MONASH University

Insurance Work and Health Group
Division of Health Systems, Services and Policy
School of Public Health and Preventive Medicine

THE COMMUNITY LOCKDOWN IN VICTORIA, AUSTRALIA (JULY TO OCTOBER 2020): IMPLICATIONS FOR HEALTH DURING THE SECOND COVID-19 WAVE

30TH NOVEMBER 2020

This research report was prepared by:

Dr Daniel Griffiths, Insurance Work and Health Group, School of Public Health and Preventive Medicine, Monash University, 553 St Kilda Road, Melbourne 3004 Victoria, Australia.

Mr Luke Sheehan, Insurance Work and Health Group, School of Public Health and Preventive Medicine, Monash University, 553 St Kilda Road, Melbourne 3004 Victoria, Australia.

Dr Caryn van Vreden, Insurance Work and Health Group, School of Public Health and Preventive Medicine, Monash University, 553 St Kilda Road, Melbourne 3004 Victoria, Australia.

Associate Professor Dennis Petrie, Centre for Health Economics, Monash Business School, 900 Dandenong Road, Victoria 3145, Australia.

Professor Malcolm Sim, Monash Centre for Occupational & Environmental Health (MonCOEH), Faculty of Medicine Nursing and Health Sciences, Monash University, 553 St Kilda Road, Melbourne 3004 Victoria, Australia.

Professor Alex Collie, Insurance Work and Health Group, School of Public Health and Preventive Medicine, Monash University, 553 St Kilda Road, Melbourne 3004 Victoria, Australia.

For further information relating to this report please contact Professor Alex Collie via the study email address (info@covidstudy.net) or +61 3 9903 0525.

This report may be cited as:

Griffiths, D., Sheehan, L., van Vreden, C., Petrie, D., Sim, M. & Collie, A. The Community Lockdown in Victoria, Australia (July-October 2020): Implications For Health During The Second COVID-19 Wave. Insurance Work and Health Group, Faculty of Medicine Nursing and Health Sciences, Monash University (2020).

ACKNOWLEDGMENTS

Funding for this project was provided by Monash University and by the icare Foundation. The views expressed are those of the authors and may not reflect the views of study funders.

DISCLAIMER

The information provided in this document can only assist an individual or organisation in a general way. Monash University accepts no liability arising from the use of, or reliance on, the material contained in this document. Before relying on the material, users should carefully make their own assessment as to its accuracy, currency, completeness and relevance for their purposes, and should obtain any appropriate professional advice relevant to their particular circumstances. The material in this report is subject to copyright right, if any person wishes to use, reproduce or adapt the material in this report, please contact the author.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Objective. To determine to what extent the Victorian community lockdown in response to the second wave of COVID-19 cases affected health and several determinants of health including finances, work, social interaction, health service use and help-seeking of working-age adults compared with the rest of Australia.

Project methodology. The COVID-19 Work and Health Study was established to track a large cohort of working-age Australians, with a focus on people whose work was affected during the early stages of the pandemic. The study collected data upon enrolment for 2,603 Australians in early 2020 (during the first COVID-19 wave) and then again 1 and 3 months later. The third survey corresponded to the timing of the Victorian lockdown during the winter of 2020, providing the serendipitous opportunity to compare the work and health outcomes of Victorians with people in the rest of Australia over this period.

Findings. Compared to participants outside of the state of Victoria, during the second wave lockdown period, participants from Victoria reported:

- worse mental health and higher rates of psychological distress,
- lower levels of engagement in paid work, and
- reduced in-person social interaction but increased virtual/telephonic interactions.

In addition, Victorians reported that they were more likely than people in the Rest of Australia to:

- have avoided seeking medical treatment
- be working from home (if they were working),
- seek mental health support from friends or family,
- make behavioural changes to manage mental health problems, and
- have had a COVID-19 test

Conclusions. This study presents evidence that the second wave of COVID-19 cases and subsequent community-wide lockdown in the state of Victoria during winter of

2020 contributed to worsening mental health, elevations in psychological distress and changes in a number of important determinants of health including work, healthcare and social interactions. Similar lockdowns are now occurring around the globe to reduce transmission of SARS-CoV-2, and are likely to occur in the future as large-scale outbreaks continue to occur. Our findings suggest that in addition to lockdown measures, governments imposing such restrictions need to focus on improving access to mental health supports and healthcare services, providing financial assistance to communities and supporting social interactions.

In summary, lockdown measures must be coupled with additional community wide supports and services that address the social determinants of health.

BACKGROUND & OBJECTIVES

Public health measures to reduce SARS-CoV-2 transmission have transformed how we live and work. This has had flow-on consequences for health including most notably increases in community prevalence of mental health conditions and psychological distress (ABS, 2020; Fisher et al, 2020). Underlying these health changes have been dramatic changes in the social determinants of health which have been affected directly by infection control measures such as physical distancing, travel and movement restrictions, stay at home orders, and closure of businesses. As such we have seen changes in the way we work and live resulting in increases in social isolation, job losses and financial stress along with reductions in face-to-face interactions. A review of 24 studies that have examined the impacts of quarantine on mental health found that the psychological impacts of quarantine are “wide-ranging, substantial, and can be long lasting” (Brooks, 2020).

The COVID-19 Work and Health Study was established to track work and health outcomes in a large cohort of working age Australians, with a particular focus on those whose work was affected during the early stages of the pandemic. The study collected data upon enrolment in 2,603 Australians during early 2020 using a self-reported survey. Participants then complete follow-up surveys 1, 3 and 6 months after enrolment. Findings from the baseline survey demonstrated that people who had lost work or lost their jobs early in the pandemic had significantly higher levels of psychological distress than a comparison group of people whose work was unaffected (Griffiths, in-press).

Objective: To determine to what extent the Victorian community lockdown in response to the second wave of COVID-19 cases affected health and several determinants of health.

Data collection for the 3-month follow-up survey coincided with an extended lockdown in the Australian state of Victoria, instituted by the state government to contain an outbreak of confirmed COVID-19 cases beginning in winter (June / July 2020). Approximately 40% of participants in the study are from Victoria, with the remaining

participants from other states and territories in Australia that had relatively few cases of COVID-19 and where restrictions were much less severe. The study thus provides a unique opportunity to examine the impact of the second Victorian wave lockdown on health and determinants of health compared with the rest of Australia.

THE VICTORIAN LOCKDOWN IN JULY-OCTOBER 2020

Several countries globally are experiencing additional waves of COVID-19 cases and deaths in mid to late 2020. Community lockdowns are used commonly as part of a viral containment strategy, in addition to other public health measures. Whilst the WHO have not advocated the use of lockdowns as the primary measure to control viral transmission, such measures are being used to limit incident cases to a level where controlling the rate of transmission with other public health measures such as mass testing, contact tracing and isolation procedures becomes feasible, and to reduce the risk of healthcare systems being overwhelmed by COVID-19 cases. Understanding the impact of the extended community lockdowns in Victoria will help inform policy makers of the consequences of lockdown measures.

Australia experienced a first national wave of COVID-19 cases during March and April 2020. These outbreaks were rapidly contained through restrictions and contact tracing with each Australian state and territory implementing individual timelines for easing restrictions (Andrews, 2020a-d; Barr, 2020a-e; Berejiklian, 2020a-k; Gunner, 2020a-b; Gutwein, 2020a-g; Marshall, 2020a-c; McGowan, 2020a-f; Palaszczuk, 2020a-i). A spike in community transmission in the state of Victoria in June resulted in the state Government re-imposing restrictions on household gatherings (maximum of five household visitors) on 22nd June 2020 (Andrews, 2020e). This marked the start of a series of increasing restrictions in Victoria from the end of June, whilst the rest of Australia continued to ease restrictions.

The sequential implementation of the community lockdown in Victoria is outlined in Table 1, and areas with differing restrictions are represented in Figure 1. The first lockdowns in Victoria, as part of its second wave of COVID-19 cases, were localised to 10 postcode areas in Melbourne (Andrews, 2020f) on 30th June at 11:59pm (lockdown population=311,600). Residents in these areas were required to comply

with a directive outlining four acceptable reasons to leave home: (1) shopping for essentials, (2) for medical or compassionate needs, (3) exercise in compliance with the public gathering restriction of two people, and (4) for essential work or education purposes. Two additional Melbourne postcodes were added to the lockdown area (Andrews, 2020g) from 4th July (lockdown population=345,100), including nine public housing towers of 3,000 residents with the additional condition of not being able to leave the tower under any circumstances for five days. The interstate border between New South Wales and Victoria was closed from 8th July (Berejiklian, 2020l).

COVID-19 cases continued to rise leading to the Premier of Victoria announcing that metropolitan Melbourne and the neighbouring Mitchell Shire (to the north of metropolitan Melbourne) would enter a 6-week long community wide lockdown (Andrews, D 2020h) from 11:59pm on 8th July 2020 (lockdown population = ~5,000,000). Several additional components were added to the existing restrictions including mandatory face coverings within Victoria, and visitor limits in the Otway-Colac region (Andrews, 2020i). Notably, there were higher level of restrictions in metropolitan Melbourne, including a curfew from 8pm to 5am following the declaration of a state of disaster on 2nd August (Andrews, 2020j). By 5th August regional Victoria was under a lockdown with fewer restrictions than Melbourne resulting in the entire state of Victoria under some form of lockdown (lockdown population=~6,490,000), whilst the rest of Australia were easing restrictions (Australian population not under lockdown=~19,010,000).

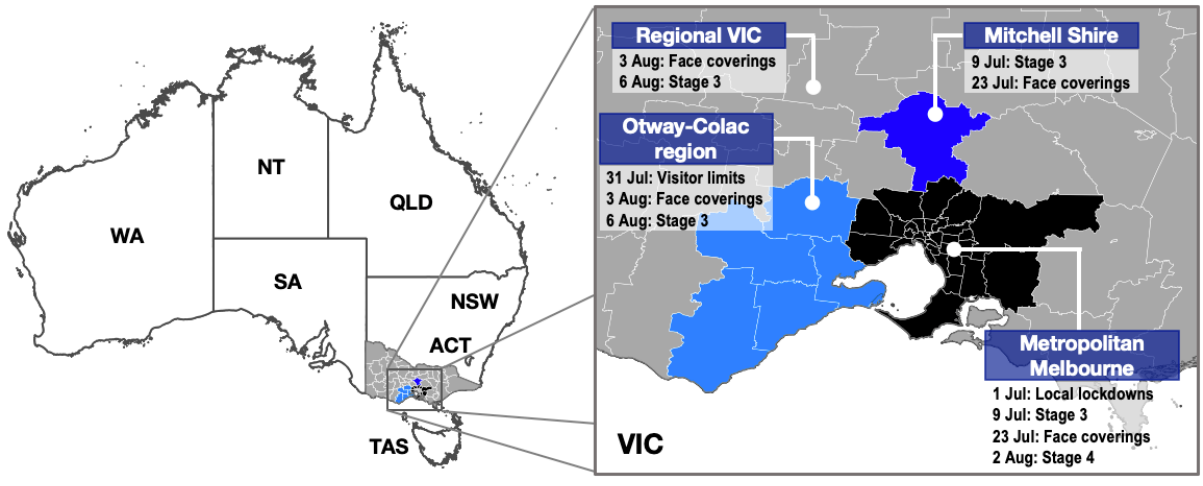

FIGURE 1. STAGED LOCKDOWN IN VICTORIA: AFFECTED REGIONS AND KEY DATES.

In addition to the lockdowns in metropolitan Melbourne, several industries were required to cease onsite operations for six weeks from 11:59pm on 5th August, including retail, some manufacturing and administration (Andrews, 2020k). Contactless services (e.g., 'click and collect') and delivery services were permitted with strict safety protocols in place, and hardware stores remained open onsite, but for tradespeople only. A second set of industries were permitted to operate, but under significantly different conditions including scaling back onsite operations: two-thirds of the workforce in the meat industry, warehousing and distribution centres, 25 percent of the workforce on construction sites with a limit of five people for small-scale construction. Throughout, metropolitan Melbourne employees working in permitted industries who could not work from home were required to have a Worker Permit when travelling to and from work. By 11:59pm on 7th August all open businesses and services were required to enact a COVIDSafe plan focused on safety, prevention and response in the event of COVID-19 cases linked to the workplace (Andrews, 2020k).

TABLE 1. SUMMARY OF VICTORIAN RESTRICTIONS DURING THE SECOND COVID-19 WAVE

Restrictions	Date†	Areas affected
Postcode lockdown (Andrews, 2020f)	30 June	10 postcodes areas in Melbourne
Postcode lockdown (Andrews, 2020g)	4 July	2 additional postcodes areas in Melbourne
Interstate border closed between New South Wales and Victoria (Berejiklian, 2020l)	8 July	NSW-VIC border
Stage 3 restrictions. Four reasons to leave home: • Shopping for essential items • Caregiving • Exercise (1 hour) • Work (employers must support you to work from home if you can work from home) (Andrews, 2020h)	8 July	Metropolitan Melbourne and Mitchell Shire
Schools return to flexible and remote learning for pupils in Prep to Year 10 (i.e. ages 5/6 to 15/16) (Andrews, 2020l)	20 July	Metropolitan Melbourne and Mitchell Shire
Face coverings mandatory (Andrews, 2020m)	22 July	Metropolitan Melbourne and Mitchell Shire

Visitor limits. No hosting visitors at home or visiting people at their home (Andrews, 2020i)	30 July	Otway-Colac region (6 local government areas west of Melbourne)
Stage 4 restrictions. • Curfew from 8pm to 5am • 5km distance limit from home. • 1-hour exercise limit • Maximum gathering of two. • Shopping limited to one person per household. • Weddings banned (from 5 Aug) • All onsite students learning from home (5 Aug) (Andrews, 2020j)	2 August	Metropolitan Melbourne
Face coverings mandatory (Andrews, 2020i)	2 Aug	Victoria
Stage 3 restrictions. Four reasons to leave home: • Shopping for essential items • Caregiving • Exercise (1 hour) • Work (employers must support you to work from home if you can work from home) (Andrews, 2020n)	5 Aug	Regional Victoria (including Mitchell Shire)

†Victorian restrictions were generally imposed at 11:59pm on the listed dates and affecting residents on the following day. Exceptions include the curfew imposed at 6:00pm, changes to schooling taking place in the morning, and NSW-VIC border closure at 12:01am (by NSW).

FINANCIAL SUPPORT AND STIMULUS

During the early stages of the pandemic in Australia (March-April 2020), the Australian government responded to the surge in unemployment with financial assistance to support small and medium businesses and to keep workers employed (Morrison, 2020a). Two subsequent economic stimulus packages included a supplemental income support payment of AUD$550 per fortnight for people receiving the Australian unemployment benefit known as JobSeeker (Morrison, 2020b), and a fortnightly wage subsidy of AUD$1500 per employee paid to eligible businesses that were significantly affected by the COVID-19 restrictions, known as JobKeeper (Morrison, 2020c). Eligibility for the JobKeeper scheme was adapted in response to the winter lockdown in Victoria to help more businesses qualify (Morrison, 2020d). Coupled with the

restriction for onsite operations for some industries, the Victorian Government created grants for businesses suffering significant losses or closures valued at $5,000 in regional Victoria, or up to $10,000 for businesses in Melbourne and Mitchell Shire (Andrews, 2020k). For people engaged in work, the Victorian Government also introduced two payments to ensure that workers with symptoms consistent with a SARS-CoV-2 infection were tested and remained in isolation: (1) $450 COVID-19 test isolation payment, and (2) $1,500 COVID-19 leave for eligible Victorians (Andrews, 2020o). A range of other financial supports were introduced for families and individuals (DHHS VIC Government, 2020a) including hardship and relief packages, moratoriums on evictions, early access to superannuation lump sums withdrawals and mortgage holidays. Businesses and industries have seen additional survival packages, hardships funds, and support programs for tourism (DHHS VIC Government, 2020a).

COVID-19 CASES IN AUSTRALIA

Two waves of COVID-19 cases took place in Australia between March and October 2020 (Figure 2). The first wave during March/April took place across Australia whereas the second wave was localised to the state of Victoria, consisting of around three times as many COVID-19 cases as the first wave (around 20,000 cases compared to 6,500 cases in the first wave). Victoria had around a 14-fold increase in cases from the first wave of Victorian cases (covid19data, 2020).

The community lockdown in Victoria was an effective strategy for reducing transmission of SARS-CoV-2 during the second wave. The number of daily cases in Victoria peaked at 687 on 5th August 2020. As of 25th November 2020 the state had recorded 26 straight days without a positive case of COVID-19 and no attributed deaths (DHHS VIC Government, 2020b). Restrictions in Victoria were eased over October and early November (Andrews, 2020p-t).

METHODS

COVID-19 WORK AND HEALTH COHORT

A cohort of 2603 eligible participants enrolled in the COVID-19 Work and Health Study. Australians aged 18+ were recruited into the study if they were employed in a paid job, or self-employed, at any time during the period October to December 2019. Recruitment focused on those who experienced pandemic-related work loss, in addition to a comparison group of workers whose working hours were unaffected. Participants completed either an (1) online survey, or (2) a computer assisted telephone interview. The survey questions were equivalent between survey modes. Participants were entered into a draw for a voucher incentive upon survey completion, and 2152 provided consent to be contacted for three follow-up surveys after 1 month, 3 months and 6 months post-baseline. The study protocol is available online (ANZCTR, 2020) and the findings from the baseline/enrolment survey have also been published (Griffiths, in-press).

DATA COLLECTION

The study design involves four surveys during 2020 (Figure 2) collecting data on a range of health indicators, work and determinants of health (Table 2):

Survey 1 - 'Early pandemic'

This survey was the baseline or enrolment survey conducted immediately following the launch of the study. Data were collected beginning 27 March with the last participant completing the baseline survey on 12 June 2020. This period coincided with the first set of COVID restrictions that were enacted across all Australian states and territories early in the pandemic.

Survey 2 - 'Between COVID-19 waves'

Participants then completed a second survey 1 month after their baseline survey. This data were collected between 27 April and 26 July 2020. This survey coincided with the period in between the first (national) and second (state of Victoria) waves of COVID-19 cases.

Survey 3 - 'Victorian lockdown period'

The third study survey was conducted 3 months after their baseline survey, with data collected between 1 July and 30 September 2020. This period overlapped very closely with the second Victorian wave and its associated lockdown period. Data from this survey is the focus of this report.

Survey 4 - 'Post wave 2'

A fourth survey is currently (as at the date of production of this report) being conducted. This is timed to occur 6 months after the baseline survey. Data collection began on 1 October and will continue until end Dec 2020. These data are not yet available for analysis.

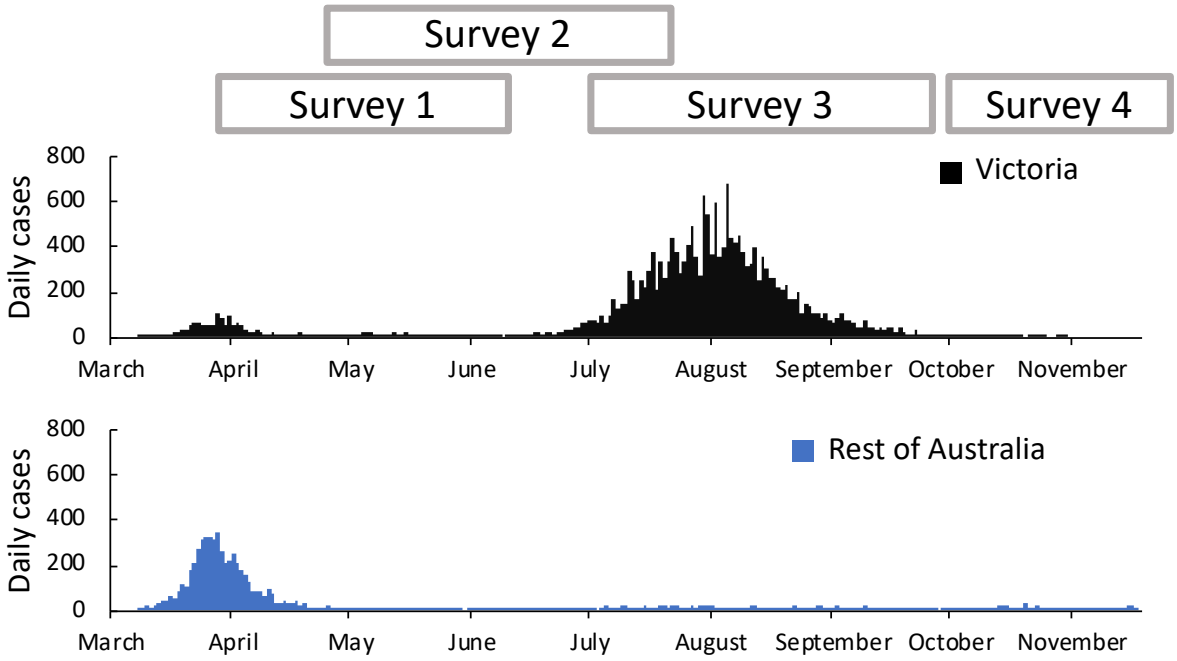

FIGURE 2. TIMELINE FOR THE SURVEY DATA COLLECTION PERIOD, OVERLAID ON DAILY COVID-19 CASE COUNT FOR VICTORIA AND THE REST OF AUSTRALIA FROM MARCH TO MID-NOVEMBER 2020.

SURVEY CONTENT

The survey covers a range of items relating to work and health, and determinants of health, using standardised and validated scales, survey items included in prior studies of unemployed people and those with work-related disability, and items developed

specifically for this study. The content includes work characteristics (both prior to the COVID-19 pandemic and current, if applicable), returning to work, demographics, income and financial stress, health and quality of life, psychological distress, social interactions, self-efficacy, medical conditions, and interactions with Centrelink. Study measures have been described elsewhere (ANZCTR, 2020).

Mental and physical health was measured using the Short Form-12 (SF-12) quality-of-life questionnaire (Ware, Kosinski & Keller, 1996), and mental and physical health summary scores were subsequently derived. Poor mental or physical health was defined as SF-12 physical or mental component summary scores less than 45 (Ware, 2002). The measure of psychological distress was assessed using the Kessler 6 psychological distress scale (Kessler, 2002), with scores categorised into none or low, moderate and high psychological distress (Kessler, 2003; Prochaska, 2012). For this analysis, scores were dichotomized into moderate or high distress, and low or no distress, consistent with prior studies (Collie, 2019).

The financial situation of respondents was assessed with the question '*If all of a sudden you had to get $2000 for something important, could the money be obtained within a week?*' (ABS, 2014). A dichotomous response grouping was formed by collapsing the response groups 'No' and 'Don't know'. This question was complimented by measuring financial stress using a 10-point scale from 1 (not at all stressed) to 10 (as stressed as can be). Financial distress was described as responses greater than 5.

The Duke Social Support Index series of questions (Koenig, 1993) was used to measure social interactions with others through a series of questions about spending time with others, making or receiving calls, and participating in groups (sports, clubs, religious meetings or other groups). Three binary variables were derived from these questions, including (1) spending time in-person with non-household members during the previous week, (2) attending club meetings, religious meetings or other groups, and (3) speaking on the telephone less than once a day on average over seven days.

A range of additional study specific questions were developed to cover several themes relating to work and health, such as actions taken to manage mental health,

engagements with health services, job-finding actions, financial management, interactions with Centrelink, workplace re-opening, and working from home.

TABLE 2. OVERVIEW OF DATA COLLECTED DURING THE FOUR SURVEY TIMEPOINTS.

Measure	Survey 1 (Early pandemic)	Survey 2 (Between COVID-19 waves)	Survey 3 (Victorian lockdown period)	Survey 4 (Post wave 2)
Demographic & Household	Y			
Work / Employment History	Y			
Physical and Mental Health	Y	Y	Y	Y
Engagement in Paid Work	Y	Y	Y	Y
Income and Financial Stress	Y	Y	Y	Y
Social Interactions	Y	Y	Y	Y
Centrelink Interactions	Y			Y
Self-efficacy	Y			
Health Service Use		Y	Y	Y
Help-seeking (mental health)		Y	Y	Y
Job-findings actions		Y	Y	Y
Financial management		Y		
Working from home	Y	Y	Y	Y
Workplace re-opening			Y	Y
COVID-19 testing/exposure			Y	Y

DATA ANALYSIS

Analysis for this report focuses on data collected across the first 3 surveys. Analysis sought to compare outcomes in participants from Victoria to participants from all other Australian states and territories combined. State of residence was defined using postcode data collected at the enrolment survey.

First, descriptive statistics including counts, percentages, and measures of central tendency and variability were calculated to characterise the study groups (Victoria; Rest of Australia) at each of the three study timepoints. Changes in outcomes between groups over time (Table 3) were visualised by plotting the percentage change in the

outcome for survey 2 and 3 relative to survey 1 (Figure 3), either for mean scores (health measures) or group percentages (work and social interactions).

Second, we compared the two study groups on each outcome at each survey timepoint using binary logistic regression models. This analysis determines whether participants from Victoria were different from those from the Rest of Australia at each time-point. We expect to see differences in outcomes between Victoria and the Rest of Australia at the 3rd survey timepoint which was during the lockdown period, but not at the prior two surveys. Models were adjusted for age group and gender at baseline, employment status and whether people were working or not at the corresponding survey time-point, as well as survey mode (online, telephone). Models for Employment (i.e. employed or unemployed) and Work (i.e. currently working or stood down / furloughed) did not include either Work or Employment as covariates. Models for the outcome Working From Home (at least some of the time) were restricted to individuals that were both employed and working at the corresponding survey. Regression models for Receiving JobKeeper wage subsidy were restricted to respondents who were employed during the corresponding survey timepoint, whereas models for Receiving JobSeeker considered all respondents. The reference group for these analyses was the Rest of Australia. Adjusted odds ratios (AORs) describe the odds of the outcome occurring in Victorians compared to the Rest of Australia at that survey timepoint. This is coupled with a 95% confidence interval (95% CI) describing an interval where the true AOR would be likely to lie. AORs greater than one indicate that the odds of the outcome are higher for Victorians, and those less than one indicate the odds of that outcome are lower for Victorians than participants in the Rest of Australia.

Third, we compared outcomes in the two study groups at Survey 3 using one-way Analysis of Covariance (ANCOVA) tests. In simple terms, the ANCOVA examines the influence of group (Victoria or Rest of Australia) on an outcome at Survey 3 (during the Victorian lockdown) while removing the effect of the same outcome at an earlier survey (before the Victorian lockdown). This allows us to be more confident in attributing any group differences at Survey 3 to differences between groups at the time the survey was conducted. One major difference between groups at this timepoint was

that Victoria was in lockdown. For each of the ANCOVA models, data from Survey 3 were the outcomes and models were adjusted for categories on the corresponding outcome at Survey 1, as well as for age group, gender, employment status, whether people were working or not, and survey mode. For some outcomes, data were not collected during Survey 1 and for these outcomes data from Survey 2 was included in the model as an adjustment. ANCOVA tests for Employment did not include Work as a covariate, and ANCOVA tests for Work did not include Employment as a covariate. The ANCOVA test for differences in Working From Home were restricted to individuals working at both timepoints. The reported F value describes the ratio of between group variance (the variance of the means for Victorians and people in the Rest of Australia) versus the within group variance, adjusted for covariates. An F ratio larger than a critical value indicates a significant difference (less likely to occur simply due to random chance) between Victoria and Rest of Australia. Results are considered significant for p-values less than 0.05.

RESULTS

STUDY PARTICIPANTS

A total of 2603 participants completed Survey 1 of which 2105 (81%) gave consent for further participation. Of these, which 1646 (78.2% of those who consented to follow-up) completed Survey 2 and 1383 (65.7%) completed Survey 3. A subset of 1246 (59.7%) participants completed all three surveys.

Of the cohort completing all three surveys, around a third (36.3%) resided in the state of Victoria, with the remaining two thirds (63.7%) residing in the Rest of Australia. The gender, age, work, employment characteristics of these groups is included in Table 3.

TABLE 3. CHARACTERISTICS OF PARTICIPANTS WHO COMPLETED ALL THREE SURVEYS.

Characteristic	Number (%) of Victorian participants	Number (%) of participants from the Rest of Australia
Participants	452 (100.0)	794 (100.0)
Gender		
Female	272 (60.2)	467 (58.8)
Male	180 (39.8)	325 (40.9)
Age Group		
18-24 years	36 (8.0)	52 (6.5)
25-34 years	74 (16.4)	97 (12.2)
35-44 years	88 (19.5)	125 (6.7)
45-54 years	120 (26.5)	205 (25.8)
55-64 years	106 (23.5)	262 (33.0)
65+ years	28 (6.2)	53 (6.7)
Survey method		
Online	178 (39.4)	274 (34.5)
Phone	274 (60.6)	520 (65.5)
Work status (at survey 1)		
Employed	378 (83.6)	660 (83.1)
Unemployed	74 (16.4)	134 (16.9)
Working	271 (60.0)	492 (62.0)
Not working	181 (40.0)	302 (38.0)

TRENDS IN OUTCOMES

At the third survey, corresponding with the Victorian COVID-19 lockdown period, Victorian participants reported worse mental health, were more likely to have moderate to high levels of psychological distress, had lower levels of in-person social interaction and were less likely to be working and more likely to be working from home, than participants from the Rest of Australia (Table 4). There were no differences between Victorians and non-Victorians on measures of physical health, access to financial resources or government support (Table 4).

TABLE 4. SUMMARY STATISTICS FOR PRIMARY OUTCOME MEASURES FOR VICTORIANS AND PEOPLE IN THE REST OF AUSTRALIA ACROSS SURVEY TIMEPOINTS

Location (N completing all three surveys)	**Victoria** (N=452)			**Rest of Australia** (N=794)		
Survey timepoint	**Survey 1**	**Survey 2**	**Survey 3**	**Survey 1**	**Survey 2**	**Survey 3**
Health (over the past month)						
Mean SF-12 Mental Health Summary Score	44.2	45.3	44.9	45.3	46.8	47.5
Mean SF-12 Physical Health Summary Score	55.5	54.8	54.4	54.3	54.2	53.7
Distress (over the past month)						
Percent reporting Moderate or High Psychological Distress	48.9%	46.8%	49.9%	44.1%	39.4%	37.3%
Work (current)						
Percent working more than 0 hours	60.0%	65.9%	70.4%	62.0%	69.7%	79.7%
Percent employed	83.6%	83.4%	83.2%	83.1%	83.8%	86.0%
Social interactions (past week)						
Percent spending time with no one outside their household (in person)	35.3%	24.6%	53.6%	25.0%	19.4%	17.4%
Finance (current)						
Resources (Can obtain $2,000 for something important)	77.2%	82.3%	84.3%	77.9%	83.9%	84.8%
Government income support						
Receiving JobSeeker	-	17.3%	14.4%	-	13.4%	11.7%
Employer applied for / receiving JobKeeper	-	36.4%	30.7%	-	35.5%	26.6%

Visualisation of relative changes over time in these outcomes compared to the first survey (Figure 3) shows that between the first and second surveys the outcomes in Victorians were consistent with the Rest of Australia, with improvement in mental health, reductions in psychological distress, reductions in time spent alone and increases in working. However, between the second and third surveys these outcomes diverge between participants from Victoria and the Rest of Australia. Participants from the Rest of Australia largely continue on a positive trajectory, while Victorian participants report on average worsening mental health, increases in psychological distress and social isolation to a point that exceeds the levels observed at the first survey, and a slower improvement in the number of people working than the Rest of Australia (Figure 3).

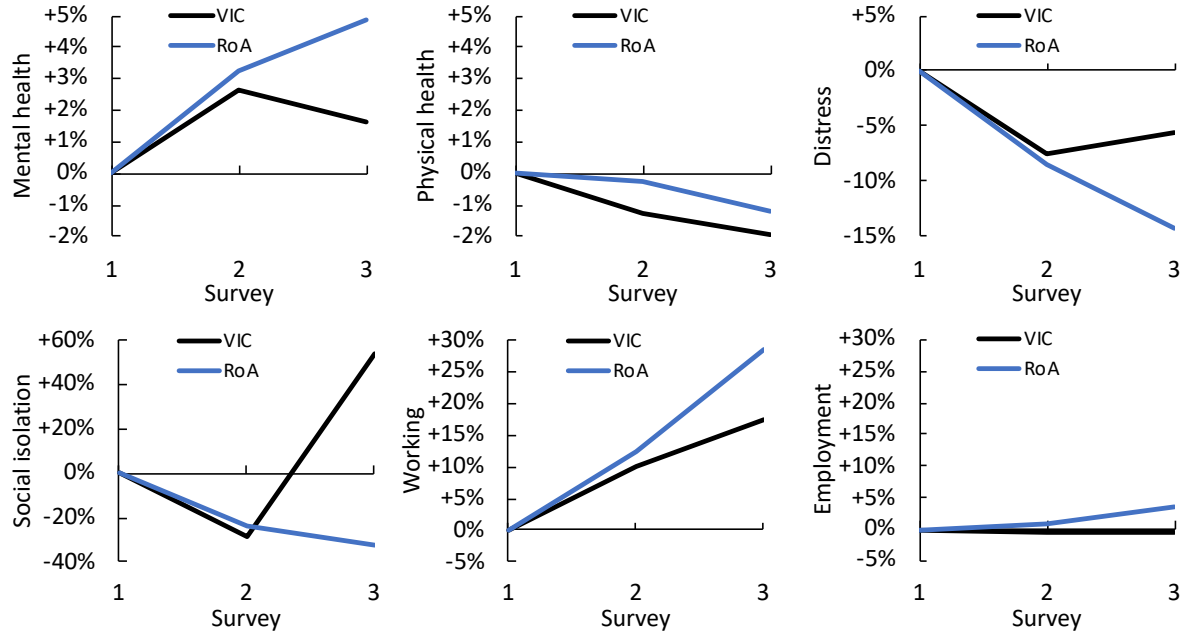

FIGURE 3. RELATIVE CHANGES IN WORK, HEALTH AND SOCIAL INTERACTIONS OF VICTORIANS AND PEOPLE IN THE REST OF AUSTRALIA ACROSS THREE SURVEY TIMEPOINTS COMPARED TO SURVEY 1.

WORK AND EMPLOYMENT

Our surveys collected information on whether people were employed and also whether people reported working any hours in the previous month. Within the Victorian cohort sample 16.4% were unemployed during the early pandemic and 16.8% were employed during the Victorian lockdown period. For the cohort of people outside of

Victoria in our sample, unemployment decreased from 16.9% to 14.0%. It should be noted that because we purposefully recruited people who had lost work, unemployment is higher in our sample than the national average.

There were no differences between Victoria and the rest of Australia in working status at the first survey (Table 4). Fewer people in Victoria were working at the third survey (Adjusted Odds Ratio=0.62, 95% Confidence Interval=[0.48, 0.81]) compared to people outside of Victoria. The divergence in working status over time between the two groups was statistically significant (F[1,1360]=14.94). Whilst there were small differences in employment between the two groups during the Victorian lockdown, they were not statistically significant.

Victorians in our sample were also more likely to report working from home across the study period, compared with the Rest of Australia. At the first survey 49.7% of working Victorians were working from home compared to 42.1% for workers in other Australian states and territories. By the third survey, 46.5% of working Victorians were working at home, while the proportion of workers outside of Victoria who were working from home had reduced to 28.4%. This divergence in working from home between Victorians and workers in the Rest of Australia over the study period was statistically significant (F[1, 731]=21.45).

Victorians were more likely to continue working from home during the 2020 Victorian lockdown than workers in the Rest of Australia.

MENTAL HEALTH

At the first survey, the average SF-12 mental health component summary score was 43 out of 100, compared to a reference (pre-pandemic) population reference average of 50 out of 100. For survey respondents who completed all three surveys, mental health improved on average between survey 1 and survey 2 coinciding with an easing of restrictions nationally following the first wave of COVID-19 cases (Figure 3). Mental health continued to improve by survey 3 for people outside of Victoria, whilst the

mental health of people in Victoria decreased during the second wave and subsequent lockdown. Poor mental health was significantly more common at survey 3 for people in Victoria (AOR=1.65, 95% CI=[1.29, 2.10]) than for those elsewhere in Australia, after taking into account the effects of differences between those groups such as employment status, whether people were working, gender, age group and the mode of survey administration. After also controlling for mental health score at survey 1, there was a significant difference between the mental health scores of Victorians and the Rest of Australia group at the third survey (F[1, 1353]=14.75).

There was a high level of psychological distress in our cohort during survey 1, where 18.6% of the national cohort reported psychological distress scores corresponding to probable serious mental illness (Griffiths, pre-print). The current analysis shows reductions in levels of distress between survey 1 and survey 2 (Figure 3) as financial supports and stimulus were implemented and restrictions were easing nationally. However, by the Victorian winter 2020 lockdown period people in Victoria were reporting a further increase in psychological distress, whereas distress levels continued to decrease for people in the Rest of Australia. People in the Victorian lockdown had significantly higher odds of moderate-to-high distress (AOR=1.48, 95% CI = [1.15, 1.89]) compared to people in other Australian states and territories in the study cohort. After also controlling for psychological distress at survey 1, there was a significant difference in the levels of poor mental health between Victorians and the Rest of Australia group at the third survey (F[1, 1337]=11.52).

The mental health of Victorians deteriorated during the 2020 Victorian COVID-19 lockdown compared to the Rest of Australia.

PHYSICAL HEALTH

The national study cohort reported relatively good physical health. Average SF-12 Physical Health Summary scores were above the pre-pandemic population reference of 50 across all three surveys. The physical health of the cohort decreased slightly over time. Participants from Victoria experienced a slightly larger decrease in physical health compared with the decline in physical health of people in Australian states and

territories outside of Victoria, however these differences were not statistically significant after adjusting for differences in employment, working, gender, age group, and survey method. No significant effects were observed in physical health at survey 3 after adjusting for physical health at survey 1 (F[1, 1353] = 0.34), suggesting that the Victorian lockdown did not have a significant impact on physical health.

SOCIAL INTERACTIONS

Nationally, during the early pandemic (survey 1), 32.8% of the cohort had not spent any time in person with non-household members during the previous week. This decreased to 22.4% of the cohort as restrictions began to ease (survey 2), then increased to 30.7% by the Victorian lockdown period (survey 3). At the third survey, 53.6% of Victorian participants had not spent time with anyone outside their household during the previous week, compared to 17.4% of people elsewhere in Australia. Compared to the early stages of the pandemic, Victoria saw a 62.9% increase in social isolation during the winter lockdown period (Figure 3). Not spending time with others (excluding household members) was more common for Victorian participants at survey 3 (AOR=6.04, 95% CI=[4.67, 7.82]), as was not attending club meetings, religious meetings or other groups (AOR=2.12, 95% CI=[1.62, 2.79]). After also controlling for the corresponding interaction levels at survey 1, there was a significant difference between Victorians and the Rest of Australia group at the third survey on both measures of not spending time with anyone outside one's own household (F[1, 1353]=226.27), and attending sports clubs, religious meetings and other groups (F[1,1352]=37.26).

At the first survey the national median number of calls with friends, relatives or other people over the previous week in the whole cohort was five. Throughout the study participants from Victoria were more likely to be engaged in a call with at least one person a day, compared to participants outside of Victoria. This effect increased over time, with Victorians at the third survey significantly more likely to participate in daily

Victorians reported fewer in-person social interactions but more virtual/telephone interactions during the 2020 Victorian lockdown than people in the Rest of Australia.

calls than participants from the Rest of Australia (F[1, 1335]=7.44), even after controlling for daily call frequency at survey 1.

FINANCIAL STRESS

The number of people with the capacity to obtain AUD$2,000 within a week increased from the early pandemic to the Victorian lockdown period, and similar increases were observed for Victorians (+7.1%) as for the Rest of Australia (+6.9%). No statistically significant differences in financial stress between groups were observed at either the first or third surveys. Similarly, no significant differences were observed between groups on access to emergency finances.

GOVERNMENT INCOME SUPPORT

Nationally, the number of people receiving JobSeeker or supported by JobKeeper decreased from survey 2 to survey 3. Within our sample, the percentage of people receiving JobSeeker reduced by 2.9% in Victoria and by 1.7% in the Rest of Australia. The reduction in the number of people supported by JobKeeper was smaller in Victoria (-5.7%) compared to the Rest of Australia (-8.9%).

After adjusting for demographics and work status, no significant differences were observed in the proportion of each study group receiving either the JobSeeker payment from Centrelink, or having their employment supported by the JobKeeper subsidy, at either the second or third survey where this data was collected. Percentages reflect our study cohort which focuses on people experiencing work loss, and differs from state-based, or national, population data.

HEALTH SERVICE USE AND HEALTHCARE AVOIDANCE

Victorians were more likely to have used no healthcare services at the third survey (AOR=1.35, 95% CI=[1.07, 1.69]) compared with participants from the Rest of Australia. In particular, significantly fewer Victorians reported consultations with dentists (Table 6).

At the third survey, 36.6% of Victorians reported either delaying or cancelling an appointment with a health professional in the past month, or having avoided seeking treatment for a problem for which they would have normally sought help. Health care avoidance was less common among participants from the Rest of Australia at 24.5%. After also controlling for scores at survey 1, Victorians were significantly more likely to avoid seeking medical treatment than participants from the Rest of Australia ($F[1, 1332]=12.08$).

Victorians were more likely to avoid seeking medical treatment during the 2020 Victorian lockdown than other Australians.

Our survey included a set of questions regarding reasons for avoiding healthcare. Of those who reported healthcare avoidance, there were statistically significant differences between Victorian and non-Victorian participants in the reasons for avoidance.

During survey 3, 44.9% of Victorians reported the concern of coming into contact with others as a reason for avoiding, cancelling or delaying health services, compared to 29.2% of people in the Rest of Australia. This difference was statistically significant (AOR=2.09, 95% CI=[1.34, 3.26]). Victorians were also more likely to report that healthcare professionals asked them not to come for a consultation or treatment (AOR=11.42, 95% CI=[2.50, 52.12]). Victorians were statistically less likely than non-Victorians to report being too busy, or being concerned about the cost as the reason for avoiding, delaying or cancelling healthcare.

Concern of coming into contact with other people was the main reason cited by Victorians for the elevated avoiding, delaying or cancelling of healthcare during the 2020 Victorian lockdown.

ACTIONS TAKEN FOR MENTAL HEALTH

Talking to others about mental health was more common among participants from Victoria (58.9%) compared with those from the Rest of Australia (51.3%). Whilst there were no significant differences between groups in talking to health professionals about

mental health, talking to family and friends about mental health was significantly more common in Victoria at the third survey (AOR=1.29, 95% CI=[1.03, 1.63]).

At the third survey, 90.1% of participants from Victoria reported taking at least one additional action to manage their mental health during the prior month, compared to 83.5% of non-Victorian participants. The most common reported action was watching or reading something uplifting, whereas the least common reported action was calling a telephone support line to manage mental health. Compared to non-Victorian participants, at the third survey Victorians reported significantly higher levels of watching or reading something uplifting (AOR=1.37, 95% CI=[1.08, 1.73]), distracting themselves by keeping active or learning a new skill (AOR=1.65, 95% CI=[1.31, 2.08]), drinking more alcohol than normal (AOR=1.63, 95% CI=[1.24, 2.14]) and participating in an online forum or chat group (AOR=1.85, 95% CI=[1.25, 2.74]).

Victorians were more likely than other Australians to speak with family and friends, and to make behavioural changes to manage mental health during the Victorian 2020 lockdown.

COVID-19 TESTING

Victorians were significantly more likely to report having taken a test to diagnose COVID-19 than other Australians at the third survey (AOR=1.82, 95% CI=[1.43, 2.34]). Data on this outcome was not collected at prior surveys so we cannot determine if this difference was also apparent earlier in the pandemic.

TABLE 5. PRIMARY OUTCOMES: CHANGES IN HEALTH AND DETERMINANTS OF HEALTH DURING THE 2020 VICTORIAN LOCKDOWN.

Outcome	Adjusted odds ratios (AOR) [95% Confidence Interval]		Analysis of covariance (ANCOVA) adjusted F ratio of variances
	VIC vs RoA during the early pandemic (Survey 1)	VIC vs RoA during the lockdown period (Survey 3)	VIC vs RoA during the lockdown period while accounting for pre-lockdown status (Survey 3 accounting for Survey 1)
Health (over the past month)			
Moderate-High psychological distress	1.08 [0.89, 1.31]	**1.48**** [1.15, 1.89]	F[1, 1337]=**11.52****
Poor mental health	1.10 [0.92, 1.33]	**1.65**** [1.29, 2.10]	F[1, 1353]=**14.75****
Poor physical health	0.96 [0.74, 1.24]	0.77 [0.54, 1.11]	F[1, 1353]=0.34
Work (current)			
Employed	1.10 [0.89, 1.37]	0.88 [0.64, 1.20]	F[1,1360]=1.95
Working	1.09 [0.90, 1.33]	**0.62**** [0.48, 0.81]	F[1,1360]=**14.94****
Working from home (at least some of the time)	**1.34*** [1.07, 1.68]	**2.17**** [1.65, 2.86]	F[1, 731]=**21.45****
Social interactions (during the past week)			
Didn't spend time with anyone (excluding household members)	**1.53**** [1.27, 1.83]	**6.04**** [4.67, 7.82]	F[1,1353]=**226.27****
Attended no club meetings, religious meetings or other groups	0.91 [0.74, 1.13]	**2.12**** [1.62, 2.79]	F[1,1352]=**37.26****
Spoke on the telephone / online call on fewer than 7 occasions	**0.83*** [0.69, 0.98]	**0.68**** [0.54, 0.85]	F[1,1335]=**7.44****
Finance (current)			
Resources (Can obtain $2,000 for something important)	1.21† [1.00, 1.48]	1.16 [0.84, 1.60]	F[1,1350]=0.05
High financial stress	0.94 [0.78, 1.14]	0.93 [0.72, 1.20]	F[1,1348]=0.32

**p<0.01, *0.01≤p<0.05, †0.05≤p<0.1. Reference group for Victorians were people in the Rest of Australia (RoA) at the corresponding survey timepoint. Models were adjusted for employment status, working status, gender, age group, and survey mode. ANCOVA models also adjusted for the variable at Survey 1 corresponding to the respective Survey 3 variable (when available).

TABLE 6. SECONDARY OUTCOMES: GOVERNMENT INCOME SUPPORT AND MANAGEMENT OF PERSONAL HEALTH DURING THE VICTORIAN LOCKDOWN.

Outcome (percentage change in cohort subgroups)	Adjusted odds ratios (AOR) [95% Confidence Interval]		Analysis of covariance (ANCOVA) adjusted F ratio
	VIC vs RoA between COVID-19 waves (Survey 2)	VIC vs RoA during the lockdown period (Survey 3)	VIC vs RoA during the lockdown period while accounting for pre-lockdown status (Survey 3 accounting for Survey 2)
Government income support			
Receiving JobSeeker	1.20 [0.86, 1.67]	1.11 [0.76, 1.64]	F[1,1232]=0.90
Employer applied for / receiving JobKeeper	1.08 [0.83, 1.39]	1.10 [0.83, 1.47]	F[1, 898]=0.72
Healthcare use (past month)			
None	1.08 [0.87, 1.34]	**1.35*** [1.07, 1.69]	F[1,1232]=3.48†
Consulted a General Practitioner (GP)	**0.77*** [0.62, 0.95]	0.82 [0.65, 1.04]	F[1, 1232]=1.21
Consulted a Dentist	1.02 [0.73, 1.41]	**0.61**** [0.42, 0.87]	F[1, 1232]=**6.46***
Consulted a Nurse	0.67 [0.41, 1.10]	0.64 [0.37, 1.11]	F[1, 1232]=1.12
Consulted a Physiotherapist/Hydrotherapist	0.91 [0.62, 1.33]	0.67† [0.45, 1.01]	F[1, 1232]=2.73†
Consulted a Psychologist	0.90 [0.59, 1.35]	1.00 [0.66, 1.50]	F[1, 1232]=0.94
Healthcare avoidance			
Delayed or cancelled a GP consultation	1.20 [0.87, 1.66]	**1.58**** [1.12, 2.22]	F[1,1232]=3.11†
Delayed or cancelled a consultation with another healthcare provider (not a GP)	1.24 [0.93, 1.64]	**1.46*** [1.07, 1.98]	F[1,1232]=2.19
Avoided seeking medical treatment for a problem I would normally seek help with	**1.31*** [1.01, 1.72]	**1.81**** [1.36, 2.42]	F[1,1232]=**11.81****
None of the above	**0.79*** [0.63, 0.99]	**0.58**** [0.46, 0.75]	F[1, 1232]=**12.08****
Reasons for avoiding, delaying or cancelling health care			
I was concerned about coming into contact with other people	**1.76*** [1.20, 2.59]	**2.09**** [1.34, 3.26]	F[1, 193]=2.07

I was too busy	1.01 [0.62, 1.64]	**0.39**** [0.22, 0.69]	F[1, 193]=0.15
I was concerned about the cost	0.81 [0.50, 1.32]	**0.55*** [0.31, 0.98]	F[1, 193]=1.64
The doctor / healthcare professional asked me not to come	0.52 [0.20, 1.37]	**11.42**** [2.50, 52.12]	F[1, 193]=**8.20****
Have you spoken to anyone about your mental health?			
No	0.91 [0.73, 1.13]	0.82† [0.65, 1.03]	F[1, 1232]=2.40
Health professional(s)§	0.91 [0.70, 1.19]	0.84 [0.62, 1.12]	F[1, 1232]=0.01
Non-health professional(s)ǁ	1.14 [0.91, 1.41]	**1.29*** [1.03, 1.63]	F[1, 1232]=2.81†
Other actions taken to help manage mental health			
No actions	0.97 [0.70, 1.34]	**0.56**** [0.39, 0.80]	F[1, 1232]=**15.27****
Watched or read something uplifting	**1.31*** [1.05, 1.62]	**1.37*** [1.08, 1.73]	F[1,1232]=**4.07***
Distracted yourself by keeping active or learning a skill	**1.38**** [1.12, 1.70]	**1.65**** [1.31, 2.08]	F[1, 1232]=**15.23****
Drunk more alcohol than normal	0.93 [0.72, 1.20]	**1.63**** [1.24, 2.14]	F[1, 1232]=**16.77****
Participated in an online forum / chat group	1.40† [0.97, 2.00]	**1.85**** [1.25, 2.74]	F[1, 1232]=**6.98****
Called a telephone support line	0.75 [0.38, 1.50]	1.35 [0.68, 2.67]	F[1, 1232]=1.83
COVID-19 testing			
I have had a COVID test	-	**1.82**** [1.43, 2.34]	-

**p<0.01, *0.01≤p<0.05, †0.05≤p<0.1. §i.e. a general practitioner, psychologist, psychiatrist, or other specified health professional. ǁi.e. a friend, family member, partner, spouse, colleague, or other specified non-health professional. Reference group for Victorians were people in the Rest of Australia (RoA) at the corresponding survey timepoint. Models were adjusted for employment status, working status, gender, age group, and survey mode.

DISCUSSION AND CONCLUSIONS

The state of Victoria experienced a second COVID-19 wave and a prolonged set of community-wide restrictions during July to October of 2020. These restrictions were effective in reducing COVID-19 cases in Victoria from a maximum of 687 cases per day at the peak on 5 August 2020 to 26 consecutive days of zero new cases as at 25th November (covid19data, 2020). By comparing Victorians exposed to the outbreak and related restrictions to other Australians living in areas with few COVID cases and under a less substantial set of restrictions, this study presents evidence that the second wave and restrictions had adverse impacts on the mental health of Victorians and on several determinants of health including social interactions, engagement in work and health service use. Our findings show that participants in other Australian states and territories continued to recover from the first Australian wave of COVID-19 cases in March/April 2020 and the associated restrictions, with improvements in their mental health and determinants of health.

Compared to those from the Rest of Australia, during the Victorian lockdown participants from Victoria reported:

- Worse mental health and a higher rate of psychological distress,
- lower levels of engagement in paid work,
- reduced in-person social interaction but increased virtual/telephonic interactions,

In addition, Victorians reported that they were more likely to:

- have avoided seeking medical treatment
- be working from home (if they were working),
- seek mental health support from friends or family,
- make behavioural changes to manage mental health problems, and
- have had a COVID-19 test

Importantly, we observed no differences between Victorians and other Australians on levels of financial stress, ability to access funds in an emergency and employment, despite more Victorians reporting that they were not engaged in paid work. One explanation for this finding is that the Commonwealth government COVID-19 financial support and stimulus (e.g., Job Keeper and the Coronavirus Supplement for those on Job Seeker) has supported the financial and employment circumstances of Victorians during the winter lockdown.

We also observed significant differences in the way work is conducted during the Victorian lockdown. The proportion of participants working from home fell sharply between the first and third surveys in other Australian states and territories, but remained elevated in Victoria during the lockdown. One feature of the Victorian lockdown was restrictions on business operations across many industries and the requirement to work from home if possible. Working from home presents another set of challenges to health and wellbeing (Shaw et al, 2020). Methods for reducing any negative health impacts of prolonged, enforced periods of working from home present an opportunity for further study.

Despite the significant elevations in psychological distress and worsening mental health among Victorians during the winter 2020 lockdown, we did not find evidence of increased use of formal professional health services to manage mental health (e.g., consultations with a psychologist, accessing a telephone support line). In contrast, Victorians reported that they were more likely to avoid seeking medical treatment for a problem they would normally seek help with. The most common reason for avoiding healthcare was reported as concern about coming into contact with other people, suggestive of concern of contracting the coronavirus. The need to enhance access to frontline healthcare and mental health support has been noted consistently since the beginning of the pandemic (Every-Palmer, 2020; Fisher, 2020) and our study provides further evidence of the need for additional effort and investment in such services. In addition to formal health services, strategies such as investment in mental health first aid training, via employers or community services, provide an opportunity to enhance individual's ability to respond to the mental health needs of their co-workers, friends and family members. While the long-term mental health consequences of exposure to an extended lockdown period remain unknown, they may be substantial. Our findings demonstrate a need for continued monitoring of mental health in communities exposed to such restrictions.

Community wide lockdowns of the type implemented in Victoria during winter 2020 are currently being implemented in many countries to contain and reduce the spread of COVID-19 infections. For example England, Spain, France, Poland, Austria, Ireland, Wales the Czech Republic and other nations in Europe increased the stringency of their community restrictions during October and November 2020, in response to rising COVID-19 case numbers (Hale, 2020). The Victorian winter 2020 lockdown included a wide range of policy

responses that are also now occurring in these nations, including school closures, business closures, cancelling public events, restrictions on gatherings, stay at home requirements, restriction on movement, mandatory facial coverings, increase in testing and contact tracing efforts, additional investment in healthcare, financial stimulus and public information campaigns. Many of these responses have been in place for many weeks or months. Our findings suggest that lockdowns may have substantial community wide impacts on mental health and on the determinants of health, although we note that impacts of COVID-19 restrictions in these nations will reflect the mix of policy responses and the local social and community characteristics.

Our findings are consistent with those of a recent rapid review of published studies examining the psychological impacts of quarantine (Brooks, 2020). This review identified 24 studies that have reported negative psychological consequences in people undergoing periods of quarantine, including psychological distress, symptoms of post-traumatic stress, confusion and anger. Factors contributing to stress were reported as including longer durations of quarantine, fear of infection, boredom, inadequate information provision from authorities and poor access to supplies, financial losses and the stigma associated with being in quarantine particularly among high risk cohorts such as healthcare workers. Most prior studies reported acute effects, however there was some evidence of longer-lasting psychological impacts. Our findings extend these findings as we also identify changes in determinants of health including social interactions, help-seeking and medical treatment. This review recommended multiple mitigation strategies including keeping the duration of quarantine as brief as possible, clear information provision to those affected, provision of adequate supplies and promoting activities that relieve boredom and promote social interaction.

This study reports findings from data collection in a national sample of working age Australians that coincided with a community wide lockdown in the state of Victoria. The co-occurrence of data collection during the lockdown period, and the presence of baseline (pre-lockdown) data in both Victoria and other Australian states and territories enabled a ‘natural experiment’ in which we were able to compare health and determinants of health in a sample exposed to lockdown conditions with a smaller degree of exposure, and to examine changes over time in both groups. The study was not designed to examine the impacts of lockdown, and thus we have limited data on person level exposures to some features of the Victorian

lockdown. For example, participants in our study with school aged children may have been affected by the extended school closures while other participants without children may not have been affected by that particular policy response.

For these analyses, we have compared Victoria with the rest of Australia. As noted in the introduction, metropolitan Melbourne had an extended and more stringent set of restrictions than regional Victoria. Comparison of these two sub-groups will occur in future analyses where sufficient numbers permit, but has not been addressed in this report. Our study uses standardised and validated health metrics to assess physical and mental health, financial stress and social interactions, and a range of study-specific measures to assess work, employment and other outcomes. The study was not designed to examine the prevalence of these outcomes, but rather to examine differences in outcomes based on the exposure to work and job loss (ANZCTR, 2020). While we have adjusted our statistical analyses for a range of demographic, employment and survey factors that can affect health and determinants of health, the outcomes in this report should not be interpreted as reflecting outcomes in the general community, as it does not include those outside the working age range. For the purposes of analysis, we have treated the lockdown period as a single period. In reality the restrictions implemented in Victoria were introduced over time and were modified in their stringency and their scope in the communities to which they were applied. It is probable that some restrictions had more impact than others on the outcomes measured, however we are unable to determine the relative impact of the various restrictions enacted. Nor have we distinguished between the outcomes of those early versus late in the lockdown period.

CONCLUSIONS

This study presents evidence that the community-wide lockdown in the state of Victoria during the winter of 2020 contributed to worsening mental health, elevations in psychological distress and changes in a number of important determinants of health including work, avoidance of healthcare and social interactions, which were more severe than the effects which occurred in the rest of Australia not in lockdown. Similar lockdowns are now occurring around the globe to reduce transmission of SARS-CoV-2, and are likely to take place in future as outbreaks continue to occur. Our findings suggest that in addition to lockdown measures, governments imposing such restrictions need to focus on improving and

encouraging access to mental health supports and healthcare services, providing financial assistance to communities and supporting social interactions. In summary, lockdown measures must be coupled with additional community wide supports and services that address the social determinants of health.

REFERENCES

Andrews, D (VIC Premier) 2020a. Statement From The Premier, media release. 10 May, url: https://www.premier.vic.gov.au/statement-premier-65 (accessed 10 August 2020)

Andrews, D (VIC Premier) 2020b. Statement From The Premier, media release. 16 May, url: https://www.premier.vic.gov.au/statement-premier-66 (accessed 10 August 2020)

Andrews, D (VIC Premier) 2020c. Statement From The Premier, media release. 24 May, url: https://www.premier.vic.gov.au/statement-premier-67 (accessed 10 August 2020)

Andrews, D (VIC Premier) 2020d. Statement From The Premier, media release. 14 June, url: https://www.premier.vic.gov.au/statement-premier-68 (accessed 10 August 2020)

Andrews, D (VIC Premier) 2020e. Statement From The Premier, media release. 18 June, url: https://www.premier.vic.gov.au/statement-premier-70 (accessed 10 August 2020)

Andrews, D (VIC Premier) 2020f. Statement From The Premier, media release. 30 June, url: https://www.premier.vic.gov.au/statement-premier-72 (accessed 10 August 2020)

Andrews, D (VIC Premier) 2020g. Statement From The Premier, media release. 4 July, url: https://www.premier.vic.gov.au/statement-premier-73 (accessed 10 August 2020)

Andrews, D (VIC Premier) 2020h. Statement From The Premier, media release. 7 July, url: https://www.premier.vic.gov.au/statement-premier-74 (accessed 10 August 2020)

Andrews, D (VIC Premier) 2020i. Statement From The Premier, media release. 30 July, url: https://www.premier.vic.gov.au/statement-premier-75 (accessed 10 August 2020)

Andrews, D (VIC Premier) 2020j. Statement On Changes To Melbourne's Restrictions, media release. 2 August, url: https://www.premier.vic.gov.au/statement-changes-melbournes-restrictions (accessed 10 August 2020)

Andrews, D (VIC Premier) 2020k. Statement From The Premier, media release. 3 August, url: https://www.premier.vic.gov.au/statement-from-premier-03-aug (accessed 10 August 2020)

Andrews, D (VIC Premier) 2020l. Return To Flexible And Remote Learning, media release. 12 July, url: https://www.premier.vic.gov.au/return-flexible-and-remote-learning (accessed 10 August 2020)

Andrews, D (VIC Premier) 2020m. Face Coverings Mandatory For Melbourne And Mitchell Shire, media release. 19 July, url: https://www.premier.vic.gov.au/face-coverings-mandatory-melbourne-and-mitchell-shire (accessed 10 August 2020)

Andrews, D (VIC Premier) 2020n. Statement On Changes To Regional Restrictions, media release. 2 August, url: https://www.premier.vic.gov.au/statement-changes-regional-restrictions (accessed 10 August 2020

Andrews, D (VIC Premier) 2020o. Supporting Victorian Workers To Get Tested And Stay Home, media release. 23 July, url: https://www.premier.vic.gov.au/supporting-victorian-workers-get-tested-and-stay-home (accessed 10 August 2020)

Andrews, D (VIC Premier) 2020p. Statement from the premier, media release. 12 October, url:https://www.premier.vic.gov.au/metro-students-head-back-classroom (accessed 13 November 2020)

Andrews, D (VIC Premier) 2020q. Statement from the premier, media release. 18 October, url: https://www.premier.vic.gov.au/statement-premier-77 (accessed 13 November 2020)

Andrews, D (VIC Premier) 2020r. Statement from the premier, media release. 25 October, url:https://www.premier.vic.gov.au/statement-premier-78 (accessed 13 November 2020)

Andrews, D (VIC Premier) 2020s. Statement from the premier, media release. 26 October, url: https://www.premier.vic.gov.au/statement-premier-79 (accessed 13 November 2020)

Andrews, D (VIC Premier) 2020t. Statement from the premier, media release. 8 November, url:https://www.premier.vic.gov.au/statement-premier-81 (accessed 13 November 2020)

Australian and New Zealand Clinical Trials Registry (ANZCTR) [Internet]: School of Public Health and Preventive Medicine Faculty of Medicine Nursing and Health Sciences, Monash University (Australia); 2020 - Identifier ACTRN12620000857909. The impact of work loss during the COVID-19 pandemic on health and employment. A prospective longitudinal study of health and employment outcomes in Australians who have lost work during the COVID-19 pandemic. 2020 Sept 21. Available from https://anzctr.org.au/ACTRN12620000857909.aspx

Australian Bureau of Statistics. General Social Survey (GSS): Household Survey Questionnaire, cat. no. 4159.0, Canberra: Australian Bureau of Statistics; 2014.

Australian Bureau of Statistics. Household Impacts of COVID-19 Survey, 14-17 April 2020, Australia Canberra; 2020 May 5. Contract No.: 49400DO004_2020.

Barr, A (ACT Chief Minister) 2020a. Joint Statement: Chief Minister & Deputy Chief Minister, media release. 1 May, url: https://www.cmtedd.act.gov.au/open_government/inform/act_government_media_releases/barr/2020/joint-statement-chief-minister-and-deputy-chief-minister (accessed 17 August)

Barr, A (ACT Chief Minister) 2020b. Statement: ACT Chief Minister, media release. 12 May, url:https://www.cmtedd.act.gov.au/open_government/inform/act_government_media_releases/barr/2020/statement-chief-minister (accessed 17 August)

Barr, A (ACT Chief Minister) 2020c. Next steps in Canberra's Recovery Plan, media release. 20 May, url: https://www.cmtedd.act.gov.au/open_government/inform/act_government_media_releases/barr/2020/next-steps-in-canberras-recovery-plan (accessed 17 August)

Barr, A (ACT Chief Minister) 2020d. Canberra's Recovery Plan – supporting our community and our economy, media release. 26 May, url: https://www.cmtedd.act.gov.au/open_government/inform/act_government_media_releases/barr/2020/canberras-recovery-plan-supporting-our-community-and-our-economy (accessed 17 August)

Barr, A (ACT Chief Minister) 2020e. Next stage of Canberra's Recovery Plan – Choose local, to support our locals, media release. 12 June, url: https://www.cmtedd.act.gov.au/open_government/inform/act_government_media_releases/barr/2020/next-stage-of-canberras-recovery-plan-choose-local,-to-support-our-locals (accessed 17 August)

Berejiklian G (NSW Premier), 2020a, Update on COVID-19 restrictions. NSW Government, 28-Apr-20, url: https://www.nsw.gov.au/media-releases/update-on-covid-19-restrictions (accessed 9 August 2020)

Berejiklian G (NSW Premier), 2020b, NSW to ease restrictions this week. NSW Government, 10-May-20, url: https://www.nsw.gov.au/media-releases/nsw-to-ease-restrictions-week-0 (accessed 9 August 2020)

Berejiklian G (NSW Premier), 2020c, Students start returning to the classroom. NSW Government, 11-May-20, url: https://www.nsw.gov.au/media-releases/students-start-returning-to-classroom (accessed 9 August 2020)

Berejiklian G (NSW Premier), 2020d, NSW students return to the classroom full-time. NSW Government, 19-May-20, url: https://www.nsw.gov.au/media-releases/nsw-students-return-to-classroom-full-time (accessed 9 August 2020)

Berejiklian G (NSW Premier), 2020e, Museums, galleries and libraries to reopen from 1 June 2020. NSW Government, 20-May-20, url: https://www.nsw.gov.au/media-releases/museums-galleries-and-libraries-to-reopen-from-1-june-2020 (accessed 9 August 2020)

Berejiklian G (NSW Premier), 2020f, Holiday travel restrictions to be lifted from 1 June 2020. NSW Government, 20-May-20, url: https://www.nsw.gov.au/media-releases/holiday-travel-restrictions-to-be-lifted-from-1-june-2020 (accessed 9 August 2020)

Berejiklian G (NSW Premier), 2020g, NSW Government to open pubs, clubs, cafes and restaurants to 50 patrons. NSW Government, 22-May-20, url: https://www.nsw.gov.au/media-releases/nsw-government-to-open-pubs-clubs-cafes-and-restaurants-to-50-patrons (accessed 9 August 2020)

Berejiklian G (NSW Premier), 2020h, Beauty and nail services can recommence June 1. NSW Government, 24-May-20, url: https://www.nsw.gov.au/media-releases/beauty-and-nail-services-can-recommence-june-1 (accessed 9 August 2020)

Berejiklian G (NSW Premier), 2020i, Changes for worship, weddings and funerals. NSW Government, 29-May-20, url: https://www.nsw.gov.au/media-releases/changes-for-worship-weddings-and-funerals (accessed 9 August 2020)

Berejiklian G (NSW Premier), 2020j, Further restrictions to ease on Saturday. NSW Government, 11-Jun-20, url: https://www.nsw.gov.au/media-releases/further-restrictions-to-ease-on-saturday (accessed 9 August 2020)

Berejiklian G (NSW Premier), 2020k, Further COVID-19 restrictions set to ease from 1 July. NSW Government, 14-Jun-20, url: https://www.nsw.gov.au/media-releases/further-covid-19-restrictions-set-to-ease-from-1-july (accessed 9 August 2020)

Berejiklian, G (NSW Premier) 2020l. Border closure to protect NSW, media release. 6 July, url: https://www.nsw.gov.au/media-releases/border-closure-to-protect-nsw (accessed 13 November 2020)

Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. The Lancet.

Collie A, Sheehan L, Lane TJ, Iles R. Psychological Distress in Workers' Compensation Claimants: Prevalence, Predictors and Mental Health Service Use. J Occup Rehabil. 2020 Jun;30(2):194-202. doi: 10.1007/s10926-019-09862-1. PMID: 31646415.

covid19data 2020. Cases: States and Territories. url:https://www.covid19data.com.au/states-and-territories (accessed 18 November 2020)

Department of Health and Human Services (DHHS, Victorian Government), 2020a. Financial and other support for coronavirus (COVID-19). url: https://www.dhhs.vic.gov.au/financial-support-coronavirus-covid-19#economic-survival-package (accessed 18 November)

Department of Health and Human Services (DHHS, Victorian Government), 2020b. Coronavirus update for Victoria - Wednesday 25 November, media release. 11 November, url: https://www.dhhs.vic.gov.au/coronavirus-update-victoria-25-november-2020 (accessed 26 November 2020)

Every-Palmer S, Jenkins M, Gendall P, Hoek J, Beaglehole B, et al. (2020) Psychological distress, anxiety, family violence, suicidality, and wellbeing in New Zealand during the COVID-19 lockdown: A cross-sectional study. PLOS ONE 15(11): e0241658. https://doi.org/10.1371/journal.pone.0241658

Government of South Australia, 2020a. COVID-19 Update 18 November. 18 November. url: https://www.covid-19.sa.gov.au/latest-news/covid-19-update-18-november (accessed 19 November 2020)

Government of South Australia, 2020b. Circuit breaker restrictions in place from tonight, media release. 18 November. url: https://www.covid-19.sa.gov.au/latest-news/circuit-breaker-restrictions-in-place-from-tonight (accessed 19 November 2020)

Gunner, M (NT Chief Minister) and Lauren Moss, 2020a, Territory Parks to Start Opening From This Weekend, media statement. 27 April. url: http://newsroom.nt.gov.au/mediaRelease/33193 (accessed 9 August 2020)

Gunner, M (NT Chief Minister), 2020b, The Territory's Roadmap to the New Normal , media statement. 30 April. url: http://newsroom.nt.gov.au/mediaRelease/33205 (accessed 9 August 2020)

Gutwein, P (TAS Premier) 2020a. Tasmania's Roadmap to Recovery, 8 May. url: https://coronavirus.tas.gov.au/media-releases/tasmanias-roadmap-to-recovery (accessed 10 August 2020)

Gutwein, P (TAS Premier) 2020b. Restrictions to ease from tomorrow, 17 May. url: https://coronavirus.tas.gov.au/media-releases/restrictions-to-ease-from-tomorrow (accessed 10 August 2020)

Gutwein, P (TAS Premier) 2020c. Stage Two restrictions to be eased 3pm Friday 5 June, 2 June. url: https://coronavirus.tas.gov.au/media-releases/stage-two-restrictions-to-be-eased-3pm-friday-5-june (accessed 10 August 2020)

Gutwein, P (TAS Premier) 2020d. Stage Two restrictions begin to ease, 5 June. url: https://coronavirus.tas.gov.au/media-releases/stage-two-restrictions-begin-to-ease (accessed 10 August 2020)

Gutwein, P (TAS Premier) 2020e. Tasmania reaches zero active cases and brings forward easing of restrictions, 12 June. url: https://coronavirus.tas.gov.au/media-releases/tasmania-reaches-zero-active-cases-and-brings-forward-easing-of-restrictions (accessed 10 August 2020)

Gutwein, P (TAS Premier) 2020f. Aged Care Restrictions, 18 June. url: https://coronavirus.tas.gov.au/media-releases/aged-care-restrictions (accessed 10 August 2020)

Gutwein, P (TAS Premier) 2020g. Further restrictions eased, 17 June. url: https://coronavirus.tas.gov.au/media-releases/further-restrictions-eased (accessed 10 August 2020)

Hale, Thomas, Noam Angrist, Emily Cameron-Blake, Laura Hallas, Beatriz Kira, Saptarshi Majumdar, Anna Petherick, Toby Phillips, Helen Tatlow, Samuel Webster (2020). Oxford COVID-19 Government Response Tracker, Blavatnik School of Government.

Jane RW Fisher, Thach Duc Tran, Karin Hammargerg, Jayagowri Sastry, Hau Nguyen, Heather Rowe, Sally Popplestone, Ruby Stocker, Claire Stubber and Maggie Kirkman. Mental health of people in Australia in the first month of COVID-19 restrictions: a national survey. Med J Aust [pre-print]; 2020. https://www.mja.com.au/journal/2020/mental-health-people-australia-first-month-covid-19-restrictions-national-survey. Accessed 20 August 2020.

Griffiths D, Sheehan L, Van Vreden C, Petrie D, Grant G, Whiteford P, Sim M, Collie A. The impact of work loss on mental and physical health during the COVID-19 pandemic: Findings from a prospective cohort study. In-press. Journal of Occupational Rehabilitation.

Griffiths D, Sheehan L, Van Vreden C, Petrie D, Grant G, Whiteford P, Sim M, Collie A. The impact of work loss on mental and physical health during the COVID-19 pandemic: Findings from a prospective cohort study. medRxiv. 2020 Sept.

Kessler RC, Andrews G, Colpe LJ, Hiripi E, Mroczek DK, Normand SL, et al. Short screening scales to monitor population prevalences and trends in non-specific psychological distress. Psychological medicine. 2002;32(6):959-76.

Kessler RC, Barker PR, Colpe LJ, Epstein JF, Gfroerer JC, Hiripi E, et al. Screening for serious mental illness in the general population. Archives of general psychiatry. 2003;60(2):184-9.

Koenig HG, Westlund RE, George LK, Hughes DC, Blazer DG, Hybels C. Abbreviating the Duke Social Support Index for use in chronically ill elderly individuals. Psychosomatics. 1993;34(1):61-9.

Marshall, S (SA Premier), 2020a. Operation Restore Elective Surgery, media release. 12 May. url: https://www.premier.sa.gov.au/news/media-releases/news/operation-restore-elective-surgery (accessed 10 August)

Marshall, S (SA Premier), 2020b. Government accelerates local jobs and business recovery; indoor dining back on menu, media release. 20 May. url: https://www.premier.sa.gov.au/news/media-releases/news/government-accelerates-local-jobs-and-business-recovery-as-indoor-dining-back-on-the-menu (accessed 10 August)

Marshall, S (SA Premier), 2020c. First frothies in the front bar, media release. 27 May. url: https://www.premier.sa.gov.au/news/media-releases/news/first-frothies-in-the-front-bar (accessed 10 August)

McGowan, M (WA Premier) 2020a, Cautious easing of restrictions thanks to WA's COVID-19 progress, media statement. 26 April. url: https://www.mediastatements.wa.gov.au/Pages/McGowan/2020/04/Cautious-easing-of-restrictions-thanks-to-WAs-COVID-19-progress.aspx (accessed 8 August 2020)

McGowan, M (WA Premier) 2020b, The WA roadmap for easing COVID-19 restrictions, media statement. 10 May. url: https://www.mediastatements.wa.gov.au/Pages/McGowan/2020/05/The-WA-roadmap-for-easing-COVID-19-restrictions.aspx (accessed 8 August 2020)

McGowan, M (WA Premier) 2020c, Increase in elective surgery for Western Australians, media statement. 15 May. url: https://www.mediastatements.wa.gov.au/Pages/McGowan/2020/05/Increase-in-elective-surgery-for-Western-Australians.aspx (accessed 8 August 2020)

McGowan, M (WA Premier) 2020d, Regional travel restrictions to be lifted as part of WA roadmap, media statement. 25 May. url: https://www.mediastatements.wa.gov.au/Pages/McGowan/2020/05/Regional-travel-restrictions-to-be-lifted-as-part-of-WA-roadmap.aspx (accessed 8 August 2020)

McGowan, M (WA Premier) 2020e, Phase 3 of COVID-19 roadmap to commence from Saturday, June 6, media statement. 29 May. url: https://www.mediastatements.wa.gov.au/Pages/McGowan/2020/05/Phase-3-of-COVID-19-roadmap-to-commence-from-Saturday-June-6.aspx (accessed 8 August 2020)

McGowan, M (WA Premier) 2020f, Kimberley to reopen to the rest of Western Australia, media statement. 4 June. url: https://www.mediastatements.wa.gov.au/Pages/McGowan/2020/06/Kimberley-to-reopen-to-the-rest-of-Western-Australia.aspx (accessed 8 August 2020)

Morrison, S (Prime Minister of Australia) 2020a, *Economic stimulus package,* media release. 12 March. url: https://www.pm.gov.au/media/economic-stimulus-package (accessed 30 July 2020)

Morrison, S (Prime Minister of Australia) 2020b, *Supporting Australian workers and business,* media release. 22 March. url: https://www.pm.gov.au/media/supporting-australian-workers-and-business (accessed 30 July 2020)

Morrison, S (Prime Minister of Australia) 2020c, *$130 billion JobKeeper payment to keep Australians in a job*, media release. 30 March. url: https://www.pm.gov.au/media/130-billion-jobkeeper-payment-keep-australians-job (accessed 30 July 2020)

Morrison, S (Prime Minister of Australia) 2020d, More support for more businesses and workers, media release. 7 August. url: https://www.pm.gov.au/media/more-support-more-businesses-and-workers (accessed 7 August 2020)

Palaszczuk, A (QLD Premier) 2020a, COVID restrictions ease - Ministerial Media Statements. 26 April. url: https://statements.qld.gov.au/statements/89738 (accessed 9 August 2020)

Palaszczuk, A (QLD Premier) 2020b, Qld COVID-19 – Sunday April 26 – Restrictions to ease as recoveries increase - Ministerial Media Statements. 26 April. url: https://statements.qld.gov.au/statements/89740 (accessed 9 August 2020)

Palaszczuk, A (QLD Premier) 2020c, Queenslanders urged to play it safe this weekend - Ministerial Media Statements. 1 May. url: https://statements.qld.gov.au/statements/89765 (accessed 9 August 2020)

Palaszczuk, A (QLD Premier) 2020d, Queensland success leads sensible steps back to school - Ministerial Media Statements. 4 May. url: https://statements.qld.gov.au/statements/89773 (accessed 9 August 2020)

Palaszczuk, A (QLD Premier) 2020e, Qld COVID-19 – Fri May 1: NRL go ahead / Flat curve / Recreation rule test - Ministerial Media Statements. 1 May. url: https://statements.qld.gov.au/statements/89770 (accessed 9 August 2020)

Palaszczuk, A (QLD Premier) 2020f, Premier clears path for kick off - Ministerial Media Statements. 1 May. url: https://statements.qld.gov.au/statements/89768 (accessed 9 August 2020)

Palaszczuk, A (QLD Premier) 2020g, Major easing of restrictions will open Queensland for Queenslanders - Ministerial Media Statements. 31 May. url: https://statements.qld.gov.au/statements/89931 (accessed 9 August 2020)

Palaszczuk, A (QLD Premier) 2020h, Premier maps road to easing restrictions - Ministerial Media Statements. 8 May. url: https://statements.qld.gov.au/statements/89800 (accessed 9 August 2020)

Palaszczuk, A (QLD Premier) 2020i, COVID Safe Plans mean more customers for Qld businesses - Ministerial Media Statements. 5 June. url: https://statements.qld.gov.au/statements/89960 (accessed 9 August 2020)

Prochaska JJ, Sung HY, Max W, Shi Y, Ong M. Validity study of the K6 scale as a measure of moderate mental distress based on mental health treatment need and utilization. International journal of methods in psychiatric research. 2012;21(2):88-97.

Shaw, W.S., Main, C.J., Findley, P.A. *et al.* Opening the Workplace After COVID-19: What Lessons Can be Learned from Return-to-Work Research?. *J Occup Rehabil* 30, 299–302 (2020). https://doi.org/10.1007/s10926-020-09908-9

Ware, J., Jr., Kosinski, M., & Keller, S. D. (1996). A 12-Item short-form health survey: Construction of scales and preliminary tests of reliability and validity. *Medical Care, 34*(3), 220–233.

Ware, John & Kosinski, M. & Turner-Bowker, Diane & Gandek, B..(2002). How to score SF-12 items. SF-12 v2: How to Score Version 2 of the SF-12 Health Survey. 29-38.