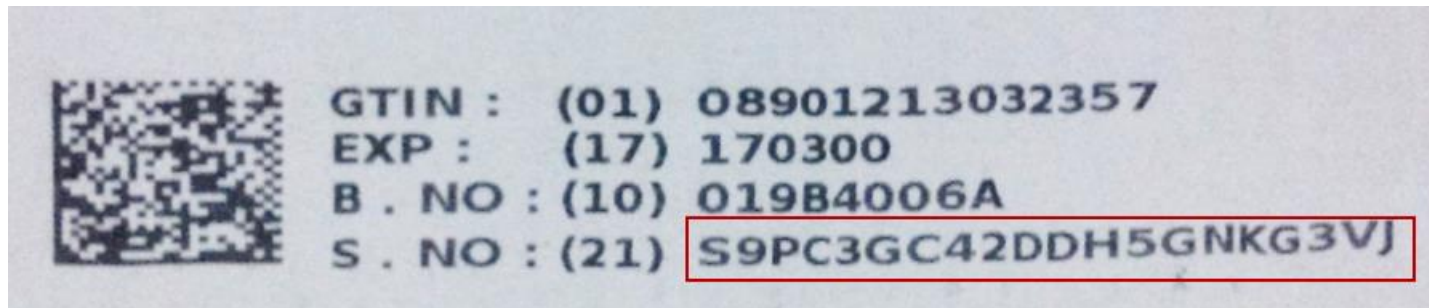
Quality of bar code

- Bar codes need to be printed on paper sticker instead of rough box surface.

- Suppliers may consider quality of bar codes issue like no, skewed and deformed bar codes
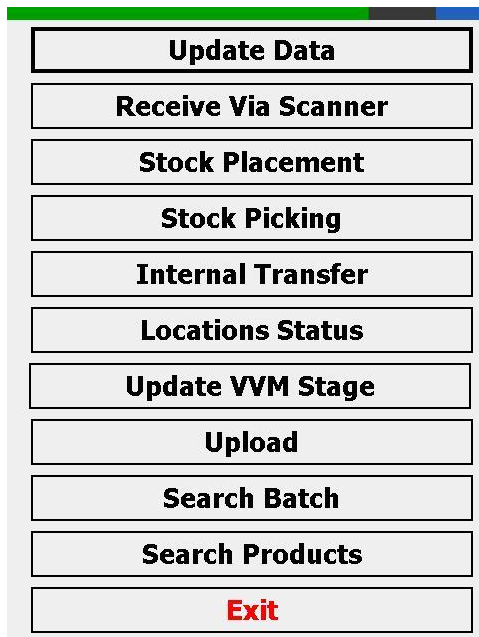
Mix batches and lose products

- Mix batch in a secondary box requires multiple bar codes or needs to be avoided

- Sub-national consignments must be packed/distributed as per the quantity of secondary package and must not contain any lose products
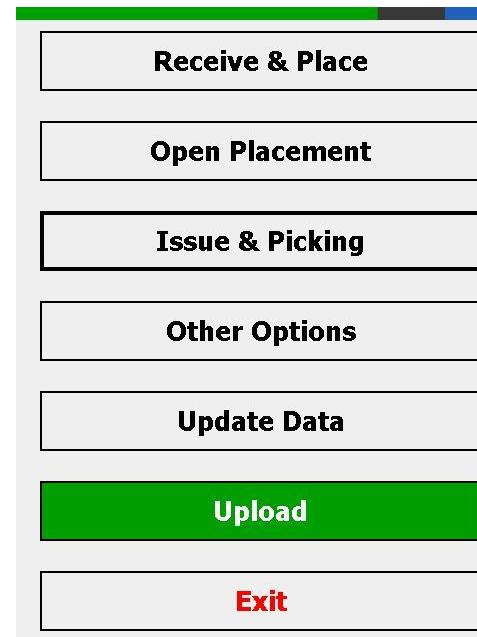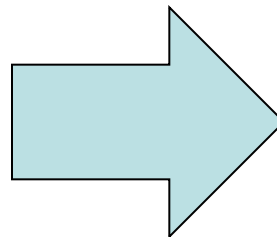
Simplification of vLMIS Scanner App

- Simplification and enhancement of bar code scanner application

Update Data
Receive Via Scanner
Stock Placement
Stock Picking
Internal Transfer
Locations Status
Update VVM Stage
Upload
Search Batch
Search Products
Exit

Receive & Place
Open Placement
Issue & Picking
Other Options
Update Data
Upload
Exit

Before Pilot

Current

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Helpdesk Support Mechanism

- Support email i.e. support@lmis.gov.pk

- Mantis open source application to log support tickets

- HR deputed to receive support calls

- Strong liaison with provincial program teams

Pakistan vLMIS is multi dimensional, multi level EPI need based IS with GS1 bar coding & GIS capability

- Walk, talk and shoulder with the Government and partners for the highest ownership

- We do not need to re-invent as it is an open source, countries may adapt in their local context

- Multi-donor efforts should exploit the experiences of vLMIS for strengthening routine immunization efforts

- Multi level data review, OTJ training and field monitoring and supportive supervision are must

- Industry should respond to bar coding requirement of all antigen for accountable country level supply chain

- Right technology at the right time and the right place 36

Before Reforms in Federal EPI Store

After Reforms in Federal EPI Store

Thanks

For more information

www.deliver.jsi.com
www.lmis.gov.pk