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Stranded abroad during the COVID-19 pandemic: examining the psychological and financial impact of border restrictions

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ABSTRACT

Objective: With the easing of COVID-19-related international travel restrictions in late 2021 it is time to consider the direct and indirect social, emotional, and financial impacts that these border closures have had. The study aims to evaluate the psychological and financial distress reported by people stranded abroad due to international travel restrictions introduced in response to the COVID-19 pandemic.

Methods: Between July and September 2021, we implemented a cross-sectional online survey targeting individuals stranded abroad due to international travel restrictions. The survey collected data about COVID-19 travel restriction-related travel impacts; personal stress, anxiety, and depression (using the validated DASS-21tool); as well as impacts on housing and financial security; and demographic data.

Findings: We had 1054 participants complete the survey; most were trying to return to the Oceania region (75.4%), with 45% stranded in Europe. Overall, 64.2% reported financial distress while stranded abroad. 64.4% ($\bar{x}$=9.43, SD=5.81) reported either a moderate or severe (based on the DASS-21 classification) level of depression, 41.7% for anxiety ($\bar{x}$=5.46, SD=4.74), and 58.1% for stress ($\bar{x}$=10.64, SD=5.26). Statistically significant factors associated with moderate to extremely severe depression, anxiety, and stress were financial stress, an employment change, being <30yrs, having a high perceived risk of contracting COVID-19 abroad and being stranded for >2 months.

Conclusion: The study is among the first to explore the psychological and financial distress-related impacts associated with being stranded abroad due to COVID-19 travel restrictions. It highlights a range of unintended consequences that arise from pandemic-related travel restriction, identifies the health and social needs for a particularly vulnerable population, and provides clues as to the types of support that may be adopted to best support them. This research will assist policymakers in identifying support packages for people stranded abroad due to global disaster.

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STRENGTHS AND LIMITATIONS OF THIS STUDY

- One of the first to explore the psychological and financial distress-related impacts associated with being stranded abroad due to COVID-19 travel restrictions
- Analysing responses from respondents globally identified that 64% had moderate to extreme depression
- Respondents experienced homelessness, significant financial distress, and reported little to no support from their national governments.
- While all attempts were made to recruit participants from around the world, the study relied on convenience sampling approaches and so we may not have captured all relevant countries.

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BACKGROUND

In response to the COVID-19 pandemic, most countries around the world have implemented some level of international travel restriction or complete border closures (1-3). As of February 2020, many countries had commenced repatriation of their citizens stranded abroad. By the end of 2020, some countries like Japan and Spain claimed to have completely repatriated every citizen that wanted to return. However, reports continue to suggest stranded travellers are still trying to get to their country of residence (referred to as 'home') 20 months into the COVID-19 pandemic despite many countries reopening borders (4, 5).

Factors impacting on people's ability to return to their home have included countries placing limits on the number of passengers that can enter the country, caps on the hotel quarantine capacities, the cost of travel and hotel quarantine, and in some cases having restrictions on flights from certain high-risk countries. Our previous study (pre-print available) suggested that the support available to those who were stranded abroad was limited, and in some cases difficult to access and comprehend (6). Support provided by countries has varied from repatriation flights, emergency accommodation, mental health and medical assistance, emergency call lines and financial assistance. However, of the countries that were reviewed, we were unable to identify any one country providing all the different support types listed. Public commentary through news and social media has hinted at the level of psychosocial impact on citizens stranded abroad. These articles suggest that many of these travellers felt abandoned by their governments, had little financial support, and for some, experienced depression and homelessness (7-9). While the findings from many COVID-19 studies have reported high levels of psychological distress in nearly all populations, the focus of these studies has been on domestic populations, like healthcare and frontline workers, students and those in lockdown and quarantine (9-18). One study, with similar aims to the present study, found 63% of Saudi citizens living abroad as students during COVID-19 experienced 'psychiatric' distress symptoms (19).

There is currently limited understanding of the level of psychological distress that has been experienced by those stranded abroad wanting to return. This study examined the impacts of travel restrictions on people stranded abroad, who were unable to return to their country of citizenship/residence during the COVID-19 pandemic. We aimed to 1) measure the prevalence of psychological impact associated with being stranded overseas due to covid-related travel restrictions and 2) identify demographic and circumstantial factors associated with severe psychological impact.

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METHODS

Population and procedures

An online survey was created and administered anonymously using the *Qualtrics* (20) survey platform, with respondents recruited through a variety of social media channels. Respondents were those people who were either still stranded away from their country of residence/home or had been stranded at some point since the commencement of the COVID-19 pandemic. There were no limitations placed on the country of residence, nor the length of time the person had been stranded for. To meet the inclusion criteria, respondents had to self-identify as having attempted to return to their country of residence but have had their travel plans changed. The survey was open between 20 July 2021 and 24 September 2021. Participants unique IP addresses prevented duplicate entries. Ethical approval for this study was granted by the UNSW Human Research Ethics Committee (#210418). All participants indicated their consent to participate.

Patient and Public Involvement

No patient involved

Survey instruments and measures

Demographics: included gender, age, level of education, ethnicity, employment status, history of chronic illness, and living status. Ethnicity was classified based on the nine broad groups according to the Australian Standard Classification of Cultural and Ethnic Groups (21).

Travel experiences: Respondents were asked where they were stranded abroad and where they intended to return to, and this data was recoded into geographic groups based on the World Health Organisation regions (22). Questions focused on their current situation (whether they had returned, were still stranded abroad awaiting return or still abroad but had decided to stay), flight cancellations/delays, length of time waiting to return and their experiences with travel.

Mental wellbeing: The depression, anxiety, and stress scale (DASS-21) was used in this study (23). The DASS-21 is a validated self-report tool, previously used in COVID-19 research studies (13, 24), containing 21 items assessing scores of depression, anxiety, and stress symptoms (7 items each). Respondents were asked to reflect on when they were stranded abroad (for participants who had already returned) or reflecting on the last two weeks and rate each statement on a 5-point Likert scale from 0 (unsure/do not recall; did not apply to me at all) to 3 (applied to me very much, or most of the time). Scores in each sub section are then multiplied by 2 to give a final score categorising the depression, anxiety, and stress into

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normal, mild, moderate, severe, or extremely severe. Higher scores reflect increased emotional and psychological distress.

As we suspected some potential participants having returned home already and could be potentially reflecting further than 2 weeks, we included an additional option of "unsure/do not recall" to allow for removal of recall bias during the analyses phase. Participants were asked whether they had access to crisis support or mental health services while abroad and if 'yes', whether they had used this service or support. Finally, respondents reported their perceived risk of contracting COVID-19 both in the country where they are/were stranded and the country where they had or were waiting to return to (Scale of 1-10; 1 being no risk and 10 being high risk).

Financial wellbeing: Respondents were initially asked whether they felt financial stress while stranded abroad (yes/no), then if 'yes' were asked how they addressed the financial stress (receiving financial support from family, government loans, bank credit, or social services). Questions on employment situation and changes while abroad were asked along with a question on whether the participant experienced homelessness while abroad. Homelessness was defined as a period where participants did not have somewhere to stay/live.

Statistical analyses

We aimed to collect responses from a minimum of 1,200 people to allow analysis with a margin of error of approximately 3.2%. Descriptive analysis involved the calculation of means, standard deviation, confidence interval and standard errors. Chi-square test of independence were first used to compare categorical variables. Independent variables that showed a significant association with DASS severity scores at a $p<.2$ level was included in the model as predictor variables. The DASS scores were dichotomised to reflect either no/mild symptom severity or moderate to extremely severe. Multivariable logistic regression was then performed to analyse the effect of age, perceived risk of contracting COVID-19 while stranded, financial stress, time stranded, employment change and homelessness on predicting moderate to extremely DASS. No multicollinearity amongst variables was identified. P values of <.05 was considered statistically significant. All data analyses were conducted using SPSS (25).

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RESULTS

Participant characteristics

A total of 1054 participants completed the full survey, while a further 296 respondents completed over 75% of the questions and were included. Demographic information is provided in Table 1. The mean age was 41.09±13.08, with 69.5% being female, 43.8% of north-west European ethnicity, while most had a tertiary education (90.7%) and were stranded in the European Region (EUR) and were trying to return to the Western Pacific Region (WPR).

Almost one in four participants (*n* = 303/1214) reported a historical or current COVID-19 infection, and of those the majority rated a 'mild' symptom severity (85.1%). Participants' overall level of perceived risk of contracting COVID-19 while abroad was moderate to high (*n* =806, M = 6.64, *SD*=2.85, range 1-10, where 1 = no risk, and 10=high risk), with 25.4% rating the perceived risk while abroad at high risk (10). Comparatively, the overall level of perceived risk of contracting COVID-19 in the country where participants had returned to was low to moderate (*n* =605, M = 5.10, *SD*=2.72, range 1-10, where 1 = no risk, and 10=high risk), with 21.4% rating the perceived risk at 'home' as low risk.

Travel experiences

Initially 44% of respondents had left their country of residence to take up long-term employment, with over 60% stranded abroad for more than 5 months (63.6%), and just over a quarter either having had booked a flight or awaiting flight availability (26.6%). Refer to table 2 for a full breakdown of participants experiences and current situation while stranded abroad.

Mental wellbeing

Figure 1 presents the respondents (*n*=1133) self-reported depression, anxiety, stress symptom severity scores based on the DASS-21 tool. Of the respondents, 64.4% scored moderate to extremely severe depression symptoms ($\bar{x}$=9.43, SD=5.81), 41.7% scoring moderate to extremely severe anxiety symptoms ($\bar{x}$=5.46, SD=4.74), and 58.1% scoring between moderate to extremely severe stress symptoms ($\bar{x}$=10.64, SD=5.26).

Many reported no access to crisis support or mental health services while abroad (63.5%) (*n* = 719/1133), and of those that did have access, only 37.9% (*n* = 272/719) utilised the services. A total of 12% (*n* = 133/1112) experienced a period of homelessness while stranded abroad. Of those that were willing to share their experiences (*n* = 94), commonly noted situations included living in temporary accommodation (32%), sleeping on the couch or in a spare bedroom at a friend/family members place (32%), and staying in emergency

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accommodation (including homeless shelters) (17%). Less common experiences were those that lived on the street, trains, at the airport, in cars, in tents (<20%). Two respondents disclosed having experienced a sexual assault while homeless shelter.

Financial wellbeing

Financial distress was reported in 64.2% (n=723/1127), and 45% (n=433/1127) reported a change in employment. A breakdown of ways in which participants sought to address financial distress along with employment changes and current employment situation are reported in Table 3.

Factors associated with and predictors of depression, anxiety, and stress

Chi square analyses revealed significant associations between participants DASS categories and their age, time stranded abroad, financial stress, homelessness, employment change, and their perceived risk of contracting COVID-19. No associations were found between DASS severity categories and having access to crisis support or mental health services (see Supplementary file 1). For depression, logistic regression identified financial stress, employment change, and a high perceived risk of contracting COVID-19 as predictors of moderate to extremely severe depression. Overall, the model correctly discriminated 67.7% of cases and Nagelkerke R^2 indicated a 14% variation of depression explained by the model. For anxiety, logistic regression identified financial stress, employment change, and a high perceived risk of contracting COVID-19, as predictors of moderate to extremely severe anxiety. Overall, the model correctly discriminated 64.5% of cases and Nagelkerke R^2 indicated a 13% variation of anxiety explained by the model. Finally for stress, logistic regression identified financial stress, employment change, and a high perceived risk of contracting COVID-19, as predictors of moderate to extremely severe stress. Overall, the model showed goodness of fit to the data ($\chi^2(14) = 95.772$, $p<.001$), correctly discriminated 63.6% of cases and Nagelkerke R^2 indicated a 13% variation of stress explained by the model. Table 4 presents results of the multivariable logistic regression. Being 30 years or older and stranded for 2 months or less was associated with decreased odds of moderate to extremely severe depression, anxiety, and stress.

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DISCUSSION

This study evaluated the psychological and financial distress of individuals stranded abroad during the COVID-19 pandemic and highlights the importance of providing additional support to this vulnerable group in future public health events. Amongst our respondents we found that over half had been stranded for longer than five months, with the majority having more than one flight cancellation or change. Our results confirm sentiments shared on social media by people stranded abroad, that reflect experiences of having no financial support, depression, homelessness and a general feeling of abandonment by their governments (7-9). Given the continued flight changes and delays (incurring additional costs) in the population of individuals stranded abroad, along with changes to employment, it is perhaps not surprising that we documented a high level of financial distress (64.2%), employment changes (45%), and experiences of homelessness (12%). Our findings align with results from non-travel related COVID studies which have indicated an increase in financial distress (16), increases in experiences of homelessness (26) and growing employment changes (27) during the pandemic. Comparatively, we reported much higher findings compared to a survey of the general population conducted within the first 6 months of the pandemic, finding that 30% of Australians were financially stressed because of the pandemic (28). This difference could be explained by those stranded abroad having different elements of uncertainty (additional flight costs, additional rent, and expenses due to the length of time stranded, and uncertain employment) compared to the general population.

Based on our findings, we recommend policymakers prioritise increasing the availability of financial assistance in the form of government grants or loans for living and flight costs incurred due to being stranded abroad, or alternatively providing the option to access social support while abroad if an individual would have been eligible had they not been abroad. Furthermore, considering the proportion of people who reported experiencing homelessness, the cases of sexual assault within homeless shelters, and previous research indicating a lack of emergency accommodation options for citizens abroad during COVID-19 (6), it is recommended that policymakers provide a solution to this issue, whether it be through financial assistance or an emergency accommodation program similar to those that the French and Spanish governments introduced (6).

At this stage in the pandemic, it is almost indisputable that COVID-19 has had a psychological impact on populations around the world, whether it be healthcare workers, people in lockdown or quarantine, or specific countries or communities, the stressors were all encompassing (10-13, 29, 30). Our findings reflect much higher incidence of moderate to

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extremely severe depression (64.4%), anxiety (41.7%), and stress (58.1%), compared to domestic populations around the world (24). Previous research show lower DAS severity scores (24), especially when comparing our results to studies exploring psychological impacts of COVID-19 on healthcare workers (31, 32) and domestic students (33, 34). One study observing the psychological correlates of COVID-19 on the general population in Austria, reported drastically lower scores of depression (21.6%), anxiety (28.6%) and stress (28%), and found that 'frequent contact with family or friends' was shown to be a protective factor (24).

However, research on international students during COVID-19, have reflected high DASS severity, similar to our study findings (19, 35). Possible reasons for these differences could be the parallels between international student experiences and those stranded, both living abroad and arguably away from their immediate social support network (family). A range of factors contributed to the psychological wellbeing of individuals in this study. Having financial stress, any employment change, being aged <50yrs, having a high perceived risk of contracting COVID-19 and being stranded for >5months were all associated with predicting moderate to extremely severe depression, anxiety, and stress. These results are not surprising considering the literature shows that many stressors, like financial distress, fear of COVID-19 infection, loneliness, inadequate information, and employment issues have all presented as predictors of poor mental health and in the case of financial distress, can go further than predicting depression to suicidal thoughts and behaviours (30, 36). Unique to this study, however, is the finding that the longer an individual is stranded abroad the more likely they are to present with moderate to severe DAS symptoms.

Interestingly, of the age categories in this investigation, participants >69yrs had lower scores of depression, anxiety, and stress, inconsistent with research conducted in Spain and Canada suggesting increased DASS scores in elders (37, 38). This, as was noted by the authors of the Sightlines Project (39), may be due to older people being more financial secure than other age groups. It may also reflect that older people were less likely to have insecurity associated with employment or have younger dependent family members to provide direct care to. This may have provided more opportunity for flexibility in their travel plans.

These results reflecting high severity of DASS in those stranded abroad, provides both current and future direction for policymakers. We recommend policymakers provide adequate mental health interventions be available to those stranded abroad, either online or face-to-face where possible through a local consulate.

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It is hard to deny that people have been deprived of the ability to return to their country of citizenship or permanent residence, as shown by the 63.3% of our respondents being stranded abroad for longer than 5 months. Addressing public health threats from a health security perspective has already increased fears that it legitimises government actions, potentially undermining personal sovereignty, and impeding human rights (40). A commonly cited human rights treaty in response to imposed restrictions is Article 12 (41) of the International Covenant on Civil and Political Rights (ICCPR), a treaty with 74 signatories and 173 parities which states that "No one shall be arbitrarily deprived of the right to enter his own country" (41).

The most frequently mentioned human rights breach was the Australian government imposing not only a complete ban on incoming flights from India, but potential criminal penalties of up to five years imprisonment, and/or fines up to $66000 (AUD) (42). Mostly in reference to breaching Article 12 (41) of the International Covenant on Civil and Political Rights (ICCPR), this ban, implemented under the *Biosecurity Act 2015(43)*, between April and May 2021, has been labelled a 'racist rights breach' (44), with the Australian Human Rights Commission approaching the federal government directly with their concerns (42). Due to impacts of ongoing border closures and individuals struggling to return home, as further highlighted in this study, Australian citizens stranded abroad submitted a human rights complaint to the United Nations Human Rights Committee under the ICCPR, with the UN Human Rights Committee already successfully requesting to the Australian Government the prompt repatriation of two Australians in April 2021 (45).

Due to the results of our study alongside the probable human rights breaches, we recommend policymakers seriously reconsider current and future restriction of movement of citizens and permanent residents returning home who are at risk of financial distress and severe DASS the longer that they are stranded for. With international borders reopening around the world, some being restricted for nearly 20 months, it is critical to not only look at the impact of travel restrictions from the perspective of reducing infectious disease importations, but also from the perspective of those stranded abroad, who were arguably one of the most impacted by them. In doing so, policymakers can determine where further support is needed in future emergency situations resulting in people stranded abroad.

Limitations

This work is not without limitations. Firstly, like other cross sectional survey studies, it lacks a longitudinal follow up on participants. Secondly, the self-report questionnaire for psychological symptoms raises possible selection bias and subjectivity, however our sample

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size being large, and the addition of an optional 'do not recall' response should mitigate certain bias. Thirdly, we were unable to capture the specific immigration status of those returning, i.e., whether they were citizens, permanent residents, or short-term visa holders. Finally, we did not examine pre-existing mental health conditions which could prove to be a confounding factor, and there was an over representation of women, those returning to the western pacific region and participants with an academic background, possible due to convenience sampling issues and survey distribution from Australia, which may not fully represent the population of people who were stranded abroad. Notwithstanding the previously mentioned limitations, findings from this study provide insights not previously reported into the psychological and financial impacts and support needed for individuals stranded abroad due to COVID-19 travel restrictions. These insights will be valuable for policy makers as they design and deliver support programs in response and prepare for future events.

Conclusion

This research suggests that being stranded abroad during COVID-19 may lead to not only an increase in financial stress, but quite severe depression, anxiety, and stress. Our findings show that being young, stranded abroad for longer, having a high perception of infection risk, experiencing employment changes and financial stress are all associated with increased severity of depression, anxiety, and stress. Participants reported that lack of mental and social health support while stranded. This indicates that there are gaps in services available for this vulnerable population or lack of communication as to how to access them; both issues that need to be resolved.

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ABBREVIATIONS

AFR: African region

AMR: Region of the Americas

COVID-19: Novel coronavirus disease 2019

DAS: Depression, anxiety, and stress

DASS-21: The 21-item depression, anxiety, and stress scale

EMR: Eastern Mediterranean region

EUR: European region

SEAR: South-East Asian region

WPR: Western Pacific region

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DECLARATIONS

Ethics approval and consent to participate

Ethical approval for this study was granted by the UNSW Human Research Ethics Committee (#210418). All participants were anonymous and indicated their consent to participate.

Competing interests

The authors declare that they have no competing interests.

Contribution statement

PM conducted data collection, data analysis, manuscript writing and contributed to study design. AC, MS and HS conceived study design, interpretation of the data and were involved with manuscript writing and had final oversight. KB supported the statistical analysis of the data and ST supported the interpretation and write up of the findings. All authors read and approved the final manuscript.

Funding

Not applicable

Data sharing

The data used in this study is available upon request from the authors.

Supplementary information

Supplementary file 1: Associations between participant factors and levels of depression, anxiety, and stress

Figure Legend

Figure 1. Depression, anxiety, and stress categories of citizens stranded abroad during COVID-19 (% of sample)

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Table 1. Characteristics of participants stranded during COVID-19

Variables		*n*	%
Sex recorded at birth		**(1054)**	
	Female	733	69.5
	Male	308	29.2
	Another term	2	.2
	Prefer not to say	11	.8
Gender		**(1054)**	
	Female	732	69.4
	Male	304	28.8
	Another term	5	.5
	Prefer not to say	13	1.2
Age		**(1054)**	
	18-29	226	21.4
	30-49	545	51.7
	50-69	262	24.9
	70+	21	1.1
Main language spoken at home		**(1054)**	
	English	940	89.2
	Other	83	7.9
	Spanish	11	1.0
	Urdu	7	.7
	French	7	.7
	Chinese	6	.6
Highest level of education		**(1054)**	
	Tertiary education	956	90.7
	Secondary education	91	8.6
	Primary education	5	.5
	No formal education	2	.2
Current employment situation		**(1250)**	
	Working now for pay	620	56.0
	Unemployed	240	21.7
	Other	95	8.6
	Student	88	7.9
	Live with parents/guardians	86	8.0
	Stay at home parent/caregiver	84	7.6
	Retired	82	7.4
	Volunteer	23	2.1
	Unable to work due to disability or illness	18	1.6
Ethnicity	**(1054)**		
	North-West European	462	43.8
	Oceanian	242	23
	Unsure	134	12.7

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	South-East Asian	70	6.6
	Southern and Eastern European	68	6.5
	Southern and Central Asian	27	2.6
	People of the Americas	26	2.5
	North-East Asian	11	1.0
	North African and Middle Eastern	10	.9
	Sub-Saharan African	4	.4
Usual country of residence		**(1341)**	
	WPR	1011	75.4
	EUR	176	13.1
	AMR	93	6.9
	SEAR	29	2.2
	EMR	25	1.9
	AFR	7	.5
Country where stranded		**(1341)**	
	EUR	608	45.3
	WPR	311	23.2
	AMR	238	17.7
	EMR	79	5.9
	SEAR	78	5.8
	AFR	27	2.0
Initial reason for leaving country of residence		**(1245)**	
	Long-term employment	550	44.2
	Other	272	21.8
	Visiting family or friends	260	20.9
	Travel to study overseas	72	5.8
	Travel for business	54	4.3
	Tourism	37	3.0

AFR, African Region; AMR, Region of the Americas; SEAR, South-East Asian Region; EUR, European Region; EMR, Eastern Mediterranean Region; WPR, Western Pacific Region

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Table 2. Travel experiences of participants stranded abroad during COVID-19

Variables		*n*	%
Time stranded abroad		**(1341)**	
	<1 month	89	6.6
	1-2 months	91	6.8
	2-3 months	128	9.5
	3-5 months	98	7.3
	>5 months	853	63.6
	No wait	82	6.1
Number of flight cancellation/changes		**(1245)**	
	Not applicable	319	25.6
	0 changes	152	12.2
	1 cancellation or delay	245	19.7
	2 cancellation or delay	196	15.7
	3 cancellation or delay	147	11.8
	4 cancellation or delay	65	5.2
	5 cancellation or delay	31	2.5
	>5 cancellations or delays	90	7.2
Experiences while trying to return		**(1245)**	
	Limit on the number of people who could enter the country	740	59.4
	Inability to book a flight	671	53.9
	Flight cancellation	660	15.3
	COVID-19 testing requirements prior to flying	281	22.6
	Other	229	18.4
	Separation from family/companion	**172**	13.8
	Visa issues	147	11.8
	Delays during transit	44	3.5
Current situation		**(1245)**	
	Booked a flight/waiting for flight availability	357	26.6
	Unable to return but have decided to stay	352	26.2
	Returned to country of residence after delays	323	24.1
	Other	295	22
	Returned to country of residence after being stuck in transit	14	1

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Table 3. Financial and employment characteristics of participants stranded abroad during COVID-19

Variables		*n*	%
Addressing financial stress		**(763)**	
	Received financial support from family or friends	354	46.4
	Borrowed money from a bank	58	7.6
	Received a government loan to cover your living costs	14	1.8
	Received a government loan to cover the cost of a flight home	8	1
	Accessed emergency financial support from the organisation or services in the country you were stuck	43	5.6
	Received financial support from an insurance company	6	.8
	Received financial support from your employer	39	5.1
	Applied but did not receive a government loan	39	5.1
	Personal savings	47	6.2
	Early withdrawal of superannuation	27	3.5
	Other	128	16.8
Current employment situation		**(1250)**	
	Working now for pay	620	56.0
	Unemployed	240	21.7
	Retired	82	7.4
	Student	88	7.9
	Unable to work due to disability or illness	18	1.6
	Volunteer	23	2.1
	Stay at home parent/caregiver	84	7.6
	Other	95	8.6
Employment change while abroad		**(717)**	
	Worked remotely	123	17.2
	Lost job	119	16.6
	Stood down, not working for pay, but not fired	45	6.3
	Pay cut	32	4.5
	Reduction of hours	63	8.8
	Not working but receiving government assistance	27	3.8
	Back in paid work	31	4.3
	Resigned	77	10.7
	Contract not renewed	69	9.6
	Increase in hours	18	2.5
	Other	113	15.8

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Table 4. Predictors of moderate to extremely severe depression, anxiety, and stress in participants stranded abroad during COVID-19 (n=956)

Variables	Depression				Anxiety				Stress			
	OR	95% C.I		*p*	OR	95% C.I		*p*	OR	95% C.I		*p*
Age (yrs)				**.005**				**.030**				**.007**
18-29*												
30-49	.535	.366	.780		.646	.461	.906		.644	.452	.917	
50-69	.542	.350	.839		.563	.375	.845		.579	.383	.873	
>69	.303	.097	.945		.767	.238	2.407		.174	.046	.660	
Perceived risk of COVID-19				**.026**				**.003**				**.003**
Not applicable	1.595	.384	6.627		1.608	.433	5.840		2.317	.573	9.368	
Low risk*												
Moderate risk	1.099	.723	1.672		.700	.456	1.076		1.042	.691	1.571	
High risk	1.617	1.147	2.279		1.364	.973	1.912		1.708	1.223	2.387	
Time stranded				**<.001**				**<.001**				**.003**
No wait	.893	.399	1.997		.697	.308	1.579		.936	.421	2.082	
<1 month	.357	.174	.735		.332	.149	.738		.459	.224	.940	
1-2 months	.396	.201	.781		.420	.208	.849		.475	.242	.932	
2-3 months	.587	.313	1.101		.571	.303	1.078		.702	.377	1.308	
3-5 months*												
>5 months	1.281	.770	2.129		.984	.601	1.610		1.062	.647	1.743	
Homelessness, ref.no	1.522	.947	2.444	.082	1.392	.920	2.105	.118	1.186	.767	1.834	.444
Employment Change, ref.no	1.405	1.040	1.900	**.027**	1.569	1.177	2.092	**.002**	1.564	1.171	2.090	**.002**
Financial Stress, ref.no	1.501	1.103	2.041	**.010**	1.728	1.268	2.345	**<0.001**	1.682	1.246	2.269	**<.001**

*Reference variable

OR, log odds ratio controlling for other variables in the model; EXP (B), adjusted odds ratio; C.I, confidence interval; *p*, probability value (statistically significant <.05).

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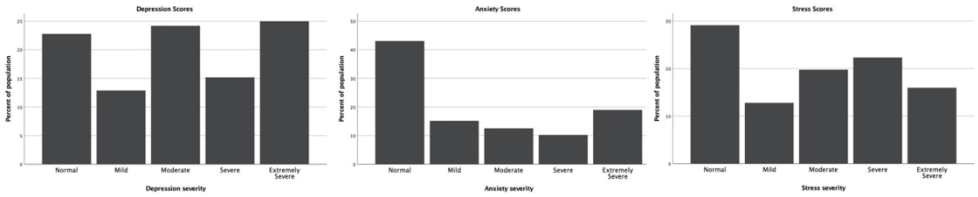

Depression, anxiety, and stress categories of citizens stranded abroad during COVID-19 (% of sample)

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Supplementary file 1. Associations between participant factors and levels of depression, anxiety, and stress

	Depression							
Variables	**Normal**	**Mild**	**Moderate**	**Severe**	**Extremely Severe**	**χ 2**	**df**	***p***
Age						33.482	12	<.001
18-29	38 (15.4%)	19 (14.4%)	55 (21.7%)	41 (25.8%)	72 (27.8%)			
30-49	121 (49.2%)	79 (59.8%)	131 (51.6%)	77 (48.4%)	137 (52.1%)			
50-69	76 (30.9%)	33 (25%)	64 (25.2%)	38 (23.9%)	51 (19.4%)			
70+	11 (4.5%)	1 (0.8%)	4 (1.6%)	3 (1.9%)	2 (0.8%)			
Time stranded abroad						82.982	20	<.001
No wait	20 (7.8%)	4 (2.7%)	12 (4.4%)	6 (3.5%)	10 (3.9%)			
Up to 1 month	32 (12.4%)	16 (11%)	14 (5.1%)	5 (2.9%)	7 (2.5%)			
1-2 months	32 (12.4%)	10 (6.8%)	23 (8.4%)	7 (4.1%)	8 (2.8%)			
2-3 months	32 (12.4%)	18 (12.3%)	22 (8%)	22 (12.8%)	23 (8.1%)			
4-5 months	21 (8.1%)	15 (10.3%)	22 (8%)	15 (8.7%)	21 (7.4%)			
5+ months	121 (46.9%)	83 (56.8%	181 (66.1%)	117 (68%)	213 (75.3%)			
Financial stress						35.123	4	<.001
Yes	140 (54.3%)	85 (58.6%)	172 (63%)	109 (64.1%)	218 (77.6%)			
No	118 (45.7%)	60 (41.4%)	101 (37%)	61 (35.9%)	63 (22.4%)			
Homelessness						30.149	4	<.001
Yes	17 (6.6%)	16 (11.3%)	26 (9.7%)	16 (9.5%)	58 (20.9%)			
No	239 (93.4%)	125 (88.7%)	243 (90.3%)	152 (90.5%)	220 (79.1%)			
Employment Change						22.648	4	<.001
Yes	89 (38.2%)	45 (34.9%)	107 (43.5%)	74 (49%)	158 (55.9%)			
No	144 (61.8%)	84 (65.1%)	139 (56.5%)	77 (51%)	109 (44.1%)			
Flight changes or cancellations						36.694	24	.029
0 changes	23 (11.5%)	21 (20%)	31 (17.3%)	21 (16.9%)	26 (12.9%)			
1 cancelation or delay	70 (35%)	28 (26.7%)	48 (26.8%)	34 (27.4%)	34 (16.8%)			

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2 cancelations or delay	42 (21%)	20 (19%)	34 (19%)	30 (24.2%)	46 (22.3%)			
3 cancelations or delay	30 (15%)	18 (17.1%)	32 (17.9%)	21 (16.9%)	33 (15.8%)			
4 cancelations or delay	14 (7%)	6 (5.7%)	13 (7.3%)	6 (4.8%)	19 (9.4%)			
5 cancelations or delay	4 (2%)	3 (2.9%)	5 (2.8%)	3 (2.4%)	14 (6.4%)			
5+ cancelations or delay	17 (8.5%)	9 (8.6%)	16 (8.9%)	9 (7.3%)	34 (16.3%)			
Perceived risk of contracting COVID-19 (1-10 scale)						67.542	40	.004
1	29 (11.2%)	13 (8.9%)	21 (7.7%)	8 (4.7%)	29 (7.1%)			
2	34 (13.2%)	10 (6.8%)	12 (4.4%)	6 (3.5%)	14 (4.9%)			
3	25 (9.7%)	11 (7.5%)	21 (7.7%)	14 (8.1%)	17 (6%)			
4	13 (5%)	7 (4.8%)	12 (4.4%)	6 (3.5%)	12 (4.2%)			
5	31 (12%)	19 (13%)	21 (7.7%)	16 (9.3%)	24 (8.5%)			
6	10 (3.9%)	8 (5.5%)	19 (6.9%)	11 (6.4%)	13 (4.6%)			
7	28 (10.9%)	16 (11%)	35 (12.8%)	19 (11%)	29 (10.2%)			
8	30 (11.6%)	14 (9.6%)	35 (12.8%)	31 (18%)	40 (14.1%)			
9	14 (5.4%)	12 (8.2%)	17 (6.2%)	5 (2.9%)	21 (7.4%)			
10	42 (16.3%)	32 (21.9%)	75 (27.4%)	51 (29.7%)	83 (29.3%)			
Not Applicable	2 (0.8%0	4 (2.7%)	6 (2.2%)	5 (2.9%)	10 (3.5%)			
Access to crisis support or mental health services						3.314	4	.507
Yes	95 (36.8%)	55 (37.7%)	109 (39.8%)	63 (36.6%)	92 (32.5%)			
No	163 (63.2%)	91 (62.35)	165 (60.2%)	109 (63.4%)	191 (67.5%)			
	Anxiety							
Variables	**Normal**	**Mild**	**Moderate**	**Severe**	**Extremely Severe**	**χ 2**	**df**	***p***
Age						35.225	12	<.001
18-29	69 (15.4%)	36 (22.5%)	35 (25.7%)	36 (32.7%)	56 (25.1%)			
30-49	229 (51%)	86 (53.8%)	66 (48.55)	52 (47.3%)	112 (56.3%)			
50-69	138 (30.7%)	35 (21.9%)	32 (23.5%)	21 (19.1%)	36 (18.1%)			
70+	13 (2.9%)	3 (1.9%)	3 (2.2%)	1 (0.9%)	1 (0.5%)			

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Time stranded abroad						49.486	20	<.001
No wait	22 (4.5%)	12 (7%)	9 (6.3%)	3 (2.6%)	7 (3.3%)			
Up to 1 month	51 (10.5%)	8 (4.7%)	7 (4.9%)	3 (2.6%)	5 (2.3%)			
1-2 months	43 (8.8%)	12 (7%)	6 (4.2%)	10 (8.6%)	9 (4.2%)			
2-3 months	55 (11.3%)	20 (11.6%)	11 (7.7%)	15 (12.9%)	16 (7.4%)			
4-5 months	38 (7.8%)	15 (8.7%)	17 (12.0%)	5 (4.3%)	19 (8.8%)			
5+ months	279 (57.2%)	105 (61%)	92 (64.8%)	80 (69%)	72 (33.3%)			
Financial stress						53.944	4	<.001
Yes	258 (53.2%)	114 (66.3%)	97 (68.8%)	85 (73.3%)	172 (79.8%)			
No	227 (46.8%)	58 (33.7%)	44 (31.2%)	31 (26.7%)	44 (20.2%)			
Homelessness						18.517	4	<.001
Yes	44 (9.2%)	15 (8.9%)	16 (11.4%)	16 (13.8%)	43 (20.1%)			
No	434 (90.8%)	154 (91.1%)	124 (88.6%)	100 (86.2%)	171 (79.9%)			
Employment Change						34.917	4	<.001
Yes	156 (35.7%)	66 (44.6%)	65 (50%)	57 (52.8%)	129 (59.6%)			
No	281 (64.3%	82 (55.4%)	65 (50%)	51 (47.2%)	87 (40.4%)			
Flight changes or cancellations						29.009	24	.220
0 changes	50 (14.3%)	16 (13.7%)	19 (19.4%)	15 (17.2%)	22 (13.8%)			
1 cancelation or delay	110 (31.5%)	27 (23.1%)	21 (21.4%)	23 (26.4%)	33 (20.8%)			
2 cancelations or delay	79 (22.6%)	23 (19.7%)	15 (15.3%)	13 (14.9%)	41 (25.8%)			
3 cancelations or delay	48 (13.8%)	23 (19.7%)	22 (22.4%)	19 (21.8%)	21 (13.2%)			
4 cancelations or delay	21 (6%)	9 (7.7%)	8 (8.2%)	7 (8%)	13 (8.2%)			
5 cancelations or delay	9 (2.6%)	7 (6%)	2 (2%)	2 (2.3%)	8 (5%)			
5+ cancelations or delay	32 (9.2%)	12 (10.3%)	11 (11.2%)	8 (9.2%)	21 (13.2%)			
Perceived risk of contracted COVID-19 (1-10 scale)						81.128	40	<.001
1	47 (9.6%)	8 (4.7%)	12 (8.5%)	9 (7.8%)	18 (7%)			
2	49 (10%)	5 (2.9%)	7 (4.9%)	1 (0.9%)	16 (6.5%)			

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3	43 (8.8%)	11 (6.4%)	14 (9.9%)	6 (5.2%)	14(6.5%)			
4	20 (4.1%)	14 (8.1%)	7 (4.9%)	2 (1.7%)	7(3.3%)			
5	62 (12.7%)	13 (7.6%)	8 (5.6%)	9 (7.8%)	19 (8.8%)			
6	25 (5.1%)	13 (7.6%)	9 (6.3%)	5 (4.3%)	9(4.2%)			
7	62 (12.7%)	15 (8.7%)	13 (9.2%)	17 (14.7%)	20(9.3%)			
8	54 (11.1%)	32 (18.6%)	20 (14.1%)	15 (12.9%)	29(13.5%)			
9	24 (4.9%)	17 (9.9%)	10 (7%)	7 (6%)	11 (5.1%)			
10	92 (18.9%)	39 (22.7%)	39 (27.5%)	41 (35.3%)	72(33.5%)			
Not applicable	10 (2%)	5 (2.9%)	3 (2.1%)	4 (3.4%)	5(2.3%)			
Access to crisis support or mental health services						2.210	4	.697
Yes	188 (38.5%)	59 (34.3%)	49 (34.5%)	38 (32.8%)	80(37.2%)			
No	300 (61.5%)	113 (65.7%)	93 (65.5%)	78 (67.2%)	135 (62.8%)			
	Stress							
Variables	**Normal**	**Mild**	**Moderate**	**Severe**	**Extremely Severe**	**χ 2**	**df**	***p***
Age						51.326	12	<.001
18-29	47 (15%)	23 (17.2%)	44 (21.3%)	69 (29.9%)	41(25.4%)			
30-49	154 (49.2%)	76 (56.7%)	106 (51.2%)	113 (48.9%)	90(56.8%)			
50-69	96 (30.7%)	34 (25.4%)	56 (27.1%)	46 (19.9%)	30(17.8%)			
70+	16 (5.1%)	1 (0.7%)	1 (0.5%)	3 (1.3%)	0			
Time stranded abroad						50.180	20	<.001
No wait	22 (6.7%	3 (2.1%)	12 (5.4%)	12 (4.7%)	4(2.2%)			
Up to 1 month	38 (11.5%)	9 (6.2%)	9 (4%)	13 (5.1%)	5(2.8%)			
1-2 months	27 (8.2%)	15 (10.3%)	16 (7.1%)	16 (6.3%)	6(3.3%)			
2-3 months	36 (10.9%)	15 (10.3%)	23 (10.3%)	30 (11.9%)	13(7.2%)			
4-5 months	28 (8.5%)	11 (7.6%)	17 (7.6%)	27 (10.7%)	11(6.1%)			
5+ months	179(54.2%)	92 (63.4%)	147 (65.6%)	155 (61.3%)	142 (78.5%)			
Financial stress						40.368	4	<.001
Yes	176 (53.5%)	85 (58.6%)	146 (65.8%)	174 (69%)	143(79.9%)			

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No	153 (46.5%)	60(41.4%)	76 (34.2%)	78 (31%)	36(20.1%)			
Homelessness						13.393	4	.010
Yes	28 (8.5%)	15 (10.7%)	24 (10.9%)	32 (13%)	34 (19.3%)			
No	300 (91.5%)	125 (89.3%)	197 (89.1%)	215 (87%)	142 (80.7%)			
Employment Change						31.232	4	<.001
Yes	101 (33.8%)	50 (40.7%)	96 (47.1%)	113 (51.4%)	92 (58.1%)			
No	198 (66.2%)	73 (59.3%)	108 (52.9%)	107 (48.6%)	66 (41.9%)			
Flight changes or cancellations						27.073	24	.301
0 changes	28 (11.5%)	15 (15%)	28 (18.8%)	31 (17%)	26 (14.8%)			
1 cancelation or delay	79 (32.4%)	26 (26%)	43 (28.9%)	42 (23.1%)	31 (17.8%)			
2 cancelations or delay	56 (23%)	21 (21%)	31 (20.8%)	36 (19.8%)	35 (20%)			
3 cancelations or delay	36 (14.8%)	18 (18%)	24 (16.1%)	32 (17.6%)	30 (17%)			
4 cancelations or delay	16 (6.6%)	6 (6%)	11 (7.4%)	14 (7.7%)	14 (8.1%)			
5 cancelations or delay	9 (3.7%)	2 (2%)	2 (1.3%)	7 (3.8%)	8 (5.9%)			
5+ cancelations or delay	20 (8.2%)	12 (12%)	10 (6.7%)	20 (11%)	28 (16.3%)			
Perceived risk of contracted COVID-19 (1-10 scale)						66.487	40	.005
1	35 (10.6%)	11 (7.6%)	14 (6.3%)	16 (6.3%)	14 (8.3%)			
2	34 (10.3%)	10 (6.9%)	14 (6.3%)	11 (4.3%)	7 (3.9%)			
3	28 (8.5%)	14 (9.7%)	18 (8%)	20 (7.9%)	8 (4.4%)			
4	17 (5.2%)	7 (4.8%)	7 (3.1%)	13 (5.1%)	6 (3.3%)			
5	40 (12.1%)	15 (10.3%)	22 (9.8%)	19 (7.5%)	14 (8.35)			
6	21 (6.4%)	6 (4.1%)	12 (5.4%)	13 (5.1%)	9 (5%)			
7	34 (10.3%)	26 (17.9%)	24 (10.7%)	27 (10.7%)	16 (8.8%)			
8	41 (12.4%)	18 (12.4%)	35 (15.6%)	30 (11.9%)	26 (14.4%)			
9	14 (4.2%)	10 (6.9%)	20 (8.9%)	18 (7.1%)	7 (3.9%)			
10	62 (18.8%)	25 (17.2%)	53 (23.7%)	78 (30.8%)	65 (35.9%)			
Not applicable	4 (1.2%)	3 (2.1%)	5 (2.2%)	8 (3.2%)	7 (3.9%)			

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Access to crisis support or mental health services						3.371	4	.498
Yes	113 (34.2%)	60 (41.4%)	82 (36.6%)	98 (38.7%)	64 (33.7%)			
No	217 (65.8%)	85 (58.6%)	142 (63.4%)	155 (61.3%)	130 (66.3%)			

χ 2 , chi squared; df, degrees of freedom; *p*, probability value (statistically significant <.05).

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STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	3
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	4
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	4-5
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	*4-5*
Bias	9	Describe any efforts to address potential sources of bias	5
Study size	10	Explain how the study size was arrived at	
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	5
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	5
		(*b*) Describe any methods used to examine subgroups and interactions	5
		(*c*) Explain how missing data were addressed	5
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	5
		(*e*) Describe any sensitivity analyses	5
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	6
		(b) Give reasons for non-participation at each stage	6
		(c) Consider use of a flow diagram	NA
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	6
		(b) Indicate number of participants with missing data for each variable of interest	Tables
Outcome data	15*	Report numbers of outcome events or summary measures	6-7
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	6-7

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		(*b*) Report category boundaries when continuous variables were categorized	
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	6-7
Discussion			
Key results	18	Summarise key results with reference to study objectives	8
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	10-11
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	8-11
Generalisability	21	Discuss the generalisability (external validity) of the study results	8-11
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	NA

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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International cross-sectional study examining the psychological and financial impact of travel restrictions on citizens and permanent residents stranded abroad during the COVID-19 pandemic

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International cross-sectional study examining the psychological and financial impact of travel restrictions on citizens and permanent residents stranded abroad during the COVID-19 pandemic

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ABSTRACT

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Objectives: This study aimed to evaluate the psychological and financial distress reported by citizens and permanent residents stranded abroad due to international travel restrictions introduced in response to the COVID-19 pandemic.

Design: An international cross-sectional study.

Setting: A primary analysis of data collected between July and September 2021 through an online survey targeting individuals stranded abroad, and unable to return to their country of residence due to international travel restrictions.

Respondents: A total of 1054 individuals aged 18-84.

Data analysis: Multivariable logistic regression models were used to explore the relationship between higher levels of depression, anxiety and stress and participant variables.

Outcome measures: The survey answered questions regarding COVID-19 travel restriction-related impacts; personal stress, anxiety, and depression (using the validated DASS-21tool); as well as impacts on housing and financial security and demographic data.

Results: A total of 75.4% of respondents reported wanting to return to the Oceania region (75.4%), with 45% stranded in Europe. 64.2% reported financial distress while stranded abroad. 64.4% ($\bar{x}$=9.43, SD=5.81) reported moderate-to- extremely severe (based on the DASS-21 classification) levels of depression, 41.7% for anxiety ($\bar{x}$=5.46, SD=4.74), and 58.1% for stress ($\bar{x}$=10.64, SD=5.26). Multivariable analysis indicated that financial stress, an employment change, being <30yrs, having a high perceived risk of contracting COVID-19 abroad and being stranded for >2 months, were significantly related to scores of moderate-to-extremely severe depression, anxiety, and stress.

Conclusion: The study is among the first to explore the psychological and financial distress-related impacts associated with being stranded abroad due to COVID-19 travel restrictions. It highlights a range of unintended consequences that arise from pandemic-related travel restriction, identifies the health and social needs for a particularly vulnerable population, and provides clues as to the types of support that may be adopted to best support them.

STRENGTHS AND LIMITATIONS OF THIS STUDY

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- This study collected novel data on the psychological and financial distress-related impacts associated with being stranded abroad due to COVID-19 travel restrictions
- Analysing results based on the DASS-21 tool revealed high prevalence of moderate-to-extremely severe depression, anxiety, and stress.
- Multivariable analyses were conducted on respondents' depression, anxiety, and stress scores to explore predictor and protective factors.
- Psychological data were collected on self-reported scales, which may lead to responder bias.
- Participant recruitment relied on convenience sampling and may not have captured travellers from all relevant countries.

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BACKGROUND

In response to the COVID-19 pandemic, most countries around the world have implemented some level of international travel restriction or complete border closures (1-3). As of February 2020, many countries had commenced repatriation of their citizens stranded abroad. By the end of 2020, some countries like Japan and Spain claimed to have completely repatriated every citizen that wanted to return. However, reports continue to suggest stranded travellers were still trying to get to their country of residence (referred to as 'home') 20 months into the COVID-19 pandemic despite many countries reopening borders (4, 5). In September 2021, every country globally has some level of travel restrictions (except those without data), with many countries still maintaining total border closures, while others had in place quarantine systems, screening measures and travel bans on high-risk regions (6). Factors impacting on a person's ability to return to their home have included countries placing limits on the number of passengers that can enter the country, caps on the hotel quarantine capacities, the cost of travel and hotel quarantine, and in some cases having restrictions on flights from certain high-risk countries. Our previous study suggested that the support available to those who were stranded abroad was limited, and in some cases difficult to access and comprehend (7). Support provided by countries has varied from repatriation flights, emergency accommodation, mental health and medical assistance, emergency call lines and financial assistance. However, of the countries that were reviewed, we were unable to identify any one country providing all the different support types listed.

Public commentary through news and social media has hinted at the level of psychosocial impact on citizens stranded abroad. These articles suggest that many of these travellers: have felt abandoned by their governments, had little financial support, and for some, experienced depression and homelessness (8-10). While the findings from many COVID-19 studies have reported high levels of psychological distress in nearly all populations, the focus of these studies has been on domestic populations, like healthcare and frontline workers, students and those in lockdown and quarantine (10-19). One study, with similar aims to the present study, found 63% of Saudi citizens living abroad as students during COVID-19 experienced 'psychiatric' distress symptoms (20).

Even though travel restrictions have been in place since early 2020, there is currently limited understanding of the level of psychological distress that has been experienced by those stranded abroad wanting to return. This study examined the impacts of travel restrictions on people stranded abroad, who were unable to return to their country of citizenship/residence during the COVID-19 pandemic. We aimed to 1) measure the prevalence of psychological

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impact associated with being stranded overseas due to covid-related travel restrictions and 2) identify demographic and circumstantial factors associated with severe psychological impact.

METHODS

Population and procedures

An online survey was created and administered anonymously using the *Qualtrics* (21) survey platform, with respondents recruited through a variety of social media channels. Respondents were those people who were either still stranded away from their country of residence/home or had been stranded at some point since the commencement of the COVID-19 pandemic. There were no limitations placed on the country of residence, nor the length of time the person had been stranded for. To meet the inclusion criteria, respondents had to self-identify as having attempted to return to their country of residence but have had their travel plans changed. The survey was open between 20 July 2021 and 24 September 2021. Respondents unique IP addresses prevented duplicate entries. Ethical approval for this study was granted by the UNSW Human Research Ethics Committee (#210418). All respondents indicated their consent to participate. This study did not receive any funding.

Patient and Public Involvement

No patient involved

Survey instruments and measures

Demographics: included gender, age, level of education, ethnicity, employment status, history of chronic illness, and living status. Ethnicity was classified based on the nine broad groups according to the Australian Standard Classification of Cultural and Ethnic Groups (22).

Travel experiences: Respondents were asked where they were stranded abroad and where they intended to return to, and this data was recoded into geographic groups based on the World Health Organisation regions (23). Questions focused on their current situation (whether they had returned, were still stranded abroad awaiting return or still abroad but had decided to stay), flight cancellations/delays, length of time waiting to return and their experiences with travel.

Mental wellbeing: The depression, anxiety, and stress scale (DASS-21) was used in this study (24). The DASS-21 is a validated self-report tool, previously used in COVID-19 research studies (14, 25), containing 21 items assessing scores of depression, anxiety, and stress symptoms (7 items each). Respondents were asked to reflect on when they were stranded abroad (for respondents who had already returned) or reflecting on the last two weeks and rate each statement on a 4-point Likert scale from 0 (unsure/do not recall; did not apply to me

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at all) to 3 (applied to me very much, or most of the time). Scores in each sub section are then multiplied by 2 to give a final score categorising the depression, anxiety, and stress into normal (Depression: 0-9; Anxiety: 0-7; Stress: 0-14), mild (Depression: 10-13; Anxiety: 8-9; Stress: 15-18), moderate (Depression: 14-20; Anxiety: 10-14; Stress: 19-25), severe (Depression: 21-27; Anxiety: 15-19; Stress: 26-33), or extremely severe (Depression: 28+; Anxiety: 20+; Stress: 34+). Higher scores reflect increased emotional and psychological distress.

As we suspected some potential respondents having returned home already and could be potentially reflecting further than 2 weeks, we included an additional option of "unsure/do not recall", with any respondent who selects this option to be removed for DASS21 analysis, which would allow for removal of recall bias during the analyses phase. Respondents were asked whether they had access to crisis support or mental health services while abroad and if 'yes', whether they had used this service or support. Finally, respondents reported their perceived risk of contracting COVID-19 both in the country where they are/were stranded and the country where they had or were waiting to return to (Scale of 1-10; 1 being no risk and 10 being high risk).

Financial wellbeing: Respondents were initially asked whether they felt financial stress while stranded abroad (yes/no), then if 'yes' were asked how they addressed the financial stress (receiving financial support from family, government loans, bank credit, or social services). Questions on employment situation and changes while abroad were asked along with a question on whether the participant experienced homelessness while abroad. Homelessness was defined as a period where respondents did not have somewhere to stay/live.

Statistical analyses

We aimed to collect responses from a minimum of 1,200 people to allow analysis with a margin of error of approximately 3.2%. Descriptive analysis involved the calculation of means, standard deviation, confidence interval and standard errors. Chi-square test of independence were first used to compare categorical variables. Independent variables that showed a significant association with DASS severity scores at a $p<.2$ level was included in the model as predictor variables. The DASS scores were dichotomised to reflect either no/mild symptom severity or moderate to extremely severe. Multivariable logistic regression was then performed to analyse the effect of age, perceived risk of contracting COVID-19 while stranded, financial stress, time stranded, employment change and homelessness on predicting moderate to extremely DASS. No multicollinearity amongst variables was

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identified. P values of <.05 was considered statistically significant. All data analyses were conducted using SPSS (26).

RESULTS

Respondent characteristics

A total of 1054 respondents completed the full survey, while a further 296 completed over 50% of the questions and were included in the descriptive analysis but excluded from regression analysis. See Figure 1 for a full breakdown on inclusions. Demographic information is provided in Table 1. The mean age was 41.09±13.08, with 69.5% (733/1054) being female, 43.8% (462/1054) of north-west European ethnicity, while most had a tertiary education (90.7%, 956/1054) and were stranded in the European Region (EUR) (45.3%, 608/1341) and were trying to return to the Western Pacific Region (WPR) (75.4%, 1011/1341).

Approximately 25% (303/1214) reported a historical or current COVID-19 infection, and of those the majority rated a 'mild' symptom severity (85.1%, 258/303). Respondents' mean overall level of perceived risk of contracting COVID-19 while abroad (on a scale of 1 to 10, where 1 = no risk, and 10=high risk) was 6.64 (n=1182, *SD*=2.85), with 24.7% (300/1214) rating the perceived risk while abroad at high risk (10). Comparatively, the overall mean level of perceived risk of contracting COVID-19 in the country where respondents had returned to was 4.11 (n=673, *SD*=2.81), with only 11.9% (54/673) rating the perceived risk at 'home' as high risk.

Travel experiences

Initially 44% (550/1245) of respondents had left their country of residence to take up long-term employment, with over 60% stranded abroad for more than 5 months (63.6%, 854/1341), with 26.6% (357/1245) either having had booked a flight or awaiting flight availability. Refer to table 2 for a full breakdown of respondents experiences and current situation while stranded abroad.

Mental wellbeing

Figure 2 presents the respondents (*n*=1133) self-reported depression, anxiety, stress symptom severity score categories based on the DASS-21 tool. Of the respondents, 64.4% scored moderate to extremely severe depression symptoms ($\bar{x}$=18.87, SD=11.62), 41.7% scoring moderate to extremely severe anxiety symptoms ($\bar{x}$=10.91, SD=9.47), and 58.1% scoring between moderate to extremely severe stress symptoms ($\bar{x}$=21.48, SD=10.52).

Many reported no access to crisis support or mental health services while abroad (63.5%, 719/1133), and of those that did have access, only 37.9% (157/414) utilised the services. A

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total of 12% (133/1112) experienced a period of homelessness while stranded abroad. Of those that were willing to share their experiences (n = 94/133), commonly noted situations included living in temporary accommodation (32%, 30/94), sleeping on the couch or in a spare bedroom at a friend/family members place (32%, 30/94), and staying in emergency accommodation (including homeless shelters) (17%, 16/94). Less common experiences were those that lived on the street, trains, at the airport, in cars, in tents (<20%, 18/94). Two respondents disclosed having experienced a sexual assault while staying at a homeless shelter.

Financial wellbeing

Financial distress was reported in 64.2% (723/1127), and 45% (433/1127) reported a change in employment. A breakdown of ways in which respondents sought to address financial distress along with employment changes and current employment situation are reported in Table 3.

Factors associated with and predictors of depression, anxiety, and stress

Chi square analyses revealed significant associations between respondents DASS categories and their age, time stranded abroad, financial stress, homelessness, employment change, and their perceived risk of contracting COVID-19 (on a scale from 1 to 10, with 1-3 being considered low risk, 4-6 moderate risk and 7-10 high risk). No associations were found between DASS severity categories and having access to crisis support or mental health services (see Supplementary file 1). For depression, logistic regression identified financial stress, employment change, and a high perceived risk of contracting COVID-19 as predictors of moderate to extremely severe depression. Overall, the model correctly discriminated 67.7% of cases and Nagelkerke R^2 indicated a 14% variation of depression explained by the model. For anxiety, logistic regression identified financial stress, employment change, and a high perceived risk of contracting COVID-19, as predictors of moderate to extremely severe anxiety. Overall, the model correctly discriminated 64.5% of cases and Nagelkerke R^2 indicated a 13% variation of anxiety explained by the model. Finally for stress, logistic regression identified financial stress, employment change, and a high perceived risk of contracting COVID-19, as predictors of moderate to extremely severe stress. Overall, the model showed goodness of fit to the data ($\chi^2(14) = 95.772$, $p<.001$), correctly discriminated 63.6% of cases and Nagelkerke R^2 indicated a 13% variation of stress explained by the model. Table 4 presents results of the multivariable logistic regression. Being 30 years or older and stranded for 2 months or less was associated with decreased odds of moderate to extremely severe depression, anxiety, and stress.

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DISCUSSION

This study evaluated the psychological and financial distress of individuals stranded abroad during the COVID-19 pandemic and highlights the importance of providing additional support to this vulnerable group in future public health events. Amongst our respondents we found that over half had been stranded for longer than five months, with the majority having more than one flight cancellation or change. Our results confirm sentiments shared on social media by people stranded abroad, that reflect experiences of having no financial support, depression, homelessness and a general feeling of abandonment by their governments (8-10). Given the continued flight changes and delays (incurring additional costs) in the population of individuals stranded abroad, along with changes to employment, it is perhaps not surprising that we documented a high level of financial distress (64.2%), employment changes (45%), and experiences of homelessness (12%). Our findings align with results from non-travel related COVID studies which have indicated an increase in financial distress (17), increases in experiences of homelessness (27) and growing employment changes (28) during the pandemic. Comparatively, we reported much higher findings compared to a survey of the general population conducted within the first 6 months of the pandemic, finding that 30% of Australians were financially stressed because of the pandemic (29). This difference could be explained by those stranded abroad having different elements of uncertainty (additional flight costs, additional rent, and expenses due to the length of time stranded, and uncertain employment) compared to the general population.

Based on our findings, we recommend policymakers prioritise increasing the availability of financial assistance in the form of government grants or loans for living and flight costs incurred due to being stranded abroad, or alternatively providing the option to access social support while abroad if an individual would have been eligible had they not been abroad. Furthermore, considering the proportion of people who reported experiencing homelessness, the cases of sexual assault within homeless shelters, and previous research indicating a lack of emergency accommodation options for citizens abroad during COVID-19 (7), it is recommended that policymakers provide a solution to this issue. Whether it be through financial assistance or an emergency accommodation program similar to those that the French and Spanish governments introduced, where citizens residing permanently abroad have the option of offering accommodation or a room to citizens who are stranded, governments have to prioritise a solution and effectively communicate this support package (7).

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At this stage in the pandemic, it is almost indisputable that COVID-19 has had a psychological impact on populations around the world, whether it be healthcare workers, people in lockdown or quarantine, or specific countries or communities, the stressors were all encompassing (11-14, 30, 31). Our findings reflect much higher incidence of moderate to extremely severe depression (64.4%), anxiety (41.7%), and stress (58.1%), compared to domestic populations around the world (25). Previous research show lower DAS severity scores (25), especially when comparing our results to studies exploring psychological impacts of COVID-19 on healthcare workers (32, 33) and domestic students (34, 35). One study observing the psychological correlates of COVID-19 on the general population in Austria, reported drastically lower scores of depression (21.6%), anxiety (28.6%) and stress (28%), and found that 'frequent contact with family or friends' was shown to be a protective factor (25).

However, research on international students during COVID-19, have reflected high DASS severity, aligned with our study findings (20, 36). Possible reasons for these differences could be the parallels between international student experiences and those stranded, both living abroad and arguably away from their immediate social support network (family). A range of factors contributed to the psychological wellbeing of individuals in this study. Having financial stress, an employment change and having a high perceived risk of contracting COVID-19 were all associated with predicting moderate to extremely severe depression, anxiety, and stress. Additionally, the length of time stranded was also associated with higher severity of DASS, with >5months for depression and stress, and 3-5months for anxiety. These results are not surprising considering the literature shows that many stressors, like financial distress, fear of COVID-19 infection, loneliness, inadequate information, and employment issues have all presented as predictors of poor mental health and in the case of financial distress, can go further than predicting depression to suicidal thoughts and behaviours (31, 37). Unique to this study, however, is the finding that the longer an individual is stranded abroad the more likely they are to present with moderate to severe DAS symptoms.

Interestingly, of the age categories in this investigation, respondents >69yrs had lower scores of depression, anxiety, and stress, inconsistent with research conducted in Spain and Canada suggesting increased DASS scores in elders (38, 39). This, as was noted by the authors of the Sightlines Project (40), may be due to older people being more financial secure than other age groups. It may also reflect that older people were less likely to have insecurity associated with employment or have younger dependent family members to provide direct care to. This

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may have provided more opportunity for flexibility in their travel plans. These results reflecting high severity of DASS in those stranded abroad, provides both current and future direction for policymakers. We recommend policymakers provide adequate mental health interventions be available to those stranded abroad, either online or face-to-face where possible through a local consulate.

It is hard to deny that people have been deprived of the ability to return to their country of citizenship or permanent residence, as shown by the 63.3% of our respondents being stranded abroad for longer than 5 months. Addressing public health threats from a health security perspective has already increased fears that it legitimises government actions, potentially undermining personal sovereignty, and impeding human rights (41). A commonly cited human rights treaty in response to imposed restrictions is Article 12 (42) of the International Covenant on Civil and Political Rights (ICCPR), a treaty with 74 signatories and 173 parities which states that "No one shall be arbitrarily deprived of the right to enter his own country" (42).

The most frequently mentioned human rights breach was the Australian government imposing not only a complete ban on incoming flights from India, but potential criminal penalties to Australian citizens or permanent residents of up to five years imprisonment, and/or fines up to $66000 (AUD), for attempting to enter Australia from India through a third country (43). Mostly in reference to breaching Article 12 (42) of the International Covenant on Civil and Political Rights (ICCPR), this ban, implemented under the *Biosecurity Act 2015(44)*, between April and May 2021, has been labelled a 'racist rights breach' (45), with the Australian Human Rights Commission approaching the federal government directly with their concerns (43). Due to impacts of ongoing border closures and individuals struggling to return home, as further highlighted in this study where the majority of respondents were trying to return to, Australian citizens stranded abroad submitted a human rights complaint to the United Nations Human Rights Committee under the ICCPR, with the UN Human Rights Committee already successfully requesting to the Australian Government the prompt repatriation of two Australians in April 2021 (46).

Due to the results of our study alongside the probable human rights breaches, we recommend policymakers seriously reconsider current and future restriction of movement of citizens and permanent residents returning home who are at risk of financial distress and severe DASS the longer that they are stranded for. With international borders reopening around the world, some being restricted for nearly 20 months, it is critical to not only look at the impact of travel restrictions from the perspective of reducing infectious disease importations, but also

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from the perspective of those stranded abroad, who were arguably one of the most impacted by them. In doing so, policymakers can determine where further support is needed in future emergency situations resulting in people stranded abroad.

Limitations

This work is not without limitations. Firstly, like other cross sectional survey studies, it lacks a longitudinal follow up on respondents. Secondly, the self-report questionnaire for psychological symptoms raises possible selection bias and subjectivity, however our sample size being large, and the addition of an optional 'do not recall' response should mitigate certain bias. Thirdly, we were unable to capture the specific immigration status of those returning, i.e., whether they were citizens, permanent residents, or short-term visa holders. Finally, we did not examine pre-existing mental health conditions which could prove to be a confounding factor, and there was an over representation of women, those returning to the western pacific region and respondents with an academic background, possible due to convenience sampling issues and survey distribution originating in Australia, which may not fully represent the population of people who were stranded abroad. The study did not collect information on treatment of anxiety, stress, or depression, nor did we collect data on suicide ideation. Notwithstanding the previously mentioned limitations, findings from this study provide insights not previously reported into the psychological and financial impacts and support needed for individuals stranded abroad due to COVID-19 travel restrictions. These insights will be valuable for policy makers as they design and deliver support programs in response and prepare for future events.

Conclusion

This research suggests that being stranded abroad during COVID-19 may lead to not only an increase in financial stress, but quite severe depression, anxiety, and stress. Our findings show that being young, stranded abroad for longer, having a high perception of infection risk, experiencing employment changes and financial stress are all associated with increased severity of depression, anxiety, and stress. Respondents reported that lack of mental and social health support while stranded. This indicates that there are gaps in services available for this vulnerable population or lack of communication as to how to access them; both issues that need to be resolved.

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ABBREVIATIONS

AFR: African region

AMR: Region of the Americas

COVID-19: Coronavirus disease of 2019

DAS: Depression, anxiety, and stress

DASS-21: The 21-item depression, anxiety, and stress scale

EMR: Eastern Mediterranean region

EUR: European region

SEAR: South-East Asian region

WPR: Western Pacific region

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DECLARATIONS

Ethics approval and consent to participate

Ethical approval for this study was granted by the UNSW Human Research Ethics Committee (#210418). All respondents were anonymous and indicated their consent to participate.

Competing interests

The authors declare that they have no competing interests.

Contribution statement

PM conducted data collection, data analysis, manuscript writing and contributed to study design. AC, MS and HS conceived study design, interpretation of the data and were involved with manuscript writing and had final oversight. KB supported the statistical analysis of the data and ST supported the interpretation and write up of the findings. All authors read and approved the final manuscript.

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Not applicable

Data sharing

The data used in this study is available upon request from the authors.

Supplementary information

Supplementary file 1: Associations between participant factors and levels of depression, anxiety, and stress

Figure Legend

Figure 1. Flowchart of participant inclusion

Figure 2. Depression, anxiety, and stress categories of citizens stranded abroad during COVID-19 (% of sample)

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Table 1. Characteristics of respondents stranded during COVID-19

Variables		*n*	%
Sex recorded at birth		**(1054)**	
	Female	733	69.5
	Male	308	29.2
	Another term	2	.2
	Prefer not to say	11	.8
Gender		**(1054)**	
	Female	732	69.4
	Male	304	28.8
	Another term	5	.5
	Prefer not to say	13	1.2
Age		**(1054)**	
	18-29	226	21.4
	30-49	545	51.7
	50-69	262	24.9
	70+	21	1.1
Main language spoken at home		**(1054)**	
	English	940	89.2
	Other	83	7.9
	Spanish	11	1.0
	Urdu	7	.7
	French	7	.7
	Chinese	6	.6
Highest level of education		**(1054)**	
	Tertiary education	956	90.7
	Secondary education	91	8.6
	Primary education	5	.5
	No formal education	2	.2
Current employment situation		**(1250)**	
	Working now for pay	620	56.0
	Unemployed	240	21.7
	Other	95	8.6
	Student	88	7.9
	Live with parents/guardians	86	8.0
	Stay at home parent/caregiver	84	7.6
	Retired	82	7.4
	Volunteer	23	2.1
	Unable to work due to disability or illness	18	1.6
Ethnicity	**(1054)**		
	North-West European	462	43.8
	Oceanian	242	23
	Unsure	134	12.7

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	South-East Asian	70	6.6
	Southern and Eastern European	68	6.5
	Southern and Central Asian	27	2.6
	People of the Americas	26	2.5
	North-East Asian	11	1.0
	North African and Middle Eastern	10	.9
	Sub-Saharan African	4	.4
Usual country of residence		**(1341)**	
	WPR	1011	75.4
	EUR	176	13.1
	AMR	93	6.9
	SEAR	29	2.2
	EMR	25	1.9
	AFR	7	.5
Country where stranded		**(1341)**	
	EUR	608	45.3
	WPR	311	23.2
	AMR	238	17.7
	EMR	79	5.9
	SEAR	78	5.8
	AFR	27	2.0
Initial reason for leaving country of residence		**(1245)**	
	Long-term employment	550	44.2
	Other	272	21.8
	Visiting family or friends	260	20.9
	Travel to study overseas	72	5.8
	Travel for business	54	4.3
	Tourism	37	3.0

AFR, African Region; AMR, Region of the Americas; SEAR, South-East Asian Region; EUR, European Region; EMR, Eastern Mediterranean Region; WPR, Western Pacific Region

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Table 2. Travel experiences of respondents stranded abroad during COVID-19

Variables		*n*	%
Time stranded abroad		**(1341)**	
	<1 month	89	6.6
	1-2 months	91	6.8
	2-3 months	128	9.5
	3-5 months	98	7.3
	>5 months	853	63.6
	No wait	82	6.1
Number of flight cancellation/changes		**(1245)**	
	Not applicable	319	25.6
	0 changes	152	12.2
	1 cancellation or delay	245	19.7
	2 cancellation or delay	196	15.7
	3 cancellation or delay	147	11.8
	4 cancellation or delay	65	5.2
	5 cancellation or delay	31	2.5
	>5 cancellations or delays	90	7.2
Experiences while trying to return		**(1245)**	
	Limit on the number of people who could enter the country	740	59.4
	Inability to book a flight	671	53.9
	Flight cancellation	660	15.3
	COVID-19 testing requirements prior to flying	281	22.6
	Other	229	18.4
	Separation from family/companion	172	13.8
	Visa issues	147	11.8
	Delays during transit	44	3.5
Current situation		**(1245)**	
	Booked a flight/waiting for flight availability	357	26.6
	Unable to return but have decided to stay	352	26.2
	Returned to country of residence after delays	323	24.1
	Other	295	22
	Returned to country of residence after being stuck in transit	14	1

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Table 3. Financial and employment characteristics of respondents stranded abroad during COVID-19

Variables		*n*	%
Addressing financial stress		**(n/836 responses)**	**% of respondents (n=1127)**
	Received financial support from family or friends	354	31.4
	Other	201	17.8
	Borrowed money from a bank	58	5.1
	Personal savings	47	4.2
	Accessed emergency financial support from the organisation or services in the country you were stuck	43	3.8
	Received financial support from your employer	39	3.5
	Applied but did not receive a government loan	39	3.5
	Early withdrawal of superannuation	27	2.4
	Received a government loan to cover your living costs	14	1.2
	Received a government loan to cover the cost of a flight home	8	0.7
	Received financial support from an insurance company	6	0.5
Current employment situation		**(1250)**	
	Working now for pay	620	56.0
	Unemployed	240	21.7
	Retired	82	7.4
	Student	88	7.9
	Unable to work due to disability or illness	18	1.6
	Volunteer	23	2.1
	Stay at home parent/caregiver	84	7.6
	Other	95	8.6
Employment change while abroad		**(n/717 responses)**	**% of respondents (n=1127)**
	Worked remotely	123	10.9
	Lost job	119	10.6
	Other	113	10.0
	Resigned	77	6.8
	Contract not renewed	69	6.1
	Reduction of hours	63	5.6
	Stood down, not working for pay, but not fired	45	4.0
	Pay cut	32	2.8
	Back in paid work	31	2.8
	Not working but receiving government assistance	27	2.4
	Increase in hours	18	1.6

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Table 4. Predictors of moderate to extremely severe depression, anxiety, and stress in respondents stranded abroad during COVID-19 (n=956)

Variables	Depression				Anxiety				Stress			
	OR	95% C.I		*p*	OR	95% C.I		*p*	OR	95% C.I		*p*
Age (yrs)				**.005**				**.030**				**.007**
18-29*												
30-49	.535	.366	.780		.646	.461	.906		.644	.452	.917	
50-69	.542	.350	.839		.563	.375	.845		.579	.383	.873	
>69	.303	.097	.945		.767	.238	2.407		.174	.046	.660	
Perceived risk of COVID-19				**.026**				**.003**				**.003**
Not applicable	1.595	.384	6.627		1.608	.433	5.840		2.317	.573	9.368	
Low risk*												
Moderate risk	1.099	.723	1.672		.700	.456	1.076		1.042	.691	1.571	
High risk	1.617	1.147	2.279		1.364	.973	1.912		1.708	1.223	2.387	
Time stranded				**<.001**				**<.001**				**.003**
No wait	.893	.399	1.997		.697	.308	1.579		.936	.421	2.082	
<1 month	.357	.174	.735		.332	.149	.738		.459	.224	.940	
1-2 months	.396	.201	.781		.420	.208	.849		.475	.242	.932	
2-3 months	.587	.313	1.101		.571	.303	1.078		.702	.377	1.308	
3-5 months*												
>5 months	1.281	.770	2.129		.984	.601	1.610		1.062	.647	1.743	
Homelessness, ref.no	1.522	.947	2.444	.082	1.392	.920	2.105	.118	1.186	.767	1.834	.444
Employment Change, ref.no	1.405	1.040	1.900	**.027**	1.569	1.177	2.092	**.002**	1.564	1.171	2.090	**.002**
Financial Stress, ref.no	1.501	1.103	2.041	**.010**	1.728	1.268	2.345	**<0.001**	1.682	1.246	2.269	**<.001**

*Reference variable

OR, log odds ratio controlling for other variables in the model; EXP (B), adjusted odds ratio; C.I, confidence interval; *p*, probability value (statistically significant <.05).

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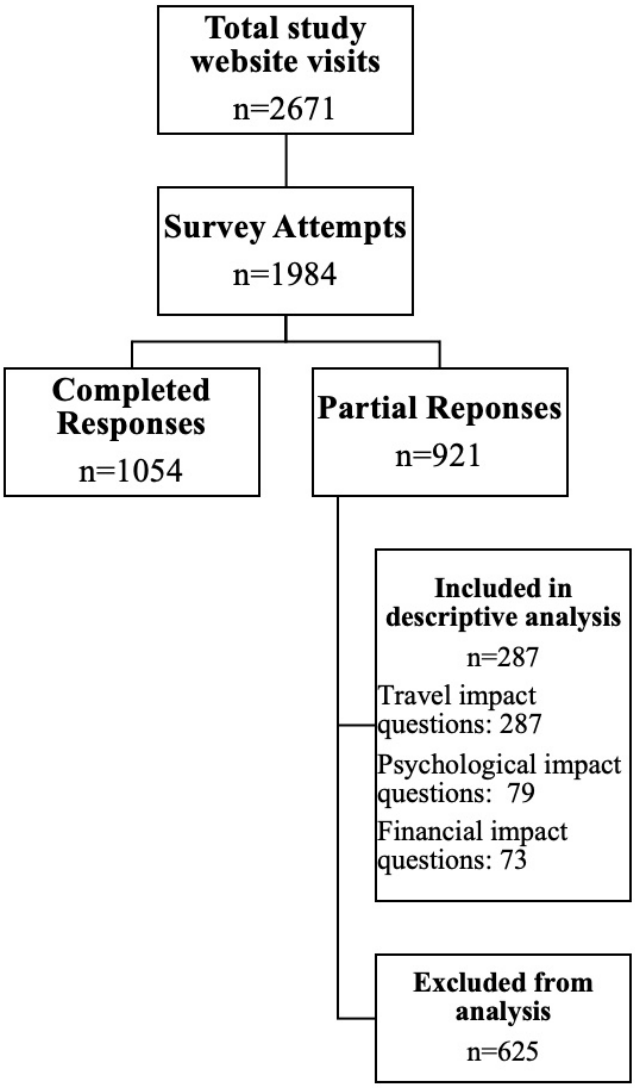

Figure 1. Flowchart of participant inclusion

117x177mm (144 x 144 DPI)

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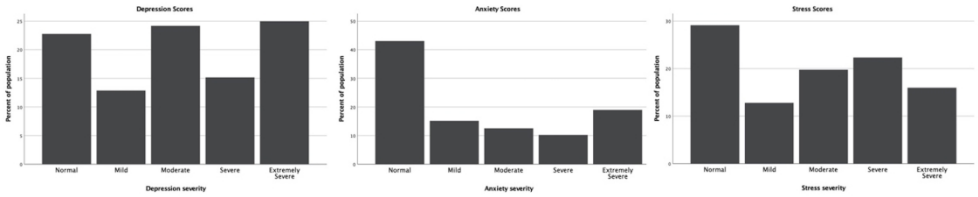

Figure 2. Depression, anxiety, and stress categories of citizens stranded abroad during COVID-19 (% of sample)

427x94mm (144 x 144 DPI)

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Supplementary file 1. Associations between participant factors and levels of depression, anxiety, and stress

	Depression							
Variables	**Normal**	**Mild**	**Moderate**	**Severe**	**Extremely Severe**	**χ 2**	**df**	***p***
Age						33.482	12	<.001
18-29	38 (15.4%)	19 (14.4%)	55 (21.7%)	41 (25.8%)	72 (27.8%)			
30-49	121 (49.2%)	79 (59.8%)	131 (51.6%)	77 (48.4%)	137 (52.1%)			
50-69	76 (30.9%)	33 (25%)	64 (25.2%)	38 (23.9%)	51 (19.4%)			
70+	11 (4.5%)	1 (0.8%)	4 (1.6%)	3 (1.9%)	2 (0.8%)			
Time stranded abroad						82.982	20	<.001
No wait	20 (7.8%)	4 (2.7%)	12 (4.4%)	6 (3.5%)	10 (3.9%)			
Up to 1 month	32 (12.4%)	16 (11%)	14 (5.1%)	5 (2.9%)	7 (2.5%)			
1-2 months	32 (12.4%)	10 (6.8%)	23 (8.4%)	7 (4.1%)	8 (2.8%)			
2-3 months	32 (12.4%)	18 (12.3%)	22 (8%)	22 (12.8%)	23 (8.1%)			
4-5 months	21 (8.1%)	15 (10.3%)	22 (8%)	15 (8.7%)	21 (7.4%)			
5+ months	121 (46.9%)	83 (56.8%	181 (66.1%)	117 (68%)	213 (75.3%)			
Financial stress						35.123	4	<.001
Yes	140 (54.3%)	85 (58.6%)	172 (63%)	109 (64.1%)	218 (77.6%)			
No	118 (45.7%)	60 (41.4%)	101 (37%)	61 (35.9%)	63 (22.4%)			
Homelessness						30.149	4	<.001
Yes	17 (6.6%)	16 (11.3%)	26 (9.7%)	16 (9.5%)	58 (20.9%)			
No	239 (93.4%)	125 (88.7%)	243 (90.3%)	152 (90.5%)	220 (79.1%)			
Employment Change						22.648	4	<.001
Yes	89 (38.2%)	45 (34.9%)	107 (43.5%)	74 (49%)	158 (55.9%)			
No	144 (61.8%)	84 (65.1%)	139 (56.5%)	77 (51%)	109 (44.1%)			
Flight changes or cancellations						36.694	24	.029
0 changes	23 (11.5%)	21 (20%)	31 (17.3%)	21 (16.9%)	26 (12.9%)			
1 cancelation or delay	70 (35%)	28 (26.7%)	48 (26.8%)	34 (27.4%)	34 (16.8%)			

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2 cancelations or delay	42 (21%)	20 (19%)	34 (19%)	30 (24.2%)	46 (22.3%)			
3 cancelations or delay	30 (15%)	18 (17.1%)	32 (17.9%)	21 (16.9%)	33 (15.8%)			
4 cancelations or delay	14 (7%)	6 (5.7%)	13 (7.3%)	6 (4.8%)	19 (9.4%)			
5 cancelations or delay	4 (2%)	3 (2.9%)	5 (2.8%)	3 (2.4%)	14 (6.4%)			
5+ cancelations or delay	17 (8.5%)	9 (8.6%)	16 (8.9%)	9 (7.3%)	34 (16.3%)			
Perceived risk of contracting COVID-19 (1-10 scale)						67.542	40	.004
1	29 (11.2%)	13 (8.9%)	21 (7.7%)	8 (4.7%)	29 (7.1%)			
2	34 (13.2%)	10 (6.8%)	12 (4.4%)	6 (3.5%)	14 (4.9%)			
3	25 (9.7%)	11 (7.5%)	21 (7.7%)	14 (8.1%)	17 (6%)			
4	13 (5%)	7 (4.8%)	12 (4.4%)	6 (3.5%)	12 (4.2%)			
5	31 (12%)	19 (13%)	21 (7.7%)	16 (9.3%)	24 (8.5%)			
6	10 (3.9%)	8 (5.5%)	19 (6.9%)	11 (6.4%)	13 (4.6%)			
7	28 (10.9%)	16 (11%)	35 (12.8%)	19 (11%)	29 (10.2%)			
8	30 (11.6%)	14 (9.6%)	35 (12.8%)	31 (18%)	40 (14.1%)			
9	14 (5.4%)	12 (8.2%)	17 (6.2%)	5 (2.9%)	21 (7.4%)			
10	42 (16.3%)	32 (21.9%)	75 (27.4%)	51 (29.7%)	83 (29.3%)			
Not Applicable	2 (0.8%0	4 (2.7%)	6 (2.2%)	5 (2.9%)	10 (3.5%)			
Access to crisis support or mental health services						3.314	4	.507
Yes	95 (36.8%)	55 (37.7%)	109 (39.8%)	63 (36.6%)	92 (32.5%)			
No	163 (63.2%)	91 (62.35)	165 (60.2%)	109 (63.4%)	191 (67.5%)			
	Anxiety							
Variables	**Normal**	**Mild**	**Moderate**	**Severe**	**Extremely Severe**	**χ 2**	**df**	***p***
Age						35.225	12	<.001
18-29	69 (15.4%)	36 (22.5%)	35 (25.7%)	36 (32.7%)	56 (25.1%)			
30-49	229 (51%)	86 (53.8%)	66 (48.55)	52 (47.3%)	112 (56.3%)			
50-69	138 (30.7%)	35 (21.9%)	32 (23.5%)	21 (19.1%)	36 (18.1%)			
70+	13 (2.9%)	3 (1.9%)	3 (2.2%)	1 (0.9%)	1 (0.5%)			

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Time stranded abroad						49.486	20	<.001
No wait	22 (4.5%)	12 (7%)	9 (6.3%)	3 (2.6%)	7 (3.3%)			
Up to 1 month	51 (10.5%)	8 (4.7%)	7 (4.9%)	3 (2.6%)	5 (2.3%)			
1-2 months	43 (8.8%)	12 (7%)	6 (4.2%)	10 (8.6%)	9 (4.2%)			
2-3 months	55 (11.3%)	20 (11.6%)	11 (7.7%)	15 (12.9%)	16 (7.4%)			
4-5 months	38 (7.8%)	15 (8.7%)	17 (12.0%)	5 (4.3%)	19 (8.8%)			
5+ months	279 (57.2%)	105 (61%)	92 (64.8%)	80 (69%)	72 (33.3%)			
Financial stress						53.944	4	<.001
Yes	258 (53.2%)	114 (66.3%)	97 (68.8%)	85 (73.3%)	172 (79.8%)			
No	227 (46.8%)	58 (33.7%)	44 (31.2%)	31 (26.7%)	44 (20.2%)			
Homelessness						18.517	4	<.001
Yes	44 (9.2%)	15 (8.9%)	16 (11.4%)	16 (13.8%)	43 (20.1%)			
No	434 (90.8%)	154 (91.1%)	124 (88.6%)	100 (86.2%)	171 (79.9%)			
Employment Change						34.917	4	<.001
Yes	156 (35.7%)	66 (44.6%)	65 (50%)	57 (52.8%)	129 (59.6%)			
No	281 (64.3%	82 (55.4%)	65 (50%)	51 (47.2%)	87 (40.4%)			
Flight changes or cancellations						29.009	24	.220
0 changes	50 (14.3%)	16 (13.7%)	19 (19.4%)	15 (17.2%)	22 (13.8%)			
1 cancelation or delay	110 (31.5%)	27 (23.1%)	21 (21.4%)	23 (26.4%)	33 (20.8%)			
2 cancelations or delay	79 (22.6%)	23 (19.7%)	15 (15.3%)	13 (14.9%)	41 (25.8%)			
3 cancelations or delay	48 (13.8%)	23 (19.7%)	22 (22.4%)	19 (21.8%)	21 (13.2%)			
4 cancelations or delay	21 (6%)	9 (7.7%)	8 (8.2%)	7 (8%)	13 (8.2%)			
5 cancelations or delay	9 (2.6%)	7 (6%)	2 (2%)	2 (2.3%)	8 (5%)			
5+ cancelations or delay	32 (9.2%)	12 (10.3%)	11 (11.2%)	8 (9.2%)	21 (13.2%)			
Perceived risk of contracted COVID-19 (1-10 scale)						81.128	40	<.001
1	47 (9.6%)	8 (4.7%)	12 (8.5%)	9 (7.8%)	18 (7%)			
2	49 (10%)	5 (2.9%)	7 (4.9%)	1 (0.9%)	16 (6.5%)			

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3	43 (8.8%)	11 (6.4%)	14 (9.9%)	6 (5.2%)	14(6.5%)			
4	20 (4.1%)	14 (8.1%)	7 (4.9%)	2 (1.7%)	7(3.3%)			
5	62 (12.7%)	13 (7.6%)	8 (5.6%)	9 (7.8%)	19 (8.8%)			
6	25 (5.1%)	13 (7.6%)	9 (6.3%)	5 (4.3%)	9(4.2%)			
7	62 (12.7%)	15 (8.7%)	13 (9.2%)	17 (14.7%)	20(9.3%)			
8	54 (11.1%)	32 (18.6%)	20 (14.1%)	15 (12.9%)	29(13.5%)			
9	24 (4.9%)	17 (9.9%)	10 (7%)	7 (6%)	11 (5.1%)			
10	92 (18.9%)	39 (22.7%)	39 (27.5%)	41 (35.3%)	72(33.5%)			
Not applicable	10 (2%)	5 (2.9%)	3 (2.1%)	4 (3.4%)	5(2.3%)			
Access to crisis support or mental health services						2.210	4	.697
Yes	188 (38.5%)	59 (34.3%)	49 (34.5%)	38 (32.8%)	80(37.2%)			
No	300 (61.5%)	113 (65.7%)	93 (65.5%)	78 (67.2%)	135 (62.8%)			
	Stress							
Variables	**Normal**	**Mild**	**Moderate**	**Severe**	**Extremely Severe**	**χ 2**	**df**	***p***
Age						51.326	12	<.001
18-29	47 (15%)	23 (17.2%)	44 (21.3%)	69 (29.9%)	42(25.4%)			
30-49	154 (49.2%)	76 (56.7%)	106 (51.2%)	113 (48.9%)	94(56.8%)			
50-69	96 (30.7%)	34 (25.4%)	56 (27.1%)	46 (19.9%)	30(17.8%)			
70+	16 (5.1%)	1 (0.7%)	1 (0.5%)	3 (1.3%)	0			
Time stranded abroad						50.180	20	<.001
No wait	22 (6.7%	3 (2.1%)	12 (5.4%)	12 (4.7%)	4(2.2%)			
Up to 1 month	38 (11.5%)	9 (6.2%)	9 (4%)	13 (5.1%)	5(2.8%)			
1-2 months	27 (8.2%)	15 (10.3%)	16 (7.1%)	16 (6.3%)	6(3.3%)			
2-3 months	36 (10.9%)	15 (10.3%)	23 (10.3%)	30 (11.9%)	13(7.2%)			
4-5 months	28 (8.5%)	11 (7.6%)	17 (7.6%)	27 (10.7%)	11(6.1%)			
5+ months	179(54.2%)	92 (63.4%)	147 (65.6%)	155 (61.3%)	142 (78.5%)			
Financial stress						40.368	4	<.001
Yes	176 (53.5%)	85 (58.6%)	146 (65.8%)	174 (69%)	143(79.9%)			

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No	153 (46.5%)	60(41.4%)	76 (34.2%)	78 (31%)	36(20.1%)			
Homelessness						13.393	4	.010
Yes	28 (8.5%)	15 (10.7%)	24 (10.9%)	32 (13%)	34 (19.3%)			
No	300 (91.5%)	125 (89.3%)	197 (89.1%)	215 (87%)	142 (80.7%)			
Employment Change						31.232	4	<.001
Yes	101 (33.8%)	50 (40.7%)	96 (47.1%)	113 (51.4%)	92 (58.1%)			
No	198 (66.2%)	73 (59.3%)	108 (52.9%)	107 (48.6%)	66 (41.9%)			
Flight changes or cancellations						27.073	24	.301
0 changes	28 (11.5%)	15 (15%)	28 (18.8%)	31 (17%)	26 (14.8%)			
1 cancelation or delay	79 (32.4%)	26 (26%)	43 (28.9%)	42 (23.1%)	28 (17.8%)			
2 cancelations or delay	56 (23%)	21 (21%)	31 (20.8%)	36 (19.8%)	32 (20%)			
3 cancelations or delay	36 (14.8%)	18 (18%)	24 (16.1%)	32 (17.6%)	27 (17%)			
4 cancelations or delay	16 (6.6%)	6 (6%)	11 (7.4%)	14 (7.7%)	13 (8.1%)			
5 cancelations or delay	9 (3.7%)	2 (2%)	2 (1.3%)	7 (3.8%)	8 (5.9%)			
5+ cancelations or delay	20 (8.2%)	12 (12%)	10 (6.7%)	20 (11%)	26 (16.3%)			
Perceived risk of contracted COVID-19 (1-10 scale)						66.487	40	.005
1	35 (10.6%)	11 (7.6%)	14 (6.3%)	16 (6.3%)	14 (8.3%)			
2	34 (10.3%)	10 (6.9%)	14 (6.3%)	11 (4.3%)	7 (3.9%)			
3	28 (8.5%)	14 (9.7%)	18 (8%)	20 (7.9%)	8 (4.4%)			
4	17 (5.2%)	7 (4.8%)	7 (3.1%)	13 (5.1%)	6 (3.3%)			
5	40 (12.1%)	15 (10.3%)	22 (9.8%)	19 (7.5%)	14 (8.35)			
6	21 (6.4%)	6 (4.1%)	12 (5.4%)	13 (5.1%)	9 (5%)			
7	34 (10.3%)	26 (17.9%)	24 (10.7%)	27 (10.7%)	16 (8.8%)			
8	41 (12.4%)	18 (12.4%)	35 (15.6%)	30 (11.9%)	26 (14.4%)			
9	14 (4.2%)	10 (6.9%)	20 (8.9%)	18 (7.1%)	7 (3.9%)			
10	62 (18.8%)	25 (17.2%)	53 (23.7%)	78 (30.8%)	65 (35.9%)			
Not applicable	4 (1.2%)	3 (2.1%)	5 (2.2%)	8 (3.2%)	7 (3.9%)			

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Access to crisis support or mental health services						3.371	4	.498
Yes	113 (34.2%)	60 (41.4%)	82 (36.6%)	98 (38.7%)	64 (33.7%)			
No	217 (65.8%)	85 (58.6%)	142 (63.4%)	155 (61.3%)	130 (66.3%)			

χ 2 , chi squared; df, degrees of freedom; *p*, probability value (statistically significant <.05).

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STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	5
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	*5*
Bias	9	Describe any efforts to address potential sources of bias	5
Study size	10	Explain how the study size was arrived at	
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	5
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	6
		(*b*) Describe any methods used to examine subgroups and interactions	6
		(*c*) Explain how missing data were addressed	6
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	6
		(*e*) Describe any sensitivity analyses	6
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	7
		(b) Give reasons for non-participation at each stage	7
		(c) Consider use of a flow diagram	Figure 1
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	7
		(b) Indicate number of participants with missing data for each variable of interest	Tables
Outcome data	15*	Report numbers of outcome events or summary measures	7/8

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Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	7/8
		(*b*) Report category boundaries when continuous variables were categorized	
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	7/8
Discussion			
Key results	18	Summarise key results with reference to study objectives	9
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	12
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	12
Generalisability	21	Discuss the generalisability (external validity) of the study results	10-12
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	NA

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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BMJ Open

International cross-sectional study examining the psychological and financial impact of travel restrictions on citizens and permanent residents stranded abroad during the COVID-19 pandemic

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Primary Subject Heading:	Infectious diseases
Secondary Subject Heading:	Global health, Public health, Mental health
Keywords:	COVID-19, Public health < INFECTIOUS DISEASES, MENTAL HEALTH, INFECTIOUS DISEASES

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International cross-sectional study examining the psychological and financial impact of travel restrictions on citizens and permanent residents stranded abroad during the COVID-19 pandemic

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Word count: 3664
Abstract: 295; Main body: 3563
Keywords: COVID-19; Pandemic; Public Health; Travel; Depression; Anxiety; Stress

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ABSTRACT

Objectives: This study aimed to evaluate the psychological and financial distress reported by citizens and permanent residents stranded abroad due to international travel restrictions introduced in response to the COVID-19 pandemic.

Design: An international cross-sectional study.

Setting: A primary analysis of data collected between July and September 2021 through an online survey targeting individuals stranded abroad and unable to return to their country of residence due to international travel restrictions.

Respondents: A total of 1054 individuals aged 18-84.

Data analysis: Multivariable logistic regression models were used to explore the relationship between higher levels of depression, anxiety and stress and participant variables.

Outcome measures: The survey answered questions regarding COVID-19 travel restriction-related impacts; personal stress, anxiety, and depression (using the validated DASS-21tool); as well as impacts on housing and financial security and demographic data.

Results: A total of 75.4% of respondents reported wanting to return to the Oceania region (75.4%), with 45% stranded in Europe. 64.2% reported financial distress while stranded abroad. 64.4% ($\bar{x}$=9.43, SD=5.81) reported moderate-to- extremely severe (based on the DASS-21 classification) levels of depression, 41.7% for anxiety ($\bar{x}$=5.46, SD=4.74), and 58.1% for stress ($\bar{x}$=10.64, SD=5.26). Multivariable analysis indicated that financial stress, an employment change, being <30yrs, having a high perceived risk of contracting COVID-19 abroad and being stranded for >2 months, were significantly related to scores of moderate-to-extremely severe depression, anxiety, and stress.

Conclusion: The study is among the first to explore the psychological and financial distress-related impacts associated with being stranded abroad due to COVID-19 travel restrictions. It highlights a range of unintended consequences that arise from pandemic-related travel restriction, identifies the health and social needs of a particularly vulnerable population, and provides clues as to the types of support that may be adopted to best support them.

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STRENGTHS AND LIMITATIONS OF THIS STUDY

- This study was open to participants worldwide to support a broad insight into the psychological and financial impact of COVID-19 related travel restrictions.
- This study addressed the psychological impact of COVID-19 related travel restrictions using the validated DASS-21 tool, strengthening statistical analyses.
- Multivariable analyses were conducted on respondents' depression, anxiety, and stress scores to explore predictor and protective factors.
- Psychological data were collected on self-reported scales, leading to responder bias.
- Participant recruitment relied on convenience sampling and may not have captured impacted individuals from all relevant countries.

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BACKGROUND

In response to the COVID-19 pandemic, most countries worldwide have implemented some level of international travel restriction or complete border closures (1-3). As of February 2020, many countries had commenced repatriation of their citizens stranded abroad. By the end of 2020, some countries like Japan and Spain claimed to have repatriated entirely every citizen that wanted to return reports continue to suggest stranded travellers were still trying to get to their country of residence (referred to as 'home') 20 months into the COVID-19 pandemic despite many countries reopening borders (4, 5). In September 2021, every country has some level of travel restrictions (except those without data), with many countries still maintaining total border closures, while others had in place quarantine systems, screening measures and travel bans on high-risk regions (6).

Factors impacting a person's ability to return to their home have included countries placing limits on the number of passengers that can enter the country, caps on the hotel quarantine capacities, the cost of travel and hotel quarantine, and in some cases having restrictions on flights from certain high-risk countries. Our previous study suggested that the support available to those stranded abroad was limited and in some cases, challenging to access and comprehend (7). Support provided by countries has varied from repatriation flights, emergency accommodation, mental health and medical assistance, emergency call lines and financial assistance. However, of the countries that were reviewed, we were unable to identify any one country providing all the different support types listed.

Public commentary through news and social media has hinted at the level of psychosocial impact on citizens stranded abroad. These articles suggest that many of these travellers: have felt abandoned by their governments, had little financial support, and for some, experienced depression and homelessness (8-10). While the findings from many COVID-19 studies have reported high levels of psychological distress in nearly all populations, the focus of these studies has been on domestic populations, like healthcare and frontline workers, students and those in lockdown and quarantine (10-19). With similar aims to the present study, one study found 63% of Saudi citizens living abroad as students during COVID-19 experienced 'psychiatric' distress symptoms (20).

Even though travel restrictions have been in place since early 2020, there is currently limited understanding of the level of psychological distress that has been experienced by those stranded abroad wanting to return. This study examined the impacts of travel restrictions on people stranded abroad who could not return to their country of citizenship/residence during the COVID-19 pandemic. We aimed to 1) measure the prevalence of psychological impact

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associated with being stranded overseas due to covid-related travel restrictions and 2) identify demographic and circumstantial factors associated with severe psychological impact.

METHODS

Population and procedures

An online survey was created and administered anonymously using the *Qualtrics* (21) survey platform, with respondents recruited through various social media channels. Respondents were those people who were either still stranded away from their country of residence/home or had been stranded at some point since the commencement of the COVID-19 pandemic. There were no limitations placed on the country of residence or the length of time the person had been stranded for. To meet the inclusion criteria, respondents had to self-identify as having attempted to return to their country of residence but have had their travel plans changed. The survey was open between 20 July 2021 and 24 September 2021. Respondents unique IP addresses prevented duplicate entries. Ethical approval for this study was granted by the UNSW Human Research Ethics Committee (#210418). All respondents indicated their consent to participate. This study did not receive any funding.

Patient and Public Involvement

No patient involved

Survey instruments and measures

Demographics: including gender, age, level of education, ethnicity, employment status, history of chronic illness, and living status. Ethnicity was classified based on the nine broad groups according to the Australian Standard Classification of Cultural and Ethnic Groups (22).

Travel experiences: Respondents were asked where they were stranded abroad and where they intended to return to, and this data was recoded into geographic groups based on the World Health Organisation regions (23). Questions focused on their current situation (whether they had returned, were still stranded abroad awaiting return or still abroad but had decided to stay), flight cancellations/delays, length of time waiting to return and their experiences with travel.

Mental wellbeing: The depression, anxiety, and stress scale (DASS-21) were used in this study (24). The DASS-21 is a validated self-report tool, previously used in COVID-19 research studies (14, 25), containing 21 items assessing scores of depression, anxiety, and stress symptoms (7 items each). Respondents were asked to reflect on when they were stranded abroad (for respondents who had already returned reflecting on the last two weeks and rate each statement on a 4-point Likert scale from 0 (unsure/do not recall; did not apply

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to me at all) to 3 (applied to me very much, or most of the time). Scores in subsection are then multiplied by 2 to give a final score categorising the depression, anxiety, and stress into normal (Depression: 0-9; Anxiety: 0-7; Stress: 0-14), mild (Depression: 10-13; Anxiety: 8-9; Stress: 15-18), moderate (Depression: 14-20; Anxiety: 10-14; Stress: 19-25), severe (Depression: 21-27; Anxiety: 15-19; Stress: 26-33), or extremely severe (Depression: 28+; Anxiety: 20+; Stress: 34+). Higher scores reflect increased emotional and psychological distress.

As we suspected some potential respondents had returned home already and could be potentially reflecting further than 2 weeks, we included an additional option of "unsure/do not recall", with any respondent who selects this option to be removed for DASS21 analysis, which would allow for removal of recall bias during the analyses phase. Respondents were asked whether they had access to crisis support or mental health services while abroad and if 'yes', whether they had used this service or support. Finally, respondents reported their perceived risk of contracting COVID-19 both in the country where they are/were stranded and the country where they had or were waiting to return to (Scale of 1-10; 1 being no risk and 10 being high risk).

Financial wellbeing: Respondents were initially asked whether they felt financial stress while stranded abroad (yes/no), then if 'yes' were asked how they addressed the financial stress (receiving financial support from family, government loans, bank credit, or social services). Questions on employment situation and changes while abroad were asked along with a question on whether the participant experienced homelessness while abroad. Homelessness was defined as a period where respondents did not have somewhere to stay/live.

Statistical analyses

We aimed to collect responses from a minimum of 1,200 people to allow analysis with a margin of error of approximately 3.2%. Descriptive analysis involved the calculation of means, standard deviation, confidence interval and standard errors. Chi-square test of independence were first used to compare categorical variables. Independent variables that showed a significant association with DASS severity scores at a $p<.2$ level was included in the model as predictor variables. The DASS scores were dichotomised to reflect either no/mild symptom severity or moderate to extremely severe. Multivariable logistic regression was then performed to analyse the effect of age, perceived risk of contracting COVID-19 while stranded, financial stress, time stranded, employment change and homelessness on predicting moderate to extremely DASS. No multicollinearity amongst variables was

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identified. P values of <.05 was considered statistically significant. All data analyses were conducted using SPSS (26).

RESULTS

Respondent characteristics

A total of 1054 respondents completed the full survey, while a further 296 completed over 50% of the questions and were included in the descriptive analysis but excluded from regression analysis. See Figure 1 for a full breakdown on inclusions. Demographic information is provided in Table 1. The mean age was 41.09±13.08, with 69.5% (733/1054) being female, 43.8% (462/1054) of north-west European ethnicity, while most had a tertiary education (90.7%, 956/1054) and were stranded in the European Region (EUR) (45.3%, 608/1341) and were trying to return to the Western Pacific Region (WPR) (75.4%, 1011/1341).

Approximately 25% (303/1214) reported a historical or current COVID-19 infection, and of those the majority rated a 'mild' symptom severity (85.1%, 258/303). Respondents' mean overall level of perceived risk of contracting COVID-19 while abroad (on a scale of 1 to 10, where 1 = no risk, and 10=high risk) was 6.64 (n=1182, *SD*=2.85), with 24.7% (300/1214) rating the perceived risk while abroad at high risk (10). Comparatively, the overall mean level of perceived risk of contracting COVID-19 in the country where respondents had returned to was 4.11 (n=673, *SD*=2.81), with only 8.02% (54/673) rating the perceived risk at 'home' as high risk.

Travel experiences

Initially 44% (550/1245) of respondents had left their country of residence to take up long-term employment, with over 60% stranded abroad for more than 5 months (63.7%, 854/1341), with 28.7% (357/1245) either having had booked a flight or awaiting flight availability. Refer to table 2 for a full breakdown of respondent's experiences and current situation while stranded abroad.

Mental wellbeing

Figure 2 presents the respondents (*n*=1133) self-reported depression, anxiety, stress symptom severity score categories based on the DASS-21 tool. Of the respondents, 64.4% scored moderate to extremely severe depression symptoms ($\bar{x}$=18.87, SD=11.62), 41.7% scoring moderate to extremely severe anxiety symptoms ($\bar{x}$=10.91, SD=9.47), and 58.1% scoring between moderate to extremely severe stress symptoms ($\bar{x}$=21.48, SD=10.52).

Many reported no access to crisis support or mental health services while abroad (63.5%, 719/1133), and of those that did have access, only 37.9% (157/414) utilised the services. A

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total of 12% (133/1112) experienced a period of homelessness while stranded abroad. Of those that were willing to share their experiences (n = 94/133), commonly noted situations included living in temporary accommodation (32%, 30/94), sleeping on the couch or in a spare bedroom at a friend/family members place (32%, 30/94), and staying in emergency accommodation (including homeless shelters) (17%, 16/94). Less common experiences were those that lived on the street, trains, at the airport, in cars, in tents (<20%, 18/94). Two respondents disclosed having experienced a sexual assault while staying at a homeless shelter.

Financial wellbeing

Financial distress was reported in 64.2% (723/1127), and 38.4% (433/1127) reported a change in employment. A breakdown of ways in which respondents sought to address financial distress along with employment changes and current employment situation are reported in Table 3.

Factors associated with and predictors of depression, anxiety, and stress

Chi square analyses revealed significant associations between respondents DASS categories and their age, time stranded abroad, financial stress, homelessness, employment change, and their perceived risk of contracting COVID-19 (on a scale from 1 to 10, with 1-3 being considered low risk, 4-6 moderate risk and 7-10 high risk). No associations were found between DASS severity categories and having access to crisis support or mental health services (see Supplementary file 1). For depression, logistic regression identified financial stress, employment change, and a high perceived risk of contracting COVID-19 as predictors of moderate to extremely severe depression. Overall, the model correctly discriminated 67.7% of cases and Nagelkerke R^2 indicated a 14% variation of depression explained by the model. For anxiety, logistic regression identified financial stress, employment change, and a high perceived risk of contracting COVID-19, as predictors of moderate to extremely severe anxiety. Overall, the model correctly discriminated 64.5% of cases and Nagelkerke R^2 indicated a 13% variation of anxiety explained by the model. Finally for stress, logistic regression identified financial stress, employment change, and a high perceived risk of contracting COVID-19, as predictors of moderate to extremely severe stress. Overall, the model showed goodness of fit to the data ($\chi^2(14) = 95.772$, $p<.001$), correctly discriminated 63.6% of cases and Nagelkerke R^2 indicated a 13% variation of stress explained by the model. Table 4 presents results of the multivariable logistic regression. Being 30 years or older and stranded for 2 months or less was associated with decreased odds of moderate to extremely severe depression, anxiety, and stress.

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DISCUSSION

This study evaluated the psychological and financial distress of individuals stranded abroad during the COVID-19 pandemic and highlights the importance of providing additional support to this vulnerable group in future public health events. Amongst our respondents we found that over half had been stranded for longer than five months, with the majority having more than one flight cancellation or change. Our results confirm sentiments shared on social media by people stranded abroad, that reflect experiences of having no financial support, depression, homelessness and a general feeling of abandonment by their governments (8-10). Given the continued flight changes and delays (incurring additional costs) in the population of individuals stranded abroad, along with changes to employment, it is perhaps not surprising that we documented a high level of financial distress (64.2%), employment changes (38.4%), and experiences of homelessness (12%). Our findings align with results from non-travel related COVID studies which have indicated an increase in financial distress (17), increases in experiences of homelessness (27) and growing employment changes (28) during the pandemic. Comparatively, we reported much higher findings compared to a survey of the general population conducted within the first 6 months of the pandemic, finding that 30% of Australians were financially stressed because of the pandemic (29). This difference could be explained by those stranded abroad having different elements of uncertainty (additional flight costs, additional rent, and expenses due to the length of time stranded, and uncertain employment) compared to the general population.

Based on our findings, we recommend policymakers prioritise increasing the availability of financial assistance in the form of government grants or loans for living and flight costs incurred due to being stranded abroad, or alternatively providing the option to access social support while abroad if an individual would have been eligible had they not been abroad. Furthermore, considering the proportion of people who reported experiencing homelessness, the cases of sexual assault within homeless shelters, and previous research indicating a lack of emergency accommodation options for citizens abroad during COVID-19 (7), it is recommended that policymakers provide a solution to this issue. Whether it be through financial assistance or an emergency accommodation program similar to those that the French and Spanish governments introduced, where citizens residing permanently abroad have the option of offering accommodation or a room to citizens who are stranded, governments have to prioritise a solution and effectively communicate this support package (7).

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At this stage in the pandemic, it is almost indisputable that COVID-19 has had a psychological impact on populations around the world, whether it be healthcare workers, people in lockdown or quarantine, or specific countries or communities, the stressors were all encompassing (11-14, 30, 31). Our findings reflect much higher incidence of moderate to extremely severe depression (64.4%), anxiety (41.7%), and stress (58.1%), compared to domestic populations around the world (25). Previous research show lower DAS severity scores (25), especially when comparing our results to studies exploring psychological impacts of COVID-19 on healthcare workers (32, 33) and domestic students (34, 35). One study observing the psychological correlates of COVID-19 on the general population in Austria, reported drastically lower scores of depression (21.6%), anxiety (28.6%) and stress (28%), and found that 'frequent contact with family or friends' was shown to be a protective factor (25).

However, research on international students during COVID-19, have reflected high DASS severity, aligned with our study findings (20, 36). Possible reasons for these differences could be the parallels between international student experiences and those stranded, both living abroad and arguably away from their immediate social support network (family). A range of factors contributed to the psychological wellbeing of individuals in this study. Having financial stress, an employment change and having a high perceived risk of contracting COVID-19 were all associated with predicting moderate to extremely severe depression, anxiety, and stress. Additionally, the length of time stranded was also associated with higher severity of DASS, with >5months for depression and stress, and 3-5months for anxiety. These results are not surprising considering the literature shows that many stressors, like financial distress, fear of COVID-19 infection, loneliness, inadequate information, and employment issues have all presented as predictors of poor mental health and in the case of financial distress, can go further than predicting depression to suicidal thoughts and behaviours (31, 37). Unique to this study, however, is the finding that the longer an individual is stranded abroad the more likely they are to present with moderate to severe DAS symptoms.

Interestingly, of the age categories in this investigation, respondents >69yrs had lower scores of depression, anxiety, and stress, inconsistent with research conducted in Spain and Canada suggesting increased DASS scores in elders (38, 39). This, as was noted by the authors of the Sightlines Project (40), may be due to older people being more financial secure than other age groups. It may also reflect that older people were less likely to have insecurity associated with employment or have younger dependent family members to provide direct care to. This

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may have provided more opportunity for flexibility in their travel plans. These results reflecting high severity of DASS in those stranded abroad, provides both current and future direction for policymakers. We recommend policymakers provide adequate mental health interventions be available to those stranded abroad, either online or face-to-face where possible through a local consulate.

It is hard to deny that people have been deprived of the ability to return to their country of citizenship or permanent residence, as shown by the 63.3% of our respondents being stranded abroad for longer than 5 months. Addressing public health threats from a health security perspective has already increased fears that it legitimises government actions, potentially undermining personal sovereignty, and impeding human rights (41). A commonly cited human rights treaty in response to imposed restrictions is Article 12 (42) of the International Covenant on Civil and Political Rights (ICCPR), a treaty with 74 signatories and 173 parities which states that "No one shall be arbitrarily deprived of the right to enter his own country" (42).

The most frequently mentioned human rights breach was the Australian government imposing not only a complete ban on incoming flights from India, but potential criminal penalties to Australian citizens or permanent residents of up to five years imprisonment, and/or fines up to $66000 (AUD), for attempting to enter Australia from India through a third country (43). Mostly in reference to breaching Article 12 (42) of the International Covenant on Civil and Political Rights (ICCPR), this ban, implemented under the *Biosecurity Act 2015(44)*, between April and May 2021, has been labelled a 'racist rights breach' (45), with the Australian Human Rights Commission approaching the federal government directly with their concerns (43). Due to impacts of ongoing border closures and individuals struggling to return home, as further highlighted in this study where the majority of respondents were trying to return to, Australian citizens stranded abroad submitted a human rights complaint to the United Nations Human Rights Committee under the ICCPR, with the UN Human Rights Committee already successfully requesting to the Australian Government the prompt repatriation of two Australians in April 2021 (46).

Due to the results of our study alongside the probable human rights breaches, we recommend policymakers seriously reconsider current and future restriction of movement of citizens and permanent residents returning home who are at risk of financial distress and severe DASS the longer that they are stranded for. With international borders reopening around the world, some being restricted for nearly 20 months, it is critical to not only look at the impact of travel restrictions from the perspective of reducing infectious disease importations, but also

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from the perspective of those stranded abroad, who were arguably one of the most impacted by them. In doing so, policymakers can determine where further support is needed in future emergency situations resulting in people stranded abroad.

Limitations

This work is not without limitations. Firstly, like other cross sectional survey studies, it lacks a longitudinal follow up on respondents. Secondly, the self-report questionnaire for psychological symptoms raises possible selection bias and subjectivity, however our sample size being large, and the addition of an optional 'do not recall' response should mitigate certain bias. Thirdly, we were unable to capture the specific immigration status of those returning, i.e., whether they were citizens, permanent residents, or short-term visa holders. Finally, we did not examine pre-existing mental health conditions which could prove to be a confounding factor, and there was an over representation of women, those returning to the western pacific region and respondents with an academic background, possible due to convenience sampling issues and survey distribution originating in Australia, which may not fully represent the population of people who were stranded abroad. The study did not collect information on treatment of anxiety, stress, or depression, nor did we collect data on suicide ideation. Notwithstanding the previously mentioned limitations, findings from this study provide insights not previously reported into the psychological and financial impacts and support needed for individuals stranded abroad due to COVID-19 travel restrictions. These insights will be valuable for policy makers as they design and deliver support programs in response and prepare for future events.

Conclusion

This research suggests that being stranded abroad during COVID-19 may lead to not only an increase in financial stress, but quite severe depression, anxiety, and stress. Our findings show that being young, stranded abroad for longer, having a high perception of infection risk, experiencing employment changes and financial stress are all associated with increased severity of depression, anxiety, and stress. Respondents reported that lack of mental and social health support while stranded. This indicates that there are gaps in services available for this vulnerable population or lack of communication as to how to access them; both issues that need to be resolved.

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ABBREVIATIONS

AFR: African region

AMR: Region of the Americas

COVID-19: Coronavirus disease of 2019

DAS: Depression, anxiety, and stress

DASS-21: The 21-item depression, anxiety, and stress scale

EMR: Eastern Mediterranean region

EUR: European region

SEAR: South-East Asian region

WPR: Western Pacific region

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DECLARATIONS

Ethics approval and consent to participate

Ethical approval for this study was granted by the UNSW Human Research Ethics Committee (#210418). All respondents were anonymous and indicated their consent to participate.

Competing interests

The authors declare that they have no competing interests.

Contribution statement

PM conducted data collection, data analysis, manuscript writing and contributed to study design. AC, MS and HS conceived study design, interpretation of the data and were involved with manuscript writing and had final oversight. KB supported the statistical analysis of the data and ST supported the interpretation and write up of the findings. All authors read and approved the final manuscript.

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Data sharing

The data used in this study is available upon request from the authors.

Supplementary information

Supplementary file 1: Associations between participant factors and levels of depression, anxiety, and stress

Figure Legend

Figure 1. Flowchart of participant inclusion

Figure 2. Depression, anxiety, and stress categories of citizens stranded abroad during COVID-19 (% of sample)

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Table 1. Characteristics of respondents stranded during COVID-19

Variables		*n*	%
Sex recorded at birth		**(1054)**	
	Female	733	69.5
	Male	308	29.2
	Another term	2	.2
	Prefer not to say	11	.8
Gender		**(1054)**	
	Female	732	69.4
	Male	304	28.8
	Another term	5	.5
	Prefer not to say	13	1.2
Age		**(1054)**	
	18-29	226	21.4
	30-49	545	51.7
	50-69	262	24.9
	70+	21	1.1
Main language spoken at home		**(1054)**	
	English	940	89.2
	Other	83	7.9
	Spanish	11	1.0
	Urdu	7	.7
	French	7	.7
	Chinese	6	.6
Highest level of education		**(1054)**	
	Tertiary education	956	90.7
	Secondary education	91	8.6
	Primary education	5	.5
	No formal education	2	.2
Current employment situation		**(1250)**	
	Working now for pay	620	56.0
	Unemployed	240	21.7
	Other	95	8.6
	Student	88	7.9
	Live with parents/guardians	86	8.0
	Stay at home parent/caregiver	84	7.6
	Retired	82	7.4
	Volunteer	23	2.1
	Unable to work due to disability or illness	18	1.6
Ethnicity	**(1054)**		
	North-West European	462	43.8
	Oceanian	242	23
	Unsure	134	12.7

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	South-East Asian	70	6.6
	Southern and Eastern European	68	6.5
	Southern and Central Asian	27	2.6
	People of the Americas	26	2.5
	North-East Asian	11	1.0
	North African and Middle Eastern	10	.9
	Sub-Saharan African	4	.4
Usual country of residence		**(1341)**	
	WPR	1011	75.4
	EUR	176	13.1
	AMR	93	6.9
	SEAR	29	2.2
	EMR	25	1.9
	AFR	7	.5
Country where stranded		**(1341)**	
	EUR	608	45.3
	WPR	311	23.2
	AMR	238	17.7
	EMR	79	5.9
	SEAR	78	5.8
	AFR	27	2.0
Initial reason for leaving country of residence		**(1245)**	
	Long-term employment	550	44.2
	Other	272	21.8
	Visiting family or friends	260	20.9
	Travel to study overseas	72	5.8
	Travel for business	54	4.3
	Tourism	37	3.0

AFR, African Region; AMR, Region of the Americas; SEAR, South-East Asian Region; EUR, European Region; EMR, Eastern Mediterranean Region; WPR, Western Pacific Region

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Table 2. Travel experiences of respondents stranded abroad during COVID-19

Variables		*n*	%
Time stranded abroad		**(1341)**	
	<1 month	89	6.6
	1-2 months	91	6.8
	2-3 months	128	9.5
	3-5 months	98	7.3
	>5 months	853	63.6
	No wait	82	6.1
Number of flight cancellation/changes		**(1245)**	
	Not applicable	319	25.6
	0 changes	152	12.2
	1 cancellation or delay	245	19.7
	2 cancellation or delay	196	15.7
	3 cancellation or delay	147	11.8
	4 cancellation or delay	65	5.2
	5 cancellation or delay	31	2.5
	>5 cancellations or delays	90	7.2
Experiences while trying to return		**(1245)**	
	Limit on the number of people who could enter the country	740	59.4
	Inability to book a flight	671	53.9
	Flight cancellation	660	15.3
	COVID-19 testing requirements prior to flying	281	22.6
	Other	229	18.4
	Separation from family/companion	172	13.8
	Visa issues	147	11.8
	Delays during transit	44	3.5
Current situation		**(1245)**	
	Booked a flight/waiting for flight availability	357	26.6
	Unable to return but have decided to stay	352	26.2
	Returned to country of residence after delays	323	24.1
	Other	295	22
	Returned to country of residence after being stuck in transit	14	1

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Table 3. Financial and employment characteristics of respondents stranded abroad during COVID-19

Variables		*n*	%
Addressing financial stress		**(n/836 responses)**	**% of respondents (n=1127)**
	Received financial support from family or friends	354	31.4
	Other	201	17.8
	Borrowed money from a bank	58	5.1
	Personal savings	47	4.2
	Accessed emergency financial support from the organisation or services in the country you were stuck	43	3.8
	Received financial support from your employer	39	3.5
	Applied but did not receive a government loan	39	3.5
	Early withdrawal of superannuation	27	2.4
	Received a government loan to cover your living costs	14	1.2
	Received a government loan to cover the cost of a flight home	8	0.7
	Received financial support from an insurance company	6	0.5
Current employment situation		**(1250)**	
	Working now for pay	620	56.0
	Unemployed	240	21.7
	Retired	82	7.4
	Student	88	7.9
	Unable to work due to disability or illness	18	1.6
	Volunteer	23	2.1
	Stay at home parent/caregiver	84	7.6
	Other	95	8.6
Employment change while abroad		**(n/717 responses)**	**% of respondents (n=1127)**
	Worked remotely	123	10.9
	Lost job	119	10.6
	Other	113	10.0
	Resigned	77	6.8
	Contract not renewed	69	6.1
	Reduction of hours	63	5.6
	Stood down, not working for pay, but not fired	45	4.0
	Pay cut	32	2.8
	Back in paid work	31	2.8
	Not working but receiving government assistance	27	2.4
	Increase in hours	18	1.6

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Table 3. Financial and employment characteristics of respondents stranded abroad during COVID-19

Variables		*n*	%
Addressing financial stress		**(n/836 responses)**	**% of respondents (n=1127)**
	Received financial support from family or friends	354	31.4
	Other	201	17.8
	Borrowed money from a bank	58	5.1
	Personal savings	47	4.2
	Accessed emergency financial support from the organisation or services in the country you were stuck	43	3.8
	Received financial support from your employer	39	3.5
	Applied but did not receive a government loan	39	3.5
	Early withdrawal of superannuation	27	2.4
	Received a government loan to cover your living costs	14	1.2
	Received a government loan to cover the cost of a flight home	8	0.7
	Received financial support from an insurance company	6	0.5
Current employment situation		**(1250)**	
	Working now for pay	620	56.0
	Unemployed	240	21.7
	Retired	82	7.4
	Student	88	7.9
	Unable to work due to disability or illness	18	1.6
	Volunteer	23	2.1
	Stay at home parent/caregiver	84	7.6
	Other	95	8.6
Employment change while abroad		**(n/717 responses)**	**% of respondents (n=1127)**
	Worked remotely	123	10.9
	Lost job	119	10.6
	Other	113	10.0
	Resigned	77	6.8
	Contract not renewed	69	6.1
	Reduction of hours	63	5.6
	Stood down, not working for pay, but not fired	45	4.0
	Pay cut	32	2.8
	Back in paid work	31	2.8
	Not working but receiving government assistance	27	2.4
	Increase in hours	18	1.6

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Table 4. Predictors of moderate to extremely severe depression, anxiety, and stress in respondents stranded abroad during COVID-19 (n=956)

Variables	Depression				Anxiety				Stress			
	OR	95% C.I		*p*	OR	95% C.I		*p*	OR	95% C.I		*p*
Age (yrs)				**.005**				**.030**				**.007**
18-29*												
30-49	.535	.366	.780		.646	.461	.906		.644	.452	.917	
50-69	.542	.350	.839		.563	.375	.845		.579	.383	.873	
>69	.303	.097	.945		.767	.238	2.407		.174	.046	.660	
Perceived risk of COVID-19				**.026**				**.003**				**.003**
Not applicable	1.595	.384	6.627		1.608	.433	5.840		2.317	.573	9.368	
Low risk*												
Moderate risk	1.099	.723	1.672		.700	.456	1.076		1.042	.691	1.571	
High risk	1.617	1.147	2.279		1.364	.973	1.912		1.708	1.223	2.387	
Time stranded				**<.001**				**<.001**				**.003**
No wait	.893	.399	1.997		.697	.308	1.579		.936	.421	2.082	
<1 month	.357	.174	.735		.332	.149	.738		.459	.224	.940	
1-2 months	.396	.201	.781		.420	.208	.849		.475	.242	.932	
2-3 months	.587	.313	1.101		.571	.303	1.078		.702	.377	1.308	
3-5 months*												
>5 months	1.281	.770	2.129		.984	.601	1.610		1.062	.647	1.743	
Homelessness, ref.no	1.522	.947	2.444	.082	1.392	.920	2.105	.118	1.186	.767	1.834	.444
Employment Change, ref.no	1.405	1.040	1.900	**.027**	1.569	1.177	2.092	**.002**	1.564	1.171	2.090	**.002**
Financial Stress, ref.no	1.501	1.103	2.041	**.010**	1.728	1.268	2.345	**<0.001**	1.682	1.246	2.269	**<.001**

*Reference variable

OR, log odds ratio controlling for other variables in the model; EXP (B), adjusted odds ratio; C.I, confidence interval; *p*, probability value (statistically significant <.05).

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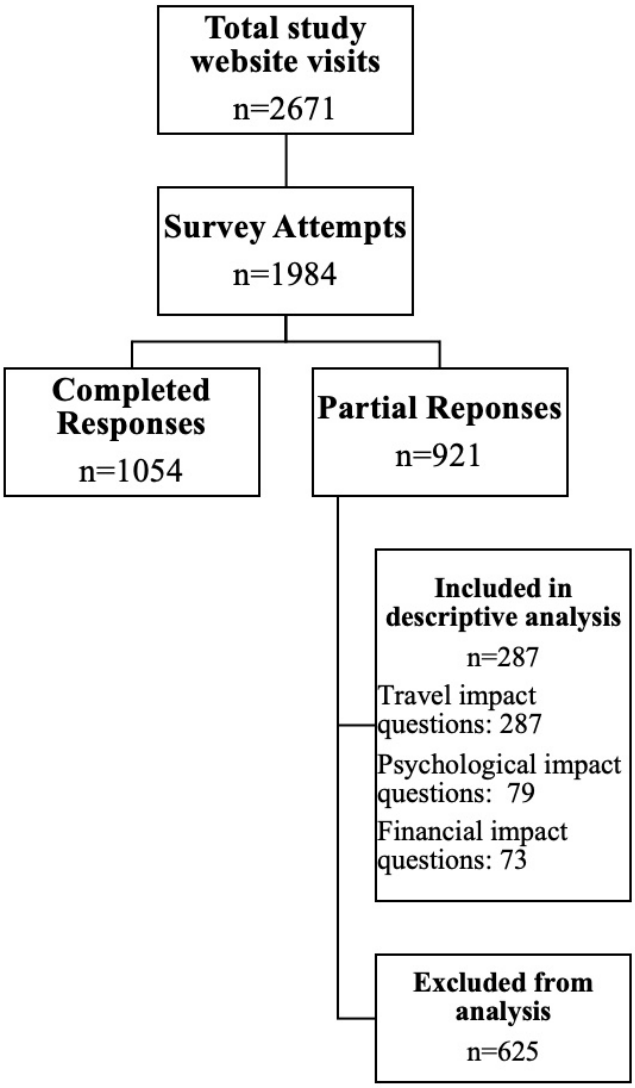

Figure 1. Flowchart of participant inclusion

117x177mm (144 x 144 DPI)

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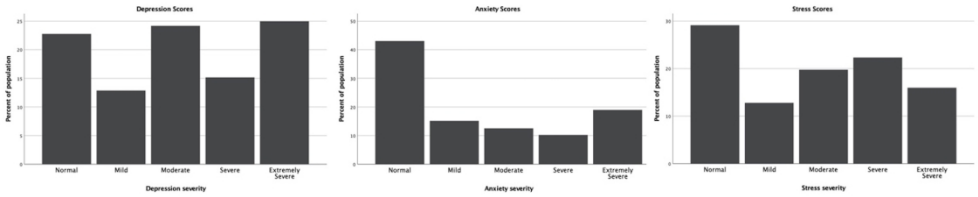

Figure 2. Depression, anxiety, and stress categories of citizens stranded abroad during COVID-19 (% of sample)

427x94mm (144 x 144 DPI)

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Supplementary file 1. Associations between participant factors and levels of depression, anxiety, and stress

	Depression							
Variables	**Normal**	**Mild**	**Moderate**	**Severe**	**Extremely Severe**	**χ 2**	**df**	***p***
Age						33.482	12	<.001
18-29	38 (15.4%)	19 (14.4%)	55 (21.7%)	41 (25.8%)	72 (27.8%)			
30-49	121 (49.2%)	79 (59.8%)	131 (51.6%)	77 (48.4%)	137 (52.1%)			
50-69	76 (30.9%)	33 (25%)	64 (25.2%)	38 (23.9%)	51 (19.4%)			
70+	11 (4.5%)	1 (0.8%)	4 (1.6%)	3 (1.9%)	2 (0.8%)			
Time stranded abroad						82.982	20	<.001
No wait	20 (7.8%)	4 (2.7%)	12 (4.4%)	6 (3.5%)	10 (3.9%)			
Up to 1 month	32 (12.4%)	16 (11%)	14 (5.1%)	5 (2.9%)	7 (2.5%)			
1-2 months	32 (12.4%)	10 (6.8%)	23 (8.4%)	7 (4.1%)	8 (2.8%)			
2-3 months	32 (12.4%)	18 (12.3%)	22 (8%)	22 (12.8%)	23 (8.1%)			
4-5 months	21 (8.1%)	15 (10.3%)	22 (8%)	15 (8.7%)	21 (7.4%)			
5+ months	121 (46.9%)	83 (56.8%	181 (66.1%)	117 (68%)	213 (75.3%)			
Financial stress						35.123	4	<.001
Yes	140 (54.3%)	85 (58.6%)	172 (63%)	109 (64.1%)	218 (77.6%)			
No	118 (45.7%)	60 (41.4%)	101 (37%)	61 (35.9%)	63 (22.4%)			
Homelessness						30.149	4	<.001
Yes	17 (6.6%)	16 (11.3%)	26 (9.7%)	16 (9.5%)	58 (20.9%)			
No	239 (93.4%)	125 (88.7%)	243 (90.3%)	152 (90.5%)	220 (79.1%)			
Employment Change						22.648	4	<.001
Yes	89 (38.2%)	45 (34.9%)	107 (43.5%)	74 (49%)	158 (55.9%)			
No	144 (61.8%)	84 (65.1%)	139 (56.5%)	77 (51%)	109 (44.1%)			
Flight changes or cancellations						36.694	24	.029
0 changes	23 (11.5%)	21 (20%)	31 (17.3%)	21 (16.9%)	26 (12.9%)			
1 cancelation or delay	70 (35%)	28 (26.7%)	48 (26.8%)	34 (27.4%)	34 (16.8%)			

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2 cancelations or delay	42 (21%)	20 (19%)	34 (19%)	30 (24.2%)	46 (22.3%)			
3 cancelations or delay	30 (15%)	18 (17.1%)	32 (17.9%)	21 (16.9%)	33 (15.8%)			
4 cancelations or delay	14 (7%)	6 (5.7%)	13 (7.3%)	6 (4.8%)	19 (9.4%)			
5 cancelations or delay	4 (2%)	3 (2.9%)	5 (2.8%)	3 (2.4%)	14 (6.4%)			
5+ cancelations or delay	17 (8.5%)	9 (8.6%)	16 (8.9%)	9 (7.3%)	34 (16.3%)			
Perceived risk of contracting COVID-19 (1-10 scale)						67.542	40	.004
1	29 (11.2%)	13 (8.9%)	21 (7.7%)	8 (4.7%)	29 (7.1%)			
2	34 (13.2%)	10 (6.8%)	12 (4.4%)	6 (3.5%)	14 (4.9%)			
3	25 (9.7%)	11 (7.5%)	21 (7.7%)	14 (8.1%)	17 (6%)			
4	13 (5%)	7 (4.8%)	12 (4.4%)	6 (3.5%)	12 (4.2%)			
5	31 (12%)	19 (13%)	21 (7.7%)	16 (9.3%)	24 (8.5%)			
6	10 (3.9%)	8 (5.5%)	19 (6.9%)	11 (6.4%)	13 (4.6%)			
7	28 (10.9%)	16 (11%)	35 (12.8%)	19 (11%)	29 (10.2%)			
8	30 (11.6%)	14 (9.6%)	35 (12.8%)	31 (18%)	40 (14.1%)			
9	14 (5.4%)	12 (8.2%)	17 (6.2%)	5 (2.9%)	21 (7.4%)			
10	42 (16.3%)	32 (21.9%)	75 (27.4%)	51 (29.7%)	83 (29.3%)			
Not Applicable	2 (0.8%0	4 (2.7%)	6 (2.2%)	5 (2.9%)	10 (3.5%)			
Access to crisis support or mental health services						3.314	4	.507
Yes	95 (36.8%)	55 (37.7%)	109 (39.8%)	63 (36.6%)	92 (32.5%)			
No	163 (63.2%)	91 (62.35)	165 (60.2%)	109 (63.4%)	191 (67.5%)			
	Anxiety							
Variables	**Normal**	**Mild**	**Moderate**	**Severe**	**Extremely Severe**	**χ 2**	**df**	***p***
Age						35.225	12	<.001
18-29	69 (15.4%)	36 (22.5%)	35 (25.7%)	36 (32.7%)	56 (25.1%)			
30-49	229 (51%)	86 (53.8%)	66 (48.55)	52 (47.3%)	112 (56.3%)			
50-69	138 (30.7%)	35 (21.9%)	32 (23.5%)	21 (19.1%)	36 (18.1%)			
70+	13 (2.9%)	3 (1.9%)	3 (2.2%)	1 (0.9%)	1 (0.5%)			

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Time stranded abroad						49.486	20	<.001
No wait	22 (4.5%)	12 (7%)	9 (6.3%)	3 (2.6%)	7 (3.3%)			
Up to 1 month	51 (10.5%)	8 (4.7%)	7 (4.9%)	3 (2.6%)	5 (2.3%)			
1-2 months	43 (8.8%)	12 (7%)	6 (4.2%)	10 (8.6%)	9 (4.2%)			
2-3 months	55 (11.3%)	20 (11.6%)	11 (7.7%)	15 (12.9%)	16 (7.4%)			
4-5 months	38 (7.8%)	15 (8.7%)	17 (12.0%)	5 (4.3%)	19 (8.8%)			
5+ months	279 (57.2%)	105 (61%)	92 (64.8%)	80 (69%)	72 (33.3%)			
Financial stress						53.944	4	<.001
Yes	258 (53.2%)	114 (66.3%)	97 (68.8%)	85 (73.3%)	172 (79.8%)			
No	227 (46.8%)	58 (33.7%)	44 (31.2%)	31 (26.7%)	44 (20.2%)			
Homelessness						18.517	4	<.001
Yes	44 (9.2%)	15 (8.9%)	16 (11.4%)	16 (13.8%)	43 (20.1%)			
No	434 (90.8%)	154 (91.1%)	124 (88.6%)	100 (86.2%)	171 (79.9%)			
Employment Change						34.917	4	<.001
Yes	156 (35.7%)	66 (44.6%)	65 (50%)	57 (52.8%)	129 (59.6%)			
No	281 (64.3%	82 (55.4%)	65 (50%)	51 (47.2%)	87 (40.4%)			
Flight changes or cancellations						29.009	24	.220
0 changes	50 (14.3%)	16 (13.7%)	19 (19.4%)	15 (17.2%)	22 (13.8%)			
1 cancelation or delay	110 (31.5%)	27 (23.1%)	21 (21.4%)	23 (26.4%)	33 (20.8%)			
2 cancelations or delay	79 (22.6%)	23 (19.7%)	15 (15.3%)	13 (14.9%)	41 (25.8%)			
3 cancelations or delay	48 (13.8%)	23 (19.7%)	22 (22.4%)	19 (21.8%)	21 (13.2%)			
4 cancelations or delay	21 (6%)	9 (7.7%)	8 (8.2%)	7 (8%)	13 (8.2%)			
5 cancelations or delay	9 (2.6%)	7 (6%)	2 (2%)	2 (2.3%)	8 (5%)			
5+ cancelations or delay	32 (9.2%)	12 (10.3%)	11 (11.2%)	8 (9.2%)	21 (13.2%)			
Perceived risk of contracted COVID-19 (1-10 scale)						81.128	40	<.001
1	47 (9.6%)	8 (4.7%)	12 (8.5%)	9 (7.8%)	18 (7%)			
2	49 (10%)	5 (2.9%)	7 (4.9%)	1 (0.9%)	16 (6.5%)			

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3	43 (8.8%)	11 (6.4%)	14 (9.9%)	6 (5.2%)	14(6.5%)			
4	20 (4.1%)	14 (8.1%)	7 (4.9%)	2 (1.7%)	7(3.3%)			
5	62 (12.7%)	13 (7.6%)	8 (5.6%)	9 (7.8%)	19 (8.8%)			
6	25 (5.1%)	13 (7.6%)	9 (6.3%)	5 (4.3%)	9(4.2%)			
7	62 (12.7%)	15 (8.7%)	13 (9.2%)	17 (14.7%)	20(9.3%)			
8	54 (11.1%)	32 (18.6%)	20 (14.1%)	15 (12.9%)	29(13.5%)			
9	24 (4.9%)	17 (9.9%)	10 (7%)	7 (6%)	11 (5.1%)			
10	92 (18.9%)	39 (22.7%)	39 (27.5%)	41 (35.3%)	72(33.5%)			
Not applicable	10 (2%)	5 (2.9%)	3 (2.1%)	4 (3.4%)	5(2.3%)			
Access to crisis support or mental health services						2.210	4	.697
Yes	188 (38.5%)	59 (34.3%)	49 (34.5%)	38 (32.8%)	80(37.2%)			
No	300 (61.5%)	113 (65.7%)	93 (65.5%)	78 (67.2%)	135 (62.8%)			
	Stress							
Variables	**Normal**	**Mild**	**Moderate**	**Severe**	**Extremely Severe**	**χ 2**	**df**	***p***
Age						51.326	12	<.001
18-29	47 (15%)	23 (17.2%)	44 (21.3%)	69 (29.9%)	42(25.4%)			
30-49	154 (49.2%)	76 (56.7%)	106 (51.2%)	113 (48.9%)	94(56.8%)			
50-69	96 (30.7%)	34 (25.4%)	56 (27.1%)	46 (19.9%)	30(17.8%)			
70+	16 (5.1%)	1 (0.7%)	1 (0.5%)	3 (1.3%)	0			
Time stranded abroad						50.180	20	<.001
No wait	22 (6.7%	3 (2.1%)	12 (5.4%)	12 (4.7%)	4(2.2%)			
Up to 1 month	38 (11.5%)	9 (6.2%)	9 (4%)	13 (5.1%)	5(2.8%)			
1-2 months	27 (8.2%)	15 (10.3%)	16 (7.1%)	16 (6.3%)	6(3.3%)			
2-3 months	36 (10.9%)	15 (10.3%)	23 (10.3%)	30 (11.9%)	13(7.2%)			
4-5 months	28 (8.5%)	11 (7.6%)	17 (7.6%)	27 (10.7%)	11(6.1%)			
5+ months	179(54.2%)	92 (63.4%)	147 (65.6%)	155 (61.3%)	142 (78.5%)			
Financial stress						40.368	4	<.001
Yes	176 (53.5%)	85 (58.6%)	146 (65.8%)	174 (69%)	143(79.9%)			

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No	153 (46.5%)	60(41.4%)	76 (34.2%)	78 (31%)	36(20.1%)			
Homelessness						13.393	4	.010
Yes	28 (8.5%)	15 (10.7%)	24 (10.9%)	32 (13%)	34 (19.3%)			
No	300 (91.5%)	125 (89.3%)	197 (89.1%)	215 (87%)	142 (80.7%)			
Employment Change						31.232	4	<.001
Yes	101 (33.8%)	50 (40.7%)	96 (47.1%)	113 (51.4%)	92 (58.1%)			
No	198 (66.2%)	73 (59.3%)	108 (52.9%)	107 (48.6%)	66 (41.9%)			
Flight changes or cancellations						27.073	24	.301
0 changes	28 (11.5%)	15 (15%)	28 (18.8%)	31 (17%)	26 (14.8%)			
1 cancelation or delay	79 (32.4%)	26 (26%)	43 (28.9%)	42 (23.1%)	28 (17.8%)			
2 cancelations or delay	56 (23%)	21 (21%)	31 (20.8%)	36 (19.8%)	32 (20%)			
3 cancelations or delay	36 (14.8%)	18 (18%)	24 (16.1%)	32 (17.6%)	27 (17%)			
4 cancelations or delay	16 (6.6%)	6 (6%)	11 (7.4%)	14 (7.7%)	13 (8.1%)			
5 cancelations or delay	9 (3.7%)	2 (2%)	2 (1.3%)	7 (3.8%)	8 (5.9%)			
5+ cancelations or delay	20 (8.2%)	12 (12%)	10 (6.7%)	20 (11%)	26 (16.3%)			
Perceived risk of contracted COVID-19 (1-10 scale)						66.487	40	.005
1	35 (10.6%)	11 (7.6%)	14 (6.3%)	16 (6.3%)	14 (8.3%)			
2	34 (10.3%)	10 (6.9%)	14 (6.3%)	11 (4.3%)	7 (3.9%)			
3	28 (8.5%)	14 (9.7%)	18 (8%)	20 (7.9%)	8 (4.4%)			
4	17 (5.2%)	7 (4.8%)	7 (3.1%)	13 (5.1%)	6 (3.3%)			
5	40 (12.1%)	15 (10.3%)	22 (9.8%)	19 (7.5%)	14 (8.35)			
6	21 (6.4%)	6 (4.1%)	12 (5.4%)	13 (5.1%)	9 (5%)			
7	34 (10.3%)	26 (17.9%)	24 (10.7%)	27 (10.7%)	16 (8.8%)			
8	41 (12.4%)	18 (12.4%)	35 (15.6%)	30 (11.9%)	26 (14.4%)			
9	14 (4.2%)	10 (6.9%)	20 (8.9%)	18 (7.1%)	7 (3.9%)			
10	62 (18.8%)	25 (17.2%)	53 (23.7%)	78 (30.8%)	65 (35.9%)			
Not applicable	4 (1.2%)	3 (2.1%)	5 (2.2%)	8 (3.2%)	7 (3.9%)			

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Access to crisis support or mental health services						3.371	4	.498
Yes	113 (34.2%)	60 (41.4%)	82 (36.6%)	98 (38.7%)	64 (33.7%)			
No	217 (65.8%)	85 (58.6%)	142 (63.4%)	155 (61.3%)	130 (66.3%)			

χ 2 , chi squared; df, degrees of freedom; *p*, probability value (statistically significant <.05).

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STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	5
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	*5*
Bias	9	Describe any efforts to address potential sources of bias	5
Study size	10	Explain how the study size was arrived at	
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	5
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	6
		(*b*) Describe any methods used to examine subgroups and interactions	6
		(*c*) Explain how missing data were addressed	6
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	6
		(*e*) Describe any sensitivity analyses	6
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	7
		(b) Give reasons for non-participation at each stage	7
		(c) Consider use of a flow diagram	Figure 1
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	7
		(b) Indicate number of participants with missing data for each variable of interest	Tables
Outcome data	15*	Report numbers of outcome events or summary measures	7/8

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Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	7/8
		(*b*) Report category boundaries when continuous variables were categorized	
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	7/8
Discussion			
Key results	18	Summarise key results with reference to study objectives	9
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	12
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	12
Generalisability	21	Discuss the generalisability (external validity) of the study results	10-12
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	NA

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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