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.

misuse, mood disorders without psychotic symptoms, eating disorders, and personality disorders.[1] However, they did not mention the exact proportions of these diagnoses for the analysis. We considered that the differences in the proportions of psychiatric diagnoses might have affected the differing research findings, and we recommend that the authors mention the number of patients with each psychiatric diagnosis.

We declare no competing interests.

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Association between mental illness and COVID-19 in South Korea: a post-hoc analysis

We are honoured to respond to the letters by Hirofumi Hirakawa and colleagues[1] and Jewel Park and colleagues[2] regarding our Article,[3] which investigated the potential association between pre-existing mental illness and positivity for SARS-CoV-2 and clinical outcomes of COVID-19 in a South Korean nationwide cohort. The authors proposed the need for further analysis stratified by subtype of psychiatric disorders and region of residence.

Hirakawa and colleagues pointed out that our study did not have a subgroup analysis of mental illness by subtype. Therefore, we did a post-hoc analysis to investigate the potential association between COVID-19 susceptibility and specific pre-existing psychiatric disorders (appendix pp 2–3). We used propensity score matching between 47 058 individuals without a mental illness and 47 058 with a mental illness, as previously described.[3] The risk of SARS-CoV-2 infection was associated with 95 (4·1%) of 2321 patients who misused alcohol or drugs , compared with 1391 (3·0%) of 47 058 patients who did not have any mental illness (table, appendix p 6; fully adjusted odds ratio [OR] 1·41, 95% CI 1·14–1·74), but was not associated with patients having anxiety and stress-related disorders (951 [2·8%] of 34 536), mood disorders (707 [2·9%] of 24 804), personality disorders (13 [3·3%] of 400), or eating disorders (four [1·3%] of 313).

Residents of the Daegu–Gyeongbuk region had the highest number in all of South Korea of COVID-19 cases (special pandemic control area) and two clusters of COVID-19 cases at a psychiatric hospital.[4] Although we matched and adjusted for the region of residence (urban or rural area),[3] Park and colleagues suggested that our main results should be interpreted carefully given our dataset bias, which could have led to the unfavourable outcomes of COVID-19. Therefore, we investigated the differences between the Daegu–Gyeongbuk region and the other areas regarding severe mental illness and COVID-19 susceptibility and clinical outcomes. Among the 216 418 people tested for SARS-CoV-2, we identified 34 651 (16·0%) patients with COVID-19 in the Daegu–Gyeongbuk region and 181 767 (84·0%) patients with COVID-19 in other areas. We used propensity score matching for both groups (appendix pp 7, 10, 11; Daegu–Gyeongbuk matched cohort, n=15 756; other areas matched cohort, n=78 148; standardised mean difference in each cohort <0·08). SARS-CoV-2 test positivity was not associated with patients

See **Online** for appendix

	COVID-19 event number of total number	Minimally adjusted OR*	Fully adjusted OR†
Original analysis			
No mental illness	1391/47 058 (3·0%)	1 (ref)	1 (ref)
Any mental illness	1383/47 058 (2·9%)	0·99 (0·92–1·07)	1·00 (0·93–1·08)
Other mental illness	1023/36 257 (2·8%)	0·93 (0·85–1·01)	0·94 (0·86–1·02)
Severe mental illness	360/10 801 (3·3%)	1·11 (0·99–1·23)	1·10 (0·99–1·22)
Post-hoc analysis			
No mental illness	1391/47 058 (3·0%)	1 (ref)	1 (ref)
Anxiety and stress-related disorders	951/34 536 (2·8%)	0·92 (0·85–1·01)	0·94 (0·87–1·02)
Mood disorders (excluding people with psychotic symptoms)	707/24 804 (2·9%)	0·96 (0·87–1·05)	0·97 (0·89–1·06)
Alcohol or drug misuse	95/2321 (4·1%)	1·39 (1·12–1·71)‡	1·41 (1·14–1·74)‡
Personality disorders	13/400 (3·3%)	1·09 (0·62–1·90)	1·10 (0·63–1·92)
Eating disorders	4/313 (1·3%)	0·41 (0·14–1·13)	0·43 (0·16–1·15)

Data are OR (95% CI) unless specified. OR=odds ratio. *Minimally adjusted for age and gender. †Fully adjusted for age; gender; region of residence; history of diabetes, cardiovascular disease, cerebrovascular disease, chronic obstructive pulmonary disease, asthma, hypertension, or chronic kidney disease; and Charlson comorbidity index. ‡Significant differences (p<0·05).

Table: **Propensity score-matched adjusted ORs for the risk of those with a mental illness testing positive for SARS-CoV-2 stratified by subtype of psychiatric disorders**

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having severe mental illness in the Daegu–Gyeongbuk region (fully adjusted OR 1·05, 95% CI 0·90–1·23) or those in the other areas (0·94, 95% CI 0·76–1·17) compared with patients without mental illness, which is in agreement with the results of our original analysis (appendix p 4–6, 9).

Among the 7160 patients positive for SARS-CoV-2, we identified 3827 (53·4%) patients with COVID-19 in the Daegu–Gyeongbuk region and 3333 (46·6%) patients with COVID-19 in other areas. We used propensity score matching for both groups (appendix pp 8, 12, 13; Daegu–Gyeongbuk matched cohort, n=1718; other areas matched cohort, n=848; standardised mean difference in each cohort <0·1). Patients with severe mental illness in the Daegu–Gyeongbuk region had a high risk of severe COVID-19 outcomes (fully adjusted OR 2·55, 95% CI 1·59–4·10), which was similiar to patients in other areas (2·66, 95% CI 1·08–6·57).

Our post-hoc analysis showed a potential association between mental illness and COVID-19 stratified by subtype of pre-existing psychiatric disorders and region. According to a cohort analysis, patients with depression or anxiety are more susceptible to SARS-CoV-2 infection,[5] which is inconsistent with our results. Mental illness influenced several environmental risk factors; thus, strict propensity score matching and risk adjustment were required to understand the effect of psychiatric disorders. We found novel relationships between SARS-CoV-2 positivity and alcohol or drug misuse, which were not reported in our original analysis. Biologically, chronic alcohol ingestion increases alveolar permeability which might facilitate viral entry to the lung and decrease the pulmonary immune defence to pathogens, consequently increasing the rate of the infection.[6] Also, because alcohol or drugs are usually consumed during social activity and talking, these people are highly likely to violate rules of social distancing and wearing masks.[7] Consistent with other reports, these findings identified people who misused alcohol or drugs as a susceptible population at increased risk of COVID-19, showing the need to screen and treat this population to control the COVID-19 pandemic.[7]

Although there were clusters of infections associated with COVID-19 at psychiatric hospitals in some areas, our region-stratified results were similar to our main results, suggesting that patients with a severe mental illness were at a slightly higher risk of having severe clinical outcomes of COVID-19 than were patients with no history of mental illness, independent of regional COVID-19 influential factors.

We declare no competing interests. SWL and JMY contributed equally to this work.

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Phenomenology, delusions, and belief

Jasper Feyaerts and colleagues[1] make an important point about recognising the experiential dimensions of delusions. Following Jaspers and Schneider, they note that some delusions, particularly in schizophrenia, appear to arise spontaneously and reflect more pervasive shifts in phenomenological experience. As such, they argue that delusions have an inherently experiential component that is distinct from ordinary beliefs and overlooked in contemporary research. We agree with Feyaerts and colleagues on the importance of phenomenology, although we note three caveats.

First, their distinction between delusion and ordinary belief presupposes a conception of what ordinary belief entails. Beliefs, however, are highly heterogeneous and current concepts are poorly defined, but evolving.[2] Beliefs can vary along many properties—including their origins and relationship to experience—and they can encompass several distinct subtypes.[2] A phenomenological approach might therefore need to be applied to ordinary belief to help better frame nosological boundaries. Such research could help characterise delusions themselves: experiencing delusions as anomalous, which some