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Editorial

Measurement and Evaluation Outcomes for mHealth Communication: Don’t We Have an App for That?

JAMES M. SHERRY AND SCOTT C. RATZAN

There are few areas in the field of health communication that have generated as many enthusiasts in such a brief time as has mHealth—the use of mobile devices to communicate health information—and with good reason. The number of cell phones (billions) and messages (trillions) around the globe is ever increasing. So too, the numbers of tech savvy health care providers and consumers seeking information ubiquitously accessible at less than an arm’s length away. With some 10% of the global economy in the information-dependent health sector, the potential for new applications would appear limitless.

The reviews and solicitations leading to this Journal of Health Communication Supplement have sought to take a snapshot of this still nascent field with respect to its measurement and evaluation outcomes. It should be no surprise that among the major themes to emerge is the compelling need for significantly more evidence of intervention efficacy. Or, that despite a paucity of “hard evidence,” early experience provides insights that will help channel investments in more productive ways even while it sheds a cautionary light on emerging mHealth myths.

Among the most pervasive mHealth myths are that:

- mHealth communication programs are relatively simple to design and operate;
- mHealth interventions are inexpensive, have high reach and are demonstrably cost-effective; and
- mHealth approaches are universally applicable.

Leaving Room for Innovation

Nonetheless, for the moment at least, the compelling potential of the mHealth field exceeds its evidence-base and evaluation shortcomings. Proof-of-concept is now well established and mHealth is no longer seen as a tool in search of a problem, or as innovation for innovation’s sake. Investors and innovators do not appear to be waiting for evaluators’ reports to make their decisions, and increased mHealth intervention development appears inevitable.

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In the early days of innovation, design, and new programming, anecdote commonly precedes evidence. While more evidence is essential to better guide innovation, raising the evaluation bar too high or too early risks favoring the (unevaluated) status quo. To make their best contribution to the field, evaluators will need a strategy to get out ahead of the design process. For their part, implementers and policymakers need to acknowledge that most mHealth interventions are still in an experimental phase and should be rolled out hand-in-hand with an appropriate level of quasi-experimental design and monitoring.

**Strategic Directions**

Notwithstanding the newness of the field, its broad range of approaches, and the lack of an agreed taxonomy or essential definitions, several strategic directions are becoming evident.

In general, mHealth communication interventions appear *more* likely to succeed when they are designed to extend or connect existing health resources by making human contact more efficient, and are integrated within broader systems. Successful interventions include: improving diagnosis and compliance with treatment guidelines; improving patient information that leads to more selective service utilization; and increasing administrative efficiencies that lead to greater client satisfaction and confidence.

Conversely, mHealth interventions appear *less* likely to succeed when developed as a stand-alone behavior change strategy, particularly in settings where there are limited outside health resources and support. Greater success appears to accompany efforts that include more personalized and interactive interventions and those aimed at increasing social support as well as knowledge.

At the other end of the spectrum, the mining of large scale datasets that include temporal, demographic, and geospatial information is largely untapped as an eHealth/mHealth strategy. Integrated decision systems with diagnostic devices, triage of messages, linkage with drug delivery, and therapeutic interventions and monitoring, linking patient and provider, also show promise. A mainstay of internet-based advertising, this approach has received little attention in public health circles to date, perhaps as a consequence of limited public sector investment, limited commercial interests, and limited experience (and comfort) with the attending privacy issues.

**Challenges and Risks**

In both low and high resource settings, the intuitive appeal of mHealth interventions to policymakers may call for more cautious advocacy for strategies where evidence or experience is weak. Front-line public health workers and the mHealth program designers are unlikely to view local challenges and opportunities similarly. Currently, there is a tendency to practice public health at increasing distances from the communities in which it is produced; mHealth strategies should not be seen as making a virtue of that failing.

In high level resource settings, mHealth programs are generally under development within the margins of well financed health systems with well established technical and managerial infrastructures, including those in eHealth. Building from those capacities, even small efficiencies in reducing service utilization and enhancing evidence-based self care also offer great potential for cost savings.
The circumstance of mHealth program development in low resource settings is fundamentally different. Service fluctuations and bandwidth limitations are improving but still problematic. More significant is the lack of eHealth infrastructure to build upon, coupled with limited health service response capacity. In contrast to the increasingly equitable access to mobile phone technology in high resource settings, sporadic access with broadband and mobile technology in low resource settings persists and can be highly correlated to income, literacy, and male ownership, reinforcing knowledge divides. Finally, the comparative advantage of mHealth approaches that “connect the dots” between multiple service providers and clients is less valuable when there are fewer dots to connect. Consequently, the common assumption that mHealth programs developed in high resource settings can be easily adapted to low resource settings requires more intense scrutiny.

Looking Forward: Innovate and Evaluate

mHealth investors, implementers, and evaluators share a common challenge to articulate a strategy that will maintain enthusiasm in the field while right-sizing expectations and re-envisioning success. A successful strategy will need to envision the development of thousands of locally relevant interventions of modest impact rather than simply rely on the eventual emergence of a limited number of high-impact global interventions capable of carrying the field.

The unanswered question remains not if, but rather how fast and how efficiently mHealth will realize its transformative potential. Innovation and evaluation in synergy can help to drive that transformation—safeguarding evidence-based interventions from being upended by the unsubstantiated anecdote, while enabling the innovation process to change the status quo.