

# Mind the gap

## COMMENTARY ON... TOMORROW'S WORLD<sup>†</sup>

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### SUMMARY

Research into the use of digital technology to deliver treatment for psychosis is turning up some fascinating applications, but enthusiasm for these products must be tempered with a realistic appraisal of the steps from initial proof of concept to a marketable device.

### DECLARATION OF INTEREST

None

Digital technologies have had a profound impact on our daily life, transforming how we communicate, shop and manage personal finances. According to the Office for National Statistics (2015), 49% of the population have used the internet to access health information, and it is estimated that there are at least 16 500 health apps for use on smartphones (Kerry 2015). The UK government has commissioned analyses of the market potential for digital health (Monitor Deloitte 2015) and invested in organisations such as MindTech ([www.mindtech.org.uk](http://www.mindtech.org.uk)) to evaluate and promote digital health innovations. Although initially focused on well-being and common mental disorder, new implementations are slowly emerging for psychosis (O'Hanlon 2016).

### Ingredients of successful innovation

What makes a successful innovation? Generally speaking, it is something that reduces the drudgery of time-consuming tasks, improves the effectiveness of existing methods or does something that was previously not possible. All digital health innovations have required many hours of development and many need ongoing technical support. So beyond innovation, affordability is key. An innovation aimed at the well-being of the wider population can be sold more cheaply because of the size of the market than one providing supervised treatment to patients. The Big White Wall ([www.bigwhitewall.com](http://www.bigwhitewall.com)), for example (now also available as a smartphone app), is able to provide moderated services as well as self-help for common mental disorders because it has a very large user base in the UK, as well as the USA and New Zealand, and

also has been very successful at attracting funding from venture capital and social investment funds, in addition to fee-paying users.

### Remote monitoring – who wants it?

It is a rather different picture for psychosis, where there is as yet no comparable large-scale investment. Instead, the apps and other technology-based interventions described by O'Hanlon and colleagues are still some way off the market. Some seem closer than others, as for example using text messaging to monitor patients. Mobile phone use by people suffering from psychosis is high enough to encourage one interviewee in O'Hanlon's review to say that the use of such text-based monitoring is 'ready to go'. But hold on. Who wants this product and how big is the market? Of the huge number of health apps on the market, most remain unused, just 36 accounting for half of all downloads (Kerry 2015). It may be an appealing idea that I could contact patients I was worried about with daily text messages to check medication adherence or monitor for early signs of relapse, but the patients most at risk are probably those least likely to accept this intrusion into their daily lives. Adoption by clinicians is also challenging, as shown, for example, by only 61% of those in the ITAREPS study sticking to the protocol (Španiel 2012). This is not to decry what is an intriguing development that might be adopted by some clinicians and patients, but I would contest the notion that any of these are quite 'ready to go' on a large scale until we have the results of implementation trials to tell us who will use the technology, for how long and whether, outside of the specially recruited research population, it really gains traction in the clinic.

### Enhancing and enabling therapy

So if none of the simple innovations quite meets the criterion of making life easier for the end user, what about those that improve the way an existing therapy is delivered? Cognitive remediation is an interesting example. Originally delivered by rather dull pencil-and-paper tasks with one-to-one support, more recent computerised versions are moving towards self-administration, with tasks

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presented in a more engaging format. Memory tasks, for example, are set in the context of making a telephone call or finding a list of items in a mock-up of a supermarket. But presumably a handful of cognitive remediation kits will do for an entire clinical service. So each will have a pretty hefty price tag if development costs and ongoing support are to be found.

Even more immersive ‘serious games’ are in the offing, and the use of virtual reality (VR) has some intriguing possibilities now that the hardware is simpler and cheaper. But while hardware costs have fallen, the cost of software development could be staggering, depending on the ‘realism’ that is attempted, and it is not surprising that younger patients familiar with the very high quality of commercial video games report that current therapeutic efforts fall short of their expectations of gaming quality (Wartena 2013). Of course, this only matters in so far as the realism of therapeutic software actually affects the clinical outcome, and up to now, we have little research to guide us. The development of AVATAR therapy is a case in point. When Julian Leff conceived the idea of replacing the ‘empty chair’ in dialogue therapies with the computerised avatar of a patient’s voice, he rejected the idea of immersive VR in favour of a simpler two-dimensional animation, with voice-transforming software that allowed the patient to create and then dialogue with a representation of the voice, much as one would do in a Skype conversation (Leff 2013). The approach achieves something that was not previously possible, by making audible a close replica of the voice the patient hears, a feature commented on favourably by several participants in our current clinical trial (ISRCTN 65314790; Craig 2015). Of course, it remains an open question as to whether the effectiveness would be any better or worse in the VR environment, though there is little doubt that the AVATAR system is cheaper, simpler and more portable across clinical settings

than current VR. Even so, the future marketing strategy for AVATAR will need to work through some considerable challenges, including how the software is maintained, whether the software is marketed separately from training in the therapy, and what sort of organisation will provide ongoing support at what cost to the user.

## Conclusions

O’Hanlon and colleagues discuss intriguing developments, but these are still quite a way off practical implementation. As with any innovation spin out, the ultimate challenge lies in understanding the market and developing sound business plans to deliver against expectation.

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