

NOVEMBER 2020



THE DIGITAL MENTAL HEALTH REVOLUTION

TRANSFORMING CARE THROUGH
INNOVATION AND SCALE-UP

Jonty Roland
Emma Lawrance
Tom Insel
Helen Christensen



ONE WORLD
OUR HEALTH 

Suggested reference for this report: Roland J, Lawrance E, Insel T, Christensen H. The digital mental health revolution: Transforming care through innovation and scale-up. Doha, Qatar: World Innovation Summit for Health, 2020.

ISBN: 978-1-913991-00-5

THE DIGITAL MENTAL HEALTH REVOLUTION TRANSFORMING CARE THROUGH INNOVATION AND SCALE-UP

WISH 2020 Forum on Mental Health
and Digital Technologies

CONTENTS

- 03 Foreword
- 04 Executive summary
- 10 Section 1. The state of innovation in digital mental health
- 24 Section 2. Four attributes to fulfill the potential of digital mental health
- 30 Section 3. A roadmap to guide progress
- 36 Acknowledgments
- 39 References

FOREWORD

Mental health is at the forefront of the digital health movement, and its progress has been further accelerated by the COVID-19 pandemic. This can be seen in the rapid shift to digital channels among formal mental health systems, and in the surge in demand as we anticipate the subsequent mental health pandemic in many countries.

There has always been a powerful economic and humanitarian case for investment in mental health in all countries. That case is even stronger in times of social upheaval and economic stress – as we are now living through. The innovations outlined in this report give us the means to quickly scale-up often low-cost approaches to reach millions more people. They will also help us gather the data that will allow us to improve our services and demonstrate the value that strong mental health systems provide.

Governments, healthcare institutions, businesses, and schools all have a powerful role to play in shaping this future and defining the outcomes and evidence needed. However, they are not alone in navigating the innovation and implementation challenges of the digital mental health revolution. As this report shows, we are joined by a tremendous movement of professionals and people with lived experience who are calling for us to do better. With their enthusiasm and partnership, we can make the challenges we now face into an extraordinary moment of possibility for new ideas and action.



Professor the Lord Darzi of Denham, OM, KBE, PC, FRS
Executive Chair, WISH,
Qatar Foundation
Co-Director, Institute of
Global Health Innovation,
Imperial College London



Scientia Professor Helen Christensen, AO
Director and Chief Scientist,
Black Dog Institute
Professor of Mental Health,
University of New
South Wales



Dr Tom Insel
Co-Founder and
Chair, Humanest Care

EXECUTIVE SUMMARY

Of all the fields in healthcare, the opportunity for digital transformation in mental health is one of the greatest. This is partly because most mental health services are limited to verbal exchanges that can be readily provided remotely. More importantly, it is because – in the words of The Lancet Commission on Global Mental Health and Sustainable Development – “all countries are developing countries”.¹ That is, the gap between what people need and what current systems can deliver in high-, middle- and low-income countries is currently so great that only a revolution in access, quality and engagement through technology can meaningfully address it. For modern health systems, digital mental health tools are not just a future luxury, they are an urgent necessity.

In recent years there has been an explosion of new digital tools for mental health assessment, support, prevention and treatment. There are now more than 10,000 mental health apps available, and almost 100 new digital mental health start-ups every year. Some of these tools have proven effectiveness, are low cost, and are already benefiting millions of people around the world – for example, instant crisis text messaging, digitized or ‘gamified’ versions of cognitive behavioral therapy (CBT), and online training packages for frontline staff. (See [WISH 2018 Anxiety and Depression Report](#) for further information and additional case study.) However, many other tools have underperformed, meaning the gap in ‘effective coverage’ for mental health disorders still remains, with as few as one in 10 people in need benefiting from traditional mental health services – even in well-resourced health systems.

One factor that has held back progress is the polarized innovation landscape, where invention and implementation largely take place in two parallel tracks: academically driven innovations backed by rigorous evidence of efficacy in trials, but disappointing levels of impact in the real world; and commercially driven innovations with (in some cases) high levels of engagement but little interaction with formal health systems, and often weak evidence of effectiveness.

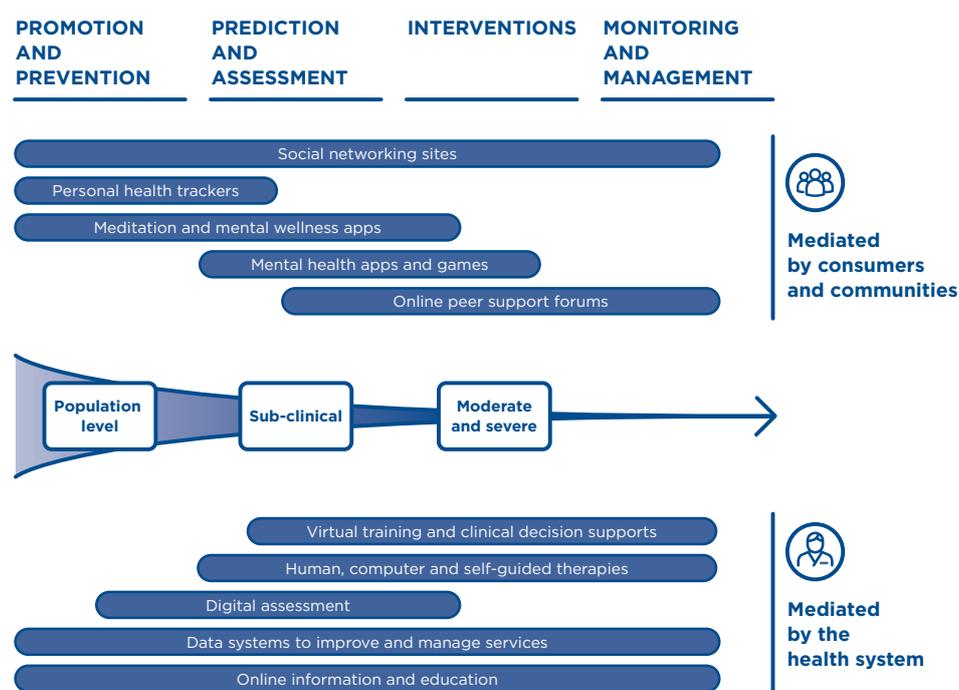
Today, the sector is at a critical inflection point, in part driven by the accelerated shift to online care necessitated by the COVID-19 pandemic. Many mental health systems rapidly shifted from almost entirely face-to-face to nearly all virtual within just a few weeks. While some mental health leaders have described this as a ‘decade of progress within two months’, the scale-up has also revealed how current digital mental health approaches and tools remain fragmented, heavily reliant on traditional treatment approaches, and largely neglect user experience and engagement.

See [WISH 2018 Anxiety and Depression Report](#), page 33.

The next generation of technologies is needed more than ever to combine the best of clinical science and consumer engagement. The challenge for developers and health systems is to create solutions that look fundamentally different from traditional mental health services. This is a much more profound shift than simply digitizing interventions that work offline. For technology to close the efficacy gap, innovators will need to pare down mental healthcare back to its essential ‘active ingredients’, and then use the full capabilities of digital technology and human practitioners to create instantaneous, adaptive and scalable services.

The framework shown in Figure 1 gives a simplified overview of the current digital mental health landscape, highlighting 10 key areas of innovation. Many of the best examples integrate several of these applications into one platform, and bridge the divide between consumers and professionals.

Figure 1. Pieces of the puzzle: A framework for understanding digital technologies in mental health



To realize the true potential of digital mental health, the next generation of innovations must have four key attributes. These should be central to decisions by health systems, developers, investors, and users on what to buy and build in future:

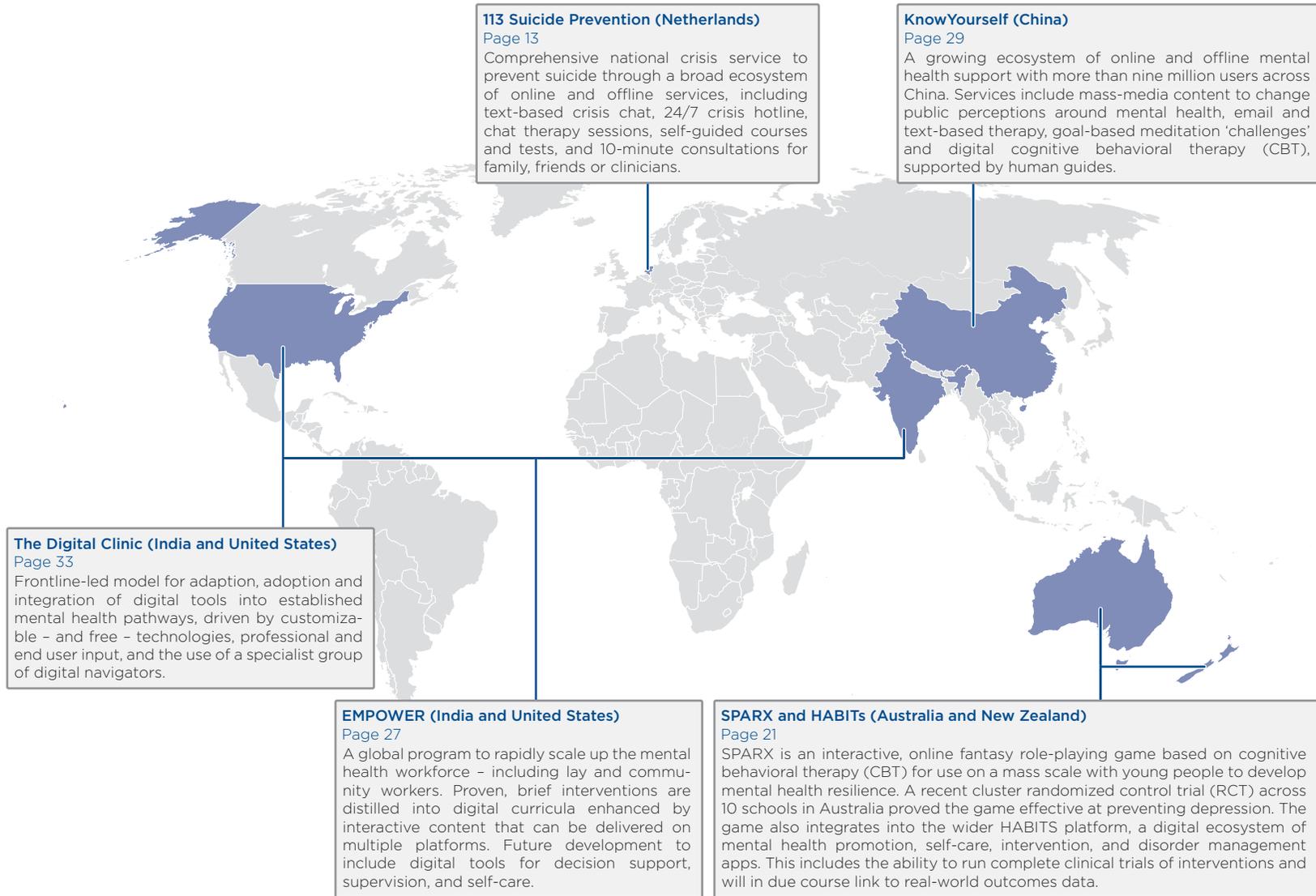
- 1. Move from apps to an integrated ‘operating system’ of care:** Shift from isolated tools to integrated, multifunction platforms – or digital ecosystems – that work across entire mental health pathways.

- 2. Develop tools that are highly effective and engaging:** Harness the lessons of how to simultaneously achieve high levels of efficacy and engagement, by combining the expertise of researchers, companies and end users.
- 3. Address inequalities:** Increase the level of innovation geared toward low-resource settings, so that new tools can better address inequalities and everyone can benefit from cost-effective solutions.
- 4. Build trust in digital tools:** Reduce risks and protect users from potential harm.

This revolution has already begun, and governments, investors, businesses, schools and health leaders all have a role to play in ensuring that it is not another 'false dawn'. To guide this process, this report provides a high-level maturity matrix to help local, regional and national systems in determining where they are in most need of focused progress (see Table 1 in [Section 3](#)). This is accompanied by a set of questions directed at each key group of organizations to shape their contribution to accelerating progress.

Current international case studies are presented throughout the report. The following pages illustrate their coverage.

Figure 2. International case studies snapshot



“Young people are the frontline of this movement: change must start with us.”

A perspective on this report from eight Young Leaders for The Lancet Commission on Global Mental Health and Sustainable Development (see Acknowledgments).

As the most active group of users globally, digital technologies have a profound impact on young people's lives – often as the dominant means of connecting socially, establishing self-care routines, accessing information, and speaking out. For many, the experience of mental health issues is already profoundly impacted by digital technologies – whether through WhatsApp groups of peers facing similar challenges, dedicated apps such as Calm, or simply searching the internet for information.

While many health systems are beginning to recognize this trend, few really listen to what young people want, let alone involve us in the process of designing digital support tools. This would help to overcome the many barriers that still exist, including:

- **Access:** It is often assumed that all young people are constantly connected, but there are still vast 'digital deserts' in all countries. Connectivity is often poor and the internet an unaffordable luxury for families struggling to put food on the table.
- **Relevance:** Tools are heavily skewed toward Western users, often are not culturally relevant, or are only geared to addressing general wellbeing and not serious mental illness.
- **Privacy and security:** While the stigma surrounding mental health has decreased, there is still tremendous pressure for young people to appear invincible. Concerns about privacy give young people much higher security expectations for digital mental health tools than platforms they use for other things.

Although fragmented and unequal today, with the systematic support of health leaders, the potential of this sector is limitless. We want to see a future where digital mental health tools are:

- safe and trustworthy through proper regulation and support.
- designed by and for young people.
- engaging but not infantilizing.

- culturally relevant and bespoke to different subsets of interests and connectivity.
- integrated with the formal health system, rather than an add-on.

Health leaders should start by focusing on the basics – working across sectors to ensure that digital access and skills are a right and not a privilege, and adapting the many free and evidence-based tools to their own contexts. They should invest properly in online and face-to-face services, and guide these investments with systematic initiatives driven by coalitions of public agencies, non-governmental organizations (NGOs), the private sector, and young people themselves.

SECTION 1. THE STATE OF INNOVATION IN DIGITAL MENTAL HEALTH

What is digital mental health? This report takes a broad definition of digital mental health as the use of internet-connected devices and software for the promotion, prevention, assessment, treatment and management of mental health, either as stand-alone tools or integrated with traditional services.

In global healthcare, there is no area with as wide a treatment gap as mental health, where the majority of needs go unmet across high-, middle- and low-income countries alike. Fortunately, the nature of mental health interventions makes them uniquely well positioned to benefit from digital innovation at every stage, from prevention and assessment to intervention, monitoring and management.

In recent years there has been an explosion of new digital tools to improve mental health, developed by researchers, companies, and consumers themselves. Some of these tools have already helped to rapidly improve access and quality, while others have underperformed. Now the sector is at a critical inflection point; the next generation of technologies need to combine the best of user engagement, clinical science and business model innovation. In achieving these changes, there is the opportunity to create a significant advance toward better quality and coverage for mental health.

Understanding the global need for better mental healthcare

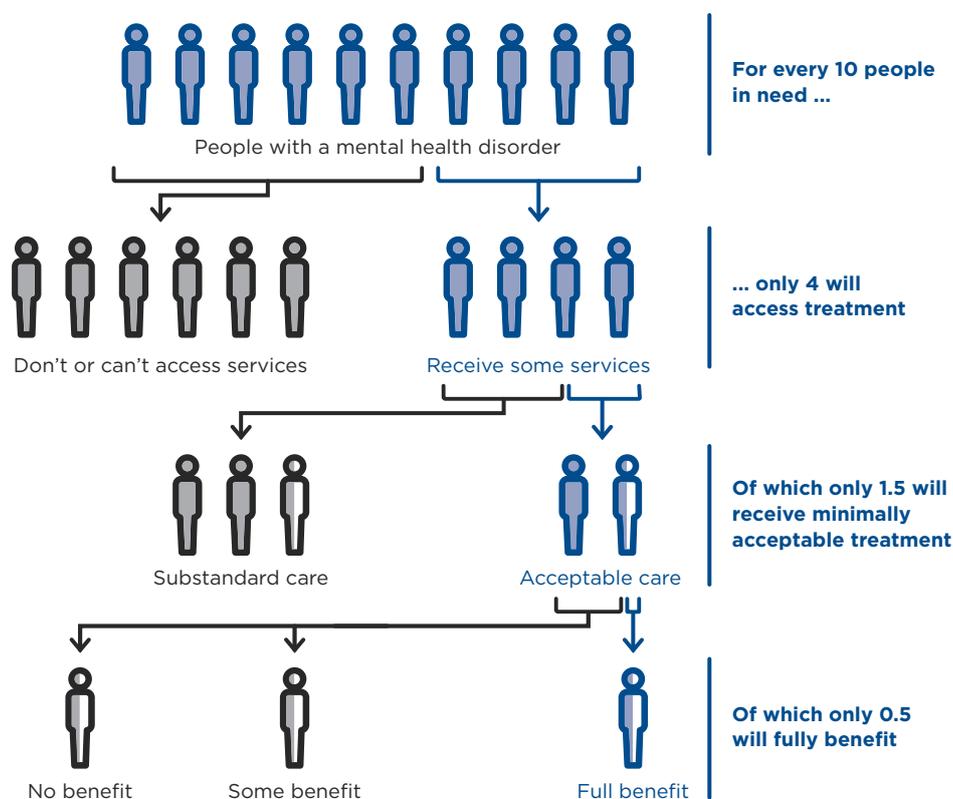
Figures on the global gap for mental health treatment can be daunting. In high-income countries, up to 50 percent of people with mental health disorders receive no treatment. This extends to almost 90 percent in low-resource settings (emerging economies or deprived communities in wealthy countries), which face the greatest burden of mental ill health.²

The scale of this challenge is huge, with mental health disorders affecting one in three people worldwide at some point in their life – accounting for nearly a third of all years lived with disability globally, and eight million

deaths annually (almost a million of which are by suicide).³ What these statistics hide, however, is the even larger gap in 'effective coverage' – good-quality, accessible services that actually work.

Figure 3 uses average statistics, based on data from the US, on need, engagement and outcomes to show the '40-40-30' rule. This illustrates that, even in one of the world's best resourced mental health systems, just a small fraction of the people in need benefit – perhaps fewer than one in 10.

Figure 3. The '40-40-30' rule* for effective coverage of mental health



Source: US averages on need, engagement and outcomes^{4,5,6,7}

* 40-40-30 rule: 40 percent of those in need access treatment, of those who do, 40 percent will not receive minimally acceptable treatment; of those who do receive acceptable care, only 30 percent will fully benefit.⁸

Addressing the gap in mental healthcare coverage

There are four components to this gap in ‘effective coverage’.

- 1. Access:** Even relatively well-resourced health systems do not have the capacity to provide treatment for people with mental health disorders. Waiting lists can be long, even in Organisation for Economic Co-operation and Development (OECD) health systems, where there are 15 psychiatrists per 100,000 people on average.⁹ Worldwide, 45 percent of the population live in countries with *less than one* psychiatrist per 100,000 people, and similarly low levels of other mental health workers.¹⁰ Out-of-pocket costs are also a major barrier in many countries.
- 2. Engagement:** Even where services are freely available, many people experiencing mental health problems choose not to access them – often because they feel that these services can be stigmatizing, and sometimes because the symptoms of hopelessness, anxiety or denial preclude seeking help.¹¹ Rates of non-engagement are especially high among marginalized groups, such as ethnic minorities, who often report discrimination by the mental health system, and young people, who are still developing their identity and sense of what kinds of feelings are ‘normal’.^{12,13,14}
- 3. Quality:** When access is available, care is often fragmented, episodic, and not based on scientific evidence. Medications, psychological treatments, and rehabilitative supports are rarely offered in an integrated, patient-centered care plan. In contrast to other areas of medicine, mental healthcare is rarely based on objective measurement of outcomes and, without patient feedback, quality does not improve.
- 4. Efficacy:** Even when delivered to world-class standards of care, most mental health treatments, given as singular interventions, are only partially effective. Psychiatric diagnosis is not precise and remains an imperfect predictor of treatment response. This means that clinicians often do not know what treatments to choose, why people improve (or do not), and what the ‘active ingredient’ behind any success is.^{15,16,17}

The need for digital tools in mental health is not simply to add scale and efficiency to existing care models. The goal cannot be to have services similar to face-to-face care, but cheaper. Rather, digital innovation is needed at every stage of the system – to rethink and redesign what is delivered, how it is delivered, who it is for, and how we know if it works.



CASE STUDY 1. 113 SUICIDE PREVENTION

Netherlands

Crisis helplines and text services – geared toward suicide prevention – have become some of the most widely available digital mental health services worldwide. For example, Crisis Text Line, which began in the US, has now been translated into similar initiatives in five countries. It uses anonymous text-based communication with well trained volunteers, supported by algorithms to prioritize individuals most at risk. The aim is to talk people back from a point of crisis toward calmer thinking, and direct them to relevant help. Equivalent services are increasingly available in settings as diverse as Nigeria and Thailand, using established platforms such as WhatsApp and dedicated apps.^{18,19}

One of the most comprehensive crisis helplines is the 113 Suicide Prevention service from the Netherlands, where more than 90,000 people with (severe) suicidal thoughts and/or behaviors seek help each year. Funded primarily through the Dutch Government, the service has evolved a broad ecosystem of online and offline services to work toward a comprehensive response to suicide prevention, including:

- crisis chat – human-first text chat service with trained volunteers and, if necessary, a mental health professional.
- crisis telephone – a 24-hour, seven-days-a-week hotline to talk directly with trained volunteers and, if necessary, a mental health professional.
- email therapy – online chat dialogues with a mental health professional.
- a self-help suicide prevention course supported by an evidence-based approach.²⁰
- self-guided tests to indicate the severity of someone’s symptoms.
- 10-minute telephone consultations with a mental health professional for clinicians, family or friends of someone in need.
- support services for significant others.

The 113 Suicide Prevention service also provides online training to stimulate conversation and break the taboo about discussing suicide. It has established national programs to prevent suicide, such as Suicide Prevention Action Networks in specific regions (SUPRANET Community) and in mental healthcare settings (SUPRANET Care).²¹

The opportunity for a ‘digital revolution’ in mental healthcare

Many fields of healthcare talk about a ‘digital health revolution’ as a result of the rapid increase in use of mobile phones and mobile internet at all ages, geographies and wealth levels, as well as advances in artificial intelligence (AI). However, the opportunity in mental healthcare is unique, supported by factors including:

- the ability to provide care anonymously and ubiquitously.
- instantaneous access in moments of acute crisis or vulnerability.
- the ability to rapidly scale-up during periods of acute need, such as after humanitarian crises or during pandemics.²² (See [WISH 2020 PTSD and Toxic Stress in Children Report](#) for further information.)
- the functionality to passively and objectively monitor behaviors that indicate someone’s mental health status, such as sleep patterns, social interactions and mood.
- the potential for giving a voice to people with lived experience of mental health issues who have historically experienced stigma, under-representation and lack of prioritization by decision-makers.
- a particularly strong reach for adolescents and young adults – the critical stage at which most serious lifelong mental health conditions develop and are more easily preventable.²³

See [WISH 2020 PTSD and Toxic Stress in Children Report](#).

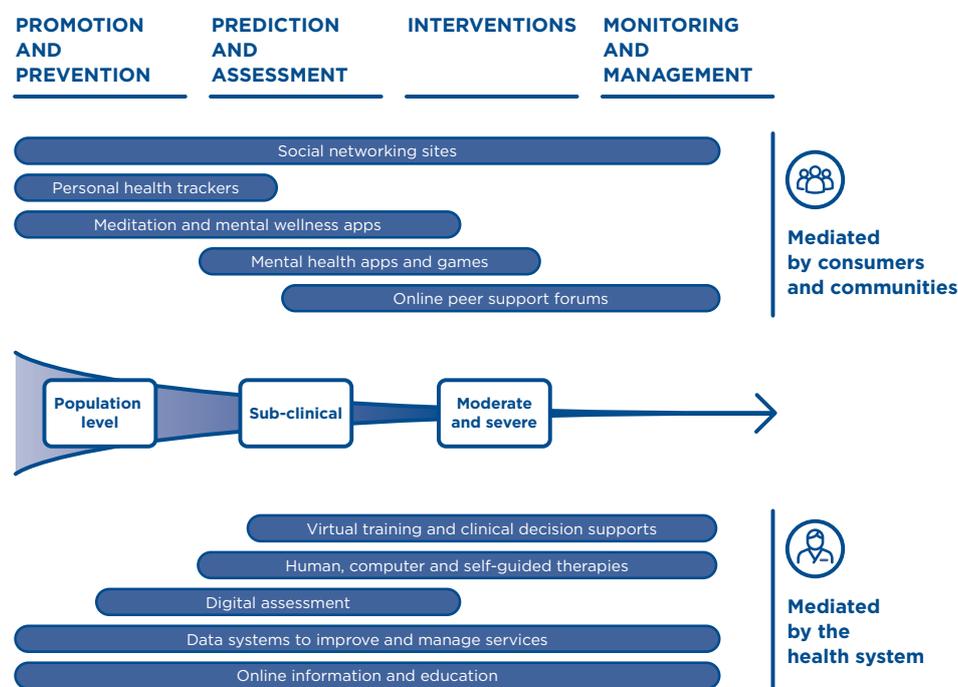
For these reasons, digital mental health is already ahead of other healthcare domains in many respects, representing the largest focus area for disease-specific mobile apps available online.²⁴

The current digital mental health landscape

The framework below outlines some of the key tools and applications that are currently being used across the digital mental health landscape. This picture is only the beginning, however. The real vision is not for these technologies to be deployed in isolation, but as an integrated continuum working to rapidly expand access to care that is more personalized, proactive, engaging and effective. This opportunity exists for all health systems, but especially for low-resource settings, and in countries without mature mental health systems, where there is the greatest agility and potential to benefit.

The framework in Figure 4 outlines 10 ways digital tools are currently being used to improve mental health in the formal health system and consumer market. Each area is then examined in more detail.

Figure 4. Pieces of the puzzle: A framework for understanding digital technologies in mental health



1. Social networking sites: Social media platforms and online searches are the most ubiquitous digital mental health tools today. Google processes around 10 million searches for mental health information each day, Pinterest reports this as the fourth most searched for category among its 300 million members, and Reddit's depression community has some 600,000 members.²⁵ Most of these platforms are only loosely curated, so the quality of advice given, while sometimes good, can be of low quality or even harmful. The scale of engagement suggests that social media platforms are meeting some needs, including a common preference to seek advice away from the perceived power dynamics of professional services.

2. Personal health trackers: Building on the widespread use of physical fitness apps, there are a number of popular mental health trackers. Digital journals are among the most common, enabling people to track goals, behaviors, emotional state and, in some cases, medications. Some of these trackers can give prompts and suggest sources of help if a person's mental health appears to be deteriorating, while others allow users to share the data with friends or professionals.

- 3. Meditation and mental wellness apps:** A wide variety of digital tools exist to promote meditation, better sleep, positive emotions, and improved cognition. These mental wellness tools are marketed to the general population, but many are popular with people who have a specific mental health disorder. This category has seen a surge in private investment in recent years. It includes products such as Headspace, a meditation app that claims to have more than a million paid subscribers worldwide, and which has demonstrated some effectiveness in clinical trials.^{26,27}
- 4. Mental health apps and games:** There are currently around 200 commercial developers in the digital mental health sector. Their products cover a wide variety of direct-to-consumer applications to address specific mental health disorders such as depression and anxiety, addictions, autism, attention deficit hyperactivity disorder (ADHD), and post-traumatic stress disorder (PTSD).²⁸ Many of these products are digitized versions of offline tools, such as cognitive behavioral therapy (CBT). ‘Gamification’ – the use of gaming formats to drive user engagement – is one of the most promising fields within this category across a range of different mental health disorders.²⁹
- 5. Online peer support forums for mental health:** People with mental health disorders can benefit greatly from interacting with their peers to feel more connected, share without threat of stigma, and gain insight from other people with lived experience.³⁰ These spaces are carefully designed and curated to accommodate the potential impacts to those at risk of negative social interactions online.³¹ There are a variety of dedicated online peer support forums for mental health that are moderated by trained volunteers, lay workers or professionals, such as Big White Wall, Humanest Care, and 7 Cups, as well as many more informal online networks.
- 6. Online information and education:** There are tremendous opportunities from public education geared toward mental health promotion and disorder prevention, as well as information on where to seek help and manage more serious conditions. There is now good evidence that targeted digital interventions to develop better mental health knowledge and skills can have a protective effect.^{32,33} A key trend among health systems is to move beyond text-based content to mirror the forms of media that young people want to consume – for example, two-minute, or 20-second videos.
- 7. Data systems to improve and manage services:** One of the most immediate ways that digital technologies can strengthen the mental health system is by improving the efficiency and effectiveness of

offline models of care.³⁴ This includes streamlining workflows for staff, automating repetitive tasks, or connecting behavioral health tools directly to electronic records. Some systems have also begun using large-scale routine outcomes monitoring to improve care – for example, England’s Improving Access to Psychological Therapies (IAPT) service, which delivers rapid-access psychological therapies to more than half a million people in the UK. ‘Before-and-after’ symptom scores are collected for 98 percent of sessions. The scores are analyzed centrally and reported publicly.³⁵

8. Digital assessment: There are many ways that digital technologies can be used to assess individuals’ mental health symptoms, stratify risks, and then track these over time.³⁶ In particular, there has been tremendous interest in the concept of ‘digital phenotyping’ or ‘mobile sensing’, where personal data, collected in real-time and away from the clinic, might be used to predict and detect the development of, or recovery from, a mental health disorder. Potential uses include detecting when someone is at risk of suicide through algorithms that monitor online content consumption and natural language processing (NLP) of text.³⁷ Other open-source digital phenotyping platforms have demonstrated early results in predicting relapse in illnesses such as schizophrenia.³⁸ This is an emerging science, however, and reliable real-world applications are still being tested.

9. Human, computer and self-guided therapies: There is a wide variety of digital therapeutic approaches being deployed by mental health systems around the world today, using video, voice or text. Some of these approaches attempt to directly replicate traditional care models, where psychiatrists, psychologists or counselors conduct booked sessions, as they would in a face-to-face appointment. Others deploy technology to do what traditional care cannot, such as instantaneous access to crisis counseling. An increasing number seek to reduce, replace or augment the role of human professionals. They do this either by using pre-defined therapeutic approaches such as CBT and dialectical behavior therapy (DBT) algorithms that can be implemented by volunteers or lower-skilled staff, or direct interactions between the user and an AI-driven interface. Many of these tools have been found to be effective – even as self-guided online services.³⁹ One example is MindSpot Australia, used by more than 100,000 people to access free and evidence-based tools for anxiety, stress, depression, and low mood.⁴⁰

10. Virtual training and clinical decision support: Training professional and lay mental health workers through instantaneous advice and prompts, as well as more established virtual education, is an

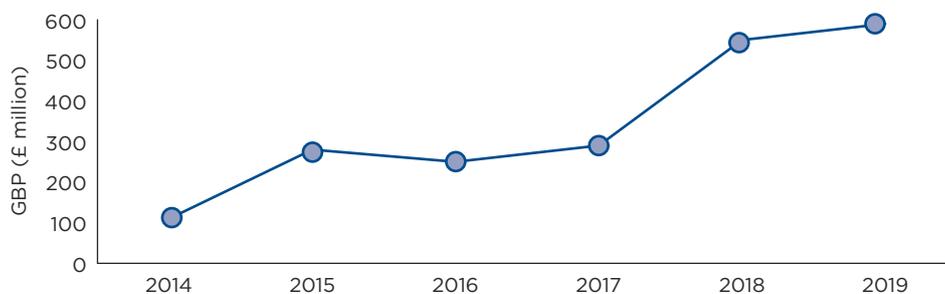
increasingly essential component of mental health delivery programs. Psych Hub is one of the largest mental health education platforms, with certified courses and resources for all types of mental health professionals. Others, such as HeadCoach, offer platforms tailored for particular audiences – in this case, managers in the Australian workplace.⁴¹ Many virtual mental health training platforms are also looking to provide more real-time decision support, such as prompts or easily accessible resources for use in the field (for example, see the EMPOWER case study in [Section 2](#)).

Where are we now? Moving beyond the ‘Wild West’ of digital mental health

The growing pace and success of digital mental health applications has helped to address the global treatment gap. Yet, many expectations for the sector have not been realized as quickly as hoped. Improvements in access, efficacy, and outcomes have mainly been marginal rather than revolutionary. Despite a surge in new investment and research in recent years, the collective evidence for the real-world impact that digital technologies can make on mental health at a mass scale is still “emerging and positive, but not yet conclusive”.⁴²

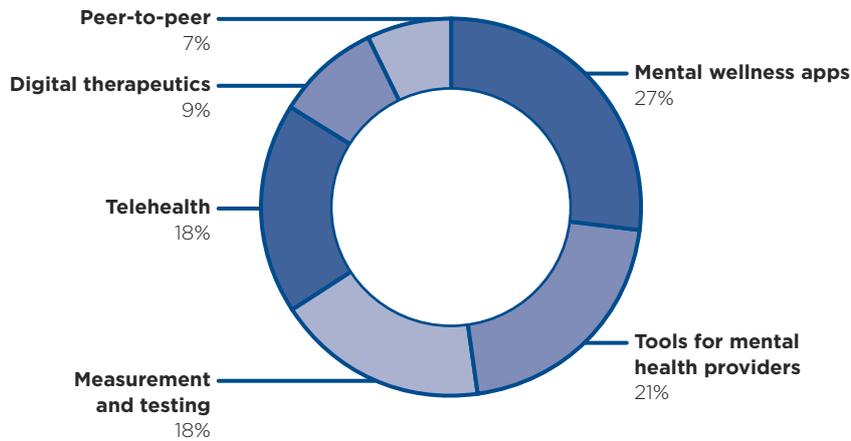
Many commentators describe the current digital mental health sector as a ‘Wild West’, pointing to the more than 10,000 mental health apps now available to download, with just a handful including any published, peer-reviewed literature to support their claims of effectiveness. More than 900 (predominantly digital) mental health start-ups have been mapped – a figure estimated to be increasing by around 100 per year – and collectively these start-ups raised some \$750 million in investment 2019. Figures 5 and 6 show the rapid growth of mental health start-ups and their categories of service.

Figure 5. Capital raised by mental health start-ups



Source: Octopus Ventures (2020)⁴³

Figure 6. Digital and tech-based mental health start-ups by category (649 total)



Source: Hays (2020)⁴⁴

To some extent, this trend is a result of increasing interest among employers and health systems. It is also due to a growing ‘nothing about us without us’ user movement that demands consultation about fundamental changes to traditional mental healthcare: when these changes do not happen fast enough, consumers use or create tools for themselves. This is often a positive development. However, it can be difficult for health leaders to understand what works, and put the increasing number of tools and technologies into a coherent system.

Today, the sector is at a critical inflection point where most innovations have been addressing barriers either to engagement or efficacy, but rarely both. This has produced a polarized landscape, each side with a necessary but insufficient part of the solution:

- **Innovations with academic and/or government backing:** These have largely involved taking evidence-based interventions from the offline world and putting them online. These tools are often rigorously researched in high-quality trials – where they demonstrate some efficacy – but fail to scale up because the user experience is poor, the human support provided in clinical trials is not replicated in real-world settings, or the innovation takes so long to come to market that the technology is obsolete by the time it does. While not true for all publicly backed tools, a number of recent large-scale evaluations have shown disappointing real-world impacts with apps that performed well in smaller trials. This is partly because users did not sustain their engagement after a few days or uses.⁴⁵

- **Innovations driven by, or for, consumers directly:** In some cases, scale-up and user engagement for these innovations has been very strong, but quality and efficacy are often poor. Many of these consumer tools are free and widely available, quickly solving the access problem, but doing little for the treatment gap. For example, only one out of the 73 top-ranking mental health apps includes any citation to peer-reviewed literature to support effectiveness claims.⁴⁶ Nevertheless, the rates of user engagement and retention for some of these unmoderated tools is many times higher than supposedly more effective interventions. This is an important signal that the mental health system is not currently offering what people are looking for, and should be a wake-up call to engage more with people's needs.

The experience of professionals and service users during the pandemic has strengthened the consensus for a need to bridge this divide and create a 'next generation' of digital mental health innovations. These must combine the best of both approaches - blending effective online and offline tools into a coherent, digitally enabled mental health system. What this will look like is still emerging, but it may well produce solutions that are fundamentally different from traditional mental health interventions and treatments. This means moving beyond making established tools digital (for example, online CBT) and instead taking services back to the 'core components' of good mental health prevention, treatment and management. Emerging work by the Wellcome Trust has started to define these 'core components' as including reducing loneliness, engaging the imagination, and having conversations that change perceptions.⁴⁷ Shaping the next generation of digital innovations with these goals in mind will test many assumptions about what mental healthcare is. Perhaps this will even change our understanding of mental health itself.

This transition will be challenging for healthcare leaders and mental health professionals, but the rewards for the systems and societies that engage in this process are difficult to overstate. Fortunately, in most contexts, there is a generation of younger people pushing for this change and enthusiastic to be involved at the forefront.



CASE STUDY 2. SPARX AND HABITS

Australia and New Zealand

Adolescence is a critical time for mental health prevention and promotion – around half of mood disorders, such as depression, begin presenting during this time, affecting around one in five young people. While adolescents are among the least likely groups to seek help from the formal healthcare system for mental health issues (75 percent do not), they are the most likely group to look for support from digital media. This means traditional approaches to prevention and promotion need to adapt.

One such innovation is SPARX, an online fantasy role-playing game. Adapted from CBT methodology, the game helps users develop skills to better cope with negative thoughts, balance their emotions and produce a sense of achievement. The approach is engaging and interactive – it begins with a customized player avatar and a guide who journey together through seven provinces, completing quests that restore the world's balance and defeat negative thoughts (called Gnats). Along the way, the player meets different characters, solves puzzles and completes games. As each quest is completed, the guide explains how to use the new skills to feel better and enjoy life in the real world.

SPARX was developed in New Zealand, where it receives public funding for dissemination. In this context it has demonstrated comparable effectiveness to standard care at reducing depression, anxiety and feelings of hopelessness for young people seeking help for depression. Most powerfully, in a subsequent cluster randomized control trial (RCT) across 10 schools in Australia, the game proved effective at preventing depression – showing for the first time the potential for digital tools to preemptively protect young people from depression.⁴⁸ The effect size was modest but robust, significant and sustained at six months, with 36 percent in the intervention group exhibiting a reliable improvement. The intervention is now being tested in Australia with a sample of 10,000 young people in an RCT that includes the collection of digital phenotyping measures (see [Section 1](#)), through the Future Proofing App. The study collects data on mental health change, education outcomes and links to health and lifetime hospital records. It also includes passive measures of voice, location, activity, typing speed, and memory using the Intelligent Sensing to Inform and Learn (InSTIL) platform.⁴⁹

SPARX makes up one part of the HABITS mental health app, which consists of a secure digital assessment, monitoring and delivery platform, hosting a range of eHealth interventions. Developed by

Professor Sally Merry and her team at the University of Auckland in New Zealand, the app allows young people to be screened and offered behavior intervention technologies (BITs) to fit their needs and encourage the development of coping skills. It also includes a 'research engine' that helps manage clinical and preventive trials. Longer term it will link to real-world outcomes via secure medical and education records. (See [WISH 2015 Mental Health and Wellbeing in Children Report](#) for further information and additional case study.)

See [WISH 2015 Mental Health and Wellbeing in Children Report](#), page 24.

COVID-19: Mental health's 'never go back' moment?

The COVID-19 pandemic has created immense pressure on mental health services. First, because of the upsurge in demand driven by increases in financial distress, isolation and bereavement. Second, because of disruption to established services – with many temporarily closing face-to-face services in the community.

Digital tools have been at the forefront of mental health responses. For example, the UK's Kooth plc service, which runs virtual mental health services on behalf of the National Health Service (NHS), has seen an increase of 34 percent in young people and 53 percent in adults seeking support.⁵⁰ Some commercial US start-ups report that demand has increased as much as fifteen-fold since the pandemic began.⁵¹

Responding to these dual challenges, many mental health systems have made dramatic shifts into new digital services – turning to video-conferencing and changing regulations and payment models almost overnight. The Netherlands trained more than 10,000 mental health professionals in the use of videoconferencing in a month, showing how rapid scale-up in digital tools can be achieved with enough incentive. Kenya has also implemented many digital mental health responses, including virtual Psychological First Aid for health workers.⁵²

Many have hailed this change as long overdue, and resulting in a permanent legacy and cultural shift among professionals and service users. However, given the necessary speed, many changes have also been sporadic and rushed, exacerbating the shortcomings of current digital mental health tools:

- Shifting 'from a room onto Zoom' rather than more fundamentally rethinking what digital can do.
- Picking from the available market of tools, which perpetuates the commercial-academic divide.
- Leaving behind communities with poor access to technology and digital literacy.

SECTION 2. FOUR ATTRIBUTES TO FULFILL THE POTENTIAL OF DIGITAL MENTAL HEALTH

Millions of people are already using and benefiting from digital mental health tools worldwide, but the current era of innovation has only unlocked a fraction of the opportunity. To achieve this potential, four key attributes are needed to harness science and scale. These attributes should guide health systems, developers, investors and users when deciding what to buy and build in the future.

1. Move from apps to an integrated ‘operating system’ of care

Shift from isolated tools to integrated, multifunction platforms – or digital ecosystems – that work across entire mental health pathways.

The majority of digital mental health tools available today offer a single function (for example, peer support, or CBT). While a handful of tools are broader, there are very few examples of integrated ecosystems spanning whole pathways of care.

The challenge is to move from a plethora of apps to create integrated systems of digital and face-to-face care that consist of best practice approaches at each stage of the pathway – including prevention. The primary end goal is to achieve better and more flexible healthcare and support, not to simply scale-up particular tools. To date, start-ups, such as Ginger, have created sophisticated and responsive blended healthcare services, offering in-person, text, video and app-based mental health channels for different needs. However, in many countries, the sustainability of such integrated digital healthcare requires large-scale investment, workforce planning and opportunities for healthcare industries, technology companies, and lived experience to come together.

2. Develop tools that are highly effective and engaging

Harness the lessons of how to simultaneously achieve high levels of efficacy and engagement, by combining the expertise of researchers, companies and end users.

Technologists, clinical scientists and online communities all hold part of the solution for the mental health revolution. However, they currently work on parallel tracks that are typically focused on innovation around either engagement or efficacy, but rarely both.

Incentives play a key part in understanding this division. The commercial must work within the constraints of current market forces. In practice, this means that:

- business models are based on subscriptions or commercializing user data, making their fundamental focus not ‘will it work’ but ‘who will buy/use it’?
- investment in rigorous forms of evaluation does not make economic sense when this money could instead be used on marketing and building scale.
- development is tailored to the needs of the most valuable consumers – typically Western, white and affluent.

Meanwhile, incentives for academics and researchers have their own limitations. For example: they can focus on publication rather than implementation; research grants can pale in comparison to the size of investment required to create large-scale, consumer-facing digital platforms; and academics and researchers can have limited knowledge and skills in commercialization.

While these misaligned incentives remain, true collaboration to generate efficacy and engagement in digital mental health will be difficult to achieve. Overcoming this means rewarding those who can develop a shared value proposition around real-world outcomes, and restricting the ability of developers to make unsubstantiated marketing claims. In practice, only governments and healthcare institutions have the power to do this, making it essential for them to start shaping the market toward the outcomes they most want, and the standards of evidence they need.

3. Address inequities

Increase the level of innovation geared toward low-resource settings, so that new tools can better address inequalities and everyone can benefit from cost-effective solutions.

Digital mental health is a global movement, with some form of intervention or tool in development in every region and major economy around the world (albeit most at an early stage).⁵³ Despite these positive signs, huge disparities exist across the sector, with the vast majority of investment and research funding being spent in higher-income countries, as well as being directed toward more affluent communities.

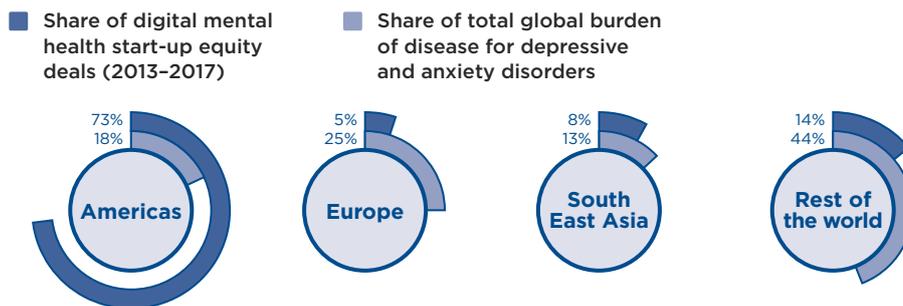
This deficit misses out a large proportion of people who could benefit from digital mental health. It also fails to capture the huge potential for innovation that exists in low-resource contexts, which everyone would stand to benefit from. For example:

- culturally diverse and sensitive approaches to presenting, promoting and improving mental health that may appeal to communities more than medicalized approaches.
- targeted approaches to enhancing access or effectiveness for underserved groups, such as rural or low-income communities.
- leaner delivery models, including examples of ‘reverse innovation’ for face-to-face services – such as the use of peer support and lay mental health workers – can be transferred from low- to high-income contexts.
- smarter research designs that more effectively balance the need for evidence with the need for agility and scale.

There is a strong case for co-development across high-, middle- and low-resource settings. However, many digital mental health tools developed in higher-income contexts have shown the ability to cross borders and communities while maintaining strong efficacy, by using adjustments to language and tone.⁵⁴ Those looking to rapidly increase their health system’s progress toward universal health coverage for very little cost should examine the existing landscape of effective, evidence-based digital mental health tools available, and rapidly scale-up the most appropriate.

Figure 7 shows the distribution of depressive and anxiety disorders across the world, and shows this as in stark contrast to current patterns in the distribution of private funding for mental health start-ups.

Figure 7. Share of total global burden of disease for depressive and anxiety disorders, by WHO region; and share of digital mental health start-up equity deals (2013 to 2017)



Sources: WHO (2017)⁵⁵ and CB Insights (2018)⁵⁶



CASE STUDY 3. EMPOWER

India and United States

One of the most important breakthroughs in the field of global mental health over the last decade has been the demonstration of community health, non-specialist and peer support workers as effective providers of brief psychological treatments. These models are scalable, inexpensive, achieve comparable outcomes and, in some cases, are more acceptable to people in need than specialist services.^{57,58,59,60,61,62} However, even low-cost models face significant scaling challenges – in particular, how to rapidly train and sustain non-specialist workers’ skills, how to enhance their capabilities when simple psychological therapies are not enough, and how to monitor and improve what they are doing in the field.

EMPOWER is an initiative that harnesses digital technologies to accelerate the scaling up of these models and improve access to psychosocial therapies for millions of people. The EMPOWER process starts with identifying proven brief behavioral interventions and psychological treatments that have been effectively delivered by non-specialized providers. Provider training manuals are then converted into competency-based digital curricula, using interactive content such as short stories and role play. A valid assessment is developed to test these skills after the training and in the field.

Work has already begun on digitizing manuals for depression, adolescent mental health, and early child development. Other manuals in production include harmful drinking, trauma and autism. The initiative is currently working on programs for community health workers in India and the US. In the longer term, the initiative aims to integrate its provider-facing learning components with digital tools for enabling delivery and supervision, and connecting these with patient-facing digital tools (such as remote monitoring and self-care apps).

4. Build trust in digital tools

Reduce risks and protect users from potential harm.

Alongside the potential for digital technologies to benefit mental health, it is important to recognize the risks and potential harms that online environments create. Three issues threaten to undermine trust in digital tools as a force for good, and require distinct innovation and policy approaches as part of the next generation of ‘environmental public health’ in the online world.

- **Threats to personal privacy and data security:** This is especially important in digital mental health, given the widespread stigma and strong desire for anonymity among many users. In a survey of 1,500 young people across 125 countries, 67 percent reported personal data security as a primary concern when using technology to engage with their health.⁶³ (See [WISH 2020 LHSN Report on Cybersecurity and Health-care](#) for further information.)
- **Addiction to screens undermining healthy real-world connections and mental health:** Responding to the active global debate about whether time spent on screens might have negative effects on mental health, especially among children and young people who make up around a third of internet users globally.
- **Online engagement that may be harmful to mental health:** Including content promoting self-harm, distorted body image, sexual exploitation and extortion, cyberbullying, exposure to violent and pornographic media, and online gambling.⁶⁴

See [WISH 2020 LHSN Report on Cybersecurity and Health-care](#), page 13.

These three areas require solutions that address the risks without impinging on the community connection, economic opportunities and education that digital technologies give to millions of children and young people every day. Progress toward smarter systems of ‘environmental protection’ for the digital world is hindered by the current rudimentary understanding of patterns of digital use and how these impact on mental health. For example, the current evidence on screen time suggests that there is a small correlation of worse mental health among young people who use mobile devices more than a moderate level (around two hours per day), as well as among those who do not use devices at all.^{65,66} Yet the majority of research available is crude, cannot separate cause and effect, and does not differentiate between the types of digital device, the specific content consumed, or what groups are most vulnerable. Priority should be given to longitudinal research and innovations in measuring digital exposures and their effects, such as the recently launched Screenomics platform for researchers.⁶⁷



CASE STUDY 4. KNOWYOURSELF

China

Despite making huge advances in ‘health for all’ over the last 15 years, China’s progress on universal coverage for mental health has been less dramatic. The ratio of psychiatrists per capita is around one-eighth of the OECD average, necessitating a reliance on other mental health professional groups.⁶⁸ A 2013 Mental Health Law severely restricted the ability of psychologists and psychotherapists to practice outside of hospitals and, in 2018, the government ceased issuing such professional accreditation altogether.⁶⁹ This was partly due to widespread substandard practice and even “outright quackery” but had the effect of making China’s treatment gap even larger.⁷⁰

Realizing that replicating a Western-style mental health system in China was not realistic – or necessarily desirable – KnowYourself has rapidly evolved as an alternative model for the digital age. Founder, Annabelle Qian, wanted to find a way of bringing established mental health promotion and prevention approaches, and evidence-based psychological treatments, to a mass market. The aim was to combine them with data-driven insights to make them appealing, engaging and effective for China’s context. Chiefly operating through a mini-app on the WeChat platform, the company now has nine million users across its growing ecosystem of services, which includes:

- a media business that seeks to foster new understandings and public perceptions about mental health, through engaging articles and cartoons.
- an online, email and text-based ‘therapy mail’ model where clients converse with trained mental health workers.
- digital self-care products blending multiple methodologies including weekly or 21-day meditation ‘challenges’ and cognitive behavioral therapy (CBT).
- face-to-face support groups operating across five cities, using volunteers to deliver standardized content focused on ‘milder’ psychological problems – for example, topic groups include ‘career anxiety’, and there are groups for single mothers.
- in-person workshops and retreats blending meditation, mindful movement, expressive arts, and other methodologies.

The key differentiator of the company is its vision to bridge the academic and commercial worlds. It starts with evidence-based approaches and standardizes them so they can be rolled out across China. It then refines these through its own trials.

SECTION 3. A ROADMAP TO GUIDE PROGRESS

Table 1. Digital mental health maturity matrix

	Level 1	Level 2	Level 3	Level 4
Trust and regulation 	Consumers and providers have no supportive data standards or regulatory framework for quality and safety to guide digital mental health development or delivery.	Some basic standards exist (eg for patient data), but these are not actively enforced – especially in the consumer market.	Comprehensive standards for data and tools are used in the formal mental health system, but little more than signposting of ‘safe’ or ‘approved’ tools for consumers.	End users and providers feel confident in navigating across the digital mental health sector safely, securely and with a clear understanding of the evidence base behind tools.
Funding and payment 	A largely out-of-pocket/freeware market, with no dedicated funding streams for digital mental health, and often no ability for providers to bill for digital interactions.	Payment models allow providers to bill for digital interactions. Targeted funding streams exist to seed development of digital mental health tools, but not scale-up.	Outcome-based incentives encourage the use of digital mental health tools among providers. Academia–industry partnerships help to drive development and scale.	Publicly-funded digital mental health services are a vibrant sector for non-profit, academic and commercial digital mental health tool development, with payment incentives weighted towards patient and population outcomes.
Workforce 	Most mental health professionals see digital tools as a distraction from their ‘real work’. Digital training is absent from curricula, or optional.	Some formal digital training but little action-learning or empowerment to change systems. Innovations are largely ‘passion projects’ by enthusiastic users or staff.	Professionals are developed and empowered to lead change in partnership with people with lived experience. All staff receive regular training and most digital mental health progress is frontline-led.	All staff seen as digital mental health workers, and perceive tools as essential to maximizing their time and expertise. Specialist cadres of digital mental health workers emerge and are in high demand.
Integrated ecosystem 	Most digital mental health activity is in isolated, consumer-driven apps. Formal providers have a few basic, non-interoperable systems.	Signposting of evidence-based consumer apps, which staff are familiar with but do not integrate with their own systems. Formal services have a few multi-function tools but none that span across different providers.	Several multi-sided platforms exist into which different staff and consumer tools can integrate across pathways for different disorders. Digital service platforms are typically outsourced and separate from mainstream mental health services.	A coherent digital mental health ecosystem exists, with interoperability of tools and platforms offering blended care spanning mental health promotion, disorder prevention, assessment, interventions, monitoring and management.
Monitoring, evaluation and learning 	Little or no measurement of meaningful outcomes from digital mental health tools. Developers keep data to themselves.	Each digital mental health initiative picks its own outcomes, defined and measured their own way, with no systematic sharing of the lessons learned.	Agreed standards for prioritizing, defining, measuring and publishing outcome and other data exist and are mostly adhered to across the formal mental health system and commercial developers.	Mental health systems use the data from digital tools and systems to continuously improve access, engagement and benchmark comparative efficacy of new tools. There are clear standards of evidence that tools must transparently meet to achieve scale.

Governments, investors, health systems, schools and employers all have a role in realizing the potential of digital mental health. To guide their actions, this section sets out a matrix (see Table 1) that categorizes the current level of digital mental health maturity within a local, regional or national health system, and prioritizes the areas most in need of focused improvement. This is followed by our recommendations for specific questions that each provider should ask themselves in determining their contribution to progress along each of the four levels.

Governments

In the process of setting the environmental conditions for the right kind of digital mental health ecosystem to develop, governments should consider the following:

- 1.** Is there an agreed vision for the type of digitally-enabled mental health system that professionals, the public and people with mental health disorders would most like?
- 2.** Is this vision backed up by an appropriately funded strategy for development, with specific, measurable targets for how this will increase access, engagement and efficacy over time?
- 3.** Are regulations and ethical standards in place to enable the different domains of the mental health system to pursue this strategy, build public trust, and restrict access and support for those providers or platforms that do not follow the rules? Ideally these should draw on existing best-practice frameworks,⁷¹ but also respond to the priority concerns of local professionals and end users.
- 4.** Are there training programs and curricula to support digital knowledge and skills development as core competencies for all mental health professionals?
- 5.** Are there initiatives to fund or co-fund the development and scale-up of new types of digital mental health tools and services, such as industry partnerships or digital mental health incubators?
- 6.** Are publicly funded research agencies aligned to the areas identified as having greatest potential in digital mental health? Is sufficient weight being given to research geared to digital platform infrastructure, implementation and scale-up?

7. Who are the groups at greatest risk of missing out on digital mental health services (for example, because of low digital literacy or internet access), and what additional measures are needed to bridge these gaps?

Investors and developers

For any given investment or development decision, investors and developers should ask the following:

1. Does your proposed innovation/digital tool address a current unmet mental health need?
2. What is the theoretical basis or proposed 'active ingredient' of the intervention?
3. Have clinicians and people with lived experience been involved in the development and testing of the innovation?
4. What is the business model for the innovation that ensures sustainability while ideally reducing stigma and health inequalities?
5. What research evidence is required to justify the claims of the innovation – and what regulatory barriers need to be addressed?
6. How will the innovation integrate with (or disrupt) existing healthcare pathways, and how will the resistance to this disruption be overcome?
7. How will the innovation be updated and maintained to evolve in light of new evidence, and stay compliant with developing data privacy and user protection standards?



CASE STUDY 5. THE DIGITAL CLINIC

India and United States

Engaging the workforce and end users is essential to effective innovation and implementation, but what might such an approach look like? One solution in the US and India is the Digital Clinic model, being developed by the Department of Psychiatry at the Beth Israel Deaconess Medical Center in Boston.⁷²

The Digital Clinic model attempts to put the insights and priorities of frontline staff and patients at the center of the adaption and adoption processes – using technology to enhance rather than undercut the therapeutic alliance, clinical workflows and shared decision-making. The process involves starting with a highly customizable – and free – technology platform, mindLAMP, that can support multiple different functions and link together patient interfaces (eg messaging or other apps), clinical systems (eg electronic records), and data science (for service improvement).⁷³

This is combined with a new care team member – the digital navigator – whose role is to smooth the workflow, customization, training and troubleshooting the new tool. Using the tool and the navigator, the digital clinic can then begin to evolve digital features and services in response to the needs of individual staff and patients. Each new clinic considers what preconditions should be put in place for existing staff and services, what new customizations to the tool are required, and what adjustments to rules and policies might be necessary – with constant feedback from a committee of staff, patients and data scientists. The result is a highly flexible approach to creating integrated digital and offline care services that are continuously improving to meet the needs of professionals and service users.

Health systems

Health systems worldwide should ask the following:

- 1.** Have a clear and realistic set of objectives been defined for the mental health system or pathway that should be supported through digital innovation and implementation?
- 2.** What is the scope of any new digital tool or service being developed or commissioned, including its target group, how it will sit within existing pathways, and the performance thresholds for engagement and efficacy?
- 3.** Are there standards of evidence, ethics and privacy required to proceed with roll-out of a new digital tool, and have these been clearly communicated so that developers can easily follow them?
- 4.** Is there a clear payment model for new digital mental health innovations that incentivize broad improvement of outcomes most important to end users, with an appropriate balance of risk between the payer and provider?
- 5.** Has a roll-out plan been agreed for how any new tool will be integrated and deployed within the existing system, and is it interoperable with existing systems?
- 6.** Has the experience of professionals, the public, and people with lived experience of mental health disorders been embedded across the process of innovation and implementation?

Educational institutions and employers

In promoting and protecting the mental health of children, students and workers, educational institutions and employers should lead by example, by reflecting on the following questions:

- 1.** Have the impacts of poor mental health on children, students and workers been carefully considered and quantified?
- 2.** Have available digital tools and services to improve mental health been assessed with input from children, students and workers, and engagement with potential partners?

3. What non-digital support is going to be required to make these innovations successful?
4. Has an investment case been produced, taking into account the tangible and intangible costs and benefits of any program?
5. Are the available services, (including free tools), adequately promoted so that everyone is aware of where to seek help, with adequate staff training and options for people to also seek help anonymously?
6. Are the impacts of implementation being measured and recorded to inform improvements to the program, and to share with other institutions?

(See [WISH 2020 Role of Schools in Child and Adolescent Health Report](#) for additional case study.)

See [WISH 2020 Role of Schools in Child and Adolescent Health Report](#), page 25.

ACKNOWLEDGMENTS

The Forum Advisory Board for this paper was chaired by Helen Christensen, Director and Chief Scientist, Black Dog Institute and Professor of Mental Health at University of New South Wales, Australia. The Co-Chair was Dr Tom Insel, Co-Founder and Chair, Humanest Care, USA.

This paper was written by Helen Christensen and Tom Insel in collaboration with Jonty Roland, Independent Health Systems Consultant and Honorary Research Fellow, Institute of Global Health Innovation, Imperial College London. The WISH Research Fellow was Emma Lawrance, Mental Health Innovations Fellow, Institute of Global Health Innovation, Imperial College London.

Sincere thanks are extended to the members of the WISH 2020 Forum on Mental Health and Digital Technologies advisory group who contributed their ideas and insights to this paper:

- Nick Allen, Director, Center for Digital Mental Health, University of Oregon and CEO, Ksana Health
- Pamela Y Collins, Professor of Psychiatry and Behavioral Sciences, and Professor of Global Health, and Director, Global Mental Health Program, University of Washington
- Suhaila Ghuloum, Senior Consultant Psychiatrist, Hamad Medical Corporation, and Chair of Middle East Division, Royal College of Psychiatrists
- Oliver Harrison, CEO Health Moonshot, Telefónica Alpha
- Chris Hollis, Director, National Institute of Health Research (NIHR) MindTech Medtech Co-operative, and Professor of Child & Adolescent Psychiatry, University of Nottingham
- Victoria Hornby, CEO, Mental Health Innovations
- Julia Kagunda, Chief Psychologist, Inuka Wellness, and Lecturer at Daystar University
- Theresa Nguyen, Chief Program Officer, Mental Health America
- Heleen Riper, Professor of eMental-Health, Department of Clinical, Neuro and Developmental Psychology, VU University Amsterdam
- Shekhar Saxena, Professor of the Practice of Global Mental Health, Harvard TH Chan School of Public Health
- Ilima Singh, Professor of Neuroscience & Society and Co-Director of the Wellcome Centre for Ethics and Humanities, University of Oxford

- John Torous, Director of Digital Psychiatry Division, Department of Psychiatry, Beth Israel Deaconess Medical Center, Harvard Medical School
- Miranda Wolpert, Head of Mental Health Priority Area, Wellcome Trust, and Professor of Evidence Based Research and Practice, University College London
- Annabelle Qian, Founder, KnowYourself

With very special thanks to the eight Young Leaders for The Lancet Commission on Global Mental Health and Sustainable Development, who generously took the time to give their perspectives on the questions raised in this report and contribute to a group discussion on its key themes:

- Ashley Foster-Estwick
- Grace Gatera
- David Karorero
- Kumba Philip-Joe
- Damian Juma
- Claudia Sartor
- Chinwendu Ukachukwu
- Lian Zeitz

The chairs and authors also thank others who made significant contributions to the report, including:

- Joshua Chauvin, Consultant, Alpha Health
- Mychelle Farmer, NCD Child, Centre for Global Child Health, Hospital for Sick Children, Toronto
- Stephen Hays, Founder and Managing Partner, What If Ventures
- Mowafa Househ, Associate Professor, College of Science and Engineering, Hamad Bin Khalifa University, Qatar
- John Naslund, Instructor in Global Health and Social Medicine, Harvard Medical School
- Annie Njenga, Chief of Operations - Kenya, Inuka
- Vikram Patel, Professor, Department of Global Health and Population, Harvard TH Chan School of Public Health
- Gabriela Pavarini, Postdoctoral Researcher, Neuroscience, Ethics and Society Group, Department of Psychiatry, University of Oxford
- Beck Smith, Policy and Advocacy Lead, Mental Health Priority Area, Wellcome Trust
- Sheena Wood, Research Assistant to Dr Vikram Patel, Department of Global Health and Social Medicine, Harvard Medical School

The interviews that informed this report were conducted by Jonty Roland. The Chair and authors thank all who contributed. Any errors or omissions remain the responsibility of the authors.

We would like to thank the WISH team for their support and guidance in preparing this report: Nicolette Davies, Gianluca Fontana and Niki O'Brien, Institute of Global Health Innovation, Imperial College London.

REFERENCES

1. Patel V, et al. The Lancet Commission on Global Mental Health and Sustainable Development. *The Lancet*. 2018; 392(10157).
2. Thornicroft G, et al. Undertreatment of people with major depressive disorder in 21 countries. *British Journal of Psychiatry*. 2017; 210, P119–124.
3. Vigo D, et al. Estimating the true global burden of mental illness. *Lancet Psychiatry*. 2016; 3(2), P171–178.
4. US Department of Health and Human Services. *National Survey on Drug Use and Health*. Washington, DC: US Department of Health and Human Services; 2013.
5. Kessler RC, et al. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*. 2005; 62(6), P617–627.
6. Wang PS, et al. Twelve-month use of mental health services in the United States: Results from the National Comorbidity Survey Replication. *Archives of General Psychiatry*. 2005; 62(6), P629–640.
7. Merikangas KR, et al. Service utilization for lifetime mental disorders in U.S. adolescents: Results of the National Comorbidity Survey-Adolescent Supplement (NCS-A). *Journal of the American Academy of Child and Adolescent Psychiatry*. 2011; 50(1), P32–45.
8. Insel T. Forthcoming.
9. OECD iLibrary. *OECD Health Statistics*. www.oecd-ilibrary.org/social-issues-migration-health/data/oecd-health-statistics_health-data-en [accessed 24 July 2020].
10. World Health Organization. *Global Health Observatory (GHO) data: Psychiatrists and nurses (per 100 000 population)*. www.who.int/gho/mental_health/human_resources/psychiatrists_nurses/en [accessed 24 July 2020].
11. Patel V, Saxena S. Achieving universal health coverage for mental disorders. *BMJ*. 2019; 366, I4516.
12. Mays VM, et al. Perceived discrimination in healthcare and mental health/substance abuse treatment among blacks, Latinos, and whites. *Medical Care*. 2017; 55(2), P173–181.
13. Wallace S, et al. Cumulative effect of racial discrimination on the mental health of ethnic minorities in the United Kingdom. *American Journal of Public Health*. 2016; 106(7), P1294–1300.
14. Gulliver A, et al. Perceived barriers and facilitators to mental health help-seeking in young people: A systematic review. *BMC Psychiatry*. 2010; 10(13).
15. Cohen ZD, DeRubeis RJ. Treatment selection in depression. *Annual Review of Clinical Psychology*. 2018; 14, P209–236.
16. Cuijpers P, et al. The role of common factors in psychotherapy outcomes. *Annual Review of Clinical Psychology*. 2019; 15, P207–231.

17. Cuijpers P, et al. Component studies of psychological treatments of adult depression: A systematic review and meta-analysis. *Psychotherapy Research*. 2019; 29(1), P15–29.
18. Mental Health Innovation Network. *Mentally Aware Nigeria Initiative*. www.mhinnovation.net/organisations/mentally-aware-nigeria-initiative [accessed 31 July 2020].
19. Sati. *Homepage*. www.satiapp.co [accessed 31 July 2020].
20. van Spijker BAJ, et al. Effectiveness of online self-help for suicidal thoughts: Results of a randomised controlled trial. *PLoS One*. 2014; 9(2).
21. Setkowski K, et al. Feasibility and impact of data-driven learning within the suicide prevention action network of thirteen specialist mental healthcare institutions (SUPRANET Care) in the Netherlands: A study protocol. *BMJ Open*. 2018; 8.
22. Wind TR, et al. The COVID-19 pandemic: The ‘black swan’ for mental health care and a turning point for e-health. *Internet Interventions*. 2020; 20.
23. Kessler, R. et al. Age of onset of mental disorders: A review of recent literature. *Current Opinion in Psychiatry*. 2007; 20(4), P359–364.
24. IQVIA Institute for Human Data Science. *The Growing Value of Digital Health*. Durham, NC: IQVIA Institute for Human Data Science; 2017.
25. Authors’ estimate.
26. Bostock S, et al. Mindfulness on-the-go: Effects of a mindfulness meditation app on work stress and well-being. *Journal of Occupational Health Psychology*. 2019; 24(1), P127–138.
27. Madhavan M, et al. Review and evaluation of mindfulness-based iPhone apps. *JMIR mHealth uHealth*. 2015; 3(3).
28. Hays S. Approaching 1,000 mental health startups in 2020. *Medium*. 10 January 2020.
29. Lau HM, et al. Serious games for mental health: Are they accessible, feasible, and effective? A systematic review and meta-analysis. *Frontiers in Psychiatry*. 2017; 7, P209.
30. Naslund JA, et al. The future of mental health care: Peer-to-peer support and social media. *Epidemiology and Psychiatric Sciences*. 2016; 25(2), P113–122.
31. Odgers CL. Smartphones are bad for some adolescents, not all. *Nature*. 2018; 554(7693), P432.
32. Teesson M, et al. Combined prevention for substance use, depression, and anxiety in adolescence: A cluster-randomised controlled trial of a digital online intervention. *Lancet Digital Health*. 2020; 2(2), P74–84.
33. Buntrock C, et al. Effect of a web-based guided self-help intervention for prevention of major depression in adults with subthreshold depression: A randomized clinical trial. *JAMA*. 2016; 315(17), P1854–1863.

34. Martinez C, Farhan I. *Making the Right Choices: Using data driven technology to improve mental health care*. London: Reform; 2019.
35. Clark DM, et al. Transparency about the outcomes of mental health services (IAPT approach): An analysis of public data. *The Lancet*. 2017; 391(10121), P679–686.
36. Martinez C, Farhan I. *Making the Right Choices: Using data-driven technology to improve mental health care*. London: Reform; 2019.
37. Allen N, Auerbach RP. *MAPS: Mobile Assessment for the Prediction of Suicide study*. Forthcoming.
38. Allen NB, et al. Short-term prediction of suicidal thoughts and behaviors in adolescents: Can recent developments in technology and computational science provide a breakthrough? *Journal of Affective Disorders*. 2019; 250, P163–169.
39. Karyotaki E, et al. Efficacy of self-guided internet-based cognitive behavioral therapy in the treatment of depressive symptoms: A meta-analysis of individual participant data. *JAMA Psychiatry*. 2017; 74(4), P351–359.
40. MindSpot. *Homepage*. mindspot.org.au [accessed 24 July 2020].
41. Gayed A, et al. A new online mental health training program for workplace managers: Pre-post pilot study assessing feasibility, usability, and possible effectiveness. *JMIR Mental Health*. 2018; 5(3).
42. Gaebel W, et al. *Transnational Policy for e-Mental Health: A guidance document for European policymakers and stakeholders*. Brussels: European Regional Development Fund; 2020.
43. Octopus Ventures. *Mental Health Investment Data*. London: Octopus Ventures; 2020.
44. Hays S. Approaching 1,000 mental health startups in 2020. *Medium*. 10 January 2020. (The category 'Non-Tech Start Ups' number 68 organizations has been removed from calculations.)
45. Dorsey E, et al. The use of smartphones for health research. *Academic Medicine*. 2017; 92(2), P157–160.
46. Larsen ME, et al. Using science to sell apps: Evaluation of mental health app store quality claims. *NPJ Digital Medicine*. 2019; 2, P1–6.
47. Wellcome. *Mental health: transforming research and treatments*. wellcome.ac.uk/what-we-do/our-work/mental-health-transforming-research-and-treatments [accessed 11 September 2020].
48. Perry Y, et al. Preventing depression in final year secondary students: School-based randomized controlled trial. *Journal of Internet Medical Research*. 2017; 19(11).
49. Barnett S, et al. Intelligent Sensing to Inform and Learn (InSTIL): A scalable and governance-aware platform for universal, smartphone-based digital phenotyping for research and clinical applications. *Journal of Medical Internet Research*. 2019; 21(11).
50. Kooth plc. *How has COVID-19 Affected the Mental Health of Children and Young People in the United Kingdom?* xenzone.com/wp-content/uploads/2020/04/230420_CYP_infographic.pdf [accessed 24 July 2020].

51. What If Ventures. *Q1 2020 Investment Report: Explosion in mental health start up funding*. Frisco, Texas: What If Ventures; 2020.
52. Mental Health Innovation Network. *Community Mental Health: Experiences from Nairobi's COVID-19 response*. Geneva: Mental Health Innovation Network; 2020.
53. Naslund JA, et al. The future of mental health care: Peer-to-peer support and social media. *Epidemiology and Psychiatric Sciences*. 2016; 25(2), P113-122.
54. Gaebel W, et al. *Transnational Policy for e-Mental Health: A guidance document for European policymakers and stakeholders*. Brussels: European Regional Development Fund; 2020.
55. World Health Organization. *Depression and Other Common Mental Disorders: Global health estimates*. Geneva: World Health Organization; 2017.
56. CB Insights. *Mental Health and Wellness Tech Investment Report*. New York: CB Insights; 2018.
57. Singla DR, et al. Psychological treatments for the world: Lessons from low- and middle-income countries. *Annual Review of Clinical Psychology*. 2017; 13, P149-181.
58. Nadkarni A, et al. Counselling for Alcohol Problems (CAP): A lay counsellor-delivered brief psychological treatment for harmful drinking in men, in primary care in India: A randomised controlled trial. *The Lancet*. 2017; 389(10065), P186-195.
59. Patel V, et al. The Healthy Activity Program (HAP): A lay counsellor-delivered brief psychological treatment for severe depression, in primary care in India: A randomised controlled trial. *The Lancet*. 2017; 389(10065), P176-185.
60. Rahman A, et al. Effect of a multicomponent behavioral intervention in adults impaired by psychological distress in a conflict-affected area of Pakistan: A randomized clinical trial. *JAMA*. 2016; 316(24), P2609-2617.
61. Rahman A, et al. Interventions for common perinatal mental disorders in women in low- and middle-income countries: A systematic review and meta-analysis. *Bulletin of the World Health Organization*. 2013; 91(8), P593-601.
62. Singla DR, et al. Improving the scalability of psychological treatments in developing countries: An evaluation of peer-led therapy quality assessment in Goa, India. *Behaviour Research and Therapy*. 2014; 60, P53-59.
63. Devex. *Health and Technology: What young people really think*. Washington, DC: Devex; 2019.
64. Dubicka B, Theodosiou L. *Technology Use and the Mental Health of Children and Young People*. London: Royal College of Psychiatrists; 2020.
65. Naslund JA, et al. The future of mental health care: Peer-to-peer support and social media. *Epidemiology and Psychiatric Sciences*. 2016; 25(2), P113-122.
66. Houghton S, et al. Reciprocal relationships between trajectories of depressive symptoms and screen media use during adolescence. *Empirical Research*. 2018; 47, P2453-2467.
67. Reeves B, Robinson T, Ram N. *Time for the Human Screenome Project*. www.nature.com/articles/d41586-020-00032-5 [accessed 31 July 2020].

68. Xiang Y-T, et al. Rethinking progress and challenges of mental health care in China. *World Psychiatry*. 2018; 17(2), P231-232.
69. Chen HH, et al. Mental Health Law of the People's Republic of China: Translated and annotated version of China's new Mental Health Law. *Shanghai Archives of Psychiatry*. 2012; 24(6), P305-321.
70. Clay R. Psychotherapy in China. *Monitor on Psychology*. 2019; 50(9), P26.
71. Torous J, et al. Towards a consensus around standards for smartphone apps and digital mental health. *World Psychiatry*. 2019; 18(1), P97-98.
72. Publication forthcoming.
73. Torous J, Vaidyam A. Multiple uses of app instead of using multiple apps: A case for rethinking the digital health technology toolbox. *Epidemiology and Psychiatric Sciences*. 2020; 29.

WISH RESEARCH PARTNERS

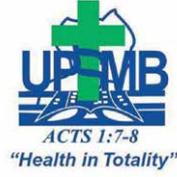


WISH gratefully acknowledges the support of the Ministry of Public Health



THE AGA KHAN UNIVERSITY





ISBN 978-1-9139910-0-5



9 781913 991005 >

www.wish.org.qa