Use of RapidPro for remote collection of nutrition data during the drought emergency and COVID-19 pandemic in Zimbabwe

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The authors would like to thank all those who contributed information to this article including the Ministry of Health in Zimbabwe, the UNICEF Zimbabwe nutrition team and Nutrition Cluster partners. Most importantly, we would like to thank the dedicated health personnel in Zimbabwe, at both facility and community level, for their continuous monitoring and reporting through this system which allowed the timely identification of and treatment for malnourished children. We are also grateful to the United Nations Central Emergency Response Fund (CERF) and European Civil Protection and Humanitarian Aid Operations (ECHO) who funded this initiative, for their generous and continued contributions.

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of UNICEF and the Zimbabwe Ministry of Health and Child Care.

Baby (9 months) is measured for malnutrition by Unicef volunteers at a food distribution point in Manzwire village, Zimbabwe

ZIMBABWE

What we know: The COVID-19 pandemic and resulting movement restrictions have challenged the collection of routine nutrition monitoring data, limiting the ability of countries to identify changes in the nutrition situation.

What this article adds: The RapidPro data management system enabled the continuation of routine nutrition data collection in Zimbabwe in the COVID-19 context. A number of indicators were selected for weekly (instead of monthly) reporting in nutritionally vulnerable, drought prone districts. Village health workers (VHWs) and health facility staff were prompted weekly to submit data via the mobile phone short messaging service (SMS) which were automatically collated via RapidPro software and analysed regularly at national level. A national level monitoring and evaluation officer responsible for quality control followed up with districts and health staff if data discrepancies were noted. To date, over 9,146 VHWs provide reports using the RapidPro system; on average, 70% of responses were complete and correct. This system enabled near real-time screening data (Family mid-upper-arm circumference (MUAC)) and information on ready-to-use therapeutic feeding (RUTF) supplies that were used by the Nutrition Cluster for decision making and response planning to support continued wasting treatment services. Successful scale-up of RapidPro was as a result of strong government leadership, the inclusion of RapidPro activities in Ministry of Health activity plans and integration with national nutrition reporting systems. In due course, this data will be automated to feed directly into the Demographic Health and Information Survey verion two (DHIS2) data management platform.

Background

An effective emergency response relies on timely and accurate data to inform prompt and evidence-based decision making and programming. During the emergency response to Cyclone Idai in Zimbabwe in 2019, RapidPro software (Box 1) was used to facilitate the remote collection of nutrition data in two districts of the country. Following this success, plans were being made to re-initiate the use of this technology at the start of 2020 in the light of predicted back-to-back droughts and poor grain harvests. As redeployment of RapidPro was being prepared, the COVID-19 pandemic took hold, resulting in movement restrictions across the country put in place to mitigate the spread of the virus. This had an immediate impact on the delivery of nutrition services and the routine collection of nutrition montitoring information, creating challenges for effective decision-making by the government, Nutrition Cluster and partners. In response, plans were made by the Zimbabwean Ministry of Health and Child Care (MoHCC), with technical and financial support from UNICEF Zimbabwe supported by the Nutrition Cluster, to scale up the use of RapidPro technology to 27 priority districts (wider than initially planned) to support the continuation of nutrition delivery services within this new challenging operational environment.

Box 1 RapidPro

RapidPro is an open source software that allows for the collection of data via text messaging services (short messaging services (SMS)). The SMS facility is widely available on all types of phones and the platform does not require an active internet connection, making it a feasible approach in areas of limited internet coverage. For nutrition programmes, RapidPro is able to provide weekly geo-referenced data for the monitoring of nutrition programme caseloads, coverage of implemented activities and the use of and need for nutrition resources, including nutrition supplies such as ready to use therapeutic food (RUTF) and multiple micronutrient powders (MNPs).

RapidPro was developed by ONA,[1] a social enterprise that builds data infrastructure to enable data driven decision-making. RapidPro can be integrated with the ONA platform to enable data validation, analysis and visualisation. ONA can also register users who are able to create new or update contact information for respondents and access information as it is being received.

In Zimbabwe, the routine nutrition information system is embedded into the District Health Information System version two (DHIS2). Within this system, routine nutrition data, including clinic-based growth monitoring and village health worker (VHW) data, are recorded on paper monthly and then sent to a District Health Officer who enters it into the DHIS2 system. Within this system, it takes around one month from reporting for data to be available. An automated system already exists for weekly disease surveillance in the country, using a two-way mobile messaging system to monitor disease and report events by health facilities. In this system, data are transmitted via the short messaging service (SMS) to a central server from where it is automatically transferred to DHIS2. However, nutrition information is not currently integrated within this system. RapidPro is not intended to replace the routine nutrition information system, but to fast track data flow from frontline workers to national level. In due course, the intention is to feed RapidPro data into the DHIS2 system to ensure MoHCC ownership and avoid duplication. This article describes the process of planning, preparation and implementation of RapidPro and presents the results of data collection between April and October 2020 and lessons learnt.

Planning for use of RapidPro

Prior to the scale-up of the RapidPro system, a mapping exercise of existing information management systems was conducted by Nutrition Cluster members, led by the MoHCC and the Nutrition Cluster Coordinator. This was an important first step to avoid duplication of efforts, identify areas for potential integration and explore current information gaps that could be addressed by the use of the RapidPro system. Gaps identified in this exercise included a lack of near real-time nutrition data for use in emergency responses, a lack of data on children admitted with moderate acute malnutrition (MAM) and children reached with multiple micronutrient powders (MNPs). Following this, 27 districts were prioritised for implementation of RapidPro. This was achieved through the ranking of all 63 districts by severity of drought impact according to key nutrition indicators (prevalence estimates of stunting and wasting of children aged 6 to 59 months and estimates of minimum acceptable diet of children aged 6 to 23 months). Twenty five of the most affected districts were identified and two additional 'hotspots' were added based on rising rates of wasting.

Selection of indicators

The number of nutrition indicators collected was streamlined from the routine list of indicators to include high frequency indicators at health facility and community level that had potential to provide trend data (Box 2). Streamlining took place to avoid overloading health workers and reporting processes while allowing the ongoing monitoring of trends at facility level and early identification of hotspot areas. Data on the status of supplies for health facilities were also collected to ensure no stock-out of life-saving nutrition supplies and emergency orders for facilities with fast depleting stocks. The frequency of collection of these indicators was increased from monthly to weekly during the implementation period.

Capacity building of health staff

The MoHCC and national level partners were already familiar with the RapidPro process from previous training that had been cascaded to district level within the nutrition, health information and information technology government departments. To support the 2020 deployment of RapidPro, short refresher trainings were conducted at national level with support from UNICEF Zimbabwe which were then cascaded to priority districts. Refresher trainings enabled a similar level of understanding of the system and its functioning at national, provincial and district levels. From the districts, trainings were then cascaded to health facility staff and then on to VHWs using a training-of-trainers approach. Most of these trainings were carried out before the COVID-19 movement restrictions were imposed. After COVID-19 movement restrictions were in place, some trainings were carried out using online platforms and, where this was not possible, infection prevention and control measures were put in place to enable face-to-face training. Job aids were also developed in relation to the RapidPro system to be used by the nutritionists, health information officers and VHWs.

Data collection and validation

Following deployment of the new system, on a weekly basis, when prompted through messages, VHWs and health facility staff sent data for the selected indicators via SMS to a short-code. The system was designed to make VHW reporting as simple as possible given the general level of

[1] https://ona.io/home/

Box 2 High frequency indicators selected in Zimbawe for monitoring with RapidPro

Health facility level indicators

Number of children (6-59 months) screened for wasting using mid-upper-arm circumference (MUAC) and weight for height z-score (WHZ)
Number of children with severe wasting (disaggregated by sex)
Number of children with moderate wasting (disaggregated by sex)
Number of children who received vitamin A supplement (disaggregated by sex)
Number of children who received multiple micronutrient powders (MNPs) (disaggregated by sex)
Number of caregivers of children under two years of age who were reached with infant and young child feeding (IYCF) messages
Number of sachets of ready-to- use therapeutic foods (RUTF) in stock at the health facility

Community level indicators

Number of children (6-59 months) screened for wasting using MUAC
Number of children with 'red' MUAC referred to the health facility for severe wasting treatment
Number of children with 'yellow' MUAC referred to the health facility for moderate wasting treatment
Number of children who received vitamin A supplement
Number of caregivers of children under two years of age who were reached with IYCF messages

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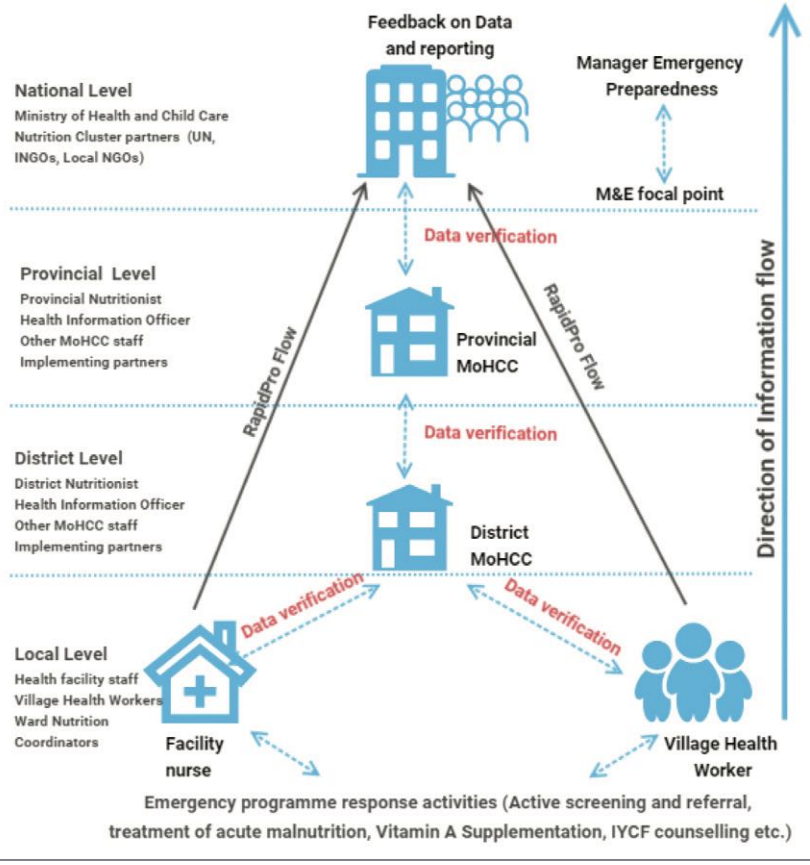
A village health worker takes the MUAC measurement of a child in Buhera District, Zimbabwe

Figure 1 RapidPro data flow from frontline workers to national level



literacy. The system used reverse billing with no charge to the recipient for sending messages. The bill was paid at national level by MoHCC with financial support from UNICEF and its donors.

A benefit of the process is that it bypasses data analysis and validation at district and provincial levels, thereby allowing data to reach the national level cloud server in near real-time. The trade-off, however, is that data is received at national level in its raw and uncleaned form. This necessitates having some capacity at national level to clean (remove duplications and incomplete responses), quality check and analyse the data received. At national level, a Monitoring and Evaluation (M&E) officer under the nutrition department of the MoHCC and an information management officer at UNICEF received and analysed the data sent by frontline workers and any incorrect data was passed back to health facilities or VHWs via SMS for checking and correcting. Despite the training and message reminders, in the first two to three weeks of reporting a number of errors were noted that required checking. Data validation rules were also developed to ensure quality of reporting, for example to ensure that VHWs were not able to refer more children to the health facility than the number of children that were screened that week. Following this process of validation, results were regularly shared with all interested parties including provincial and district cadres and Nutrition Cluster members through email or an online shared folder. The data flow is described in Figure 1.

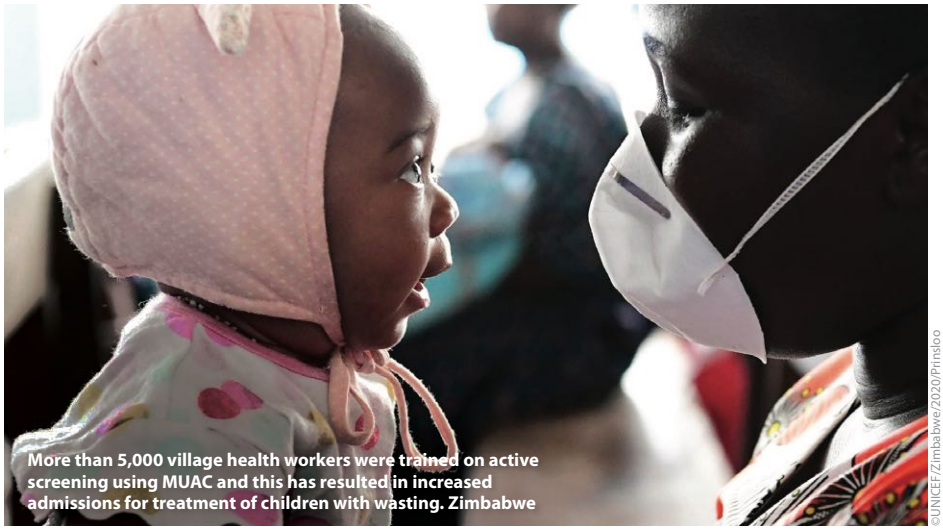
To improve efficiency of this process, plans are currently being made to use the ONA platform for validation of data by officers at district, provincial and national levels and for further analysis and visualisation. The ONA platform will shorten the validation process as district level staff will be able to login to the platform, browse through the data submitted and make any necessary changes when data discrepancies are evident.

Results

Reporting on RapidPro started in April 2020 in 655 health facilities across the 27 priority districts. By October 2020, this had increased to all 684 health facilities. Other non-priority districts continued to report their data routinely through the DHIS2. During the first week of April 2020, 13% of registered health facilities reported data correctly, following all the reporting format requirements. During the second week of April this rose to 35% and by the 25th week in October 2020, 74% of registered health facilities reported data correctly. Continuous follow-up was conducted to ensure that health facilities reported data consistently. As time unfolded, respondents became more familiar with the system and reporting rates improved substantially. One critical challenge in reporting was that some health facilities did not possess a health facility phone and facility staff's personal phones had to be used. Reporting was therefore often not done when that particular staff member was off-duty. This has subsequently been rectified by registering more than one phone number per health facility.

At community level, 5,009 VHWs were registered by the first week of reporting and submitted reports using their personal mobile phones or, in the few instances where VHWs did not have their own phone, a friend's/neighbour's phone. Additional VHWs were registered in the following weeks based on feedback from health facilities. To date, over 9,146 VHWs have been registered to provide reports using the RapidPro system. On average, 70% of registered VHWs send complete and correct responses (following the correct reporting format requirements). Continuous follow-up is done at district level to ensure VHWs are aware of the correct reporting formats and that they are reporting consistently on RapidPro.

Screening for wasting in Zimbabwe has continued in the COVID-19 lockdown following adoption of mother-led mid-upper-arm circumference (MUAC) approaches (also known as Family MUAC) which aimed to limit the risk of exposure to COVID-19. Family MUAC was introduced in Zimbabwe prior to COVID-19, however it was rapidly scaled up to cover all 27 drought-prone districts with the arrival of the pandemic to ensure the continuation of screening activities in vulnerable communities. Training



More than 5,000 village health workers were trained on active screening using MUAC and this has resulted in increased admissions for treatment of children with wasting. Zimbabwe

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Silabaziso Ncube, a UNICEF-supported community health worker, shows the mobile phone that she uses for reporting on the number of children she has screened with MUAC. Insiza North, Zimbabwe

of mothers was carried out through a cascade approach whereby UNICEF implementing partners trained VHWs who then trained mothers in their area. Reporting of children screened through the mother-led MUAC approach has been included within the RapidPro system with VHWs reporting the measurements taken by mothers. Between April (when data collection started) to October 2020, over 2.5 million screening episodes were recorded at community level as reported by VHWs. This is in comparison to the 1.1 million screening episodes noted in the same time period the previous year (April to October 2019) when the mother-led MUAC approach was not in place. A VHW reports on each child's MUAC reading an average of once per month and it is therefore estimated that over 400,000 children (46% of the total children 6-59 months in the 27 districts) were screened each month. Supplies of ready-to-use therapeutic food (RUTF) were also closely monitored in the 684 facilities across the 27 districts allowing for timely restocking of supplies and only 4% of health facilities reported stock-outs during the reporting period.

During the reporting period (April to October 2020), 25,488 children were reported at community level with a 'red' MUAC reading (indicating severe wasting) and 91,543 with a 'yellow' MUAC reading (indicating moderate wasting) and were referred to health facilities for further investigations. Of the children referred, 5,596 were admitted for treatment of severe wasting while 5,768 were admitted for treatment of moderate wasting. This is similar to the numbers admitted in 2018 (5,509) and slightly less than those admitted in 2019 (6,376) for the same time period and the same districts. This is in line with trends for admissions of severe wasting at national level during 2020 which have seen a drop compared to 2019 as services were affected by the restrictions associated with COVID-19. The large discrepancy between the number of children reported as wasted by VHWs and the numbers admitted for treatment when verified at health clinics (using weight-for-height) is being further investigated and likely includes double counting of children between weeks. This indicates that the VHWs still require more training and supportive supervision in MUAC measurement and in te reporting of data and also that mothers may require refresher training. This discrepancy may also be as a result of MUAC-only screening having the propensity to pick up a high number of 'false positives'; this also needs more investigation in the Zimbabwe context.

Discussion and lessons learnt

Building on the experience and learning from the use of RapidPro in the Cyclone Idai response, Zimbabwe was quickly able to restart and scale up the use of this reporting platform when the COVID-19 pandemic began and associated travel restrictions and lockdowns were put in place. RapidPro was identified as a suitable data collection tool in light of COVID-19 due to its ability to allow remote community level and heath facility level data collection. This helped to ensure continuous monitoring of the nutrition situation in Zimbabwe within the 27 most drought-affected and nutritionally vulnerable districts in the country.

The availability of nutrition information through RapidPro contributed to informed decision making during the COVID-19 crisis. The Nutrition Cluster was able to monitor disruptions to essential nutrition services caused by the crisis in a near real-time manner (weekly) and put in place measures to support the continuity of services for those children requiring treatment. For example, the Nutrition Cluster was able to promptly see the drop in utilisation of essential nutrition services at health facility level following the COVID-19 related lockdown. Such data enabled informed decision making around the need for various adaptations to the delivery of services for the treatment of wasting and community engagement and counselling around breastfeeding and young child feeding in the context of COVID-19. The availability of the data on a regular basis also meant that RUTF stock-levels were monitored closely and those health facilities requiring replenishment were stocked in a timely manner.

During the process of using the RapidPro system for the reporting of nutrition data, the following aspects were noted to be critical to its successful rollout. Firstly, the mapping of the existing information management systems was an important initial step to avoid duplication of efforts, identify areas for integration and highlight gaps that could be addressed by the RapidPro system. Secondly, government leadership and ownership of the nutrition information systems initiatives was critical. For the COVID-19 response, decisions on the scale-up of the RapidPro reporting system were made through the Nutrition Cluster and under the leadership of the MoHCC, resulting in improved buy-in and ownership of the system by MoHCC as well as the Nutrition Cluster partners. This also enabled improved communication between the MoHCC and partners. Thirdly, a systems strengthening approach was key to ensuring that the RapidPro strengthened, but did not undermine, routine reporting systems. The health monitoring information systems (HMIS) and monitoring and planning departments in the MoHCC were engaged throughout to ensure that the data collected was fed into the national reporting system rather than serving as a parallel platform. The National Nutrition Unit in the MoHCC took the lead in engagement with other departments, making it easier to get their buy-in. In addition, plans were put in place to ensure that, in future, RapidPro data feeds into the DHIS2 in an automated fashion. Finally, appropriate approaches for the capacity building of key cadres at all levels was essential to create momentum in the use of the system and support its functioning. Creating the same level of understanding of the system and how it functions across all users at all levels was important as well as ensuring sufficient training and trouble-shooting were provided to VHWs. It is clear that the importance of on-the-job training and supportive supervision cannot be underestimated, as the errors in numbers reported shows, and the propensity of MUAC-only screening to pick up a large number of 'false positives' also requires more investigation.

The MoHCC National Nutrition Unit has since decided to restart the sub-committee on information management, a technical body formed within the Nutrition Cluster, which will oversee the next steps for the use of the RapidPro reporting system. These include working to improve data quality in the 27 districts through review and quality control of the numbers being reported by VHWs with refresher training and mentorship visits planned for those VHWs reporting unlikely numbers or reporting using text instead of numbers. Weekly reporting is still in place and will continue until nutrition service delivery has recovered. In addition, the automatic link (using an ONA platform) between the RapidPro system and the national HMIS (that uses DHIS2) will be completed before any further scale-up of the system to ensure proper reporting into the national HMIS.

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