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

University of Oslo
Health Information Systems Programme (HISP)
November 2020
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)
<table>
<thead>
<tr>
<th>01</th>
<th>Measure uptake, coverage &amp; equitable distribution over time, by geography and across risk groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>Supply chain readiness &amp; traceability of vaccines down to points of service delivery</td>
</tr>
<tr>
<td>03</td>
<td>Ensure that individuals can be monitored for the full course of multi-dose regimen</td>
</tr>
<tr>
<td>04</td>
<td>Provide a personal vaccination record/certificate</td>
</tr>
<tr>
<td>05</td>
<td>Multiple distribution strategies; novel &amp; innovative distribution approaches</td>
</tr>
<tr>
<td>06</td>
<td>Vaccine safety monitoring</td>
</tr>
</tbody>
</table>

**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

**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

**Immunization eRegistry** for longitudinal tracking & follow up of individuals
- DHIS2-based IER deployed at national scale in Rwanda and Ghana

**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

**Mass campaigns & supplemental immunization activities monitoring** adapted for COVID-19 distribution strategies
- Uganda national MR campaign (2019); Bangladesh MR campaign (ongoing)

**Adverse Events Following Immunization (AEFI) Tracker**: WHO approved
- Buy-in from AFRO to support national system strengthening for vaccine safety with DHIS2

**Vaccine safety monitoring**
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

Visit our interactive demo at: https://who-demos.dhis2.org/demo
Supply Chain: Facility level visualization

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

Stock status by month

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

- 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

Product catalog with pictures  
Barcode search  
Data entry  
Supply out reporting
COVID-19 Vaccine Registry

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

- Developed based on stage 3 of the CBS program of the DHIS2 COVID19 package
- Extended the Index case app to add the list of exams
- PDF files with digital signatures and barcodes are generated by health professionals

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
### Reporting Form for Adverse Events Following Immunization (AEFI)

**Patient Name:**

**Patient's Full Address:**

**Date of birth:** __/__/___

**Gender:** M □ F □

**Telephone:**

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

**Today’s date:** __/__/___

### Health facility (place or vaccination centre) name & address:

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Diluent (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Date of vaccination</td>
</tr>
</tbody>
</table>

**Adverse event(s):**

- [ ] Severe local reaction □ > 3 days □ beyond 24 hours
- [ ] Seizure □ convulsion □ convulsion
- [ ] Acute febrile reaction
- [ ] Allergic reaction
- [ ] Other (specify) ____________________________________________

**Other vaccines (specify):**

**Brand Name:**

**Date of vaccination:** __/__/___

**Time of vaccination:** __:__

**Dose (1st, 2nd, etc.):** __

**Batch/Lot number:**

**Expiry date:** __/__/___

**Place:**

**Contact number:**

**Email:**

---

### WHO Tracker Configuration Development Instance

**2016-03-02**

**Reporter's name:**

**Designation and Department:**

**Address:**

**Contact number:** +91 345 67 98 765

**E-mail:** celine@cardinalmail.com

<table>
<thead>
<tr>
<th>Vaccine 1</th>
<th>Vaccine 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles and Rubella vaccine</td>
<td>Select or search from the list</td>
</tr>
</tbody>
</table>

**Brand Name:**

**Date of vaccination:** __/__/___

**Time of vaccination:** __:__

**Dose (1st, 2nd, etc.):** __

**Batch/Lot number:**

**Expiry date:** __/__/___

**Place:**

**Contact number:**

**Email:**

---

### Other events:

**Serious Yes/No:** □ Yes □ No

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

**Other important medical event (specify):** ____________________________________________

---

**Date of death:** __/__/___

**Time of death:** __:__

**Time of reconstitution:** __:__

**Place:**

**Date of reconstitution:** __/__/___

**Expiry date:** __/__/___

**Place:**

---
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

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