



**oxfordvr**

Immersive technology for mental health

**Can automated virtual reality  
therapy revolutionize mental  
healthcare?**



# Can automated virtual reality therapy revolutionize mental healthcare?

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## SECTION 1: EXECUTIVE SUMMARY

Technology is transforming efficiencies and outcomes in primary mental healthcare in ways that were scarcely imaginable five years ago. Digital and mobile applications have expanded access to care, enhanced clinical management and enabled early intervention. Yet little has been done to tackle the care of serious and complex mental health problems, such as depression and psychosis including schizophrenia.

More than 2.48 million people were in contact with NHS mental health services during 2018 in the UK. Of these, 200,000 are individuals living with psychosis. Psychosis accounts for approximately 30% of all expenditure on adult mental health and social care. It is one of the most life-impacting conditions in healthcare and arguably the most significant in mental health in terms of poorest lifelong outcomes and has the greatest variation in access to evidence-based care. Widespread access to therapy remains challenging for many individuals. Many reports show that the quality of therapy can be extremely variable too.

Oxford VR's automated immersive virtual reality (VR) therapy has already proven its significant potential in a landmark clinical trial which was published in [The Lancet Psychiatry](#) in 2018. This highly scalable solution demonstrated that results were as good, and likely better, than first-class in-person therapy and shows its capacity to:

- ▶ **expand access to high-quality treatment**
- ▶ **improve engagement rates in therapy**
- ▶ **potentially lower the cost of treating patients**



## SECTION 2:

# THE SCALE OF THE UK'S UNMET MENTAL HEALTH NEEDS

Three-quarters of people with a mental health issue receive no mental healthcare support at all in the UK. People with severe and prolonged mental illness are at risk of dying on average 15 to 20 years earlier than other people. The number of people with severe mental illness is growing. Over 550,000 people registered with a GP had a diagnosis of schizophrenia, bipolar affective disorder or other psychoses in 2017/18, an increase of over 50,000 since 2014/15. Barriers to providing optimal mental health care are multi-factorial and complex:

### **Inadequate funding at a time of increasing demand**

Historically in the UK, mental health has been chronically underfunded and has not received the same level of political prioritisation as physical health care. Poor mental health carries an economic and social cost of £105 billion a year in England and accounts for 23% of the burden of disease in the UK, yet spending on mental health services equates to only 11% of the UK NHS budget. The UK's growing ageing population are the highest consumers of healthcare - it costs three times more to look after a 75-year-old than a 30-year-old. Nearly half of adults aged 55+ say they have experienced depression.

### **Inadequate provision and access problems**

Accessing mental health services remains a significant problem for many patients. Long waits for psychological therapy still prevail in secondary care (specialist care) and many people simply never have access to these interventions. Almost one-fifth of people who have care coordinated through the Care Programme Approach (for people with more severe or complex needs) have not had a formal meeting to review their care in the previous 12 months.

A woman with blonde hair tied back, wearing a purple long-sleeved shirt, is shown in profile, looking towards the right. Her hand is near her chin, suggesting she is listening intently. In the foreground, the back of another person's head and shoulders, wearing a light-colored shirt, is visible, slightly out of focus.

## SECTION 2:

# THE SCALE OF THE UK'S UNMET MENTAL HEALTH NEEDS (CONT.)

### **Inadequate quality of services**

According to the NHS Mental Health Taskforce Five Year Forward View report, one in three NHS patients with depression and other mental health problems in England receives treatment that is defined as 'poor'. Among those who are helped, too few have access to the full range of interventions recommended by the National Institute for Health and Care Excellence (NICE).

### **Understaffed workforce and insufficient training**

A total of 23,686 mental health staff left the UK's NHS between June 2017 and May 2018. That is the equivalent of one in eight of the sector's whole workforce. Furthermore, one in 10 mental health posts were unfilled at the end of June 2018. The rate of unfilled NHS consultant psychiatrist posts in England has doubled in the last six years. This is happening at a time when services are already seriously understaffed and struggling to cope with a surge in patients seeking help for anxiety, depression and other disorders.



## SECTION 3: WHAT IS AUTOMATED VR THERAPY?

Oxford VR's automated VR therapy translates evidence-based cognitive behavioural therapy (CBT) through immersive VR environments to provide a powerful new psychological treatment. This innovation in mental health builds on 20 years of research by Professor Daniel Freeman at the University of Oxford into the use of immersive technologies to understand and treat psychological conditions.

Mental health problems are inseparable from the environment; for example, if you have a fear of heights, it's walking near heights, if you have a fear of spiders it's being near spiders. In more severe mental health conditions such as depression and psychosis, social avoidance (avoidance and anxiety associated with normal social or occupational functioning) is a common feature.

In VR therapy, individuals put on a headset and enter VR simulations of the situations and environments that trigger their symptoms. Throughout their treatment, individuals are guided by an automated virtual coach and asked to complete several different tasks that are graded in difficulty and are coached on helpful responses. The VR environments give people reassurance they can try out new things safely and that they're not in any real danger.

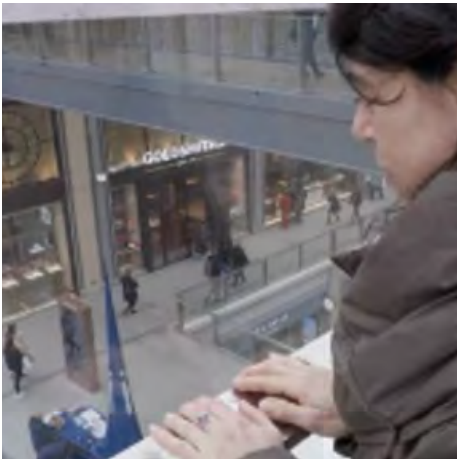
*"VR therapy is transforming the mental healthcare experience. Great care has been taken to make treatment programmes clinically challenging yet also engaging and even fun. Service users are central to the treatment design process and treatment programmes draw on exciting gamification technology."*

Barnaby Perks, Co-founder & CEO, Oxford VR



## AUTOMATED VR THERAPY FOR FEAR OF HEIGHTS

Oxford VR's first application of VR therapy was for treating fear of heights, which is the most common phobia. One in five people report having had a strong unreasonable fear of heights during their lifetime, and one in 20 people reach diagnostic criteria for acrophobia (extreme fear of heights).



## FROM LAB TO LANDMARK TRIAL

In early 2018 Oxford VR conducted a ground-breaking randomised controlled trial of VR therapy for its fear of heights treatment programme. People who had experienced this condition for an average of 30 years were randomly allocated either automated VR therapy or no treatment. The VR therapy was delivered via 30-minute interventions. On average, people spent approximately two hours in VR therapy over five treatment sessions.



## PEER VALIDATION OF OXFORD VR THERAPY'S EFFECTIVENESS

The findings of Oxford VR's fear of heights trial were published in The Lancet Psychiatry and showed that recovery rates were double the expected rate for traditional face-to-face therapy. All participants in the VR group showed a reduction in their fear of heights, with the average reduction being 68%. Half of the participants saw a reduction in their fear of over 75%. These results demonstrate the dramatic effects on psychological wellbeing that automated VR therapy can produce.



## SECTION 4:

# AUTOMATED VR THERAPY'S POTENTIAL TO TREAT SERIOUS MENTAL ILLNESSES

The Lancet Psychiatry study demonstrated the potential of Oxford VR's immersive therapy to address a variety of mental health problems including more serious and complex mental health conditions such as psychosis.

Oxford VR is an integral collaborator in gameChange, a £4 million project funded by the UK National Institute of Health Research (NIHR), the first large-scale multi-site trial to revolutionize treatment of psychosis. The project has three components; 1) design and development of treatment 2) the roll out of a clinical trial and 3) develop an implementation plan and roadmap to roll out treatments across the NHS. gameChange demonstrates the real clinical value of Oxford VR's proprietary development capability which the company has accelerated since 2018.

Psychosis is a serious mental illness. People with psychosis die on average 15 to 20 years earlier than the general population. The most common symptoms of psychotic illness are delusions and hallucinations. Thinking processes, perception and emotional response may also be affected. All too often, individuals with psychosis find day-to-day life so anxiety-provoking that they simply withdraw. Work and home life suffer and mental and physical health deteriorate.

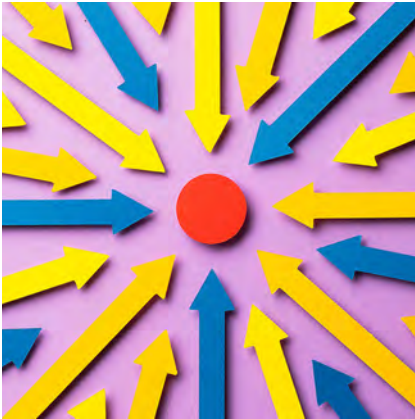
The cost of treating psychosis is forecast to be in the region of £4 billion by 2026 for NHS England. The automated nature of VR therapy means it could provide a cost-effective and highly scalable solution to complement existing care.

To date, real-world implementation of psychological interventions for psychosis is poor. Currently only 5% of people with psychosis receive psychological treatment. Barriers include patients not being offered therapy, therapy being insufficiently user-friendly or accessible to a diverse range of people. Empowering clinicians to provide therapy for patients in secondary care is an especially important aim, given that the time from onset of psychosis to the provision of evidence-based treatment has a significant influence on long-term outcomes. The



# gameChange

Improving lives through VR therapy



## USER CENTERED DESIGN

People with a lived experience of psychosis have been instrumental in helping to design the VR therapy being used in the gameChange trial in order to deliver the very best user experience.

Working alongside The McPin Foundation and The Royal College of Art, Oxford VR treatment design experts, animators, clinical psychologists and computer programmers are ensuring that the needs of the patient come first to transform the experience of mental healthcare with a treatment programme that is engaging, easy to use and right for patient needs.



## GAMIFYING MENTAL HEALTHCARE

VR therapy draws on exciting gamification technology to increase the impact of therapy and improve patient engagement rates. Great care has been taken to make the treatment programmes clinically challenging but also engaging and even fun.

Automated VR therapy enables exposure to powerful simulations of environments that trigger an individual's symptoms in a safe setting. The VR environments and activities are so compelling and immersive that patient testimonies show that users find VR therapy easy to engage with and even enjoyable to do.



## VR THERAPY IS AUTOMATED

Oxford VR therapy is automated and uses a virtual coach. Prized therapists can therefore be redeployed to more urgent cases or other aspects of care.

Automated VR therapy not only opens up access, it standardises clinical excellence and ensures adherence to the treatment protocol enabling fast and high-quality evidence-based treatment.

The implications are huge not just for patients, but for health systems, because this innovation enables automated delivery of care. If scaled up, such treatments could open up access to care for millions more people.

"Innovation is the only solution we have for a sustainable NHS, both economically and in meeting the challenges and demands upon it"

**Lord Ara Darzi**

Director of Institute of Global Health Innovation at Imperial College London

## SECTION 5:

### BARRIERS TO ADOPTION

Not everyone agrees with a tech-powered approach to mental healthcare either. For some professionals, the therapist-patient relationship is at the heart of the treatment. Freud stressed the importance of 'transference' between patient and therapist. Counselling pioneer Carl Rogers believed that "the therapist's empathy for their patient is enough to bring positive change."

However Professor Daniel Freeman disagrees and says "If we're serious about addressing the mental health crisis, we have to let go of the idea that therapy can only be done face-to-face and recognise the huge gains tech interventions can potentially provide."

There are still a lot of barriers in the way of patients, including stigma, affordability and access too. So what prevents some technologies which are evidence-based, good for patients and cost-effective, from being used? Some of the common reasons include issues such as:

- innovations are developed and driven by industry rather than clinicians, in collaboration with patients.
- developing robust evidence base for new innovations is both costly and takes considerable time and resources.
- looking for innovative practice and undertaking the hard work of sustainable implementation is not often considered to be part of anybody's day job.
- innovations may only be seen as successful if they can produce immediately positive effects, such as in-year savings, at the location of implementation. Those innovations which have wider pathway benefits, over a longer time frame, can struggle to be adopted.

Innovation is at the core of Oxford VR's business alongside a commitment to ensuring an evidence-based approach. According to Jason Freeman, Chief Treatment Design Officer "Collaboration with stakeholders including clinicians is fundamental to our VR therapy development process. Patients are always involved, providing input on designs, trying iterations of the software, and ultimately participating in pilot studies and randomised controlled clinical trials."



## SECTION 6: LOOKING TO THE FUTURE

There is a risk that traditional face to face therapy will become inaccessible to large parts of the population, due to factors like a shortage of qualified clinicians, the rising cost of care, a growing reliance on antidepressant medication or the impracticality or limitations of providing treatment.

The NHS Mental Health Taskforce's Five Year Forward View report which was published in 2016 highlights that delivering better care to more people not only requires increased investment, it also requires the development of new ways to improve the quality and productivity of services. The report sets out that NHS England should commit to trialling new approaches at scale: specifically new models of collaborative specialist care that meet the mental health needs of people with severe mental illness.

VR therapy could be the catalyst to a new, more immersive and more easily accessible experience for patients. VR headsets offer advanced visual simulations that traditional models of therapy cannot. Automated VR therapy can render the anxiety-provoking stimuli for individual patients, vividly, cost effectively, and on demand.

Oxford VR believes their therapy platform has the potential to help address many of the mental health challenges faced globally by increasing its availability. Enabling widespread use of automated VR therapy could change the paradigm of the healthcare economy, resulting in a high quality treatment that is safe and effective and welcomed by users being made to millions more people.

Barnaby Perks, Co-founder & CEO, Oxford VR says "The key to cost reduction is the replacement of expensive and scarce therapist resources with an avatar coach and low-cost mental health support workers. This would mean that skilled clinicians who are in short supply can be redeployed to meet other clinical care needs."



## SECTION 6: LOOKING TO THE FUTURE (CONT.)

Oxford VR's automated immersive therapy has the potential to improve access and deliver high quality treatment at significantly lower cost than traditional therapy. Improved access to effective mental health services also leads to reduced physical health costs.

"Given the cost burden both directly and indirectly associated with serious and complex mental illnesses and significant under-treatment, VR Therapy is an evidence-based treatment whose time has come that is patient-centred and digitally-enabled and can hugely benefit patients and clinicians." says Barnaby Perks, Co-founder & CEO, Oxford VR.

Professor Daniel Freeman thinks that automated VR therapy will help people with a wide range of mental health conditions, including obsessive-compulsive disorder and depression. "There's no shortage of ideas. It's just we have to commit the resources, disorder by disorder. We have years of work for our programming team," he says. "There are no technical barriers here."



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Oxford VR would like to thank and acknowledge all the patients who have helped us to develop and refine our VR therapy programmes.



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