Technology and behavioural health: an implementation challenge

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As the world's population and wealth expand rapidly, two overarching issues have emerged in behavioural health care: (1) how to address the rapidly increasing awareness of mental health and addiction disorders, especially in the poorer strata of population in high-income countries and in low- and middle-income countries and (2) how to leverage new technologies to expand access to effective services. Because these two issues converge on productivity, the solution must necessarily involve technology. Addressing these issues by expanding infrastructure and work-force would be expensive, unaffordable and insufficient. (Witness the common dilemma of countries with meager resources investing in training mental health professionals who then move to wealthy countries to increase income!)

The following two essays by leaders in the behavioural health technology field, Ben-Zeev (2014) and Kane (2014), provide in this issue of EPS a view into the enormous potential of existing and developing technologies. Implementing and integrating these tools in many contexts will, however, present a new set of challenges.

For mental health patients (or for people with mental health needs who choose not to be patients), technology will reinforce and drive the movement towards self-determination and self-management. People are increasingly seeking information, finding treatment providers and buying health care tools on the internet. Worldwide, the availability of electronic health communications outpaces the expansion of services several-fold. In developing countries, technological communications regarding health will precede the development of a professional workforce by years and perhaps decades. But the validity dilemma looms large: for example, nearly all of the tens of thousands of smart phone health applications now available are entirely untested and probably ineffective.

How do people know if the information is unbiased and evidence-based? How do they know if the products are competently designed and effective rather than merely promotional? And how do they know if they should use these tools independently or only in conjunction with a relationship with a health care provider? Researchers must address these problems before industry once again develops solutions that meet their needs for profits at the expense of the public's need for health.

Families of people with mental health problems have greater access to information than ever before, but they are more likely to be overwhelmed or misled than educated because of the generally poor quality of health information on the internet. Even when families are able to find high-quality websites, the information may not answer their questions, which tend to be specific to the circumstances of their relatives. Unlike effective family psycho-education programmes, current websites do not train families to be care managers, educate them about environmental and social processes, explain how to provide an optimal environment and handle crises and connect them for support to other families living with similar concerns. These services can and should be available as part of a comprehensive behavioural health programme. Researchers must develop appropriate technology programmes and learn how to integrate them into clinical services. Relying on industry to do so will further bias families towards overvaluing medications and undervaluing psychological, social and environmental interventions.

Clinicians, whether professionals or local health workers working under 'task-shifting' arrangements, will need to develop expertise with specific technology tools as well as with information technologies in general. How will they identify optimal technologies for specific groups? How will they tailor the tools for specific patients? How will they use technology to augment their reach and capacity? And who will back them up on technology problems as well as clinical problems? Educators and researchers need to solve these problems before dissemination outpaces knowledge. Another possibility is that a new type of

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provider will emerge: a behavioural health technologist who personalises programmes, teaches patients how to use them, monitors their use, revises or changes the programmes as new goals appear and joins the clinical team in the same way that a housing or vocational specialist might.

What about training? How will the field develop a new generation of clinicians who are adept at using technology optimally? Clinical trainees are not currently learning these skills in universities because faculty members do not possess the expertise themselves. Instead, clinicians are adopting technologies on their own, often finding sub-optimal programmes and combining them with their clinical work in a sub-optimal fashion. Effective tools must be identified, but who will establish these ratings? As often happens, the best models may emerge from the field as innovative practitioners and patients create useful pathways to find and employ effective tools. But researchers will need to abstract, synthesise and generalise practical knowledge from the field. The problem of training clinicians on technology, which is of course even more severe in low-resource settings, will probably be solved by technology, which may provide more accurate, evidence-based, reliable and useful training modules than traditional educational approaches.

Managers will also need to learn new ways of doing their jobs. How will they know if clinicians have learned to use available technologies efficiently, if patients are using them successfully, if tools are aligning with patients' dynamic aspirations and so on? The same development and training problems discussed above will appear here, probably calling for similar technological solutions.

Insurers perceive the advantages of technology tools, but are currently uncertain how to pay for the tools, how to monitor their use, how to manage benefits and risks related to use and how to pay for services enhanced by technology. These pressures will hasten the development of experimental payment models, such as prepaid services, accountable care organisations, paying for outcomes and more. But ethical, effective and efficient models of deployment, developed and validated by researchers, will be necessary.

Policy makers will also have critical choices to make soon. The advantages of technology are clear: technology tools can enhance access, capacity, efficiency and outcomes. But resistance will be substantial, especially in wealthy countries where the pharmaceutical industry, professional organisations, guilds, hospitals and other institutions have vested interests in maintaining traditional services. Technology will undermine the power structure of health care, not just the profits but also the hierarchies of mental health providers and the control of decisions. In countries with national health insurance, rigid and hierarchical decision-making often interferes with necessary implementation processes at the local level; implementing technology may be too bureaucratic also. In low-resource countries, technology tools will give patients access to the same information as professionals and thereby prepare them for a more active role in decision-making – a change that will threaten paternalistic health care systems in many countries.

Researchers must identify not only the best interventions but also the best implementation procedures (Tansella & Thornicroft, 2009; Thornicroft *et al.* 2011). The development and efficacy testing procedures for new technologies are well established and clear (Marsch *et al.* 2014), but the organisation, financing, cultural translation and implementation challenges remain largely unsolved. These dilemmas constitute the work of services research. Two approaches might be considered. The first and traditional approach is 'top–down' implementation that begins with the government, policy makers and health care system administrators. A relatively successful example would be the World Health Organization's development, publication and dissemination of procedures for evidence-based mental health practices in many languages for low- and middle-income countries. Many countries have adopted these tools to enhance use of medications. The second approach is 'bottom–up'. The paradigmatic example here would be the use of 'learning communities' to implement supported employment programmes in many parts of the USA and Europe (Becker *et al.* 2014). Learning communities on supported employment have involved local users and providers, thereby valuing the goals, cultures, workforces, economies, practice patterns, health care systems and social support systems of these local stakeholders and enhancing their ability to implement services that they want in ways that fit into their cultures and make sense to them.

Top-down solutions often work well for simple, provider-driven services such as identifying illnesses and delivering appropriate medications. Bottom-up solutions may be superior for implementing complex psychosocial interventions that require support from people with mental health problems, their families, their communities and social organisations as well as health care organisations. Implementing technology tools in a particular culture is likely to require both approaches.

Deployment of technology tools will be a complex and highly idiosyncratic process. The diversity will be extraordinary even within countries. Participation by local experts, particularly end users, will therefore be essential. Learning communities create teams of local experts combined with technical experts to learn

from each other and solve problems in an iterative fashion. Local experts lead the process because they know their own communities and resources, including needs, potential uses, contexts, linguistic subtleties and so on. Technical experts can supply realistic options, implement the desired changes, measure the outcomes and help the teams to decide on next steps. The procedures can differ significantly across localities, and the teams can also learn from each other. The cycle of planning, implementing, evaluating and planning again must be iterative. The learning community forms a base of expertise for expansion to more teams and larger areas.

Concurrently, government and policy experts need to develop the legal, financing, regulatory, privacy and deployment procedures to support solutions that arise from community-based research. If they establish structures to support ineffective deployment procedures that local users do not want, the interventions will fail. Similarly, if local users prefer services that cannot be financed under current structures, their goals will be thwarted.

In summary, the technological revolution that has transformed most industries across the world is now entering behavioural health. The opportunities are legion. The lower strata of population in high-income countries as well as most people in low- and middle-income countries may benefit by essentially avoiding, or leaping over, many of the mistakes made in high-resource countries because they have high internet capacity relative to their access to a professional workforce. But these benefits will depend on careful services research that extends from culturally sensitive implementation to ethical financing models.

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