

Moving beyond the individual: mHealth tools for social change in low-resource settings

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Mobile phone use in low-income and middle-income countries (LMICs) reflects one reward of globalisation: the unprecedented potential for real-time, targeted social connectivity via mobile devices.¹ In the context of Universal Health Coverage, arguably a priority for many low-resourced regions, digital communications via text messaging (short messaging service; SMS) or social networking sites (SNS) offer an opportunity to improve reach of health information and services to diverse and remote populations.² Recent discussion about the benefit of using mobile devices for health (mobile health; mHealth) for LMICs refers to challenges of scaling and sustainability.^{3,4} Yet some of the less commonly described issues relate to the assumptions around message content, the theoretical basis of the messages and delivery modes (SMS/ SNS), in other words understanding what messages and modes of delivery are salient to different population groups. We also question how mobile technologies may influence change at a societal level. In contexts where social networks are extensive but resources are scarce, SNS offer an accessible and socially acceptable avenue to inspire collective action to promote health.

Our experience in employing a text message approach for behaviour change in a low-resourced Pacific Island population concurs with the growing consensus on the huge potential of technology for targeted support for health risk behaviours.⁵ In partnership with local colleagues, we meticulously adapted, revised, retested, revised and piloted a series of text messages designed to support smokers to quit.⁶ Similar effort was invested in culturally adapting an SMS programme for pregnant women in New Zealand.⁷ Collectively, we were determined to appropriate existing programmes to avoid reinventing the wheel. Theory-based and evidence-based programmes with proven

Summary box

- ▶ Mobile phone use in low-income and middle-income countries has increased, and with that offered huge potential to provide timely support for overworked and under-resourced health systems.
- ▶ Behaviour change theory, which guides many mHealth interventions, is typically rational, sequential and designed to motivate and maintain personal behaviour change, such that cultures underpinned by emphasis on family, collectivist values may not benefit optimally.
- ▶ We propose drawing on social networks as resources to inspire collective action—and to offer clues on improving the reach, resonance and impact of health messages to support social and behavioural change.
- ▶ The benefit of mHealth is the opportunity for scaling and sustainability, especially in low-resource settings—it is therefore important to consider how change occurs within and across social and cultural groups, and the role mobile devices can play in this process.

value in high-income countries were adapted on the basis that, with some modifications, they are serviceable in other contexts and populations. This approach has considerable merit on many grounds, including cost benefits. Yet we should also continue to explore alternative approaches to adaptation, starting from the concept of behaviour change to modes of delivery for populations, and the health systems, which may benefit most from well-designed, meaningful health data and information.

Adapting a New Zealand smoking cessation programme in a Pacific Island country context affirmed that the process of adapting an existing mobile tool is feasible and acceptable. Messages were linguistically and culturally adapted with local stakeholders to reflect the nuances of the setting and population (smokers in Samoa). Yet, in the absence of a de novo designed alternative, ideally co-created with the local users (smokers and those



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who connected with smokers in a social network), are we settling for nothing more than a 'near enough' option? We need to understand to what extent is a bespoke, culturally embedded programme an improvement on the adapted version and why. In the context of resource and expertise constraints, adaptation and renovation are a viable option, yet in accepting this approach we miss the opportunity to learn how programmes/messages via mobile would be constructed if the opportunity was offered to the users. Moreover, mobile relates to more than hardware or technology; population migration and diaspora mean that user-driven adaptation also needs to be portable—relevant and accessible irrespective of location. We think here of communities with elastic and transnational connections. In this context, SNS are practical, culturally germane mechanisms for communication and intervention.

mHealth interventions tend to emphasise individual self-efficacy as a mechanism for behaviour change. Originating from the academic discipline of psychology, theories of behaviour change provide a robust accepted framework for message development and adaptation. Various applied these theories lean heavily on individual intrinsic motivators to behaviour change. They offer deceptively elegant models, readily modifiable to context, and to varying extent are measurable. A fundamental assumption within these models is that with appropriate support, guidance and self-driven (autonomous) motivation, changing problematic behaviour (eat more fruit, move more, quit smoking) is possible and sustainable (with relapse prevention). Behavioural models translate into a prescribed suite of messages, delivered via mobile phone, and this interaction (message plus mode of delivery—to the pocket) stimulates cognitive processes required for behaviour change.⁸ In effect, the stages of behaviour change are often theorised to be sequential, rational and individual. The COM-B model advanced by Michie *et al*⁹ is arguably more context-sensitive than others, but remains firmly focused on the core components of behaviour (capability, opportunity and motivation). This model recognises the importance of understanding interactions between the key components required for behaviour change.

Despite attempts to operationalise behaviour change models, and to reflect contextual elements (notably policy, structural elements), fundamentally the models remain intent on altering elements of behaviour systems. As such, behaviour change models sit awkwardly with the values of many cultures in respect to the separation of behavioural motivation from cultural context. In the Pacific, for example, greater value or priority is devoted to collective well-being, the health of the family as a balance of spiritual, physical, mental and social well-being.¹⁰ This is not to say that elements of behaviour change models are wholly irrelevant but rather that they have yet to find their place within collectivist models of health.

Although adaptation of mHealth for behaviour change interventions is feasible, and acceptable in many settings,

there remain questions about the salience of messaging and equity of access. We argue that for a sustained, more inclusive impact of mobile technologies for health, an adjustment of power (who designs it) and propulsion (the delivery) is necessary. Co-creation or co-design of tools has emerged in recognition of the critical role of 'end-user' in the design process. The 'co' being the cooperation and collaboration between those who know the potential of the tool and those who know their community needs. Although arguably this was always a consideration, the merging of design and health methodologies has produced a more useful hybrid approach that seeks to democratise the process of designing useful tools for health purposes.¹¹

Social media platforms, such as Facebook or WhatsApp, offer unprecedented access to networks far beyond those reached via short-lived, didactic mass media campaigns or even fastidiously scripted text messages. Social media-infused content is by default endorsed within a network (likes, shares) or rejected (no shares, no likes). This low-resource mechanism into a social context presents a useful alternative to the traditional personalised mHealth approaches; how one performs in context with the other is yet to be determined. When used as intended, social media platforms hold considerable potential as a collective social good—as a flexible, rapid means of disseminating information in real time. The need to measure impact remains; methods such as social network analysis and diffusion of innovation modelling are required to ensure that the real impacts of social media platforms are indeed reaching those who would benefit most. Technologies are undoubtedly an essential component of a functioning health system. They are also a potential key determinant of health equity in a country.¹²

One of the challenges for mHealth interventions, particularly when introduced into low-resourced settings, is evaluating the impacts—plural. This is important not for behavioural change, but also the broader, potentially more impactful social changes that occur over a longer period and which may have deeper reach and resilience. How can we effectively capture these 'changes' as they occur and what types of evidence are necessary to document and feedback into refining our processes to ensure that we do not settle on 'good enough'?

In summary, mobile phones have the potential for informing diaspora, remote and disadvantaged communities. Mobile phone use in LMICs has increased remarkably. Consequently, it is now an option with huge potential to provide timely support for overworked and under-resourced health systems. Our work in the adaptation of existing mHealth tools within the Pacific region has taught us plenty, not the least being that the dominant methods of behaviour change may not be ideally suited to the populations that they 'serve'. In essence, behaviour change theory, which guides many mHealth interventions, is typically designed to motivate and maintain personal behaviour change, such that cultures underpinned by emphasis on family, collectivist values

may not benefit optimally. We propose drawing on social networks as resources to inspire collective action—and to offer clues on improving the reach, resonance and impact of health messages to support social and behavioural change.

We have much to learn in this field of mHealth, but keeping pace with technology is only part of the story. The benefit of mHealth is the opportunity for scaling and sustainability, especially in low-resource settings—it is therefore important to consider how change occurs within and across social and cultural groups, and the role mobile devices can play in this process. There is a definite need to improve how we share the power and resources that underpin mHealth potential and ensure that all can experience the benefits.

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REFERENCES

1. Müller AM, Alley S, Schoeppe S, *et al*. The effectiveness of e- & mHealth interventions to promote physical activity and healthy diets in developing countries: a systematic review. *Int J Behav Nutr Phys Act* 2016;13:109.
2. Cave D. *Digital islands: how the pacific's ICT revolution is transforming the region*. Sydney: Lowy Institute for International Policy, 2012.
3. Amoakoh-Coleman M, Borgstein AB, Sondaal SF, *et al*. Effectiveness of mhealth interventions targeting health care workers to improve pregnancy outcomes in low- and middle-income countries: a systematic review. *J Med Internet Res* 2016;18:e226.
4. Lee SH, Nurmatov UB, Nwaru BI. Effectiveness of mHealth interventions for maternal, newborn and child health in low- and middle-income countries: systematic review and meta-analysis. *J Glob Health* 2016;6.
5. Umali E, McCool J, Whittaker R. Possibilities and expectations for mhealth in the pacific islands: insights from key informants. *JMIR Mhealth Uhealth* 2016;4:e9.
6. McCool J, Tanielu H, Umali E, *et al*. Assessing the cross-cultural adaptation and translation of a text-based mobile smoking cessation program in samoa (TXTaofiTapaa): pilot study. *JMIR Mhealth Uhealth* 2018;6:e173.
7. Dobson R, Whittaker R, Bartley H. Development of a culturally tailored text message maternal health program: TextMATCH. *JMIR mhealth uhealth* 2017;5.
8. Gurman TA, Rubin SE, Roess AA. Effectiveness of mHealth behavior change communication interventions in developing countries: a systematic review of the literature. *J Health Commun* 2012;17(Suppl 1):82–104.
9. Michie S, van Stralen MM, West R. The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implement Sci* 2011;6:42.
10. Suaalii-Sauni T, Wheeler A, Saafi E, *et al*. Exploration of pacific perspectives of pacific models of mental health service delivery in New Zealand. *Pac Health Dialog* 2009;15:18–27.
11. Reay S, Collier G, Kennedy-Good J, *et al*. Designing the future of healthcare together: prototyping a hospital co-design space. *CoDesign* 2017;13:227–44.
12. Loring BJ, Friel S, Matheson D. Improving community health equity: the potential role for mHealth in Papua New Guinea. *The Journal of Community Informatics* 2013;9.