Initial impacts of COVID-19 on mental health in Australia

ANU Centre for Social Research and Methods

Professor Nicholas Biddle[1], Associate Professor Ben Edwards[1], Professor Matthew Gray[1] and Kate Sollis[1]

1   ANU Centre for Social Research and Methods

Australian National University

Abstract

This paper presents data on the initial impacts of COVID-19 on psychological distress among the Australian population and compares these data to a nationally representative sample in the United States. The Australian survey is based on interviews with 3,155 Australians over the period 14-27 April 2020, with many of these respondents linked at the individual level to survey responses obtained prior to the spread of COVID-19. We find a substantial increase in the levels of psychological distress between February 2017 and April 2020 for the Australian population, increasing from 8.4 per cent reporting a serious mental illness in 2017 to 10.6 per cent during the COVID-19 pandemic. These increases in severe psychological distress are largely concentrated in young Australian adults aged 18 to 34 years. Compared to the survey in the United States of over 10,000 respondents, Australia does not appear to have as high levels of distress on average. However, the levels of psychological distress reported by younger Australian adults are similar to those being reported by Americans of the same age. While a substantial minority of Australians are experiencing higher rates of psychological distress as a result of the COVID-19 pandemic, there were some positive findings. In Australia, 61 per cent of people were very hopeful about the future, higher than the rate in the US of 52 per cent. These high levels of hope for the future were also found to be protective against some of the negative mental health impacts during this time.

Acknowledgements

ANU Centre for Social Research and Methods

1 Introduction

COVID-19 has led to an increase in many of the risk factors for poor mental health including uncertainty, the risk of ill health, job loss and social isolation.[1] In Australia, the COVID-19 pandemic immediately follows what has been historically the most destructive summer of bushfires, preceded by a period of widespread and prolonged drought. When the pandemic commenced, Australia was already in a position of considerable economic uncertainty. In addition, the ability of people to access mental health services may be disrupted by COVID-19 related restrictions. Many services have had to change how they operate – shifting from face-to-face services to online methods (Smyth, Moloney, Brady, Harman & Essler, 2020).

On 13 May 2020, the United Nations released a policy brief on COVID-19 and the need for mental health action, stating that "The mental health and wellbeing of whole societies have been severely impacted by this crisis and are a priority to be addressed urgently." The Director-General of the World Health Organisation, Dr Tedros Adhanom Ghebreyesus said on the 14th May "The impact of the pandemic on people's mental health is already extremely concerning".

There is emerging evidence for a number of countries that the rates of psychological distress are very high, including in China, Italy, Norway and the US and that symptoms of psychological distress are increasing.[2] Preliminary research from international studies indicates that loneliness during the COVID-19 pandemic is a pre-disposing factor for mental health concerns (Cerami et al. 2020; Okruszek et al. 2020).

There is also some evidence for Australia that there have been increases in anxiety, psychological distress, and mental health problems following the COVID-19 pandemic reaching Australia (ABS 2020). The Australian Government and state and territory governments are providing a range of resources and additional mental health services including additional funding for telephone and online support services, and specific services for children (Jorm 2020). *The National Mental Health and Wellbeing Pandemic Response Plan* has been adopted by the National Cabinet and provides for an additional AU$48.1 million funding.

While there is some data on the increases in psychological distress and mental health problems in Australia associated with COVID-19, including official data from the Australian Bureau of Statistics, there is currently no available longitudinal data – apart from that presented in this report – which provides data collected from the same group of people prior to and during the COVID-19 pandemic. This is a significant gap, as longitudinal data allows for changes in psychological distress and mental health problems to be analyzed at the individual level and risk and protective factors to be identified.

To help address this gap, this paper provides data on the initial impacts of COVID-19 on psychological distress in Australia. It is based on the 33rd ANUpoll which collected information from 3,155 Australians over the period 14-27 April 2020. It is the first longitudinal survey data on the impact of COVID-19 on the Australian population, with respondents to the April ANUpoll also interviewed a number times immediately prior to COVID-19 (including February 2020) with questions about psychological distress also previously asked in February 2017. There were 1,745 people who responded to the February 2017 ANUpoll who also responded to the April 2020 ANUpoll. The initial analysis of the April ANUpoll data was released by the ANU Centre for Social Research and Methods on the 9th May (Biddle et al. 2020), with this current paper expanding on the mental health measures in the survey.

ANU Centre for Social Research and Methods

While Australia has been affected by COVID-19, the health impact at the time of writing has been smaller than in a number of other countries that Australia often compares itself against, with far fewer COVID-19 cases and deaths. However, it is also the case that the physical distancing and social isolation measures in Australia have been more severe than in many other countries and this may have resulted in comparatively greater levels of social isolation in Australia and greater economic impacts and uncertainty. This paper compares the level of mental health symptoms in Australia with those being experienced in the United States during the initial COVID-19 pandemic period.

The remainder of this paper comprises five parts. First, we present results for the impact of COVID-19 on the rates of psychological distress experienced by Australians and the increases in these levels since February 2017 (Part 2). Next, we compare the two cross-sections as separate datasets, also providing data on how psychological distress has changed for different population sub-groups (particularly by age) (Part 3). We then turn to the longitudinal data, analyzing the factors associated with changes in psychological distress at the individual level. Part 4 compares the mental health symptoms in Australia with those in the United States, followed by data on the extent to which Australians are hopeful about the future and which factors are associated with being more hopeful (Part 5). The final section joins the dots between key findings, and sets out areas of concern and hope.

2   Change in psychological distress between February 2017 and April 2020

The April 2020 ANUpoll measured mental health as did comparable data on Life in Australia™ from February 2017. The Kessler (K6) comprises six items and has been widely used and validated in many epidemiological studies (Kessler et al. 2002). Specifically, the K6 questions ask the respondent how often in the last four weeks they felt: 'nervous'; 'hopeless'; 'restless or fidgety'; 'so depressed that nothing could cheer you up'; 'that everything was an effort'; and 'worthless'. There were five response categories, from "none of the time" to "all the time", with values ranging from 1 through 5. Respondents who score highly on this measure are considered to be at risk of a serious mental illness (other than a substance use disorder). It is important to recognise that the K6 screens for the risk of serious mental illness, but is not a clinical diagnostic measure.

The K6 items can be summed to produce an index, with potential values ranging from 6 to 30. People with a sum of 11 to 18 out of a possible maximum of 30 are categorized as experiencing *moderate* psychological distress. This group can be considered to be struggling with mental distress worthy of mental health support but are not at risk of clinical levels of mental health problems like those in the serious category (Prochaska et al, 2012). Those with a K6 sum of 19 or higher out of a possible maximum of 30 are categorized as experiencing *severe* psychological distress consistent with having a 'probable serious mental illness'.

Figure 1 shows the percentage of respondents in the April ANUpoll and comparable data from February 2017 reporting that in the last 4 weeks they felt each of the indicators of psychological distress some, most, or all of the time (using probability weights). Four of six of these indicators of distress increased by a statistically significant amount between February 2017 and April 2020. The percentage of the population that was nervous some, most, or all of the time increased from 27.4 to 44.5 per cent; the percentage reporting feelings of

hopelessness increased from 18.5 to 26.2 per cent; the percentage reported feeling restless or fidgety increased from 36.3 to 42.0 per cent; and the percentage reporting feeling so sad that nothing could cheer them up increased from 13.2 to 18.6 per cent.[3]

Figure 1   Proportion of respondents reporting feeling indicators of psychological distress, February 2017 and April 2020
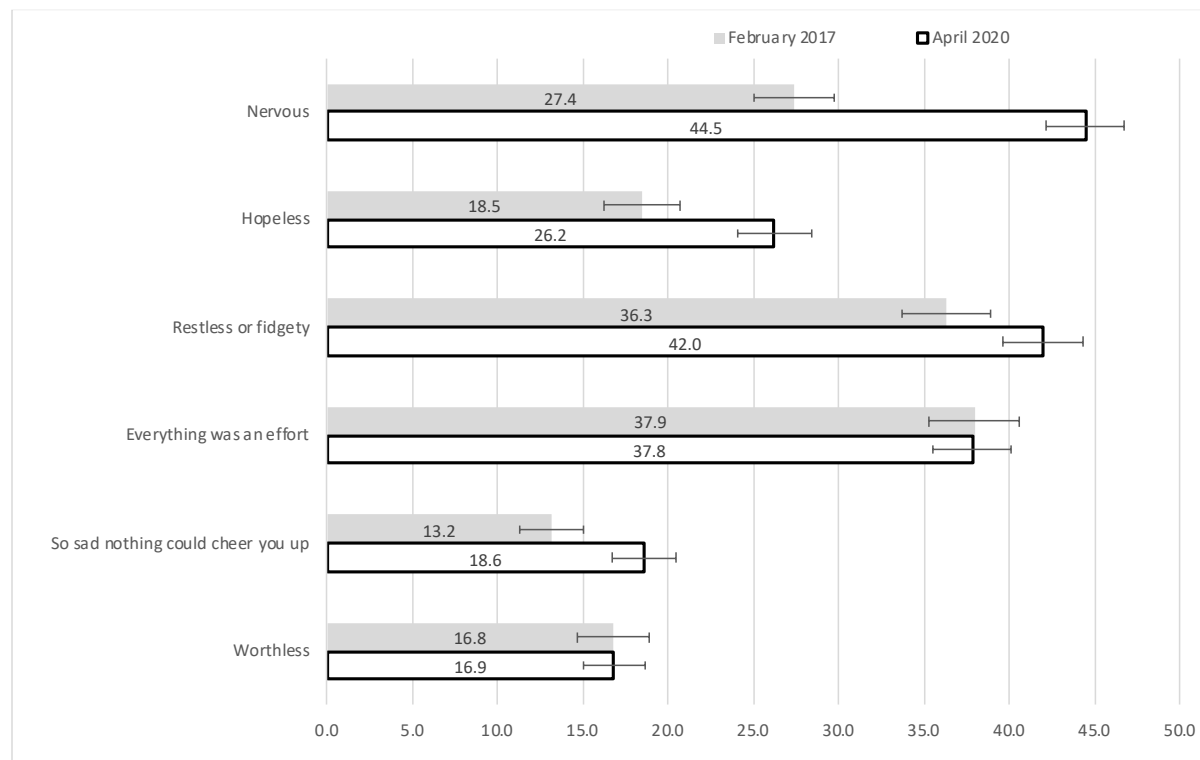
Notes: The "whiskers" on the bars indicate the 95 per cent confidence intervals for the estimate.
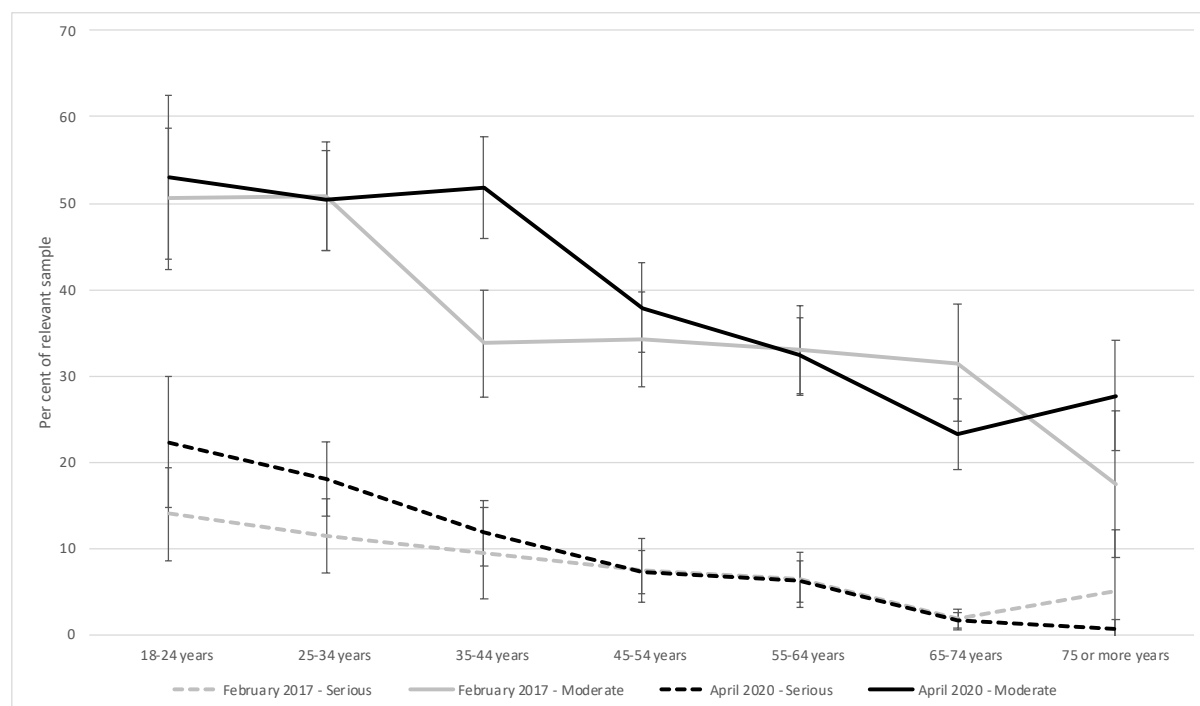
Source: Life in AustraliaTM February 2017 and ANUpoll, April 2020.

Combining the individual items, we find that in February 2017, 37.3 per cent of the sample were estimated to be in moderate distress, while 8.4 per cent were estimated to be in severe distress. By April 2020, this had increased to 40.8 per cent and 10.6 per cent respectively, with both increases statistically significant.

2.1   Changes in mental health outcomes by age

The changes in mental health outcomes between 2017 and April 2020 differ between age groups. Figure 2 provides information on the proportion of the population in moderate and in severe psychological distress in February 2017 and April 2020 by age group. There have been large increases in the proportion of 18 to 24 year olds and 25 to 34 year olds experiencing severe psychological distress, but no increases for those 35-years and older. The proportion of 18 to 24 year olds experiencing severe psychological distress increased from 14.0 per cent in 2017 to 22.3 per cent in April 2020.

ANU Centre for Social Research and Methods

Figure 2   Proportion of respondents with severe or moderate psychological distress, February 2017 and April 2020, by age group.

Notes: The "whiskers" on the bars indicate the 95 per cent confidence intervals for the estimate.

Source: Life in AustraliaTM February 2017 and ANUpoll, April 2020.

While there has been a large increase in the percentage of those aged 34-years or younger reporting severe psychological distress, the differences are not statistically significant at the 95 per cent confidence level due to relatively high standard errors related to sample size. One way of obtaining more precise estimates (i.e., smaller standard errors) is to use the K6 continuous measure of psychological distress. Using the K6 continuous measure, there are substantial and statistically significant increases between 2017 and February 2020 in the level of psychological distress being experienced by those aged 18 to 24 years, 25 to 34 years, and 35 to 44 years (Figure 3). For older age groups there has been either no change (45 to 64 years) or reductions in psychological distress, and these reductions are statistically significant for those aged 65 to 74 year age group (95 per cent confidence level) and those 75 years and over (90 per cent confidence level).[4]

ANU Centre for Social Research and Methods

Figure 3   Psychological distress (K6) aggregate score, February 2017 and April 2020, by age group
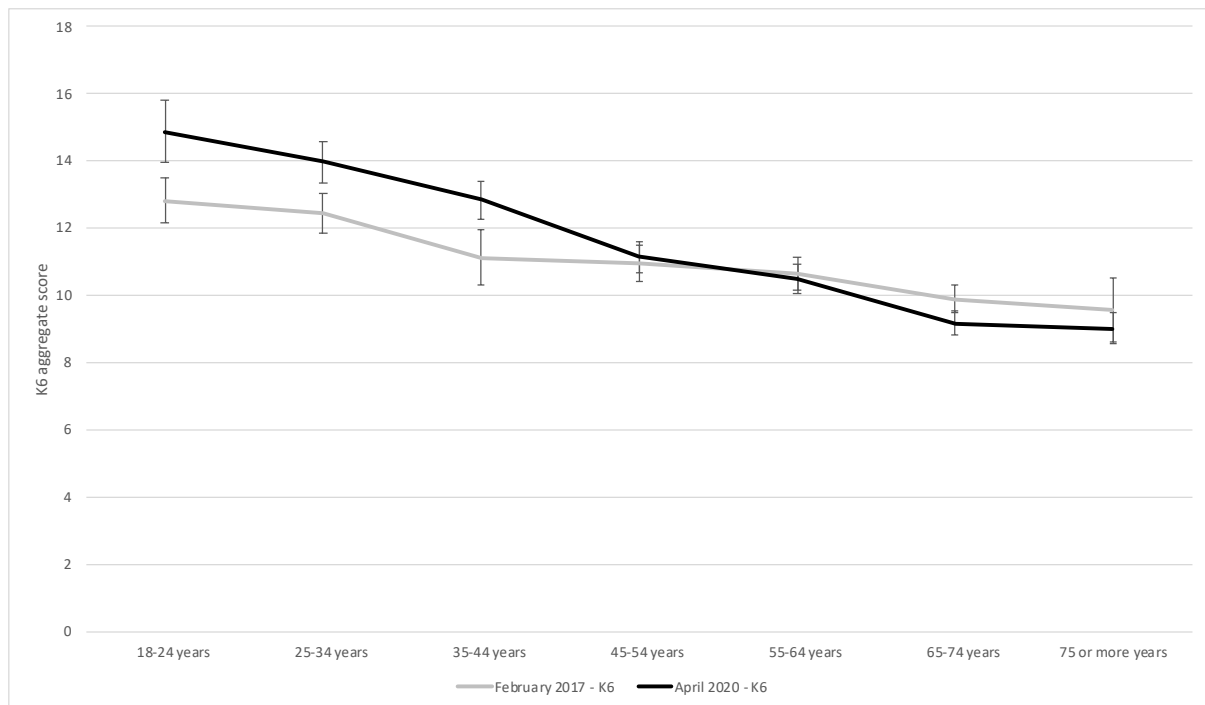

Notes: The "whiskers" on the bars indicate the 95 per cent confidence intervals for the estimate.

Source: Life in AustraliaTM February 2017 and ANUpoll, April 2020

3   The relationship between changes in mental health and COVID-19 related views and experiences

One of the benefits of the data used in this paper is that about half of those surveyed in February 2017 were also surveyed in April 2020.[5] This allows analysis of the factors associated with change over time in psychological distress at the individual level.[6]

As there is over three years between the times at which psychological distress was measured, it is not possible to attribute the change in psychological distress directly or solely to COVID-19. However, there are self-reported measures of COVID-19 exposure that we can compare alongside change in psychological distress, giving very strong *prima facie* evidence for the effect of COVID-19. Specifically, in a regression model, we include psychological distress (continuous K6) in April 2020 as the dependent variable, and psychological distress in February 2017 as a control variable. For the baseline model, we also control for a range of demographic, socioeconomic, and geographic characteristics. We then add two COVID-19 specific measures – whether a person was anxious or worried about COVID-19, and whether a person thought it was likely that they would be infected by COVID-19 in the next 12 months – to create Model 2. Finally, in Model 3 we include the self-reported expected probability of a person losing their job in the next 12 months, estimated for those who were employed in April 2020.

The results presented in Model 1 confirm the descriptive statistics presented above, with no difference in the change in psychological distress between those aged 18 to 34 years and those age 35 to 44 years (the base case) but relative improvements in psychological distress amongst

7

those aged 45 years and over (particularly for those aged 65 years and over). The model also shows, however, that psychological distress has worsened for females relative to males; those born in a non-English speaking country relative to those born in Australia; as well as those with both high levels of education (particularly a degree) and those with low levels of education (have not completed Year 12) relative to those who have completed Year 12 but do not have a degree. Psychological distress has improved, however, for those in relatively disadvantaged areas relative to those in the middle quintile (at least at the 10 per cent level of significance); and for those outside of capital cities compared to those who live in capital cities (at the 5 per cent level of significance).

The results in Model 2, however, show that those who reported that they experienced anxiety or worry specifically related to COVID-19, and those who thought they were likely to be infected, had a relative worsening in psychological distress. While these results hold in the model where we control for demographic, socioeconomic and geographic characteristics, the effect is also apparent in the unconditional averages. For those who were anxious or worried about COVID-19, there was an increase in psychological distress of 0.78 points, whereas for those who were not anxious or worried there was a decline by -0.30. For those who thought it was likely that they would be infected by COVID-19, there was an increase in psychological distress of 1.00 points, whereas for those who did not think it was likely only increased by 0.02 points (essentially, no change).

In the final model, we focus on those who were employed in April 2020 and look at the association with the self-reported probability of losing one's job. Controlling for the full range of characteristics, we find that an increase in the self-reported probability of losing one's job is associated with a 0.02 point increase in psychological distress (with a p-value of 0.001). While this does not necessarily demonstrate a causal relationship (it is possible that increases in psychological distress have been the cause of concern about future job prospects), the results do demonstrate that there is a strong relationship between the labour market and mental health outcomes.

Table 1   Factors associated with psychological distress (K6)

	Model 1		Model 2		Model 3 (employed)	
	Coeff.	Signif.	Coeff.	Signif.	Coeff.	Signif.
Psychological distress in February 2017	0.537	***	0.511	***	0.537	***
Anxious or worried about COVID-19			1.306	***	1.003	**
Expected likelihood of being infected by COVID-19			0.544	*	0.773	*
Expected probability of losing one's job					0.021	***
Female	0.601	**	0.419		0.570	
Aged 18 to 24 years	0.599		0.725		0.346	
Aged 25 to 34 years	0.441		0.755		0.487	
Aged 45 to 54 years	-1.191	**	-0.991	**	-1.026	*
Aged 55 to 64 years	-1.515	***	-1.405	***	-1.406	***
Aged 65 to 74 years	-2.007	***	-1.689	***	-1.613	*
Aged 75 years plus	-2.504	***	-2.312	***	-2.939	***
Indigenous	1.216		0.764		0.940	
Born overseas in a main English speaking country	0.038		-0.067		0.483	
Born overseas in a non-English speaking country	1.098	*	0.980	*	0.607	
Speaks a language other than English at home	-0.166		-0.244		-0.305	
Has not completed Year 12 or post-school qualification	-0.911	*	-0.962	*	-0.810	
Has a post graduate degree	-1.136	**	-1.253	**	-1.171	
Has an undergraduate degree	-0.978	*	-1.032	**	-0.620	
Has a Certificate III/IV, Diploma or Associate Degree	-1.019	**	-1.049	**	-0.688	
Lives in the most disadvantaged areas (1st quintile)	-0.812	*	-0.722		-0.396	
Lives in next most disadvantaged areas (2nd quintile)	-0.325		-0.400		-0.028	
Lives in next most advantaged areas (4th quintile)	-0.629		-0.729		-0.328	
Lives in the most advantaged areas (5th quintile)	-0.642		-0.808	*	-0.445	
Lives in a non-capital city	-0.757	**	-0.826	***	-0.550	
Constant	7.446	***	6.796	***	5.324	***
Sample size	1,526		1,491		763	

Source: ANUpoll, April 2020 and ANUpoll, January 2020.

Notes: OLS Regression Model. The base case individual is female; aged 35 to 44; non-Indigenous; born in Australia; does not speak a language other than English at home; has completed Year 12 but does not have a post-graduate degree; lives in neither an advantaged or disadvantaged suburb (third quintile); and lives in a capital city.

Coefficients that are statistically significant at the 1 per cent level of significance are labelled ***; those significant at the 5 per cent level of significance are labelled **, and those significant at the 10 per cent level of significance are labelled *.

ANU Centre for Social Research and Methods

## 4   International comparison: Australia and the United States of America

In addition to the K6 scale, in the April 2020 ANUpoll we also included questions from the John Hopkins COVID-19 mental health scale (Coronavirus and Mental Health Measurement Working Group 2020) which was specifically developed to evaluate mental health during the COVID-19 pandemic. The John Hopkins scale asks participants how often they experienced five symptoms in the past week:

- Have you felt depressed?
- Have you felt lonely?
- Have you felt hopeful about the future?
- Have you felt nervous, anxious or on edge?
- Have you had physical reactions, such as sweating, trouble breathing, nausea, or a pounding hearth, when thinking about your experience (e.g. social distancing, loss of income/work, concerns about infection) with the coronavirus/COVID-19 pandemic?[7]

The response categories are: 'rarely or none of the time (less than 1 day)'; 'some or little of the time (1-2 days)'; 'occasionally or a moderate amount of time (3-4 days)'; and 'most or all of the time (5-7 days)'.

Figure 4 shows the percentage of people in Australia and the US who report that they were feeling that way for at least 3-4 days in the last week. The Australian data are from the April 2020 ANUPoll collected 14-27 April; the US data are for two time periods: 19-24 March, and 20-26 April 2020. There are several points to take from Figure 4. First, the levels of feeling nervous, anxious or on edge and depressed while high in Australia, are much lower than in the US. For example, 22 per cent of the Australian population reported feeling nervous, anxious or on edge for at least 3-4 days per week, while in the US it was 43 per cent for 19-24 March and 34 per cent for 20-26 April 2020. Second, there is little difference between Australia and the US in the percentage of the population feeling lonely: 20 per cent in Australia, compared with 19 and 23 per cent in the US for the respective surveys. This is also the case with physical stress reactions (both 7 per cent in Australia and the US). Third, despite the levels of negative feelings being high in both countries, most people were very hopeful about the future (61 per cent in Australia, 52 per cent in the United States in April 2020).

Figure 4   Percentage of people in Australia who report that they were feeling that way for at least 3-4 days in the last week, ANU Poll and Pew Research Centre's American Trends Panel
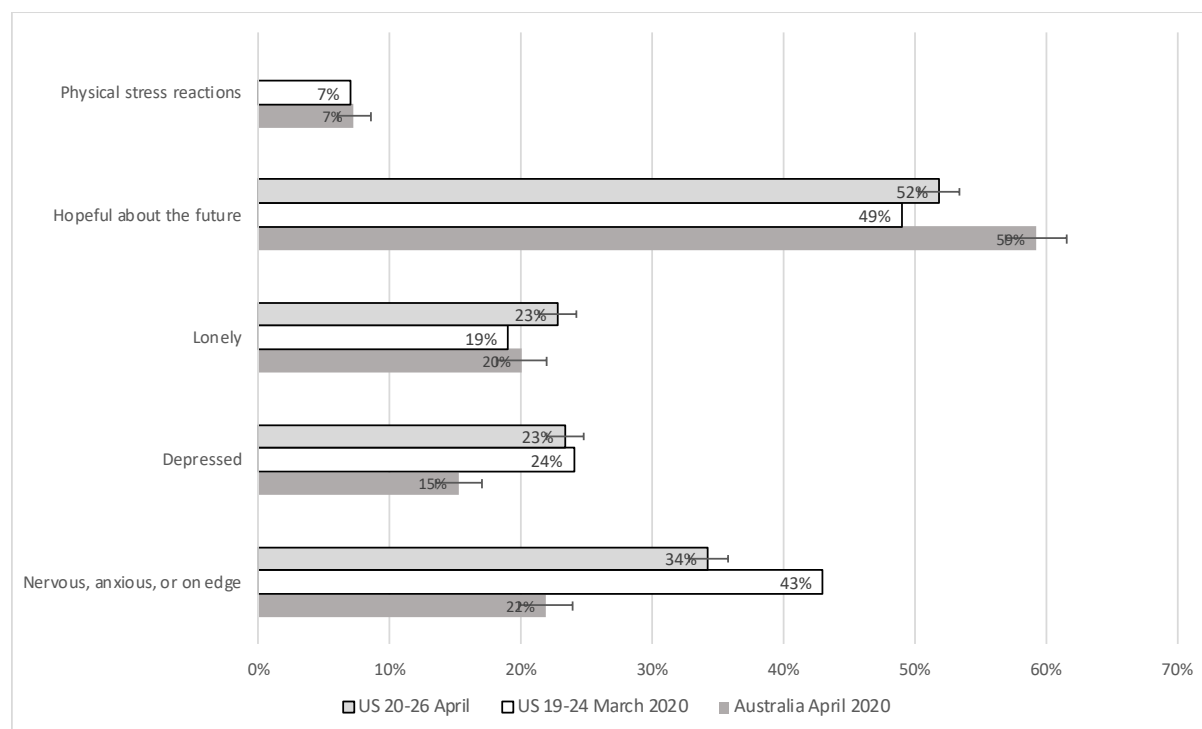

Notes: The Pew Research Centre's American Trends April 2020 panel did not include the question on physical stress reactions. The "whiskers" on the bars indicate the 95 per cent confidence intervals for the estimate. Confidence intervals were not generated for Pew Research Centre's American Trends April 2020 panel as this was sourced from Keeter (2020).

Source: ANUpoll, April 2020 and March, 2020 Pew Research Centre's American Trends Panel estimates are from Keeter (2020) and April, 2020 estimated using population weights from Pew Research Centre's American Trends Panel

The John Hopkins mental health scale items on feeling nervous, anxious or on edge, depressed, and lonely can be combined to generate a summary score in a similar way to the way in which the K6 measure can be treated. To facilitate direct comparisons with recent US research using the Pew Research Centre's American Trends Panel April survey that used high scores on these items in the US (Keeter, 2020), we establish the same cut off score for the Australian population.[8] In the United States we find that 33 per cent have high levels of distress using this cut-off while in Australia there were substantially lower levels of distress at 24 per cent.[9]

Further evidence for age differences in high levels of distress in April 2020 in Australia can be found when examining the John Hopkin's distress scale. Figure 5 shows the predicted probabilities of high levels of distress for Australians by age group. The predicted probabilities are derived from a logistic regression model that controls for sex, country of birth, citizenship, speaking language other than English at home, indigenous status, and education (see Table A1). Results also show a pronounced pattern of distress by age with 42 per cent of 18 to 24 year olds having high distress levels in the past week. Over one-in-three 25 to 34 year olds (34 per cent) had high levels of distress, and over one-in-four 35 to 44 year olds had high levels of distress (28 per cent). Females were more likely to have distress (26%) compared to males (22%), as did indigenous people (40%) compared to non-indigenous people (24%).

Figure 5   Probability of people in high distress by age according to the John Hopkins distress scale, ANU Poll April 2020
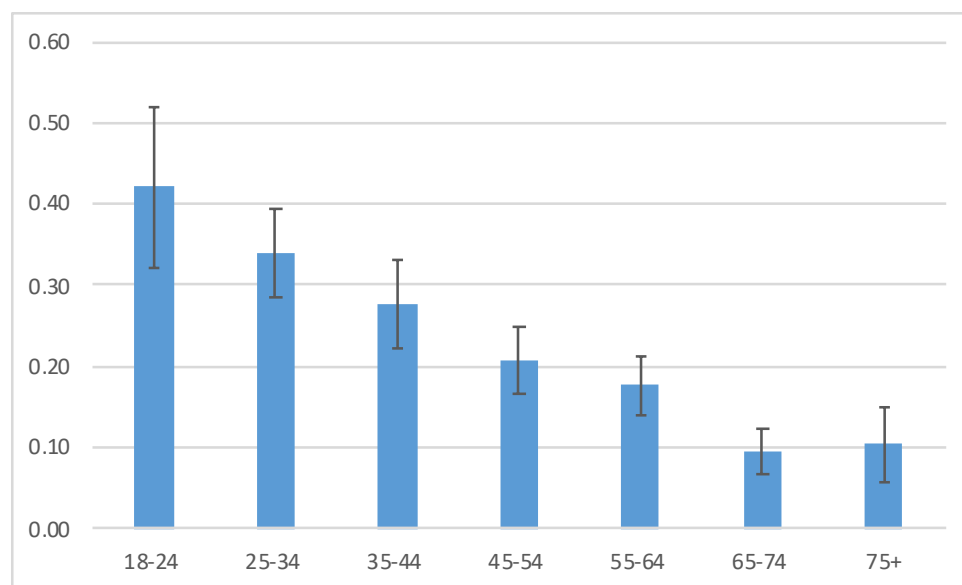
Notes: The "whiskers" on the bars indicate the 95 per cent confidence intervals for the estimate.
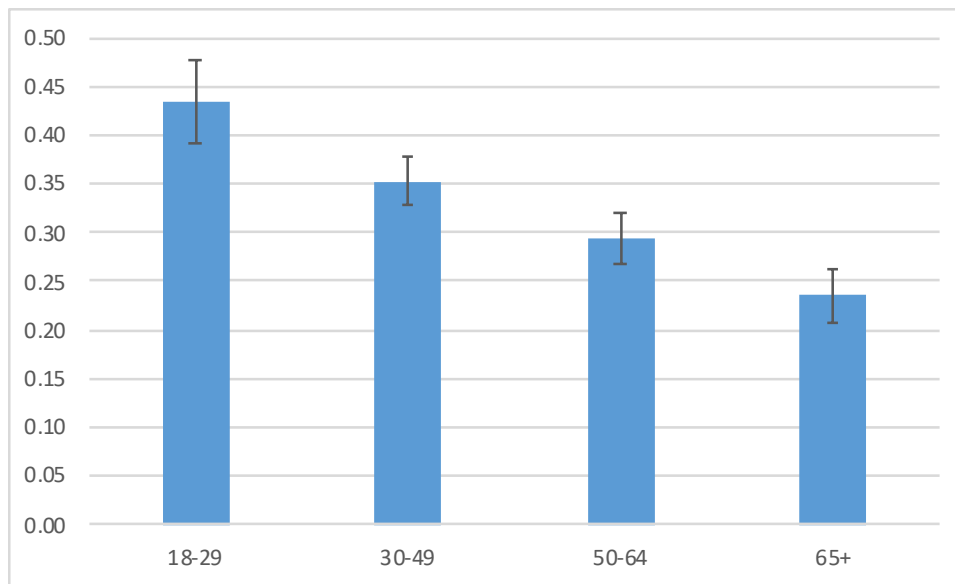
Source: ANUpoll, April 2020; Estimated probabilities from logistic regression model with survey weights

Are these age differences in mental health similar in the United States? Some insights into levels of distress by age can be found in the American Trends Panel in April 2020. To adjust for other demographic differences between the two countries, we estimated high levels of distressed based on the same cut-offs for high distress for the John Hopkins distress scale and demographic characteristics in a logistic regression model (see Table A2).[10] While we take account of some demographic differences, we acknowledge that there are many more cultural and political differences that cannot be taken into account by our approach.

We find similar levels of distress in the younger age groups but not for older age groups in the United States. Forty-three percent 18-29 year olds experience high distress while 35 per cent of 30-49 year olds had high distress levels slightly higher but similar to the levels of distress in Australia. For the United States population, 29 per cent of 50 to 64 years olds and 24 per cent of those aged 65 years or older old had high distress levels. While age categories were not directly comparable between the ANU Poll and data in the American Trends Panel, it appears as though young people are similarly affected in both countries. In the United States the mental health burden is greater for those over age 50 years, even adjusting for other demographic characteristics.

The only other demographic characteristic that was statistically associated with high distress was sex. In the US, more females had high distress (38.5 per cent) compared to males (26.5 per cent).[11]

ANU Centre for Social Research and Methods

Figure 6   Probability of people in high distress by age according to the John Hopkins distress scale, US, April 2020

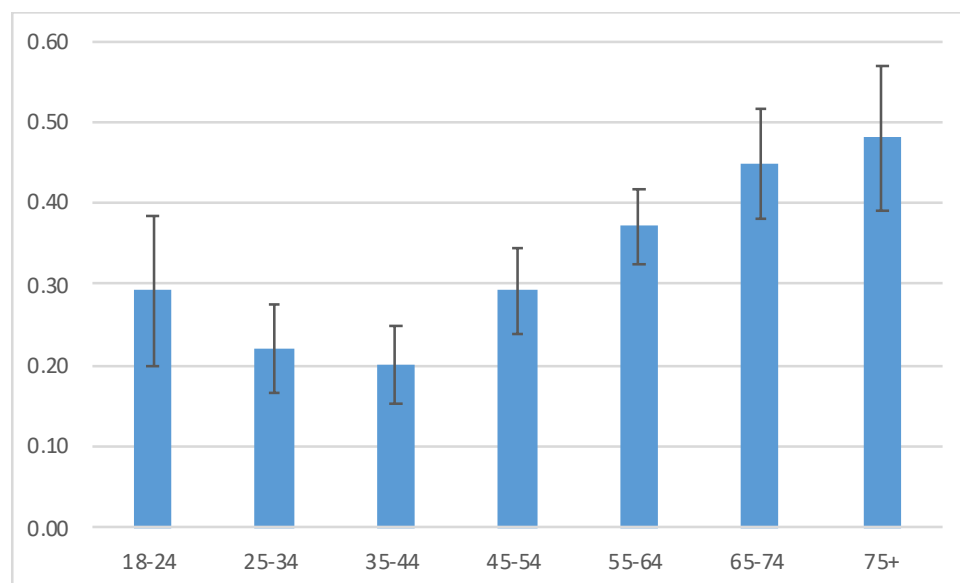Notes: The "whiskers" on the bars indicate the 95 per cent confidence intervals for the estimate.
Sources: Pew Research Centre American Trends Panel, April 2020; Estimated probabilities from a logistic regression with survey weights.

5   Hope for the future during the COVID-19 pandemic

Psychological resources can help protect individuals against mental health problems. An important psychological resource is hope, which has been considered to be both the level of motivation towards a goal (disposition) and also the perceived ability to achieve the desired goal (Snyder et al. 1991). Individuals with higher levels of hope tend to have lower levels of stress and depression (Waynor et al. 2012) and higher life satisfaction (Bronk et al. 2009). The impact of hope on psychological health has been examined in the context of COVID-19 by Yildirim et al. (2020), who reported that hope had significant associations with psychological health and subjective wellbeing.

In April 2020 we asked participants: In the last week "Have you felt hopeful about the future?" and for these analyses we categorised those who indicated that they were hopeful "most or all of the time (5-7 days)" as hopeful. This item captures a dispositional view of hope. As it turns out, 30% of the Australian population were hopeful about the future most or all of the time. To examine demographic correlates of high levels of hope we estimated a logistic regression controlling for previous levels of health, happiness, life satisfaction, and employment (current in February; ever unemployed for 3 months or more). There were statistically significant differences in hope by age but not for other demographic variables (see Table A3). Figure 7 overleaf shows that those aged under 55 years of age had significantly lower rates of high hope compared to those over the age of 54 years. These results are consistent with findings from mental health, with older Australians having better mental health and higher levels of hope for the future while younger Australians have worse mental health and less hope for the future.

Figure 7   Percentage of people who have high hope for the future (hopeful most or all of the time) by age (controlling for demographic characteristics and prior health), ANU Poll
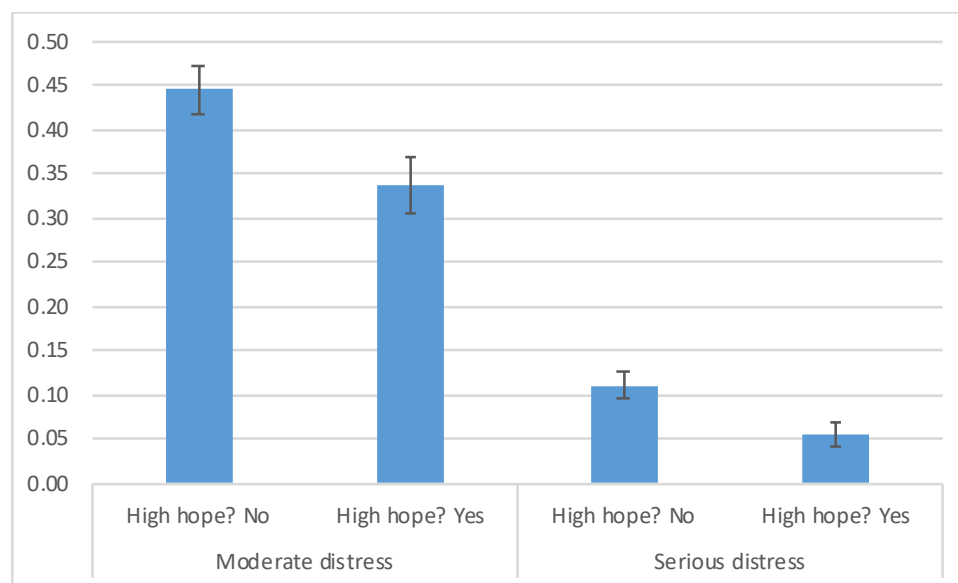

Notes: Estimated probabilities from logistic regression model with survey weights. The "whiskers" on the bars indicate the 95 per cent confidence intervals for the estimate.

Source: ANUpoll, April 2020.

Next we tested the extent to which having high hope for the future protected against the negative mental health shocks documented earlier. For both measures of distress (Kessler 6 and JHU distress) we estimated a regression model controlling for previous levels of health, happiness and life satisfaction and employment (current in February; ever unemployed for 3 months or more) and then added high hope for the future (see Table A4). We found that those with high hope for the future had significantly lower rates of moderate and serious distress on the K6 (34% and 5.5%) compared to those with lower hope (45% and 11%, Figure 8). For the JHU Distress scale we found a similar pattern of results, with those with high hope for the future having significantly lower rates of high distress than those with lower levels of hope (15% compared to 27%). Given that information about people's hope for the future was collected concurrently with their mental health, we cannot rule out reverse causality – although this finding held even after taking account of pre-COVID-19 pandemic health, happiness, and life satisfaction.

Figure 8   Percentage of people with moderate or serious distress by high hope for the future (hopeful most or all of the time) (controlling for demographic characteristics and prior health), ANU Poll

Notes: Estimated probabilities from logistic regression model with survey weights. The "whiskers" on the bars indicate the 95 per cent confidence intervals for the estimate.

Source: ANUpoll, April 2020

6   Concluding comments

As far as we aware, this is the first paper that tracks the mental health of a representative sample of the Australian population before and after the commencement of the COVID-19 pandemic. These new data suggest that there has been a substantial increase in the levels of psychological distress (including to levels that are consistent with a serious mental illness) between February 2017 and April 2020 for the Australian population, increasing from 8.4 per cent to 10.6 per cent.

The increases in severe psychological distress are largely concentrated in young Australian adults aged 18 to 24 year olds and those aged 25 to 34 year olds. The proportion of 18-24 years olds experiencing severe psychological distress increased from 14.0 per cent in 2017 to 22.3 per cent in 2020. The increase for those aged 25-34 years has been from 11.5 per cent to 18.0 per cent. Amongst Australians aged 35 to 44 years, while there is no evidence of increases in severe psychological distress there has been increases in the percentage experiencing moderate levels of psychological distress (33.8 per cent to 51.8 per cent). The increase in the level of severe psychological distress being experienced by younger adult Australians is very substantial and if sustained, could lead to adverse clinical outcomes including hospitalisation due to self harm and higher deaths by suicide.

Comparing Australia to the US, it is apparent that the levels of psychological distress being experienced by the Australian population are not as high as the levels in the United States. However, the levels of psychological distress being experienced by younger Australian adults are similar to those being reported by Americans of the same age.

ANU Centre for Social Research and Methods

The data reported in this paper suggest that, at least in Australia, the mental health of young adults should be a major concern for policymakers and medical practitioners. While our data do not include those under 18-years of age, information about how this group is faring is urgently needed, along with data to improve understanding of factors that enhance and ameliorate the risk for mental health problems among young people in particular. Previous research using ANU Poll (Biddle, Edwards, Gray and Sollis 2020) has documented that young people (18 to 24 year olds) experienced the greatest job losses and reductions in hours worked, and the April 2020 Labour Force Survey shows the youth unemployment rate rose at twice the rate of the overall unemployment rate (ABS, 2020). We show a very strong association in this paper between concerns about future job loss and measures of psychological distress.

The evidence of the impact of the Great Recession in other countries and from previous economic downturns highlights that youth entering or establishing themselves in the labour force during periods of economic downturn do worse on a variety of indicators including mental health, job stability and earnings across the lifecourse (Gray, Edwards, Hayes and Baxter, 2009; Schoon and Bynner, 2017). To this end, given that we have found that older people's sense of trust in others and belief in the fairness of the rest of the population have increased substantially (Biddle, Edwards, Gray and Sollis 2020), there may well be wide support for intergenerational measures to support Australian youth during this difficult period.

While a substantial minority of Australians are experiencing higher rates of psychological distress, and there has been an increase in serious mental illness as a result of the COVID-19 pandemic, there are some positive findings from our survey. Despite the levels of negative feelings being high in Australia, 61 per cent of people were very hopeful about the future – higher than the rate in the US of 52 per cent. These relatively high levels of hope for the future are also likely to be protective against some of the negative mental health impacts.

References

Australian Bureau of Statistics. (2020). 4940.0 - Household Impacts of COVID-19 Survey, 14-17 Apr 2020.

Biddle, N., B. Edwards, M. Gray, and K. Sollis (2020). "Hardship, distress, and resilience: The initial impacts of COVID-19 in Australia", COVID-19 Briefing Paper, ANU Centre for Social Research and Methods, Australian National University, Canberra.

Bronk , K., P. Hill, D. Lapsley, T. Talib and H. Finch (2009). "Purpose, hope, and life satisfaction in three age groups." *The Journal of Positive Psychology*, 4:6, 500-510.

Australian Bureau of Statistics (ABS) (2020). "Household Impacts of COVID-19 Survey, 14-17 April 2020." *ABS Catalogue No. 4940.0*, ABS, Canberra.

Cerami, C., G. Santi, C. Galandra, A. Dodich, S. Cappa, T. Vecchi and C. Crespi (2020). "Covid-19 Outbreak in Italy: Are we ready for the psychosocial and the economic crisis? Baseline findings from the PsyCovid Study." PsyArXiv.

Coronavirus and Mental Health Measurement Working Group. (2020). John Hopkins Covid Distress scale. Johns Hopkins Bloomberg School of Public Health.

Ebrahimi, O. V., Hoffart, A., & Johnson, S. U. (2020, May 9). The mental health impact of non-pharmacological interventions aimed at impeding viral transmission during the COVID-19 pandemic in a general adult population and the factors associated with adherence to these mitigation strategies. https://doi.org/10.31234/osf.io/kjzsp

Frasquilho, D., M. Matos, F. Salonna, D. Guerreiro, C. Storti, T. Gaspar and J. Caldas-de-Almeida (2015). "Mental health outcomes in times of economic recession: a systematic literature review." *BMC Public Health*, 16(115).

Gray, M., Edwards, B., Hayes, A., and Baxter, J. (2009). "The impacts of recessions on families." *Family Matters*, 83, 7-14.

Jorm, A. (2020). "The government will spend $48 million to safeguard mental health. Extending JobKeeper would safeguard it even more." *The Conversation*, May 16th. https://theconversation.com/the-government-will-spend-48-million-to-safeguard-mental-health-extending-jobkeeper-would-safeguard-it-even-more-138778

Keeter, S. (2020). "People financially affected by COVID-19 outbreak are experiencing more psychological distress than others." Pew Research Center.

Liu, D., Y. Ren, F. Yan, Y. Li, X. Xu, X. Yu, W. Qu, Z. Wang, B. Tian, F. Yang, Y. Yao, Y. Tan, R. Jiang and S. Tan (2020). "Psychological Impact and Predisposing Factors of the Coronavirus Disease 2019 (COVID-19) Pandemic on General Public in China." SSRN.

Okruszek, L.,A. Aniszewska-Stanczuk, A. Piejka, M. Wisnieweska and K. Zurek, K. (2020). "Safe but lonely? Loneliness, mental health symptoms and COVID-19." PsyArXiv.

Pancani, L., M. Marinucci, N Aureli and P. Riva (2020). "Forced social isolation and mental health: A study on 1006 Italians under COVID-19 quarantine." PsyArXiv.

Prochaska, J., H-Y. Sung,W. Max, Y. Shi and M. Ong (2012). "Validity study of the K6 scales as a measure of moderate mental distress based on mental health treatment need and utilization." *International Journal of Methods in Psychiatric Research*, 21(2): 88-97.

Reeves, A.,M. McKeen, D. Gunnell, S. Chang, S. Basu, B. Barr, B and D. Stuckler (2014). "Economic shocks, resilience, and male suicides in the Great Recession: cross-national analysis 0f 20 EU countries." *European Journal of Public Health*, 25: 404-409.

Schoon, I. and J. Bynner (eds) (2017). *Young People's Development and the Great Recession: Uncertain Transitions and Precarious Futures*. Cambridge University Press, Cambridge.

Smyth, B., Moloney, L., Brady, J., Harman, J. J., & Esler, M. (2020). COVID-19 and Separated Families. CSRM COVID-19 Issues paper. Canberra, ANU.

Snyder, C., C. Harris, J. Anderson, S. Holleran, L. Irving, S. Sigmon, et al. (1991). "The will and the ways: Development and validation of an individual differences measure of hope." *Journal of Personality and Social Psychology,* 60(4): 570–585.

United Nations (2020). 'COVID-19 and the Need for Action on Mental Health.' *United Nations Policy Brief*.

Wang, C., R. Pan, X. Wan, Y. Tan, L. Xu, R. S. McIntyre, F. N. Choo, B. Tran, R. Ho, V. K. Sharma and C. Ho (2020). "A Longitudinal Study on the Mental Health of General Population during the COVID-19 Epidemic in China." Brain, Behavior, and Immunity. doi: 10.1016/j.bbi.2020.04.028

Waynor, W., N. Gao, J. Dolce, L. Haytas and A. Reilly (2012). "The relationship between hope and symptoms." *Psychiatric Rehabilitation Journal, 35*(4): 345.

Yilidirim, M. & Arsian, G. (2020). Exploring the Associations Between Resilience, Dispositional Hope, Preventive Behaviours, Subjective Well-Being, and Psychological Health Among Adults During Early Stage of COVID-19. *PsyArXiv. doi:10.31234/osf.io/vpu5q*

Appendix 1   About the survey

The fieldwork for the April 2020 ANUPoll commenced on the 14th of April and continued for a two-week collection period. The majority of data collection occurred at the start of this survey window, with 52.4 per cent of the sample enumerated in the first two days of full data collection. A total of 3,950 active panel members were invited to take part in the survey, of which 3,155 responded, leading to a completion rate of 79.9 per cent for the survey.

We linked data from previous waves of ANUpoll and from other data collection using Life in Australia™. Between October-December 2019, the panel was refreshed with n = 347 panellists being retired and n = 1,810 new panellists being recruited. This recruitment used a G-NAF (Geocoded National Address File) sample frame and push-to-web methodology. Only online participants were recruited in order to balance the demographics (the age profile of panel members was older and more educated than that of the Australian population). The recruitment rate (RECR) for the replenishment was 12.1 per cent.

The linkage rates to previous waves of data collection that were used in this analysis were:

- February 2020 – 92.6 per cent (2,920 participants)

- February 2017 – 52.3 per cent (1,651 participants)

The Social Research Centre collected data online and through Computer Assisted Telephone Interviewing (CATI) in order to ensure representation from the offline Australian population. Around 6.5 per cent of interviews were collected via CATI. The contact methodology adopted for the online Life in Australia™ members is an initial survey invitation via email and SMS (where available), followed by multiple email reminders and a reminder SMS. Telephone non-response of panel members who have not yet completed the survey commenced in the second week of fieldwork and consisted of reminder calls encouraging completion of the online survey.

The contact methodology for offline Life in Australia™ members was an initial SMS (where available), followed by an extended call-cycle over a two-week period. A reminder SMS was also sent in the second week of fieldwork. Taking into account recruitment to the panel, the cumulative response rate for this survey is 8.1 per cent.

Unless otherwise stated, data in the paper is weighted to population benchmarks. For Life in Australia™, the approach for deriving weights generally consists of the following steps:

1. Compute a base weight for each respondent as the product of two weights:

    a. Their enrolment weight, accounting for the initial chances of selection and subsequent post-stratification to key demographic benchmarks

    b. Their response propensity weight, estimated from enrolment information available for both respondents and non-respondents to the present wave.

2. Adjust the base weights so that they satisfy the latest population benchmarks for several demographic characteristics.

In designing the questionnaire for the April 2020 ANUpoll, the project team balanced six often competing priorities:

- The rapidly changing policy environment related to COVID-19;
- Keeping questions consistent with pre-pandemic survey items in order to facilitate longitudinal analysis of change through time;

ANU Centre for Social Research and Methods

- Being able to compare items to comparable international surveys in order to compare outcomes in Australia to those internationally;
- Benchmarking results to nationally representative population estimates;
- Setting the survey up for future analysis and monitoring using subsequent waves of data collection; and
- Minimising harm and distress to survey participants.

The ethical aspects of this research have been approved by the ANU Human Research Ethics Committee (2014/241).

Appendix: Regression models

In this section we present predicted probabilities from regression models based on ANU Poll and the Pew American Trends Panel.

Table A1   Factors associated with high psychological distress (John Hopkins Distress scale), April 2020 ANU Poll

	Model 1	
	Odds Ratio.	Signif.
Gender: Female	1.261	*
Gender: Other	1.695	
Age, compared to 18 to 24 years:		
Aged 25 to 34 years	0.704	**
Aged 35 to 44 years	0.519	**
Aged 45 to 54 years	0.351	***
Aged 55 to 64 years	0.285	***
Aged 65 to 74 years	0.137	***
Aged 75 years plus	0.153	***
Indigenous	2.31	***
Born overseas in a main English speaking country	0.764	
Born overseas in a non-English speaking country	1.340	
Speaks a language other than English at home	0.949	
Citizen	0.753	
Education, compared to "Has not completed Year 12 or post-school qualification":		
Has High School only	1.234	
Has a Certificate (I, II, III/IV)	0.777	
Has University (Undergraduate, Postgraduate, Advanced and Diploma level)	0.571	***
Not stated	1.038	
Constant	0.855	
Sample size	3,111	

Source: ANUpoll, April 2020 and ANUpoll, January 2020.

Notes: Logistic Regression Model.

Coefficients that are statistically significant at the 1 per cent level of significance are labelled ***; those significant at the 5 per cent level of significance are labelled **, and those significant at the 10 per cent level of significance are labelled *.

ANU Centre for Social Research and Methods

Table A2   Factors associated with high psychological distress (John Hopkins Distress scale), April 2020 Pew Research Centre American Trends Panel

	Odds Ratio	Significance
Age (cf. 18-29):		
30-49	0.70	0.00
50-64	0.53	0.00
65+	0.39	0.00
Sex (cf. Male):		
Female	1.76	0.00
Refused	2.11	0.30
Education (cf. Less than high school):		
High school graduate	0.87	0.44
Some college, no degree	0.71	0.06
Associate's degree	0.64	0.02
College graduate/some post..	0.62	0.01
Postgraduate	0.64	0.01
Refused	0.72	0.71
Race (cf. White non-Hispanic):		
Black non-Hispanic	1.03	0.79
Hispanic	1.07	0.57
Other	1.13	0.39
Refused	0.85	0.63
Citizen (cf. Yes):		
No	0.70	0.13
Refused	0.64	0.51
US born	1.31	0.08
Constant	0.61	0.05
Sample size	10,093	

Source: Pew Research Centre American Trends Panel, April 2020

Notes: Logistic Regression Model.

Table A3   Factors associated with high hope, April 2020 ANU Poll

	Odds Ratio	Significance
Age, compared to 18 to 24 years:		
Aged 25 to 34 years	0.73	0.25
Aged 35 to 44 years	0.81	0.41
Aged 45 to 54 years	1.03	0.91
Aged 55 to 64 years	1.60	0.06
Aged 65 to 74 years	1.96	0.01
Aged 75 years plus	2.18	0.01
Employed: Wave 37	1.17	0.31
Employed: Wave 35	0.87	0.37
Ever unemployed for 3 months or more	0.89	0.42
Life satisfaction (Wave 34)	1.16	0.00
Happiness (Wave 35)	1.24	0.00
Self reported health, Wave 5 (cf. Excellent)		
Very good	0.61	0.00
Good	0.50	0.00
Fair[1]	0.34	0.00
Gender, (cf. Male):		
Gender: Female	0.82	0.03
Gender: Other	0.99	0.99
Born overseas in a main English speaking country	1.36	0.08
Born overseas in a non-English speaking country	0.85	0.26
Citizen (cf. Yes):		
No	1.02	0.92
Speaks a language other than English at home	1.30	0.15
Indigenous	0.70	0.36
Education, compared to "Has not completed Year 12 or post-school qualification":		
Has High School only	1.25	0.23
Has a Certificate (I, II, III/IV)	1.27	0.18
Has University (Undergraduate, Postgraduate, Advanced and Diploma level)	1.14	0.39
Not stated	1.09	0.75
SEIFA (cf, Lives in most disadvantaged areas (1st quintile)):		
Lives in next most disadvantaged areas (2nd quintile)	1.03	0.85

ANU Centre for Social Research and Methods

Lives in next most disadvantaged areas (3rd quintile)	1.07	0.65
Lives in next most advantaged areas (4th quintile)	0.94	0.67
Lives in the most advantaged areas (5th quintile)	0.89	0.44
Constant	0.03	0.00
Sample size	2,672	

Source: ANUpoll, April 2020 and ANUpoll, January, February 2020.

Notes: Logistic Regression Model. [1] Poor health omitted in this case due to missing data.

ANU Centre for Social Research and Methods

Table A4   **Factors associated with moderate and serious mental health, April 2020 ANU Poll**

	Odds Ratio	Significance
High hope	0.42	0.00
Age, compared to 18 to 24 years:		
Aged 25 to 34 years	0.92	0.75
Aged 35 to 44 years	0.67	0.13
Aged 45 to 54 years	0.33	0.00
Aged 55 to 64 years	0.26	0.00
Aged 65 to 74 years	0.12	0.00
Aged 75 years plus	0.15	0.00
Employed: Wave 37	0.75	0.14
Employed: Wave 35	0.74	0.14
Ever unemployed for 3 months or more	1.39	0.03
Life satisfaction (Wave 34)	0.89	0.00
Happiness (Wave 35)	0.83	0.00
Self reported health, Wave 5 (cf. Excellent)		
Very good	1.44	0.03
Good	2.13	0.00
Fair	2.45	0.00
Poor	3.90	0.02
Gender, (cf. Male):		
Gender: Female	1.64	0.00
Gender: Other	0.62	0.71
Born overseas in a main English speaking country	1.73	0.01
Born overseas in a non-English speaking country	0.91	0.63
Citizen (cf. Yes):		
No	1.08	0.72
Speaks a language other than English at home	0.88	0.51
Indigenous	1.68	0.24
Education, compared to "Has not completed Year 12 or post-school qualification":		
Has High School only	1.49	0.09
Has a Certificate (I, II, III/IV)	1.04	0.86

ANU Centre for Social Research and Methods

Has University (Undergraduate, Postgraduate, Advanced and Diploma level)	1.07	0.72
Not stated	0.77	0.46
SEIFA (cf, Lives in most disadvantaged areas (1st quintile)):		
Lives in next most disadvantaged areas (2nd quintile)	1.19	0.35
Lives in next most disadvantaged areas (3rd quintile)	1.66	0.00
Lives in next most advantaged areas (4th quintile)	1.15	0.45
Lives in the most advantaged areas (5th quintile)	1.37	0.06
/cut1	-2.66	
/cut2	0.28	
Sample size	2672	

Source: ANUpoll, April 2020 and ANUpoll, January, February 2020.

Notes: Ordered logistic Regression Model.

ANU Centre for Social Research and Methods

Endnotes

[1]   Systematic reviews of mental health in times of economic recession show that mental health and wellbeing declines in these periods, and increases in unemployment rates were related to mental health in 30 countries including Australia (Frasquilho et al. 2015; Reeves et al. 2015). A recent analyses of cohorts studies in the United Kingdom showed that the 2008 recession and subsequent austerity was most impacting those of younger working-age (19-34 years) compared to those of older working age (37-53 years) or retirement age (Thomson and Katikireddi 2018).

[2]   Relevant studies include Liu et al. (2020), Cerami et al (2020), Ebrahimi et al. (2020), Pancani et al. (2020) and Keeter (2020).

[3]   ABS estimates of the same K6 items were collected via face-to-face interviews in the case of the National Health Survey (NHS) but are largely similar our estimates in 2017. The ABS also conducted a survey of a little over one thousand respondents in April 2020 through computer assisted telephone

The increases in mental health problems highlighted by the longitudinal ANU Poll are also reflected when comparing estimates from the ABS NHS to ABS Covid-19 survey in April 2020 which occur over a similar time period. Although the ABS data reflects two separate cross-sectional surveys, it is noteworthy the findings are similar. The anxiety items "nervous" and "restless or fidgety" had the greatest increases in both the ANUpoll and ABS data while depressive items such as feelings of "worthlessness" were stable or registered smaller increases (i.e. "hopeless", "so sad nothing could cheer you up") suggesting that at least in its initial stages, mental health problems around anxiety are likely to be of greater concern than depression.

[4]   The results from the ANUpoll data is consistent with findings from the ABS Household Impacts of COVID-19 Survey in April 2020 that shows that when compared to the National Health Survey in 2017, K6 symptoms increased for feeling nervous (20 to 35 per cent), restless or fidgety (24 to 42 per cent) and everything was an effort (22 to 26 per cent) while feelings of worthlessness and feelings of depression that nothing could cheer them up were largely unchanged (ABS 2020). The ABS estimates for 2017 are based from face-to-face interviews as part of the National Health Survey. The ABS estimates for April 020 are from Computer Assisted Telephone Interviews.

[5]   Across our sample, there were 1,600 respondents with the continuous measure of K6 who were interviewed in February 2017 and April 2020. For 16.1 per cent of the longitudinal sample, the K6 score in February 2017 was exactly the same as the K6 score in April 2020.

[6]   For 41.0 per cent of the sample, the level of psychological distress was lower in April 2020 than it was in February 2017 and for 42.9 per cent psychological distress increased. While the proportion of experiencing improvements and worsening of psychological distress was similar, the increases in psychological distress were larger on average (3.9 points) than were the reductions (3.2 points).

ANU Centre for Social Research and Methods

7   The first three items are from the Centre for Epidemiologic Studies-Depression Scale (CES-D, Radloff and Sawyer 1977). The fourth item is from the Generalised Anxiety Disorder Screener (GAD-7, Spitzer et al. 2005). The fifth item is from the Impact of Events Scale – Revised (IES-R, Weiss, 2007).

8   Item mean scores above 2.33 (out of 4) were defined as high distress.

9   The 95 per cent confidence interval for the proportion with high levels of distress in the US is 31.3 to 34.3 per cent. The 95 per cent confidence interval for Australia is 22.0 to 26.2 per cent.

10   Age, sex, education, race, citizen and US born.

11   The 95 per cent confidence interval for high distress for US females is 36.5 to 40.6 per cent. The 95 per cent confidence interval for high distress for US males is 24.4 to 28.7 per cent.