

COVID-19 Health Risks and Labour Supply

Nalini Agarwal and James Bishop^[*]



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Abstract

There is evidence that concerns about becoming infected with COVID-19 at work have affected people's willingness to participate in the labour force in some countries. This article examines whether similar health concerns have contributed to a reduction in labour supply in Australia. It finds no evidence that these concerns had a discernible effect on labour supply during the COVID-19 outbreaks in 2020 and 2021. In early 2022, however, the substantial escalation in cases of the Omicron variant led a small number of people to avoid the workplace, at least temporarily.

Introduction

Since early 2020, outbreaks of the COVID-19 virus have caused significant disruptions to the labour market in Australia. These disruptions have originated from the direct effects of lockdowns on workers and, in the most recent outbreak, by sickness or requirements to isolate. In addition to these direct effects on the supply of labour, a key uncertainty is the extent to which the *fear* of infection has led people to drop out of the workforce, particularly during periods of high community transmission (Lowe 2021). For example, have health concerns dissuaded people from working in jobs where risk of infection is relatively high, or led them to retire earlier than otherwise?

This article assesses whether the risk of being infected with COVID-19 in the workplace has affected people's willingness to work at various points during the pandemic. We find no evidence of this during the COVID-19 outbreaks in 2020 and 2021 in Australia. Even during periods of higher community transmission and fewer public health measures, such as during the Omicron outbreak, the direct effects of isolation requirements and illness associated with COVID-19 appear to have been more important than the fear of infection for determining the path of labour supply. This contrasts with the evidence for some other countries, such as the United States, which suggest that a marked deterioration in the public health

situation meaningfully reduced people’s willingness to work and, consequently, exacerbated existing worker shortages. Although the current analysis is retrospective, the findings shed light on how labour supply might be affected by future outbreaks.

Health risks have been front of mind for many Australians

The COVID-19 pandemic has created significant health concerns for individuals and society. Despite better health outcomes in Australia relative to other countries, data from the 2020 Household Income and Labour Dynamics (HILDA) survey show that most Australians in 2020 viewed the risk of hospitalisation following a COVID-19 infection as high (Graph 1)^[1] – considerably higher than actual hospitalisation rates seen in early 2020. These data were collected prior to the vaccination rollout in 2021, which reduced these risks. The self-assessed risk of severe illness rises with age and is overall higher for those who identified as having a medical condition such as chronic bronchitis, diabetes, asthma or heart disease at the time of the survey (as indicated by the upward shift in the curve in Graph 1).

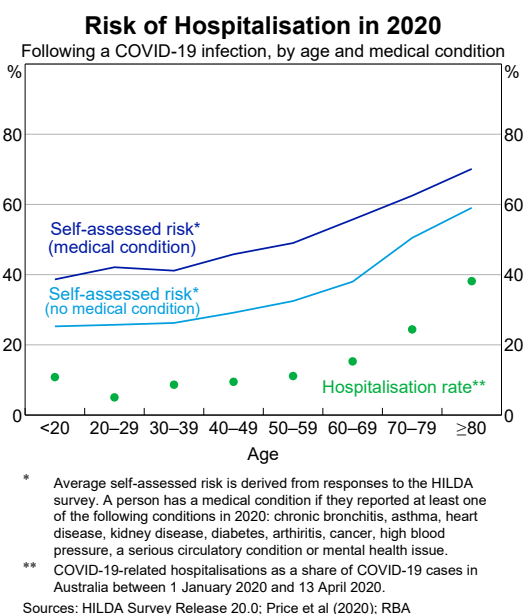
The *perceived risk* of COVID-19 is often a stronger predictor of how people will respond to an outbreak than the *actual risk* of infection and severe illness (Dryhurst *et al* 2021; Eichenbaum *et al* 2020). This connects to the concept of ‘dread risk’, which refers to how individuals might overestimate the risk of low probability events – particularly those that receive a great deal of media attention like the COVID-19 pandemic – and consequently, engage in risk averse behaviour.^[2]

Health risks can lead people to change their economic behaviour

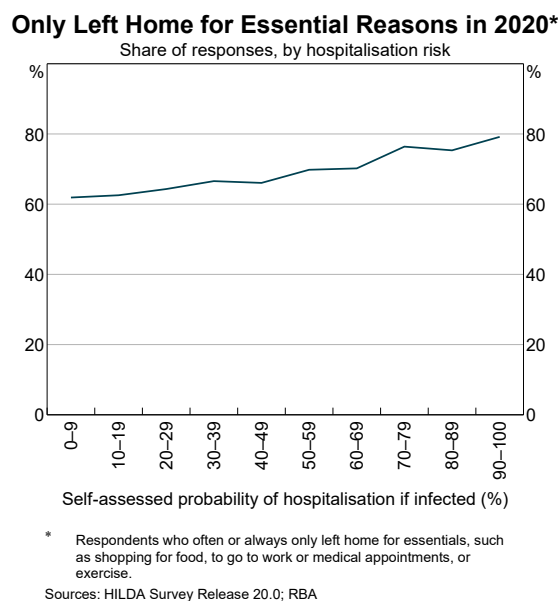
The HILDA survey provides evidence that the fear of infection associated with COVID-19 has led to changes in how people interact with each other and the community. For example, those who assessed they had a higher risk of severe illness were more likely to remain at home for anything but essential purposes, compared with those with a lower risk (Graph 2).

Overall, however, there is little quantitative evidence for Australia on the extent to which fear of infection has led to a voluntary change in economic behaviour. In particular, it is difficult to determine the extent to which people are voluntarily avoiding situations that might expose them to the virus – such as dining in at cafes, going to shopping centres or working in high-contact jobs like retail or hospitality – and the significance of this for the aggregate economy. The importance of voluntary behavioural changes, if any, are likely to be

Graph 1



Graph 2



obscured by the use of public health interventions (e.g. lockdowns) to curtail the virus’s spread.^[3] A growing body of international research has found that factors other than public health interventions, such as voluntary behaviour changes due to fear of infection, had a large effect on consumer spending and mobility in the early stages of the pandemic (Gupta, Simon and Wing 2020). This was evident in a range of countries that made use of public health interventions to differing extents, such as the United States and Sweden (Sheridan *et al* 2020; Eichenbaum *et al* 2020; Goolsbee and Syverson 2021; Fang, Wang and Yang 2020).

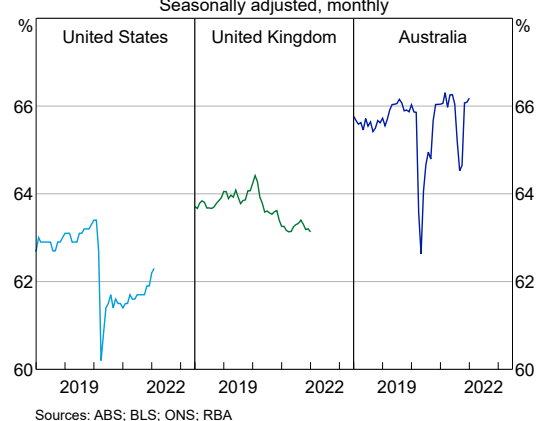
In terms of labour supply, large numbers of workers have left the labour market in countries like the United States and the United Kingdom, with international research suggesting that it could in part be due to a fear of becoming infected with COVID-19 (Forster van Aerssen *et al* 2021). In the early stages of the pandemic before vaccinations were available, a US survey found that nearly 6 million Americans (2.3 per cent of the working-age population) cited concerns of spreading or getting COVID-19 as a reason for not working.^[4] This number has since fallen but remains high due to the Omicron outbreak, at slightly more than 1 per cent of the working-age population. The pandemic also lowered people’s willingness to work (as measured by lower desired hours of work), particularly for those in jobs with higher potential exposure to the virus (Faberman, Mueller and Sahin 2022).

It is also notable that the labour force participation rates in the United States and the United Kingdom have not recovered to the same extent as in many other advanced economies, including Australia (Graph 3). One potential explanation for the difference between Australia and the United States and the United Kingdom could be the comparably worse health outcomes and associated health risks in the latter two countries. In turn, this may help to explain why wage pressures in the United States and the United Kingdom have built more quickly than in Australia, although a number of other factors, including inertia in Australia’s wage-setting institutions, are also likely to be relevant. On the other hand, the accumulation of household savings

and growth in household wealth during the pandemic may also be reducing people’s sense of urgency to return to work in the United States and the United Kingdom, relative to Australia. Similarly, the availability and nature of government support, a re-evaluation of longer-term personal and professional goals (perhaps as part of the ‘Great Resignation’ in the United States) or an increased need to care for young children could also be important factors. The observation that participation rates have recovered strongly in a number of European countries that experienced large COVID-19 outbreaks in 2020 and 2021 also suggests that the fear of infection may not be the main factor driving cross-country differences in labour force participation rates.

Declines in labour force participation in the United States and the United Kingdom have been particularly large for older workers, many of whom have opted to retire early (Nie and Yang 2021). This ‘retirement boom’ in the United States could reflect not only the greater risk of being infected with COVID-19 at work but also that rising asset values made retirement feasible (Faria e Castro 2021). In Australia, data from the Labour Force Survey suggests that retirements were not excessive compared to previous years, perhaps reflecting better health outcomes with less frequent outbreaks and lower infection numbers throughout 2020 and 2021 (Graph 4). Although the number of workers expecting to retire over the coming year picked up in November 2021, it is too early to tell whether this reflects the baby boomer cohort

Graph 3
Labour Force Participation Rates
Seasonally adjusted, monthly



reaching retirement age, fear of infection or the growth in housing prices encouraging older workers to pull forward their retirements as observed in the United States.

Measuring the effect of health risks on labour supply

In light of the above evidence, we now turn to the central question of this article: have COVID-19-related health risks affected people’s willingness to work at various points during the pandemic? By using a case study approach, the analysis focuses on two periods – the COVID-19 outbreaks in Victoria in 2020 and in Sydney in 2021, respectively – to measure the effect of health risks on labour supply decisions.

Case study 1: The second wave of COVID-19 infections in Victoria in mid-to-late 2020

The labour force participation rate in Victoria fell sharply during the ‘second wave’ of COVID-19 infections in the second half of 2020, both in absolute terms and relative to those states that did not have outbreaks at the same time.^[5] However, it is unclear how much of this decline in labour force participation reflected that workers were fearful of going to work because of health concerns, and how much of it was due to other factors, such as the lockdown, large swings in demand, the effects of the income support measures or the need to take care of family and children during the pandemic. To isolate the contribution of health concerns to the

fall in participation, a way of controlling for these other factors was required.

To do this, we used HILDA survey data to compare the employment outcomes of Victorians who were likely to have been particularly sensitive to the risk of being infected with COVID-19 at work, to those who were not as sensitive. The former were a group of people who indicated that they had been diagnosed with a long-term medical condition (such as chronic bronchitis, asthma or heart disease; see Graph 1, above) and were thus at greater risk of experiencing severe illness if they were infected with COVID-19 (Kompaniyets *et al* 2021).

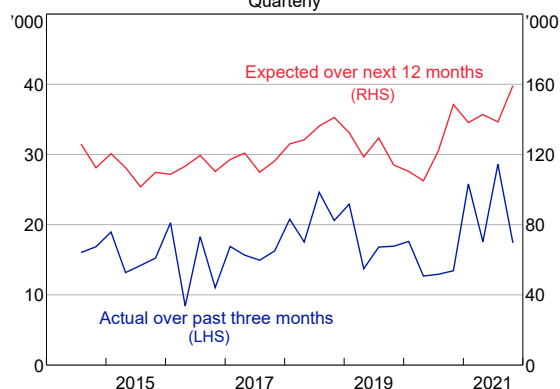
Graph 1 above suggests that these people were aware of this greater risk.^[6] The key assumption in this approach is that the labour force participation rates of these two groups would have followed the same trajectory in the absence of the COVID-19 outbreak in Victoria, controlling for factors like age and sex that would also otherwise affect changes in participation.^[7]

The rate at which Victorians with underlying medical issues participated in the labour force fell sharply during the second wave (Graph 5). However, this decline in labour force participation was no larger than that of Victorians who did not have pre-existing medical issues – the difference in the magnitude of this fall was small at a 1/3 percentage point, and not statistically significant. This finding of no statistically significant relationship between the degree of health risks and changes in labour force participation rates was also apparent when we controlled for other differences across these two groups that might have been relevant for peoples’ willingness or ability to work during the outbreak, such as age, sex, education level and child caring responsibilities.

Case study 2: The COVID-19 outbreak in Sydney in mid-2021

The second case study looks at the third wave of COVID-19 infections in mid-2021 that was associated with the Delta variant. This period provided a so-called ‘natural experiment’ for estimating the effects of health risks on labour supply, arising from the early stages of the vaccination rollout in Australia. In late-May 2021,

Graph 4
Retirements
Quarterly



Sources: ABS; RBA

people aged 40 years and over were prioritised for vaccinations. This led to otherwise similar people facing very different health risks from a COVID-19 infection: those just over 40 years of age who received the vaccine faced lower risks of infection and, in case of a break-through infection, less risk of severe disease and hospitalisation than otherwise similar people just below 40 who had not yet received the vaccine (Bernal *et al* 2021). Even though vaccination rates were low, the first dose vaccination rate for 40–44 year olds was 15 percentage points higher than that for 35–39 year olds by mid-July (Graph 6).^[8] This suggests that vaccine age-eligibility led to an increase in the probability of receiving a vaccination and created an important difference between the two groups in terms of COVID-19 risk profiles. We exploited this difference to understand the impact of vaccine eligibility – and accordingly, different health risks – on labour supply.

Accordingly, we compared the employment outcomes of people who narrowly passed this age-based eligibility test with those who narrowly missed out to see if there was any difference between the two groups. By focusing only on people very close to the age of 40, we could ensure that these two groups were very similar in all characteristics *on average*, except for their vaccine eligibility; for example, people who had their 40th birthday in April 2021 – and were eligible for the vaccine – and were likely to live in similar areas,

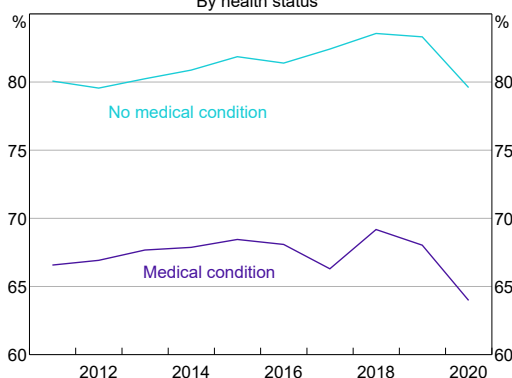
work in similar jobs and be subject to similar lockdown rules as those who had their 40th birthday in August 2021 but were not eligible for the vaccine. As such, this approach allowed us to attribute any difference in employment across these two groups to differences in their COVID-19 risk profile while controlling for other factors that might be relevant to their decision to remain at work.^[9] For the period studied, it was likely that any link between vaccination and employment would reflect the effect of vaccines in lowering health risks at work, rather than via other channels that have been more important recently during the Omicron outbreak, such as the role of vaccination mandates and isolation requirements.

It is easy to determine whether there is any effect on employment just by looking at a graph. Graph 7 plots the number of paid jobs in Greater Sydney region (including Blue Mountains, Central Coast and Wollongong) up until 15 July 2021 against the age of the job-holder. The dots represent the total number of paid jobs held by people falling into different age buckets (with each bucket being one month wide). The solid lines show lines-of-best-fit, estimated separately for people above and below the age of 40. We focused on Sydney as, at that time, it was experiencing about 100 COVID-19 cases per day, case numbers were rising and the region was in lockdown. Intuitively, the effect of health risks on people’s behaviour (if any) are likely to be larger in regions where the virus is circulating in the community.

Graph 5

Labour Force Participation Rate in Victoria

By health status*



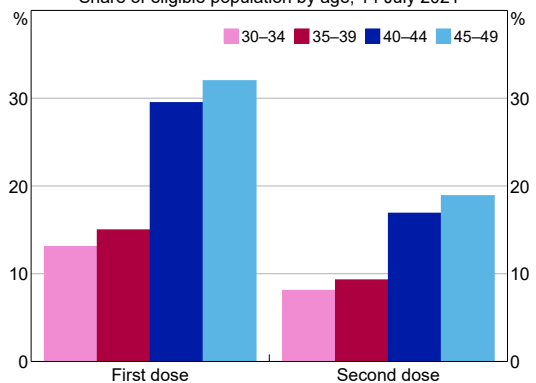
* A person has a medical condition if they reported in the HILDA Survey to have at least one of the following conditions in 2020 and prior to the pandemic: chronic bronchitis, asthma, heart disease, diabetes, arthritis, cancer, high blood pressure, a serious circulatory condition or a mental health issue. The sample is restricted to the working age population in Victoria below the age of 70.

Sources: HILDA Survey Release 20.0; RBA

Graph 6

COVID-19 Vaccinations

Share of eligible population by age, 14 July 2021



Source: Australian Immunisation Register

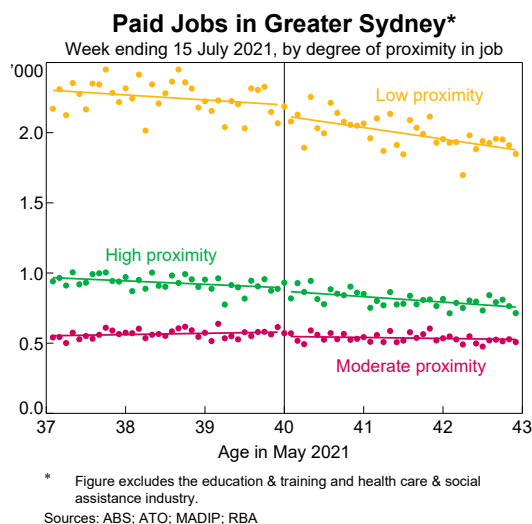
If vaccination eligibility had a positive effect on labour supply at the individual level, we would expect to see an upward level shift in the dots just above the cut-off relative to the dots just below the cut-off; that is, there would be more paid jobs for workers slightly above the age of 40 due to a decline in COVID-19 health risks stemming from vaccine eligibility. There is no evidence of this. Indeed, comparing the estimated line-of-best-fit on either side of cut-off point suggests that, if anything, being eligible for a vaccine led to a very small decline in paid employment.^[10] However, this effect is not statistically significant.

We also tested to see whether an individual's labour supply response to COVID-19-related health risk depended on the type of job they held. In particular, we might expect that a person's ability to remain socially distant at work would influence their willingness to work. For example, health risks may be more relevant to labour supply decisions of people working in hospitality or other customer-facing service industries where social distancing is difficult. On the other hand, health risks are likely to be largely irrelevant to labour supply decisions in jobs that can be done from home. To examine this, we classified individuals' jobs by the expected degree of physical proximity to others in their workplace.^[11] For example, hospitality, retail and construction were all classified as jobs that require a high degree of physical proximity, while professional and financial services were characterised as 'low proximity' jobs due to a

greater ability to work from home. Again, we found no evidence of a discontinuity and hence an effect of vaccine eligibility on labour supply – even in jobs involving a high degree of physical proximity to others (Graph 8).

These results were consistent for Australia as a whole and those living in regions with higher community transmission at the time, like Melbourne and those Sydney Local Government Areas (LGAs) that had the highest rates of community transmission in mid-July (Graph 9) – referred to by the authorities as 'LGAs of concern'. We also found no effects of vaccine eligibility on other measures of labour supply, such as total employed persons and hours worked.

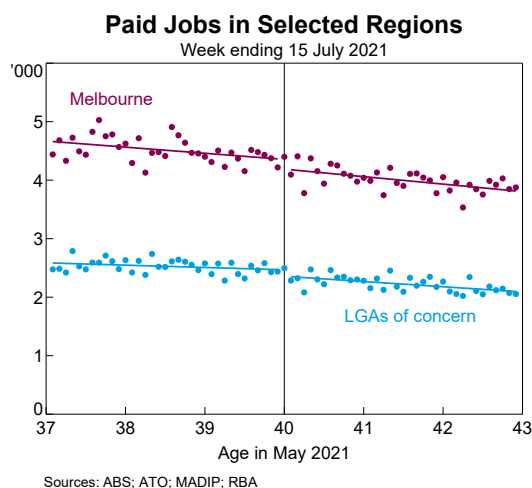
Graph 8



Graph 7



Graph 9



Overall, we found that changes in vaccine eligibility – and, accordingly, changes in COVID-19-related health risks – had no discernible effect on labour supply for people close to the age of 40 years during the Delta outbreak. One potential explanation for this result is that the risk profile for those close to the age of 40 was actually quite small, due to the lower probability of severe illness associated with catching COVID-19 at that age and the much lower infection rates in the community relative to overseas and the recent Omicron outbreak. In saying that, data from the HILDA survey in late 2020 suggested that more than one-third of all individuals around the age of 40 years believed there was at least a 50 per cent chance that they would need to be hospitalised if infected with COVID-19. As mentioned above, such subjective assessments are likely to matter more than the actual risk for behaviour.

Nevertheless, we might expect to see a stronger response from older people or in environments with higher community transmission and/or less protection from public health measures. The experience in other countries, such as the United States, is informative here, although there are important differences between these countries that need to be factored in. For example, in the United States, workers in customer-facing jobs may be more willing to forgo work during an outbreak since the wage rates for those jobs are generally much lower than in Australia.

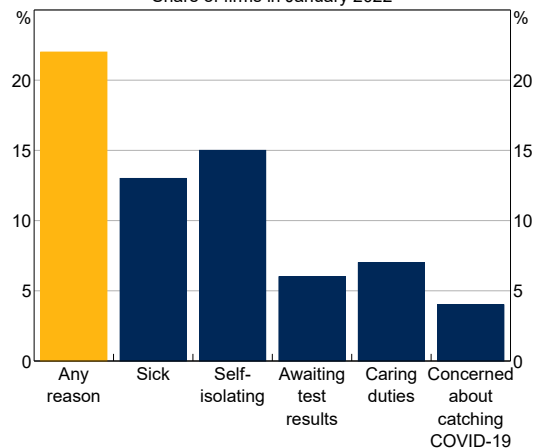
Health concerns during the Omicron outbreak

While we found no evidence of changes in labour supply due to COVID-19 health risks during the second and third waves in Melbourne and Sydney, respectively, it is possible that workers will respond differently now that we are ‘living with COVID-19’. Australian Bureau of Statistics survey data show that around one-fifth of all employing firms experienced staff availability issues in January 2022, reflecting the large increase in COVID-19 cases due to the Omicron outbreak (Graph 10). Although most staff shortages appeared to be driven by isolation requirements as a result of infection or close contact, 4 per cent of all firms mentioned that

concerns about catching COVID-19 at the workplace affected the availability of at least some of their employees. In turn, this suggests that *less than 4 per cent of all workers* were unavailable due to concerns about catching COVID-19, although it is difficult to infer from these data the precise number or age group of workers affected. In February, when COVID-19 cases fell, the share of firms citing concerns about COVID-19 as a reason for staff absences also fell, to 2 per cent. This provides some evidence of a voluntary behaviour change due to health risks, at least temporarily during periods of high community transmission. Because similar survey questions were not asked during earlier outbreaks, we need to be cautious in drawing the conclusion that health concerns had a larger effect on labour supply than they did during those previous outbreaks.

Although the effects of the Omicron outbreak on labour supply are expected to be short lived at the time of writing, a key uncertainty is whether future outbreaks of the COVID-19 virus will contribute to recurring staff unavailability issues, due to sickness or fear of infection. Indeed, retirement intentions picked up at the end of 2021 and may reflect older Australians responding to a higher perceived risk with COVID-19 circulating in the community – although it is too early to determine whether this will result in actual retirement and whether it is entirely due to fear of infection (see Graph 4, above).

Graph 10
COVID-19 Factors Affecting Staff Availability*
 Share of firms in January 2022



* Firms could select more than one response.
 Sources: ABS; RBA

Conclusion

By looking at two case studies, we found no clear evidence that a fear of being infected with COVID-19 reduced the supply of labour in a meaningful way during previous outbreaks in Australia. More timely data suggest that the emergence of the Omicron variant – and with it, greater community transmission and fewer public activity restrictions – has discouraged a small number of people from going to the workplace, at least temporarily. The international experience is also informative in thinking about whether people may opt to withdraw from the workforce. However, it is also important to keep in mind the differences in public health systems and other features of the labour market (such as the higher wages for lower-paid workers in Australia relative to the United States) when drawing any lessons.

Appendix A

Regression discontinuity model with Single Touch Payroll (STP) data

We used a regression discontinuity model to estimate the effect of vaccine age eligibility on labour supply. We only included individuals who were aged between 38 and 42 years in May 2021 in our estimation sample. We estimated the below equation using data that was aggregated by year and month of birth:

$$\ln E_{i, July} = \alpha + \beta_1 A_{genorm_{i, May}} + \beta_2 Elig_{i, May} + \beta_3 Elig_{i, May} \cdot A_{genorm_{i, May}} + \epsilon_{it}$$

Where:

- $\ln E_{i, July}$ refers to the log of the number of paid jobs in the week ending 15 July worked by people in age group i (where age groups are defined by year and month of birth).
- $A_{genorm_{i, May}}$ refers to the age (in years and months) of the workers in age group i in mid-May minus 40 years.
- $Elig_{i, May}$ is a dummy variable that is equal to 1 if the individuals were aged 40 and above in mid-May and zero otherwise. We excluded those who turned 40 years old between May and July 2021 (inclusive) from the estimation sample, because that group could not be cleanly allocated to the treatment or control.
- β_2 is the coefficient of interest, which captures the effect of vaccine age-eligibility on labour supply.

Table A1 shows the estimates of β_2 from the above specification. Column (1) presents the results for all of Australia, while Columns (2)–(4) show results for Greater Sydney, Sydney ‘LGAs of concern’ and Greater Melbourne, respectively. The point estimates are small and not statistically significant for all regions studied. As such, there was no evidence that changes to vaccine eligibility affected the number of payroll jobs. We found similar results when using a measure of employment as the dependent variables (calculated as the number of unique employed individuals in the STP microdata) and when we used a slightly later period to measure outcomes (mid-August 2021). ✎

Table A1: Regression Discontinuity Regression Results

Main results

	(1) Australia	(2) Greater Sydney	(3) LGAs of concern	(4) Greater Melbourne
ln(Jobs)	–0.00730 (0.0291)	–0.0253 (0.0320)	–0.0400 (0.0325)	–0.0435 (0.0289)
ln(EmployedPersons)	–0.00840 (0.0290)	–0.0254 (0.0313)	–0.0374 (0.0326)	–0.0450 (0.0287)
Observations (Age groups)	45	45	45	45

Notes: standard errors in parentheses. Coefficients shown are the treatment effect of vaccine eligibility on labour market outcomes.

Sources: ATO; ABS; RBA

Endnotes

- [*] The authors are from Economic Research Department. They would like to thank Benjamin Beckers, Emma Chow, Jessica Meredith and Neya Suthaharan for their thoughtful advice and suggestions.
- [1] The majority of the fieldwork for the 2020 HILDA survey was conducted in August and September 2020, which followed the first lockdown in New South Wales and overlapped with lockdowns in Victoria (Watson, Jin and Summerfield 2021). The remaining surveys were conducted until February 2021, which coincided with localised lockdowns in parts of Sydney, Perth and Melbourne. Outside of these lockdowns, activity restrictions were still in place, such as visitor limitations and mask-wearing requirements in certain situations.
- [2] For a related discussion, see Jones (2021); Haldane (2015). For a discussion on dread risk in the literature, see Kahneman and Tversky (2013); Barro (2006); Nakamura *et al* (2013).
- [3] As discussed in RBA (2022), the emergence of the Omicron variant has led to increased precautionary behaviour on the part of consumers related to health considerations. Information from the Bank's business liaison program and other timely indicators suggest that spending on a range of discretionary goods and services declined in January 2022, particularly in hospitality and tourism, but the overall impact on consumer spending has been much smaller than during periods of lockdown. This is despite many jurisdictions winding back public health restrictions.
- [4] These data are part of the US Census Bureau's Experimental Data Series; as such, data products may not meet some of the Census Bureau's statistical quality standards.
- [5] Our key data source for this analysis – the HILDA survey – was in the field during the second wave in Victoria; 95 per cent of surveys were conducted while restrictions were in place.
- [6] The self-assessed probability of hospitalisation (if infected) was 13 percentage points higher on average for people with health issues compared to those without health issues (this calculation compared people of similar ages).
- To account for the possibility that job loss during the pandemic could lead to a deterioration in a person's health (which would bias our estimates), we required the health condition to have been diagnosed before the pandemic. We also restricted the sample to the working age population below the age of 70.
- [7] This exercise is akin to a difference-in-difference model, where the treatment and control groups are defined as those with and without underlying health conditions, respectively. By focusing on the *change* in participation rates during the pandemic relative to pre-pandemic rates, this approach abstracts from the fact that people with health conditions tend to be less likely to participate in the labour market in general. Controls (e.g. age) are interacted with the time dummy to absorb the effects of any, say, age-specific shocks during the outbreak.
- [8] This was six weeks after individuals aged over 40 became eligible for vaccinations but before vaccines were prioritised for those under the age of 40.
- [9] This approach is called a regression discontinuity design (RDD) method, which is discussed in further detail in Appendix A. To get such a narrow band around the vaccine eligibility cut off (and hence a very similar group of people), we used novel administrative taxation data collected through Single Touch Payroll enabled firms. This provided us with high frequency and near-real time data on individual's pay and employment outcomes for almost all employing firms from January 2020, merged with data on the individual's month and year of their birth from the ATO's client register accessed via the Multi-Agency Data Integration Project (MADIP) (2006 – 2020).
- [10] This difference between the two lines-of-best fit is essentially our estimate for the regression discontinuity model. The estimate reflects the local average treatment effect for a narrow group of people around the age of 40 years who were affected by the age-based vaccination program only. The results are provided in Appendix A.
- [11] This classification is based on a Grattan Institute Report, which calculates the degree of physical proximity within an industry by the extent to which occupations in that industry require close physical proximity to other people (Coates *et al* 2020).

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