The Use of Digital Technologies and Approaches for Real-Time Monitoring of Supplementary Immunization Activities

Good practices and lessons learned

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Gavi
The Vaccine Alliance

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Contact: pubdoc@unicef.org

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Acronyms

AEFI	Adverse events following immunization
DHIS 2	District Health Information Software 2
EOC	Emergency Operations Centre
EPI	Expanded Programme on Immunization
GIS	Geographic information system
GPS	Global positioning system
OPV	Oral polio vaccine
ODK	Open Data Kit
RTM	Real-time monitoring
SMS	Short message service
TCV	Typhoid conjugate vaccine
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
WHO	World Health Organization
WHO-AFR	WHO Regional Office for Africa

Executive summary

Supplementary immunization activities and mass immunization campaigns are effective strategies for delivering vaccination to children who have otherwise been missed by routine services.[1] Real-time monitoring (RTM) – activities that employ digital technologies to accelerate the sharing, analysis and use of data to improve campaign quality[2] – can enhance the quality of supplementary immunization activities and campaigns by helping implementers review progress against targets; identify issues and gaps; track supplies, human resources and vaccine sessions; and make prompt decisions about corrective actions.[3] In light of COVID-19 vaccine roll-out, the use of RTM to support immunization campaigns is more important than ever.

This report compiles the good practices and lessons learned from countries implementing RTM for immunization campaigns. Data and information were collected from various sources, including interviews with United Nations Children's Fund (UNICEF) and World Health Organization (WHO) regional and country office staff; consultations with key partners; a field mission to Pakistan; and documents and journal articles. Four countries with robust experience implementing RTM technologies for immunization campaigns – Indonesia, Pakistan, Uganda and Zambia – were included as case studies.

Pakistan conducted a national measles campaign in 2018 that reached 37 million children and a typhoid campaign in Sindh province in 2019 that reached 9.5 million children. In both campaigns, RTM data collected through RapidPro Surveyor, KoBo Toolbox and WhatsApp were used to target missed children and reach millions of people in short time frames. The Pakistan case illustrated how the combination of data and communication tools enabled prompt action and ultimately contributed to quality improvements at every stage of the campaigns.

Indonesia conducted a nationwide measles-rubella campaign targeting 68 million children in two phases. RTM using RapidPro facilitated timely and efficient tracking and analysis of coverage against targets. Users reported high rates of satisfaction with the platform, analyses showed consistency with official data submitted through the manual reporting system, and districts with higher reporting rates were more likely to achieve their target coverage rate. The case confirmed the importance of quality assurance measures and a theory of change to conducting successful campaigns and improving process and outcomes.

Uganda conducted a nationwide measles-rubella campaign targeting 18.1 million children and a polio/oral polio vaccine (OPV) campaign targeting 8.2 million children, beginning in October 2019. The national response team combined the data collection abilities of Open Data Kit (ODK) with a District Health Information Software (DHIS) 2 dashboard to promptly consolidate, visualize and analyse the data. RTM approaches supported timely campaign progress, results and feedback, which in turn facilitated corrective actions and helped Uganda save on costs associated with transporting data and printing forms.

Zambia has implemented RTM for cholera, measles-rubella and polio immunization campaigns for the past five years. RTM approaches were deployed for campaigns that vary greatly in scope (nationwide vs. targeted), delivery methods (static-site vs. school-based vs. outreach vs. house-to-house) and for a broad range of target populations (infant through adult age). Stakeholders and users reported satisfaction with

1 World Health Organization, 'Planning and Implementing High-Quality Supplementary Immunization Activities for Injectable Vaccines: Using an example of measles-rubella vaccines – field guide', WHO, Geneva, 2016.

2 Ramalingam, Ben et. al., 'Bridging the Gap: How real-time data can contribute to adaptive management in international development', USAID, June 2017.

3 Ibid; Oh, D. H. et al., 'Real-Time Monitoring of Vaccination Campaign Performance Using Mobile Phones—Nepal', Morbidity and Mortality Weekly Report, vol. 65, no. 39, 2016, pp. 1072-1076; United Nations Children's Fund, 'Learning How to Mainstream and Scale Digital Monitoring Solutions: National real-time monitoring systems strengthening and scale using RapidPro – lessons learned brief', UNICEF, 2018.

the speed of access to data, the ease of coordinating with colleagues at all levels, the ability to monitor activities everywhere (even in remote areas) and the level of teamwork.

In addition, relevant journal articles describing the effect of digital RTM tools for immunization were identified and reviewed. Out of 200 articles screened based on title and abstract, six relevant cases from the Democratic Republic of the Congo and Somalia (multi-country study), Haiti, Iraq, Malawi, Nepal, Nigeria and South Sudan were selected for the full-text review. The literature review found that RTM was associated with: outcomes that bolster campaign effectiveness, including improvements in data quality, timeliness and completeness; more accurate micro plans; stronger accountability of field teams; and better collaboration, partnership and communication at all levels. Challenges spanned both technological and programmatic areas. In some places, there were very short timeframes for planning, leading to insufficient stakeholder and user engagement. Network connectivity was a common challenge, and some countries' field teams had difficulty accessing their data on the same day due to a requirement for central level data cleaning/downloading/approval.

Overall, 13 country experiences and nearly 70 good practices and lessons learned are documented in this report.

High-level **benefits** of using RTM included:

1. RTM can contribute to the achievement of campaign targets
1. RTM enables the rapid use of data for decision-making and prompt corrective actions
2. RTM can improve data quality
3. RTM approaches help enforce accountability at all levels
4. RTM can support improvements in campaign planning
5. RTM can be used for media monitoring and addressing vaccine hesitancy and rumours
6. RTM approaches can refine outreach strategies
7. RTM can strengthen routine immunization systems
8. RTM approaches support rapid collection of standardized data and its integration with other digital solutions, over paper-based approaches
9. RTM supports daily immunization activity monitoring

High-level **good practices** included:

1. Using RTM before, during/intra and after campaigns;
2. Leveraging and aligning with existing technology and eHealth programme structures to strengthen national systems;
3. Consulting users and stakeholders continually;
4. Testing and iterating systems to meet user needs;
5. Choosing complementary and interoperable technologies;
6. Investing in the capacities of users at multiple levels of health systems;
7. Ensuring information technology and network assistance are available; and
8. Applying effective data use processes for RTM.

High-level **lessons learned** included:

1. RTM planning should be initiated early;
2. Government ownership and leadership are indispensable to accelerating adoption and ensuring sustainability;
3. For RTM approaches to function efficiently, the number of platforms and forms, the use of paper, and manual data processing and downloading should all be minimized;
4. The "real-time" (same day) element should be prioritized during platform selection, with appropriate processes in place to support accountability for decision making;
5. Training materials, data entry forms, dashboard templates and other tools should be developed at the global or regional levels for platforms used by multiple countries;
6. The use of RTM data can improve public awareness and strengthen local advocacy; and

7. Resources need to be in place for the use of RTM data.

As countries continue to adopt or refine their use of RTM for supplementary immunization activities and campaigns, a systematic approach to mapping user/stakeholder needs, ensuring integration with the broader eHealth and immunization landscape and addressing bottlenecks to real-time access to data will be critical for sustaining and enhancing the contributions of RTM.

The case studies show that real-time data systems can, in the right circumstances and with the right enabling conditions, facilitate real-time decision-making. Ultimately, the use of real-time data systems for real-time decision-making is not about technology. It is about a strategic and cultural environment that enables technology to be utilized as support to organizational decision-making and institutional digital transformation. While technology can certainly raise questions and opportunities, it cannot open the door to this kind of transformation – either within programmes or more broadly in organizations and alliances. As with other forms of evidence utilization, political, institutional and individual will are critical.