

# Towards Precision Psychiatry for Youth: the PRE-EMPT Centre of Research Excellence Roadmap.

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## Abstract

*Background.* Mental illnesses mostly occur before 25 years of age when early identification and intervention could delay, ameliorate, or prevent lifelong disability. However, several challenges hinder optimal psychiatric care in youth due to the diversity of presentations, comorbidities, illness courses, and treatment responses. It is increasingly clear that one-size-fits-all approaches will not be effective and personalised approaches are needed to guide therapeutic pathways for individuals. Following precedents in other medical fields, machine learning approaches may address these needs by providing decision support tools that predict diagnoses, prognoses, and therapies. This paper outlines how such a future of augmented care may be facilitated through the establishment of the world's first 'Prediction of Early Mental Disorder and Preventative Treatment Centre of Research Excellence' (PRE-EMPT). *Methods.* Five key components of the Centre will be addressed, including interdisciplinary collaboration, data harmonization, methods sharing, development of decision support tools, and capacity building. *Conclusion.* Implementation of research methodology guidelines within the Centre will assist in the production of reproducible, transparent, and open-source techniques and models. When combined, this paper will address key challenges facing the future of psychiatric care for youth and a roadmap of how to address them.

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