

Roundtable: Stimulating investment in extended reality for mental health

Executive Summary

[Innovate UK](#) (IUK) (part of [UK Research and Innovation](#)) has invested £20m in the future of extended reality (XR) as applied to mental health through its [Mindset-XR Programme](#) which runs from 2023 to 2027.

As a part of this investment package in 2024, IUK commissioned the [Health Innovation Network for south London](#) (HIN) to deliver the [Mindset-XR Innovation Support Programme](#), which aims to provide support to innovators in this space, and develop the surrounding innovation ecosystem.

Crucial to sustainable development of any nascent technology is ongoing investment. Earlier this year, the HIN facilitated an investor roundtable event to gauge the levels of interest investors currently have in XR for mental health as an investment opportunity, and identify areas which might generate further interest for investment.

The roundtable was attended by 12 individuals representing private or public investors and/or the mental health system.

Themes which arose from the discussion were:

Making the case for XR in mental health:

- *Investor interest:* There is excitement and interest in XR for mental health. Investors see potential, and some think now may be the right time for XR to grow in mental health.
- *Service demand:* There is significant demand for digital innovation in mental health services due to the number of people affected by mental health issues, which the health and care system is struggling to meet.

Barriers to be addressed:

- *Clinical engagement:* There is currently a skills gap between mental health clinical knowledge and understanding of immersive technology. There needs to be more transfer of skills and sharing of knowledge in order for clinicians to support the development and implementation of XR in mental health.
- *Innovator engagement:* Innovators in XR often find there is more money to be made more quickly in other areas such as gaming, limiting interest in developing solutions for mental health. The slower pace of health system procurement, clinical research and regulation can be a deterrent to people used to working in fast paced creative/tech fields.
- *Route to market:* Greater clarity is needed as to which use cases are likely to deliver demonstrable impact and value, as well as more certainty around regulatory

pathways.

- *Infrastructure*: Health service providers need to consider infrastructure in preparation for XR use and data capture/analysis, including, physical space and IT infrastructure. Data collection was seen as both a significant potential barrier and opportunity.

Opportunities to be realised:

- *Customer engagement*: Service user involvement was noted as crucial to success in terms of the use case identification, testing, development and implementation.
- *Investor confidence*: Much of growing investor confidence is about providing assurance, for example, communicating successful use cases, highlighting where funding sits, explaining the advantages to the UK health system, and communicating clinical needs in ways non-clinical investors can interpret.
- *Multi-sector collaboration*: This is a field in which multiple sectors have the opportunity to collaborate in ways not often seen. There is potential to engage pharma and private healthcare/insurance alongside the NHS. Additionally, it was thought that XR for mental health would advance significantly through combinations with other technologies, such as, artificial intelligence (AI) and biometrics devices.

Next steps include:

- A follow-up roundtable on clinical priorities and use cases.
- Ongoing engagement with investors to grow the investor network associated with Mindset.
- Continual development of case studies and evidence to communicate what works.

Context

Innovate UK (IUK) has funded the £20 million Mindset-XR programme to drive growth of immersive technology/extended reality (XR) solutions for mental health in the UK. In February 2024 IUK commissioned the Health Innovation Network South London (HIN) to deliver a support package for XR projects for mental health to develop their innovation toward market readiness, known as the Mindset-XR Innovation Support Programme. This includes nurturing a supportive ecosystem to facilitate the market entry of these innovations.

The HIN identified that there was a gap in knowledge on what opportunities and challenges exist for private and public investment in nascent XR technology for mental health. In order to begin this discussion an in-person roundtable event was arranged for 21st March 2024. In attendance were 12 individuals with private or public investment, and/or health system knowledge.

Setting the scene

The HIN provided a summary of the need for XR in mental health, care and education. This rationale includes the rise in the number of people experiencing mental health issues, demand pressures on the mental health system and workforce challenges, alongside a need to provide a wider range of options for service users and clinicians (see Appendix 2).

Three key themes were identified to shape the roundtable discussion:

1. Gauging the current and potential level of interest among investors for XR in mental health.
2. Identifying perceived or actual risks to investment in XR for mental health.
3. Recommendations to overcome barriers to investment.

To explore these themes in a structured manner, the discussion was separated into three questions:

1. How exciting is this sector compared to other investment opportunities in the UK? What would make it more so?
2. How prepared are UK investors to fund early stage XR innovation whilst anticipating longer term returns, and what could be done to improve this?
3. What would encourage investment in the UK XR-for-mental-health sector over other global markets?

The below is an aggregate summary of the feedback given by those in attendance and does not reflect the views of any individual or organisation.

Summary of discussion

Excitement and interest in the UK XR for mental health sector:

- Some investors funded early stage XR a decade or more ago. The market was not ready at that stage, but there is a feeling that the market has since developed and investors felt now may be the right time for early adoption and investment.
- It was noted that there is a role for investors in contributing to generating market awareness.
- There can be preparedness to invest in early-stage technology provided there is evidence which supports the premise of the innovation (e.g., a well evidenced Cognitive Behavioural Therapy approach) with an appropriate business structure.
- Investors felt the money and the need were evident, but the pace of adoption in the NHS is discouragingly slow and investment in products marketed at the NHS are generally considered high risk due to relatively long sales cycles (up to a decade is expected).
- Mental illness impacts a significant proportion of the population (1 in 4 of us in our lifetime). Hence investors may have lived experience (past/present or as patient/carer) of mental health issues which mean they are keen to invest in solutions, but still require the same level of evidence and risk evaluation.
- Currently there has been significant public investment in mental health innovation in addition to IUK, including the Mental Health Mission and Wellcome Trust funding for research. Investors felt there is a need to change the narrative around public funding for mental health in the UK, as claiming persistent public underfunding does not give private investors confidence.
- If an innovation is only focused on public funding and the NHS market, investors would be nervous to invest based on barriers to engaging and contractual arrangements. Innovators need to look to other potential markets such as private pay to encourage investors.
- A fundamental aspect of investment is de-risking (identifying potential risk to return on investment and minimising this risk). There are currently a high number of 'unknowns' in XR for mental health which could cause investors to hold back.
- Following COVID-19 it was thought that more people are aware of the importance of mental health and there was perceived to have been a rise in philanthropic investment, without expectation of financial return.

Clinical opportunity:

- It is important to define what is meant by mental health – especially where it crosses into other fields such as population health, education and physical health.
- Currently there are very few people with clinical skills who also understand emerging technology such as XR. There is a need to upskill the workforce in the use and implementation of XR, and encourage people with both clinical and technical expertise to join/remain in the health and care workforce.
- Opportunities exist to align with governmental priorities, such as return to work for people who experience a mental illness and reducing wait lists for treatment.
- An area that is thought to have seen more investment is the 'grey area' between

mental wellbeing and mental illness. For example, where private healthcare providers are working with employers. However, it can be difficult to measure the impact of this quantitatively.

- Collection of data on outcome measures may be patchy, and there is no singular measure of good mental health, so interventions tend to be siloed as a solution for a particular discreet diagnosis of mental illness, rather than a broader measure of mental wellness.

Innovator perspective:

- XR for mental health is often developed across multiple sectors. Clinicians and academics often need to work with XR developers. However, for some XR developers there is currently more money to be made by investing their resources in developing other products such as XR for gaming.
- Individuals who gravitate toward development of XR often come from varied professional backgrounds, such as creative or technical. These fields can be fast-paced and developers can find healthcare industry regulation, evidence requirements and time frame expectations to be an obstacle. Thus, there is often a mismatch of skills on teams developing XR for mental health because it can be difficult to attract the creative/technical expertise required to work with clinicians, or developers head for international markets with less complex regulation pathways.

Opportunities for collaboration:

- Investors identified that testing of technology can be done more swiftly in non-healthcare fields, for example, the usability and acceptability of technology can be tested in the gaming sector, which can run in parallel to traditional clinical trials for clinical efficacy and effectiveness, to speed up adoption.
- As XR innovators often come from sectors outside of health and care they are likely to need support to understand regulatory pathways, the importance of clinical research and how to navigate the health system. There can be a mismatch in communication, including on the timeframes to market, between health and creative sectors. It was noted that the health innovation networks and the Mindset-XR Innovation Support Programme are working in the space between multisector innovators and the health system.
- XR technology may prove uniquely beneficial where it is combined with other technology, (i.e. XR and bio/neuro feedback, or XR and artificial intelligence (AI)). When these are joined up some investors felt XR could enhance traditional models of care. For example, combining AI with XR technology could allow AI to look at patient data sets and provide a personalised XR therapy experience.
- Innovators could consider working more collaboratively with the NHS by offering their expertise and resources to support the necessary transformation work required when implementing new technologies. This in turn would speed up adoption and support the health system where it is currently under pressure and staff have limited capacity for transformation projects.
- Public and private sectors could work together more, including pharma and private insurance, public and private investors, and public and private health care providers.

- Cross industry learning between health and education could be beneficial, as both sectors were thought to experience similar challenges. There may also be funding in other fields, such as education to procure XR for mental health from a population health/early intervention/holistic perspective.
- Many sectors are willing to collaborate in ways that haven't been seen before, such as the gaming sector working with the health sector, and it is this collaboration which will be key to success and scale.

Customer communication/service user involvement:

- Mental health services are about 'selling hope' that tomorrow will be better than today, with hopelessness as a factor in poor mental health. Any development of technology within mental health needs to be based on an understanding of not only the evidence behind mental health but also what an effective immersive experience is for users.
- Investors were pleased to see emphasis placed on service user involvement and cocreation by the HIN Mindset XR Innovator Support programme, as this is recognised to be key to successful adoption of innovation.
- There are ethical considerations when it comes to XR for mental health, including data harvesting. More needs to be done to enable service users to trust those who collect and use their data, especially where it is being used commercially.
- Robust data is needed to identify opportunities, risks, success and development needs. However, investors felt that data is currently patchy or inaccessible. There is learning to be taken from the gaming industry when it comes to data harvesting, but for application to mental health this can present a challenge.
- Clinicians could be clearer to innovators and investors on the outcomes they measure in order to evidence mental health recovery.
- Some innovators have experienced unexpected positive outcomes from XR, such as higher acceptability by neurodiverse people. These potential positives need to be explored more fully.

Communicating the opportunities:

- Those working to support innovators such as Health Innovation Networks, IUK and other public bodies can make investors aware of any specific advantages to investing in UK innovation and markets specifically in mental health.
- For investors mental health may only be part of a wider portfolio, and they may have limited clinical knowledge. Therefore, clear information on where existing funding is spent in mental health (or social care) and what is meant by 'mental health' would support risk assessment and decision making.
- Case studies can be used to articulate the possibilities available, impact and success stories.
- Where there are infrastructure, logistical and software transformation requirements for the implementation of XR in mental health case studies can demonstrate how these can be successfully navigated, covering for example, physical space within healthcare organisation premises to safely use some XR; addressing IT challenges; collating data which contributes to evidence of efficacy and safety/regulatory requirements.

Route to market:

- Successful healthcare innovations address a clearly identified need and market segment. There is a need for use cases to show what works well and does not work well so channels for investment into viable products are clearer.
- The regulatory pathway for XR in mental health needs to be developed. In order to get this right, regulators need to understand the full breadth of both mental health and technology. Currently regulators often approach from a medical perspective, which can present challenges for innovations in wellbeing/emotional health.

Summary and recommendations

The roundtable discussion demonstrated that XR for mental health is an exciting investment prospect. Yet there are issues to address in order to both increase and derisk investments.

It is recommended that further discussions take place, supported by relevant stakeholders in all sectors with an interest in XR, to develop a greater understanding of the needs of investors as well as clinical, creative and technical fields. Regulation, data, workforce development, infrastructure and procurement pathways are considerations which will not resolve overnight. However, with open communication and collaboration mutually supportive steps forward can likely be agreed in the medium-to-long term.

Recommendations

- IUK and other public investment bodies should regularly gauge the readiness of investors in XR and mental health to sense check whether interest in investment is increasing or declining, and what has influenced this.
- Bodies with influence over market entry for innovation to the health system (e.g., regulatory bodies such as NICE and MHRA, and NHS procurement) should aim to provide clarity on the requirements on innovators to enable targeted investment.
- The health and care sector should increasingly engage with other public sector fields such as education to find cross-over applications and benefits.
- Innovators in XR for mental health should think widely about their potential offer, and where possible recognise that providing implementation support to the health system may lead to increased adoption.
- Innovators should consider multiple applications and markets alongside the NHS and gather evidence from all uptake which could support further scale.
- Innovation support infrastructure should support health service commissioners and innovators in XR for mental health to communicate their successes and share learning from market adoption via case studies.

Next steps

The Mindset-XR Innovation Support Programme will consider the feedback of investors and take the following steps in the medium-to-short term:

- The Mindset-XR Innovation Support Programme will schedule a future roundtable with a focus on identifying priority use cases for XR in mental health.

- Investors who joined this roundtable will be invited to join a network of subject matter experts who may be connected to Mindset-XR innovators to provide advice and support, as well as potential commercially beneficial introductions.
- IUK/Mindset-XR Innovation Support Programme will work with clinicians and innovators to develop case studies which demonstrate how sectors can combine to address real health system challenges.
- IUK are already looking to expand their investor network.

For further information, and to join the conversation, contact hin.mindset@nhs.net

Appendix 1

Attendees:

Name	Role	Organisation
Hitesh Thakrar	Chair, Health Innovation Network South London	Health Innovation Network South London - Chair
Aahuti Rai	Strategic Advisory	Four Points Consulting
Asha Easton	Immersive Tech Network Lead	Innovate UK Business Connect
Bruce Colley	Senior Investment Specialist	Innovate UK / IUK
David Seemungal	Director	RYSE Asset Management and Synopia Ltd
Emily Wheeler	Director of Research Partnerships and Development	MQ Mental Health Research
James Woollard	National Specialty Adviser in Digital Mental Health	NHSE
Monica Macheng	Corporate Lawyer	Hill Dickinson
Kumar Jacob	CEO	Mindwave Ventures
Manish Miglani	Managing Director	YNM Growth Capital
Richard Male	Business Development Director	Newable Ventures
Raffaella Roncone	Assistant Director and Head of Innovation and Enterprises	LCG
Aileen Jackson	Head of Mental Health	Health Innovation Network South London
Amanda Begley	Director of Digital and Transformation	Health Innovation Network South London
Anna King	Commercial Director	Health Innovation Network South London
Jillian Owens	Mindset-XR Programme Manager	Health Innovation Network South London
Laura Walton	Programme Support Officer	Health Innovation Network South London - notes
Rishi Das-Gupta	Chief Executive	Health Innovation Network South London

Appendix 2

Attendee Briefing

Round-table: Stimulating investment in immersive technology for mental health

This briefing note provides

1. Context and Aims
 2. Attendees
 3. Agenda
 4. Key questions for discussion
 5. Appendices: (1) Case Study (2) References
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1. Context and Aims

Context

IUK's £20 million [Mindset programme](#) is driving the growth of immersive digital mental health solutions in the UK. Innovate UK have partnered with the Health Innovation Network South London (HIN) to support immersive technology projects for mental health to develop their innovation toward market readiness. This includes nurturing a supportive ecosystem to facilitate the market entry of these innovations.

New ways of approaching mental health are needed for a number of reasons:

Prevalence of mental health issues ([MIND, 2017](#) and [HoC, 2024](#)):

- 1 in 4 people in the UK will experience a mental health problem each year.
- 1 in 6 people report experiencing a common mental health problem (such as anxiety and depression) in any given week.
- 20% of children aged 8 to 16 had a probable mental disorder in 2023, up from 12% in 2017.

Asymmetrical impact of mental health ([ONS, 2022](#); [Samaritans, 2021](#), [MIND, 2024](#), [Kings Health Partners 2024](#); and [NICE 2021](#))

- 16% of adults reported moderate or severe depressive symptoms after the start of the COVID-19 pandemic, up from 10% in 2019/2020
- 24% of people struggling with the cost-of-living experience depression, rising to 59% of those with long term sickness.
- 23% of Black people report experiencing a common mental health problem compared to 14% of White people. Despite higher prevalence among racialised groups, those most affected often receive the least support.
- 75% of recorded suicide deaths are men, and disproportionately fewer men access treatment for mental health. Women report experiencing mental ill health more frequently than men.
- 30% of people with long-term physical health conditions, such as diabetes, arthritis or heart problems, also experience co-existing mental health conditions, such as depression or anxiety.

- All forms of pain can cause distress and disability, but these features are particularly prominent in presentations of chronic primary pain which is estimated to affect between 1% and 6% of population in England alone.

Health system and wider impact ([National Audit Office, 2023](#); [NHS, 2022](#) and [BMA, 2023](#)):

- 1.76 million people in England referred to NHS Talking Therapies in year (2022/23).
- £2.3 billion planned spend on NHS mental health services in 2023/24 (up from £12 billion in 2021/22).
- 17% of NHS funding is spent on non NHS providers.
- 8 million people estimated in need of mental health support are not in contact with NHS services.
- 1.2 million people are on waiting lists for NHS mental health support.
- Challenges include workforce deficit and retention, increased demand for services, lack of inpatient bed availability and alternatives to hospital admissions , and overall funding to meet need.
- £117.9 billion per year is the estimated cost of mental health to the UK economy (5% of GDP).

Opportunities within the UK immersive technology sector ([IUK, 2022](#); [XRHA, 2023](#) and [DHSC, 2022](#)):

- 83% growth in immersive technology companies since 2017.
- 80% of immersive economy companies are micro-SMEs.
- £224 million private investment in immersive technology in 2021.
- \$69.3bn expected boost from XR to the UK economy by 2030.
- Health has seen the highest growth in immersive tech application in recent years.
- 79% of respondents to a 2022 IUK survey of immersive technology stakeholders reported finance as a key barrier to growth.
- Achieving digital transformation of the health and social care sector is a top priority for DHSC and NHSE.
- 350% increase in use-at-home XR in 2021.

Challenges facing those seeking to develop products to support digital therapeutics ([IUK, 2022](#); [IET, 2020](#), [DHI, 2023](#)):

- Engaging with the mental health community due to workforce capacity and digital skills, consensus on clinical acceptability, effective co-design with people with lived experience and digital exclusion / digital infrastructure maturity.
- Access to finance (57%) and skills/ immersive talent (79%) were identified as the greatest challenges in a survey of industry stakeholders
- Regulatory challenges (e.g. 18-month process to apply for a medical device licence from the MRHA) and the cost of clinical trials for companies were identified as challenges by the Institution of Engineering and Technology in their 2020 report.
- Mainstream procurement infrastructures being targeted towards large contracts, also offer poor support for XR health companies wishing to access the healthcare markets.

Aims

The aims of this round-table are:

- To discuss the barriers and opportunities for economic growth in the immersive technology sector for mental health.
- To identify ways in which existing or potential policy and infrastructure can support investment, and how immersive tech developers can work with investors to advance their mutual interests, whilst putting those affected by mental health issues at the centre of immersive tech innovation.