



The future of countries' cold chain systems: Achieving cost-efficiency in managing storage of primary health care commodities

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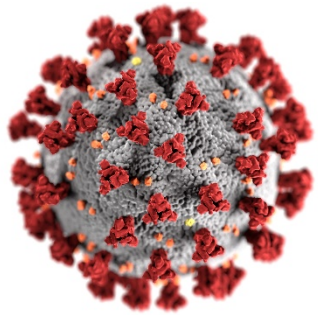


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Shaping a resilient and adaptive immunization program



New WHO-UNICEF Joint Statement on temperature-sensitive pharmaceuticals -September 2020



COVID-19



- Disrupted routine immunization services
- Postponed mass vaccination campaigns
- Interrupted nat'l & int'l supply/delivery schedule
- Surge of temperature-sensitive Covid19 therapeutics & diagnostics



Put a strain on existing cold chain capacity & alter supply & stock balances



Agenda



- Overview of the WHO-UNICEF Joint statement
 - Ms Michelle Seidel (PD, UNICEF HQ)
- Specific guidance for an effective integration
 - Ms Maricel Castro (EPI, WHO HQ)
- Integration of Immunization Supply Chain in to the Wider Health Supply Chain
 - Dr Tariku Berhanu (UNICEF CO Ethiopia)
- Key stakeholders' engagement in planning and system design
 - Mr William Musubire (MOH Uganda)
- Integration of EPI supply chain including CCE Inventory in the DHIS-2 platform
 - Dr. Monjurul Islam Fuad (MOH Bangladesh)
- Question and answer
 - Mr Dereje Haile (UNICEF)



WHO and UNICEF joint statement
encouraging greater health commodity
supply chain integration for temperature-
sensitive pharmaceuticals where appropriate

Michelle Seidel and Maricel Castro



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Overview of the WHO-UNICEF Joint Statement

BACKGROUND

- On 11 March 2020, WHO declared COVID-19 a public health emergency of international concern, which has resulted in a slowing of immunisation to prevent the spread of COVID-19.
- Some countries set up sub-national laboratories to support testing for COVID-19. The test kits, reagents and other laboratory supplies that require cold storage may likely use the existing national and sub-national cold chain facilities and equipment to accommodate the surge.
- Stockpile of unused campaign vaccines, the disrupted delivery schedules and the need to store other heat-sensitive health commodities, including COVID-19 diagnostic and therapeutic products, significantly challenge the existing cold chain capacity and alter the supply and stock balances.



World Health
Organization



**TEMPERATURE-SENSITIVE HEALTH PRODUCTS IN THE EXPANDED
PROGRAMME ON IMMUNIZATION COLD CHAIN: September 2020**

WHO and UNICEF joint statement encouraging greater health commodity supply chain integration for temperature-sensitive pharmaceuticals where appropriate

Purpose of the Joint Statement

- Reiterates the value of safe, feasible, and cost-effective integration of temperature-sensitive health products into the EPI cold chain system
- Highlights integration as a practical solution to address cold storage need of other essential health commodities
- Highlights important considerations before adopting an integrated cold chain strategy
- Recognizes the associated risks and offers practical solutions to mitigate the risks
- Provides reference to existing guidance, planning tools and other mechanisms to design and implement a safe and efficient integrated cold chain system



GENERAL RECOMMENDATIONS



- it is permissible to use the EPI/vaccine cold chain system for the storage and transport of appropriate temperature-sensitive pharmaceuticals provided that labelling and separation to distinguish vaccine and non-vaccine products is consistently adhered to
- the WHO and UNICEF guidance on safe integration must be followed to ensure the quality and potency of all health products in the shared storage space, and
- the decision to integrate should be guided by a risk-benefit analysis, cold chain capacity assessment and an integration plan.



SPECIFIC GUIDANCE TO COUNTRIES CONSIDERING TO ADAPT AN INTEGRATION COLD CHAIN STRATEGY



Key considerations on implementing integrated cold chain

Capacity Assessment & Forecasting

- Assess feasibility and plan using existing tools and latest CC assessment data
- Update inventory of available gov't & private CC facilities
- Maximize use of all available functional WHO pre-qualified CCE to store other products
- Prioritize storing vaccines in the EPI CC when capacity is limited
- Add 25%-30% surge capacity when planning for future CC capacity expansion



Key considerations on implementing integrated cold chain

Integration & Documentation

- Where safe and feasible, consider integrating storage and transport of temperature-sensitive health products (e.g. HIV and COVID-19 diagnostics and therapeutics, oxytocin & insulin) in the EPI cold chain
- Make integration as comprehensive as possible
- Involve all concerned programme managers in all phases of the CC integration process
- Update all relevant guidance, SOPs & information systems
- Allow enough transition period to ensure efficiency and safety of the integration



Key considerations on implementing integrated cold chain



Safety considerations

- Train all staff on managing integrated CC based on the new SOP & guidelines
- Keep products in their original secondary packaging during storage
- Maintain proper labeling & physical segregation at all times
- Modify receipt/distribution schedules to avoid excess burden on the cold chain
- Sustain HF level monitoring and supervision to ensure proper compliance
- Strengthen AEFI surveillance & response systems as part of risk mitigation

Key considerations on implementing integrated cold chain

Communication and coordination

- Develop communication strategy to ensure all concerned staff are aware of the relevant guidelines and SOPs
- Have clearly written roles & responsibilities for the staff managing the integrated CC
- Ensure job aids & information materials are always available
- Establish coordination mechanism for timely and effective AEFI response





Integration of Immunization supply chain in to the wider health supply chain

Experience from Ethiopia



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Outline

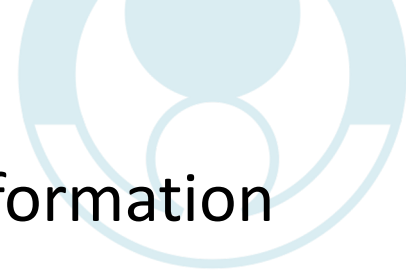


- Background and pre transition situation
- Policy support
- Rational
- Process
- Progress
- Key lesson and Future priorities

Background and pre-transformation

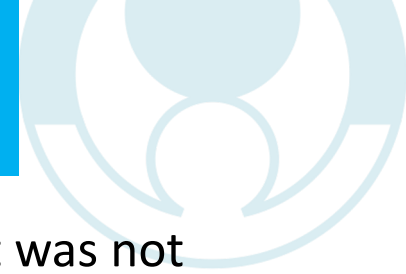


- EPI Program in Ethiopia offers 11 antigens including the most recent additions - Rotavirus in 2013, latter IPV and HPV.
- The system broadly followed the administrative structures.
- Up to six levels contributing to inefficiency and made it difficult to achieve visibility.
- Ownership and responsibility spread over different entities.



- The supply chain for other essential medicines had undergone transformation starting in 2005 with the Pharmaceutical Logistics **Master Plan**.
- This plan led to the creation of an autonomous FMOH agency, Pharmaceuticals Fund and Supply Agency (PFSA) now EPSA.
- PFSA was responsible for the entire public sector health care supply chain including the design and implementation of an “integrated” system
- The Integrated Pharmaceutical Logistics System (IPLS) delivering a range of priority health commodities (HIV, family planning, malaria, maternal & child health) to most health facilities.
- PFSA benefited from significant investment in infrastructure, systems, and human capacity.

Rationales



In 2007, PFSA's /EPSA/ mandate was envisaged as potentially extending to vaccines. However, it was not until 2013 that the FMOH made decision to transfer vaccine supply chain management to PFSA.

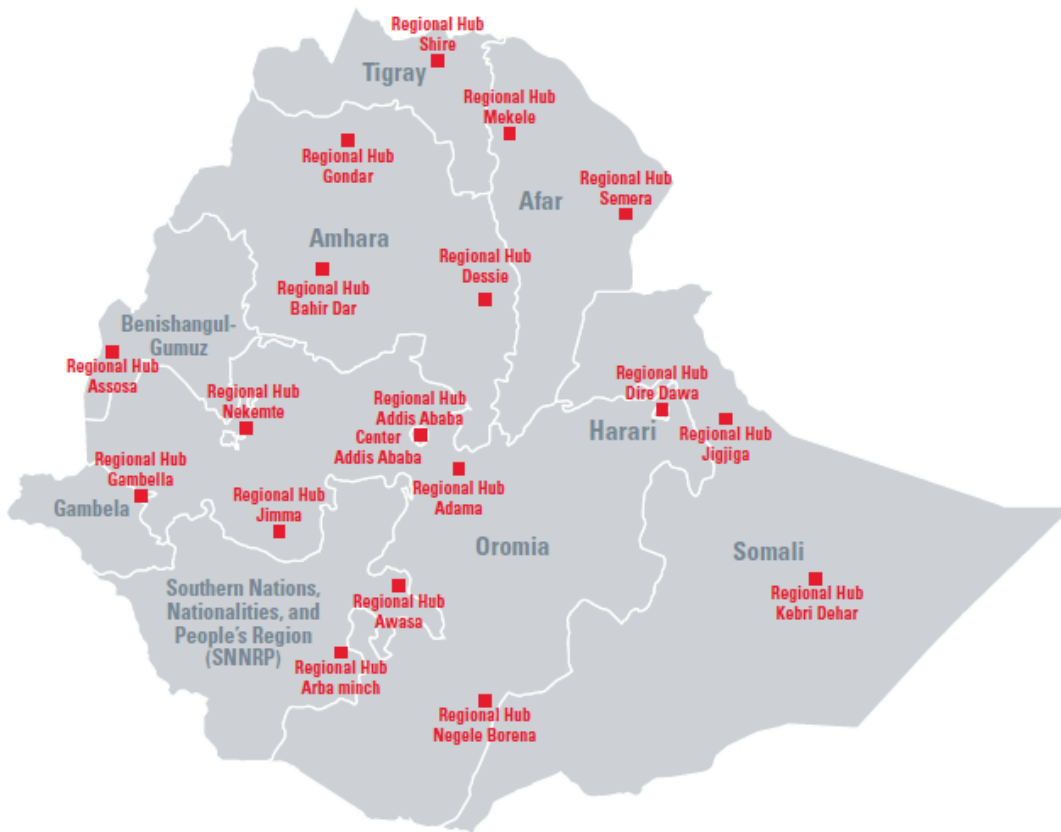
- **Visibility:** PFSA's status as a federal agency would make it easier to eliminate levels in the supply chain to **enhance data visibility and thus supply chain efficiency**
- **Accountability:** Having a single agency responsible for most aspects of the vaccine supply chain would improve accountability for system performance
- **Sustainability** - By leveraging PFSA infrastructure, systems, technology and human capacity, supply chain sustainability and performance would be enhanced
- **Efficiency:** With several new expensive, and large volume vaccines being introduced (Rota in 2013 and PCV in 2012) there was recognition that a new approach was needed for the supply chain and a reluctance to invest in the current system without major changes

Integration process



In early 2014, a Vaccine Supply Chain Management Transition Plan (FMOH 2014) was prepared and the plan was considered:

Figure 2: Locations of Regional Hubs across Ethiopia



- Procurement of cold rooms, refrigerated trucks and refrigerators; relocation of existing cold rooms to PFSA hubs; design and **implementation of an LMIS; development of SOPs; and training and recruitment of staff;** to be completed by the end of 2015.
- A phasing strategy was employed: the new distribution system with PFSA delivering initially immunization supplies from hubs to zones, next from hubs to woredas (bypassing zones) and later hubs directly to health facilities that are easily accessible.



- A later plan was developed in June 2014, followed
 - A phased approach and identified three initial regional hubs – Bahir Dar, Jimma, and Mekelle –
 - Where transition would begin first, with PFSA taking over storage and distribution of vaccines from the RHB or zonal health department (ZHD).
 - **Increased the cold room capacity from 1,300 m³ in 2013 to 4,248 cubic meter and freezer room from 45 to 200 m³. These added over two fold cold storage space in the system.**



- Isc and other keep cool health commodities to share:- the storage, transport, leadership and HR – enjoying economic scale
- Isc and other keep cool health commodities to share:- the storage, transport, leadership and HR – enjoying economic scale
- Added over 9,300 SDDs into the lower level health system /community level. The 6000 SDDs procurement project funded by the government and the procurement process used for this project adopted for the CCEOP implementation (Extended warranty and after sales service modalities).
- In 2018, the country developed an overall Immunization Supply Chain Management Strategy (2018-2023), which attempts to address the current and expected challenges in the iSC through strategic priorities and linked initiatives – in this document. HR/leadership and maintenance given due attention

Key lessons and future priorities



Key lessons

Future priorities (future priorities)

Complexities

- Countries have different SC characteristics.
- Number of levels & frequency of supply differs
- Type of vaccines being used differ.
- Do not know what the future brings e.g. COVID vaccine
- Mode of storage and distribution differs (Private or government ; air , truck , CB , Refrigerated truck etc.).
- Type of pharmaceutical product requiring refrigeration varies from country to country.

Under such complexities , prescriptive adjustment for improving efficiently and effectiveness is difficult or not impossible.

In such scenario what we can propose is **process** which can be agreed by most partners (not all). And this is where Supply chain system design comes in and what Ethiopia did in early 2007.



- https://publications.jsi.com/JSIInternet/Inc/Common/download_pub.cfm?id=22526&lid=3
- <https://chilot.files.wordpress.com/2011/01/proc-no-553-drug-fund-and.pdf>
- <https://www.researchgate.net/scientific-contributions/2114765935-TA-Mukashev>

unicef 

for every child

Thank You



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MINISTRY OF HEALTH - ETHIOPIA



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Integration of EPI supply chain including CCE Inventory in the DHIS-2 platform, Bangladesh

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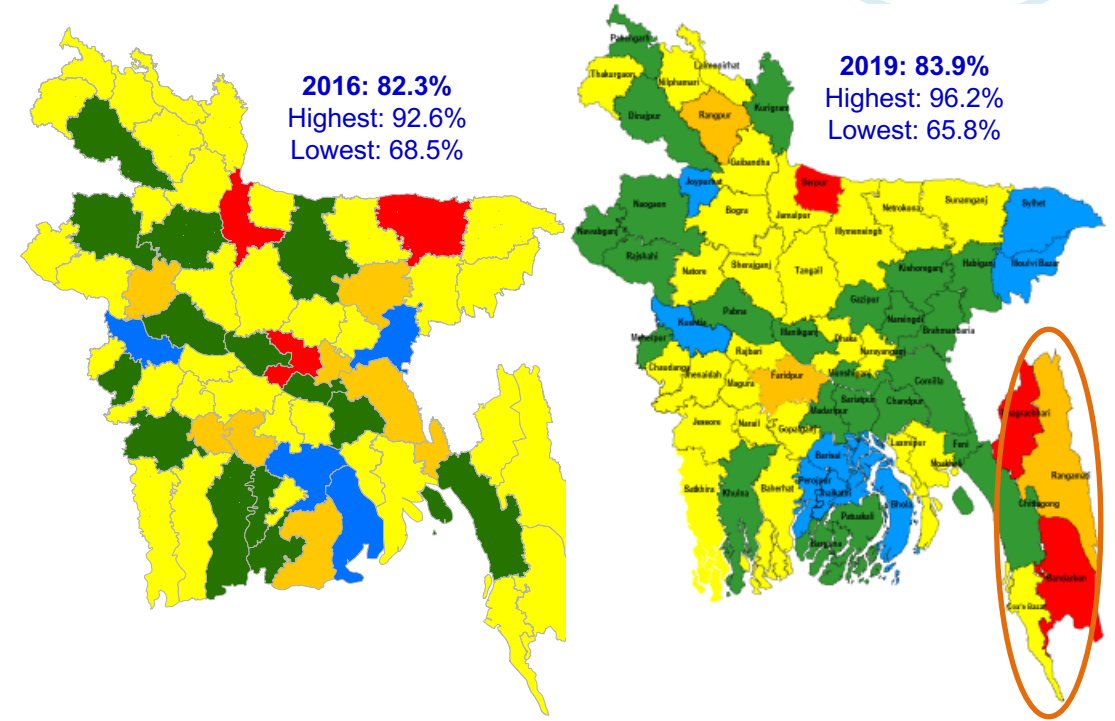
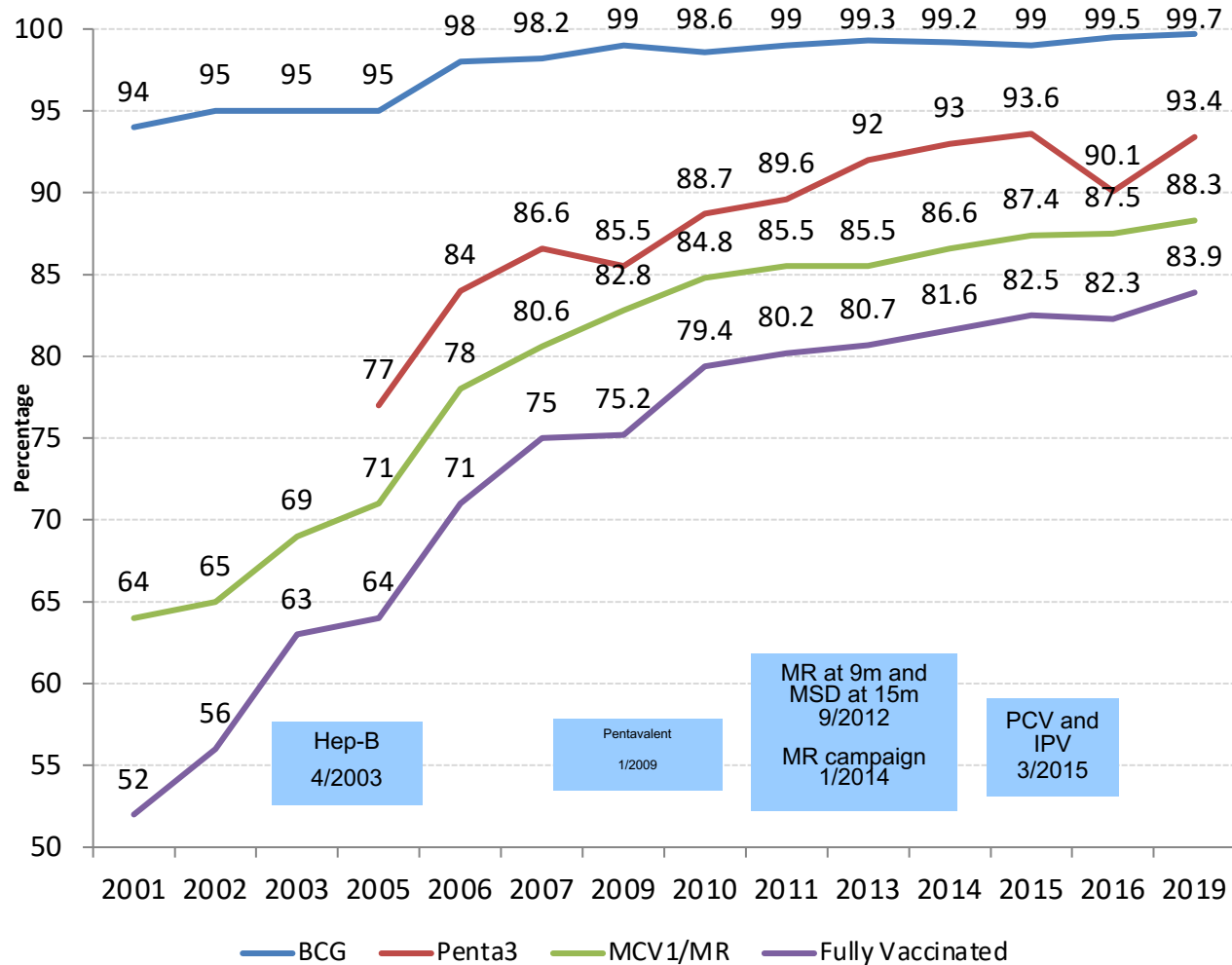
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Bangladesh Facts

- Population: 170 million
- Population 1-5 years age: 16.3 million
- Women Population (15 - 49 years age): 48 million
- Birth Cohort: 3.7 million
- Infant Mortality Rate: 38
- DPT Coverage: 93.4
- Measles Coverage: 88.3

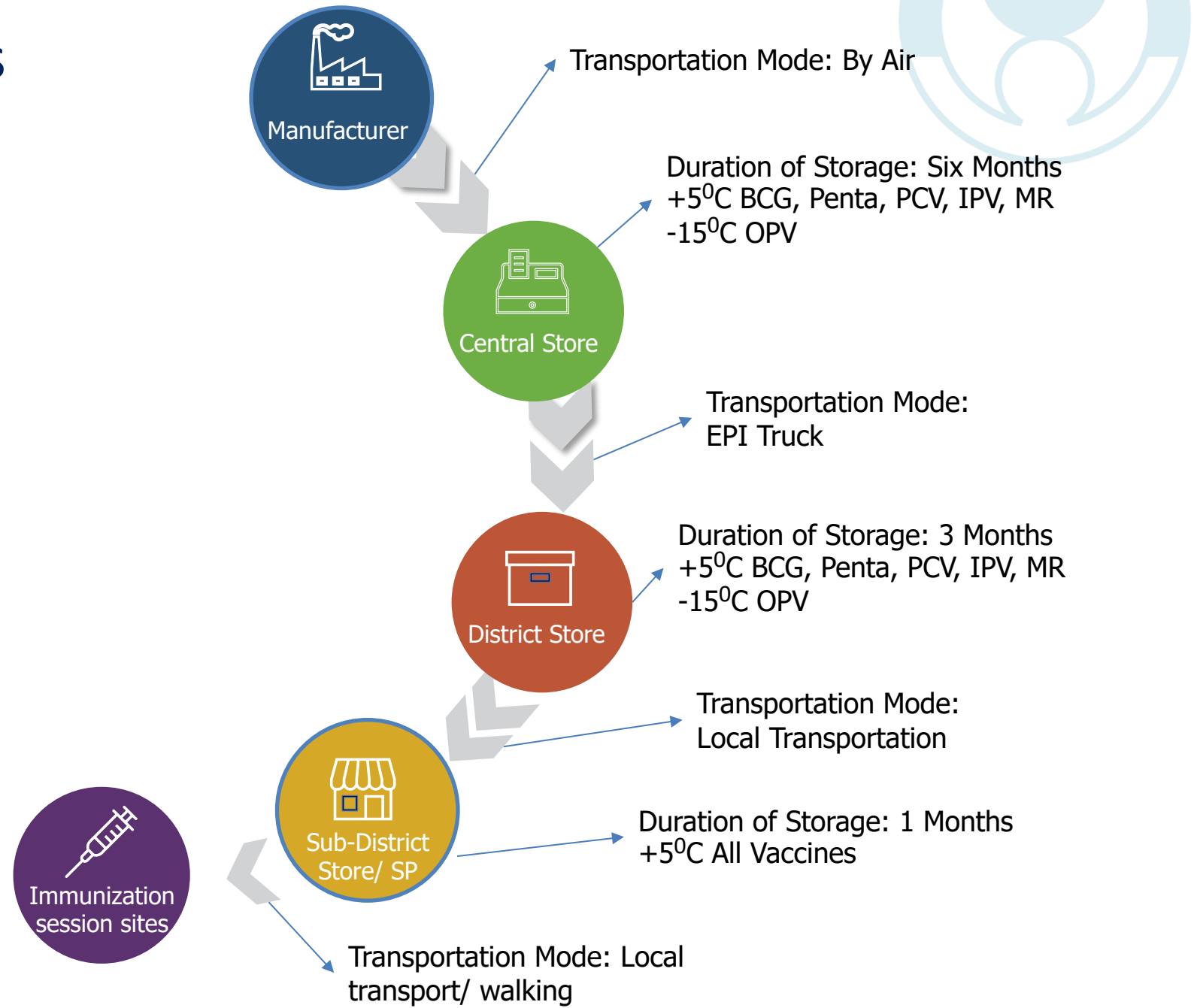
Fully Vaccination Coverage by 12 months age of children



Legend	FVC	2016	2019
■	<75%	3	3
■	75-79%	8	3
■	80-84%	35	26
■	85-89%	14	24
■	>=90	4	8

EPI Supply Chain levels

Nos. of Primary Store	1
No. of Lowest Distribution Points	64
No. of Service Delivery Level1	692
Total No. of cold chain points	757





National Health Data Warehouse in DHIS2 - Bangladesh

Case based data capture :

1. Maternal and child health
2. HIV-PLHIV patient tracker
3. Kala-Azar patient follow-up for continuation of care for elimination program
4. Hospital in-patient event capture
5. Mortality Causes of Death for CRVS
6. Cold chain equipment functionality tracking
7. Immunization e-tracker
8. VPD surveillance tracking

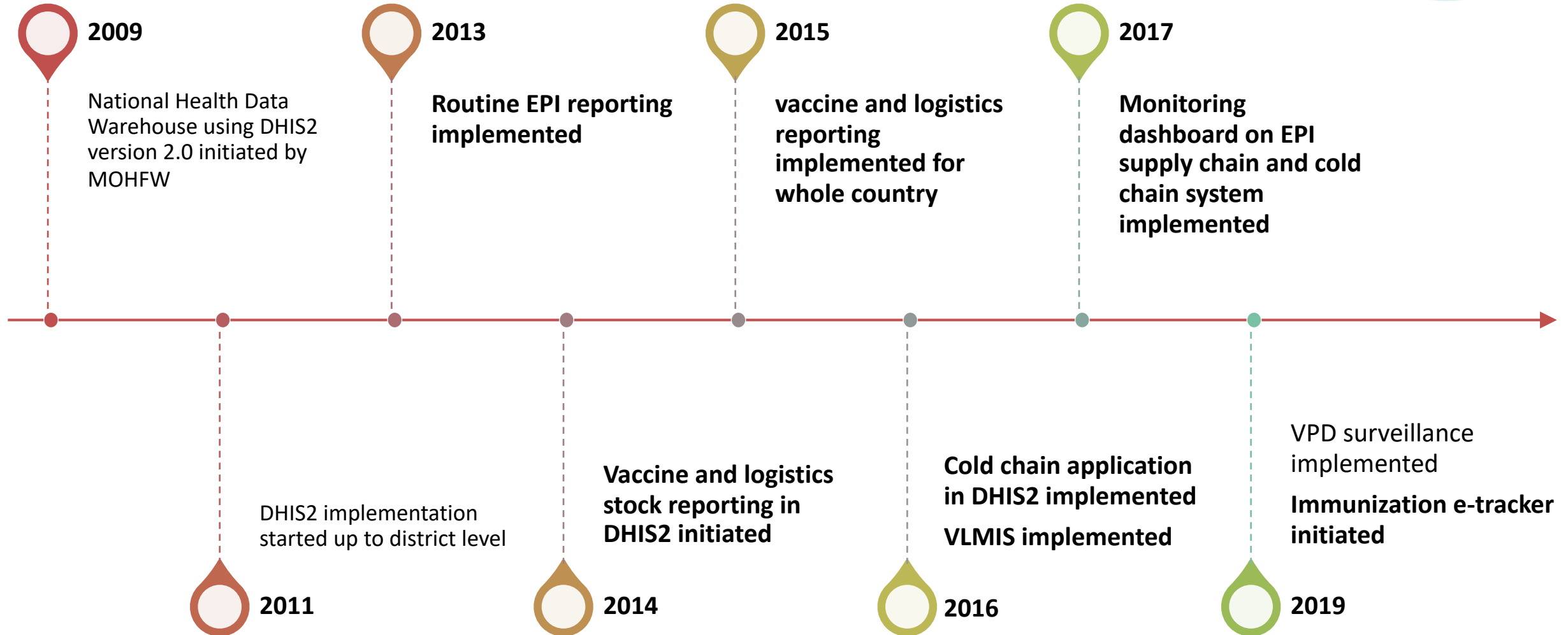
Aggregate data reporting in DHIS2

Major programs are -

1. Immunization (infant and pregnant mother)
2. Maternal Health Program including EmONC
3. Child health care including IMCI
4. Health commodities supply including vaccine and cold chain equipment
5. HIV - PMTCT,VCT, Training, High risk group
6. Cervical and Breast Cancer Screening Programme
7. Hospital daily reporting OPD and Emergency Visits, Admission
8. Telemedicine service utilization report
9. Daily Emergency Preparedness reporting
10. Monitoring of essential medicine stock
11. Newborn-SCANU, Adolescent Health and MPDSR



Integration timeline of EPI-SC and CCEI in DHIS2



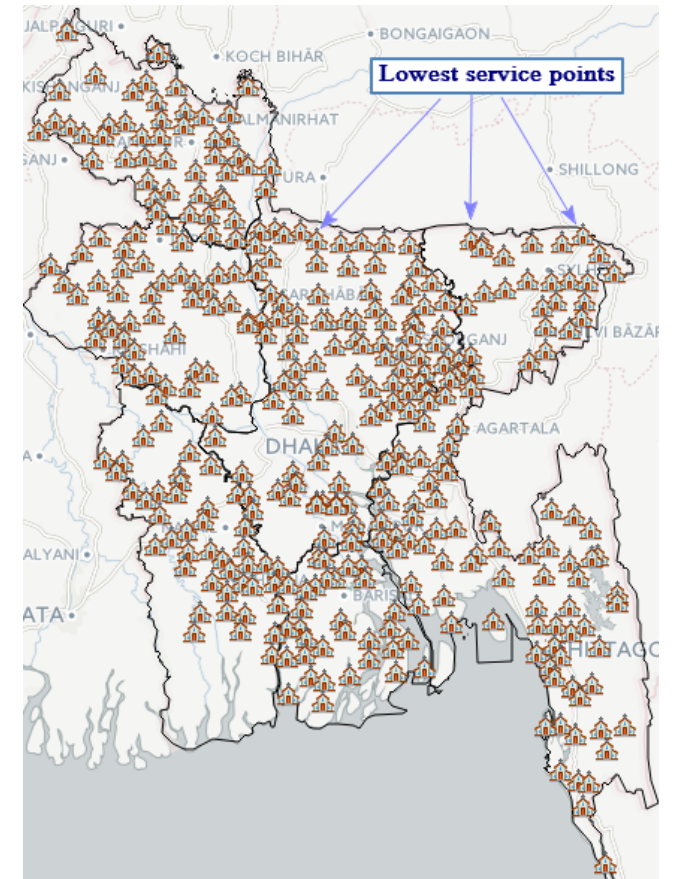


Supply chain integration in DHIS2

Supply chain type	National	District /LD	Sub-district / SP
EPI – SC (100% implemented in 64 District)	Yes	Yes	Yes
CCEI	Yes	Yes	Yes

Frequency of reporting:

Supply chain type	National	District /LD	Sub-district / SP
EPI – SC	Quarterly	Monthly	Monthly
CCEI	When there is any change in CCE status		





Data sets and elements of EPI-SC in DHIS2

Data Entry

Organisation Unit: Amtali Upazila Health Complex
 Data Set: EPI supply form (Upazila/Municipality/City Corporation)
 Period: October 2020

1st Delivery | 2nd Delivery

Vaccine | Logistics

পণ্যপ্রজাতকর্তা: বাংলাদেশ সরকার
 স্থপিত: এই সরবরাহ ফর্ম (ডাকসিন ও ডাইলুয়েন্টের জন্য)

উপজেলা: পৌরসভা/সিটি করপোরেশনের নাম: Amtali Upazila Health Complex
 চাহিদার ধরণ: মাসিক
 চাহিদা নং: সরবরাহ নং: 10
 তারিখ: কোথা হতে সরবরাহ:

ডাকসিন / ডাইলুয়েন্টের নাম Vaccine / Diluent Name	১। মাসিক প্রতিবেদন		২। চাহিদা		৩। সরবরাহ		মোদা	
	বর্তমান মজুদের পরিমাণ (ভায়াল) Current Stock	এক মাসের চাহিদা (ভায়াল) Need	নিরাপদ মজুদসহ এক মাসের চাহিদা (ক = নিরাপদ মজুদ) Need + Buffer	বর্তমান চাহিদার পরিমাণ (ভায়াল) Requested	সরবরাহের পরিমাণ (ভায়াল) Supplied	ডাকসিন/ ডাইলুয়েন্ট প্রস্তুতকারকের নাম Manufacturer Name		বাচ/লট নং Batch/ Lot
	C	D	E	F=E-C	G	H	I	
1. বিসিজি (BCG)	236	300	450	214	200	Serum Inst India	0379G197	
2. বিসিজি ডাইলুয়েন্ট (BCG Diluent)	236	300	450	214	200	Japan Lab	0700S4003	
3. পেন্টাভ্যালেন্ট (Pentavalent)	785	2058	3087	2302	2000	LG Chem Korea	PWL20509	
4. পিসিডি (৪ ডোজ ভায়াল) (PCV 4 Dose vial)	248	505	757.5	509.5	600	GSK Belgium	ASP4A184AA	
5. ওপিভি (OPV)	263	225	337.5	74.5	200	Bharat Bio	68D20002A	
6. ওপিভি ড্রপার (OPV Dropper)	263	225	337.5	74.5	200			
7. অইপিভি (IPV)	57	89	133.5	76.5	30	Bithoven Netherland	IPQ030A19	
8. এমআর (MR)	6093	300	450	-5643	0			
9. এমআর ডাইলুয়েন্ট (MR Diluent)	6093	300	450	-5643	0			
10. ডিডি (TD)	149	400	600	451	192	Biologi E Ltd	221502619B	

প্রস্তুতকারীর সাক্ষর: অনুমোদনকারীর সাক্ষর: সরবরাহকারীর সাক্ষর: অনুমোদনকারীর সাক্ষর:

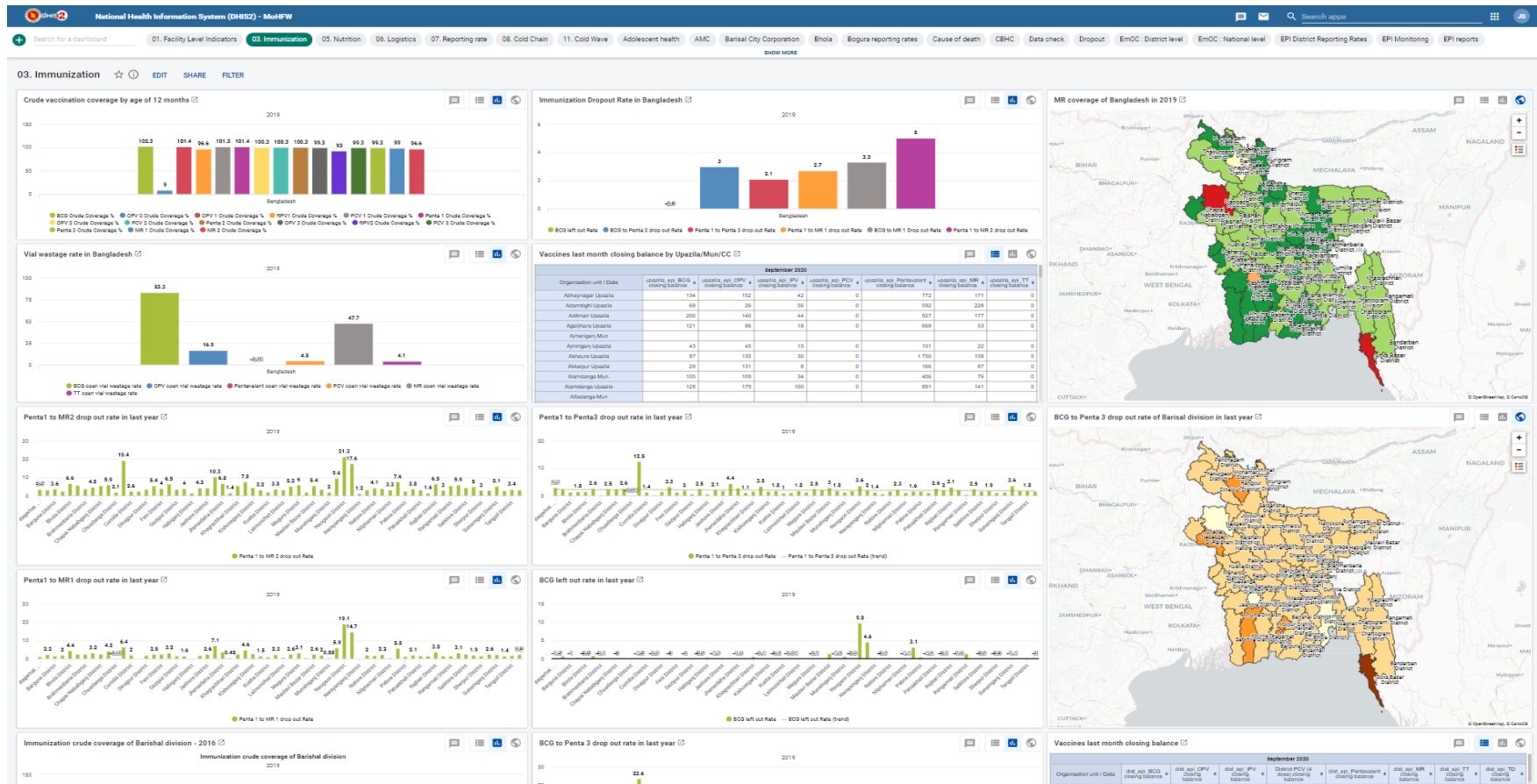
Data Sets of EPI-SC -

1. Vaccine and logistics stock report – 3 level
2. Indent form for vaccine and logistics – LD and SP
3. Supply form for vaccine and logistics – Central and LD

Data elements – Balance, Use, Damage, Receive, Supply, manufacturer, lot number, expiry date and VVM stages

Advantages of the EPI-SC in DHIS2 is used to:
 aggregate, analyze, validate and monitor stock balance, supply, receive etc. at all levels of the supply system to manage the supply chain.

Monitoring dashboard of EPI-SC in DHIS2



Monitoring of Routine EPI and EPI supply chain dashboard in DHIS2 allows to monitor

1. Vaccination coverage
2. dropout by sex disaggregated,
3. vaccine wastage,
4. vaccine and logistics stock out, supply, receive and demand from national to service points.

Cold Chain Equipment Inventory in DHIS2

Bangladesh is the first country having cold chain information system in DHIS2. It is developed through DHIS2 tracker capture application.



CCE basic info i.e. capacity, model, manufacturer, functional status etc.

Temperature alarm, repair and preventive status of CCE

CCE move option from National to SP

Report date	Organisation unit	High Alarm
2016-07-27	Barisal Civil Surgeons Office, Barisal	High Alarm
2016-07-27	Banaripara Upazila Health Complex	

Reporting modules of CCEI -

1. Temperature alarm
2. Preventive maintenance
3. Repair request
4. Repair Complete

Data elements of CCEI –

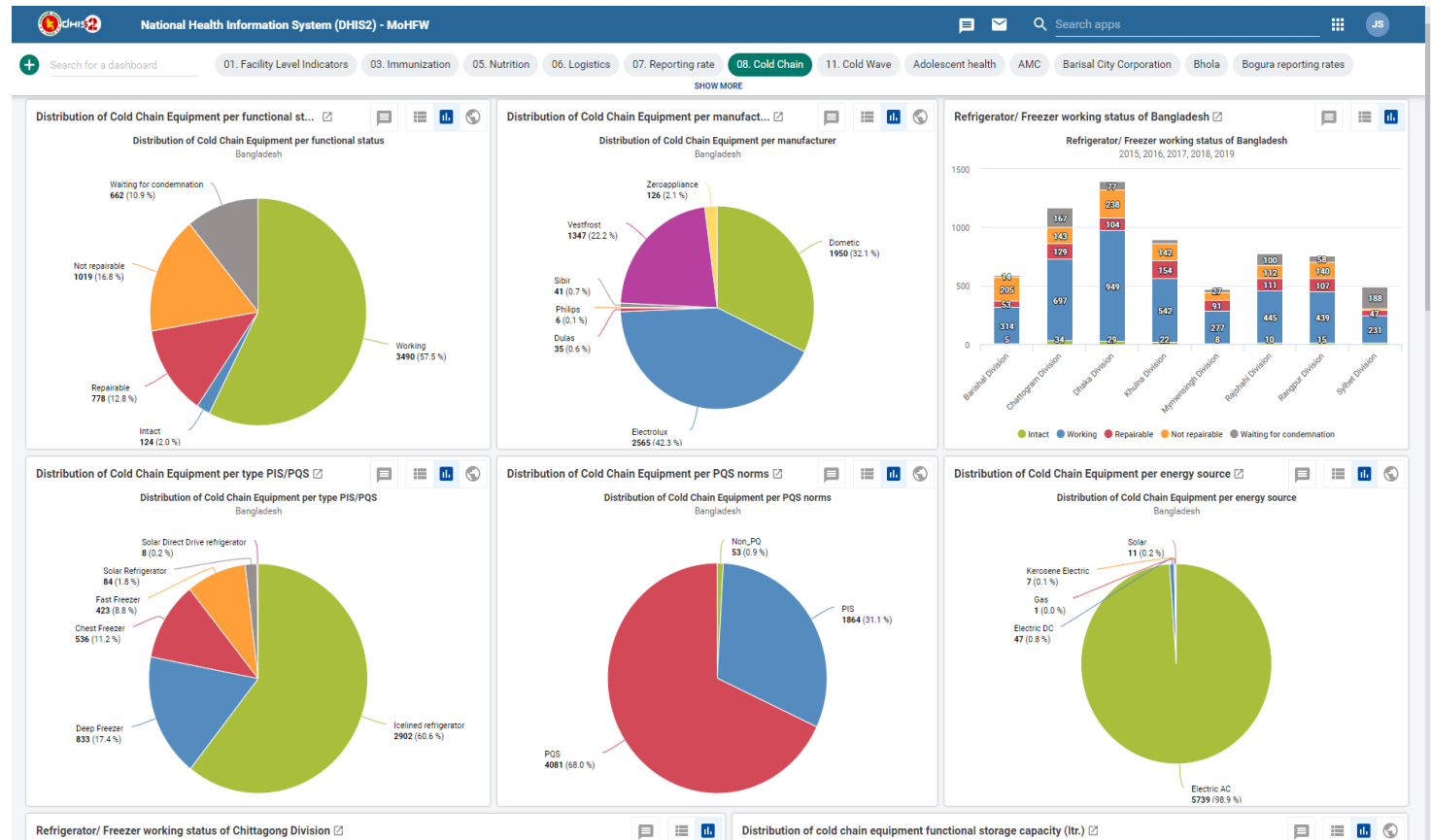
1. Serial Number
2. Catalog ID
3. Equipment Type
4. Manufacturer
5. Model
6. Year of Installation
7. Power Source
8. Storage capacity (in Itr)
9. WHO specifications

Monitoring dashboard for CCEI in DHIS2



Monitoring of Cold chain equipment inventory dashboard in DHIS2 allows to monitor-

1. Distribution of cold chain per functional status
2. Capacity
3. Repair status
4. Manufacturer
5. Equipment type, PQS/PIS norms
6. Energy sources from national to service points.
7. Distribution of cold chain equipment functional storage capacity (ltr.)



Challenges encountered



Completeness, timeliness of reporting, accuracy of data entry and use of data



Use of DHIS2 by health managers and use of data for decision making



Maintenance of devices and day to day problem solving

Capacity of server and upgradation of software including limitation of some feature in DHIS2



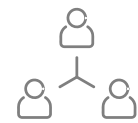
Lessons learned

- Commitment from program is the prerequisite for successful implementation of DHIS2 integration
- Prioritization by MoH&FW to have one common HMIS for reporting, coverage, supply chain management and individual health profile tracking for newborn, child, maternal and adolescent
- Use of DHIS2 from community to national level for one program make it a success
- New and Innovative approach welcomed by health managers like app base monitoring
- Using DHIS2 for supply chain management ensured effective monitoring and better planning for health managers and worker
- Timely reporting helping for better supply chain management and reduced the lead time one to two weeks at district level



Future plan with DHIS2 in Bangladesh

- Individual tracking implementation in 16 District and 8 City Corporation
- Integration with CCEI and temperature monitoring system
- To establish data driven supervision, monitoring at all level
- Integration of child biometric to track all target children



Thank You!

“Protected Together, #VaccinesWork”