

**USE CASE** From 100,000 to 100,000,000 - scaling AI in mental health care to help human therapists improve quality of care



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# From 100k to 100M

Scaling AI in *mental health care* to help human therapists improve quality of care

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[iesogroup.com](https://iesogroup.com)

*1 in 6  
people*

currently have a  
mental disorder

Data for 16+ years old in England, NHS Digital, 2014

*700k  
deaths*

by suicide each year

Global Health estimates 2019

*80%*

unmet need in world's  
leading national  
therapy service (IAPT)

2020/21 IAPT referrals reach 17% of prevalence

*15%*

global years  
lived with disability

Lancet Psychiatry, 2022

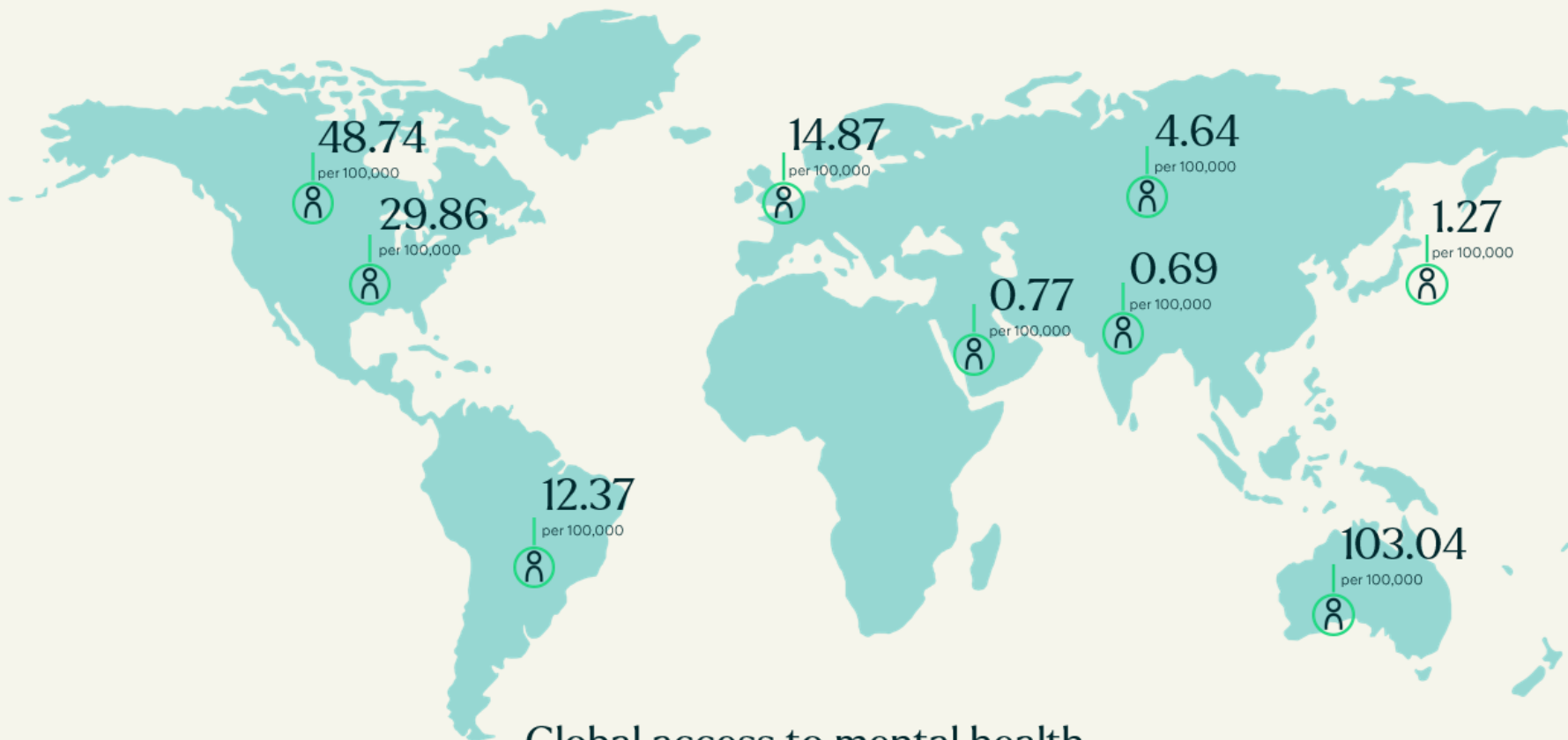
*\$1 trillion*

cost per year of  
depression and anxiety  
in lost productivity

Lancet Global Health, 2020

*50:50*

chance of success from  
treatment



## Global access to mental health

Therapists per 1000,000 population

# *Typed* therapy

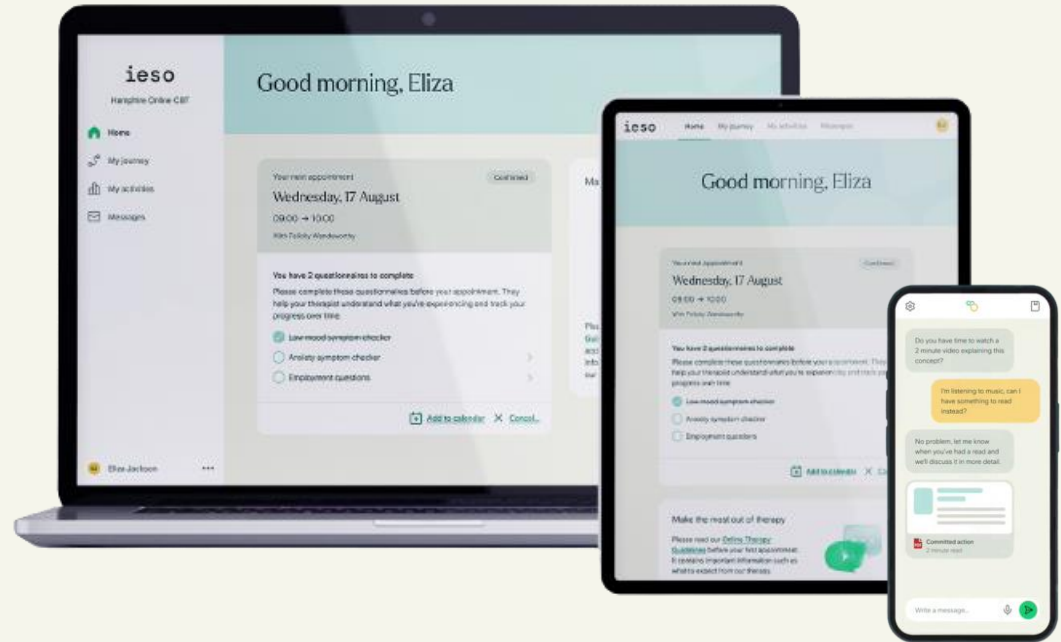
# ieso Care Platform

## One-to-one mental health treatment (CBT) through AI-enabled telehealth platform

- Patient and clinician communicate using a text interface (e.g. like a WhatsApp conversation)
- Increased access
- Multi-session treatment programme (~5-10 hrs)
- Outcomes measured at every session
- Record of intervention useful for patients and healthcare systems

### AI tools for:

- Clinical decision support
- Automated Quality control
- Clinician network management
- **Conversational agents for therapy support**

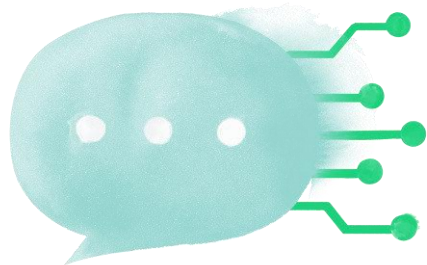


Scientific grade  
evidence

THE LANCET

AT A GLANCE

# ieso data *corpus*



**650k+**  
hrs of therapy

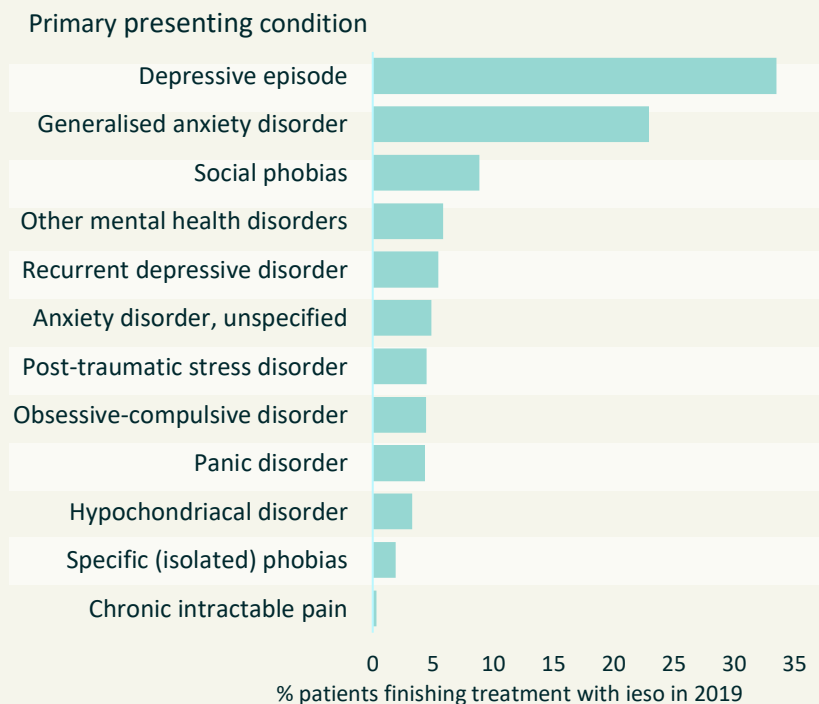


**100k+**  
people treated



**1B+**  
words exchanges

IN DETAIL

ieso data *corpus*

## Routine outcome metrics measured every session

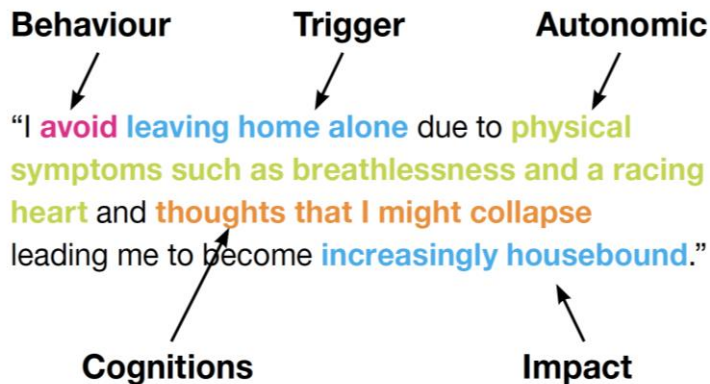
| Measure | Diagnosis                     | Range | Reliable |
|---------|-------------------------------|-------|----------|
| PHQ-9   | Depression disorders          | 0-27  |          |
| GAD-7   | Generalised anxiety disorders | 0-21  |          |

## Anxiety disorder specific measures

| Measure | Diagnosis                     | Range | Reliable |
|---------|-------------------------------|-------|----------|
| SPIN    | Social Anxiety Disorder       | 0-68  |          |
| IES=R   | Posttraumatic Stress Disorder | 0-88  |          |
| MI      | Agoraphobia                   | 1-5   |          |
| OCI     | Obsessive-compulsive disorder | 0-168 |          |
| sHAI    | Health Anxiety                | 0-54  |          |
| PDSS    | Panic Disorder                | 0-28  |          |



# *Conversational agents* for therapy support



This statement neatly summarizes the patient's problem (behavioural avoidance, physical anxiety and catastrophic thoughts) in terms of contextual triggers (when leaving home alone) and the impact it is having (become housebound). Importantly, it is written in the first person and in the patient's own words.

## Looking at the *manual*

Therapy is a natural language intervention

- What are clinicians taught?
- Textbook for structure/inspiration
- Lots of evidence that between session activities are important
- No evidence that ease of sharing is reduced using "chatbots"

### Perceptions of Chatbots in Therapy

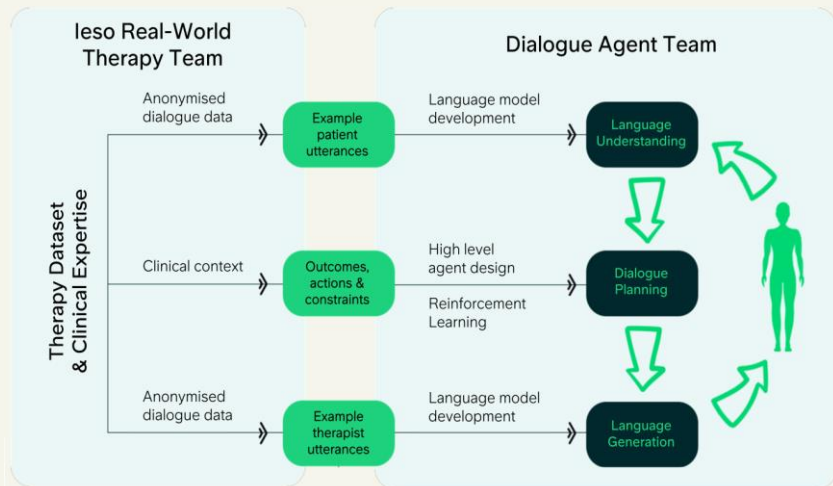
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# Conversational agents for therapy support

1. Supplement current therapist resource
2. In medium term, autonomous care is realistic for specific patient groups



08:08

Ieso CBT Companion

So based on that situation, let's try and fill in the four areas in this diagram.  
8:07 AM

Sure  
8:08 AM

A "Helicopter View" allows us to see a bigger and bigger picture the higher we get and to be less stuck and involved with the detail at ground level.  
8:08 AM

This activity will help us to zoom out as a helicopter would and learn from the bigger picture of the situation you just mentioned.  
8:08 AM

Let's move on now and try to fill in some thoughts.  
8:08 AM

Ok  
8:08 AM

With the original situation in mind, just take a moment to think about what you remember and noticed first.  
8:08 AM

# What is in the *between-sessions* intervention?

An iOS and android app downloadable from app or play store to be used by people who are being treated for general anxiety under the care of an ieso clinician.

## Conversational Activities

- Five areas formulation (vicious cycle)
- Progressive Muscle Relaxation (PMR)
- Worry Diary (Plus Worry Themes)
- Worry Classification
- Worry Time
- Problem Solving

## Features

- Buttons and free-text input
- Images, video
- Notifications

ISRCTN87336732 <https://doi.org/10.1186/ISRCTN87336732>

Digital therapeutic tools in the treatment of mild to moderate depression and anxiety disorders

# Summary of *interaction statistics*

| Users | Avg. words | Avg. dialog turns | Avg. free-text turns | Median distinct days | Median no. of activities | Mean no. of activities |
|-------|------------|-------------------|----------------------|----------------------|--------------------------|------------------------|
| 77    | 351        | 140               | 51                   | 4                    | 5                        | 9.8                    |

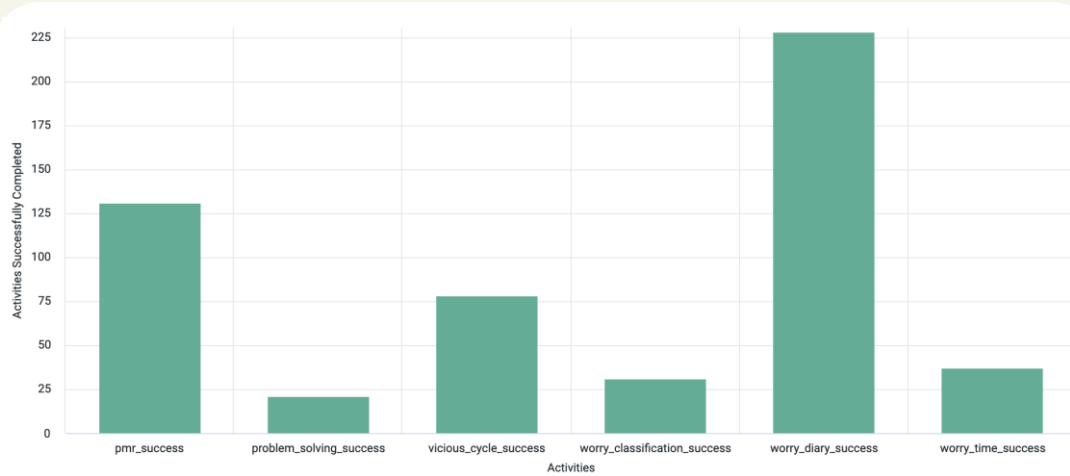


Fig 1. activities by frequency

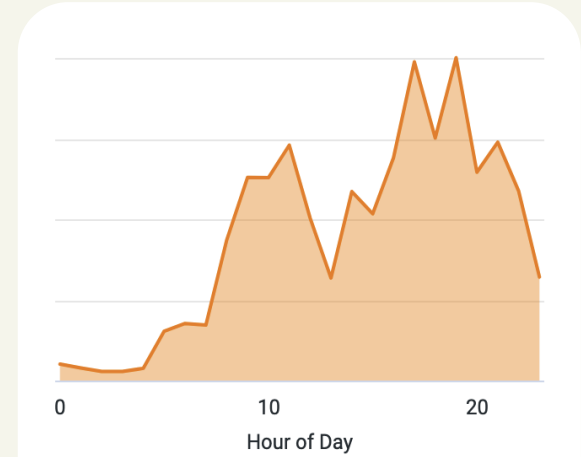


Fig 2. activity by hour of day

# Preliminary findings and take aways

- Homework app usage is significantly predictive of both recovery and improvement
- Older people are more likely to engage with the app
- On average the homework app interaction amounts to more than a 1-hour typed therapy session
- Engagement characteristics are positive for 'chatbots' as an adjunct to care

## Opportunities

- A path forward to more automated scalable mental-health care support
- More engaging technologies are becoming available (e.g. generative AI)
- Free up clinician capacity for those where automated care is *not* the answer

## Challenges

- Ensuring safety with much less human oversight
- Regulation

# Many thanks

150+ TEAM, 800 CLINICIANS, '000S OF PATIENTS



NHS TTAD Leaders & Partners, IP Group, Draper esprit, Ananda Social Venture Fund, Sony Innovation Fund, Cambridge Angels, Harvard Business School Angels, Clearly So, Thorium Technology Investors, Bupa Foundation, Innovate UK

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~~Any questions?\*~~

*What* questions do you have?

\*the phrase "any questions" is significantly predictive of shorter responses in typed-therapy



# INTELLIGENT HEALTH UK 2023

Breaking down the barriers  
between tech and healthcare