



# Will AI Help Solve the Global Mental Health Crisis?

*Mental health advocates see big opportunities as AI comes of age.*

The world is facing a mental health crisis: half of the global population is likely to experience a mental health disorder during their lifetime, but over two-thirds of people with mental illnesses go untreated. Even wealthy countries are seeing care shortages and spiraling costs: in the United States, just one-quarter of people with mental illnesses can afford treatment, and over half of young people with depression go without care.

Now, emerging AI technologies could help to alleviate that problem, transforming many aspects of mental health care—from foundational research to diagnostics and treatment. At Cincinnati Children's Hospital, physicians are already using AI to identify young patients who are at risk of self-harm. An AI model trained on a library of therapy sessions and suicide notes can detect subtle linguistic

markers—such as how often a person uses nouns or pronouns—to identify suicidality with 90% accuracy, and to flag patients with anxiety months before a traditional diagnosis becomes possible.

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Such methods could accelerate diagnostics and improve access to treatment for patients all over the world, says Dr. Frederike Petzschner, an assistant professor of psychiatry

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at Brown University, and director of the Carney Brainstorm Program. "AI is going to change the way that mental health care is provided—not just in the United States, but worldwide," Dr. Petzschnr says. "Ultimately, AI and machine learning will help us provide new kinds of support, and make better predictions about the kinds of treatment people need."

The dream of using artificial intelligence to improve mental health care is as old as AI itself. One of the first chatbots—[ELIZA](#), built by MIT researcher Joseph Weizenbaum in 1966—used rudimentary natural-language processing to repeat a user's words back to them in the style of a Rogerian psychotherapist. Another, designed soon after at Stanford, simulated a person with schizophrenia, letting clinical trainees gain experience before working with human patients.

Such experiments, however, were constrained by the limited AI technologies then available, and Weizenbaum came to believe that computers would never grow



sophisticated enough to provide useful care. "There are aspects to human life that a computer cannot understand," he [said](#).

Now, that might be changing. The rise of powerful large language models like ChatGPT and Claude has fueled an explosion of new AI tools designed to provide cognitive or talk therapy, and mindfulness exercises. While such tools are in their early stages, consumer platforms such as [Woebot](#) and [Happify](#) now use AI and automation to bring guided meditations, mood tracking, and other wellness services to users' smartphones.

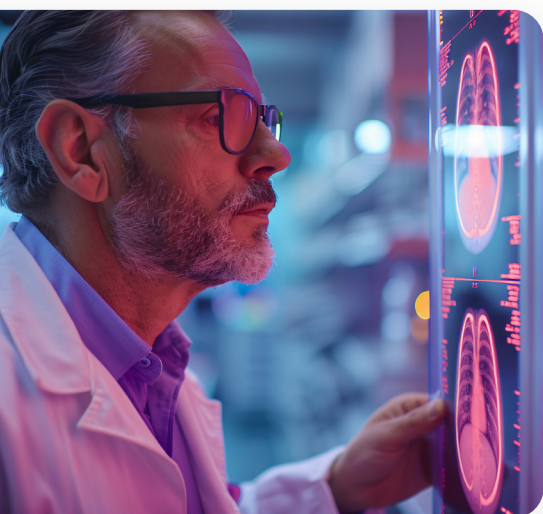
In the futuresome areas, more sophisticated AI tools could can integrate into people's lives in ways that no human therapist can match. At Imperial College

London's Brain & Behavior Lab, Dr. Aldo Faisal is developing a smartphone app for adolescents with eating disorders that tracks their behaviors, and offers real-time advice or support as they go about their day.

"Crucially, we can deliver digital micro-interventions that are tailored to a patient's individual needs," he explains. Spending time in nature has been shown to help younger patients, so the app might notice a user is passing by a park and nudge them to go in and take a walk. "That kind of targeted suggestion is far more useful than getting the general advice to spend more time outdoors,"

Dr. Faisal says. "It's like having a psychiatrist on your shoulder, giving you support right in the moment when you need it."

To train such models, however, researchers need robust datasets. That's a challenge, says Dr. Petzschnr, since unlike medical fields that rely on concrete diagnostic biomarkers, psychiatry typically



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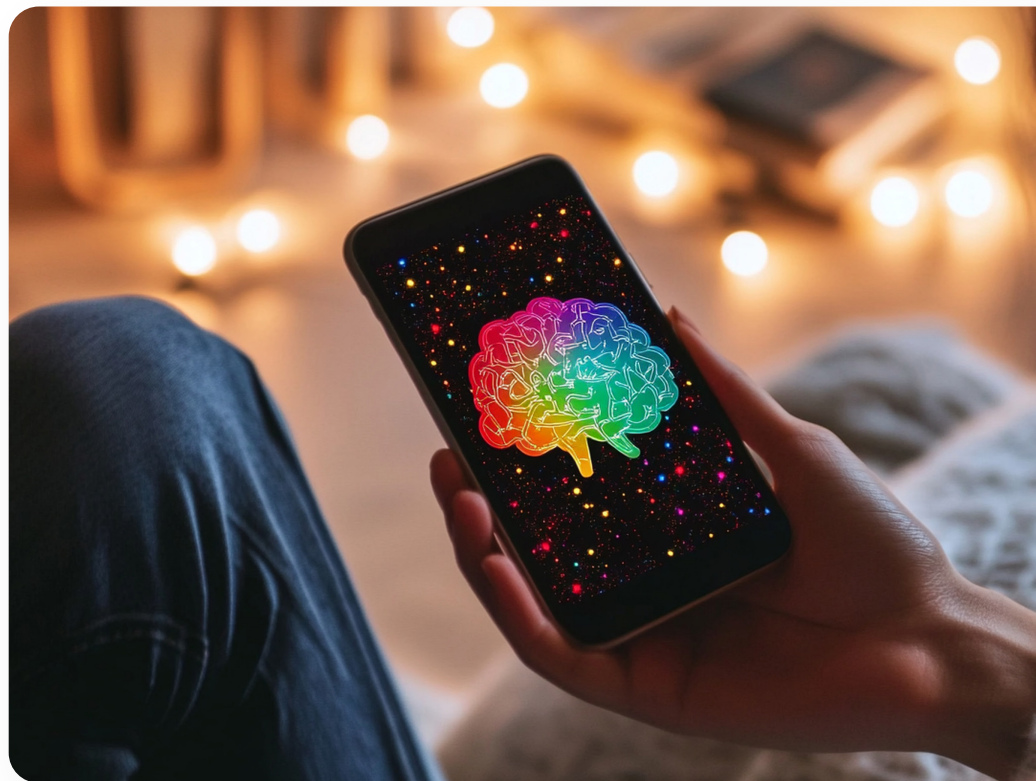


deals in subjective assessments, and syndromes defined by loose clusters of symptoms. “A group of people with the same diagnosis might not all have the same symptoms,” Dr. Petzschner explains. “We also lack effective longitudinal data, which makes it very difficult to use AI to predict diseases or manage outcomes.”

Developing effective AI models for mental health will require stronger partnerships between commercial teams with the resources and expertise to bring apps to market, and researchers who deeply understand the science of mental health, Dr. Petzschner argues. “Building AI applications for mental health isn’t easy,” she adds. “We’ll need to think deeply about what kinds of data we need.”

To collect more concrete mental health data, Dr. Faisal’s team is using complex arrays of sensors to track a subject’s every movement—from their posture and gait to the tiniest movements of their eyes—in real time as they go about daily activities. Combined with machine learning, such methods can offer powerful new insights into a range of health disorders, and could also provide more objective mental health metrics. “We can intuitively recognize when a person is sad or happy based on their body language,” he explains. “We need to find ways to capture that data in a more rigorous way.”

Using smartphones to track a person’s behavior and wellbeing can also yield



important insights from a wide range of real-world contexts. Dr. Faisal’s team recently collected smartphone data to assess the happiness of people from Spain and Latin America, and is using their findings to untangle the varying ways in which emotions are expressed in different cultures.

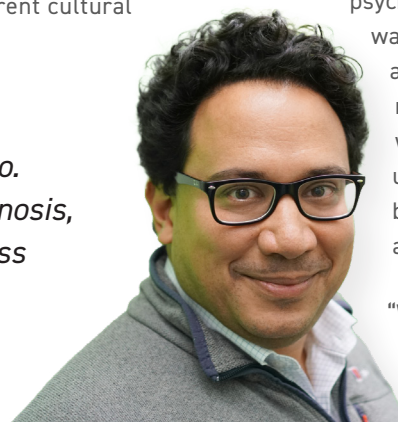
“Cultural factors pose a real challenge for AI—Europeans and Latin Americans might walk differently or gesture differently when they’re happy or unhappy, for instance,” he says. “Gathering global data gives us a chance to create AI systems that can respond appropriately to people from many different cultural backgrounds.”

Ultimately, such methods could be combined with neuroimaging and other data sources to create powerful personalized treatments based on a patient’s unique needs. “Artificial intelligence and machine learning can help us identify specific patterns linked to different depression types and treatment outcomes,” [explains](#) Harvard neuroscientist and Brainify.AI CEO Mariam Khayretdinova. “This is not a dream—this is a reality that’s gradually taking shape.”

In the nearer term, Dr. Faisal says, the hope is that AI will help ease the strain on overburdened therapists and psychiatrists. Instead of waiting for months to see a therapist, a patient might first use an AI wellness assistant, with urgent or complex cases being rapidly triaged to a human specialist.

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Faisal. "Certainly, AI has the potential to enable faster diagnosis, more consistent treatment, and democratized access to mental health care. But it can't do that work on its own. It needs to be seen as part of a package, alongside human experts."

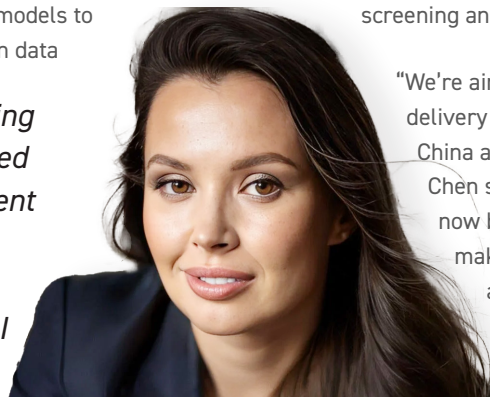
In China, where in many regions mental health professionals are in short supply, researchers are already working to use AI to provide broader access to critical services. The Lingxi project, launched by the the Tianqiao and Chrissy Chen Institute and the the National Center for Mental Disorders at Shanghai Mental Health Center in 2023, uses advanced AI algorithms and large language models to support diagnostics, detect a patient's emotional state, and support the provision of care to patients with anxiety and depression.



Working with over 100 senior psychiatrists and nearly 5,000 patients, project leader Dr. Jianhua Chen of the Shanghai Mental Health Center created a synthetic dataset allowing AI models to be trained on data

derived from real patient records, without compromising patient privacy. Now, the team is building on that breakthrough to create medical-grade conversational AI tools that can be used for early self-screening and therapeutic innovations.

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*Mariam Khayretdinova, CEO of Brainify.AI*



"We're aiming to revolutionize the delivery of mental health care in China and around the world," Dr. Chen said. "The AI models we're now building have the potential to make care far more accessible and more effective for those in need."

**About the Tianqiao and Chrissy Chen Institute** The Tianqiao and Chrissy Chen Institute (TCCI®) was created in 2016 by Tianqiao Chen and his wife Chrissy Luo, the founders of Shanda Group, with a US \$1 billion commitment to help advance brain science. The organization's vision is to improve the human experience by understanding how our brains perceive, learn, and interact with the world.

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