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## A glimpse into long COVID and symptoms

Long COVID has significant implications for individuals, health-care systems, and society. Those affected might have reduced functional capacity and cognitive and physical limitations, ultimately resulting in reduced autonomy and increased dependency on caregivers and other societal supports. Hence, more comprehensive understanding of long COVID would aid policymakers and health-care systems in developing, implementing, and evaluating future policies and health resource planning reflective of the population's needs. In *The Lancet Respiratory Medicine*, Lixue Huang and colleagues<sup>1</sup> addressed this topic in a longitudinal follow-up of patients after SARS-CoV-2 infection during the early phase of the COVID-19 pandemic (between January, 2020, and May, 2021). To date, this study has the longest duration of follow-up for post-COVID-19 outcomes in patients who survived hospitalisation for COVID-19. Still, many questions remain about the reported symptoms of long COVID, and the people who continue to live with it.

Persistent physical symptoms attributed to COVID-19 might not be specific to SARS-CoV-2 infection.<sup>2</sup> Knowledge of previous SARS-CoV-2 infection might increase a person's likelihood of experiencing persistent physical symptoms—either by affecting perception of symptoms that

might have predated the infection or by promoting maladaptive health behaviours, such as reducing physical activity or dietary exclusion, in an effort to improve health.<sup>2</sup> It is therefore crucial to delineate individual symptom manifestations before and after infection, in addition to the overall dynamics of COVID-19 symptomatology in infected populations during this pandemic.

Huang and colleagues<sup>1</sup> stated that their questionnaires included the SARS-CoV-2 vaccination survey, blood specimens for complete blood count, renal function, liver function, lipid test, and routine urine;<sup>1</sup> however, the results of these laboratory studies were omitted. Furthermore, whether self-reported symptoms of chest pain and palpitations were corroborated by objective clinical and diagnostic findings was unclear. It might be useful to have a separate analysis of respondents with or without chronic diseases such as chronic kidney disease or chronic obstructive pulmonary disease to delineate whether these affect the degree of symptomatology. The omicron variant of SARS-CoV-2 (B.1.1.529 and its sublineages) has a higher risk of reinfection compared with the other variants.<sup>3</sup> Reinfection information of relevance to these patients could help clarify the effect of long COVID among survivors.

COVID-19 survivors at 2 years had more problems with fatigue, muscle weakness, sleep difficulties, dizziness, headache, and myalgia than COVID-19 survivors at 1 year.<sup>1</sup> There is increasing evidence for brain-related injuries in patients with COVID-19.<sup>4,5</sup> Even mild COVID-19 is linked to brain damage, which might provide insight into neurological or cognitive symptoms such as difficulty concentrating, trouble sleeping, memory loss, or confusion associated with long COVID.<sup>4</sup> This might be one of the particularly relevant issues in long COVID pathogenesis,<sup>6</sup> warranting further investigation. Moreover, many of these symptoms

might be further exacerbated by physical deconditioning or sedentary behaviours, a history of smoking or alcohol consumption, pregnancy, or an overall shift to work-from-home structures. Furthermore, it would be important to capture not only the symptom presence, but the degree of impairment associated with these symptoms, whether it might be due to loss of work productivity or increased health-care use. It would be important to address not only the symptoms, but also the associations with various contributing factors to better characterise the populations at risk. This information would allow for better generalisation and the proposal of future strategies to mitigate the effects of long COVID.

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