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# Protecting mental health during periods of financial stress: Evidence from the Australian Coronavirus Supplement income support payment

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## ABSTRACT

This paper investigates whether the Australian government's Coronavirus Supplement, a temporary income support payment for unemployed jobseekers during the height of the COVID-19 pandemic, protected mental health (frequency of feeling anxious or depressed during the past week) by lowering financial stress (how comfortable people are in paying for essential services). We use unique nationally representative repeated cross-sectional data on 3843 unemployed Australian adults over the period April 6, 2020 to May 10, 2021. We find that the Coronavirus Supplement payment significantly reduced reported financial stress, and lower financial stress was associated with lower mental distress. Though the Coronavirus Supplement was designed to reduce financial stress, we find the Supplement was also successful in protecting community mental health indirectly via its ability to reduce financial stress. The findings provide support for income support packages to protect mental health during economic shocks. However, transitory support measures also tend to have short-lived positive effects on mental health, suggesting that more permanent income support reform may have longer-term mental health benefits.

## 1. Introduction

Financial stress, typically reflecting an inability to pay regular bills (cash-flow issues) or being unable to meet basic needs (deprivation), has been identified as an important factor that can increase the risk of mental health problems (Whelan et al., 2001; Butterworth et al., 2009; Kiely et al., 2015; Bulbulia et al., 2020; Nelson et al., 2020). The adverse mental health effects of financial stress are often partly due to factors such as increased anxiety, a loss of self-esteem and feelings of hopelessness (Kiely and Butterworth, 2013; Elahi et al., 2018; Frankham et al., 2020). Poor mental health has in turn been linked to an increased risk of future unemployment, and receipt of a disability benefits or other types of welfare payments (Olesen et al., 2013; Kiely and Butterworth, 2014; Bubonya et al., 2019).

Given the strong link between financial stress and mental distress, protecting individual and household income should not only alleviate feelings of financial stress but should translate into lower mental distress. One way of reducing financial hardship is via income support initiatives which, as demonstrated in Simpson et al.'s (2021) systematic

review of the impact of social security changes on mental health in high-income countries, are often crucial to support individuals in financial stress. A recent unique income support program was the Coronavirus Supplement (CVS) rolled out in Australia as part of the national government's policy response to COVID-19. Introduced in April 2020, the CVS was a temporary supplement paid to recipients of the unemployment benefit and various other welfare benefits with the purpose of replacing the lost income of Australians without adequate employment during the height of the COVID-19 pandemic.

This paper focuses specifically on whether the CVS lowered reported financial stress—whether a person is moderately or severely stressed in terms of being able to pay for essential goods and services—and whether this reduction in financial stress was in turn associated with lower mental distress, defined here as feeling depressed or anxious 'most of the time' or 'all of the time' during the past week (see Section 2.3).

Findings from existing work on Australian data have supported the prediction that socioeconomic disadvantage and financial stress are related to poorer mental health (Saunders, 1998; Butterworth et al., 2009; Kiely and Butterworth, 2013; Kiely et al., 2015). However, none of

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the existing studies has examined specific income support measures as ways of improving mental health via reductions in financial hardships. Moreover, the CVS is a unique income support initiative rolled out during the COVID-19 pandemic, and thus our findings provide additional information on how mental health can be protected in times of greater uncertainty. Australia is also an interesting case study partly because of evidence documenting a rise in the prevalence of psychological distress in recent years (Butterworth et al., 2020). Moreover, in the early stages of the COVID-19 pandemic, rates of distress among Australians were almost three times higher than pre-COVID (Butterworth, 2020; Dawel et al., 2020; Fisher et al., 2020).

Using unique nationally representative survey data on unemployed working-age Australian adults collected at high frequency during the COVID-19 pandemic, we show that the CVS was directly associated with lower financial stress, which in turn reduced mental distress.

## 2. Data, measures, and analytical methods

### 2.1. The data

We use data from 32 waves of the Taking the Pulse of the Nation (TTPN) Survey, conducted by the Melbourne Institute: Applied Economic & Social Research. Initially developed to track the impact of the COVID-19 pandemic on the lives of Australians, the TTPN is a nationally representative survey of Australian adults that also elicits responses on factors such as mental health, labour force status, and perceptions of financial stress. Each TTPN wave comprises a sample of 1200 respondents stratified by age, gender, and location to be representative of the Australian adult population. The TTPN Survey has a repeated cross-sectional design, with a new sample drawn each wave, and provides a series of independent population estimates over the course of the pandemic. For more information about the TTPN Survey and related work using this data, see Broadway et al. (2020b), Melbourne Institute (2021) and Botha et al. (2022).

Commencing in the week beginning April 6, 2020, the TTPN Survey was conducted weekly until the week beginning July 6, 2020, after which it was conducted fortnightly. Towards the end of 2020, the survey frequency changed slightly, for example to accommodate holiday periods. The TTPN Survey waves for 2020 (i.e., waves 1–24) were conducted in the weeks beginning 6 April, 13 April, 20 April, 27 April, 4 May, 11 May, 18 May, 25 May, 1 June, 8 June, 15 June, 22 June, 1 July, 6 July, 20 July, 3 August, 17 August, 1 September, 14 September, 5 October, 19 October, 2 November, 16 November, and 1 December. The TTPN Survey waves for 2021 (i.e. waves 25–32) were conducted in the weeks beginning 11 January, 1 February, 15 February, 1 March, 15 March, 5 April, 19 April, and 10 May.

The 32 waves used in this paper span the period April 6, 2020 to May 10, 2021. We focus on unemployed Australians of working-age (18–64) with complete information on all key variables. The overall sample size for all 32 waves is 38,407. From these, we initially exclude 9121 who are not of working-age. Of the remaining 28,916 working-age individuals across all TTPN samples, we exclude 66.5% (N = 19,001) who were employed and 19.1% (N = 5842) who were not active in the labour force. The remaining 4073 individuals were unemployed. Our main analysis used complete case analysis, and excluded a further 230 respondents with missing information on either mental distress or financial distress. This then results in a final analytical sample of 3843 individuals across the 32 waves used. These sample selection criteria and corresponding sample sizes are summarised in Table 1.

Our analysis is restricted to the unemployed individuals as the CVS primarily went to unemployment benefit recipients (see Section 2.3). We use unemployment status as a proxy for CVS receipt. However, it should be recognised that this introduces some imprecision: (i) the CVS was also paid to recipients of other welfare payments (not just unemployment benefits) who may not be included in our analysis sample, and (ii) not all unemployed Australians necessarily receive unemployment benefits and

**Table 1**  
Sample selection summary and sample size.

Criteria	Individuals	Percent
Full sample	38,407	100%
Working age	28,916	75.3%
Not employed or not in labour force	4073	10.3%
Non-missing responses on mental distress or financial stress	3843	10.0%

therefore some in our analysis sample may not have received the CVS. Table 2 presents the summary statistics.

### 2.2. Outcome variable

The outcome variable is a measure of mental health distress derived from the question: “During the past week, about how often did you feel depressed or anxious?” The response options are ‘none of the time’, ‘a little of the time’, ‘some of the time’, ‘most of the time’, and ‘all the time’. See Section 3 for a discussion of this variable’s distribution.

### 2.3. Explanatory variables

The main explanatory measures of interest are indicators of the availability and the level of CVS based on interview date. First announced on March 21, 2020, the CVS commenced on April 27, 2020, and was maintained at a rate of \$550 per fortnight until September 24, 2020. This effectively doubled the base rate of income support provided to unemployment benefit recipients. From September 25, 2020 to December 31, 2020, the payment was lowered to \$250 per fortnight, while from January 1, 2021 to March 31, 2021 the payment was further reduced to \$150 per fortnight. The CVS was discontinued on March 31, 2021 (see ATO, 2021; SA, 2021). The span of our sample period is from approximately three weeks prior to the introduction of the CVS to approximately six weeks after the payment ended.

Financial stress, the other main explanatory variable, is measured by asking respondents: “How would you describe your current financial conditions, in terms of paying for essential goods and services such as bills, rents, mortgages?” The response options are ‘very comfortable financially’, ‘moderately comfortable financially’, ‘making ends meet’, ‘moderately financially stressed’, and ‘very financially stressed’. This item relates to the financial hardship dimension of experiencing cash-flow problems (Kiely et al., 2015).

The TTPN Survey also collects respondents’ age group, sex and state of residence, variables which are included as controls in our regressions. We additionally control for time/period effects via inclusion of a linear time dummy representing each survey wave.

**Table 2**  
Summary statistics.

Variable	Mean	Std. Dev.	Min	Max
Mental distress	2.8163	1.2030	1	5
Financial stress	3.4239	1.0860	1	5
Coronavirus Supplement (\$)	360.15	225.24	0	550
Female	0.5240	0.4995	0	1
Age: 18–34	0.5360	0.4988	0	1
Age: 35–49	0.2444	0.4298	0	1
Age: 50–64	0.2195	0.4140	0	1
New South Wales	0.3224	0.4674	0	1
Victoria	0.2941	0.4557	0	1
Queensland	0.2014	0.4011	0	1
South Australia	0.0691	0.2537	0	1
Western Australia	0.1007	0.3010	0	1
Tasmania	0.0072	0.0843	0	1
Australian Capital Territory	0.0052	0.0717	0	1

Note: Data are weighted. N = 3843.

2.4. Analytical method

We expect that reported financial stress of unemployed persons will be responsive to the availability and level of the CVS. Thus, financial stress should be lower when the CVS is at higher levels and increasing as the CVS declines or is removed. We also expect that the CVS will be associated with different levels of mental distress via its effects on financial stress.

Using a structural equation modelling approach, we specify the 5-level mental distress score as a function of the 5-level financial stress score, the CVS, and the control variables. In the model, we also allow financial stress to be directly determined by the CVS. Fig. 1 presents a graphical depiction of the model.

This model shows that the CVS determines a person’s financial stress, which in turn is specified to directly determine mental distress. This allows us to test whether the CVS indirectly reduced mental distress because of the CVS’s role in lowering financial stress. We do recognise, however, that in reality not only the CVS is associated with financial stress, and mental distress is not only related to financial stress and the set of covariates. In preliminary analyses, we also allowed for a direct association of the CVS on mental distress (results available on request). This direct association was never significant in any sub-samples. In the interest of parsimony and consistency with our hypothesized relationships, the models presented in this paper only allow for the CVS to be related to mental distress via its relationship with financial stress. The model in Fig. 1 is estimated for the total analytic sample, as well as in subgroup analyses stratified by gender and by age group. Models were also estimated separately by state, namely New South Wales, Victoria, and all other states combined. The results, not reported here but available on request, showed no state differences and yield similar conclusions to the main results reported in this paper.

Given the discrete ordinal form of the main variables of interest, to guide against violating normality assumptions we estimate the model via the asymptotic distribution free approach in Stata, which makes no assumptions about normality (also see Section 4). We use the model chi-squared statistic, Root Mean Squared Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Standardised Root Mean Square Residual (SRMR) as standard goodness-of-fit statistics. Hu and Bentler (1999) recommend the following conditions for acceptable model fit:  $RMSEA \leq 0.06$ ,  $CFI \geq 0.90$ , and  $SRMR \leq 0.08$ .

3. Results

Fig. 2 shows the frequency distribution of responses to the mental distress question, with almost 72 per cent of unemployed respondents reporting feeling depressed or anxious “none”, “a little”, or “some of the time” during the past week, compared to approximately 28 per cent feeling depressed or anxious ‘most of the time’ or ‘all of the time’. Substantial agreement of this single-item measure of mental health distress with the Kessler-6 measure has been demonstrated with the TTPN Survey data (Botha et al., 2022). Thus, the survey is showing that, on average over the period we examine, approximately 28 per cent of

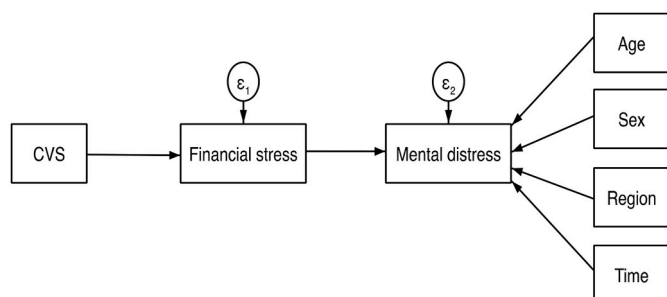


Fig. 1. Full structural equation model specification.

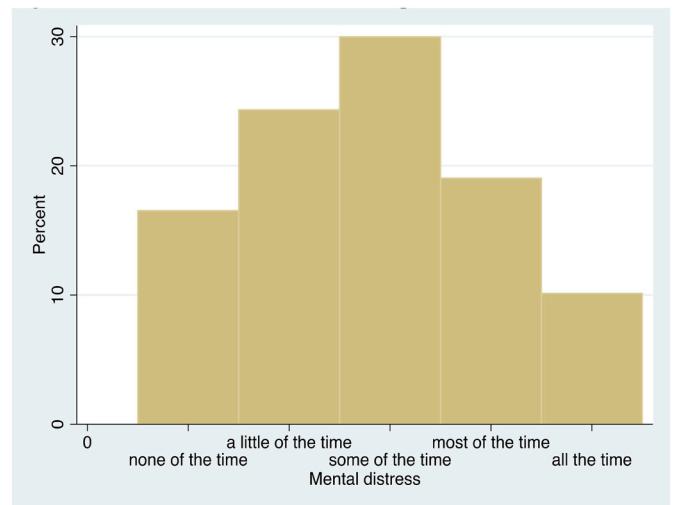


Fig. 2. Distribution of mental distress responses.

unemployed Australians can be identified as having mental distress in the past week, though this rate varied over the study period (also see Table 2).

Fig. 3 shows the distribution of responses to each financial stress category. Just under 4 per cent of unemployed individuals report being “very comfortable financially”, while just over 20 per cent report being “very financially stressed”. Roughly 37 per cent of respondents report they are making ends meet. Based on these responses, about 44 per cent of unemployed Australians report current (weekly) financial stress.

Fig. 4 shows mean levels of mental distress and financial stress in each wave over the April 2020 to March 2021 period. The findings are suggestive of a moderate positive relationship between mental distress and financial stress, as average mental distress levels tend to move in the same directions as financial stress levels (Spearman correlation = 0.409,  $p < 0.001$ ). Furthermore, implementation of the first CVS payment at the end of April 2020 was followed by a general decline in mental distress and financial stress. However, each subsequent decline in the payment was followed by increases in the prevalence of mental distress and financial stress.

The full structural equation results are reported in Tables 3 and 4. Shown at the bottom of these tables, the goodness-of-fit statistics are excellent for all models and meet the recommended thresholds (refer to

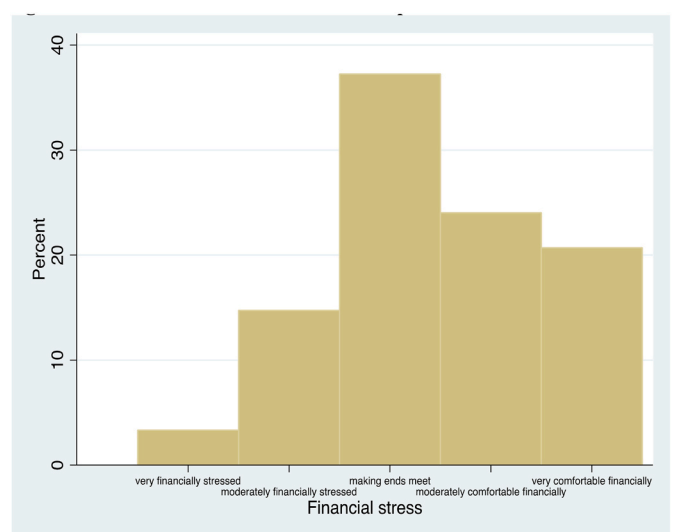
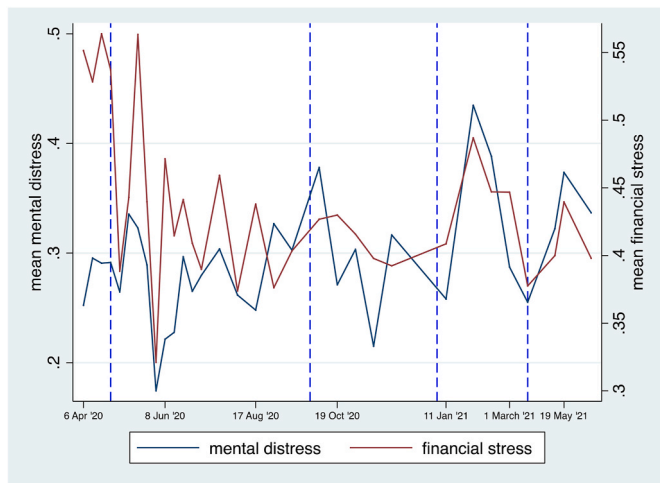


Fig. 3. Distribution of financial stress responses.



**Fig. 4.** Mental distress, financial stress, and the Coronavirus Supplement dates. Note: Each of the vertical dotted blue lines corresponds to a change in the Coronavirus Supplement. At the first vertical line the \$550 payment was introduced, at the second vertical line the payment was lowered to \$250, at the third vertical line the payment was further lowered to \$150, and at the last vertical line the payment ceased. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

Section 2.4 for goodness-of-fit threshold guidelines). Examination of post-estimation modification indices also suggested that no additional paths or correlations would meaningfully improve model fit.

Regardless of the sample considered, the importance of financial stress in predicting mental distress remains pertinent. Higher levels of financial stress are strongly associated with higher levels of mental distress. For example, for the overall sample the unstandardised coefficient suggest that a one-point increase in financial stress on the 1–5 scale is associated with a 0.458-point rise in mental distress. The standardised results imply that mental distress is higher by about 0.4 standard deviations for each standard deviation increase in financial stress. These results, for all subsamples, support a strong direct association between greater financial stress and greater mental distress. In terms of our primary focus, as expected, the CVS was significantly and directly related to lower financial stress. For instance, among men, financial stress was on average 0.18-points (or 0.08 standard deviations) lower on the 1–5 scale during the weeks with the \$500 payment as compared to weeks in which there was no CVS payment. Interestingly, the direct association between the CVS and financial stress is only evident for weeks with the \$500 and \$250 per fortnight payments relative to weeks with the \$0 payments, and not for the weeks when the CVS payment was \$150 or less. There is little evidence of a direct association between the CVS and financial stress for the 50–64 age group.

Regarding the control variables, we find little evidence of a gender difference in mental distress when comparing all unemployed men and women. Within the 18–34 age group, however, the findings suggest significantly higher distress among women than among men (Table 4). Rates of mental distress are higher among the 18–34 age group relative

**Table 3**  
Full structural model results for overall sample, males, and females.

	Overall sample		Males		Females	
	Unstandardised	Standardised	Unstandardised	Standardised	Unstandardised	Standardised
<b>Mental distress</b>						
Financial stress	0.458*** (0.017)	0.405*** (0.014)	0.492*** (0.025)	0.433*** (0.021)	0.432*** (0.022)	0.385*** (0.019)
Female	0.037 (0.035)	0.015 (0.014)				
Age group (ref: 18–34)						
35–49	–0.143*** (0.041)	–0.053*** (0.015)	–0.024 (0.061)	–0.009 (0.022)	–0.237*** (0.055)	–0.086*** (0.021)
50–64	–0.488*** (0.045)	–0.175*** (0.016)	–0.393*** (0.066)	–0.144*** (0.024)	–0.563*** (0.061)	–0.196*** (0.021)
State (ref: All other states)						
New South Wales	0.023 (0.043)	0.009 (0.017)	–0.052 (0.067)	–0.019 (0.025)	0.080 (0.061)	0.031 (0.023)
Victoria	0.006 (0.043)	0.003 (0.017)	–0.104 (0.065)	–0.041 (0.026)	0.088 (0.056)	0.037 (0.023)
Time (survey week)	0.004*** (0.001)	0.056*** (0.015)	0.003 <sup>#</sup> (0.002)	0.042 <sup>#</sup> (0.021)	0.004** (0.001)	0.063** (0.020)
Constant	1.296*** (0.071)	1.071*** (0.061)	1.206*** (0.101)	0.974*** (0.085)	1.403*** (0.092)	1.185*** (0.082)
<b>Financial stress</b>						
Coronavirus Supplement (ref: \$0)						
\$500	–0.146*** (0.045)	–0.068*** (0.021)	–0.175** (0.066)	–0.080** (0.030)	–0.122* (0.061)	–0.057* (0.029)
\$250	–0.193** (0.065)	–0.058*** (0.019)	–0.260** (0.099)	–0.074** (0.028)	–0.142 <sup>#</sup> (0.085)	–0.044 <sup>#</sup> (0.026)
\$150	–0.090 (0.061)	–0.028 (0.019)	–0.096 (0.089)	–0.030 (0.028)	–0.083 (0.082)	–0.026 (0.026)
Constant	3.555*** (0.039)	3.322*** (0.047)	3.548*** (0.056)	3.257*** (0.068)	3.559*** (0.053)	3.375*** (0.064)
<b>Variations</b>						
Error: mental distress	1.182 [1.136; 1.231]	0.807 [0.784; 0.831]	1.213 [1.141; 1.290]	0.791 [0.755; 0.823]	1.143 [1.084; 1.206]	0.813 [0.783; 0.844]
Error: financial stress	1.141 [1.101; 1.183]	0.996 [0.993; 1.000]	1.180 [1.119; 1.245]	0.994 [0.987; 1.001]	1.110 [1.059; 1.165]	0.998 [0.993; 1.002]
Observations	3843		1732		2111	
$\chi^2_{(6)}$	29.57 (p = 0.001)		9.78 (p = 0.281)		21.73 (p = 0.005)	
RMSEA	0.024 [90% CI: 0.015; 0.034]		0.011 [90% CI: 0.000; 0.032]		0.029 [90% CI: 0.014; 0.043]	
p-close (RMSEA ≤ 0.05)	1.000		1.000		0.993	
CFI	0.974		0.995		0.969	
SRMR	0.010		0.010		0.013	

Note: Standard errors are in round brackets. Square brackets contain 95% confidence intervals, unless otherwise stated. \*\*\*p < 0.001, \*\*p < 0.01, \*p < 0.05, <sup>#</sup>p < 0.10.



**Table 4**  
Full structural model results for age groups.

	Age 18–34		Age 35–49		Age 50–64	
	Unstandardised	Standardised	Unstandardised	Standardised	Unstandardised	Standardised
<b>Mental distress</b>						
Financial stress	0.413*** (0.023)	0.397*** (0.021)	0.514*** (0.033)	0.447*** (0.027)	0.527*** (0.035)	0.424*** (0.027)
Female	0.128* (0.050)	0.054* (0.021)	−0.076 (0.065)	−0.032 (0.027)	−0.004 (0.073)	−0.002 (0.029)
State (ref: All other states)						
New South Wales	−0.003 (0.060)	−0.001 (0.025)	0.053 (0.084)	0.020 (0.032)	0.113 (0.110)	0.036 (0.035)
Victoria	−0.053 (0.061)	−0.021 (0.025)	0.208** (0.079)	0.086** (0.033)	−0.077 (0.088)	−0.030 (0.035)
Time (survey week)	0.005** (0.001)	0.069** (0.021)	0.006** (0.002)	0.073** (0.027)	0.002 (0.002)	0.029 (0.030)
Constant	1.410*** (0.092)	1.216*** (0.086)	0.903*** (0.143)	0.754*** (0.124)	0.673*** (0.142)	0.535*** (0.115)
<b>Financial stress</b>						
Coronavirus Supplement (ref: \$0)						
\$500	−0.139* (0.066)	−0.062* (0.030)	−0.214* (0.085)	−0.101* (0.040)	−0.118 (0.083)	−0.058 (0.041)
\$250	−0.342*** (0.097)	−0.097*** (0.027)	−0.131 (0.118)	−0.042 (0.038)	−0.012 (0.121)	−0.004 (0.038)
\$150	−0.094 (0.090)	−0.027 (0.026)	−0.110 (0.119)	−0.033 (0.035)	−0.070 (0.108)	−0.023 (0.040)
Constant	3.559*** (0.056)	3.193*** (0.067)	3.658*** (0.074)	3.513*** (0.088)	3.461*** (0.070)	3.421*** (0.094)
<b>Variances</b>						
Error: mental distress	1.122 [1.058; 1.190]	0.835 [0.803; 0.868]	1.127 [1.043; 1.218]	0.786 [0.740; 0.834]	1.289 [1.190; 1.397]	0.816 [0.772; 0.862]
Error: financial stress	1.233 [1.172; 1.299]	0.993 [0.985; 1.001]	1.078 [1.009; 1.151]	0.994 [0.985; 1.003]	1.021 [0.946; 1.102]	0.997 [0.991; 1.004]
Observations	1828		1055		960	
$\chi^2_{(6)}$	21.54 (p = 0.003)		17.75 (p = 0.013)		1.63 (p = 0.977)	
RMSEA	0.034 [90% CI: 0.018; 0.050]		0.038 [90% CI: 0.016; 0.038]		0.000 [90% CI: 0.000; 0.000]	
p-close (RMSEA ≤ 0.05)	0.946		0.786		1.000	
CFI	0.955		0.953		1.000	
SRMR	0.014		0.014		0.006	

Note: Standard errors are in round brackets. Square brackets contain 95% confidence intervals, unless otherwise stated. \*\*\*p < 0.001, \*\*p < 0.01, \*p < 0.05, #p < 0.10.

to the older two age groups. However, among men, there is no meaningful difference in distress between the 18–34 and 35–49 age group, with the 50–64 group reporting lower distress than 18–34-year-olds (Table 3). There are no major differences in mental distress across state of residence, except within the 35–49 age group, with Victoria residents reporting significantly higher distress than residents in all other states excluding New South Wales.

From Tables 3 and 4 we noted that the CVS was related to periods of significantly lower financial stress, and that lower financial stress is associated with periods of lower mental distress. The model specification explicitly allows for an indirect effect of the CVS on mental distress, mediated by financial stress. Table 5 reports the estimated indirect effects (note that “effects” here do not imply causality and simply relate to the structural equation model terminology), which provide an indication of how the CVS was associated with mental distress via financial stress. The estimates overwhelmingly show that periods of higher CVS payments were associated with lower mental distress, and that this association was indirect via the direct relationship between higher CVS payments and lower financial stress.

Among men and women, the indirect association of a CVS payment of \$500 compared to no payment was a reduction in mental distress of roughly 0.086- and 0.053-points, respectively. The relative magnitudes of the standardised indirect effects suggest that in most samples, relative to weeks without any CVS payment, the \$500 payment periods were associated with the largest reduction in mental distress. Among Australians aged 50–64, there is no significant indirect relationship between the CVS and mental distress, which is unsurprising given that for this age group we also found no evidence of any direct association between the CVS and financial stress.

**Table 5**  
Standardised indirect effects of the CVS on mental distress via financial stress.

Outcome	Indirect effect	
	Unstandardised	Standardised
Overall		
\$500	−0.0670**	−0.0275**
\$250	−0.0883**	−0.0235**
\$150	−0.0410	−0.0113
Male		
\$500	−0.0863**	−0.0347**
\$250	−0.1279**	−0.0322**
\$150	−0.0470	−0.0128
Female		
\$500	−0.0527*	−0.0221*
\$250	−0.0613#	−0.0170#
\$150	−0.0357	−0.0099
Age: 18–34		
\$500	−0.0573*	−0.0246*
\$250	−0.1411**	−0.0386**
\$150	−0.0388	−0.0107
Age: 35–49		
\$500	−0.1099*	−0.0452*
\$250	−0.0673	−0.0188
\$150	−0.0563	−0.0145
Age: 50–64		
\$500	−0.0623	−0.0248
\$250	−0.0064	−0.0016
\$150	−0.0371	−0.0110

Note: Estimated effects are for the periods in which the relevant payment amount was received, as compared to the periods where there was no payment. \*\*\*p < 0.001, \*\*p < 0.01, \*p < 0.05, #p < 0.10.

#### 4. Sensitivity analyses

We conducted several sensitivity analyses to satisfy ourselves of the validity of the main results. The first set of checks relates to the coding of the CVS measure. In the main results, we specified the CVS payment as a categorical variable with the weeks of each payment level as a separate category. Using only a binary version of the CVS, in which we compare periods in which the payment was received with periods in which the payment was not received, produced comparable results: Financial stress was lower during weeks in which the CVS payment was paid, and the association between the CVS and mental distress is indirect via financial stress. We also experimented with using the actual amounts of the payment, where we again found results consistent with our main findings.

The second set of sensitivity checks deals with the estimation option used. Using maximum likelihood (which assumes normality) instead of the asymptotic distribution free approach yields similar conclusions in many instances. However, for some samples the goodness-of-fit statistics were inadequate, which does lend support to the use of an estimation method that allows for non-normal data (such as the asymptotic distribution free approach we applied). Third, we also applied Stata's generalized structural equation modelling (*gsem*) command that allows for non-linear methods with ordered logit link functions. The results are similar when models are estimated using ordered logit models; the CVS was indirectly associated with reduced mental distress via lower financial stress. Finally, our models relied on complete cases where respondents had information on all variables. Just over five percent ( $N = 230$ ) of unemployed persons in our sample had missing information on either mental distress or financial stress. To test the sensitivity of our results to using only complete cases, we applied the user-written "hot-deckvar" command in Stata, which imputes missing values from donor observations in a manner that preserves correlations. We imputed the mental distress and financial stress variables based on donor observations by gender, age, and state, and re-estimated all models with the imputed measures. The results from these estimations are very similar to our main results using complete cases. Results from all sensitivity analyses described in this section are available upon request.

#### 5. Conclusion

Several studies (Dawel et al., 2020; Fisher et al., 2020; Botha et al., 2022) have demonstrated poorer mental health during COVID-19 as compared to pre-pandemic levels, which in part reflect greater financial stress associated with job loss and income reductions. Using nationally representative data on unemployed working-age Australian adults, we analyse whether a temporary increase in income support payments by the Australian government—the Coronavirus Supplement (CVS), which effectively doubled benefits—was a mechanism by which community mental health was protected during the COVID-19 pandemic.

Higher levels of financial stress are strongly associated with higher levels of mental distress, a finding that is well-established in the literature (Kiely and Butterworth, 2013; Kiely et al., 2015; Simpson et al., 2021). Importantly, our main finding is that the CVS was indirectly related to lower mental distress via the payment's association with reduced financial stress. Thus, the income support measure was significantly associated with reduced mental distress because it relieved reported levels of financial stress. This finding suggests that there are substantial mental health benefits from the provision of financial support (Simpson et al., 2021) in instances of elevated financially stress levels.

That said, when considering the results (particularly Fig. 4 as well as the regression tables), mental distress and financial stress were *not* protected once the CVS payments were scaled back. This is in line with predictions and arguments by Mendes (2021) of negative financial impacts of reductions in support payments, the CVS included, and reflects the long-standing reluctance by the Australian government to address

the inadequacy of unemployment benefits in Australia. Thus, the CVS indeed seems to have been a successful measure to protect mental health, but only when paid at a substantial and sufficiently high level. This suggests that more permanent and significantly higher levels of income support payments are necessary to produce longer-term sustained improvements in population mental health. Future research is also required to investigate the long-term individual mental health effects of the provision and subsequent withdrawal of income support payments to eligible recipients.

Another interesting finding was the lack of evidence for a direct association between the CVS and financial stress for those aged 50–64, likely in part because this age group is more financially secure than younger age groups and hence not as dependent on the CVS as a source of alleviating financial pressures. This finding can be interpreted within the context of mixed evidence on the relationship between mental distress and financial circumstances over the life course, with most studies (Mirowsky and Ross, 2001; Butterworth et al., 2009; though also see Kiely et al., 2015) finding much weaker evidence of such a link among older respondents.

Note that, as highlighted in Section 2.1, our empirical approach imprecisely identified unemployment benefit recipients, as not all unemployed people receive income support payments. It is therefore likely that some respondents in our sample did not receive the CVS, but data to identify CVS recipients more accurately was not included in our dataset. Our estimates are therefore likely to be on the conservative side. Given the mode of and restrictions on the length of the TTPN Survey, only a limited number of explanatory variables could be included in the analysis. It is possible that other important controls may improve the prediction of mental distress, but due to data limitations these could not be included. Previous work by Broadway et al. (2020a), moreover, suggested that the relationship between mental distress and financial stress may also depend on family structure and parental status; this paper did not investigate these sub-samples. Conversely, the CVS was paid to people who were receiving other types of income support benefits apart from unemployment payments, such as those receiving parenting payments. The absence of some of these payment groups may limit the generalizability of our findings.

The TTPN is not a longitudinal survey and the estimates presented, although suggestive of strong associations, cannot be interpreted as causal effects. In addition, the nature of the groups of Australians who were unemployed and received welfare benefits would have changed somewhat over the course of the pandemic. It is possible that the most disadvantaged in relation to finances and mental health were also the most likely to remain on benefits. Part of the associations picked up in this paper's analysis could thus be due to a changing profile of people who are benefit recipients rather than the CVS itself.

Overall, our findings underscore the importance of social assistance payments in protecting mental health during periods increased financial stress. Relieving rates of perceived financial stress, via income support, can substantially reduce mental distress. However, our findings also imply that such income support should be of a permanent nature and at sufficiently high levels to achieve better long-term mental health outcomes.

#### CRedit author statement

**Ferdi Botha:** Conceptualization, Methodology, Software, Formal analysis, Data Curation, Writing – Original Draft, Writing – Review & Editing, Visualization, Project administration, Funding acquisition. **Peter Butterworth:** Conceptualization, Methodology, Writing – Original Draft, Writing – Review & Editing. **Roger Wilkins:** Conceptualization, Writing – Original Draft, Writing – Review & Editing.

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