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Authors

Schumann, Gunter

Benegal, Vivek

Yu, Chunshui

et al.

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Precision Medicine and Global Mental Health

Gunter Schumann,

Centre for Population Neuroscience and Precision Medicine (PONS), Institute of Psychiatry, Psychology and Neuroscience, King's College London, UK.

Vivek Benegal,

National Institute for Mental Health and Neuroscience, Bangalore, India

Yu Chunshui,

Dept. of Radiology, Tianjin Medical University, P.R. China

Tao Sha,

Beijing Normal University, P.R. China

Terry Jernigan,

UCSD, San Diego, U.S.A.

Andreas Heinz,

Dept. of Psychiatry and Psychotherapy, Charite, Humboldt University, Berlin, Germany

Ricardo Araya,

Centre for Global Mental Health, Institute of Psychiatry, Psychology and Neuroscience, King's College London, UK.

Le Yu,

Department of Earth System Science, Tsinghua University, Beijing, P.R. China

Vince Calhoun,

Mind Research Network and University of New Mexico, Albuquerque, U.S.A

Global Imaging Genetics in Adolescents (GIGA) consortium

By taking into account individual environmental exposure, lifestyle and biological vulnerability precision medicine promises to revolutionize prevention and treatment of mental illness. But as living conditions, sociocultural influences and ethnic composition between High Income Countries (HIC) and Low and Medium Income Countries (LMIC) differ greatly, so do the determinants for mental illness. For example, environmental factors related to urbanisation, are the most rapidly growing cause for mental illness [1,2], with India and China alone adding almost 700 million urban dwellers by 2050 [3]. While in many HIC planned urbanisation results in improved infrastructure, LMIC often experience rapid urbanisation with lack of planned infrastructure leading to increased poverty and environmental adversity, and increased rates of anxiety, depression and substance abuse [4]. Developing precision medicine uniquely in HIC therefore runs the risk of ignoring the needs of LMIC that carry the greatest burden of mental disorders, thus contributing to the global gap in mental health treatment.

To discuss the role of precision medicine for mental health in LMIC, the Centre for Population Neuroscience and Precision Medicine at the Institute of Psychiatry, Psychology and Neuroscience, KCL hosted a conference in London in June 2018 with experts from China, India, Latin America, the U.S. and Europe. The panel noted that economic growth and urbanisation, and the resulting social and regional disparities are among the greatest challenges for many LMIC. Identifying the risks for cognitive development and mental health in the different geographic locations and social conditions was seen as paramount. The adverse impact of these factors can best be prevented in adolescence, since 75% of the lifetime burden from mental disorders emerges by the mid-20s [5]. Precision medicine can help establish relevant risk and resilience factors and assess their impact on brain and behaviour. Defining underlying mechanisms is expected to result in more targeted prevention/early intervention, and can contribute to reducing stigma, which often is a great obstacle to access to mental health care. In addition, the experts highlighted the need to establish normative data in LMIC for comparison with measures in Western countries.

To address these challenges, the Global Imaging Genetics Initiative in Adolescence (GIGA) was established. GIGA is a consortium of several major cohorts in China, India, the UK, Europe, and the U.S. that investigates mental health outcomes in children and adolescents in different cultures, environments and ethnic groups using behavioural and brain imaging-genetic studies. To this end GIGA is working towards harmonised data acquisition, retrieval and data analysis of more than 195.000 individuals, including over 20.000 neuroimaging scans. In addition to locally acquired neuroimaging genetics, behavioural and environmental data, GIGA will enable comparability of environmental measures by using mobile phone and app technology, and analysing satellite information measuring, for example, features of urbanisation across geographical regions and across time. These measures will be integrated into a framework for adapted biomarker development aimed to improve prevention for mental disorders in LMIC and HIC.

References:

1. Galea S, Uddin M and Koenen K, 2011 The urban environment and mental disorders: epigenetic links. *Epigenetics*, 6(4), pp.400–404. [PubMed: 21343702]
2. Lambert KG, Nelson RJ, Jovanovic T and Cerdá M, 2015 Brains in the city: Neurobiological effects of urbanization. *Neuroscience & Biobehavioral Reviews*, 58, pp.107–122 [PubMed: 25936504]
3. DESA U, 2010 United Nations, Department of Economic and Social Affairs, Population Division: World Urbanization Prospects, the 2009 Revision: Highlights.
4. Funk M, Drew N and Knapp M, 2012 Mental health, poverty and development. *Journal of public mental health*, 11(4), pp.166–185.
5. Jones PB, 2013 Adult mental health disorders and their age at onset. *The British Journal of Psychiatry*, 202(s54), pp s5–s10