

# Covid-19, Stress, and Brain Morphometry by Translational Psychiatry

**Martijn Parra\***

Department of Genetics, University of Medical Center, Belgium

**Corresponding author:** Martijn Parra✉ [MartijnParra60@gmail.com](mailto:MartijnParra60@gmail.com)

Department of Genetics, University of Medical Center, Belgium

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## Abstract

With the COVID-19 epidemic has come a nearly unheard-of worldwide health calamity. Considering both the direct impacts of the illness, such as the development of psychopathology or psychiatric disorders in COVID-19-affected people, as well as the indirect repercussions associated to forced and self-imposed seclusion, this health crisis is also a mental health problem. In large-scale retrospective analyses, psychiatric disorders like anxiety and insomnia have been reported at higher rates in people with a COVID-19 diagnosis compared to either influenza or other health problems, and it has been demonstrated that having psychiatric disorders before COVID-19 infection carries a higher relative risk of COVID-19 diagnosis. However, the COVID-19 pandemic's effects on mental health go well beyond the effects of infection and the short- or long-term impacts they may have on COVID-19 survivors. In fact, measures of isolation that are imposed by an individual, a group, or the government, such as "lockdowns" and other restrictions on social interaction, have been examined for their effects on a variety of mental health outcomes in the general population, not just COVID-19 survivors.

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## Introduction

Several international studies of numerous general population cohorts have shown a peak in mental health issues, such as depression, anxiety, and schizophrenia [1]. Disentangling potentially complicated and interrelated impacts that differently affect the mental health of individuals with past diagnoses or mental health disorders, those who are at risk, or those exposed to differing degrees of stressful situations is the goal of current study in the subject [2]. However, not all members of society or people living in various countries have access to the same coping mechanisms or tools for overcoming isolation changing face-to-face social engagement with online chat [3]. These issues with mental health services also present a rare chance to connect neuroscience models of (prolonged) stress with potential brain biomarkers of patients' psychiatric disorders and their implications for the delivery of mental health services, given the extensive biological literature on the effects of stress and isolation [5]. Regional brain volumes were examined in relation to psychopathology and coping mechanisms using structural brain imaging in the most recent edition of *Biological Psychiatry: Global Open Science* by Holt-Gosselin et al They concentrate on

the amygdala, hippocampus, and insula, as well as the caudal and rostral anterior cingulate cortices, as brain regions recognised in imaging research on emotion processing and case-control studies of depression and anxiety disorders [6]. These regions are more vulnerable to stress in general and perhaps even the negative consequences of social isolation in particular [7]. For instance, the majority of recent fundamental neuroscience investigations in mice have demonstrated plastic short-term (as well as persistent alterations as a result of isolation in medial areas of the amygdala [8]. Based on these tried-and-true techniques, the authors were able to develop and test specific hypotheses about the relationship between dysfunctional pre-pandemic coping and pre-pandemic brain sizes, as well as their interaction as predictors of symptoms that emerge following social isolation [9].

## Discussion

The work offers further proof that brain structure, namely insular cortex thickness, existed before the study applies trusted, reliable imaging techniques to measure regional brain volumes as a measure of interindividual variance in both disease and brain anatomy [10]. Large-scale case-control studies of mental

diseases have examined these regional volumes, as have studies in nonclinical populations, where modest differences have also been linked to the subthreshold or subclinical appearance of mild symptoms [11]. This is a unique and significant work that will likely be followed in the near future by comparable research on existing or new psychiatric cohorts due to a number of factors [12]. Using data from fundamental neuroscience research and human brain imaging, Holt-Gosselin expands on the identification of specific brain networks and areas that are essential for the control of stress and anxiety [13]. This is an example of integrating neuroscience models with psychological elements like coping under the guidance of a hypothesis, and the results will help us better understand the brain underpinnings of widespread impacts and the demands of actual health care delivery [14]. As a result, it serves as empirical proof of the value of well-established neurobiological models, which are mostly drawn from studies of human brain imaging, for research with immediate consequences for translation and the provision of mental health services [15]. In a recent functional magnetic resonance imaging research, a similar strategy was utilised to compare functional connectome data from individuals with anxiety, depression, or schizophrenia to control people in order to examine connections with pandemic-related anxiety. Even though this study's goal was not to connect imaging data to therapeutically applicable coping, it discovered correlations to insular cortices nonetheless. The subclinical range or symptoms that don't fulfil the criteria for a clinical diagnosis but nonetheless cause a lot of subjective suffering. It is important to note that Holt-Gosselin L.'s methodology and interpretation take this element of dimensionality into account. The development of clinical diagnoses is not the only indicator of mental health outcomes; people who were previously healthy as well as those with a history of mental illness may also have temporary or enduring symptoms in the subclinical range. Thus, focusing just on psychiatric diagnoses as outcomes would fall short of painting a whole picture of the effects of such a pandemic on mental health. Previous imaging investigations have linked some specific depressed symptoms or subclinical depressive states to the amygdala volume (among other brain areas. are subclinical depressed states or depressive symptoms. Future research building on these findings may thus incorporate evaluations of subjective discomfort and symptom severity that affect quality of life even in the absence of a categorical clinical diagnosis. Although such subclinical manifestations of stress may be less upsetting than clinical disorders, they are likely to have a greater social impact. They serve as a reminder that psychiatry is capable of dealing with clinical mental health problems in addition to playing a part in population prevention and health promotion. Given the complexity of many illness features, predictors of outcomes may potentially develop as interactions between the Center for Psychiatric Research at the Philipps-Universität Marburg and the Department of Psychiatry and Psychotherapy with the COVID-19 epidemic has come a nearly unheard-of worldwide health calamity.

## Conclusion

Considering both the direct impacts of the illness, such as the development of psychopathology or psychiatric disorders in

COVID-19-affected people, as well as the indirect repercussions associated to forced and self-imposed seclusion, this health crisis is also a mental health problem. Large-scale retrospective analyses have shown that documented psychiatric disorders prior to COVID-19 infection carry a higher relative risk of COVID-19 diagnosis, while psychiatric disorders prior to COVID-19 infection have been shown to carry a higher relative risk of influenza or other health problems. However, the COVID-19 pandemic's psychological effects go well beyond the effects of infection and the short- or long-term impacts they may have on COVID-19 survivors. In fact, measures of social isolation that are initiated by an individual, a community, or the government, such as "lockdowns" and other restrictions on social interaction, have been researched for their effects on a variety of mental health outcomes in the general population, not just COVID-19 survivors. Several international studies of numerous general population cohorts have shown a peak in mental health issues, such as depression and anxiety. According to recent meta-analyses of longitudinal data, impacts in general population samples may differ significantly from those observed in mental patients. This might be because of things like coping mechanisms used to make up for social isolation. However, not all members of society or people living in other countries have access to the same coping mechanisms or skills for overcoming isolation that online discourse might provide. These issues with mental health services also offer a rare chance to connect neuroscience models of stress with potential brain biomarkers of patients' psychiatric disorders and their implications for the delivery of mental health services, given the extensive biological literature on the effects of stress and isolation. Holt-Gosselin employed structural brain imaging to examine the relationship between regional brain volumes and psychopathology as well as coping mechanisms in the most recent edition of *Biological Psychiatry: Global Open Science*. The work offers unique evidence that prior to the pandemic, the thickness of the insular cortex was a predictor of worried arousal during the pandemic, and that the link between amygdala volume and affective symptoms is connected to an interaction with coping mechanisms like self-distraction. The study applies trusted, reliable imaging techniques to measure regional brain volumes as a measure of interindividual variance in both disease and brain anatomy. Studies in nonclinical populations and large case-control studies of mental illnesses have both examined these regional volumes, where Based on a plethora of information from fundamental neuroscience research and human brain imaging, Holt-Gosselin identified certain brain networks and areas that are essential for the control of stress and the processing of emotions. They pay special attention to the amygdala, hippocampus, and insula as well as the caudal and rostral anterior cingulate cortices, which have been found to be involved in both imaging studies on emotion processing and case-control studies of depression and anxiety disorders. These regions are more vulnerable to stress in general and perhaps even the negative consequences of social isolation in particular. For instance, the majority of recent fundamental neuroscience research in mice has demonstrated plastic short-term alterations as a result of isolation in medial areas of the amygdala Based.

## Acknowledgement

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## Conflict of Interest

None

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