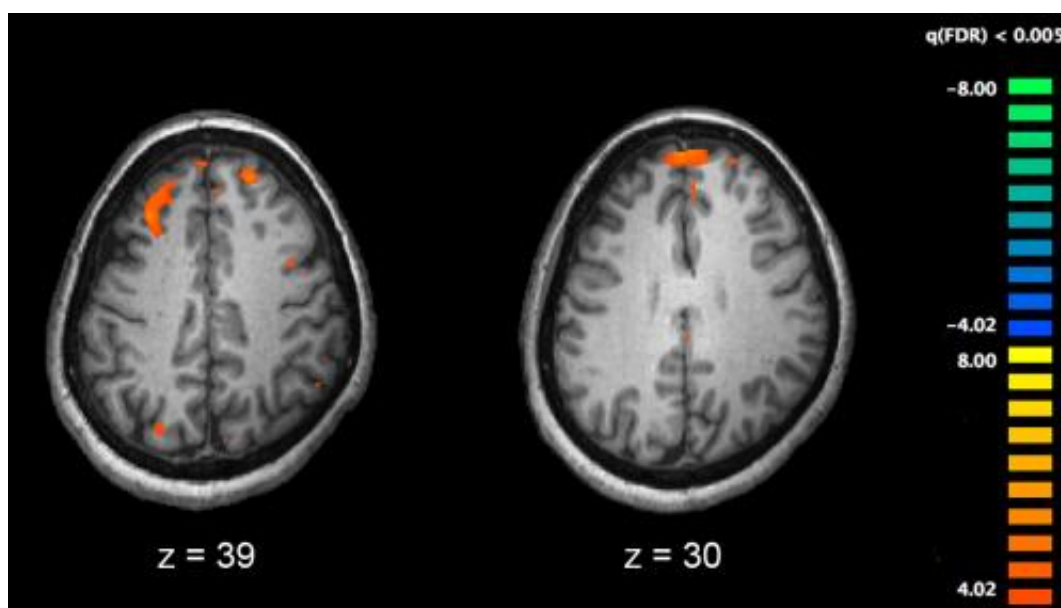


Study: Genetic risk of mental health conditions may influence where people choose to live

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Functional magnetic resonance imaging (fMRI) and other brain imaging technologies allow for the study of differences in brain activity in people diagnosed with schizophrenia. The image shows two levels of the brain, with areas that were more active in healthy controls than in schizophrenia patients shown in orange, during an fMRI study of working memory. Credit: Kim J, Matthews NL, Park S./PLoS One.

Living in cities has been highlighted as an environmental risk factor for schizophrenia and, to a lesser extent, other mental health conditions.

However, few studies have explored genetic effects on the choice of residence.

New research, published in *JAMA Psychiatry*, challenges the proposals that city living is a simple environmental risk factor for schizophrenia or that those with diagnosed mental [health](#) conditions move to cities seeking better access to healthcare services. Instead, the research suggests that genetic liability to a variety of mental health conditions may affect an individual's choice of residence.

The research was part-funded by the National Institute for Health Research (NIHR) Maudsley Biomedical Research Centre.

First author Jessye Maxwell, Ph.D. candidate from Institute of Psychiatry, Psychology & Neuroscience (IoPPN), King's College London, said: "Our research shows that at some level, an individual's genes select their environment and that the relationship between environmental and genetic influences on mental health is interrelated. This overlap needs to be considered when developing models to predict the risk of people developing mental health conditions in the future.

"Importantly, the majority of those people in our analysis did not have a diagnosed mental health condition so we are showing that across the UK [adult population](#) this genetic risk for mental health conditions plays a role in the environment that people live."

Using the [genetic data](#) from 385,793 UK Biobank participants aged 37 to 73, the researchers calculated the polygenic risk score (PRS) for each individual for different mental health conditions. The PRS assesses the genetic liability across the entire genome of each individual rather than analyzing liability at the level of individual genes.

The relationship to where people currently live and where they have

moved to was analyzed using address history and geographical distribution of population density in the UK based on [census data](#) from 1931 to 2011.

The study revealed higher genetic risks of schizophrenia, [bipolar disorder](#), anorexia and autism spectrum disorder and lower genetic risk for ADHD in those who moved from rural to urban areas, compared to those who stayed in rural areas.

Lead author, Dr. Evangelos Vassos, research fellow at the IoPPN, King's College London and Consultant Psychiatrist said: "Our study provides further evidence that genetic liability to a variety of mental disorders may contribute to the choice of a person's environment. The findings do not negate the important role that environment plays in the development of mental health conditions but it does suggest that we need more integrated approaches when exploring the causes of psychiatric disorders.

"The findings on ADHD are particularly interesting as, unlike other [mental health conditions](#), people at low genetic risk of developing ADHD appear to have the tendency to move to cities. This observation highlights the importance of examining the low end of the distribution of genetic liability and not only focusing on people at high risk. More research is needed to understand the possible reasons behind this distinction."

The study was carried out by researchers from the Social, Genetic and Developmental Psychiatry Centre at the Institute of Psychiatry, Psychology & Neuroscience, King's College London.

Census data was provided through www.VisionofBritain.org.uk and uses statistical material which is copyright of the Great Britain Historical GIS Project, Humphrey Southall and the University of Portsmouth.

The paper, "The association between genetic risk for psychiatric disorders and the probability of living in urban settings," was published in *JAMA Psychiatry*.

More information: Genetic risk of mental health conditions may influence where people choose to live, study suggests, *JAMA Psychiatry* (2021). jamanetwork.com/journals/jamap...psychiatry.2021.2983

Provided by King's College London

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