Welcome to the World Bank's SAR COVID-19 vaccination strategy workshop series

We will be starting shortly

Here are some ways to engage with us today

We want to hear from you;
- If you have questions or comments to share during the presentation, please share your thoughts using the Zoom chat feature
- Our team will monitor the questions and share them with the presenters to address immediately or when they get to the appropriate topic

At the end, there will be a short Q&A session where you can raise outstanding questions

Thank you for your engagement and participation!
Workshop 4: Digitalizing covid-19 vaccination
Initial series of five workshops to address critical COVID-19 vaccination topics

1. Feb. 22: Intro & potential vaccination scenarios
3. Mar. 8: Demand management
5. Mar. 22: Procurement and regulatory best practices

Additional topics to be covered in future workshops

Today’s workshop
Objectives for today

- Discuss role of **digital in end-to-end vaccine delivery** roll out incl. consideration for equity and inclusion
- Share learnings from **Co-WIN platform** roll out in India
- Engage in **dialogue with regional experts on emerging challenges** being faced by countries in digitizing vaccine distribution
# AGENDA

Welcome remarks & objectives  
Ajay Tandon  
5 mins

| Part 1: Session 1 – Digital enablers for vaccine delivery | Marie Eichholtzer  
Matthew Husle | 30 mins |
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<tbody>
<tr>
<td>Part 1: Session 2 – CoWIN learnings from India</td>
<td>Vikas Sheel</td>
<td>15 mins</td>
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<tr>
<td>Q&amp;A Part 1</td>
<td>Ajay Tandon</td>
<td>5 mins</td>
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<tr>
<td>Part 2: Leadership Panel:</td>
<td>Learnings from digitization of vaccine roll-out</td>
<td>30 mins</td>
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<tr>
<td>Closing Remarks</td>
<td>Gail Richardson</td>
<td>5 mins</td>
</tr>
</tbody>
</table>
Part 1: Session 1
Digital enablers for vaccine delivery

Marie Eichholtzer
Digital development specialist (ID4D)
The World Bank

Matthew Hulse
Senior Systems Architect (Digital health)
The World Bank
A cross-GPs collaboration

Digital Development
Marie Eichholtzer

Digital Development
Siddhartha Raja

Health, Nutrition, and Population
Matthew Hulse

Transport
Tatiana Peralta Quiros

Technology and Innovation Lab
Stela Mocan
Seema Angiras
Rachel Halsema
Digital journey and platforms

DIGITAL ENABLERS FOR VACCINE DELIVERY
COVID19 Vaccines Delivery Management: Problems to Solve

The following represent some of the challenges we understand the Governments in SAR countries are facing as part of its COVID-19 response, in the context of their larger digitization efforts.

- Ensuring transparency and equity in vaccine distribution and digital health response
- Ability to Securely and Consistently Aggregate and Share Health Data to Drive Decisions
- Building resilience in government ministries for a long-term digital response for recovery
- Ensuring robust digital skills to match the pace of digital technology adoption
- User experience that is appropriate and compelling for the SAR countries context
- Ensuring proactive and responsive cybersecurity
Digital Vaccine Delivery Stakeholders

End users & Advocates
- Patients
- Health-care & other professionals
- Patient Advocates & Caregivers

Healthcare Providers
- Pharmacies
- Private providers
- Public providers
- Human resources
- Labs

Technology Structures
- Local Aggregators
- Telecomm Operators
- Utilities & Power Solutions
- Internet Service Providers
- Digital Health Service Providers

Non-Governmental Funding Sources
- Start-ups
- Donors & partners
- Insurers
- Investors

Non-Governmental Organizations
- Universities & research institutions
- Local NGO's (CSO's)
- International NGO's (WHO)

Non-Governmental Organizations
- Software as a Service Companies
- Commercial Off-the-Shelf Software Companies
- Custom Software Developers
- Hardware Companies
- Other Private vendors
- Open Source Software Communities

Ministry of Health
- Ministry of Health Digital Health Leadership Committee
- Management & operations Teams for DH platform
- IT Departments

Supply Chain & Logistics
- Suppliers
- Manufacturers
- Warehouses
- Supply Chain Management
- Ports
Digital solutions will play across the vaccine delivery lifecycle

**Planning and Management**
- **Prioritization**: Use of existing databases to identify eligible beneficiaries for first vaccinations. Geospatial information systems optimize outreach.

**Supply and distribution**
- **Supply Chain**: Manage the supply chain and local demand to ensure a smooth distribution of the vaccine throughout the territory and limit wastage.

**Program Delivery**
- **Mass communication**: Use of digital tools for community engagement and to inform about the campaigns & prioritization strategy, and monitoring of social media.
- **Registration**: Tools facilitating the scheduling and reminders for appointment as well as verification of beneficiaries’ eligibility for each phase of the program.

**Functions**
- **Analytics**: Set-up of tools for monitoring and evaluation supporting the performance management of the campaign.
- **Cold Chain**: Control the cold chain of vaccines that is critical for some of the first approved vaccines requiring very low storage temperatures.
- **Records & Certificates**: Set-up of immunization records, tracking type of vaccine received, date, and linking with patient identity. Provide verifiable evidence of vaccination status.
- **Trainings**: Training of health workers to deliver the vaccine doses (e.g., vaccine preparation protocols, verification of medical history, monitoring of adverse effects).
- **Monitoring**: Adapting surveillance systems to conduct surveillance of events attributable to vaccination and effectiveness of the immunization.
- **Smart Waste Management**: To address altered global waste, countries will require smart strategies and disinfection technology for biomedical waste, plastic waste etc.
User journey: Prioritization of recipients & mass communication

Prioritization & Mass communication

The **limited supply** of vaccines means that countries must prioritize recipients.

One or more approach possible:
- Use of national **registries** and existing ID systems
- **Aggregation** of lists
- **Self declaration** by the candidates followed by verifications

Mass Communication (TV, radios, newspapers, social media, websites, municipalities)

User informed via mail, mobile app, email or SMS

Possibility to check eligibility or pre-register
User journey: Scheduling

Scheduling
- Countries may use GIS to ensure that all communities are covered in the country
- Recipients might be proactively invited to mobile campaigns
- Recipients may either book their two appointments in advance or schedule one after the other, with or without reminders
- Remote authentication using Digital ID might be used

Verification of eligibility
Check-in at the point of care
Interoperability of records
Dashboarding and dynamic supply management
Reminders

Scheduling by online website, SMS, Phone
User journey: Vaccination certificates

**Certificates**

1. Paper
2. Verifiable paper (QR code)
3. Digital

- Emerging data and interoperability **standards** (e.g. W3C, WHO, VCI, Commons, IATA)
- Exception handling needed for **equity** (e.g. for people who cannot get vaccinated or without a phone)
- **Policy/ethical/scientific questions** about what certificates should be required for and the extent of immunity are pending
Vaccine journey: Managing supply chain from long-haul to point of administration

Port of Entry and Long-Haul Transportation:
- Handling, Transloading, Clearance processes
- Temperature long haul through the transportation network

Distribution and Storage through Transport Network:
- Temperature controlled transport to and storage at strategic vaccine storage hubs
- Temperature controlled transport to point of vaccination (last mile)
- Sensors for temperature control

Points of Final Administration:
- Well-functioning last mile supply chain of vaccine and other specialized equipment
- Temperature controlled vaccine storage at point of administration
- Tracking of and follow up with individuals
Electronic logistics management information systems can leverage mobile and cloud-based technology to capture real-time data across the entire vaccine cold chain, from the zonal store depots to the last-mile health facilities and administration.

1. **Connection with global, real time data** on supply chain, sourcing and distribution network (eg. ONE Source)
2. **Mobile phone application** that allows cold chain handlers to report data on vaccine stocks, consumption and movement
3. **SIM-enabled temperature loggers attached to cold chain equipment** and warehouse monitoring (particularly important in cold and ultra-cold chain delivery)
4. **Data stored in a cloud server** that provides **web-based dashboards and data analytics** for technicians, program managers, and policymakers to view the information in real time.
Proposed blockchain system for transparent COVID-19 vaccine tracking, distribution monitoring and administration

Frontier technologies (Artificial Intelligence, Blockchain, IoT, Edge computing etc.) can help address COVID 19 Vaccine distribution, Viz:

- How much vaccine to ship where and when? (A.I – ML can help in predication and forecasting)
- Monitoring and addressing challenges with the distribution across the network. (drug manufacturers, courier companies, hospitals and pharmacies, and even various branches of government pharma companies involved in the COVID 19 supply chain). Blockchain /DLT could provide a trusted, secure, and verifiable record of every vial of vaccine and real time records of beneficiaries registered for vaccination and/or vaccinated.
- IoT sensor devices could help in continuously monitoring the vaccine delivery, storage and handling.
Digital Technologies Considerations for COVID-19 Response

The Challenge
How might we leverage appropriate suite of conventional and emerging technologies that can empower the governments in SAR countries to address the COVID-19 pandemic and prepare for future healthcare challenges with a robust, interoperable, and future-ready digital response?

Problems to Solve
- Barriers to secure, multi-party data sharing to enhance COVID-19 surveillance
- Tracking the Vaccination Response
- Ensuring secure and trustworthy supply chains and associated data flows
- Ensuring equity in healthcare responses
- Planning for a geographically segmented government digital response
- Enabling young entrepreneurs and technologists to suggest their own approaches

Technology Trends
- Secure Multi-Party Computation (source)
- Data Science (source); Machine Learning (source)
- Digital Vaccination Passports (source)
- QR Codes (source)
- Blockchain & DLT (source)
- Mathematical models to build equity in vaccine distribution (source)
- Geospatial technologies for immunization coverage, program planning and outcomes (source)
- Open source projects (source)
- Citizen Scientists (source)

Essential Enablers & Building Blocks
- Digitized Records
- Digital Identity
- Digital Skills (e.g. Cybersecurity)
- Interoperability
- Cloud
- User Experience
An Architecture Approach in Digital Health for Vaccine Delivery
### Fragmentation Leads to Reduced Health Impact

The most common way people think of digital health is by thinking about the software application.

<table>
<thead>
<tr>
<th>Planning</th>
<th>Service Delivery</th>
<th>Financing</th>
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<tbody>
<tr>
<td>Insufficiently and inconsistently driven by data</td>
<td>Ineffective and inefficient services</td>
<td>Short term waste due to development and maintenance costs of parallel systems</td>
</tr>
<tr>
<td>Misallocation of health resources</td>
<td>Inability to address performance challenges</td>
<td>Long term waste due to the difficulty of legacy integration of existing unplanned systems</td>
</tr>
<tr>
<td>Poor targeting and under-performance of health programs</td>
<td>Overlapping and inconsistent training and increased burden on health workforce</td>
<td>Shortages in support for the platforms that do exist</td>
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<tr>
<td>Inability to scale and sustain platforms</td>
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Section 4: Challenges with the Current Paradigm
Integration is two applications directly exchanging information, often involving one or both systems needing to be changed to exchange the information.

Interoperability is a way that multiple applications can exchange information without changing the actual application, often through the aid of standards and middleware such as health information exchange (HIE).

Peer to Peer Models Introduce Complexity

If everything is 'integrated', we must:
- Share supply lists
- Share facility lists
- Share stock levels
Reference Architecture Approach: Open Health Information Exchange
Source: https://ohie.org/#arch

LACChain Blueprint for a Transparency Platform for COVID-19 Immunization Management

Optimizing for 3 Pillars of the Proposed Solution:
Efficiency, Prioritization, Transparency

Digital inclusion and equity in the context of vaccine delivery
How might weak digital inclusion or possible exclusion influence vaccine delivery?

“I’m not really good at surfing websites -- my eyesight isn’t that great”
- Male (71, Washington), unable to schedule a vaccination appointment

“My husband got the appointment only because his computer-savvy daughter helped. When you Google something, you get a whole page full of things you can click on, and nothing ever tells you to schedule an appointment, so I get discouraged”
- Female (76, Florida)
Digital divides remain and could exacerbate delivery gaps

ICT access by population

- Total global population: ~7.4 Billion
- Within mobile coverage: 7 billion
- Mobile phones: 5.2 billion
- Total Internet Users: 3.2 billion
- High-speed Internet: 1.1 billion

E-government Development Index (EGDI)


Not everywhere is connected

Rural and remote areas are less likely to be connected to high-speed telecom networks.

The disparities between urban and rural areas become starker in LICs and MICs.

Public offices and facilities often face similar divides.

Maps of GSM, 3G, and LTE coverage sourced from GSMA, 2020
### Digital enablers and “safeguards”: So that solutions work, where and when needed

<table>
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<tr>
<th><strong>Inclusion</strong></th>
<th><strong>Capacity</strong></th>
<th><strong>Trust</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Challenge:</strong></td>
<td><strong>Challenge:</strong></td>
<td><strong>Challenge:</strong></td>
</tr>
<tr>
<td>• Not everywhere is connected, and not everyone is connected</td>
<td>• Weak digital literacy risks among health workers and public</td>
<td>• Weak data protection and privacy</td>
</tr>
<tr>
<td>• Possible biases in design of prioritization protocols, in distribution mechanisms</td>
<td>• Limited IT skills might hamper reliability of digital systems</td>
<td>• Immature cybersecurity protections</td>
</tr>
<tr>
<td>• Limited institutional capacity for integrated solutions</td>
<td>• Limited institutional capacity for integrated solutions</td>
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<tr>
<td><strong>Responses:</strong></td>
<td><strong>Responses:</strong></td>
<td><strong>Responses:</strong></td>
</tr>
<tr>
<td>• Rapid responses to close connectivity gaps where possible</td>
<td>• Design for simplicity</td>
<td>• Balancing privacy and data protection with using data for delivery planning and management</td>
</tr>
<tr>
<td>• Support basic tools that can work almost everywhere</td>
<td>• Use digital media and community resources/networks where possible to train and inform</td>
<td>• Assess and improve cybersecurity maturity</td>
</tr>
<tr>
<td>• Advise on the use of ethical AI and on auditing algorithms</td>
<td>• Draw on local private sector, civil society resources</td>
<td>• Deploy system-specific safeguards where the broader approaches might take time to address</td>
</tr>
<tr>
<td>• Supplement electronic networks with human networks</td>
<td>• Advise on IT procurement approaches</td>
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The Enabling Environment

- Leadership and Governance
- Services and Applications
- Standards and Interoperability
- Infrastructure
- Legislation, Policy, and Compliance
- Workforce
## Vaccine Platform Context: The Enabling Environment

<table>
<thead>
<tr>
<th>Question</th>
<th>Details</th>
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<tbody>
<tr>
<td>Who are the champions for a digital vaccination platform approach?</td>
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<tr>
<td>What governance bodies are in place for managing a digital platform approach?</td>
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<tr>
<td>Who will implement, use and maintain the technology?</td>
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<tr>
<td>What is the culture in your client’s country or organization for technology use and data sharing?</td>
<td></td>
</tr>
<tr>
<td>Are there financing arrangements that can be leveraged to invest in a unified platform?</td>
<td>What are the short–medium- and long-term financial costs of implementation and maintenance?</td>
</tr>
<tr>
<td>Are applications deployed in country currently using standards?</td>
<td>What global standards would be useful to develop policies around?</td>
</tr>
<tr>
<td>What is the culture in your client’s country or organization for technology use and data sharing?</td>
<td></td>
</tr>
<tr>
<td>Are there ethical concerns to the use of the technology or the data generated by it?</td>
<td>What is the best way to include donors?</td>
</tr>
<tr>
<td>How reliable is the national electricity grid system?</td>
<td>What areas of the country are connected to internet?</td>
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<tr>
<td>What areas of the country are connected to internet?</td>
<td>What is needed to use the technology?</td>
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<tr>
<td>What areas of the country are connected to internet?</td>
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<tr>
<td>What areas of the country are connected to internet?</td>
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- Source: National eHealth Strategy Toolkit + Additional Digital Technology questions for evaluating digital readiness of the Country
Seven Strategies to Better Engage with Data

These questions can help Ministry of Health officials better frame how to act on each data use strategy.

1. **Conversations over data**
   How can we better create structures to facilitate these conversations?

2. **Design for mid-level managers**
   Who are the actors within the information value chain who can drive data use?

3. **Use before quality**
   How do we show why improving and increasing data use is important?

4. **Together, from the bottom, over time**
   How do we choose indicators with the health workers themselves?

5. **Make it formal and integrated with current workflows**
   How can data use support how the health worker currently does their job?

6. **Accountability is not use**
   How can we create a culture around transparency and accuracy?

7. **Accounting for safety, security and privacy**
   - Does the technology have a privacy policy for any data gathered?
   - Who will have access to the data?
   - How will data security be managed including in the event of a breach? How will data be recovered in the event of loss?
Part 1: Session 2
Co-WIN learnings from India

Vikas Sheel
Joint Secretary, Ministry of Health & Family Welfare, Govt. of India
Co-WIN
(Winning Over COVID)
Digital Platform for COVID-19 Vaccine Delivery
The COVID-19 pandemic has posed an unprecedented challenge to the global community.

Our resilient health systems, tireless efforts of COVID warriors and active participation of the citizens; India has successfully limited the impact of the Pandemic.

With the possibility of a safe and effective vaccine for COVID-19 being available in the beginning of 2021, the Government of India had started preparations for roll-out of World’s largest vaccination drive, as early as June 2020.

The aim was to develop a system to track the vaccine delivery and administration, registration of beneficiaries, session planning and real time monitoring of vaccination.
• Co-WIN (COVID-19 Vaccine Intelligence Network) has been developed as an extension of the existing electronic Vaccine Intelligence Network (eVIN).

• It is a comprehensive cloud-based IT solution for planning, implementation, monitoring, and evaluation of COVID-19 vaccination in India.

• The Co-WIN system is an end-to-end solution that has utilities for the entire public health system from national up to the vaccinator level.
Co-WIN Vaccine Delivery Management System

Existing Logistics Management & Realtime Remote Temperature Monitoring Implemented across more 28,000 cold chain points Catering to 26 million infants and 30 million pregnant women every year.

CoWIN MODULES

- Beneficiary Vaccination
- Session Allocation
- Beneficiary registration
- COVID Vaccination Center
- Vaccine Carrier

- Beneficiary acknowledgement
- Unique Health ID
- QR Code based Certificate
- AEFI Reporting

Dashboard & Reports
Co-WIN – Made in India for the World

- Automated Session Planning
- Aadhaar authentication to prevent malpractice
- Creation of Unique Health ID for willing beneficiaries
- Reporting & tracking of Adverse Events Following Immunization, if any
- SMS’s to guide beneficiaries & vaccinators via the entire process
- QR code-based vaccination certificate issued after all doses
- DigiLocker integrated for data retrieval & storing QR code-based certificate
- 24x7 Helpline including IT professionals
- CHAT BOT with pattern recognition to help navigate the portal
- Self Registration for General Population allows for online appointment booking in the CVCs nearest to their location
- Multiple Dry runs conducted for field testing of software at various stages of development
- Training using IT based platforms like ECHO
• The Co-WIN 1.0 was launched and along with the COVID19 vaccination drive by the Hon’ble Prime Minister on 16th January 2021.

• Co-WIN 1.0 aimed to cover the following priority groups (COVID Warriors) –
  
  • Health Care Workers (HCWs)
  
  • Front Line Workers (FLWs) - Other Government functionaries engaged in COVID containment.

• The database for the HCWs and FLWs was pre-populated in the Co-WIN portal using bulk upload utility.

• The pre-registered HCWs and FLWs were then enlisted for vaccination in pre-defined session sites using the session planning module in Co-WIN portal
Creation of Co-WIN 1.0 Database for HCWs and FLWs

- **Health Care Workers (HCW)**
  - Data from 21 Central Ministries/States & UTs

- **Frontline Workers (FLW)**
  - Vaccinators from States & UTs
  - Session Sites & Facilities from 21 Central Ministries/State & UTs

- **Vaccinators**
  - Front Line Workers data from MHA & MoHUA
Key Achievements of Co-WIN 1.0

• Nearly 8.8 Million HCWs and 9.4 Million FLWs were registered

• By 28th Feb 2021 6.8 million HCWs and FLWs partially vaccinated (first dose) and 2.4 Million were fully vaccinated (first and second dose)

• Thus, a total of 11.7 million doses were administered within 45 days
Co-WIN 2.0 – Coverage of citizens

• Vulnerable population targeted through age appropriate priority groups.
  • All citizens aged > 60 years.
  • 45-59 years with any of the specified co-morbidities.

• Launched on 1\textsuperscript{st} of March 2021.

• More than 10 million doses administered in 10 days.

• 7.16 million citizens registered.

• Almost all those registered could get an appointment on the same day.
Co-WIN 2.0 – Key Modules for District Admin & Facility Managers

Registration of COVID Vaccination Centres

- Create Vaccination Center

Hospital Details

- Name of the Vaccination Center
- Category
- Hospital ID (NIN/PMJAY/CGHS)

Type

Address Details

- State/UT
- District
- Address
- Pincode

Updating Geo-Location of CVCs

- Update Geo Location

Session Planning for 1st and 2nd dose and deciding slots

Manage Session

Vaccination Center - A And U Tibbia College DH, Karol Bagh, New Delhi-5

By default, when you create the session, your session will be created successfully. To publish online, click the Publish Slots Online within the Action panel.

- Date
- 2nd Dose Date
- Start Time
- End Time
- Capacity
- Online%

Adding Vaccinators and Verifiers to CVCs

Staff Duty

- Name
- Mobile Number
- Role
- Center Name

A.A.KARLE 8275455225 Vaccinator Jaitapur Phc
A.L.Bansode 9767220290 Vaccinator Sirsala PHC
B. R.Kulkarni 9359157280 Vaccinator Chincholemai PHC
B.S.Shahk 8606027610 Vaccinator Ashtl RH
Co-WIN 2.0 – Key Modules for General Citizens

**Registration For Vaccination**

Register or Login for Vaccination
We will send you a One Time Password on your phone number

Enter Mobile Number

**Scheduling of Appointment**

Search

**Confirmation SMSs**

Dear Ram Kumar, you are successfully registered for COVID vaccination. Ref. ID: 7142463491848. Helpline 1075, cowin.gov.in

Dear Ram Kumar, vaccination is scheduled for 13-03-2021 FORENOON at CGHS Rajouri Garden PHC . - CoWIN

**Download Certificate post vaccination**

Neerja Rajkumar | Female
Year of Birth: 1949  Photo ID: Aadhaar Card
Dose 1: Vaccinated  
Dose 2: Not Scheduled

ID Number: X0XX-5255

**Re-scheduling and Cancellation of Appointment**

Ram Kumar | Male
Year of Birth: 1952  Photo ID: Aadhaar Card
Dose 1: Scheduled
Dose 2: Not Scheduled

ID Number: X0XX-9965

Reschedule  Appointment Slip
Co-WIN 2.0 – Key Modules for Verifier and Vaccinator

Verification using Aadhaar or other photo id types

Verification using Aadhaar

- Biometric - eKYC
- OTP - eKYC
- Demographic Auth

Capting of Picture of beneficiary and his/her phot ID for verification

Confirmation of Vaccination

Successfully Vaccinated
Vaccine Name: COVISHIELD
Batch: 41202014
Date & Time: Mar 12, 2021, 02:23 PM

Download and print certificate on the spot post vaccination

Session: Mar 12, 2021 | 9:00 AM - 6:00 PM
Search By Mobile/Recipient ID

Name | Mobile | Id Proof | Id Number | Dose |
-- | -- | -- | -- | -- |
Dina Hajara | *****0698 | Aadhaar Card | *****2612 | 1 |
## Key Achievements of Co-WIN 2.0 – Registrations

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<tr>
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<th>Onspot Registered</th>
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<td><strong>Grand Total</strong></td>
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### Key Achievements of Co-WIN 2.0 – CVC Planning

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Total Online appointment slots – 14034561
Total On spot Registration slots – 20273021
### Key Achievements of Co-WIN 2.0 – Vaccinations

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<th>At Pvt Sites</th>
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• Total Vaccine Dose Administered – 25 million
  • Dose 1 – 20 million
  • Dose 2 – 5 million

• Total Vaccination Centres – 71,009

• Total session – 1.3 million
Q & A
Part 1
Part 2: Leadership panel
Learnings from digitization of vaccine roll-out
Introducing our esteemed panelists and the moderator

Dr. Manish Pant
Chief, Health and Development
UNDP India

Prof. Khondaker A. Mamun
Founder and President
CMED Health, Bangladesh

CK Cheruvettolil
Senior strategy officer
Innovative technology solutions, BMGF

Seema Angiras
IT officer
The World Bank

Moderated By:

Vyjayanti Desai
Practice manager
ID4D and G2Px, The World Bank
Key topics for discussion today

1. Early learnings, challenges and success stories in the vaccine roll out and role of technology in supporting the process

2. How can digital solutions be leveraged to provide equitable access to population across the country

3. How can innovative digital solutions developed for covid vaccination be used for solving post pandemic health problems

4. What role can global health organization play in helping countries in digital journey
Leadership Panel | Key questions to panelist

- **Dr. Manish Pant, UNDP:** You have been involved in digitizing India’s vaccine supply chain through eVIN and have now seen its transition to Cowin. What have been some learnings from India, which other countries can leverage in digitizing the vaccine supply chain as well as the beneficiary journey?

- **Prof. Mamun, Bangladesh:** There have been significant investments in Bangladesh in digital solutions for broader Covid-19 response including vaccination. What is your view to ensure that these systems and tech can be leveraged post Covid-19 for broader health system strengthening?

- **CK, Gates foundation:** How should countries think about leveraging digital solutions to provide equitable access to population e.g. remote terrains, rural areas, population with low literacy? How is Gates foundation planning to help countries in digitizing Covid-19 vaccinations?

- **Seema, World Bank:** In your view, what have been some global learnings from digitizing Covid-19 vaccine rollouts? What have been some early challenges and success factors in the roll-out journey of countries? What is the World Bank’s role in assisting its clients?
Closing Remarks

E. Gail Richardson
Practice Manager
Health, nutrition and population global practice
SAR, The World Bank
Thank you for joining the third workshop in our World Bank SAR COVID-19 Vaccine Strategy Workshop Series

The next workshop will take place on Monday March 22 at the same time. Key topics:
• Procurement landscape overview and key learnings
• Considerations for portfolio design
• Managing regulatory hurdles and indemnification

If you have not already, please RSVP at https://www.113.vovici.net/se/13B2588B3F19B167
Annex
Key considerations for Covid-19 Vaccine Delivery

- Crises always attract many potential technology solutions
- Each solution solves at least one aspect of the vaccine delivery lifecycle for COVID-19 and some might overlap
- Countries are under time pressure to plan, budget and procure such systems in time for the start of the vaccination campaigns
- Today’s investment may lay foundations for the improvement of the health digital infrastructure of the country in the long term
- Must ensure that data protection, cybersecurity and inclusion safeguards are in place
Digitizing Health Service Delivery: Design Priorities

The Opportunity
How might we take advantage of digital and emerging technologies in selective areas to complement existing and proven infrastructure for vaccine deployment? How might we deliver what is easiest to do, with the highest benefits?

1. Open APIs - Prioritize technologies for distribution tracking, considering the use of Open APIs

2. Adjacent skillsets – Consider leveraging adjacent skillsets to medicine (e.g. military logisticians, sports logisticians) to assist in logistical planning and execution

1. Aggregation – Tackle the fragmentation challenge by creating a compelling vision to refocus on the data aggregation challenge, with simple metrics for citizens to see progress by region, according to priority status within the vaccination framework, vaccine availability / distribution status, etc.

2. AI / ML – Consider XAI / ML for select use cases, such as forecasting.

1. Multimodal – Adopt a user-centered strategy for communicating the latest vaccine information to citizens, segmented by their technological availability and awareness (e.g. radio vs. SMS vs. Corona BD app)

2. Cybersecurity – Run bug bounties for citizen-facing apps to root out potential challenges; engage in third-party code verifications to identify and remediate vulnerabilities

https://s3-eu-west-1.amazonaws.com/content.dhis2.org/Publications/DHIS2+Tools+for+COVID-19+%5BPublic+Webinar+12-02-2020%5D.pdf
### Deploying Solutions, Enablers & Safeguards

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<th>Enablers</th>
<th>Safeguards</th>
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<td><strong>Open Source</strong> (Global Public Good)</td>
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<td><strong>Data protection &amp; privacy</strong></td>
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<tr>
<td><strong>Country developed</strong></td>
<td><strong>Registries &amp; Digital ID</strong></td>
<td><strong>Cybersecurity</strong></td>
</tr>
<tr>
<td><strong>Commercial product</strong></td>
<td><strong>Connectivity &amp; digital infrastructure</strong></td>
<td><strong>Digital inclusion</strong></td>
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<tr>
<td>(company owns IPs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Skills</strong></td>
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- **Installed in country**
- **As a service (Cloud)**
User journey: Pharmacovigilance & monitoring

Reporting of adverse effects & Monitoring effectiveness

• COVID-19 vaccines are **new** to the market and all adverse effects are not yet known
• Important to be able to **adapt the guidance** to vaccinators as more information becomes available
• Recipient should be able to **notify reactions** after the 30min immediate monitoring

AEFI monitoring and notification
LACChain is being leveraged for Transparency Platform for COVID-19 immunization management. Here are few details:

- Mockup- tracking and trace webapp: [https://www.figma.com/protoc9mKG1y9GdX8T5i3qszUDo/Plataforma-de-distribuci%C3%B3n-WEB?scaling=contain&node-id=2%3A3A2](https://www.figma.com/protoc9mKG1y9GdX8T5i3qszUDo/Plataforma-de-distribuci%C3%B3n-WEB?scaling=contain&node-id=2%3A3A2)
- Mockup- user interface: [https://www.figma.com/protopyqe4LkxnoBCz2qlECUuSD07/BluePrint-User-APP-Vacunaci%C3%B3n?scaling=contain&node-id=21%3A17](https://www.figma.com/protopyqe4LkxnoBCz2qlECUuSD07/BluePrint-User-APP-Vacunaci%C3%B3n?scaling=contain&node-id=21%3A17)
- Mockup- heath care interface: [https://www.figma.com/prot08itYEqxrhdUx79TlizVnLa/BluePrint-Medical-App?scaling=contain&node-id=21%3A17](https://www.figma.com/prot08itYEqxrhdUx79TlizVnLa/BluePrint-Medical-App?scaling=contain&node-id=21%3A17)
India DIVOC (Digital Infrastructure For Verifiable Open Credentialing) Architecture Approach

Source: https://divoc.egov.org.in/
Digital divides remain and could exacerbate delivery gaps

Within-country digital divide can be significant

**African Union**

Poor households use e-government less than the rich

Sources: WDR 2016 team, based on data from Research ICT Africa (various years), ITU and Eurostat (EC various years). Data at http://bit.do/WDR2016-figO_6
Less-connected often overlaps with at-risk

Internet usage in US by age in 2019

18-29: 100%
30-49: 97%
50-64: 88%
65+: 73%

Internet usage in US by race in 2019

White: 92%
Hispanic: 86%
Black: 85%

% of individuals in EU27 use Internet for the following activities in 2020

Read online newspapers/magazines: 65%
Seek health information: 55%
Access personal health records online: 37%
For other health services online: 11%


Older Americans are less connected

The disparity of Internet access also exists in race

There is also a disparity in the ways in which older individuals use the internet
Vaccine Platform Context: The Enabling Environment

- Who are the champions for a digital vaccination platform approach?
- What governance bodies are in place for managing a digital platform approach?
- Are there financing arrangements that can be leveraged to invest in a unified platform?
- What is the best way to include donors in this conversation?
- How many applications exist in the region that are and are not interoperable with the digital platform?
- Are applications deployed in the country currently using standards? What global standards would be useful to develop policies around?
- How reliable is the national electricity grid system? Which areas of the country are connected to internet?
- Is there a national policy to ensure that digital interventions feed into a larger system, a platform?
- How much task shifting and/or creation of new roles and responsibilities is necessary to ensure all regions are using a digital platform approach to vaccination?

Source: National eHealth Strategy Toolkit
On Use Of Technology ....

Considering conventional or emerging technologies to be leveraged for digitalization of COVID19 Immunization & Goods Supply Chain Management, these Digital Technology questions can help to assess the digital readiness of the country:

- What regulatory or policy restrictions exist in the use of the technology?
- Are there ethical concerns to the use of the technology or the data generated by it?
- Has the technology been evaluated for efficacy and effectiveness?
- Has the technology been used in your client’s population?
- How long has the technology been around for?
- What technology are the end users currently using?
- Does the technology need to be customizable or tailored to the end user?
- What are the functionalities that are most important to the users?
- Are there preferred platforms or interfaces?
- What are the short-, medium-, and long-term financial costs of implementation and maintenance?
- What is needed to use the technology?
- Is there the right connectivity for the technology to work?
- Is the technology compatible or interoperable with other technologies and the information system?
- Will the technology be compatible or interoperable with planned future applications?
- How will data integration be achieved?
- Who will implement, use, and maintain the technology?
- What is the culture in your client’s country or organization for technology use and data sharing?