USING MOBILE PHONES FOR NUTRITION SURVEILLANCE: A REVIEW OF EVIDENCE

Reducing Hunger and Undernutrition

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Context

Undernutrition remains one of the major challenges in low-income countries. The consequences of undernutrition in early childhood are especially devastating and can lead to lifelong physical and mental impairments. Nutrition surveillance – or the systematic and periodic collection of information on nutrition – is vital to the capacity of governments and other agencies to track their progress towards reducing undernutrition, to promoting the accountability of their actions and to improving their ability to respond promptly to rapid changes in nutrition status brought about by food price volatility and other shocks. Nutritional surveillance data may also help to empower civil society and enhance their capacities to make claims on government and other agencies, to monitor the commitment of those agencies and to campaign around nutrition to move it higher up the policy agenda.

However, nutrition surveillance is expensive and logistically difficult and therefore often non-existent in resource-low countries. Traditional surveillance systems are also constrained by time-consuming and error-prone paper-based data collection followed by manual data entry. Consequently, monitoring of nutrition in real time and a timely response to nutritional crises is often impossible. Mobile phone technologies could help to address many of these challenges as they may help to lower the costs of data collection and improve data quality as part of a surveillance system. Data can be received and analysed more quickly, and the process of data collection is potentially more transparent and inclusive. Moreover, data can be fed back to households and communities in ways that enable them to use the data.

This brief provides highlights from an evidence review on the impact of using mobile phone technology for nutrition (and other)[1] surveillance in resource-low settings.

Evidence review process

Evidence was identified through targeted searches of five electronic databases and by scanning reports from relevant organisations and international bodies, company websites of mobile phone operators (e.g. mobile handset producers, network providers, software companies) and interest organisations of the mobile phone technology sector (e.g. GSMA).

The search indentified over 30 mobile phone-based surveillance systems. However, only nine studies assessed the impact of using mobile phone technology for nutrition (or related) surveillance and were included. The remaining studies merely offered descriptions of the design and/or the general operation and functionalities of mobile phone-based surveillance systems and were excluded. The quality of the available evidence was assessed based on the rigour and validity of the study design. No study was excluded based on the quality rating. Data extraction was guided by the overarching aims of this review and a narrative approach was chosen for the evidence synthesis.

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[1] In preparation of the review process, an initial scoping of available evidence was carried out. This stocktaking exercise suggested a lack of documented evidence on the use of mobile phones for nutrition surveillance. Consequently, it was decided to also include evidence on the use of mobile phones for surveillance in related sectors including health and agriculture.

Findings

1. There was a lack of hard evidence on the impact of using mobile phones for surveillance (and especially nutrition surveillance)

Evidence on the impact and use of mobile phone technology for surveillance was scarce and only two studies on the impact of mobile phones on nutrition surveillance were identified. The evidence that was available was of poor methodological quality, based on small pilot studies and mainly centred on feasibility issues. To fully realise and understand the potential of mobile phones for surveillance and to design sustainable and scalable surveillance systems, this evidence gap needs be addressed by well designed, comprehensive evaluation studies with clearly defined objectives.

Based on the existing evidence from the identified studies the following tentative conclusions can be drawn:

2. Mobile phones may make nutrition surveillance timelier

Although no direct comparison has been made, descriptive evidence suggested that data transfer and collation are significantly faster in mobile phone-based compared to paper-based surveillance. Depending on whether network coverage is available or not, data can be available in nearly real time. .

3. Mobile phones may help to improve data quality in nutrition surveillance

There is consistent evidence showing that automated feedback loops that highlight data entry errors in mobile phone-based surveillance systems can help to substantially improve both data entry accuracy and completeness of the data. Reliable and high-quality surveillance data are essential to inform appropriate decisions, monitor change and the impact of programmes aiming to reduce undernutrition.

4. There was a lack of comprehensive cost-effectiveness evaluations of the use of mobile phone for surveillance

There is currently no convincing evidence on the cost-effectiveness of mobile phone-based surveillance systems. While substantial costs may be saved during the collection, transfer and collation of data, the initial start-up costs and operating costs might outweigh the cost savings. To understand the potential financial benefits of mobile phone-based surveillance, cost-effectiveness evaluations need to be included in future studies.

5. Need for more focus on analysis, visualisation and reporting of surveillance data

The functional and structural possibilities of mobile phones may be a powerful tool in the timely and user-friendly analysis, visualisation and reporting of surveillance data. Unfortunately, the focus of all identified studies was on data collection and transfer and the actual data utilisation received only minimal attention. Given that underuse of surveillance data is a huge challenge, a better understanding of how mobile phones may improve this essential component of surveillance is urgently needed.

6. There was no evidence on the empowering effect of mobile phones use in surveillance systems

Although evidence suggested that mobile phones may empower local health workers via a two-way information exchange and may strengthen the capacity to respond in a few receptive stakeholders, no study attempted to assess the empowering effect of mobile phones further. For example, there was no evidence on the pathways of empowerment via surveillance and how these might be strengthened by the use of mobile phones. Future

studies are urgently needed to explore and evaluate the empowering effect of mobile phones in nutrition surveillance.

7. Mobile phone-based surveillance faces technical, financial and ethical challenges. To ensure long-term maintenance of a mobile phone-based surveillance system and to allow successful scale-up, it is important to address these challenges from the outset of the surveillance.

8. Government support, a functioning healthcare system and strategic partnership with the private sector are important for sustainability and scale-up of mobile phone-based surveillance

Nutrition surveillance can only be effective and fulfil the overarching aim of reducing undernutrition if it is sustained. Support from the government, including alignment with local surveillance needs and a strong healthcare system that can respond (and in many cases) deliver surveillance, are important for sustainability and to support scale-up. A strategic and effective partnership with the private sector may be a promising approach for the design of a sustainable and scalable surveillance system.

Conclusions

Despite the general lack of high-quality evidence from evaluation studies and many unknowns (e.g. cost-effectiveness of mobile phone-based surveillance, how to develop a sustainable business model), the available evidence suggests that mobile phones may play an important role in nutrition surveillance by reducing the time it takes and enhancing data quality. Both of these are essential for reliable and effective nutrition surveillance but long timescales and poor data quality are often shortcomings of traditional paper-based systems. Mobile phone technology also seems to have considerable but still underused capacity to support effective analysis, presentation and communication of surveillance data to stakeholders at local, district and national levels. A much better understanding of the barriers to and enablers for bringing this capacity to fruition is needed. The empowering potential of mobile phone technology very much remains an attractive yet empirically unsupported idea.