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S'pore and New Zealand researchers aim to use AI to help predict mental illness risk in youth

More than one in five of those aged 18 to 29 in Singapore are in a state of poor mental health. PHOTO: ST FILE

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SINGAPORE - Researchers from the Nanyang Technological University's (NTU) Lee Kong Chian School of Medicine and the Institute of Mental Health (IMH) are working with their counterparts in the Auckland University of Technology (AUT) to use artificial intelligence (AI) to help predict mental health conditions in youth.

According to the National Population Health Survey report 2020, more than one in five of those aged 18 to 29 here were in a state of poor mental health.

Noting that mental health is an extremely complex subject, NTU Assistant Professor Wilson Goh, who is leading the research, told The Straits Times that he and his counterparts in IMH had wanted to work on this project for more than a decade, but were constrained by the technology at

the time.

"This was before the rise of big data, before AI became such a big buzzword... we were lacking the powerful algorithms that allowed us to make sense of (such) data sets," he explained.

Prof Goh said that since then, more powerful algorithms have been developed, and his team has also been able to hire more talent and beef up its ties with researchers around the world.

These factors have made it possible for their research to begin.

Run under the newly launched Centre for Biomedical Informatics at the Lee Kong Chian School of Medicine, the project will tap data from IMH's 2009 longitudinal youth-at-risk study.

The 2009 study examined 600 young people to identify social, biological, clinical, and cognitive factors involved in the transition to psychosis in at-risk youth.

Prof Goh, who is co-director of NTU's new centre, explained that at the time of the study, blood samples were taken from each of the participants and frozen, but not analysed due to the cost and availability of technology at the time.

Now that technology has progressed, the scientists will examine data such as gene expression profiles and metabolic profiles and compare it with clinical and behavioural data from the participants, in an attempt to combine all the data into a single model and see how they all relate to one another.

"We are looking at quite possibly the largest diversity of data that's ever been tackled in a single study," said Prof Goh.

To do this, the team will be using a complicated AI algorithm developed by a professor from AUT. The extremely powerful algorithm is meant to behave like a human brain, allowing it to analyse patterns across time and spot the complex relationships between various sets of data.

The research is expected to take about three years from this year. The first year will be spent generating data from the blood samples and the results of the 2009 IMH study, and sorting relevant data from irrelevant ones.

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The next year will be spent trying to integrate clinical and behavioural data with genetic information to develop a model.

In the last year, researchers will test out their model and see if it can be applied to other settings around the world, while working out the real-world implications of the model including the policies that should govern its use.

If successful, Prof Goh hopes that the model will be able to assist clinicians in diagnosing patients with mental health issues whose conditions are harder to spot.

"It can be incredibly difficult to diagnose patients because doctors will essentially be relying on a single panel of data... but the AI is able to look at a lot more dimensions. It can give you a counter-check or an alternative perspective. If the AI disagrees with you, it may give you pause and prevent you from missing out a potential case," explained Prof Goh.

Dr Jimmy Lee, an associate professor at the school of medicine and a senior consultant with the Department of Psychosis and Research Division at IMH, noted that numerous studies have shown that early and timely intervention can improve long-term management and outcome of mental health conditions.

Dr Lee, who was involved in IMH's 2009 study, said: "By tapping the expertise of NTU's Centre for Biomedical Informatics and our partners in Auckland, we can now take a deep dive into the data and possibly discover new insights - something that was not possible when we first started our study on at-risk youth.

"This will potentially help us to map the various clinical attributes of a patient to predict disease progression and tailor personalised therapy."

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