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Viewpoint

Will Digitalisation of Routine Immunisation Prove to be a Boon or Bane?

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A B S T R A C T

Digitalisation of health services can directly enhance the quality of care, improve patient outcomes, reduce human error, increase the efficiency of the health workforce and lead to more equitable coverage. U-WIN (Universal WIN at immunisation) is an ambitious flagship initiative to digitalise vaccination events and records of routine immunisation programmes along the same lines as Co-WIN. Digitising immunisation records can provide numerous advantages over traditional systems in tracking immunisation coverage and has the potential to improve immunisation uptake. However, there are several implementation challenges. This paper attempts to provide insights into the operationalisation of U-WIN in India with a compilation of best practices in the use of digital technologies across the world and a SWOT analysis of U-WIN.

Keywords: Digitalisation, U-WIN, Co-WIN, Innovations, SWOT Analysis

Introduction

As per the World Health Organization (WHO) data on global immunisation coverage, more than 60% of unvaccinated or partially vaccinated children in 2021 were from 10 countries viz., India, Nigeria, Indonesia, Ethiopia, Philippines, the Democratic Republic of the Congo, Brazil, Pakistan, Angola, and Myanmar.[1] Currently India's Universal Immunisation Programme (UIP) targets 3.04 crore pregnant women and 2.7 crore newborns annually. More than 1.2 crore immunisation sessions are being conducted annually.[2] Use of innovative technologies and digital solutions to strengthen immunisation programmes is a vital component of universal health coverage.[3]

'The Digital India initiative' has revolutionised the functioning of the government and the health sector is no exception. After the success of the Co-WIN platform, the government has now replicated it to set up an electronic registry for routine vaccinations named 'U-WIN'. The platform envisages digitalised routine immunisation and aims to serve as a single point for registration, record-keeping, follow-ups and issuing vaccination certificates encompassing end-to-end workflows required for universal vaccine coverage. It was launched in a pilot mode in two districts of each state and union territory on January 11, 2023. Cascade training and sensitisation workshops were conducted in all states and UTs to facilitate smooth implementation of the U-WIN portal and modules for use at various levels were developed. It was eventually rolled out in the entire country with effect from July 1, 2023.[2]

Advantages of the U-WIN Platform over the Existing System

Upkeep of vaccination cards by the parents and maintenance of complete vaccination records by healthcare providers have always been a daunting task. The use of the U-WIN

platform will overcome all these above challenges and facilitate tracking the defaulters or serve as a reminder for the next jab. The beneficiaries can also download acknowledgements after getting vaccinated on their registered mobile number.

As part of the initiative, immunisation cards for pregnant women and children are being linked to ABHA-ID (Ayushman Bharat Heath Account) and all states and districts can access a common database to track and vaccinate beneficiaries.[4] An overview of the workflow is provided in Figure 1. In future, options for appointment scheduling and setting reminders for the next due date for vaccination will also be provided.[5]

The portal was adapted from India's Co-WIN platform (developed by MoHFW), which formed the backbone of COVID-19 vaccinations and was globally appreciated. There is substantial evidence that successful implementation of such technologies is imperative for strengthening immunisation by tracking and maintaining immunisation records.[6]

Use of Technologies for Improvement in Immunisation in Other Countries

Though several efforts have been made to use digital technologies for real-time monitoring of immunisation, their use is far from being universal. In Europe, only Denmark, Iceland, Malta, the Netherlands, and Norway have a national, fully implemented digital Information system on Immunisation (IIS). In the above countries, it is also utilised for tracking vaccine lots in case of an Adverse Event Following Immunisation (AEFI).[7,8]

Vaccine dose accountability may also benefit from digital solutions. The CDC vaccine tracking system (VTrckS) allows web-based ordering and tracking of publicly funded vaccines which is similar to the eVIN system of logistic management of vaccines being successfully implemented in India.[9]

The need for back-end technological support, enabling infrastructure and high cost of maintenance are challenges faced by countries. Despite this, in countries like Guatemala and South Africa, information systems enabling digital recording and transmission of immunisation data are in place.[10,11] The popularity and wide base of mobile phone use in low and middle income has been leveraged in using mobile-based technologies (instead of paper forms) to capture health and immunisation data.[12] In Mozambique mobile technologies and advanced algorithms are being used to digitalise old paper-based immunisation registries in low-resource settings.[13] Another success story is from Haiti, where a cholera vaccination campaign has been carried out through house-by-house visits by operators equipped with wireless tablets. During this campaign, children's immunisation status was assessed and recorded using a family-specific bar code and data were geo-localised and sent to a central system to create a real-time map of vaccination coverage.[14] An approach similar to the COWIN app has been used in a rural province in China, with a mobile app for facilitating immunisation data recording, tracking unimmunised children, and appointment booking.[15] Another smart-phone-based technology is being used in the 'Better Border Healthcare Program' of Thailand for recording antenatal care visits and immunisation status.[16] Android-based mobile app Open Data Kit has been used to collect data on EPI review in East and South African countries.[17]

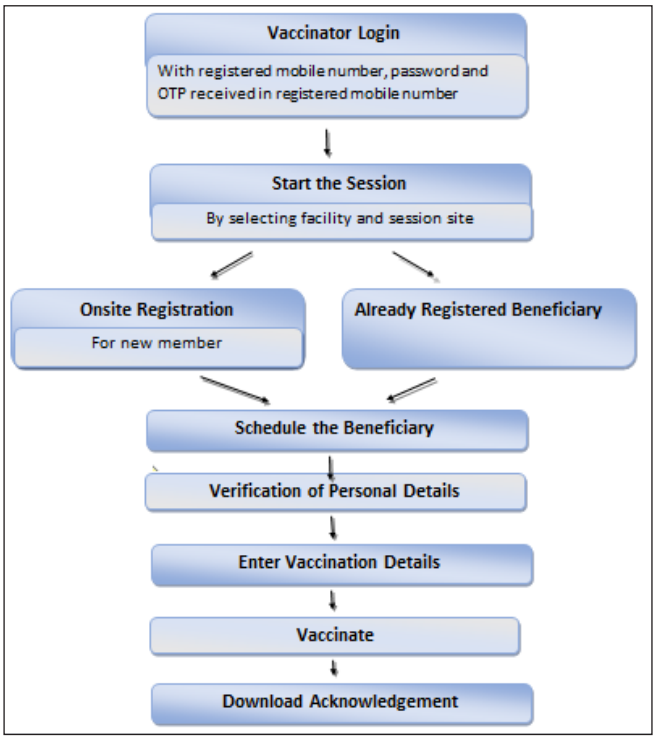

Figure 1.Overview of Workflow

SWOT Analysis

Strengths

U-WIN is a part of the series of flagship initiatives launched by the MoHFW GoI and is a reflection of a strong political will which is imperative to sustain any programme. It has been laid on the foundation of the COWIN platform which proved to be a big success. It offers multiple cross-cutting benefits to stakeholders at various levels. Firstly it has some inbuilt mechanisms to ensure accuracy of data entry and checks to prevent incorrect prescription of vaccines according to the age requirements. Since the registration and records updates are in real-time, it is a boon to the health providers to track the progress or past history of immunisation and for the administrators to estimate the coverage of a particular area without physical intervention. It is a cost-effective way to popularise immunisation and prevent drop-outs as it is designed to send reminders to

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healthcare functionaries as well as beneficiaries and can be used by supervisors as a tool to improve immunisation in high-risk pockets too. It is user-friendly and provides a facility to pre-book slots to save waiting time. It also assists the Medical Officer in-charge and ANMs to prepare the due list for the next vaccination session.

Weakness

Currently, the programme is facing some teething problems at the implementation level as the ANMs and ASHAs need robust hands-on training and supportive supervision. Also, they have been instructed to continue data entries in physical registers as well as Mother-Child Protection (MCP) cards in addition to uploading data on the U-WIN portal. To top it, the portals wherein the other health information is to be entered have also increased manifold. For a healthcare worker who is already burdened with implementing several other health programmes and making entries in eVIN (Electronic Vaccine Intelligence Network), RCH, IHIP (Integrated Health Information Platform), FPLMIS (Family Planning Logistics Information System) portals is a tedious and time-consuming task. This may also lead to curtailment of counselling time during immunisation/ ANC. Moreover, there is a lack of synchronisation between the data entered across various portals. In some places, the problem is exacerbated by frequent absenteeism of Data Entry Operators or their posts lying vacant. It has also been reported by ASHAs that due to poor connectivity of mobile-data networks at outreach sessions, the real-time entry of records is often not possible.

Opportunities

U-WIN holds a lot of promises for the future - the data may be used to generate early warning signals, hence helping in detecting Vaccine Preventable Disease (VPD) outbreaks or identifying geospatial pockets of low coverage. There is also a provision for reporting all types of AEFI(adverse event following immunisation) through SAFE vac. Thus in the event of an AEFI, it may provide prompt and valuable information (such as date of vaccination, batch and lot of vaccine, whether clustering present etc) to the District Immunisation Officer and assist the case investigation team in faster causality assessment. In the long run, the establishment of such platforms enhances the credibility and transparency of Immunisation systems and may build trust of the general population. It may also provide valuable information during disasters and help in mitigating the risk of VPDs. It has possibilities of integration with vaccine surveillance and safety evaluation.

Threats

India still faces challenges in terms of digital infrastructure, internet connectivity and power supply, particularly in remote areas. One of the mandatory resources in this system is high-speed internet connectivity which cannot be provided by mobile data, leading to delays in registration and longer waiting time. It is also subject to technological failures or data breaches. Moreover, if the digital infrastructure is not robust and secure, it could compromise the privacy and security of individuals' health or personal information. Sections of society with limited digital literacy may face challenges in accessing and understanding the immunisation records. Digitising processes may exclude segments of the population who lack access to digital infrastructure, such as hilly terrains, remote rural areas or economically disadvantaged communities leading to health inequities. As has been reported, all patients attending the immunisation or ANC clinic may not be carrying a copy of their Aadhar card at the time of registration. This could lead to a digital divide and hinder equitable access to healthcare services. Lastly, for a previously vaccinated child with no records, the authenticity of the entries is often questionable.

Conclusion and Recommendations

Pragmatic solutions can be designed to overcome the initial hiccups and implementation challenges being encountered. Establishing reliable backup mechanisms and redundant systems is crucial to ensure the availability and integrity of immunisation records. At the same time, it is vital for policymakers and stakeholders to address these concerns while implementing digitisation initiatives, ensuring that the benefits of digitised immunisation records are realised without leaving behind marginalised populations or compromising privacy and data security. Strict measures need to be in place to safeguard against unauthorised access, hacking attempts or misuse of sensitive data.

In a nutshell, U-WIN can prove to be a boon to the country as it has the potential to improve data accuracy and efficiency. With sustained capacity building and minor modifications in the delivery systems, we will surely achieve an overall positive impact on public healthcare and healthcare outcomes.

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Conflict of Interest: None

References

1. World Health Organization [Internet]. Immunization coverage; 2022 [cited 2023 Nov 12]. Available from: https://www.who.int/news-room/fact-sheets/detail/immunization-coverage

2. Ministry of Health and Family Welfare, Government of India (MoHFW-GOI). Comprehensive Multi-year Plan 2018-22. New Delhi, MoHFW; 2008.
3. Noda S. Win-ning for India: a decade of healthcare innovation [Internet]. UNDP; 2023 Sep 9 [cited 2024 Mar 30]. Available from: https://www.undp.org/india/blog/win-ning-india-decade-healthcare-innovation
4. Sharma RS, Rohatgi A, Jain S, Singh D. The Ayushman Bharat Digital Mission (ABDM): making of India's digital health story. CSI Trans ICT. 2023;11(1):3-9. [Google Scholar]
5. U-WIN. Citizen registration and appointment for vaccination: user manual [Internet]. Ministry of Health and Family Welfare; [cited 2024 May 1]. Available from: https://uwin.mohfw.gov.in/assets/pdf/Self_Registration_Module_U-WIN_SOP_v2_Apr_2024-1.pdf
6. Dudeja N, Khan T, Varughese DT, Abraham SG, Ninan MM, Prasad CL, Sarkar R, Kang G. Technologies for strengthening immunization coverage in India: a systematic review. Lancet Reg Health Southeast Asia [Internet]. 2023 [cited 2024 Apr 2];23:100251. Available from: https://doi.org/10.1016/j.lansea.2023.100251 [PubMed] [Google Scholar]
7. United Nations Children's Fund, GAVI. The use of digital technologies and approaches for real-time monitoring of supplementary immunization activities: good practices and lessons learned. New York: UNICEF; 2021.
8. Odone A, Gianfredi V, Sorbello S, Capraro M, Frascella B, Vigezzi GP, Signorelli C. The use of digital technologies to support vaccination programmes in Europe: state of the art and best practices from experts' interviews. Vaccines (Basel). 2021;9(10):1126. [PubMed] [Google Scholar]
9. Supply and safety issues surrounding an H1N1 vaccine. Lancet. 2009;374(9687):358. [PubMed]
10. Centers for Disease Control and Prevention (CDC). Progress in immunization information systems – United States, 2010. MMWR Morb Mortal Wkly Rep. 2012;61(25):464-7.
11. World Health Organization [Internet]. An integrated approach to health information systems in Guatemala; 2015 [cited 2024 Apr 4]. Available from: http://www.who.int/immunization/programmes_systems/supply_chain/optimize/guatemala/en/
12. Dell N, Breit N, Chaluco T, Crawford J, Borriello G. Digitizing paper forms with mobile imaging technologies. Proceedings of the 2nd ACM Symposium on Computing for Development. New York; 2012. [Google Scholar]
13. Integrated health information systems for vaccination in developing countries [Internet]; 2015 [cited 2024 Mar 30]. Available from: https://www.idi.ntnu.no/~ericm/gavi.pdf
14. Teng JE, Thomson DR, Lascher JS, Raymond M, Ivers LC. Using mobile health (mHealth) and geospatial mapping technology in a mass campaign for reactive oral cholera vaccination in rural Haiti. PLoS Negl Trop Dis. 2014;8(7):e3050. [PubMed] [Google Scholar]
15. Chen L, Wang W, Du X, Rao X, van Velthoven MH, Yang R, Zhang L, Koepsell JC, Li Y, Wu Q, Zhang Y. Effectiveness of a smart phone app on improving immunization of children in rural Sichuan Province, China: study protocol for a paired cluster randomized controlled trial. BMC Public Health. 2014;14:262. [PubMed] [Google Scholar]
16. Kaewkungwal J, Singhasivanon P, Khamsiriwatchara A, Sawang S, Meankaew P, Wechsart A. Application of smart phone in "Better Border Healthcare Program": a module for mother and child care. BMC Med Inform Decis Mak. 2010;10:69. [PubMed] [Google Scholar]
17. Bello IM, Umar AS, Akpan GU, Okeibunor J, Shibeshi C, Eshetu M, Magwati CJ, Fasil T, Fussum D, Mihigo R, Mkanda P. Implementation of mobile phone data collection in the conduct EPI comprehensive review in East and Southern African countries. J Immunol Sci. 2021 Apr;Spec Issue(2):1108. [PubMed] [Google Scholar]

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