Genetic + registry data AI model may predict mental disorder diagnosis

December 21 2022, by Lori Solomon

A deep learning model that combines genetics and registry data can

predict both mental disorder diagnosis and disorder progression in a clinically relevant, cross-diagnostic manner prior to clinical assessment, according to a study published online Dec. 7 in *JAMA Psychiatry*.

Rosa Lundbye Allesøe, from Copenhagen University Hospital in Denmark, and colleagues developed deep learning models to predict mental disorder diagnosis and severity. Development was based on 63,535 individuals with mental disorders (attention-deficit/hyperactivity disorder [ADHD], autism spectrum disorder [ASD], major depressive disorder [MDD], bipolar disorder [BD], and schizophrenia spectrum disorders [SCZ]) and population controls.

The researchers reported that specific diagnosis was predicted in a multidiagnostic prediction model (including the background population) with an overall area under the receiver operating characteristic curve (AUC) of 0.81 and Matthews correlation coefficient (MCC) of 0.28. Single-disorder models gave AUCs/MCCs of 0.84/0.54 for SCZ, 0.79/0.41 for BD, 0.77/0.39 for ASD, 0.74/0.38 for ADHD, and 0.74/0.38 for MDD.

Previous mental disorders and age (11 to 23 percent reduction in prediction accuracy when removed) were the most important data for multidiagnostic prediction, followed by family diagnoses, birth-related measurements, and genetic data (3 to 5 percent reduction in prediction accuracy when removed). The most severe cases were the most easily predictable when predicting disease trajectories, with an AUC of 0.72.

"Results suggest that the multidiagnostic model resembling a clinical setting prior to the examination can predict the mental disorder diagnosis with high accuracy based only on registry data and genetic information," the authors write.

 More information: Rosa Lundbye Allesøe et al, Deep Learning for

Cross-Diagnostic Prediction of Mental Disorder Diagnosis and Prognosis Using Danish Nationwide Register and Genetic Data, *JAMA Psychiatry* (2022). DOI: 10.1001/jamapsychiatry.2022.4076

Citation: Genetic + registry data AI model may predict mental disorder diagnosis (2022, December 21) retrieved 23 June 2024 from https://medicalxpress.com/news/2022-12-genetic-registry-ai-mental-disorder.html