Info Note

Co-designed solutions for collecting food & nutrition security data with mobile devices

What worked (and did not) from a NGO, government and research partnership

Sabrina Chesterman, Christine Lamanna, Jim Hammond, Nictor Namoi, Oliver Wakelin, Mary Ng'endo, Mark van Wijk and Todd Rosenstock

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Key messages

- Development partners need robust solutions that help collect more data with fewer resources.
- ICT-based surveys offer opportunities to track key indicators over time and reduce costs of monitoring.
- Results from pilots show both promising results and challenges during the transition to rapid and mobile-based surveys

Acute and chronic malnutrition stunts current and threatens future development in Sub-Saharan Africa. More than 30% of children experience short periods of significant under nutrition and are below the target height for weight. In many countries, such as Tanzania, Zambia and the Democratic Republic of the Congo, the undernutrition challenge is even more dire, with stunting rates nearing 50% (Figure 1). Effects of wasting and stunting, respectively, range from a lack of concentration to long-term cognitive impairment that constraints the ability to achieve potential.

The extent and implications of under nutrition in Sub-Saharan Africa have catalyzed political action and programs on the ground. For example, the United Nations has declared a decade of action (2016-2026) and the Sustainable Development Goals have set ambitious targets to end hunger and undernutrition by 2030. Countries and development partners are moving too, individually and in coordinated actions through programs such as Scaling Up Nutrition (SUN).

Actors employ many nutrition-sensitive interventions to improve diets and nutrition including: agriculture; water, sanitation and hygiene; market-access; *etc*. Programs then rely on measuring indicators of outcomes (weight for age), proxies of the intended outcomes (e.g., dietary diversity such as Minimal Acceptable Diet, food accessibility or hunger months), and/or indicators of intervention implementation to monitor progress and adaptively manage programming. Availability of timely, relevant and useful information could improve the efficiency and effectiveness of development programming and ultimately food and nutrition security. However, existing monitoring and evaluation (M&E) requirements are already a challenge to implement because of time and resource constraints.

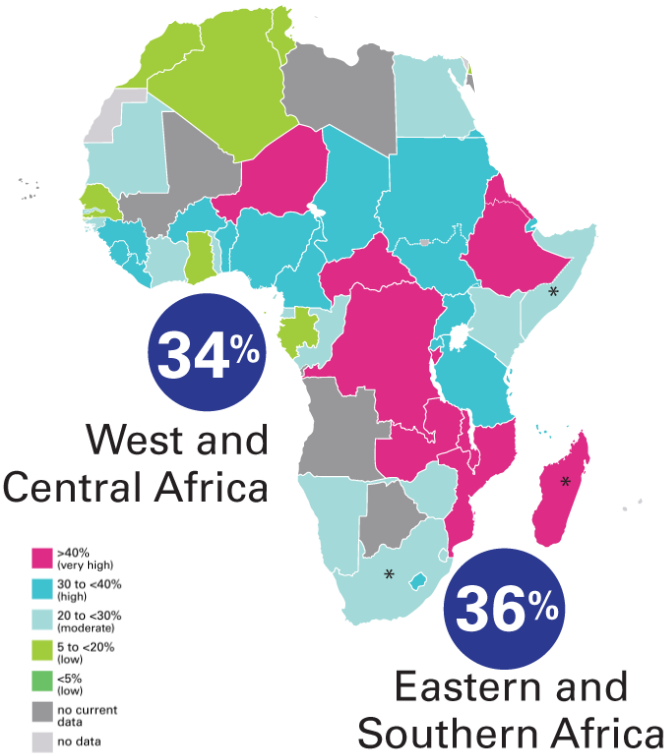

Figure 1. Stunting in Sub-Saharan Africa. Source: UNICEF

Digital tools and mobile platforms could help provide the requisite information and mitigate logistical and organizational burden of M&E requirements. But despite trends toward 'Big Data', development partners often delay to integrate technological advances into activities on the ground.

Here, we describe some lessons on what worked and what did not when research, development and government partners engaged to evaluate M&E solutions for food and nutrition in Zambia. We are reporting preliminary results of a field measurement campaign that included SUN, GIZ, CARE and CRS' FANSER and the Surveillance of Climate-smart Agriculture (SCAN) programs and projects.

Simply, more for less

Discussions among government, research and development partners highlighted a tension with current approaches to M&E in the food and nutrition security sector. There is a fundamental need to collect high quality data at significant temporal and spatial resolution to adaptively manage and deliver on programs because nutritional status changes frequently and require significant sample sizes for validity. However, the need exceeds the capacity of many of the institutions. Furthermore, the time lag between survey development and useable data often limits the utility of the data for reporting, missing the learning and planning phases of the cycle. This together contributes to M&E being more of a burden than an opportunity.

In short, development practitioners need M&E to be more comprehensive, faster and cheaper. Solutions are being sought and most of the partners had considered and are using technology (e.g., tablet-based surveys). However, few had made significant transitions to new approaches available, such as remote sensing or mobile phone-based communication.

Here, we will describe the efforts to work on two? of the challenges presented: (1) monitoring over time and (2) evidence of impact.

Monitoring over time

Increased penetration of mobile devices allows innovations in how data are collected. In Zambia, we experimented with the use of voice calls to collect key indicators of food groups consumed and dietary diversity and behavior change through knowledge, attitudes and practices (KAP) information. Both indicators can change more frequently than most monitoring programs are able to track (e.g., seasonally for food groups, or before and after trainings for KAP). Therefore, we tested the usefulness of voice calls to frequently monitor food and nutrition security during a KAP capacity building project in Zambia.

Voice calls, versus SMS, were specifically used because of the complexity of the indicators. We suspected that in many cases, enumerators may have to explain questions. Furthermore, both indicators require more than 10 questions. When clarification is needed and when questionnaires are longer than only a few questions, voice calls from a live (but remote) operator outperform other mobile-based survey options.

Initial face-to-face interviews were done with KAP program participants in the field and phone numbers were collected for callbacks by local enumerators in Eastern Zambia. Then, approximately two weeks later, those with phone numbers were called by one of the same enumerators to repeat the KAP survey using a smart phone and ODK Collect.

Of the 189 program participants reached via face-to-face interviews, only 107 (56%) were willing and able to provide a phone number for follow up interviews. Enumerators reported that many participants lacked a phone, shared a phone with others, or were unwilling to participate in the callback scheme. Of those who did provide numbers, though, the success rate of callbacks was very high, with 95 (89%) of interviewees reached within a one-week period. The major challenges with the callbacks were wrong numbers or unreachable participants, but this only affected a small proportion (~10%) of the intended interviewees.

To improve the success of voice-call surveys for monitoring food and nutrition security outcomes with high temporal frequency, a number of actions may be taken: (i) more oversight of enumerators/call centre, (ii) scheduled calls, or SMS alerts about upcoming calls, (iii) better integration in to programming to build more trust between monitors and participants, or (iv) providing financial (e.g., phone credit) or nonfinancial (e.g., information) incentivizes for long-term program participation. Though the availability of phones was lower, results in Zambia suggest there is the ability to contact persons with phone and therefore support the importance of this mode especially where mobile penetration is higher (i.e. Lamanna et al. in review).

Evidence of impact

Digital data and mobile technology can be used with various sampling designs for a broad range of applications including surveillance, baselining, longitudinal studies and impact evaluations of programs. In this study, partners piloted two uses: one, detecting changing in WASH practices with FANSER and two, monitoring changes in knowledge, attitudes and practices among SUN households.

FANSER has been operating in the Districts of Katete and Petauke for nearly two years. The project aims to improve

food security and reduce malnutrition. One set of actions to achieve this goal was to influence WASH practices through information dissemination campaigns. In this pilot, we used the rapid Rural Household Multi-Indicator Survey (RHoMIS) (Hammond et al. 2016). We asked beneficiaries and non-beneficiaries a simple six question survey to evaluate the effectiveness of the program thus far. We found a statistically significant difference in WASH practices between beneficiaries and non-beneficiaries (Figure 2). Even with a simple questionnaire, it was possible to disaggregate the causes of the significant difference. Households that have received training by FANSER tended to have better sanitation, as measured by improved toilet facilities, proper stool disposal and children not playing in the area livestock are kept. These types of data can also be used for programming. While preliminary results are promising for sanitation, emphasis may be focuses on water and hand washing going forward.

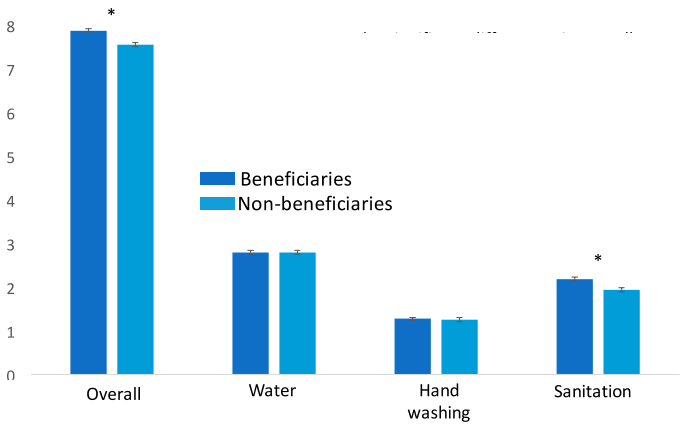

Figure 2. Impact of FANSER program in Petauke and Katete on WASH practices. After only 1.5 years, already a significant difference between beneficiaries and non-beneficiaries

Results from the work with the SUN program also point toward clear opportunities for programming. Based on the rapid survey on KAP, we could identify where persons were receiving their information and thus set clear targets to help change behavior (Figure 3). For example, 80% of the respondents received information from Community Health Workers, who provide extension outreach from local gov clinics. Within SUN programs radio and women's empowerment groups were the most effective ways to reach persons. These results present clear opportunities where SUN can have the most impact. A follow up question then would need to consider the cost-effectiveness of the various options. With those two pieces of information together, SUN would be positioned for significant change.

Conclusions

Government, NGOs, and scientists working in food and nutrition security agree that there would be significant benefits to collecting more data more often, if it could be done for less money. Here we tested a few options for meeting these goals including voice calls for higher frequency monitoring and rapid surveys for understanding the evidence of impact. We identified several challenges that preclude the ability to achieve this goal, some technical such as network connectivity, indicator incoherence, some financial such as continued support and logistics for small payments to enumerators and some programmatic. In addition, there may be ways to reach economies of scale through outsourcing to a skilled M&E unit that works across programs with implementation of rapid surveys. Further innovation is needed to implement these programs in the future.

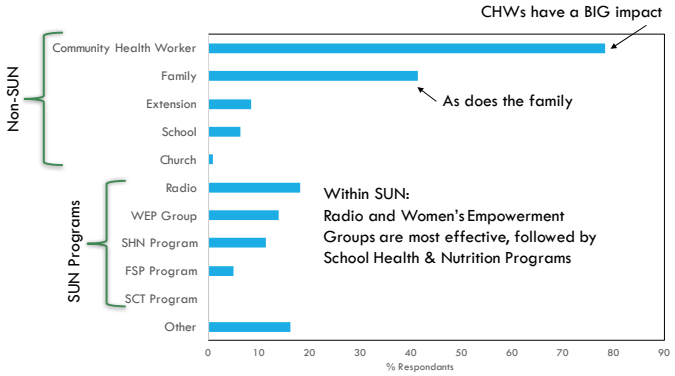

Figure 3. Sources of nutrition programming in Chipata, Zambia.

Further Reading

- Chesterman S. et al,. Collecting development data with mobile phones: Key considerations from a review of the evidence. CCAFS Info Note.
- Lamanna, C. et al.. Strengths and limitations of computer assisted telephone interviews (CATI) for nutrition data collection in rural Kenya. *In review*.
- Dabalen, A. L. et al., 2016. Mobile phone panel surveys in Developing Countries: a practical guide for microdata collection. Direction in development. Washington, D.C.: World Bank Group.
- Toninelli, D et al. (Eds). 2015. Mobile Research Methods: opportunities and challenges of mobile research methodologies. Ubiquity Press.

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Todd Rosenstock (t.rosenstock@cgiar.org) is a Climate Change and Environmental Scientist with the World Agroforestry Centre (ICRAF).

CCAFS and Info Notes

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) is a strategic partnership of CGIAR and Future Earth, led by the International Center for Tropical Agriculture (CIAT). CCAFS brings together the world's best researchers in agricultural science, development research, climate science and Earth System science, to identify and address the most important interactions, synergies and tradeoffs between climate change, agriculture and food security.

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