The relationship between COVID-19 policies and subjective wellbeing – August 2022

ANU Centre for Social Research and Methods

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Abstract

The aim of this paper is to examine the trends and determinants of wellbeing in Australia over the entire COVID-19 period, up to and including August 2022. In particular, we make use of multiple waves of the COVID-19 Impact Monitoring Survey data, focusing on the relationship between individual wellbeing and the severity of COVID-19 related policies, as measured by the stringency index by state/territory and, for all jurisdictions apart from the ACT, by capital city/non-capital city. This is the first analysis linking policy responses to a range of wellbeing outcomes in Australia at the individual level and for multiple time periods. While there have been a number of papers examining the impact of COVID-19 policies on wellbeing, Australia provides an important examination of this issue due to the relatively low rates of COVID-19 in the population for the majority of the pandemic period. By making use of a geographic specific index of COVID-19 policy responses as well as state-level case numbers across 13 waves of data collected during the pandemic period we are able to show that increases in policy stringency and increases in cases are both associated with a worsening in wellbeing at the individual level, but also that the association with the stringency value seems to be much stronger. We find a strong relationship also with a number of mental health measures, as well as a person's level of loneliness.

1 Introduction and overview

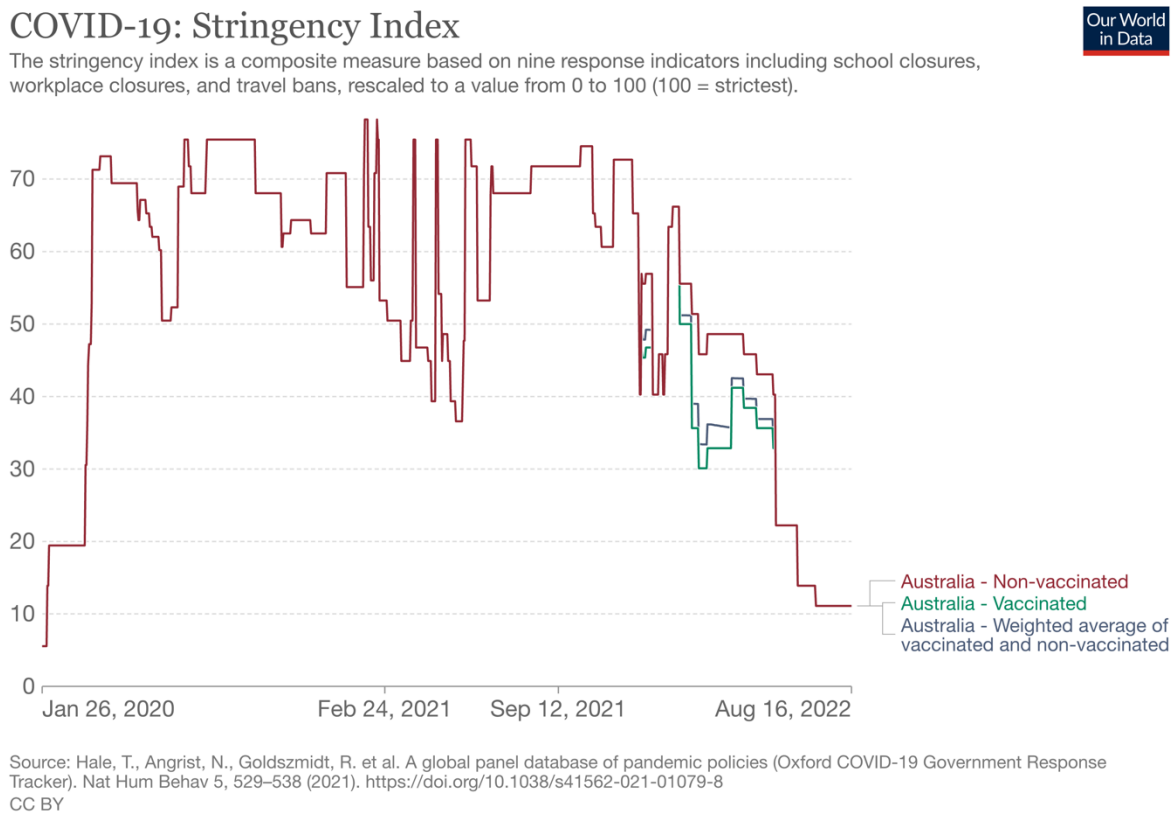
Government responses to the COVID-19 pandemic have been tracked using a range of measures and methodologies. The most commonly used is the Oxford COVID-19 Government Response Tracker (OxCGRT). According to Hale et al. (2021) 'From 1 January 2020, the data capture government policies related to closure and containment, health and economic policy for more than 180 countries, plus several countries' subnational jurisdictions. Policy responses are recorded on ordinal or continuous scales for 19 policy areas, capturing variation in degree of response.'

From the OxCGRT, the stringency index is a daily measure of the government closure and containment policies in place to reduce the spread of COVID-19 such as school, workplace and public transport closures, cancellation of public events and restrictions on the size of gatherings, and restrictions on travel (domestic and international). It also measures the policies around public health information campaigns. Indicators are coded from government policies in a way that makes them internationally comparable to other countries and within Australia. The index ranges from a minimum 0 to a maximum of 100 reflecting a stricter policy regime.

On the 14th of April, 2020, the Social Research Centre in partnership with the ANU Centre for Social Research and Methods began collection of what would become the first wave of data collection for the COVID-19 Impact Monitoring surveys, with data eventually collected on 3,155 Australians over a two-week period. During this initial data collection, international borders were closed to almost all arrivals and departures, as were many interstate borders. Other restrictions varied across states and territories, with closures of many schools, universities, businesses, and public transport. At the start of the data collection period, the Stringency Index in Australia was 73 on a scale of 0 to 100, where 100 is the strictest value possible (Figure 1).

On the 8th of August, 2022, the Social Research Centre began data collection for the 12th wave in the ANU Centre for Social Research and Methods COVID-19 Impact Monitoring series, with a total of 3,510 responses collected between the 8th and 22nd of August. By the start of this latest wave of data collection, the Stringency Index for Australia had declined to 11, lower even than in February 2020, and lower than for Canada, New Zealand, and the US. Only the UK and Ireland had similarly low Stringency Index values to Australia amongst high-income, predominantly English-speaking countries.

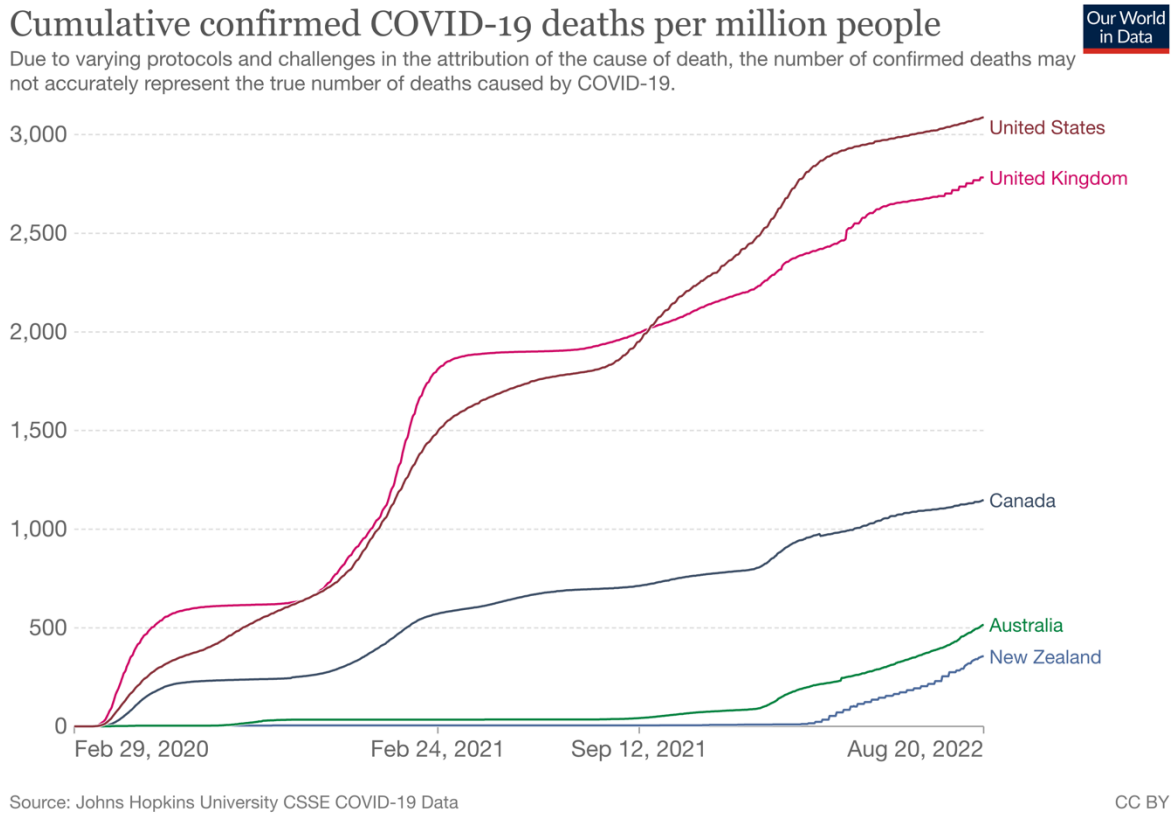
Figure 1 COVID-19 Stringency Index, January 2020 to August 2022



Between the 1st and 12th wave of data collection for the COVID-19 Impact Monitoring series, COVID-19 policies have varied quite substantially, but so too has the incidence and direct health impacts of the virus. At the start of August 2020, there had only been 17,895 confirmed cases of COVID-19 in Australia. One year later (August 1st 2021) this had slightly less than doubled to 34,612 cumulative cases, still very low per head of population compared to most other developed countries. Over the next 12 months, the cumulative number of cases increased dramatically, despite lower rates of testing in recent months, reaching 462,955 cases on the 1st of January 2022, 4.63 million on the 1st of April 2022, and 9.47 million by the 1st of August 2022.

There were also quite low death rates up until February 2022 (per million Australians, Figure 2), but a substantial increase since then. Like New Zealand, Australia has had far fewer deaths from COVID-19 than Canada, and much lower deaths still compared to the US and the UK. However, the number of deaths have been similar in 2022, at least on a per-person basis.

Figure 2 Cumulative confirmed COVID-19 deaths per million people, February 2020 to August 2022, Australia, Canada, New Zealand, UK, and US



While there has been substantial variation over time in Australia in the stringency index and the number of deaths/cases of COVID-19, there is more variation still, when we disaggregate within the country. The aim of this paper is to examine the trends and determinants of wellbeing over the entire COVID-19 period, up to and including August 2022. In particular, we make use of multiple waves of the COVID-19 Impact Monitoring Survey data, linked at the geographic level to a number of external datasets. In particular, for the first time we analyse the relationship between individual wellbeing and the stringency index by state/territory and, for all jurisdictions apart from the ACT, by capital city/non-capital city.

While there have been a number of papers examining the impact of COVID-19 policies on wellbeing, in countries with high rates of COVID-19 and deaths due to COVID-19 throughout the entire pandemic period, disease spread and mortality rates are confounded with policy responses. Australia provides an important examination of this issue due to the relatively low rates of COVID-19 in the population for the majority of the pandemic period, and this is the first analysis linking policy responses to a range of wellbeing outcomes in Australia at the individual level. The datasets used in the analysis are described in Section 3 of the paper, with Section 4 summarising the methods used. The results from the analysis are presented in Section 4 and Section 5 provides some concluding comments. Before then though, in Section 2 we discussed what is already known about the link between COVID-19 policy and related outcomes.

2 The link between COVID-19 policies and wellbeing and other outcomes

While this is the first work looking at the connection between the stringency index and wellbeing in Australia, similar work has already been done overseas. There have been a range of papers linking the OxCGRT indicators to survey data in an effort to study the individual-level effects of containment policies. Most of the literature focuses on measures of wellbeing and mental health,[1] trying to quantify the difficult-to-measure trade-offs of containment policies. These focus both on specific symptoms like experience of depression (Riehm et al. 2022; Ding et al. 2021; Lee et al. 2021) and anxiety (Plett, Pechlivanoglou & Coyte 2022; Riehm et al. 2022), and more general well-being measures such as loneliness (Atzendorf & Gruber 2021), quality of sleep (Wester et al. 2022) or overall life satisfaction (Clark & Lepinteur 2021). For the most part, existing studies show a negative effect from lockdowns; higher stringency causes greater depression, anxiety, psychological distress and lower life satisfaction.

Some papers have examined how different groups reacted or were impacted differently. The most commonly observed difference here was by gender, with women generally having worse outcomes than men (Clark & Lepinteur 2021; Koch & Park 2022; Plett, Pechlivanoglou & Coyte 2022). While there are not enough studies yet to form a consensus on differences in experience in other groups, in general, restrictions seem to have compounded existing vulnerabilities for example in those with precarious employment (Plett, Pechlivanoglou & Coyte 2022) or those from minority ethnic groups (Dobbie et al. 2022). Some studies bucked this pattern though, for example, Clark and Lepinteur (2021) found in a sample of European countries that richer people saw a greater fall in life satisfaction from stringency than poorer people. The authors speculate that restrictions may have had a disproportionate impact on the types of leisure activities that rich households engage in such as eating out at restaurants, going on holidays or to the theatre

While some papers use repeated cross-sectional or single point-in-time cross-sectional data in order to try to study these effects, the ideal approach for studying mental health in a pandemic per Daly, Sutin and Robinson (2020) is to use longitudinal data which allows for within-individual comparisons over time. Biddle and Sollis (2021) show this is important specifically in the case of Australia as there are several determinants of participation in surveying that may bias measurement of the effects of containment policies.

It is also common in the literature for papers to compare data (both cross-sectional and longitudinal) across a number of different jurisdictions at once, most commonly national jurisdictions (e.g. Riehm et al. (2022) across 43 countries, Mendez-Lopez (2022) across 26 European countries, Lee et al. (2021), Ochnick et al. (2021) each across nine countries). By comparing across jurisdictions, these studies can look at the effect of more than one time-series of policy stringency, allowing for the comparison of individuals under different restrictions in the same time-period. However, most of the existing literature uses the stringency index at a country level which obscures the substantial heterogeneity in policy responses that could be present within countries. Plett, Pechlivanoglou & Coyte (2022), is an exception and in their study they used Canadian data on stringency index at the provincial level and reported that stay at home orders were significantly associated with more anxiety.

This paper takes this model of using longitudinal, cross-jurisdictional data and applies it to Australia by looking at the effect of subnational stringency indexes on longitudinal measures of wellbeing. However, it is not the first to take a longitudinal approach to studying the impact

of COVID-19 restrictions in Australia. Butterworth et al. (2022) uses data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey to measure the effect of Victoria's mid-2020 lockdown on mental health and using a difference-in-differences model. It showed a moderate negative effect on mental health. Griffiths et al. (2022) uses a similar approach, though with a small sample but many more outcome variables and without a quasi-experimental model. It found similar harms. In both cases the research was interested just in Victoria's 2020 lockdown and used a binary treatment (in lockdown or not). This paper is the first to measure the effect across Australia and measure the effect of COVID policies in terms of a continuous stringency index, covering many containment policy settings, and from the start of the pandemic (when stringency values were high and cases were low) through to mid-2022 (when stringency values were low, but cases were high).

3 Overview of the COVID-19 Impact Monitoring Survey and the Oxford COVID-19 Government Response Tracker

3.1 COVID-19 Impact Monitoring Survey program

In April 2020, the Social Research Centre on behalf of the ANU Centre for Social Research and Methods collected the first wave of data as part of the centre's COVID-19 Impact Monitoring Series.[2] Since that first wave of data collection, surveys have been undertaken a further 11 times, with the most recent wave of data collection undertaken in August 2022.

Surveys have also been conducted with the same group of respondents in January and February 2020, just before the COVID-19 pandemic started in Australia, as part of the ANUpoll and Australian Social Survey International-ESS (AUSSI-ESS) surveys respectively.[3] This allows us to track outcomes for the same group of individuals from just prior to COVID-19 impacting Australia through to two-and-a-bit years since COVID-19 first reached Australia.

The August 2022 survey collected data from 3,510 Australians aged 18 years and over.[4] Data collection for this most recent ANUpoll commenced on the 8th of August 2022 with a pilot test of telephone respondents. The main data collection commenced on the 9th and concluded on the 22nd of August. 57.6 per cent of the sample had completed the survey by the 11th August and the average interview duration was 23.9 minutes.

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 3.5 per cent of interviews were collected via CATI.[5] A total of 4,294 panel members were invited to take part in the April 2022 survey, leading to a wave-specific completion rate of 81.7 per cent.[6]

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.

Across all twelve surveys undertaken during the COVID-19 period, there were 6,524 respondents that completed at least one of the waves of data collection. 19.1 per cent of these completed one wave of data collection only, with a further 13.1 per cent having completed two waves. At the other end of the distribution, 21.1 per cent of the cumulative respondents completed all twelve waves of data collection and a further 6.4 per cent completed eleven of the twelve waves. This leaves 40.4 per cent of the pool of respondents who completed between three and ten waves.

Table 1 gives the number of respondents for each of the twelve waves of data collection during the COVID-19 period, as well as the two pre-COVID waves. The table also gives the survey window for the data collection, and the per cent of January 2020 respondents who completed that particular wave. In between the April and August 2022 surveys, the Comparative Study of Electoral Systems (CSES) survey was undertaken on the Life in Australia™ panel, with a limited range of data items available for analysis in this paper.

Table 1 Survey participation – January 2020 to April 2022

Wave	Survey window	Sample size	Per cent of January 2020 survey that completed wave
January 2020	20th January to 3rd February, 2020	3,249	100
February 2020	17th February to 2nd March, 2020	3,228	91.4
1 – April 2020	14th to 27th April, 2020	3,155	88.8
2 – May 2020	11th to 25th May, 2020	3,249	91.0
3 – August 2020	10th to 24th August, 2020	3,061	85.9
4 – October 2020	12th to 26th October, 2020	3,043	85.5
5 – November 2020	9th to 23rd November, 2020	3,029	84.9
6 – January 2021	18th January to 1st February, 2021	3,459	83.8
7 – April 2021	12th to 26th April, 2021	3,286	80.8
8 – August 2021	10th to 23rd August, 2021	3,135	71.1
9 – October 2021	12th to 26th October, 2021	3,474	68.6
10 – January 2022	17th to 30th January, 2022	3,472	63.4
11 – April 2022	11th to the 24th April, 2022	3,587	64.0
CSES	23rd May to 5th June, 2022	3,556	63.5
12 – August 2022	8th to 22nd August, 2022	3,510	62.7

3.2 Disaggregated stringency index

Table 2 gives the stringency index at the day data collection commenced for each of the waves of data collection for the ANU CSRM COVID-19 Impact Monitoring survey, with the blue cells indicating relatively low levels of COVID-19 restrictions and the red cells a stricter policy environment. Leaving aside the pre-COVID wave of data collection, the lowest levels of restrictions were in place in Melbourne in May 2022 (value of 18.52) as well as in South Australia and the Northern Territory at the time of the most recent wave of data collection (20.37, August 2022). The highest level of restrictions were in Melbourne during the Delta-wave of infections (94.44, August 2021).

Table 3 presents the number of confirmed COVID-19 cases for every 100,000 people for each

state and territory. Presenting COVID-19 cases in this fashion enables a comparison of the number of cases COVID-19 relative to the size of the population. A few key points stand out. Firstly, the red shading highlights that for most months of 2022 rates per 100,000 people were over 100. Rates were particularly high in January and April 2022 except for Western Australia where the highest rates were in May 2022. Secondly the blue shading highlights that for most months of 2020 and 2021 for most states and territories the rates were below 1 per 100,000 people.

Table 2 Variation in OxCRGT Stringency Index by state and section of state/territory, January 2020 to August 2022

Region	Jan 2020	Apr 2020	May 2020	Aug 2020	Oct 2020	Nov 2020	Jan 2021	Apr 2021	Aug 2021	Oct 2021	Jan 2022	Apr 2022	May 2022	Aug 2022
Sydney	0	85.19	77.78	60.19	60.19	45.37	57.41	51.85	90.74	77.78	37.96	43.52	37.96	29.63
Rest of NSW	0	85.19	77.78	60.19	60.19	45.37	57.41	51.85	82.41	74.07	37.96	43.52	37.96	29.63
Melbourne	0	90.74	70.37	90.74	87.04	46.3	51.85	60.19	94.44	90.74	22.22	50	18.52	29.63
Rest of Victoria	0	90.74	70.37	90.74	75.93	46.3	51.85	60.19	62.96	76.39	22.22	50	29.63	29.63
Brisbane	0	90.74	87.04	51.85	54.63	54.63	60.19	60.19	44.44	57.41	43.52	54.63	33.33	27.78
Rest of Queensland	0	90.74	87.04	47.69	54.63	54.63	42.59	60.19	71.76	57.41	43.52	54.63	33.33	27.78
Adelaide	0	90.74	74.07	47.22	47.22	39.81	46.3	33.33	57.41	49.07	57.41	25	34.26	20.37
Rest of South Australia	0	85.19	74.07	47.22	47.22	39.81	46.3	33.33	57.41	49.07	57.41	25	34.26	20.37
Perth	0	85.19	79.63	25	40.74	40.74	54.63	54.63	51.85	57.41	49.07	60.19	60.19	24.07
Rest of Western Australia	0	85.19	79.63	25	40.74	40.74	54.63	54.63	51.85	57.41	46.76	60.19	60.19	24.07
Hobart	0	85.19	87.04	27.78	38.89	33.33	57.41	57.41	51.85	40.74	66.67	32.41	40.74	35.19
Rest of Tasmania	0	85.19	87.04	27.78	38.89	33.33	57.41	57.41	51.85	40.74	66.67	32.41	40.74	35.19
Darwin	0	90.74	66.67	27.78	27.78	27.78	40.74	51.85	51.85	51.85	51.85	52.78	49.07	20.37
Rest of Northern Territory	0	90.74	66.67	27.78	27.78	27.78	40.74	51.85	51.85	51.85	51.85	52.78	49.07	20.37
Canberra/ACT	0	83.33	77.78	61.11	57.41	31.48	49.07	49.07	43.52	87.04	46.3	35.19	29.63	26.85

Table 3 Variation in number of cases per 100,000 population, by state/territory, January 2020 to August 2022

Region	Jan 2020	Apr 2020	May 2020	Aug 2020	Oct 2020	Nov 2020	Jan 2021	Apr 2021	Aug 2021	Oct 2021	Jan 2022	Apr 2022	May 2022	Aug 2022
NSW	0	0.730922	0.042739	0.1727	0.065417	0.061928	0.089839	0.048844	3.146977	7.477558	488.7583	237.9517	124.2855	152.0562
Victoria	0	0.401769	0.174028	6.662497	0.160063	0.004297	0.03545	0.003223	0.138578	23.16727	484.1536	151.9193	181.8705	125.1512
Queensland	0	0.348854	0.024625	0.017785	0.005472	0.015049	0.047882	0.054722	0.19016	0.051986	303.2872	169.6062	131.8766	130.5482
South Australia	0	0.386701	0.004028	0.048338	0.028197	0.092647	0.048338	0.044309	0.044309	0.052366	230.4132	340.5262	217.7649	154.1727
Western Australia	0	0.43417	0.010654	0	0.053272	0.037291	0.050609	0.050609	0.023973	0.039954	0.354262	274.75	527.6609	133.261
Tasmania	0	1.266373	0.171488	0	0	0	0	0	0.013191	0.013191	238.7904	369.517	179.2973	150.6852
Northern Territory	0	0.318958	0.028996	0.057992	0	0.202973	0.347954	0.115985	0.202973	0.173977	186.6773	164.9302	108.7646	114.8248
ACT	0	0.380057	0.016524	0	0	0	0	0	0	8.410826	304.6735	216.8308	219.1937	148.8997

4 Data analysis methods

To estimate the relationship between COVID-19 policies and wellbeing, we undertake a detailed individual-level analysis, using data pooled across all areas in Australia, all individuals who complete at least one of the COVID-19 Impact Monitoring surveys, and all waves of COVID-19 data collection.

In each of the ANU Centre for Social Research and Methods COVID-19 surveys, respondents have been asked:

> 'The following question asks how satisfied you feel about life in general, on a scale from 0 to 10. Zero means you feel 'not at all satisfied' and 10 means 'completely satisfied'. Overall, how satisfied are you with life as a whole these days?'

Life satisfaction is our main dependent variable in the analysis, and we estimate the factors associated with life satisfaction using a linear regression model. Our main explanatory variables are the stringency index value for the region that person lives in, at the commencement of data collection for that wave. The main control variable is the number of cases in that state/territory per 100,000 residents. Because the number of cases has a very skewed distribution, we convert these cases to decile values. This substantially improves the explanatory power of the model. In order to compare the relationship with cases and stringency, we therefore also convert the stringency values to deciles, though it should be noted that the results do not change if we simply use a linear stringency value.

Additional control variables included in the model include the standard demographic, socioeconomic and area level variables that we have included in the regression analysis earlier in this paper. These variables are time invariant across individuals, and fixed at the values observed for that individual in the most recent wave of data collection in which they are collected. We also include a dummy variable for the wave of data collection that the life satisfaction, stringency index, and COVID-case load are valid for. Finally, as the data is pooled across individuals, we also include an individual-level random effect in the model.

Our first model for life satisfaction, which is our preferred specification, is estimated across the twelve waves of the COVID-19 Impact Monitoring series, as well as the May 2022 CSES (that is, thirteen waves in total). There are 6,245 individuals with at least one observation over that period, a total of 41,045 observations across the pooled dataset, and therefore an average of 6.6 waves per individual. Our second specification includes two pre-COVID waves of data, when cases and stringency were zero for all regions in Australia. Our third specification focuses on the first 18-months of the pandemic in Australia when borders were effectively shut, and COVID-19 cases were quite low.

In our final specifications we estimate again for the entire pandemic period, but estimate separately for different demographic and geographic sub-groups. First, we estimate separately for males and females, given the potentially different impact of COVID-19 restrictions by gender. Second, we estimate separately for three broad age groups: aged 18 to 34; aged 35 to 64; and aged 65 years and over. Previous analysis in this series (Biddle et al. 2022) has shown that the youngest of these age groups experienced a substantial drop in mental health and wellbeing during the COVID-19 period, the middle group had a steadier level of mental health and wellbeing on average (thought with some fluctuations), and the older group if anything experienced an improvement in mental health and wellbeing. Finally, we estimate separately

for those states and territories that experienced multiple periods of significant lockdown conditions (New South Wales, Victoria and the Australian Capital Territory (ACT)), as well as the remaining five states and territories.

We also present results for the association between the area-level stringency measure and an expanded set of outcome measures. Across eleven of the COVID-19 Impact Monitoring surveys we have asked respondents 'The next questions ask about how you have been feeling in the last four weeks. For each question, choose the answer that best describes how often you felt this way. In the past four weeks, how often did you feel…?' with the following six questions:

- Nervous
- Hopeless
- Restless or fidgety
- That everything was an effort
- So sad that nothing could cheer you up
- Worthless

The five response options for the K6 measures are: None of the time; A little of the time; Some of the time; Most of the time; and All of the time. As these dependent variables are ordinal, but not scalar, we estimate the factors associated with the K6 measures using the random effects ordered probit model. We include the same set of explanatory variables from Model 1 for the life satisfaction analysis, using the individual questions from the K6 module for psychological distress (that is, six regression analyses in total).

A further regression analysis focuses on loneliness. Specifically, in the same surveys that we asked the K6 questions, we have also asked respondents: 'In the past week, how often have you felt lonely?' Respondents are asked to choose from the following four response options: Rarely or none of the time (less than 1 day); Some or a little of the time (1 to 2 days); Occasionally or a moderate amount of time (3 to 4 days); and Most or all of the time (5 to 7 days). We estimate using the random effects ordered probit model again.

The final regression model focuses on people's broader views on the situation in Australia. In the first question in our surveys, respondents are asked 'Firstly, a general question about your views on living in Australia. All things considered, are you satisfied or dissatisfied with the way the country is heading?' Those who say they are very satisfied or satisfied are grouped together, and those who say they are dissatisfied or very dissatisfied are also grouped together. We therefore estimate the relationship with stringency/cases using the random effects, binary probit model.

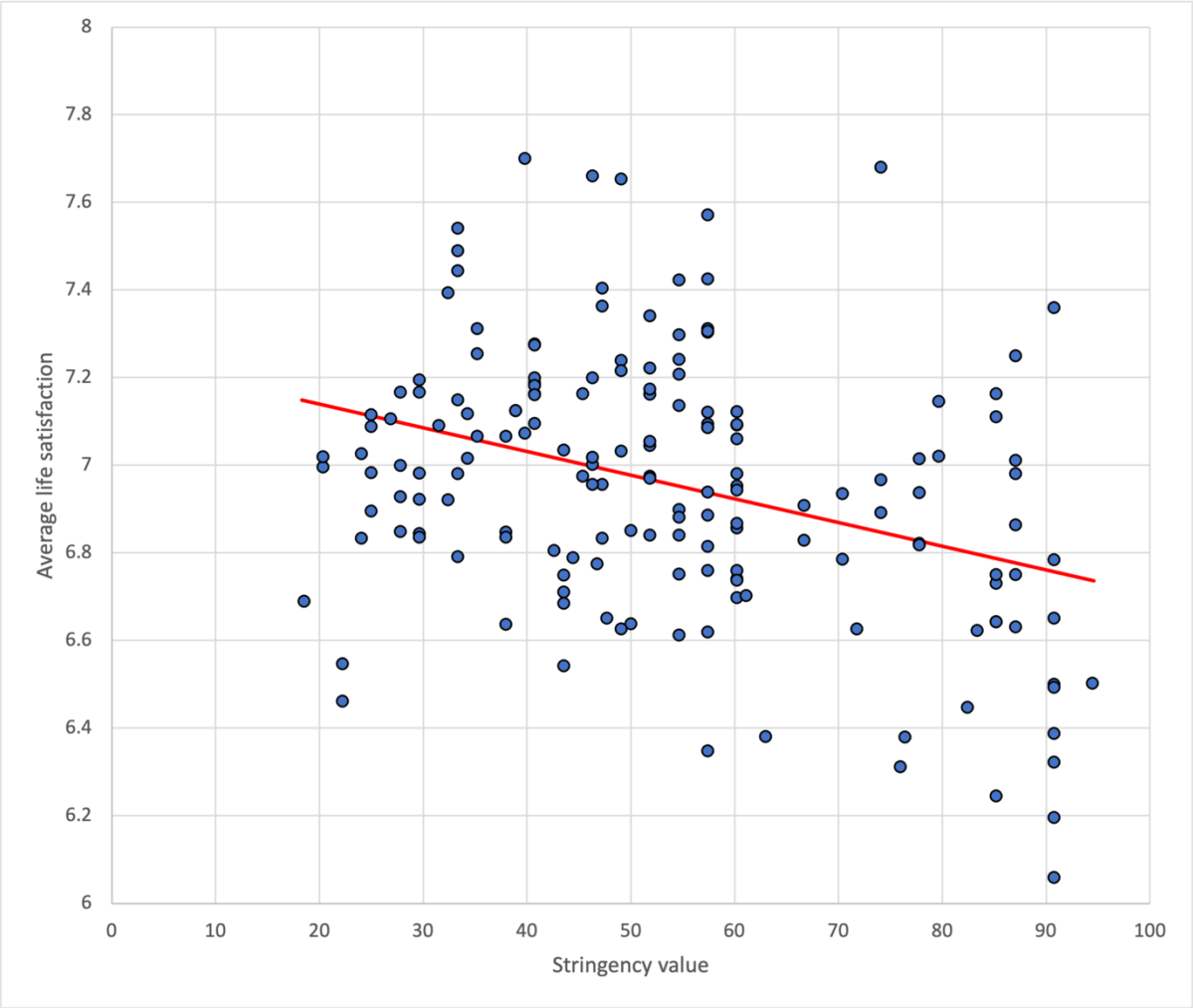
5 Results – Relationship between COVID-19 policy stringency and wellbeing and satisfaction measures

5.1 Area level differences between life satisfaction and stringency

Before presenting our regression-findings, we begin descriptively by plotting the average life satisfaction in the region (state/territory and capital city/non-capital city) during a particular wave and the stringency value that applied to that region at the start of data collection for that wave. We only present regions with at least 30 respondents, leaving 169 observations. The red line in Figure 3 represents the line of best fit through the data, which has a slope of -0.0054032

and an intercept of 7.247326. That is, as the stringency value increases, average life satisfaction in the region declines.

Figure 3 Average life satisfaction in region by stringency value, April 2020 to August 2022



Source: ANUpoll, April, May, August, October, and November 2020; January, April, August, October 2021; and January, April, May, and August 2022

5.2 Differences in individual-level life satisfaction and stringency

While Figure 3 gives a preliminary indication that stricter COVID-19 policies are related to lower levels of life satisfaction, there are a number of limitations of using area-level averages. First, even though policies might be mostly consistent within the regions at a particular point in time, there is substantial variation within regions in terms of life satisfaction. Some of that variation is likely to be explained by other characteristics on the dataset. However, there is also likely to be random variation based on who is selected to be in the sample at the particular point in time. The second limitation though is that the stringency values are not exogenously determined. They vary in response to the COVID-19 situation at that particular point in time with governments increasing the severity of the COVID-related policies when perceived risk to individuals is greatest.

Results from our first regression model at the individual-level confirm the insights from the area-level analysis that higher stringency values were significantly associated with lower levels of life satisfaction. However, by using the individual-level data we can also show that this

variation holds even when we control for variation at the individual level in demographic and socioeconomic characteristics, as well as variation across the pandemic period in COVID-19 cases per head of population. The results also show that the association with the stringency values (as measured by a one-decile increase) was more than 50 per cent higher than the association with cases (though the later was still negative and statistically significant.

The results presented in Model 2 shows that this association holds even when we extend the analysis to prior to the COVID-19 period (though the explanatory power is a bit less). When we restrict the analysis to the period of low cases and international border restrictions, not only does the explanatory power of the model increase, but the size of the coefficient for the stringency index also increases.

5.2.1 Differences by age and sex

In our estimations by sub-population, we see quite interesting variation in the relationship with stringency/cases between males and females and across age groups. For males, there is a very strong relationship between life satisfaction and stringency with a sizable negative coefficient, but the coefficient for the number of cases in the jurisdiction is no longer statistically significant (p-value = 0.157). For females, on the other hand, the coefficient for the stringency index value is smaller than for males, and not significantly different from the value for the number of cases in the area (which is once again statistically significant).

When we look at differences in the relationship between the stringency index and life satisfaction across the age distribution, the general finding appears to be that all three broad age groupings appear to be impacted by COVID-19 stringency and cases, but the magnitude of the association is much greater for young Australians. Controlling for other characteristics, a one-decile increase in the stringency index is associated with a decrease in life satisfaction of 0.060 for those aged 18 to 34, 0.041 for those aged 35 to 64, and 0.030 for those aged 65 years and older. The relationship with the number of cases in the jurisdiction also declines, with an increase by one decile associated with a decrease in life satisfaction of 0.044 for those aged 18 to 34, 0.035 for those aged 35 to 64, and 0.012 (and not statistically significant) for those aged 65 years and older.

5.2.2 Differences by state/territory

In our final set of models for life satisfaction, we also find quite different results by broad geographic classification. There were three jurisdictions that experienced multiple periods of significant COVID-19 restrictions – New South Wales, Victoria, and the ACT. While the average stringency value for this group over the period (54.1) is not that different to the average value for the five remaining jurisdictions (52.7), the range is much larger (0 to 94.4 compared to 20.4 to 90.7), as is the standard deviation (24.6 to 17.9).

For the three jurisdictions that experienced significant lockdown the relationship with the COVID-19 stringency index is negative, large, and statistically significant, with a decrease in life satisfaction of 0.051 for a one-decile increase in the stringency index. For the five remaining states and territories (average decile value of 5.6), however, the coefficient on the stringency index variable is not statistically significant (with a p-value of 0.204), and is quite small in magnitude, albeit still negative (-0.009).

That doesn't mean that these jurisdictions were not impacted by COVID-19 restrictions. Rather, the results suggest that not needing to have as strict COVID-19 policies in these jurisdictions and having a more consistent level of restrictions explains why average life satisfaction in New South Wales, Victoria, and the ACT was much lower over the COVID-19

period (6.79) than it was in the five remaining states and territories (6.93).

5.3 Differences in individual-level mental health and stringency

For three of the K6 variables (Table A3), there is a strong and mostly equal relationship between the frequency of negative mental health outcomes and both the stringency index and number of cases. Specifically, as both of these measures went up at that particular time and for that people geographic area, respondents were more likely to say that they felt nervous, hopeless, and restless or fidgety. For a further two of the dependent variables (feeling that everything was an effort and feeling so sad that nothing could cheer you up) there was still a significant association with the stringency index, but the coefficient is smaller. For the analysis of feeling that 'everything was an effort', the coefficient was only significant at the 5 per cent rather than the 1 per cent level of significance. For the last of the regression analyses of the K6 measures, feeling worthless, there was not a statistically significant relationship with the stringency index or level of COVID-19 cases.

For the last of the mental health measures (loneliness, Table A4) there is a statistically significant relationship with both the stringency measure and the number of cases in the jurisdiction. Somewhat surprisingly, however, there is a much weaker relationship between the stringency index and satisfaction with the direction of the country (Table A5), with the coefficient only significant at the 10 per cent level of significance. The coefficient is negative though, giving weak evidence that as COVID-19 policies become more stringent, people are less satisfied with the direction of the country. The coefficient for the number of cases was not statistically significant at all though. This lack of a strong relationship for these final two measures suggests that people take a broader perspective than just their own region/jurisdiction when making judgements about the direction of the country

6 Concluding comments

In a companion paper to this one (Biddle et al. 2022) we show that since the start of 2022, there has been a substantial increase in the level of subjective wellbeing in Australia. Compared to April 2022, in August 2022 Australians have a higher level of life satisfaction, a lower level of psychological distress, lower levels of loneliness, and a greater level of satisfaction with the direction of the country. However, the paper also showed that these measures of wellbeing have varied substantially across the COVID-19 period, with a number of peaks and troughs that subtly vary depending on the measure used.

We provide what is in our understanding at least the first estimate in Australia of the direct relationship between COVID-19 policy/cases across the pandemic period. By making use of a geographic specific index of COVID-19 policy responses as well as state-level case numbers across 13 waves of data collected during the pandemic period we are able to show that increases in policy stringency and increases in cases are both associated with a worsening in wellbeing at the individual level, but also that the association with the stringency value seems to be much stronger. We find that the association with COVID-19 policy responses is greater for males and young Australians, and we also find a strong relationship with a number of mental health measures, as well as a person's level of loneliness.

This of course does not mean that the COVID-19 policy responses aren't justified. We do not have a counterfactual situation in Australia where far more minimal policy interventions were put in place prior to the widespread availability of COVID-19 vaccines. However, we are able to begin to highlight the trade-offs that need to be made with COVID-19 policy responses, and

how high caseloads and strict policy measures need to be balanced if the aim of policy is to maximise wellbeing.

It is only by carefully quantifying the level of lockdown restrictions and then linking these to a high-quality longitudinal survey that we are able to accurately capture the impacts of restrictions and to think empirically about the trade-offs society needed to make during the COVID-19 period, and may need to make again in the future. There is no doubt that some forms of lockdowns were essential to helping stop the spread of COVID-19 and limit case numbers and potential deaths. However, the findings presented in this paper show that measures designed to help protect people from the pandemic also have a clear impact on mental health and wellbeing. Whether this effect is long-lasting as we abandon strict lockdowns and start to live 'COVID normal' remains to be seen.

Appendix tables

Table A1 Factors associated with life satisfaction, October 2019 to August 2022

Explanatory variables	Model 1		Model 2		Model 3	
	Coeff.	Signif.	Coeff.	Signif.	Coeff.	Signif.
Stringency index (decile)	-0.041	***	-0.042	***	-0.055	***
Number of cases per 100,000 residents (decile)	-0.030	***	-0.030	***	-0.026	***
Female	0.042		0.047		0.042	
Aged 18 to 24 years	-0.150		-0.158		-0.250	*
Aged 25 to 34 years	-0.108		-0.103		-0.230	***
Aged 45 to 54 years	-0.045		-0.058		-0.062	
Aged 55 to 64 years	0.176	***	0.166	**	0.142	*
Aged 65 to 74 years	0.556	***	0.534	***	0.588	***
Aged 75 years plus	0.884	***	0.834	***	0.969	***
Indigenous	-0.423	***	-0.477	***	-0.317	*
Born overseas in a main English-speaking country	0.046		0.056		0.047	
Born overseas in a non-English speaking country	0.030		0.034		0.015	
Speaks a language other than English at home	0.001		0.004		0.108	
Has not completed Year 12 or post-school qualification	-0.089		-0.097		-0.008	
Has a post graduate degree	0.214	***	0.223	***	0.178	**
Has an undergraduate degree	0.251	***	0.257	***	0.241	***
Has a Certificate III/IV, Diploma or Associate Degree	0.069		0.078		0.071	
Lives in the most disadvantaged areas (1st quintile)	-0.121	*	-0.123	*	-0.069	
Lives in next most disadvantaged areas (2nd quintile)	-0.053		-0.040		-0.029	
Lives in next most advantaged areas (4th quintile)	0.094		0.105	*	0.075	
Lives in the most advantaged areas (5th quintile)	0.103	*	0.118	**	0.081	
Data collected in October 2019			-0.182	***		
Data collected in January 2020			-0.149	***		
Data collected in May 2020	0.239	***	0.240	***	0.243	***
Data collected in August 2020	-0.126	***	-0.129	***	-0.155	***
Data collected in October 2020	0.020		0.016		-0.006	
Data collected in November 2020	0.204	***	0.199	***	0.152	***
Data collected in January 2021	0.266	***	0.265	***	0.230	***
Data collected in April 2021	0.231	***	0.229	***	0.194	***
Data collected in August 2021	-0.021		-0.023		-0.037	
Data collected in October 2021	0.092	***	0.091	***	0.081	**
Data collected in January 2022	-0.113	**	-0.120	**		
Data collected in April 2022	0.114	**	0.108	**		
Data collected in May 2022	0.123	***	0.114	**		
Data collected in August 2022	0.081		0.072			
Constant	6.824	***	6.826	***	6.897	***
Samples size – Observations	41,045		45,738		27,464	
Sample size – Individuals	6,245		6,299		4,900	

Notes: Random effects linear model. The base case individual is male; aged 35 to 44 years; 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; and lives in neither an advantaged or disadvantaged suburb (third quintile). Further, the base case observation was from April 2020

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 *

Source: ANUpoll, Oct 2019; January, April, May, August, October, and November 2020; January, April, August, October 2021; and January, April, May, and August 2022.

Table A2a Factors associated with life satisfaction, by sex, April 2020 to August 2022

Explanatory variables	Males		Females	
	Coeff.	Signif.	Coeff.	Signif.
Stringency index (decile)	-0.047	***	-0.035	***
Number of cases per 100,000 residents (decile)	-0.012		-0.044	***
Aged 18 to 24 years	0.130		-0.321	**
Aged 25 to 34 years	0.013		-0.184	**
Aged 45 to 54 years	0.036		-0.098	
Aged 55 to 64 years	0.243	**	0.134	
Aged 65 to 74 years	0.719	***	0.432	***
Aged 75 years plus	1.153	***	0.651	***
Indigenous	-0.554	**	-0.342	
Born overseas in a main English-speaking country	-0.073		0.140	*
Born overseas in a non-English speaking country	-0.103		0.133	
Speaks a language other than English at home	0.190	*	-0.155	*
Has not completed Year 12 or post-school qualification	-0.194		-0.007	
Has a post graduate degree	0.213	*	0.229	**
Has an undergraduate degree	0.355	***	0.178	**
Has a Certificate III/IV, Diploma or Associate Degree	0.109		0.039	
Lives in the most disadvantaged areas (1st quintile)	-0.127		-0.115	
Lives in next most disadvantaged areas (2nd quintile)	-0.183	*	0.039	
Lives in next most advantaged areas (4th quintile)	0.068		0.105	
Lives in the most advantaged areas (5th quintile)	0.028		0.158	**
Data collected in May 2020	0.171	***	0.291	***
Data collected in August 2020	-0.149	***	-0.108	**
Data collected in October 2020	-0.015		0.048	
Data collected in November 2020	0.122	**	0.269	***
Data collected in January 2021	0.203	***	0.315	***
Data collected in April 2021	0.143	***	0.299	***
Data collected in August 2021	-0.052		0.005	
Data collected in October 2021	0.041		0.133	***
Data collected in January 2022	-0.245	***	-0.004	
Data collected in April 2022	-0.052		0.248	***
Data collected in May 2022	-0.057		0.267	***
Data collected in August 2022	-0.085		0.215	***
Constant	6.746	***	6.914	***
Samples size – Observations	17,963		23,082	
Sample size – Individuals	2,696		3,549	

Notes: Random effects linear model. The base case individual is aged 35 to 44 years; 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; and lives in neither an advantaged or disadvantaged suburb (third quintile). Further, the base case observation was from April 2020

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 *

Source: ANUpoll, April, May, August, October, and November 2020; January, April, August, October 2021; and January, April, May, and August 2022.

Table A2b Factors associated with life satisfaction, by age, April 2020 to August 2022

Explanatory variables	Aged 18 to 34		Aged 35 to 64		Aged 65 plus	
	Coeff.	Signif.	Coeff.	Signif.	Coeff.	Signif.
Stringency index (decile)	-0.060	***	-0.041	***	-0.030	***
Number of cases per 100,000 residents (decile)	-0.044	***	-0.035	***	-0.012	
Female	-0.085		0.166	***	-0.097	
Aged 18 to 24 years	0.020					
Aged 25 to 34 years						
Aged 45 to 54 years			-0.021			
Aged 55 to 64 years			0.217	***		
Aged 65 to 74 years						
Aged 75 years plus					0.302	***
Indigenous	-0.259		-0.453	**	-0.308	
Born overseas in a main English-speaking country	0.149		0.143		-0.101	
Born overseas in a non-English speaking country	0.148		0.067		-0.249	*
Speaks a language other than English at home	-0.067		0.110		-0.287	*
Has not completed Year 12 or post-school qualification	-0.792	***	-0.133		-0.007	
Has a post graduate degree	0.281	*	0.282	**	0.035	
Has an undergraduate degree	0.442	***	0.322	***	0.006	
Has a Certificate III/IV, Diploma or Associate Degree	0.140		0.125		-0.045	
Lives in the most disadvantaged areas (1st quintile)	-0.333	**	-0.234	**	0.198	*
Lives in next most disadvantaged areas (2nd quintile)	-0.041		-0.069		-0.016	
Lives in next most advantaged areas (4th quintile)	0.017		0.083		0.183	*
Lives in the most advantaged areas (5th quintile)	0.054		0.135		0.114	
Data collected in May 2020	0.217	**	0.247	***	0.239	***
Data collected in August 2020	-0.098		-0.120	**	-0.141	**
Data collected in October 2020	0.021		-0.015		0.086	
Data collected in November 2020	0.309	***	0.182	***	0.196	***
Data collected in January 2021	0.348	***	0.291	***	0.187	***
Data collected in April 2021	0.253	**	0.246	***	0.202	***
Data collected in August 2021	-0.055		-0.036		0.041	
Data collected in October 2021	0.226	**	0.070		0.070	
Data collected in January 2022	0.250	*	-0.067			
Data collected in April 2022	0.321	***	0.149	**		
Data collected in May 2022	0.301	**	0.160	**		
Data collected in August 2022	0.246	*	0.071			
Constant	6.852	***	6.684	***	7.446	***
Samples size – Observations	6,523		21,712		12,810	
Sample size – Individuals	1,195		3,255		1,795	

Notes: Random effects linear model. The base case individual is male; 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; and lives in neither an advantaged or disadvantaged suburb (third quintile). Further, the base case observation was from April 2020

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 *

Source: ANUpoll, April, May, August, October, and November 2020; January, April, August, October 2021; and January, April, May, and August 2022.

Table A2c Factors associated with life satisfaction, by state/territory, April 2020 to August 2022

Explanatory variables	NSW/Vic/ACT		Other jurisdictions	
	Coeff.	Signif.	Coeff.	Signif.
Stringency index (decile)	-0.051	***	-0.010	
Number of cases per 100,000 residents (decile)	-0.015		-0.012	
Female	-0.037		0.150	**
Aged 18 to 24 years	-0.354	***	0.327	*
Aged 25 to 34 years	-0.068		-0.167	
Aged 45 to 54 years	-0.089		0.026	
Aged 55 to 64 years	0.121		0.264	**
Aged 65 to 74 years	0.436	***	0.716	***
Aged 75 years plus	0.760	***	1.082	***
Indigenous	-0.442	**	-0.402	*
Born overseas in a main English-speaking country	-0.055		0.119	
Born overseas in a non-English speaking country	0.053		-0.052	
Speaks a language other than English at home	-0.037		0.118	
Has not completed Year 12 or post-school qualification	0.088		-0.290	**
Has a post graduate degree	0.174	*	0.315	***
Has an undergraduate degree	0.286	***	0.205	**
Has a Certificate III/IV, Diploma or Associate Degree	0.095		0.043	
Lives in the most disadvantaged areas (1st quintile)	-0.149	*	-0.081	
Lives in next most disadvantaged areas (2nd quintile)	-0.056		-0.025	
Lives in next most advantaged areas (4th quintile)	0.024		0.176	*
Lives in the most advantaged areas (5th quintile)	0.100		0.175	*
Data collected in May 2020	0.219	***	0.363	***
Data collected in August 2020	-0.215	***	0.236	***
Data collected in October 2020	-0.037		0.307	***
Data collected in November 2020	0.168	***	0.464	***
Data collected in January 2021	0.233	***	0.498	***
Data collected in April 2021	0.194	***	0.466	***
Data collected in August 2021	-0.154	***	0.306	***
Data collected in October 2021	0.022		0.298	***
Data collected in January 2022	-0.286	***	0.059	
Data collected in April 2022	-0.013		0.246	***
Data collected in May 2022	0.000		0.301	***
Data collected in August 2022	0.002		0.255	***
Constant	6.916	***	6.236	***
Samples size – Observations	23,901		17,144	
Sample size – Individuals	3,735		2,510	

Notes: Random effects linear model. The base case individual is male; aged 35 to 44 years; 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; and lives in neither an advantaged or disadvantaged suburb (third quintile). Further, the base case observation was from April 2020

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 *

Source: ANUpoll, April, May, August, October, and November 2020; January, April, August, October 2021; and January, April, May, and August 2022.

Table A3a Factors associated with measures of psychological distress, April 2020 to August 2022

Explanatory variables	Nervous		Hopeless		Restless	
	Coeff.	Signif.	Coeff.	Signif.	Coeff.	Signif.
Stringency index (decile)	0.021	***	0.027	***	0.029	***
Number of cases per 100,000 residents (decile)	0.021	***	0.021	***	0.025	***
Female	0.419	***	0.222	***	0.151	***
Aged 18 to 24 years	0.568	***	0.556	***	0.814	***
Aged 25 to 34 years	0.205	***	0.285	***	0.264	***
Aged 45 to 54 years	-0.390	***	-0.224	***	-0.389	***
Aged 55 to 64 years	-0.692	***	-0.635	***	-0.646	***
Aged 65 to 74 years	-1.147	***	-1.186	***	-1.091	***
Aged 75 years plus	-1.326	***	-1.430	***	-1.356	***
Indigenous	0.670	***	0.702	***	0.609	***
Born overseas in a main English-speaking country	-0.078		-0.129	*	0.044	
Born overseas in a non-English speaking country	0.104	*	0.075		-0.039	
Speaks a language other than English at home	0.135	**	0.307	***	-0.009	
Has not completed Year 12 or post-school qualification	0.088		0.118		0.092	
Has a post graduate degree	0.006		-0.195	**	-0.009	
Has an undergraduate degree	-0.077		-0.256	***	-0.034	
Has a Certificate III/IV, Diploma or Associate Degree	0.018		-0.059		0.027	
Lives in the most disadvantaged areas (1st quintile)	-0.050		0.062		-0.058	
Lives in next most disadvantaged areas (2nd quintile)	-0.134	**	0.037		-0.124	**
Lives in next most advantaged areas (4th quintile)	-0.108	*	-0.088		-0.089	
Lives in the most advantaged areas (5th quintile)	-0.056		-0.085		-0.068	
Data collected in May 2020	-0.292	***	-0.102	***	-0.037	
Data collected in August 2020	-0.130	***	0.116	***	-0.032	
Data collected in November 2020	-0.305	***	-0.014		-0.054	
Data collected in January 2021	-0.469	***	-0.197	***	-0.274	***
Data collected in April 2021	-0.563	***	-0.268	***	-0.321	***
Data collected in August 2021	-0.513	***	-0.179	***	-0.342	***
Data collected in October 2021	-0.481	***	-0.133	***	-0.244	***
Data collected in January 2022	-0.259	***	-0.086			
Data collected in April 2022	-0.435	***	-0.235	***		
Data collected in August 2022	-0.524	***	-0.212	***		
Cut-point 1	-1.111		0.183		-0.886	
Cut-point 2	0.360		1.300		0.510	
Cut-point 3	2.006		2.632		1.923	
Cut-point 4	3.249		3.780		3.242	
Samples size – Observations	34,902		34,901		34,899	
Sample size – Individuals	6,239		6,239		6,239	

Notes: Random effects ordered probit model. The base case individual is male; 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; and lives in neither an advantaged or disadvantaged suburb (third quintile). Further, the base case observation was from April 2020

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 *

Source: ANUpoll, April, May, August, and November 2020; January, April, August, October 2021; and January, April, and August 2022.

Table A3b Factors associated with measures of psychological distress, April 2020 to August 2022

Explanatory variables	Everything an effort		So sad nothing could cheer you up		Worthless	
	Coeff.	Signif.	Coeff.	Signif.	Coeff.	Signif.
Stringency index (decile)	0.013	**	0.018	***	0.008	
Number of cases per 100,000 residents (decile)	0.013	**	0.020	***	0.013	
Female	0.221	***	0.148	***	0.186	***
Aged 18 to 24 years	0.414	***	0.477	***	0.751	***
Aged 25 to 34 years	0.185	***	0.214	***	0.328	***
Aged 45 to 54 years	-0.372	***	-0.205	***	-0.278	***
Aged 55 to 64 years	-0.670	***	-0.583	***	-0.739	***
Aged 65 to 74 years	-1.002	***	-0.906	***	-1.289	***
Aged 75 years plus	-0.986	***	-1.082	***	-1.408	***
Indigenous	0.454	***	0.771	***	0.911	***
Born overseas in a main English-speaking country	-0.074		-0.088		-0.138	*
Born overseas in a non-English speaking country	-0.048		0.287	***	0.060	
Speaks a language other than English at home	0.133	**	0.300	***	0.332	***
Has not completed Year 12 or post-school qualification	0.027		0.103		0.206	*
Has a post graduate degree	-0.163	**	-0.231	***	-0.170	*
Has an undergraduate degree	-0.216	***	-0.347	***	-0.382	***
Has a Certificate III/IV, Diploma or Associate Degree	-0.105		-0.143	*	0.009	
Lives in the most disadvantaged areas (1st quintile)	0.035		0.137	*	0.145	
Lives in next most disadvantaged areas (2nd quintile)	-0.050		0.038		0.045	
Lives in next most advantaged areas (4th quintile)	-0.174	***	-0.127	*	-0.065	
Lives in the most advantaged areas (5th quintile)	-0.151	***	-0.070		-0.135	*
Data collected in May 2020	0.059	*	0.029		0.061	
Data collected in August 2020	0.137	***	0.131	***	0.130	***
Data collected in November 2020	0.193	***	0.087	*	0.170	***
Data collected in January 2021	0.014		-0.083	*	0.012	
Data collected in April 2021	-0.037		-0.120	***	-0.008	
Data collected in August 2021	-0.014		-0.095	**	-0.066	
Data collected in October 2021	0.058	*	-0.023		0.039	
Data collected in January 2022	0.156	***	-0.005		-0.001	
Data collected in April 2022	0.013		-0.088		-0.010	
Data collected in August 2022	0.061		-0.093		-0.042	
Cut-point 1	-0.892		0.592		0.838	
Cut-point 2	0.461		1.738		1.951	
Cut-point 3	1.704		2.983		3.108	
Cut-point 4	2.962		4.030		4.070	
Samples size – Observations	34,902		34,896		34,896	
Sample size – Individuals	6,239		6,238		6,239	

Notes: Random effects ordered probit model. The base case individual is male; 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; and lives in neither an advantaged or disadvantaged suburb (third quintile). Further, the base case observation was from April 2020

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 *

Source: ANUpoll, April, May, August, and November 2020; January, April, August, October 2021; and January, April, and August 2022.

Table A4 Factors associated with loneliness, April 2020 to August 2022

Explanatory variables	Coeff.	Signif.
Stringency index (decile)	0.036	***
Number of cases per 100,000 residents (decile)	0.030	***
Female	0.301	***
Aged 18 to 24 years	0.935	***
Aged 25 to 34 years	0.350	***
Aged 45 to 54 years	-0.223	***
Aged 55 to 64 years	-0.493	***
Aged 65 to 74 years	-0.733	***
Aged 75 years plus	-0.738	***
Indigenous	0.760	***
Born overseas in a main English-speaking country	-0.065	
Born overseas in a non-English speaking country	0.201	*
Speaks a language other than English at home	0.088	**
Has not completed Year 12 or post-school qualification	0.101	
Has a post graduate degree	0.008	
Has an undergraduate degree	-0.169	
Has a Certificate III/IV, Diploma or Associate Degree	0.015	
Lives in the most disadvantaged areas (1st quintile)	0.086	
Lives in next most disadvantaged areas (2nd quintile)	-0.033	**
Lives in next most advantaged areas (4th quintile)	-0.248	*
Lives in the most advantaged areas (5th quintile)	-0.135	
Data collected in May 2020	-0.329	***
Data collected in August 2020	-0.128	***
Data collected in November 2020	-0.194	***
Data collected in January 2021	-0.333	***
Data collected in April 2021	-0.345	***
Data collected in August 2021	-0.318	***
Data collected in October 2021	-0.355	***
Data collected in January 2022	-0.346	***
Data collected in April 2022	-0.443	***
Data collected in August 2022	-0.370	***
Cut-point 1	0.673	
Cut-point 2	1.956	
Cut-point 3	3.098	
Samples size – Observations	34,894	
Sample size – Individuals	6,240	

Notes: Random effects ordered probit model. The base case individual is male; 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; and lives in neither an advantaged or disadvantaged suburb (third quintile). Further, the base case observation was from April 2020

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 *

Source: ANUpoll, April, May, August, and November 2020; January, April, August, October 2021; and January, April, and August 2022.

Table A5 Factors associated with satisfaction with the direction of the country, April 2020 to August 2022

Explanatory variables	Coeff.	Signif.
Stringency index (decile)	-0.014	*
Number of cases per 100,000 residents (decile)	-0.002	
Female	0.131	***
Aged 18 to 24 years	-0.233	**
Aged 25 to 34 years	-0.053	
Aged 45 to 54 years	-0.017	
Aged 55 to 64 years	-0.135	*
Aged 65 to 74 years	0.044	
Aged 75 years plus	0.190	**
Indigenous	-0.137	
Born overseas in a main English-speaking country	0.226	***
Born overseas in a non-English speaking country	0.317	***
Speaks a language other than English at home	0.289	***
Has not completed Year 12 or post-school qualification	0.086	
Has a post graduate degree	-0.053	
Has an undergraduate degree	0.000	
Has a Certificate III/IV, Diploma or Associate Degree	0.064	
Lives in the most disadvantaged areas (1st quintile)	0.023	
Lives in next most disadvantaged areas (2nd quintile)	0.018	
Lives in next most advantaged areas (4th quintile)	0.229	***
Lives in the most advantaged areas (5th quintile)	0.134	**
Data collected in May 2020	0.181	***
Data collected in August 2020	-0.233	***
Data collected in November 2020	0.179	***
Data collected in January 2021	0.140	**
Data collected in April 2021	-0.070	
Data collected in August 2021	-0.629	***
Data collected in October 2021	-0.392	***
Data collected in January 2022	-0.728	***
Data collected in April 2022	-0.734	***
Data collected in May 2022	-0.151	**
Data collected in August 2022	-0.132	*
Constant	1.036	***
Samples size – Observations	38,271	
Sample size – Individuals	6,240	

Notes: Random effects binary probit model. The base case individual is male; aged 35 to 44 years; 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; and lives in neither an advantaged or disadvantaged suburb (third quintile). Further, the base case observation was from April 2020

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 *

Source: ANUpoll, April, May, August, October, and November 2020; January, April, August, 2021; and January, April, May, and August 2022.

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Endnotes

1 Other studies have covered topics as varied as inflation expectations (Detmers, Ho & Karagedikli 2022) and the amount of Gastrointestinal Motility Testing conducted (Mori et al. 2020). Most of the literature however focuses on measures of wellbeing and mental health, trying to quantify the difficult-to-measure trade-offs of containment policies.

2 https://csrm.cass.anu.edu.au/research/publications/covid-19

3 The ANUpoll series of surveys is collected on a probability-based, longitudinal panel (Life in Australia™). By using probability-based recruiting (predominantly telephone-based) the unknown and unquantifiable biases inherent in opt-in (non-probability) panels are minimised and it is also possible to quantify the uncertainty around the estimates due to sampling error using standard statistical techniques. This is not possible with non-probability surveys.

4 The unit record survey data is available for download through the Australian Data Archive. http://dx.doi.org/10.26193/FCZGOK

5 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 follow up 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.

6 Taking into account recruitment to the panel, the cumulative response rate for this survey is around 6.8 per cent.