



## **Supporting Information**

### **Supplementary material**

**This appendix was part of the submitted manuscript and has been peer reviewed.  
It is posted as supplied by the authors.**

Appendix to: Holmes A, Emerson L, Irving LB, et al. Persistent symptoms after COVID-19: an Australian stratified random health survey on long COVID. *Med J Aust* 2024; doi: 10.5694/mja2.52473.

## **Questionnaire development and pretesting**

A 16-section 42-question questionnaire was developed based on the (ISARIC)-WHO Clinical Characterisation Protocol.<sup>1</sup> The development of the questionnaire included a detailed review of the pilot questionnaire and other existing survey tools used to measure symptoms of long COVID. A questionnaire development workshop was held with an expert advisory group and cognitive testing of the questionnaire was performed with 30 members of the public. Minor wording changes were made to questions 14, 15 and 23. The questionnaire was programmed in English for execution either online or by structured interview. All interviewers and supervisors selected to work on the survey attended a 3-hour briefing session.

## **Selection, stratification and contact method**

The in-scope population for the survey was Victorians aged 18 years or over recorded in the Victorian Department of Health records of reported COVID-positive diagnoses from January 2020 to 12 October 2022 and COVID close contacts registered with the Department between January 2020 to November 2021. As such, the sample by nature of the source excluded any non-reported COVID-positive or close contacts. Records with only a mailing address were also excluded from the sample. In addition, the sample excluded persons who were not residing in Victoria at the time of reporting to the Department of Health. Data cleaning processes undertaken resulted in the exclusion of contact details where a phone number was shared by more than three individuals in the sample list. This included individuals who had been listed against aged care residential facilities, supported housing, workplaces using a central number.

The population was stratified on the basis of age/location/reporting date. The final target stratum framework is outlined in table 1 below.

**Table 1: Target sample and stratification**

Age/location	Total	Group 1: COVID- positive to Nov 2021	Group 2: COVID- positive Jan-Mar 2022	Group 3: COVID contact	Group 4: COVID- positive Dec 2021	Group 5: COVID- positive Apr-Oct 2022
Melbourne 18-29 years	2690	769	738	335	300	548
Melbourne 30-49 years	3176	868	830	398	300	780
Melbourne 50-69 years	2294	611	550	307	215	611
Melbourne ≥ 70 years	1339	362	274	191	127	385
Rest of Victoria (all ages)	2101	390	608	269	158	676
Overall	11 600	3000	3000	1500	1100	3000

**Table 2: Sample age as compared with population data**

Location/age	Total cases	Percentage cases	Population <sup>19</sup>	Percentage population
Melbourne 18–29 years	2690	28.3%	766618	19.9%
Melbourne 30–49 years	3176	33.4%	1461018	37.8%
Melbourne 50–69 years	2294	24.1%	1053917	27.3%
Melbourne ≥ 70 years	1339	14.1%	524847	14.6%

Cases were contacted in three phases

In phase 1 the channel for the first contact attempt was determined as follows:

1. If a mobile number is present in the sample, invite the sample member by SMS ( $n = 33\,936 / 97.0\%$ ).
  2. If no response was received, the person was called on the mobile.
  3. If the call was not answered a second SMS was sent, followed by two emails.
2. If no mobile number is present in the sample and an email address is present, invite the sample member by email ( $n = 564 / 1.6\%$ ).
3. If no mobile number and no email address are present in the sample and a landline number is present, invite the sample member by telephone ( $n = 499 / 1.4\%$ ).

In phase 2 the step of calling via mobile was removed ( $n = 78\,476$ ).

In phase 3 cases were contacted solely via email ( $n = 39\,436$ ).

Contact outcomes are demonstrated in Figures 1 and 2.

**Figure 1: Participant selection and assessment — COVID-19 cases**

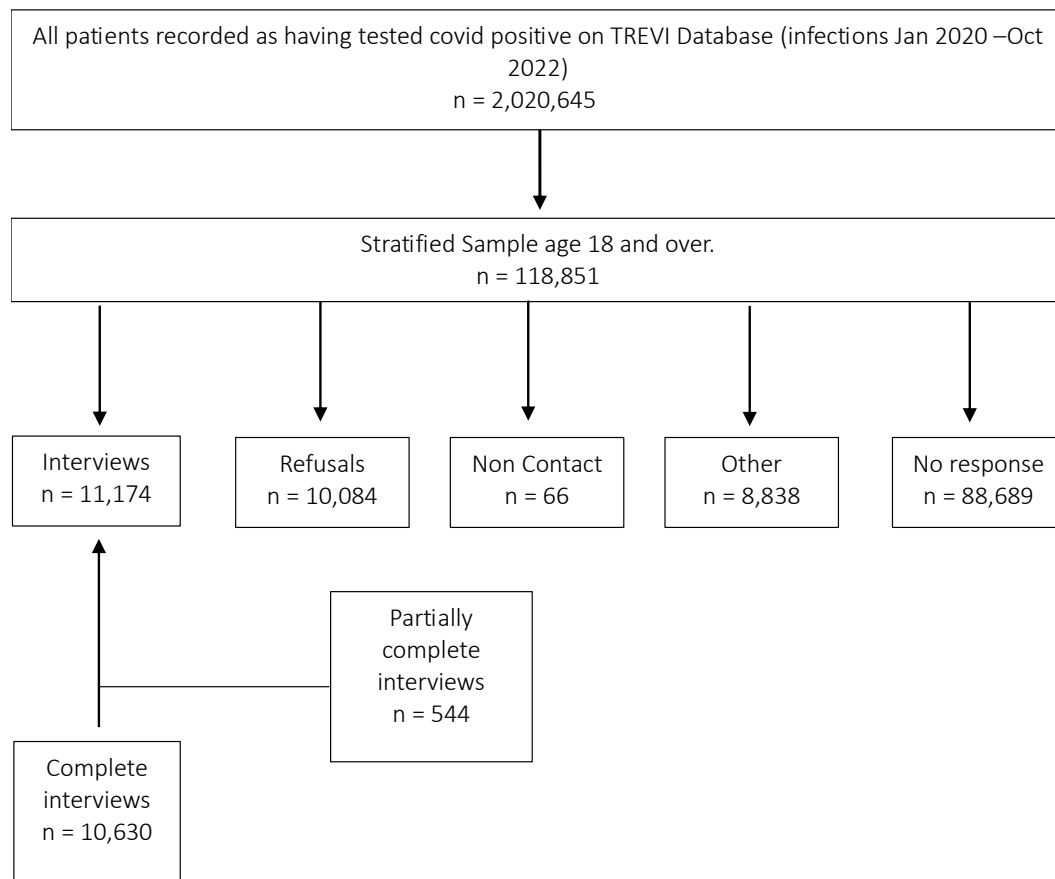
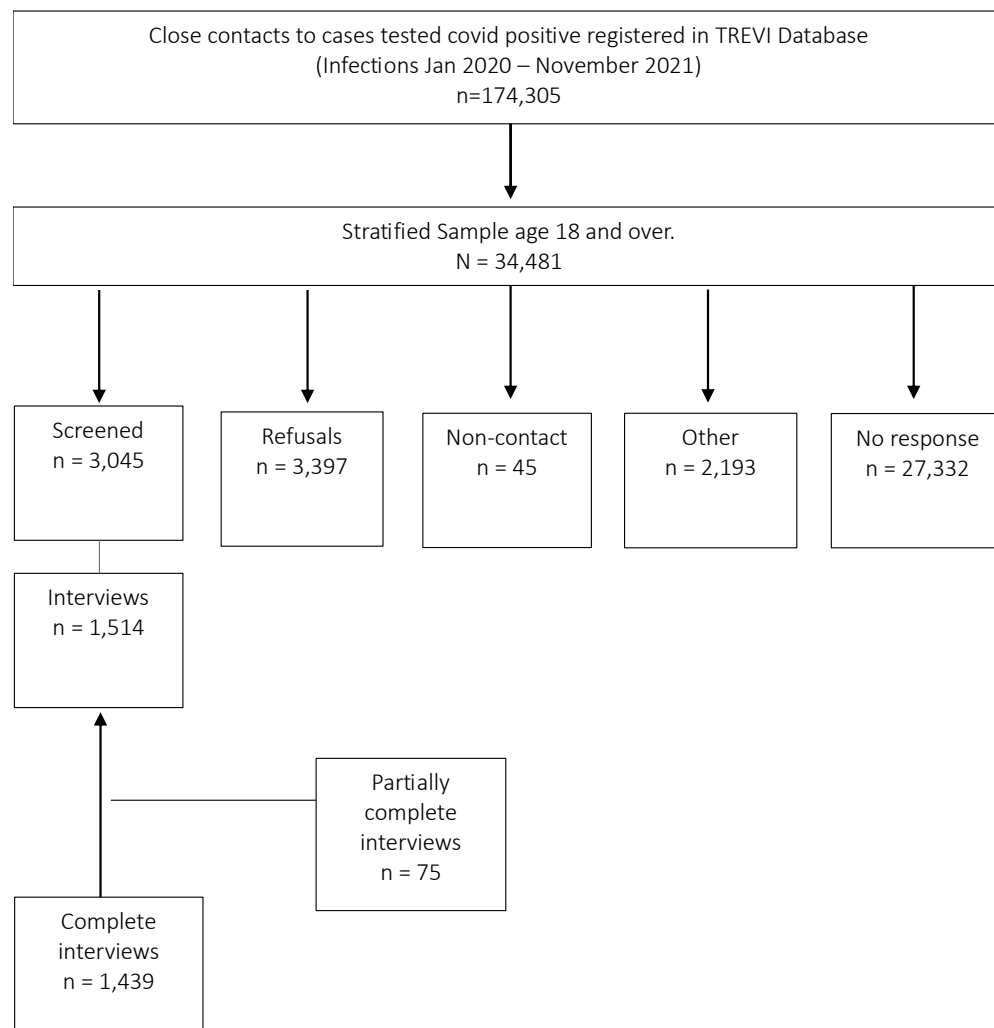


Figure 2: Participant selection and assessment — controls



## Non-response follow-up survey

Information was sought from those that had not responded (started, completed, opted out, etc) to the survey. The purpose was to capture information about those that had not responded in order that modelling could be performed to aid in weighting the main survey. Given that the selected sample had already not responded to the main survey, the follow-up survey used a different contact method that allowed the interviewer to convey the importance of the survey, and the brevity of the survey length.

**Table 3: Comparison of survey responders with 518 non-responders who completed non-response follow-up survey**

Three months after the time you got COVID how recovered and back to normal did you feel?	Responders	Non-respondents
Fully recovered (felt 100%)	44.90%	42.90%
Mostly recovered (felt 80–99%)	23.50%	24.30%
Moderately recovered (felt 50–79%)	12.00%	10.20%
Starting to recover (felt 30–49%)	4.10%	4.40%
Still unwell (felt less than 30%)	3.60%	2.10%

## Data storage, access and confidentiality

Data was stored solely within the Victorian Agency for Health Information (VAHI), a division of the Victorian Department of Health. Cases were de-identified using a unique case number. The identifying and contact information used to contact cases available through the TREVi database was not included in the dataset. Access to the dataset is only available through the Department of Health, which is limited by individual consent that allows the release of population-level analyses in keeping with the protocol approved by the ethics committee.

Table 4: EQ-5D-5L in 11 624 cases before first infection for COVID-19 and post-COVID at time of survey

EQ 5D 5L dimension ▼	None		Slight		Moderate		Severe		Extreme/unable	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Mobility	90.60%	84.60%	6.20%	10.10%	2.40%	4.00%	0.60%	1.10%	0.10%	0.20%
95% CI	[89.9%, 91.4%]	[83.7%, 85.5%]	[5.6%, 6.9%]	[9.3%, 10.8%]	[2.0%, 2.8%]	[3.6%, 4.5%]	[0.4%, 0.8%]	[0.8%, 1.3%]	[0.0%, 0.1%]	[0.1%, 0.3%]
Self-care	96.80%	95.40%	2.10%	3.00%	0.80%	1.20%	0.20%	0.20%	0.10%	0.20%
95% CI	[96.4%, 97.3%]	[94.9%, 95.9%]	[1.8%, 2.5%]	[2.5%, 3.4%]	[0.6%, 1.0%]	[1.0%, 1.5%]	[0.1%, 0.3%]	[0.1%, 0.3%]	[0.0%, 0.2%]	[0.0%, 0.3%]
Usual activities	91.00%	80.90%	6.10%	12.90%	2.10%	4.70%	0.60%	1.20%	0.20%	0.30%
95% CI	[90.3%, 91.7%]	[79.9%, 81.8%]	[5.5%, 6.7%]	[12.1%, 13.7%]	[1.7%, 2.4%]	[4.2%, 5.2%]	[0.4%, 0.8%]	[0.9%, 1.4%]	[0.1%, 0.4%]	[0.2%, 0.5%]
Pain	82.60%	72.60%	12.70%	19.10%	3.70%	6.40%	0.80%	1.60%	0.20%	0.30%
95% CI	[81.7%, 83.6%]	[71.5%, 73.7%]	[11.9%, 13.5%]	[18.1%, 20.1%]	[3.2%, 4.1%]	[5.9%, 7.0%]	[0.6%, 1.0%]	[1.2%, 1.9%]	[0.1%, 0.2%]	[0.2%, 0.4%]
Anxiety/depression	67.70%	60.10%	21.40%	23.80%	8.20%	12.20%	1.90%	2.70%	0.70%	1.20%
95% CI	[66.6%, 68.9%]	[58.9%, 61.3%]	[20.4%, 22.4%]	[22.8%, 24.9%]	[7.6%, 8.9%]	[11.4%, 13.0%]	[1.6%, 2.2%]	[2.4%, 3.1%]	[0.5%, 0.9%]	[0.9%, 1.4%]

Table 5: Data for figure in Box 2 — proportion of survey respondents with new and persistent symptoms (≥ 2 months)

	COVID-19 positive respondents				Control respondents			
	Number	Proportion	Lower 95% confidence interval	Upper 95% confidence interval	Number	Proportion	Lower 95% confidence interval	Upper 95% confidence interval
Feeling tired or fatigued	2240	19.2%	18.2%	20.3%	77	7.5%	5.9%	9.0%
“Brain fog”	1594	13.7%	12.8%	14.6%	40	3.9%	2.9%	4.9%
Feeling physically weak	1593	13.7%	12.8%	14.6%	53	5.1%	3.9%	6.4%
Unable to exercise at usual level	1502	12.9%	12.0%	13.7%	51	5.0%	3.7%	6.2%
Trouble breathing after exertion	1404	12.0%	11.2%	12.9%	30	2.9%	2.0%	3.8%
Difficulty finding words	1360	11.7%	10.9%	12.5%	38	3.7%	2.7%	4.6%
Trouble sleeping	1100	9.4%	8.7%	10.2%	51	4.9%	3.6%	6.2%
Persistent muscle pain	919	7.9%	7.2%	8.6%	33	3.2%	2.3%	4.2%
Vertigo or dizziness	875	7.5%	6.9%	8.2%	29	2.8%	1.8%	3.8%
Persistent cough	852	7.3%	6.7%	8.0%	28	2.7%	1.8%	3.6%
Headaches	747	6.4%	5.8%	7.0%	31	3.0%	1.9%	4.0%
Heart palpitations	483	4.1%	3.7%	4.6%	16	1.6%	0.9%	2.3%
Chest pains	453	3.9%	3.4%	4.4%	10	0.9%	0.5%	1.4%
Loss of appetite	404	3.5%	3.0%	3.9%	16	1.5%	0.9%	2.2%
Lost sense of smell	381	3.3%	2.9%	3.7%	5	0.5%	0.1%	0.8%
Stomach pains	360	3.1%	2.7%	3.5%	14	1.3%	0.7%	1.9%
Feeling sick	353	3.0%	2.6%	3.5%	17	1.6%	0.9%	2.4%
Constipation	341	2.9%	2.5%	3.3%	18	1.7%	0.9%	2.5%
Lost sense of taste	323	2.8%	2.4%	3.2%	5	0.5%	0.2%	0.8%
Diarrhoea	317	2.7%	2.3%	3.1%	15	1.5%	0.8%	2.1%