Statistical methods

A binomial logistic regression was performed to ascertain the effects of age, gender, comorbidities (through age-adjusted Charlson comorbidity index), number of COVID vaccination doses, and acute COVID severity on the likelihood that participants have post-COVID-19 condition. Linearity of the continuous variables with respect to the logit of the dependent variable was assessed via the Box-Tidwell (1962) procedure.[1] A Bonferroni correction was applied using all six terms in the model resulting in statistical significance being accepted when $p < 0.01$.[2] Based on this assessment, all continuous independent variables were found to be linearly related to the logit of the dependent variable. There were no significant outliers. The logistic regression model was not statistically significant, $\chi2(5) = 6.673$, p .246. The model explained 12.9% (Nagelkerke R2) of the variance in long COVID and correctly classified 65.2% of cases. Sensitivity was 76.3%, specificity was 50.0%, positive predictive value was 67.4% and negative predictive value was 60.8%.

References

1.   Box GEP, Tidwell PW. Transformation of independent variables. *Technometrics* 1962; 4: 531-550

2.   Tabachnick BG, Fidell LS. Using multivariate statistics. 6th ed. Harlow: Pearson Education, 2014.

Table 1. Post- acute coronavirus disease 2019 (COVID-19) 12 and 24- month follow up questionnaire

Question	Responses
1. Date of follow up visit	
2. Have you experienced another COVID infection since your initial infection?	Yes No If yes, please provide details regarding date of reinfection, how was infection diagnosed, what were your symptoms at the time of reinfection?
2a. If yes, please provide details regarding date of reinfection, how was infection diagnosed, what were your symptoms at the time of reinfection?	
3. Have you been vaccinated against COVID-19?	Yes No
3a. If Yes, please indicate which vaccine:	Pfizer Astra-Zeneca Other
3b. If Other, please indicate trade name:	
4. Date of first vaccine dose	
5. Date of second vaccine dose	
6. Further details regarding COVID-19 vaccination (eg. reason for no vaccination if applicable)	
7. Are you still experiencing residual symptoms from your COVID-19 infection?	Yes No Not applicable (Asymptomatic)
8. Have you had any further medical problems from your COVID infection or needed to be admitted back to hospital?	Yes No
9. Readmission to hospital in the last 12 months	
10. On a 0-10 scale, how severe are any problems you have in doing your usual activities, such as your household role, leisure activities, work or study? (Where '0' is 'I have no problems', and '10' is 'I am completely unable to do my usual activities')	Current Score: Pre-COVID score:
11. Have you had ongoing shortness of breath?	Yes No Not applicable (participant did not experience SoB during COVID) Yes, but pre-existing before COVID and unchanged, OR unrelated to COVID

Question	Responses
11a. If yes, on a scale of 0-10 with 0 not being breathless at all, and 10 being extremely breathless, how breathless are you:	At rest: On dressing yourself: On walking up a flight of stairs: Pre-COVID score:
12. Have you had any of the following ongoing respiratory tract symptoms: a. persisting cough b. chest tightness c. runny nose d. sore throat	Yes No Yes, but pre-existing before COVID and unchanged, OR unrelated to COVID
13. Do you have persisting fatigue?	Yes No Not applicable (participant did not experience fatigue during COVID) Yes, but pre-existing before COVID and unchanged, OR unrelated to COVID
13a. If Yes, how severely does this affect your mobility, personal cares, activity levels or enjoyment of life, with 0 being no effect at all and 10 being severely impacting?	Current Score: Pre-COVID score:
14. Have you had any ongoing loss of weight?	Yes No Not applicable (participant did not experience any weight change during/post COVID) Weight gain
14a. Weight gain amount	
15. Intentional loss of weight	Yes No
15a. If yes, how much weight have you lost (kilograms)?	
16. If yes, please rank your appetite or interest in eating on a scale of 0-10 with 0 being the same as usual/ no problems and 10 being very severe problems / reduction in appetite	Score
17. Have you had any ongoing diarrhoea or altered bowel habit?	Yes No Not applicable (participant did not experience diarrhoea/altered bowel habit during COVID)

Question	Responses
	Yes, but pre-existing before COVID and unchanged, OR unrelated to COVID
17a. If yes, details:	
18. Have you had any of the following ongoing systemic symptoms? a. fevers b. sweats c. muscle aches or pain d. joint aches of pain	Yes No Yes, but pre-existing before COVID and unchanged, OR unrelated to COVID
19. Have you had ongoing headaches?	Yes No Not applicable (participant did not experience headaches during COVID) Yes, but pre-existing before COVID and unchanged, OR unrelated to COVID
20. Have you had any memory related problems since the start of your COVID illness?	Yes No Not applicable (participant did not experience during COVID) Yes, but pre-existing before COVID and unchanged, OR unrelated to COVID
20a. If yes, indicate relevant categories:	- Short-term memory loss (memory that lasts ~30 seconds, i.e. remembering a phone number before writing it down, or forgetting you're in the middle of a task) - Long-term memory loss (long-term memory can be anything from remembering yesterday, forgetting you've done a task, forgetting recently learned information, or forgetting your third-grade experience) - Not being able to make new memories - Forgetting how to do routine tasks (tying your shoe laces, washing your hands) - Other
20b. Other, specify:	
20c. Did you have any of these problems pre-COVID?	Yes No
21. Have you experienced issues with "brain fog" (inability to focus, think clearly, plan, process,	Yes No

Question	Responses
understand, and maintain a coherent stream of thought; abnormally slow or fast thoughts) since the start of your COVID-19 illness?	Not applicable (participant did not experience during COVID) Yes, but pre-existing before COVID and unchanged, OR unrelated to COVID
21a. If yes, indicate relevant options:	- Difficulty with executive functioning (planning, organizing, figuring out the sequence of actions, abstracting) - Agnosia (failure to recognize or identify objects despite intact sensory functioning) - Difficulty problem-solving or decision-making - Difficulty thinking - Thoughts moving too quickly - Slowed thoughts - Poor attention or concentration - Other
21b. Other, specify:	
21c. Did you have any of these problems pre-COVID?	Yes No
22. Do you have any persistent loss of sense of smell or taste?	Yes No
22a. If yes, detail	- Loss of smell - Phantom smells (imagining/hallucinating smells - smelling things that aren't there) - Heightened sense of smell - Altered sense of smell - Loss of taste - Phantom taste (imagining/hallucinating tastes - tasting things when there's nothing in your mouth) - Heightened sense of taste - Altered sense of taste - Other
22b. Other, specify:	
22c. Did you have any of these problems pre-COVID?	Yes No
23. Have you had any persistent sleep issues?	Yes No Not applicable (participant did not experience during COVID)

Question	Responses
	Yes, but pre-existing before COVID and unchanged, OR unrelated to COVID
23a. If yes, detail:	- Lucid dreams (dreams where you are aware you are dreaming or have some control over what you dream about) - Vivid dreams - Nightmares - Insomnia - Night sweats - Restless leg syndrome - Awakened by feeling like you couldn't breathe - Sleep apnea - Waking up multiple times in the night - Other
23b. Other, specify:	
23c. Did you have any of these problems pre-COVID?	Yes No
24. Did participant agree to answer mood questions?	Yes No
25. On a scale of 0-10, how severe is the anxiety (or feeling on edge, nervous or worried) you are currently experiencing? (0 is 'I am not anxious' and 10 is 'I have extreme anxiety')	Current score: Pre-COVID score:
26. On a scale of 0-10, how severe is the depression (or feelings of hopelessness or feeling down in mood) you are currently experiencing? (0 is 'I am not depressed' and 10 is 'I have extreme depression')	Current score: Pre-COVID score:
27. Prior to COVID have you been previously diagnosed with anxiety/depression/mental health issues?	Yes No
27a. If yes, please provide details	
28. Over the last 2 weeks, how often have you been bothered by the following problems? a. Feeling nervous, anxious or on edge b. Not being able to stop or control worrying c. Little interest or pleasure in doing things d. Feeling down, depressed, or hopeless	- 0: Not at all - 1: Several days - 2: More than half the days - 3: Nearly every day
28a.	PHQ score:

Question	Responses
29. Are there any other symptoms you have been experiencing from COVID that we have not covered?	

COVID-19, coronavirus disease 2019; SoB, shortness of breath

Table 2. Clinical characteristics of the cohort of patients who were first infected with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in 2020

Characteristic	Number
Number of people	80
Gender (men)	42 (52%)
Age (years), median (IQR)	54.5 (35–63)
Ethnic background (white)	75 (94%)
Days from symptom onset until first PCR-positive specimen collected, median (IQR)	5.5 (3–7)
Age-adjusted Charlson comorbidity index, median score (IQR)	1 (0–2)
Fever	45 (56%)
Respiratory symptoms*	77 (96%)
Admitted to hospital	24 (30%)
Admitted to intensive care	4 (5%)
Immunosuppressed	2 (3%)

IQR, interquartile range; PCR, polymerase chain reaction.

* Cough, sore throat, rhinorrhoea, or shortness of breath.

Table 3. Indications for admissions to hospital after acute coronavirus disease 2019 (COVID-19), by time of follow-up*

Indication	12-month follow-up	24-month follow-up
Number of people	66	51
Arrythmia	1	1
Pericarditis	0	3
Renal calculi	1	3
Arthroscopy	1	2
Chest pain	1	1
Trauma	1	2
Gastritis/duodenitis	1	2
Pyelonephritis	1	2
Dyspnoea	0	1
Lower gastrointestinal bleeding	1	1
Cholecystectomy	1	1
Flare of rheumatological disease	0	1
Prostatectomy	0	1
Gout	1	1
Spinal fusion	1	1
Limb paraesthesia	0	1
Coronary angiogram	1	1

* Includes emergency department presentations. Some people had more than one indication for re-admission.

Table 4. Sensitivity analysis excluding participants who second SARS-CoV-2 infections at the 24-month follow-up

Characteristic	24-month follow-up
Number of people	40
Post COVID-19 condition, n (%)	13 (32%)
Activities of daily living symptom severity score [a]	5 (3.5–5)
Respiratory symptoms, n (%)	
Shortness of breath	7 (18%)
Symptom severity score [a]	
At rest	3 (1–5)
On dressing yourself	4 (3.3–4.8)
On walking up a flight of stairs	4.5 (2.8–6)
Persisting cough	5 (12%)
Chest tightness	6 (15%)
Runny nose	8 (20%)
Sore throat	2 (5%)
Systemic symptoms, n (%)	
Fever	2 (5%)
Sweats	3 (8%)
Myalgias	7 (18%)
Arthralgias	13 (32%)
Fatigue	13 (32%)
Symptom severity score [a]	5 (4.3–5.5)
Weight, n (%)	
Weight change	8 (20%)
Weight gain	5 (12%)
Weight loss	3 (8%)
Mental health symptoms, n (%)	
Anxiety	23 (58%)
Symptom severity score [a]	3 (1–5)
Depression	16 (40%)
Symptom severity score [a]	3.5 (2–5.3)
Gastrointestinal symptoms, n (%)	
Diarrhoea or altered bowel habit	5 (12%)
Neurological symptoms, n (%)	
Chronic headaches	12 (30%)
Subjective memory impairment	16 (40%)
Subjective cognitive dysfunction	13 (32%)
Chronic loss of taste or smell	3 (8%)
Chronic sleep issues	14 (35%)

[a] Median (interquartile range); Missing data accounted for <1% of total.

Table 5. Logistic regression analysis of effects of age, gender, other medical conditions (age-adjusted Charlson comorbidity index), number of SARS-CoV-2 vaccine doses, and hospitalisation on the likelihood of post-COVID-19

Variable	Adjusted odds ratio (95% confidence interval)
Age (per year)	1.00 (0.96-1.05)
Gender (men)	0.53 (0.18-1.52)
Number of COVID-19 vaccine doses (per dose)	0.31 (0.08-1.19)
Age-adjusted Charlson Comorbidity Index score (per unit)	1.01 (0.65- 1.59)
Hospitalisation	2.26 (0.64- 8.04)