Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Letter to the editor

Is schizophrenia research relevant during the COVID-19 pandemic?

In 2010, US Senators Coburn and McCain published a highly critical report of "torrential, misdirected" government spending during the 2008 Recession (Coburn and McCain, 2010). Among other items, the report singled out research on primate models of glutamate function in cocaine abuse, suggesting that "studying drug-crazed primates" would not improve the national economy (Coburn and McCain, 2010, para. 28). This begs the question: is substance abuse research relevant during a recession? Over the past three decades, researchers have tackled the question of how economic recessions impact substance use. In fact, the evidence shows that problematic substance use tends to increase during recessions, leading to higher incidence and relapse rates of substance use disorders (Nagelhout et al., 2017). If anything, substance abuse research becomes *more* relevant during a recession, to care for these additional cases.

Researchers in many areas are likely asking themselves similar questions right now, about whether their work is relevant during the COVID-19 pandemic. And as research and funding priorities are re-examined in response to the pandemic, we may face tough questions about our work's relevance in the months and years to come. Recalling Coburn and McCain, certain voices are already working to sway public opinion against allegedly wasteful research spending—see, for example, a recent Fox News article castigating the US Department of Health and Human Services for funding a small veterinary study on amino levels in dog urine during the COVID-19 crisis (Olson, 2020).

As schizophrenia researchers, we focus on a debilitating condition which remains largely invisible despite costing the world economy hundreds of billions of dollars per year (Chong et al., 2016). We all have a role to play in preventing it from becoming more invisible during this pandemic. We all should be prepared to answer tough questions—to ourselves and others—about our work's relevance in the face of this generational public health crisis.

To that end, it may be helpful briefly to review empirical findings on coronaviruses and schizophrenia. Several lines of research have linked viral infections in various life stages to psychotic psychopathology. Although retrospective epidemiological research is challenging and often contested, many studies have reported that viral infections during pregnancy increase the risk of schizophrenia (Kępińska et al., 2020). Similarly, viral infections in childhood appear to increase the risk of psychotic disorders in adulthood (Khandaker et al., 2012). Finally, psychoneuroimmunological analyses of blood, cerebrospinal fluid, neural function, and brain tissue suggest that the progression of psychotic disorders in adults may be accompanied by abnormal peripheral and brain immune responses (De Picker et al., 2017). Viral infection and immune responses may impact psychotic disorders by multiple pathways *in utero*, in childhood, and in adulthood.

Moreover, a small body of evidence suggests that coronaviruses may pose a specific risk for psychotic disorders. Coronaviruses are neuroinvasive, entering the brain *via* the olfactory neural pathway, and have been found in human brain tissue *post mortem* (Arbour et al., 2000). COVID-19 may also be able to transmit placentally from mother to child *in utero* and directly impact foetal development (H. Zeng et al., 2020; L. Zeng et al., 2020, but see also Kimberlin and Stagno, 2020). There is some evidence that coronaviruses like COVID-19 can have acute and chronic impacts on neural development and function with links to psychosis. Acute psychosis has been observed in individuals infected with SARS, a coronavirus similar to COVID-19 (Cheng et al., 2004; Gardner and Moallef, 2015), although steroidal medications administered to SARS patients may have played a role in these cases. Chronic effects have also been observed in one study of immunoreactivity in recent-onset psychosis. Severance et al. (2011) examined seroprevalence of four separate coronaviruses in 106 individuals with a recent onset of psychotic symptoms and 196 healthy controls, finding that all four coronaviruses were more seroprevalent in patients than in controls. This implies that individuals presenting with recent-onset psychosis were more likely to have a history of coronavirus infection.

Viral infection appears to be a general risk factor for psychotic disorders, and coronavirus infection may also be a specific risk factor, conferring acute and long-term risk for psychosis. Even if the increased risk is marginal, the ongoing massive worldwide exposure to COVID-19 is likely to increase the incidence of psychotic disorders by a meaningful number of cases. If this happens, it will ripple into the future, affecting not only vulnerable adults, but also children who may develop a psychotic disorder later in life, and unborn children who will carry an elevated risk throughout their lifetimes. Those impacted will need basic clinical research to understand their developing disorders, translational and intervention research to improve their quality of life, and policy research to systemically prepare for their care. Is schizophrenia research relevant during the COVID-19 pandemic? Yes. Schizophrenia research is more relevant now than ever.

Author contributions

Henry R. Cowan is the sole author of this work and is entirely responsible for its content.

Declaration of competing interest

The Author has declared that there are no conflicts of interest in relation to the subject of this work.

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