

## Inside China's Neurotech Revolution

October 1, 2026 | Opinion | By Neeraj Nitin Jadhav, Senior Industry Analyst, TechVision, Frost & Sullivan, India

**China is emerging as a major market for neuroscience and mental health technologies, with brain-computer interfaces (BCIs), artificial intelligence (AI), digital health and advanced biomarkers moving closer to clinical application. Rising mental health needs, gaps in specialist care and strong government support for brain science are accelerating innovation. As these technologies move from research to real-world use, China is building a technology-driven ecosystem that could reshape how neurological and neuropsychiatric conditions are diagnosed, monitored and treated.**



China is emerging as one of the world's most dynamic markets for neuroscience and mental health technologies. Driven by rising mental health awareness, rapid digitalisation, artificial intelligence (AI), government support for brain science research, and a growing need to address mental healthcare shortages, the country is witnessing significant innovation across brain-computer interfaces (BCIs), AI-powered mental health solutions and digital solutions.

The convergence of neuroscience, healthcare, and advanced technologies is creating new opportunities for diagnosis, monitoring, treatment, and prevention of neuropsychiatric and neurological disorders while expanding access to care for China's large population.

### **The Neuropsychiatric and Neurological Disorders Landscape**

Neuropsychiatric disorders represent a significant public health challenge in China with a 12-month prevalence rate of 9.3 per cent. National surveys have found substantial prevalence rates for conditions such as depression, anxiety disorders, schizophrenia, and substance-use disorders that have resulted in a significantly higher number of disability-adjusted life years of 20.3 million in the country. Neurological disorders, especially stroke, remains a leading cause of death and disability in China, imposing a substantial burden on public health and the economy. At the same time, China continues to face shortages of mental health and psychiatric professionals and unequal access to rehabilitation services between urban and rural regions.

Traditional cultural stigma surrounding mental illness has also historically limited treatment-seeking behavior. As a result, policymakers and healthcare providers increasingly view digital and neuroscience-based interventions as scalable solutions capable of extending neuropsychiatric and neurological disorder management services to underserved populations.

## **Key Neuroscience and Mental Health Technology Trends**

### **BCIs Move Towards Clinical Reality**

One of the most significant neuroscience trends in China is the rapid development of BCIs. The country has prioritised BCI technology as a strategic future industry, with government agencies such as the Ministry of Industry and Information Technology and the National Development and Reform Commission establishing roadmaps aimed at achieving major breakthroughs by 2027 and building globally competitive companies by 2030.

BCIs have the potential to transform treatment for conditions such as stroke-induced paralysis, neurological disorders, cognitive impairments, and certain neuropsychiatric conditions. China has already seen significant progress in clinical trials and commercialisation efforts. Researchers and startups are developing both invasive and non-invasive neural interface systems, supported by national brain research initiatives and increasing government investment. For instance, in March 2026, China's National Medical Products Administration (NMPA) announced approval of the country's first invasive BCI medical device for market launch. The device, developed by Borui Kang Medical Technology, is designed to restore hand-grasping functionality for people with quadriplegia caused by cervical spinal-cord injury. NMPA described it as the world's first commercial launch of an invasive BCI medical device.

Although current applications are focused primarily on neurological rehabilitation, future integration with technologies such as transcranial ultrasound neuromodulation can help expand the use of BCIs for alleviating symptoms of age-related disorders such as Parkinson's disease.

### **AI-powered Mental Health Solutions**

AI is becoming a cornerstone of China's digital mental health ecosystem. Companies and healthcare providers are deploying AI systems to screen for mental health disorders, analyse speech, text, and behavioural patterns, predict mental health risks, personalise treatment plans, and provide chatbot-based psychological support.

AI-powered conversational agents are increasingly integrated into mobile applications and online healthcare platforms, enabling users to access initial psychological guidance without visiting a clinic. This is particularly important in regions where psychiatric resources remain limited. Generative AI and large language models are rapidly expanding the role of conversational systems by offering patients mental-health education, emotional support, cognitive behavioral therapy (CBT) exercises, and treatment-adherence support. For instance, a randomised controlled trial involving 100 Chinese university students found that a CBT-based AI chatbot was associated with significant reductions in depression and loneliness over the intervention period.

### **Multimodal Mental-Health Biomarkers**

China is emerging as a major hub for multimodal mental-health biomarkers, driven by the convergence of digital health, wearable sensors, and large-scale psychiatric research. The trend is moving away from traditional questionnaire-based diagnosis towards objective, continuously collected biomarkers derived from multiple data streams, including speech and voice patterns; facial expressions; text and language usage; physiological signals (heart rate, HRV, and electrodermal activity); sleep and activity data; and brain and neurophysiological signals (EEG and fMRI in research settings).

The goal is to identify conditions such as depression, anxiety, bipolar disorder, schizophrenia, stress, and suicide risk earlier and more objectively than traditional clinical assessments. For instance, researchers from Peking University have demonstrated alterations in patients' acoustic features, including speech rate, pitch variability, pauses, and vocal energy, as indicators of depressive symptoms. Wearables are being leveraged to analyse patients' facial movements, eye gaze, emotional expressions, and audio-video interactions to detect anxiety, depression, and stress.

### **Challenges Facing the Sector**

The performance of implanted BCIs depends heavily on the quality and longevity of the static electrode-brain interface. These types of neural electrodes remain fixed at a particular location on the brain surface, allowing sampling of neural activity from only a limited region. Over time, they often elicit immune responses, suffer signal degradation, or fail entirely. To address this issue, researchers can focus on developing soft, movable, implantable fiber electrodes whose movement can be controlled by external magnets, allowing them to capture high-quality neural signals across the cortex and subcortical regions. This can not

only improve neural mapping but also enhance BCI stability and performance.

The use of AI for mental-health assessment and management, and the risks associated with it, are becoming a serious issue. Since AI processes large amounts of data, it can result in errors and inadvertently provide incorrect information to patients. A mental-health AI error could potentially fail to identify a crisis, reinforce delusions, misdiagnose symptoms, or create emotional dependency.

To address this issue, there is a need to implement national frameworks targeting AI companions and emotionally engaging AI systems, with emphasis on transparency, protection from psychological harm, and safeguarding patients' health. The implementation of Interim Measures for the Administration of AI Anthropomorphic Interactive Services in July 2026 is a step in the right direction and builds a framework that explicitly recognises risks due to AI, including excessive dependence and harm to mental and physical health, and requires service providers to operate within stronger safety and user-protection requirements.

## **Conclusion**

China's neuroscience and mental health technology sector is transitioning from early-stage experimentation to large-scale clinical and commercial implementation. While challenges related to implant performance and AI-associated risks remain, China's combination of technological capability, strong policy support, and significant healthcare demand positions it as a key driver of innovation in neuroscience and mental health.

As these technologies mature and regulatory frameworks continue to evolve, China is likely to play an increasingly influential role in shaping the future of technology-enabled neuropsychiatric and neurological care, ultimately improving health outcomes and quality of life for millions of patients.

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