Title: Real-Time evaluative approaches for COVID-19 vaccination: A case study on *UNICEF's Community Rapid Assessment*

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Abstract

Introduction. To implement tailored and effective approaches to strengthen acceptance and uptake of vaccines, strategies should be evidence-based. However, faced with unforeseen and unprecedented challenges, evaluators have been obliged to adopt new ways of working that take account of pandemic-related constraints while remaining focused on delivering high-quality, robust evaluative evidence. Evaluations are placing a greater emphasis on learning alongside more traditional accountability functions, and innovative approaches to evaluation are being introduced. To meet this challenge, UNICEF devised and conducted a series of real-time assessments in the Eastern and Southern Africa (ESA) Region that provided ongoing insight into the impact of COVID-19 on access to, and quality of basic services, including health and immunization services. This paper will synthesise findings on intention of COVID-19 vaccination across comparable countries in ESA and share reflections on leveraging this evidence through a case study in Rwanda. It will contribute to the discussion on how the evaluation function will adapt to the 'new normal' from the angle of evaluations in the development sector, without losing sight of relevance, timeliness and robustness of evaluative approaches, including those applied in humanitarian contexts.

Methodology. One such approach, 'Real-Time Assessments', was designed as a forward-looking reflection on how UNICEF country offices were responding to the pandemic as it unfolded. It aimed to analyze how effectively country offices were adapting and implementing the response and to explore issues of quality, to distill lessons learned for the ongoing emergency as well as for future emergencies. The organization also carried out real-time community-based mobile phone surveys across ESA to track social and behavioural trends during the pandemic – looking at, for example, issues such as demand for vaccination as well as health-seeking behaviours, coping strategies, and emerging needs in light of the pandemic. The objective was to provide timely, high-quality community-sourced data to inform COVID-19 programme and policy decisions at the country level.

Results: Real-Time Assessments effectively informed discussions and reflections, especially across regions and countries. The geographical scope of the assessment further offered a valuable opportunity for cross-country learning. This paper demonstrates how real-time community-based mobile phone surveys have thus far provided a rich and must-needed picture of the behavioural component of the outbreak at the individual and community levels, with Rwanda as an example.

Conclusions: Rapid, efficient, and evidence-based responses have been required to build ownership of and trust in COVID-19 responses through community-based processes. Adapting to the pandemic has meant exploring new methods of gathering evidence to understand how communities are being affected by the pandemic, and how programmes are responding. This has required balancing need for methodological rigour against need for efficiency and limited access to communities and stakeholders. The real-time assessment approach has provided strong collaboration and partnership between diverse levels of the COVID-19 response to adapt, use and strengthen rapid evaluative methods for practical lessons and insights, to ultimately improve country responses to meet the needs of children and their communities. As the pandemic evolves into the new normal, adaptative evaluative approaches and efforts like the CRA could supply critical insights for massive global efforts like the fight against COVID-19 and the on-going global vaccination drive.

Introduction

Since 2020, the COVID-19 pandemic has been affecting the health, livelihood and lives of children and their families in an unprecedented manner, as well as disrupting the ways in which people and organizations communicate and work. (1) The COVID-19 outbreak has also placed an overwhelming burden on health systems and authorities to respond with effective, prompt and proper interventions and policies. As the severity of the pandemic evolves, so will the needs of the community, especially considering multiple disruptions that affect food systems, supply chains, service delivery and institutional safety nets.

For a large international organization like UNICEF, with operations in more than 190 countries, the pandemic has required new ways of doing business and delivering results, including the design of evidence-based strategies and actions that aimed to shape the pandemic response in an informed, effective, and timely manner.

Although multiple innovations took place across UNICEF operations, the development of repeated and short phone-based surveys to gather behavioural evidence related to key preventive behaviours, such as handwashing, mask wearing, and social distancing, stands out in its ability to supply opportunities to examine country- and region-specific behavioural trends over time. Such rapidly deployed remote surveys have allowed governments, and other UNICEF partners, to show important community dynamics promptly, and design effective social and behaviour change (SBC) responses.

To address this need, UNICEF's Evaluation Office and Social and Behaviour Change section jointly launched the Community Rapid Assessment (CRA), a real-time evaluative approach with the aim to supply behavioural insights in 12 countries in the Eastern and Southern Africa (ESA) and the South Asia regions. The time series data and its findings were used to inform COVID-19 programming, enhancing institutional learning and evidence generation, and supplying social and behavioural insights in key areas, including on demand for COVID-19 vaccination.

This paper focuses on CRA results in the eight countries of the ESA region, and more specifically on the indicator of intention to vaccinate

Currently, UNICEF is working on assessing the CRA use and uptake by all participating countries, as the exercise continues in many countries, and the results are still being discussed locally. However, we also include in the paper a brief discussion on the use case in Rwanda as an illuminating example of a scenario where the CRA has helped national governments and UNICEF country offices in supplying rapid insights to support programming.

From the methodological standpoint, the paper aims to quickly review the relevance of such real time data effort and its value added during a complex crisis such as COVID-19, and in the case study in Rwanda, discuss its identified relevance for implementing partners and where improvements were also highlighted as needed.

Overall, as the pandemic evolves into the new normal, adaptative evaluative approaches and efforts like the CRA could supply critical insights for massive global efforts like the fight against COVID-19 and the ongoing global vaccination drive.

Methods

Study Framework

The Community Rapid Assessment had two main framework pillars on its overall approach. Its conceptual framework refers to a rapid evidence system to measure protective behaviours affecting the pandemic trajectory in the countries where the study was rolled out. Its

methodological framework relates to the development of such an evidence system as a real-time evaluation tool that provides rapid, actionable and robust insights for policy and programme considerations, while facilitating real time learning for UNICEF, host governments, and implementing partners.

COVID-19 and Knowledge, Attitudes, Behaviours, and Practices

To ease the management of a pandemic outbreak, it is critical to understand drivers and barriers that shape individual behaviours, such as social dynamics, trust in institutions and authorities[1], and other key influencing elements[2]. In this way, one of the key elements for the effective response towards the COVID-19 pandemic has been the implementation of social and behaviour change (SBC) interventions.

These change interventions are intended to shape and sustain individuals' knowledge, positive attitude, and practice of preventive behaviours such as vaccination, physical distancing, mask wearing, regular handwashing and other related practices. (2) Showing behavioural trends among demographic sub-groups, particularly those who are normally left behind, are paramount to the success of many of COVID-19 efforts to curb transmission rates. The CRA as a real-time evidence system looked to conceptualize and measure important drivers related to adopting preventive behaviours for COVID-19.

Real-Time Evaluative Approach

Traditional evaluation approaches have been designed to be rigorous and supply solid insights into programme performance. However, rapidly evolving global emergencies have needed more adaptable approaches that can produce early and rapid insights into fast evolving situations that require real-time decision-making. (3) During such emergencies, rapid evaluative approaches and real-time data are key to supplying rapid insights to inform decision-making faster and earlier than traditional ex-post facto evaluative approaches which serve different evaluative purposes. (4) (5)

In that sense, real time evaluative approaches like the CRA aim to provide iterative and flexible rapid data collection and analysis, with action-oriented insights, tailored data briefs and evidence products, multi-disciplinary teams, and participatory approaches, while supplying products and observations that aim to shape policy and programme processes while it is taking place (6). The CRA looked to provide rapid insights to inform the COVID-19 response by analyzing behavioural components in the countries where it was deployed.

Study Design

UNICEF's Community Rapid Assessment is a remote, real-time evidence generation system using short mobile phone surveys.[3] Data collection was carried out by Viamo[4], a third-party data research firm. A randomized sampling frame of 1,000 per round in each study country was conducted using a universe of all mobile phone subscribers and pursued a true random-digit

[1] For some early insight on the importance of trust on public institutions during COVID-19 pandemic, please see Lacelle-Webster, Landry and Smith 2021.
[2] To understand more UNICEF's approach to social and behaviour change programming, please see Petit, Vincent, 2019.
[3] Alternative designs were implemented where regional representativeness required a larger sample, a different research design was in place before the CRA deployment, or a mobile phone survey was not feasible.
[4] Not all countries used Viamo as surveying partner due to limitations in cost, coverage or presence in some of the countries of the study. However, VIAMO was the most common surveying firm in a large majority of 12 participating countries.

dialing (RDD) sampling approach. Data analysis and visualisations were carried out both by VIAMO and UNICEF staff, with support, technical advice and peer review from the Harvard Humanitarian Initiative and Statisticians without Borders. (7) (8). Overall, the methodological design, weighted analytics, and survey quality control was carried out by UNICEF's Evaluation Office while the conceptual framework and in-country project management was executed by UNICEF's SBC section. As an operating principle, coordination, and constant collaboration across all CRA partners and UNICEF teams became the stone pilar for all implementation, dissemination, and the ongoing assessment of the effort.

In terms of design, most participating countries had three rounds of the survey with each sample being a cross sectional sample. (9) The survey design helped replication across all participating countries by producing a tool that included questions and conceptual constructs already being used in similar behaviour-related research and surveys of organizations such as the World Health Organization, the World Bank, and others. (10) The survey included three separate modules and allowed country-specific adaptations (11). The overall survey had an average of 15-24 questions and aimed for a telephone survey of around 20 minutes.

To address bias with the sample of mobile phone respondents, a weight model to weigh the samples against nationally representative surveys or census data was developed. (12) Most surveys were weighted against Sex, Age, Urban/Rural setting, and Education of the respondents. In total,14,297 respondents were surveyed across Angola, Ethiopia, Kenya, Madagascar, Rwanda, South Africa, South Sudan, and Uganda[5] between June 2020 and April 2021. Overall, the surveys' deployment was conducted at strategic periods during the pandemic to understand the changing attitudes of the community during peaks of the pandemic[6].

The survey's core questions from the modules were included in the pooled analysis which focused on various aspects: Knowledge, Attitudes, Behaviours and Practices (KABP), Coping Strategies, Emerging Needs, and Vaccine Hesitancy.

The operational approach for the pilot was that rapid data collection and sharing could support effective interaction between authorities, development partners, health workers, journalists, and the public to encourage proper behavioural change, to manage the crisis, and supply necessary services and goods to affected populations.

As a study, the CRA aimed to answer the following questions:

1. What knowledge, attitudes, practices, and behaviours related to COVID-19 can be rapidly assessed and how are they changing over time?
2. How do community coping strategies evolve during the COVID-19 pandemic and what are the emerging needs?
3. To what extent are communities willing to take a vaccine if it becomes available?

From the overall research question, in this paper we will present some selected observations related to willingness to uptake COVID-19 vaccines and a case study on the use of the information in a CRA country, Rwanda.

[5] Currently, a new CRA design has also been implemented to Zambia and three more rounds of CRA surveys are planned for Rwanda.

[6] Some of the survey rounds were implemented during lockdowns, school closures, vaccination campaigns. To see the implementation dates of each country and timeline of COVID-19 WHO data, please visit the cited dashboard of UNICEF & Harvard Humanitarian Initative Research Collaboration 2021 at https://covid-19data.org/

Results

At the time of the CRA deployment, seven of the eight Eastern and Southern African participating countries included indicators on vaccine uptake. Descriptive statistics to the selected results from the survey are summarized below

All respondents

For the six Eastern and Southern African CRA countries that used CATI (Computer Assisted Telephone Interviewing) technology[7] with VIAMO, about 81.1% of all respondents on unweighted answers appeared to be willing to take a COVID-19 vaccine if it was becoming available to them (Figure 1).

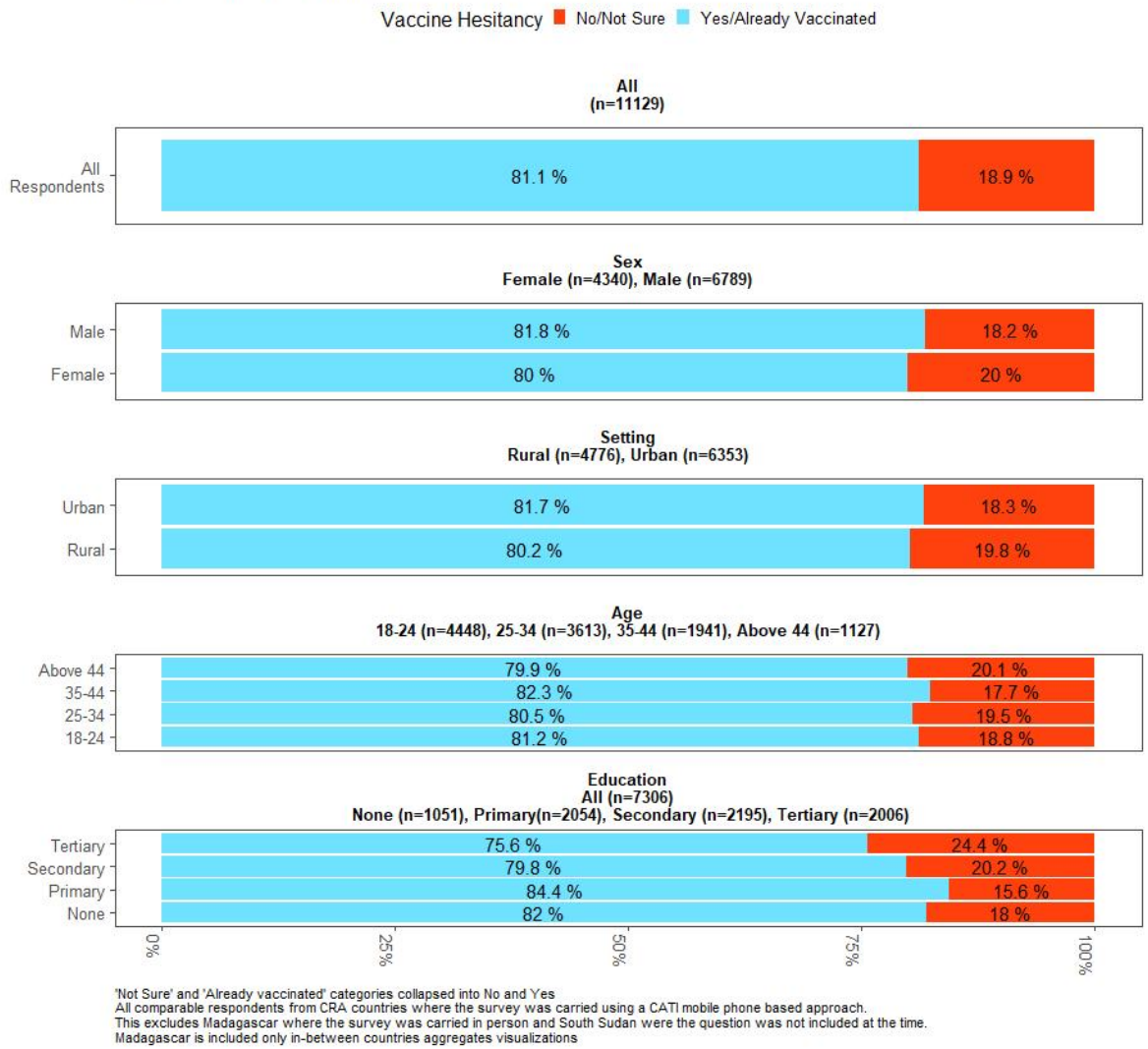


Figure 1. *If a COVID-19 vaccine becomes available and is recommended, would you take it? Per cent of Yes and No respondents for all comparable CRA respondents across Angola, Ethiopia, Kenya, Rwanda, South Africa and Uganda, unweighted*

[7] For this measure we only include countries where the survey was carried out through a CATI survey and not those that used in person or paper-based survey designs.

Similarly, fairly high frequencies on intent to be vaccinated for COVID-19 could be seen across different demographic groups (Sex, Urban and Rural Setting, Age, and Education); except for respondents that completed tertiary education, who had slightly higher percentages of respondents that were not willing to take a vaccine if available.

However, when looking at country specific samples weighted against their corresponding national population surveys, we see greater variation across round samples at different dates (Figure 2), As each country's survey was carried out during different times and with differing local COVID-19 prevalence rates, it is very likely that such changes were influenced by the national context at the moment where each survey was carried out.

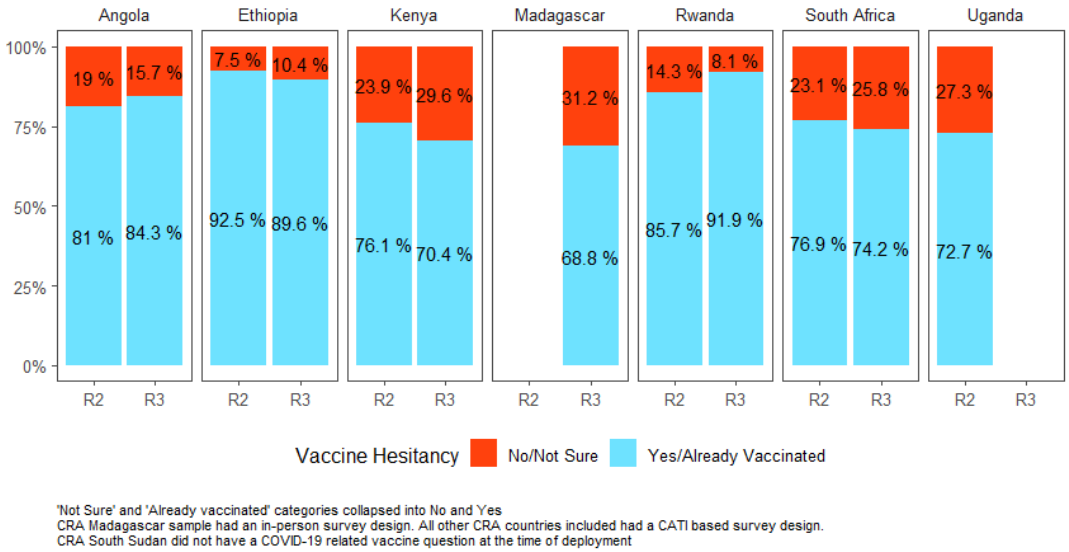


Figure 2. *If a COVID-19 vaccine becomes available and is recommended, would you take it? Per cent of Yes and No respondents per round where question was included, weighted*

For most countries, these data points are taken into consideration with observational studies that can further supply insights about the ongoing dynamic and that help contextualize the data locally. One such case refers to countries with ongoing civil conflicts or humanitarian crises, where observations on the ground point to a reduction in COVID-19 awareness or concern due to civil unrest and conflict, where COVID-19 acts as a compounding factor but not necessarily as the main area of daily concern.

Demographic factors

Looking more closely at specific demographic factors/variables supplied more insights. For example, in relation to sex differences, male respondents were more willing than female respondents to get vaccinated in Ethiopia, Kenya, and South Africa (Figure 3). During round three in Kenya, male and female respondents had more than 7% difference, compared to 3% in the earlier round. Formal hypothesis testing between demographic groups was not carried out for CRA round analytics. As noted in the Rwanda Case Study mentioned in the following pages, limited staffing precluded more formal testing of the data. However, all data was weighted, and margin of errors duly calculated, both for each round sample and for each demographic subgroup. This allows for the results to be replicated, assessed, and expanded with more in-depth studies. For the CATI countries included in the study, the margin of errors can be found at UNICEF GDC CRA Documentation page. (13)

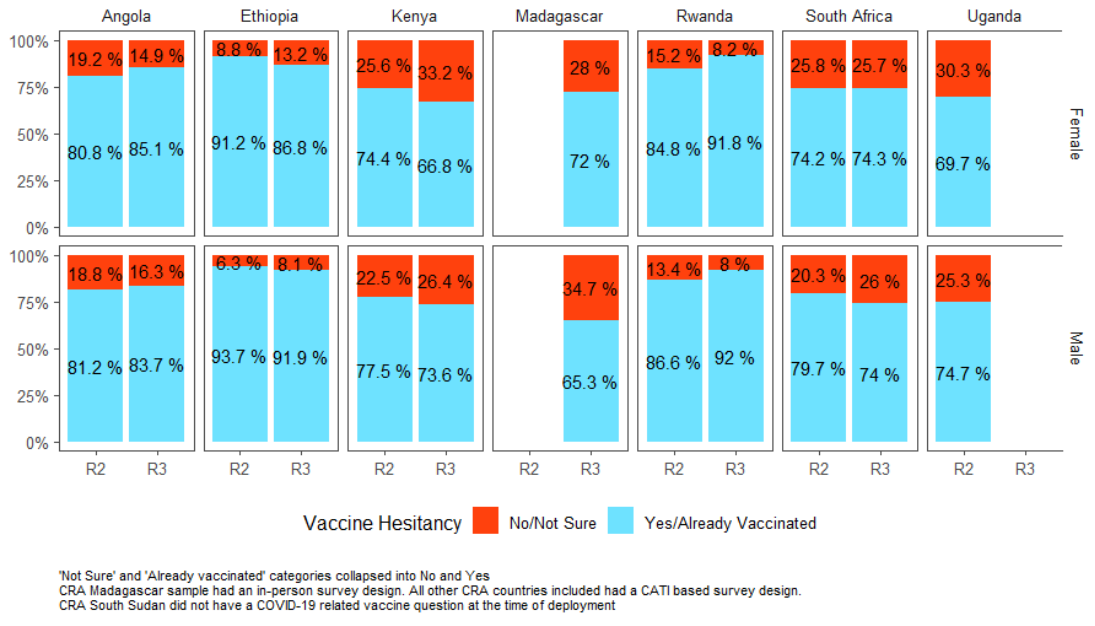


Figure 3. *If a COVID-19 vaccine becomes available and is recommended, would you take it? Per cent of Yes and No respondents by sex per round where question was included, weighted*

In relation to urban and rural settings, there were also some differences across countries (Figure 4). For example, urban populations in Angola were more willing than their rural counterparts to be vaccinated, while rural populations were more willing in Kenya and Ethiopia. In the latter, the difference was almost ten percentage points, with 85.5 per cent of rural respondents answering “yes” compared to 75.3 per cent of urban respondents.

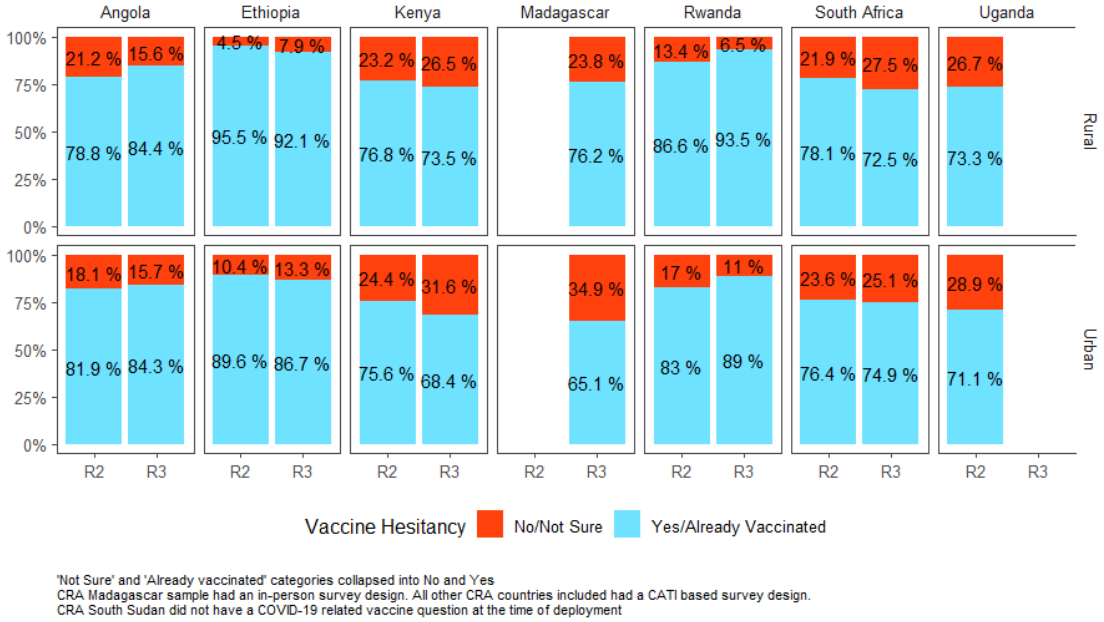
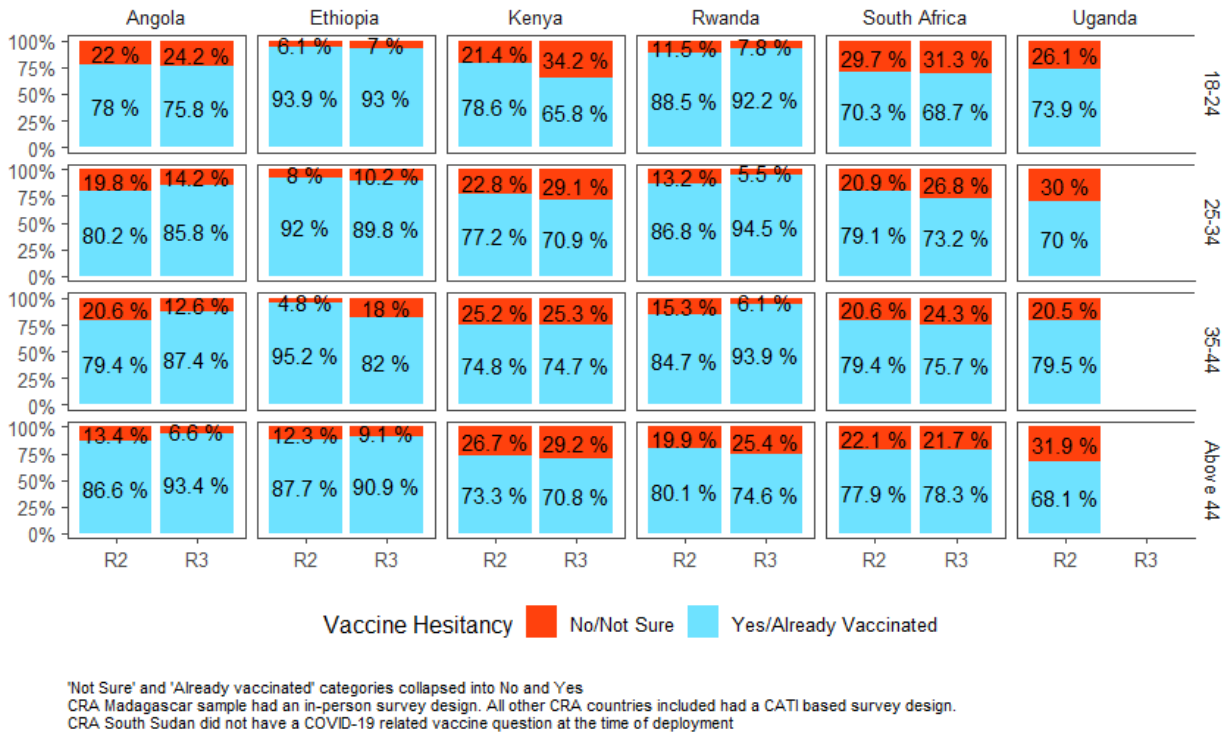


Figure 4. *If a COVID-19 vaccine becomes available and is recommended, would you take it? Per cent of Yes and No respondents by Rural/Urban setting per round where question was included, weighted*

In relation to age, CRA data showed that younger respondents have a higher willingness for being vaccinated (Figure 5). This was especially the case in Rwanda, Uganda, and Kenya. In South Africa, those over 45 years of age willing to receive a vaccine showed about 10% higher percentage of those willing than the youngest respondents. Such data points when triangulated with other contextual and qualitative data can point out trends on specific groups, where calibrated messaging can be targeted taking into consideration different messages for different age groups. As age is one of the most important factors related to COVID-19 complications, identifying key age groups with lower willingness to take a vaccine can strengthen messaging effectiveness. (14)



'Not Sure' and 'Already vaccinated' categories collapsed into No and Yes
CRA Madagascar sample had an in-person survey design. All other CRA countries included had a CATI based survey design.
CRA South Sudan did not have a COVID-19 related vaccine question at the time of deployment

Figure 5. *If a COVID-19 vaccine becomes available and is recommended, would you take it? Per cent of Yes and No respondents by Age per round where question was included, weighted*

In relation to Education, there are distinct levels across all countries (Figure 6). However, in most countries, those with tertiary education appear to have the largest percentage of respondents that are not sure or not willing to take a COVID-19 vaccine if available, compared to other education groups. To understand if such a factor is significant for all countries, further inferential approaches and formal hypotheses testing are needed. Due to the rapid requirements of the information and the limited staff to support the survey, more advanced modelling was not performed during CRA implementation. The model was designed to also provide inferential analytics and unsupervised learning approaches, but the previous limitations did not allow us to implement that potential. UNICEF intends to further review and implement the more advanced approaches as more capacity is added and the system continues to gain support across implementation countries.

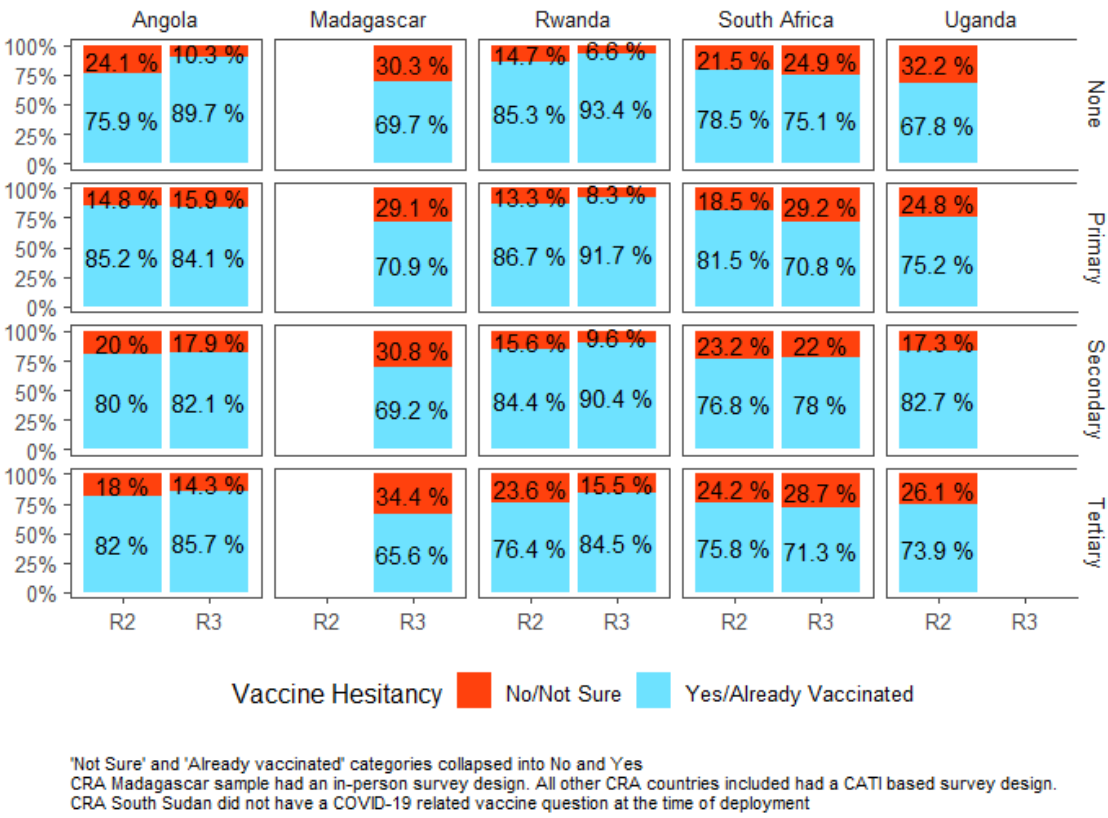


Figure 6. *If a COVID-19 vaccine becomes available and is recommended, would you take it? Per cent of Yes and No respondents by Education per round where question was included, weighted*

Rwanda Case Study

Rwanda stands out for its effective use of CRA insights into COVID-19 programming and its proposed added value to decision making processes, especially when informing vaccination efforts and addressing key behavioural barriers. As previously mentioned, its case will help show added value of the proposition to national government and local partners, as well name areas for improvement.

Evidence-led Decision Making

In Rwanda's case, the CRA findings were used to inform vaccination decision-making, particularly for demand promotion and vaccine uptake, during the Rwanda's Ministry of Health "SINDOHOKA" ("I will never give up") national communication campaign, co-led by UNICEF as Co-Chair of the National Risk Communication and Community Engagement (RCCE) Technical Working Group. For example, CRA findings were used for course correction by prioritizing those over 44 years. This group showed the lowest level of willingness to get a vaccine if available with only 74.6% of respondents willing to get a vaccine compared to other groups with percentages above 90% (Figure 5).

Using CRA findings on the most trusted source of information about COVID-19, emphasis was put on prioritizing electronic media (40% preference), print media (29% preference) and information shared by health workers and facilities (15% preference).

Similarly, CRA data was also used to support the government design and rollout of youth-led interventions, as 59% of CRA respondents reported that the community group they trust the most to support community-based actions during COVID-19 were youth groups. This also led to design key engagements with community faith-based organizations, as they were the second most trusted community organization, with 12% of respondents citing them as their most trusted community group for COVID-19 response. Finally, use of social media and "WhatsApp" messages for COVID-19 vaccine outreach was also adjusted based on the findings of the CRA.

For all the earlier instances of use, CRA data were supplemented by the findings of qualitative research conducted by key partners, primarily through the network of Rwanda Red Cross Society volunteers.

Use of CRA in other COVID-19 related programming areas

One of the key elements of use in Rwanda was the presentation of each round of findings to the Rwanda's Ministry of Health, Ministry of Education and National RCCE Working Group (including a variety of Rwanda's COVID-19 response partners: national and international organizations including United Nations agencies, bilateral agencies, and civil society organizations). In addition to vaccination, the CRA findings were useful to inform the national "Back to School" campaign, led by the Rwanda Basic Education Board. During round one, food security questions were included in collaboration with the World Food Programme to inform immediate interventions, as their own data collection was constrained at that time. As such, local adaptation of the survey through modules also supplied key information to other key areas of COVID-19 related programming.

Limitations

Although the CRA supplied critical findings in a quick survey, the UNICEF Rwanda country office staff found that the CRA findings had some limitations in its use. More specifically, the CRA was not able to show why certain groups had larger percentages of people not willing to be vaccinated. In addition, it was not able to supply insights about the uptake of booster doses by those vaccinated, willingness of parents to vaccinate their children, nor understand gender-related barriers to vaccine uptake. For these queries, the UNICEF country office complemented the CRA data with other qualitative studies and field reports that helped further investigate barriers and sharpen interventions.

Real time data collection only offers value when there is real time analysis. Although the data analysis was rapid, a small number of UNICEF staff supported the analysis for all 12 countries that were part of the CRA exercise. This limited the ability to supply more prompt in-depth analysis. It also limited more complex approaches that would have needed added time and effort.

Similarly, it was also noted that although the CRA products were visually attractive and supplied abundant information, they also lacked a more succinct format and visualizations for easier review and use by all RCCE partners, especially for the Rwanda's Ministry of Health.

However, despite these limitations, UNICEF Rwanda country office, and RCCE and government partners in the country, all highlighted the CRA as a successful and useful approach set up during the pandemic and recommended that it should be continued.

Discussion

COVID-19 has required rapid, efficient, and evidence-based responses to foment buy-in, trust, and legitimacy through community-based processes. (15) In such responses, collaborative efforts are key to success. The CRA has enabled UNICEF to provide rapid insights with a

simple yet solid design, allowing a quick turn-around to support country responses to the pandemic. Furthermore, one of the key elements of early success in both the design and use of the CRA has been on the collaboration and partnership between diverse levels of UNICEF's COVID-19 response to adapt, use, and strengthen rapid evaluative methods for practical lessons and insights to improve country responses and inform local engagement.

Although the system was piloted based on needs, it also supplies many lessons to improve and build on its early success for future rapid evaluative efforts as well as for the relevance and importance of behavioural data for events like COVID-19, especially the need to staff such data systems to improve capacity, relevance, and analytical support. (8) As the pandemic evolves into the new normal, adaptative evaluative approaches and efforts like the CRA could supply critical insights for massive global efforts like the fight against COVID-19 and the on-going global vaccination drive.

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