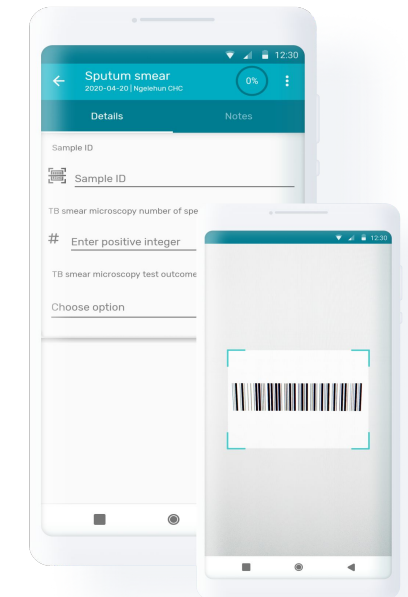
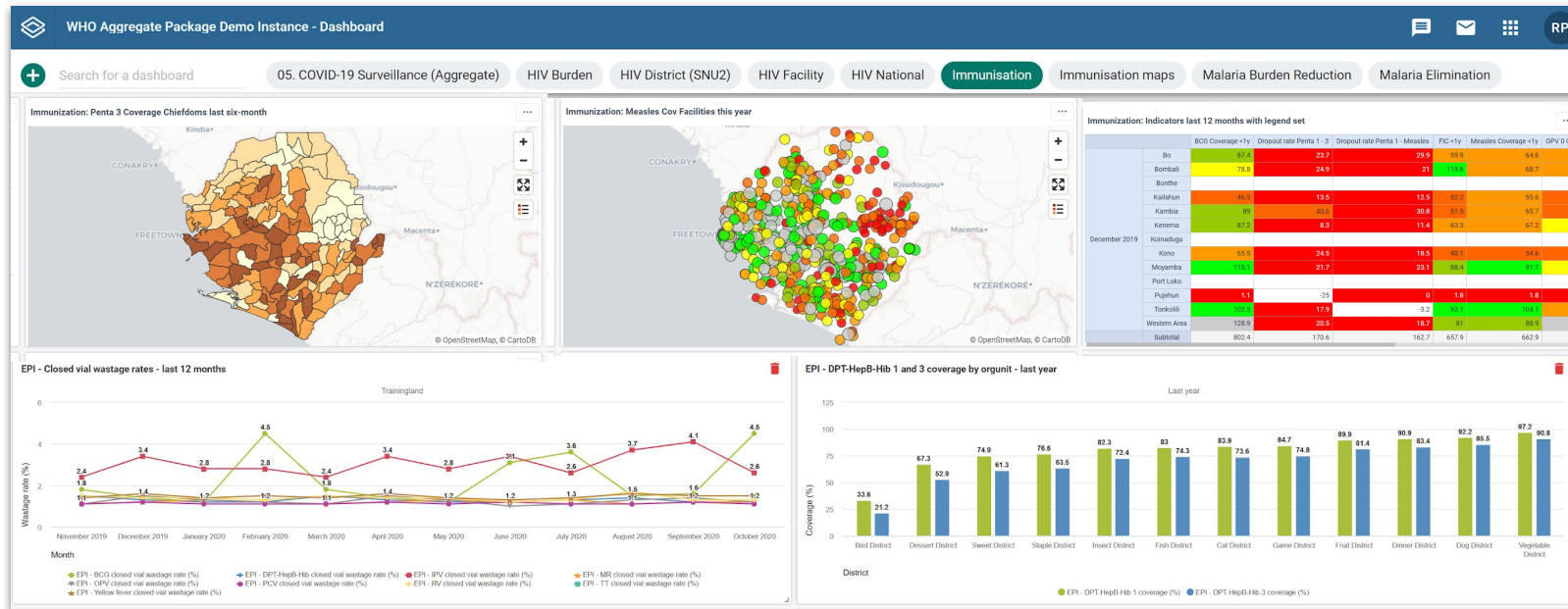


Data-driven deployment of COVID-19 Vaccines: Achieving equity, coverage & sustainability with DHIS2



University of Oslo
Health Information Systems Programme (HISP)
November 2020



dhis2

Why DHIS2 for COVID vaccine delivery?

Established technology: More than 45 countries already use DHIS2 for their national immunization programs, and 36 countries use DHIS2 for COVID-19 surveillance

Existing capacity: MoH have implemented DHIS2 for many years; technical support is provided close to the field by the 13 regional HISP groups of DHIS2 experts

Customizable tools: DHIS2 is fully customizable, allowing national teams to take ownership of their systems and modify them to meet local demands & changing requirements.

Global standards: HISP collaborates with WHO and other global partners to ensure that DHIS2 toolkits are built on global standards, for ease of integration, analysis & interoperability

Sustainable investment: Funding to countries for implementation, training and infrastructure contributes to long-term goal of strengthening health systems

Digital Public Good: DHIS2 is free and open-source. All apps, mobile apps, tools, training materials, platform improvements and innovations are shared globally with no licensing fees

Scale: 36 countries installed DHIS2 COVID-19 toolkit



DHIS2 in action

DHIS2 is in use all over the world.
Check out different use cases with
this interactive map.

Health Information System

COVID-19

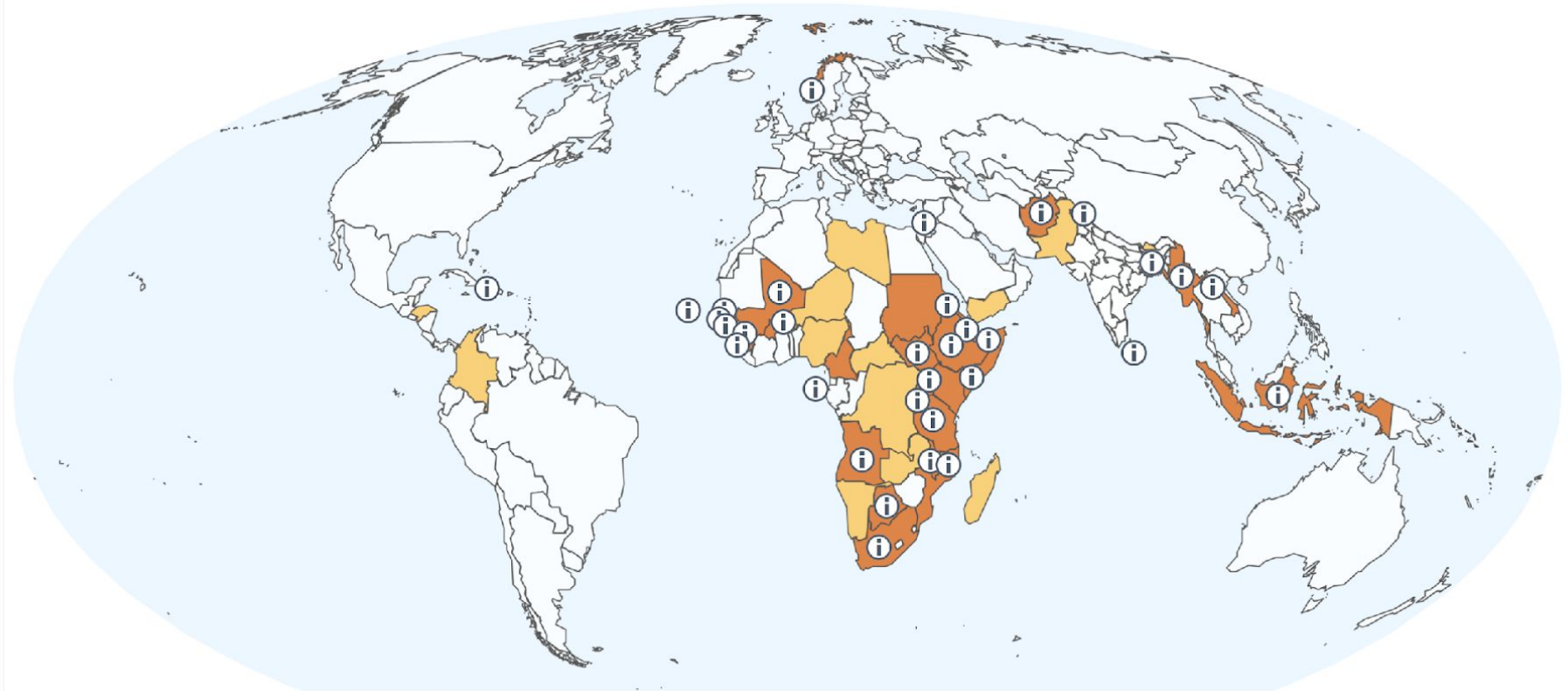
- Operational (36)
- In development (15)

Tracker

Android app

WHO Packages

Education Management Information System (EMIS)



Operational: 36

Afghanistan	Ethiopia
Angola	Guinea
Bangladesh	Guinea Bissau
Botswana	Haiti
Burkina Faso	Indonesia
Cameroon	Jammu and Kashmir
Cape Verde	Kenya
Djibouti	Laos
Eritrea	Malawi

Mali	Somalia
Mozambique	Somaliland
Myanmar	South Africa
Norway	South Sudan
Palestine	Sri Lanka
Rwanda	Sudan
Sao Tome	Tanzania
Senegal	The Gambia
Sierra Leone	Uganda

In development: 15

Bhutan	Nigeria
Central African Rep.	Pakistan
Colombia	Vanuatu
Dem. Rep. Congo	Yemen
Honduras	Zambia
Libya	Zanzibar
Madagascar	
Namibia	
Niger	

DHIS2 Toolkit for WHO NDVP Guidance



01	Measure uptake, coverage & equitable distribution over time, by geography and across risk groups	<ul style="list-style-type: none">• WHO EPI module expanded for COVID-19 vaccine data for routine facility data on vaccination utilization, wastage, cold chain & outreach data• WHO EPI module installed in 30+ countries at national scale
02	Supply chain readiness & traceability of vaccines down to points of service delivery	<ul style="list-style-type: none">• Facility & last-mile logistics data module: WHO approved health logistics metadata with barcode/QR scanning capabilities• 20 countries using DHIS2 for facility-level vaccine logistics & cold chain reporting; DRC, Mali, Yemen use DHIS2 as eLMIS
03	Ensure that individuals can be monitored for the full course of multi-dose regimen	<ul style="list-style-type: none">• Immunization eRegistry for longitudinal tracking & follow up of individuals• DHIS2-based IER deployed at national scale in Rwanda and Ghana
04	Provide a personal vaccination record/certificate	<ul style="list-style-type: none">• Electronic Health Certificates linked with Immunization eRegistry and integration with digital vaccination cards• Local innovations for DHIS2-based generation of COVID-19 negative test certificates & travel passes in Uganda, Guinea Bissau & Rwanda
05	Multiple distribution strategies; novel & innovative distribution approaches	<ul style="list-style-type: none">• Mass campaigns & supplemental immunization activities monitoring adapted for COVID-19 distribution strategies• Uganda national MR campaign (2019); Bangladesh MR campaign (ongoing)
06	Vaccine safety monitoring	<ul style="list-style-type: none">• Adverse Events Following Immunization (AEFI) Tracker: WHO approved• Buy-in from AFRO to support national system strengthening for vaccine safety with DHIS2

Approach: catalytic solutions, sustainable systems

Build on established approaches and partnerships: Expand the WHO DHIS2 Health Data Toolkit, work through regional support networks and relationships with Ministries of Health to adapt to local demands. Leverage Gavi's current investments in DHIS2 for immunization programme data solutions & Norad's catalytic COVID-19 support funding.

Strengthen existing systems, tools, & capacity: Focus on countries already using DHIS2, ensure that COVID-19 vaccine delivery solutions are integrated into existing information structures established for national immunization programmes. Use this unprecedented opportunity of focus & momentum to drive the strengthening of overall health system.

Leverage local expertise and innovation: Deploy innovative approaches to meet real-world use cases through regional HISP groups and national core teams. Share best practices and innovations globally and feedback learning to global public goods.

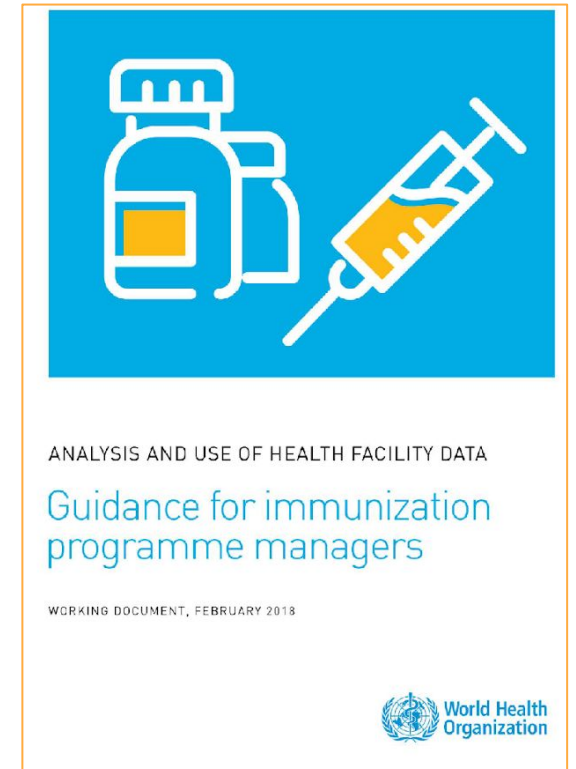
WHO Standard EPI Metadata Package

Facility aggregate monthly reporting on the follow key data:

1. Vaccinations (target: children and women of reproductive age)
 - a. BCG, DPT-HepB-HIB, IPV, OPV, MR, PCV, Rota, Yellow Fever (children)
 - b. TT (WRA & pregnant women)
 - c. According to standard disaggregations (e.g. age: <1, >=1 year)
2. Stock
3. Cold chain: functional refrigerators, alarms (low/high)
4. Outreach Sessions
5. Adverse events

Indicators & analytical outputs

- Wastage rates, coverage rates, vaccines administered, dropout rates, cold chain
- Dashboards: maps, charts, graphs, data quality (completeness & timeliness), automatically can be aggregated from facility upwards and over time



WHO dashboards for immunization programmes



WHO Aggregate Package Demo Instance - Dashboard

Search for a dashboard

05. COVID-19 Surveillance (Aggregate)

HIV Burden

HIV District (SNU2)

HIV Facility

HIV National

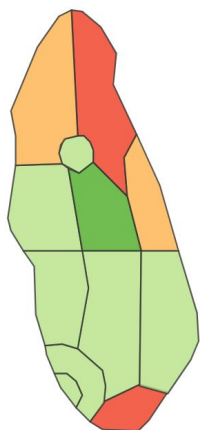
Immunisation

Immunisation maps

Malaria Burden Reduction

Malaria Elimination

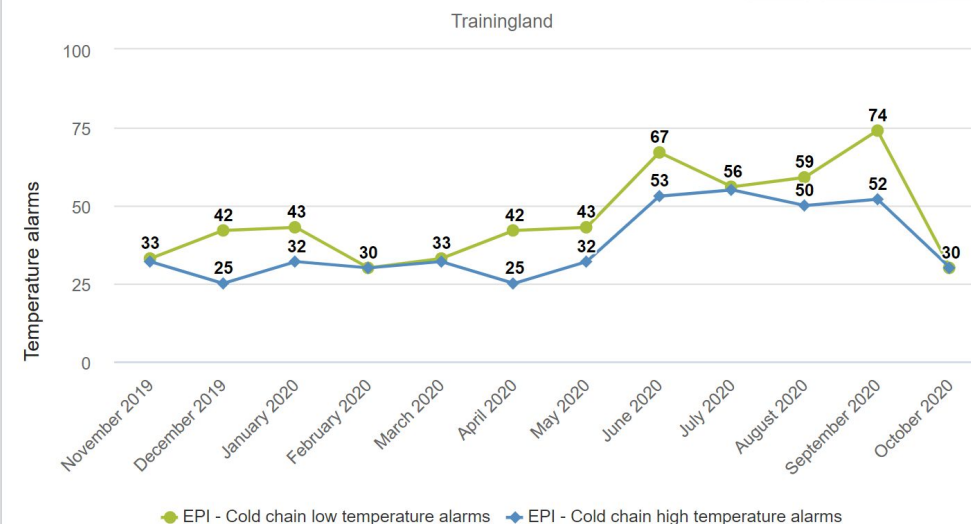
EPI - BCG coverage by district - last month



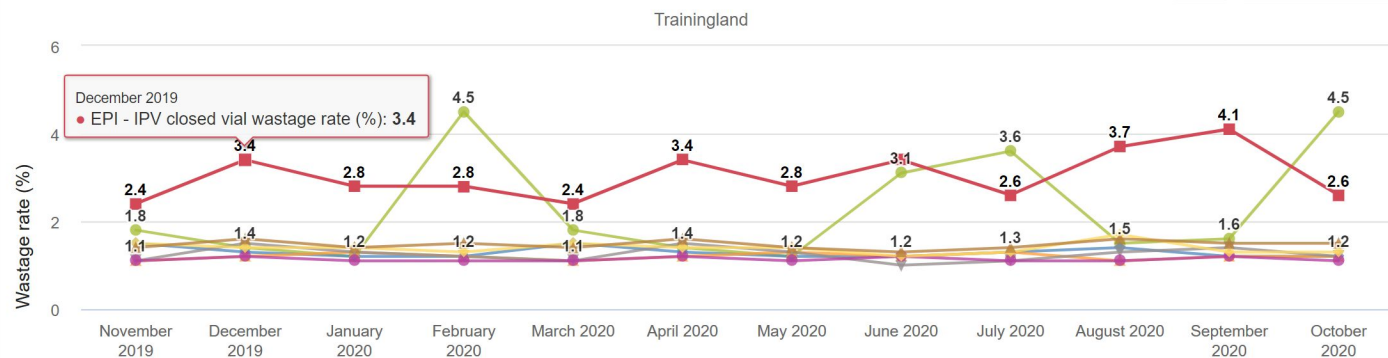
EPI - BCG Stock Status Last 6 Months by Facility

Facility	Nov 19	Dec 19	Jan 20	Feb 20	Mar 20
Panther Health Centre	2.3	4.4	3.8	3.2	2.4
Leopard Health Centre	3.8	2.7	6.1	4.3	2.9
Cheetah Health Centre	2.3	4.5	3.6	3.1	3.2
Siamese Primary Health Centre	4.6	3.3	2.5	3.6	3.1
Feral Primary Health Centre	4.7	3.4	3.4	0.1	0
Pussy Dispensary	2.5	3.4	2.3	7	6
Tiger Shark Health Centre	2.8	3.8	3.1	2.3	4.5
Orangestriped triggerfish Health Centre	3.9	3.1	6.2	4.2	3.2
Inyanga Primary Health Centre	3.3	2.3	2.3	4.9	3.6
Viperfish Health Centre	7.9	6.8	5.7	4.9	3.6
Knife-fish Hospital Gateway PHC	2.5	3.7	2.6	4.6	3
Stingray Dispensary	2.7	1.9	1.9	2	2
Sole Dispensary	2.5	3.4	2.5	2.6	3.7
Hatchfish Primary Health Centre	3.2	4.3	3.1	0.1	0
Flounder Health Centre	4.3	3	2.9	4.2	3.3
Mudsucker Private medical practice	2.6	5.5	3.3	5.2	3.7
Pirate perch Health Centre	2.5	5.7	4.8	4.2	3.4
Pecheserra Hospital Gateway PHC	3.9	2.7	2.8	2.8	2.9
Sunfish Health Centre	8.4	7.1	5.8	4.8	4.1
Mosquitofish Health Centre	5.5	4.6	3.5	2.3	3.4
Bloodsucker Primary Health Centre	2.3	2.4	4.6	0.3	0
Knife-fish Health Centre	2.2	5.1	4.1	3	3.9
Mullet Health Centre	3.2	2.3	4.4	3.4	2.4
Killifish Primary Health Centre	5.2	4.7	3.5	3.3	2.3
Salty Dog Dispensary	4.4	3.3	2.6	4.7	3.8
Pilchard Health Centre	3.3	4.6	3.1	5.2	3.9
Parrotfish Health Centre	6.5	5.4	4.4	3.2	3.3

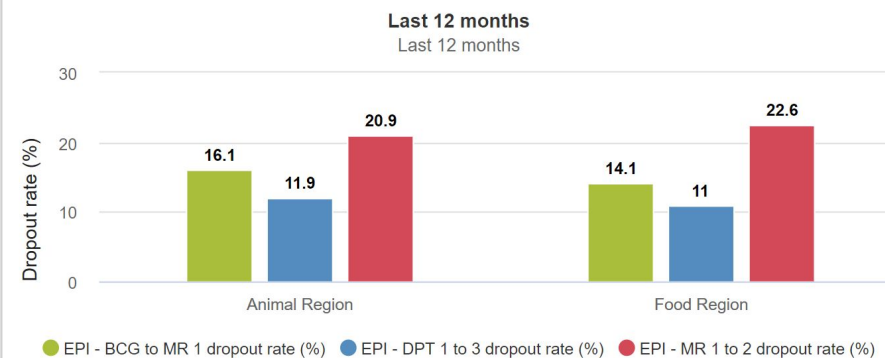
EPI - Temperature alarms - last 12 months



EPI - Closed vial wastage rates - last 12 months

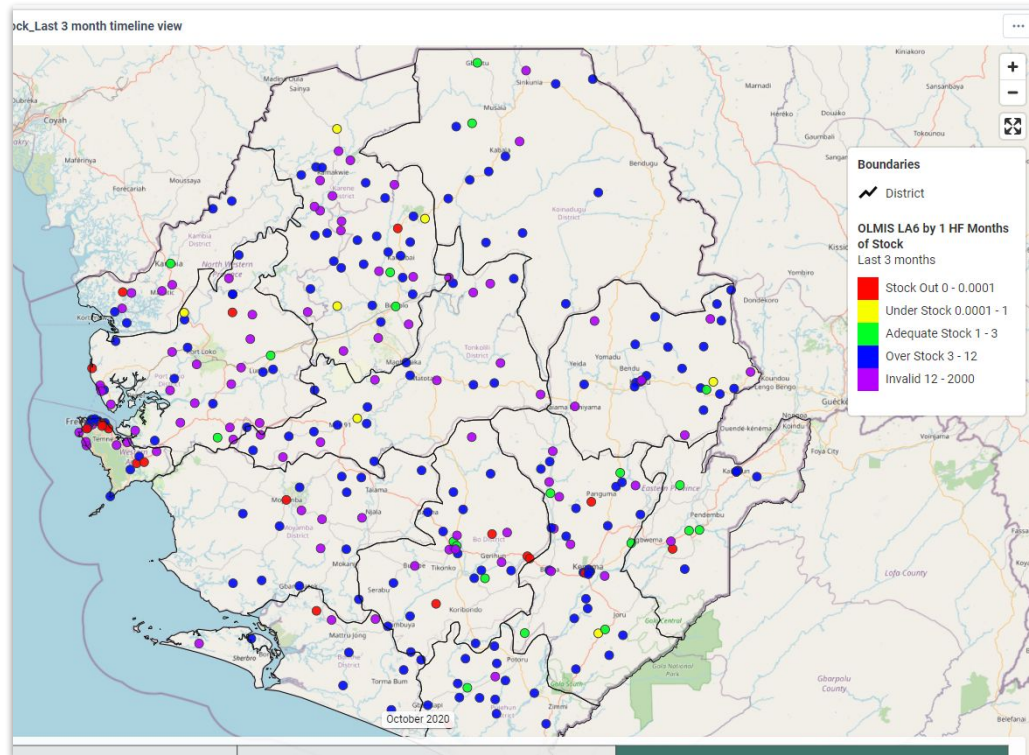


EPI - Dropout rates by orgunit - last 12 months cumulative

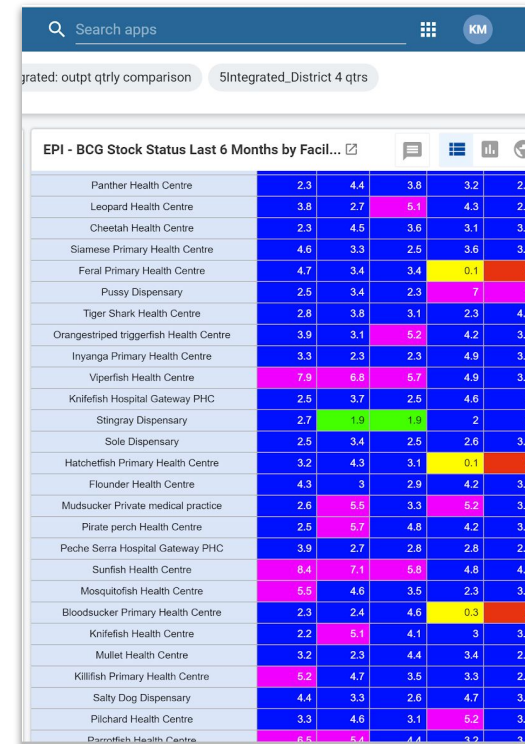


Supply Chain: Facility level visualization

Facility stock status:
adequate, under, over, stock-out, invalid



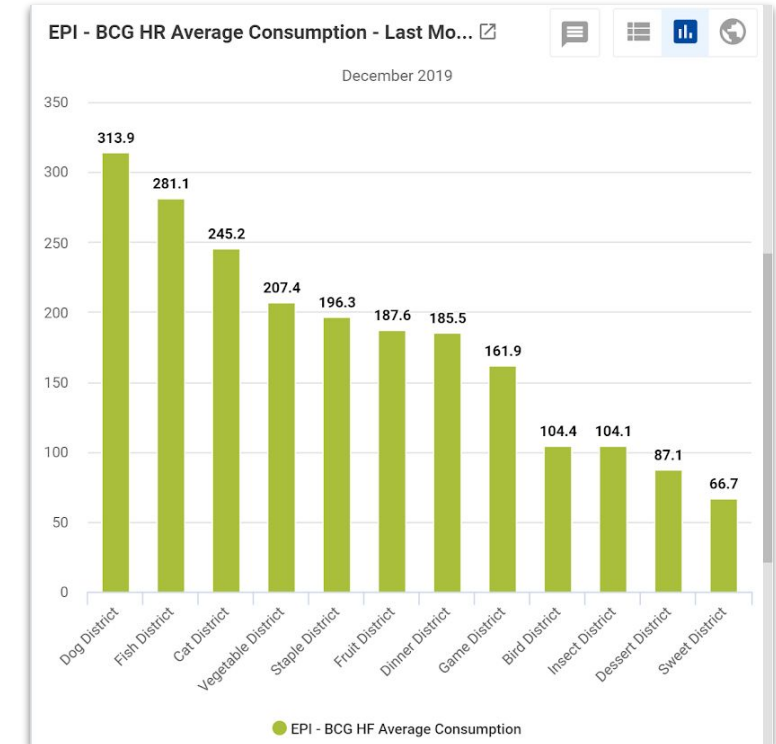
Stock status by month



EPI - BCG Stock Status Last 6 Months by Facility

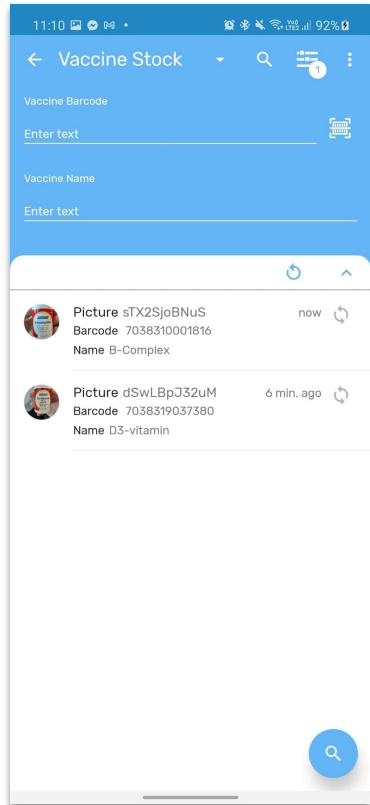
Facility	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
Panther Health Centre	2.3	4.4	3.8	3.2	2.4	
Leopard Health Centre	3.8	2.7	5.1	4.3	2.9	
Cheetah Health Centre	2.3	4.5	3.6	3.1	3.2	
Siamese Primary Health Centre	4.6	3.3	2.5	3.6	3.1	
Feral Primary Health Centre	4.7	3.4	3.4	0.1	0	
Pussy Dispensary	2.5	3.4	2.3	7	6	
Tiger Shark Health Centre	2.8	3.8	3.1	2.3	4.5	
Orangestriped triggerfish Health Centre	3.9	3.1	5.2	4.2	3.2	
Inyanga Primary Health Centre	3.3	2.3	2.3	4.9	3.6	
Viperfish Health Centre	7.9	6.8	5.7	4.9	3.6	
Knife-fish Hospital Gateway PHC	2.5	3.7	2.5	4.6	3	
Stingray Dispensary	2.7	1.9	1.5	2	2	
Sole Dispensary	2.5	3.4	2.5	2.6	3.7	
Hatchetfish Primary Health Centre	3.2	4.3	3.1	0.1	0	
Flounder Health Centre	4.3	3	2.9	4.2	3.3	
Mudsucker Private medical practice	2.6	5.5	3.3	5.2	3.7	
Pirate perch Health Centre	2.5	6.7	4.8	4.2	3.4	
Pêche Serra Hospital Gateway PHC	3.9	2.7	2.8	2.8	2.9	
Sunfish Health Centre	6.4	7.1	5.8	4.8	4.1	
Mosquitofish Health Centre	5.5	4.6	3.5	2.3	3.4	
Bloodsucker Primary Health Centre	2.3	2.4	4.6	0.3	0	
Knife-fish Health Centre	2.2	5.1	4.1	3	3.9	
Mullet Health Centre	3.2	2.3	4.4	3.4	2.4	
Killifish Primary Health Centre	5.2	4.7	3.5	3.3	2.3	
Salty Dog Dispensary	4.4	3.3	2.6	4.7	3.8	
Pilchard Health Centre	3.3	4.6	3.1	5.2	3.9	
Parrotfish Health Centre	6.5	5.4	4.4	3.2	3.3	

Average consumption by district

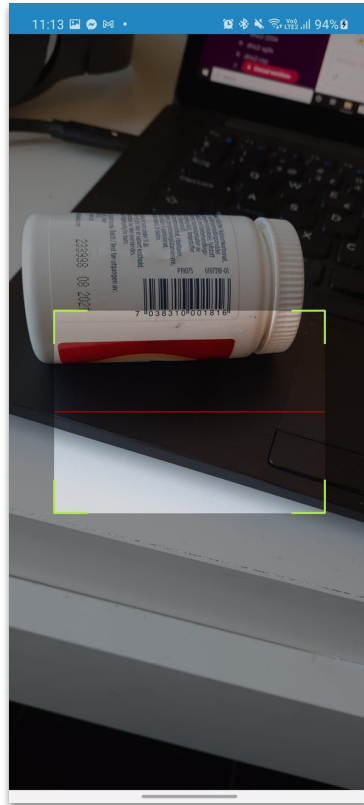


Supply chain reporting approaches at last-mile: facilities and community-based service delivery

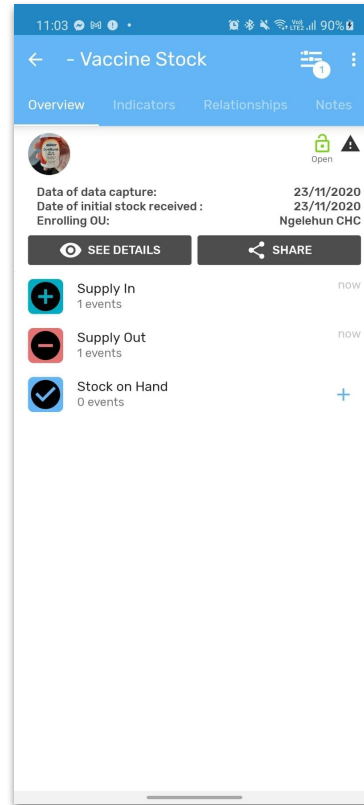
Example of vaccine catalog with DHIS2 Android App



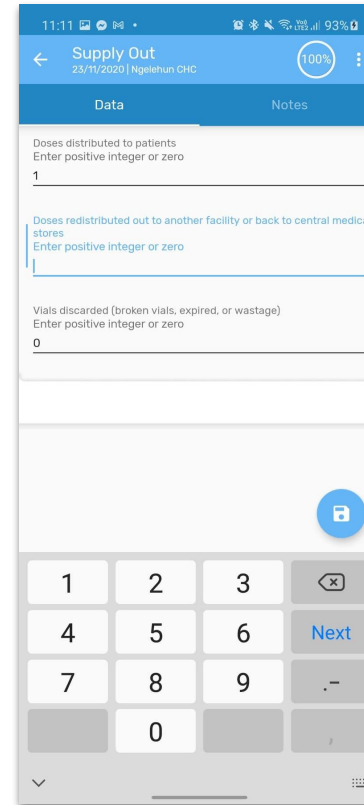
Product catalog
with pictures



Barcode search



Data entry



Supply out
reporting

Barcode enabled, ad hoc or routine capture of stock in, stock out and stock-on-hand

Automatic notifications for stock-outs and emergency resupply workflow support

On-the-fly indicators: average consumption, stock status per facility, lead time, stock-out days

Full offline support

COVID-19 Vaccine Registry



All DHIS2 modules are natively compatible with the DHIS2 Android Capture App (full offline support)

WHO Tracker Configuration Development Instance

[Back](#) National ID : 32548763 Family name : Frost This person is a health worker.

COVID-19 Vaccination Registry

Timeline Data Entry

2020-11-25
Cardinal Hospital Gate...
Patient History
(Completed)

2020-11-25
Cardinal Hospital Gate...
Vaccination
(Completed)

2020-11-25
Cardinal Hospital Gate...
Vaccination
(Completed)

Dose given on *
2020-11-25

Dose due date
2020-12-31

Eligibility

Has this patient been screened for eligibility? ☒ Yes ☐ No

Vaccination information

Vaccine typeCovax type 1

Dose number2nd dose

Date of dose expiration2022-03-10

Batch number for this dose09843593

Is this the last dose?☒ Yes ☐ No

Incomplete

Delete

Print form

11:05 4G TALE 79%

[←](#) Vaccination 100%
2020-11-25 | Cardinal Hospital Gateway

Details Notes

2 Vaccination information 5/5

Date of dose expiration
Choose date
2022-03-10

Batch number for this dose
Enter text
Tx 09843593

Is this the last dose?
☒ yes ☐ no

This person has one or more underlying conditions
(See patient history)

This person is a health worker.

DHIS2-powered travel certificates

CONTACTOS TRANSFERENCIAS **EXAMES**

Lista de pacientes submetidos a Exames

Pesquisar

OrgUnit	ID do Caso (gerado pelo sistema)	Sexo	Idade	Exames ↓
CS SMI	COVID19_0032014	Male	63	5
CS SMI	COVID19_0024654			

Detalhes de Caso de Índice
OrgUnit: CS SMI
ID do Caso (gerado pelo sistema): COVID19_0032014

Morada: Chao De Papel
Laboratório: Universidade Jean Piaget da Guiné-Bissau

Telefone de Pessoa a Contactar:
Responsável do laboratório:

Boletim de resultados

Amostra	Data da Colheita	Análise	Resultado	Data
Oropharyngeal swab		PCR	Positivo	18/06/2020

Validação Institucional
Validação técnica

Barcode

Print icons

MOH Disease Surveillance Department

COVID-19 TravelPASS

A. Demographic Information

Full Names	TEST TRUCK DRIVER
Nationality	KENYA
Date of Birth	1953-05-19
Passport No / NIN	777777777
Point of Entry No	8888888
Phone Number	0999999999
Next of KIN (Name)	TEST COMPANY
Next of KIN Phone No	9888888888

B. FirstTime Registration information

Point of Entry	1 TEST POE
Country of Departure	KENYA
Country of Destination	SOUTH SUDAN
Vehicle Registration Number	KXX555X
Date and time of entry	2020-05-18T09:35
Physical address in Uganda	KAMPALA, INDUSTRIAL AREA PLOT 46

C. COVID-19 Surveillance Information

Measured Temperature	Yes	COVID-19 TEST Results: Negative
Specimen taken	Yes	
Cleared to travel	Yes	

D. Approval

Approved by	Official Stamp	Malaba POE Incharge Turyagyenda Dennis 0772667596/0702667596 turyadennis@gmail.com
Date		
Approved by	Official Stamp	Busia POE Incharge Mr. Wabwire Tonny Fredrick 0772 883898/0756 883898
Date		
Approved by	Official Stamp	
Date		

Use cases in Rwanda, Uganda and Guinea Bissau for generating COVID-19 test certificates & travel passes for travelers.

Read more at: dhis2.org/covid-success-stories

Disclaimer: Data in screenshots are for demo purposes only; they do not represent real people nor real details

Adverse Events Following Immunization Tracker



AEFI reporting ID number:

REPORTING FORM FOR ADVERSE EVENTS FOLLOWING IMMUNIZATION (AEFI)

*Patient Name:

*Patient's full Address:

Telephone:

Sex: ☐ M ☐ F

*Date of birth : __/__/__

OR Age at onset: ☐ Years ☐ Months ☐ Days

OR Age Group at onset: ☐ <1 Year ☐ 1 to 5 Years ☐ >5 Years

*Reporter's Name:

Institution:

Designation & Department:

Address:

Telephone & E-mail:

Date patient notified event to health system: __/__/__

Today's date : __/__/__

Health facility (place or vaccination centre) name & address:									
Vaccine						Diluent (if applicable)			
*Name of vaccine	*Date of vaccination	*Time of vaccination	Dose (1 st , 2 nd , etc.)	*Batch /Lot number	Expiry date	Name of diluent	*Batch /Lot number	Expiry date	Date and time of reconstitution

*Adverse event(s):

☐ Severe local reaction ☐ >3 days ☐ beyond nearest joint

☐ Seizures ☐ febrile ☐ afebrile

☐ Abscess

☐ Sepsis

☐ Encephalopathy

☐ Toxic shock syndrome

☐ Thrombocytopenia

☐ Anaphylaxis

☐ Fever ≥38°C

☐ Other (specify).....

Date AEFI started : __/__/__

Time ____:____

Describe AEFI (Signs & Symptoms):

*Serious: Yes / No; ➡ If Yes ☐ Death ☐ Life threatening ☐ Persistent or significant disability ☐ Hospitalization ☐ Congenital anomaly

☐ Other important medical event (specify).....

*Outcome: ☐ Recovering ☐ Recovered ☐ Recovered with sequelae ☐ Not Recovered ☐ Unknown

☐ Died If Died, date of death : __/__/__ Autopsy done: ☐ Yes ☐ No ☐ Unknown

WHO Tracker Configuration Development Instance

2016-03-02

*Reporter's name:

Designation and Department:

Address:

Contact number:

E-mail:

Dr Celine

Paediatrician

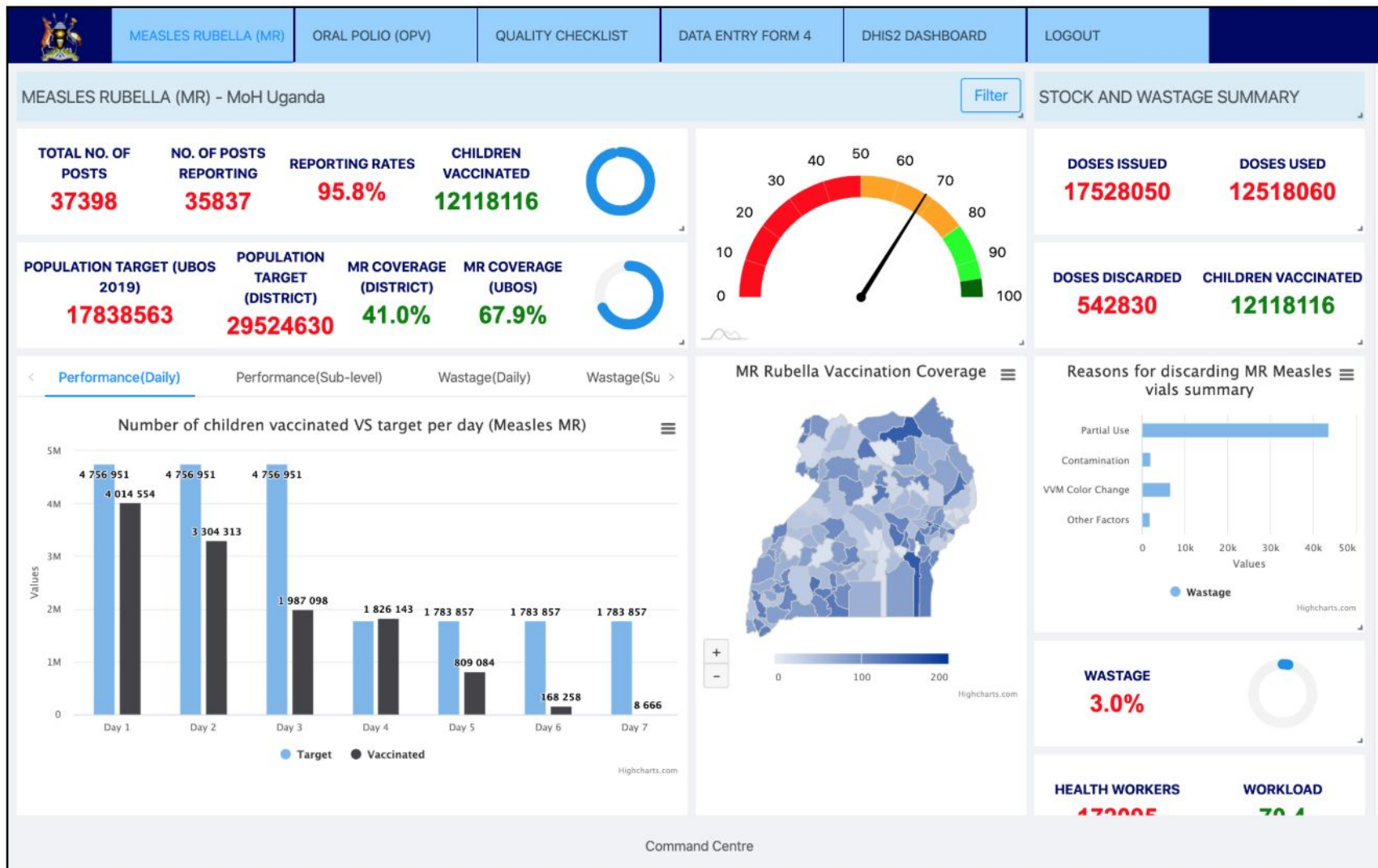
Dalmatian Private Hospital

+91 345 67 98 765

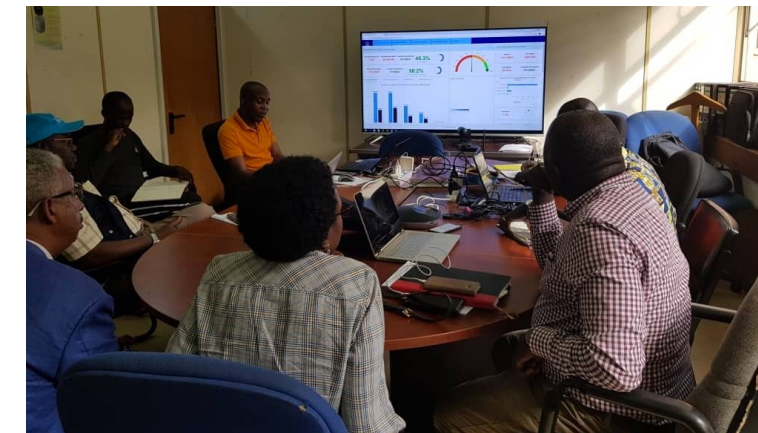
celine@cardinalmail.com

	Vaccine 1	Vaccine 2
*Name of the vaccine	Measles and Rubella vaccine × ▾	Select or search from the list ▾
Brand Name		
Other vaccines(specify)		
*Date of vaccination	2016-03-01	yyyy-MM-dd
*Time of vaccination	10:15	HH:MM
Dose(1st,2nd,etc.)	3 × ▾	Select or search from the list ▾
*Batch/Lot number	DER112CV 2015	
Expiry date	2018-11-01	yyyy-MM-dd
Diluent (if applicable)		
*Name of diluent	Khasrubel Diluent	
*Batch/Lot number	ASDF32123	
Expiry date	2018-09-01	yyyy-MM-dd
Date of reconstitution	2016-02-29	yyyy-MM-dd
Time of reconstitution	17:00	HH:MM

Immunization Campaign Monitoring



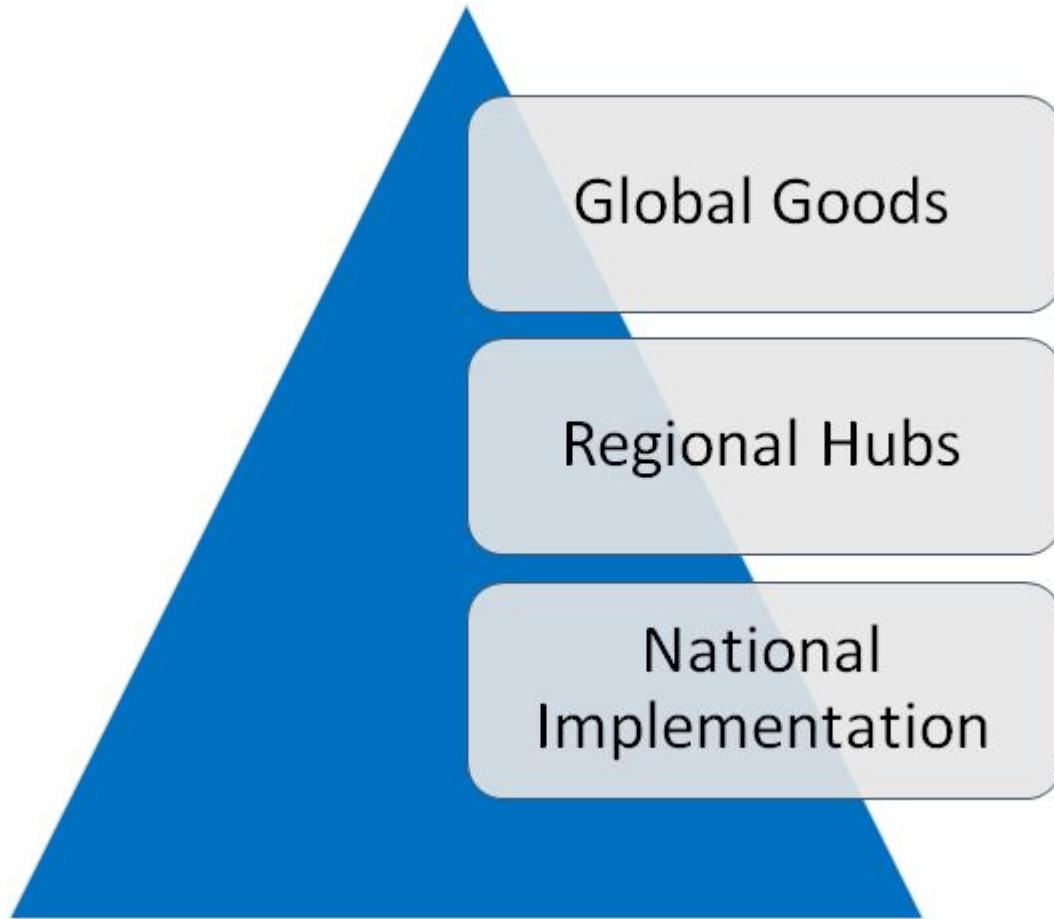
National Command Centre



District Command Centre



Operationalizing the toolkit for vaccine delivery



Expand WHO DHIS2 immunization toolkit for COVID-19 (installable metadata templates, update implementation guides, develop standard training materials).

Regional HISP groups provide technical assistance to MOH to locally adapt and integrate modules into existing DHIS2 based systems, host regional training academies, conduct training-of-trainers for national teams and support virtual learning activities.

Implement toolkit to local context; train and support end users; deploy local innovations; procure and maintain devices and infrastructure.

Planning for Country Implementation

Integration with existing DHIS2-based systems will achieve sustainability and cost efficiency by:

- Reducing barrier to entry/training required
- Re-using existing technology and infrastructure
- Leveraging MOH core HMIS team capacity for customization of the software/toolkit
- Working through existing immunization programme processes
- Reinforcing & strengthening overall data management & use for immunization programme

Illustrative Country Implementation Budget Guide

Basic Package (expansion of EPI facility vaccination & stock reporting)				
Package installation & customization	1 workshop	\$	12,000	\$ 12,000
Training of trainers	1 training	\$	12,000	\$ 12,000
Facility end user training	2000 users (1/2 day)	\$	33	\$ 66,000
Data use & analysis training	1 workshop	\$	12,000	\$ 12,000
Subtotal Basic Package				\$ 102,000
Enhanced packages (introduce Immunization Registry, Mass Campaign, AEFI tracker)				
Upgrade server & support	1 Server	\$	14,400	\$ 14,400
Package installation & customization	3 Workshops	\$	12,000	\$ 36,000
Field testing	1 Field test	\$	9,000	\$ 9,000
Training of trainers	1 training	\$	12,000	\$ 12,000
End user training	2000 users (1 day)	\$	66	\$ 132,000
Subtotal Enhanced Package				\$ 203,400
Innovation packages (electronic health certificate, interoperability solutions)				
Custom app design	1 application	\$	24,000	\$ 24,000
Interoperability TA	1 project	\$	19,000	\$ 19,000
Subtotal Innovation package				\$ 43,000
Add mobile deployment (if devices are not yet deployed)				
Devices	2000 devices	\$	150	\$ 300,000
Mobile device mgmt	2000 users	\$	12	\$ 24,000
Connectivity	2000 users	\$	20	\$ 40,000
Subtotal mobile device deployment				\$ 364,000

See DHIS2 [Implementation Guide](#), [Tracker Implementation Guide](#) and [Android Implementation Guide](#) for more info.

Thank you! Stay in touch

- For more information:
 - dhis2.org/covid-vaccine-delivery
 - Community of Practice: community.dhis2.org
 - Contact: covid@dhis2.org
- Planning for DHIS2 to support national delivery & vaccination plans
 - Contact regional HISP or covid@dhis2.org with questions about country-specific plans for DHIS2