

CASE STUDY: INDIA - USE OF DIGITAL DATA SOLUTIONS FOR THE COVID-19 VACCINATION RESPONSE

Abstract: This short case study illustrates how India successfully leveraged its existing digital data solutions as part of its COVID-19 vaccination response. It outlines the solutions used by the country and the resultant impact, benefits, challenges, and opportunities. Key lessons are summarised, and additional resources are provided for reference.

GLOBAL CHALLENGES IN COVID-19 VACCINATION

To date, many countries have faced and continue to face challenges with identifying and reaching the target populations for COVID-19 vaccination. These target populations are often not included in the national immunization programmes of many low-and-middle-income countries. In addition, many countries face challenges with vaccination session management which results in either overcrowding or unsatisfactory client experience. The low service quality of the session in turn negatively affects the community demand for vaccination and can have implications for vaccine wastage levels. A further challenge results from the fact that most countries have multiple vaccine products in use and documentation is required to permit the use of the right product for each immunization.

India anticipated these challenges and responded by using a new digital application to document and pre-register the target population, schedule vaccination appointments in order of priority, send reminders for follow-up doses, and monitor uptake of vaccines.

BACKGROUND & CONTEXT: INDIA

Pre-dating the COVID-19 pandemic, India has been using the electronic Vaccine Intelligence Network (eVIN) since 2015. This is an electronic Logistics Management Information System (eLMIS) using a licensed software deployed under overall leadership of the government and with the financial and technical support of Gavi, the Vaccine Alliance, and the United Nations Development Programme (UNDP). eVIN was migrated to a locally developed open-source platform in 2020. The system has been scaled nationally in all public health facilities; it oversees the logistics of India's Universal Immunization Programme (UIP) and is now fully managed and funded by the government.

India was severely hit by the COVID-19 pandemic, particularly during the second wave which struck the country in March 2021 leading to a record number of daily new cases and deaths. This prompted India to roll out one of the largest COVID-19 vaccination responses in the world on January 16, 2021. As of July 1, 2022, the country had administered over 1.97 billion doses of vaccine achieving a coverage of over 63% of its total population with the primary series of vaccine.

INDIA'S INNOVATIVE RESPONSE

To respond to the growing needs of the COVID-19 vaccination response, the Ministry of Health and Family Welfare (MOHFW) of the Government of India developed the COVID-19 Vaccine Intelligence Network (Co-WIN) digital platform to complement eVIN and facilitate the delivery of COVID-19 vaccines. The complementarity of the two systems is depicted in Figure 1 below.

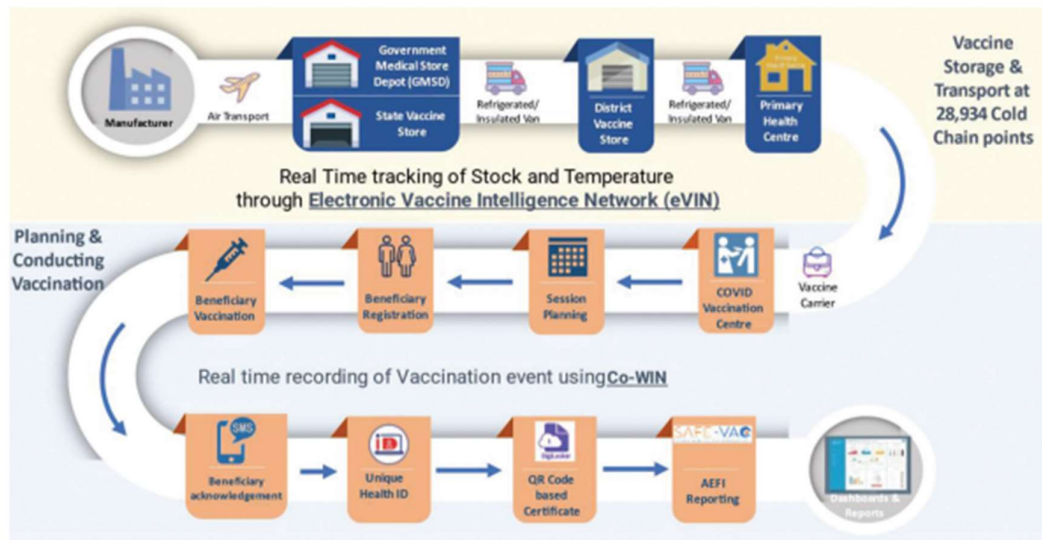


Figure 1: COVID-19 vaccine delivery management system (Pant, 2021)

The objectives of the Co-WIN digital application were:

- To ensure that every vaccination dose is digitally acknowledged and generates a certificate with a QR code.
- To provide verifiable real-time data on the number of persons vaccinated at each level of the programme in both the public and private sector.
- To facilitate the timely delivery of vaccine doses and the use of the same vaccine product to complete the vaccination series.
- To maintain security and minimize vaccine theft and fraud.
- To generate data for future pandemic planning and for research purposes.

Co-WIN is a cloud-based digitized platform that was launched in January 2021 as an open-architecture software. It facilitates beneficiary registration, scheduling appointments, and session planning. In addition, Co-WIN has several other features such as enabling reminders, reporting of adverse events following immunization (AEFI), monitoring and analytics, and generation of digital certificates with QR codes. The generation of certificates is a functionality provided by the software Digital Infrastructure for Verifiable Open Credentialing (DIVOC), which has been integrated into Co-WIN.

The system operates in all states in India in both public and private vaccination centres. Individuals can register online on the Co-WIN website or via the mobile application with their national identification number to select a location and schedule a vaccination appointment. The platform has been made available in English and 11 regional languages to allow citizens across multiple states to access the platform with ease. To circumvent any lack of digital access, the platform allows for up to six individuals to be registered under one cell phone number linked account. An assisted mode was also made available through over 240,000 Common Service Centres (CSCs) and a helpline number. Alternatively, individuals can physically visit one of the vaccination centres where a health worker will assist them with the registration. The system permitted offline data entry at sites where there was no internet connectivity with data uploaded to the central server when access was obtained.

A key feature of the platform has been its modularity and evolvability and its open architecture, which enabled interoperability with other existing systems in the public and private sectors. The Co-WIN team has been adept at keeping pace with the changing policy environment and scientific research and developments in the administration of COVID-19 vaccines. Hence, Co-WIN never became a bottleneck or delayed implementation because of changes to national vaccination policies.

The design and implementation process of Co-WIN lasted 12 months and incurred US\$10m in costs for software development, hosting infrastructure (i.e., cloud-based servers) and back-end support/helpdesk for citizens. Due to the nature of the services provided, as the client database grew, the hosting infrastructure requirements also grew, primarily due to the storage of data in the cloud, driving up costs.

OUTCOMES

IMPACT

As of July 1, 2022, the Co-WIN application has facilitated the registration of over 1 billion beneficiaries; recorded over 1.97 billion vaccine doses administered in vaccination sessions at 504,478 vaccination centres across the country, 73% of which were in rural areas; enabled real time monitoring of the vaccine rollout, providing disaggregated demographic and geographic data; and enabled the seamless rollout and correct usage of different vaccine products.

The Co-WIN website¹ handles over 1 billion visits daily and has recorded up to 3.1 billion visits on a single day. The Co-WIN platform handled 13.7 million registrations within 8 hours when eligibility for vaccination was expanded from vaccination of the highest priority use groups to include all those from 18 to 44 years of age.

BENEFITS

Co-WIN provides benefits to both beneficiaries and the immunisation programme itself, as shown in the table below:

Beneficiaries	Immunization programme
<ul style="list-style-type: none"> Facilitated universal access to COVID-19 vaccination. Provided information on location of vaccination centres and timing for vaccination sessions, allowing beneficiaries to choose the most convenient location and time. Was flexible and allowed online as well as on-site registration. Provided alerts when the next dose was due. Provided digitally verifiable certificates. 	<ul style="list-style-type: none"> Provided scalable supply chain management, including vaccine stock management and traceability. Enabled publication of vaccination schedules and declaration of stock availability. Facilitated vaccination session management. Provided real-time data for monitoring and for display on dashboards. Was easy-to-use for all system users, including frontline health workers. Minimized vaccine wastage.

¹ <https://www.cowin.gov.in/>

<ul style="list-style-type: none"> • Special provisions were available to vulnerable groups lacking a valid photo ID. 	<ul style="list-style-type: none"> • Facilitated reporting and monitoring of adverse events following immunization. • Facilitated data aggregation and analysis for policy and operation planning and future pandemic planning.
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CHALLENGES

While developing and implementing the Co-WIN platform based on the learnings of the eVIN platforms has had many benefits and had a significant impact in effectively administering over 1.97 billion doses of COVID-19 vaccines, there were a few challenges that required additional measures to be put into place.

Since the Co-WIN development was a dynamic process based on frequent updates in Covid-19 vaccination policy for priority population, new modules were developed in the platform for which health workers needed repeated training and supervision. Regular training using a combination of virtual and in-person training approaches was conducted for health workers which enabled them to use the platform. Moreover, the conduct of dry runs in advance of its launch improved the confidence of health workers in using the new technology platform.

It was also anticipated that low digital literacy and language barriers would have made it challenging for some communities to use the Co-WIN platform. To enable registration and vaccination of such communities, the government took proactive steps such as registering people without access to smartphone/internet through CSCs, setting up a dedicated 1075 helpline, and instructing people to send the WhatsApp message “book Slot’ to MyGovIndia Corona Helpdesk’s number. This was further supported by the facility of walk-in registration/ vaccination. Further, in areas without internet connectivity, vaccination records were prepared manually by the vaccinator and entered into the Co-WIN system on the day after the vaccination session. Through these measures, the Indian Government ensured that COVID-19 vaccination was equitable and easily accessible to all beneficiaries and minimized any digital divide in the uptake of vaccination.

A large proportion of the vaccinations, especially those in rural areas, were walk-ins. This often led to overcrowding in the vaccination centres and may have contributed to the spread of COVID-19 infection during periods of high community transmission.

OPPORTUNITIES BEYOND THE COVID-19 VACCINE RESPONSE

The Government of India has initiated a pilot to leverage learnings of Co-WIN for the last-mile data digitization of immunization services under the national Universal Immunization Programme (UIP). A new UIP module is being developed under Co-WIN, which will enhance its use for routine immunization. It will digitize the registration and vaccination of pregnant women, vaccination of their new-born babies, and subsequent vaccination events. It will feature individualized tracking of beneficiaries including vaccination status, digitization of session planning, and updating vaccination status and service delivery on a real-time basis. This will not only improve the delivery of routine immunization services but also facilitate a special intervention for reaching zero-dose children and missed communities.

The linking of Co-WIN to eVIN for all vaccines in UIP will provide end-to-end visibility of vaccine stocks, facilitate last-mile delivery and beneficiary tracking to improve timeliness of vaccination, reduce drop-out, and promote equity in vaccination coverage. Thus, while the story of Co-WIN started during the pandemic, the initiative will not end with the pandemic: it will continue into a repurposed digital platform for more health use-cases².

LESSONS

- The use of the interlinked Co-WIN and eVIN systems in India increased visibility, accountability, and transparency of COVID-19 vaccine delivery. It enabled the rapid registration of beneficiaries at an unprecedented pace, facilitated access to vaccination and enabled planning of service delivery. These interlinked systems can be expanded to include all the vaccines provided by the national UIP.
- Investing in a digitally trained health workforce, providing supportive supervision and timely support to resolve technical glitches are critical to success.
- Using community volunteers to facilitate the use of the system in communities with low digital literacy and language barriers is beneficial.
- Local ownership of such digital systems will help to ensure that the systems are sustained over time.

ADDITIONAL RESOURCES

The Co-WIN platform is freely available to other countries as a global good. The Government of India will provide technical support and advice to countries setting up the platform. For more information contact: **Additional Secretary (Health), Ministry of Health and Family Welfare, Government of India** - e-mail (ash-mohfw@nic.in) or phone (+91-11-23061066).

The Digital Health Centre of Excellence (DICE) (<https://www.digitalhealthcoe.org/about-digitalhealthcentreofexcellence-dice>) is a mechanism to deliver agile and coordinated technical assistance to national governments on sustainable and scalable deployment of carefully chosen mature digital health solutions that address health priorities in the context of the COVID-19 pandemic and post-pandemic health system needs. For queries or requests for technical assistance with digital solutions for COVID-19 response, email : contact@digitalhealthcoe.org

ACKNOWLEDGEMENTS

The main sources of information were the Co-WIN website (<https://www.cowin.gov.in/>) and an article published in the Asia-Pacific Tech Monitor 2021, Volume 38 (4), page 29 (https://apctt.org/sites/default/files/2022-02/Tech_Monitor_Oct-Dec_2021.pdf)

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² <https://indianexpress.com/article/opinion/columns/the-cowin-story-started-with-the-pandemic-but-it-wont-end-with-it-7956262/>