High-frequency data collection can transform our understanding of diets and nutrition
Rhys Manners

OVERVIEW

Diet quality is a critical determinant of human health and serves as a key indicator for food system sustainability . However, data on diets are small, scattered, often project-dependent, without a consistent methodology, limiting actionability (Beal et al., 2021). Contextually sensitive technologies exist that can be implemented to generate sustained and high-frequency data flow from crowds (Gibson et al., 2017Lamanna et al., 2019). Harmonisation of such data collection systems with validated diet quality assessment tools represents a pathway for high-frequency diet quality assessment across scales.

High frequency deployment of the diet quality questionnaire (Herforth et al., 2020) through an unstructured supplementary service data platform was piloted in Rwanda (Manners et al., 2022). This novel data collection system provides basic functionality to engage users, whilst having a back-end to aggregate data to generate insights about diet quality.

This innovative system is improving the understanding of diets and nutrition in Rwanda, whilst transforming the speed and costs with which this can be done. The system has crowdsourced 62,500 responses in 40 weeks. These responses point demonstrate that female, older, and middle-income Rwandans tend to have better quality diets, but with notable temporal fluctuations socio-economic groups and location. Generating these insights from traditional data collection system would be prohibitively expensive. Estimates place the cost per respondent at less than $1, compared to $33 for an identical in-person survey. The system was also more time-efficient, with responses taking less than 15 minutes, compared to an hour in-person, reducing the invasiveness of data collection interactions. Standardisation of digital data collection also facilitates the creation of interactive workspaces, permitting collaborative research and insight development (e.g. Figure 1 – www.dietquality-map.org).

A sustained data flow from the system constitutes an indispensable, scalable, and promising step towards robust data-driven policies and interventions for nutrition security and transforming our understanding of the dynamics diets and nutrition in Rwanda. These advances are invaluable to researchers, policy-makers, and
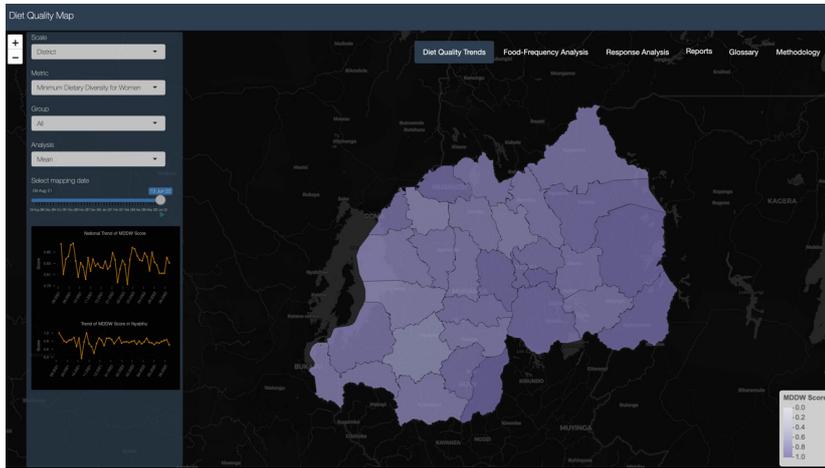
Figure 1. Interactive dashboard with insights gathered from high-frequency data collection.

development actors who are interested in addressing diet quality and nutrition security at the most critical location(s) and time.

RELEVANCE TO DIFFERENT SPATIAL AND TEMPORAL LEVELS

The agile and adaptable data collection system can be deployed for high frequency diet quality data collection, at minimal cost. The developed system could easily be adapted to the dietary and technological contexts of other countries and are investigating potential opportunities to scale activities into neighbouring countries in Central-East Africa. The system could easily be adapted to increased frequencies of data collection (e.g. daily) and scales (e.g. respondents), based upon need and budget.

S., Hess, S. Y., & Neufeld, L. M. (2021). Differences in modelled estimates of global dietary intake. In: *Lancet, 397*: 1708-1709. doi.org/10.1016/S0140-6736(21)00714-5

- Gibson, D. G., Pereira, A., Farrenkopf, B. A., Labrique, A. B., Pariyo, G. W., & Hyder, A. A. (2017). Mobile Phone Surveys for Collecting Population-Level Estimates in Low- and Middle-Income Countries: A Literature Review. In: *Journal of medical Internet research, 19(5)*, e139. doi.org/10.2196/jmir.7428

- Herforth, A. W., Wiesmann, D., Martínez-Steele, E., Andrade, G., & Monteiro, C. A. (2020). Introducing a Suite of Low-Burden Diet Quality Indicators That Reflect Healthy Diet Patterns at Population Level. In: *Current developments in nutrition, 4(12)*, nzaa168. doi.org/10.1093/cdn/nzaa168

- Manners, R., Adewopo, J., Niyibituronsa, M., Remans, R., Ghosh, A., Schut, M., Egoeh, S.G., Kilwenge, R. & Fraenzel, A. (2022). Leveraging digital tools and crowdsourcing approaches to generate high frequency data for diet quality monitoring at population scale in Rwanda. In: *Frontiers in Sustainable Food Systems.* doi.org/10.3389/fsufs.2021.804821

MORE INFORMATION