Early estimates of the impact of COVID-19 disruptions on jobs, wages, and lifetime earnings of schoolchildren in Australia

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Abstract

What effects have the Australian COVID-19 disruptions had on our present and future labour force? In the first part of this paper, I document the effects of the disruptions on current jobs and wages in Australia from the March through May period of 2020 – by income level, gender, age, and industry – drawing on the monthly labour force survey and the ABS's new Weekly Payroll Jobs and Wages in Australia survey. I find that the lockdowns have disproportionately affected both jobs and wages in certain industries, and have been regressive in their substantially different impacts on workers of different ages, with mid-life workers by far the least affected and young workers disproportionately likely to have dropped out of the labour force. I also find that the government's JobKeeper program is likely to have had a major, if short-term, impact on job preservation and income levels. In the second part of the paper, I draw on state-level data on school closures over the same period to estimate the amount of pupil-days that have been disrupted due to the lockdowns, and then apply standard estimates from the economics of education literature of the correspondence between length of schooling and wages to estimate the wage losses expected to eventuate under different assumptions about how effective online learning is relative to school-based learning. Conservative estimates indicate losses of between AUD$50 million and AUD$100 million from coronavirus-related schooling disruptions.

JEL Codes: I2, I3, J2, J3
Keywords: Covid-19, foregone wages, unemployment, JobKeeper, school closures, online learning

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1. Introduction

What economic damage has been caused by the 2020 COVID-19 disruptions in Australia? Existing research using data from other countries and/or other times can be used to provide a rough gauge of some dimensions of the damage. However, due to the new, evolving, and unprecedented nature of the situation, few quantitative estimates yet exist of the extent and nature of the damage in Australia based on Australian data. The present paper takes a step towards filling this gap.

Globally, many impacts of the COVID-19 disruptions – from the virus itself, from people's individual endogenous responses to the perceived threat posed by the virus, and from governments' policy actions in response to the situation – have already occurred both within and outside the realm of labour markets, with labour market effects like job and income loss leading to further negative effects on broader measures of health and wellbeing. Suicides and domestic violence have reportedly increased in Australia and overseas (Cormack 2020, Taub and Bradley 2020, Bosman 2020, Ashworth 2020), healthcare for problems other than those relating to COVID-19 appears to have been crowded out, leading to excess morbidity and mortality (Scott 2020, Cohen 2020, Pan 2020), and particularly in the developing world, massive amounts of excess deaths have been witnessed due to famines, the stalling of health care programs, and civil unrest (Gurda 2020, Harvey 2020, Husain 2020). Most of these impacts are likely to have been regressive in nature, hurting most of those people who were already comparatively badly off. Further impacts are likely to be revealed over time as the world slowly catches back up with the economic trajectory we otherwise would have followed, were it not for the COVID-19-induced global economic slowdown. Based on the association between GDP per capita and human health/longevity (OECD 2017), the changes set in motion by the economic braking applied around the world starting in early 2020 would be expected to produce significant long-run damage. Back-of-envelope estimates indicate that such damage may easily be equivalent to the destruction of orders of magnitude more statistical lives than the destruction of human life attributable directly to COVID-19.[1]

The scale of these effects and their long-run nature likely explain why no formal academic papers yet exist that try to estimate them comprehensively. However,

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1 The comparison appropriate for the evaluation of COVID-19 policy choices is between the loss of welfare arising from the policies pursued to the loss of welfare we would predict to have arisen were it not for those policies. While a formal accounting of these quantities is beyond the scope of the present paper, initial modelling of the potential loss of life from COVID-19 just within Australia (McCauley *et al.* 2020) delivered estimates of up to 150,000, or three orders of magnitude more than what Australia has actually experienced (just under 200), and one order of magnitude greater than what we would have experienced if we had seen the worst observed per-capita death rate in the world as of 1 July (Belgium, whose per-capita death rate would have translated to about 22,000 deaths in Australia; Statista 2020). Also, as most COVID-19 deaths and suffering occur in people aged 70 or more, the value of the quality-adjusted life years lost directly because of the virus is far lower than if the virus were age-blind. Based on the above counterfactual estimates of COVID-19-induced deaths, Australia's policy responses have arguably been far more expensive per QALY saved than what is spent by the government to save a QALY in normal times (https://clubtroppo.com.au/2020/05/18/the-corona-cost-benefit-analyses-of-richard-holden-bruce-preston-and-neil-bailey-ooops/).

short-run impacts specifically on standard labour market outcomes have already been estimated using data in other countries. In a recent series of two papers evaluating the evidence from the USA and Canada respectively, Béland and co-authors (2020a, 2020b) find evidence of significant regressivity of the economic impact of COVID-19-related disruptions in those two countries – with younger, minority, and less-educated workers and those who are unable to perform their work from home or without proximity to others feeling worse impacts than other types of workers. These authors also document significant mental health effects on affected workers. More effects on jobs and wages will eventuate as time goes by, but these papers at a minimum provide lower bounds of the damage based on a set of currently measurable outcomes in the USA and Canada.

Recent work has also attempted to estimate the longer-run effect of COVID-19 disruptions on children taken out of school. The Grattan Institute survey of this work (Sonnemann and Goss 2020) provides initial estimates of the increased achievement gap between more and less advantaged Australian students that will be created as a result of the COVID-19 school closures, and recommends further funding targeted to the neediest students in order to mitigate this outcome. However, the Institute's report falls short of estimating aggregate impacts on lifetime wages for students overall, or by level of advantage.

In this paper, I use Australian data from the period of 14 March to 30 May 2020 to gauge the impact in evidence so far on jobs and wages in different segments of the Australian labour market, and the projected impact on the adult wages of today's schoolchildren whose education has been disrupted due to school closures. In the first part of the paper, focussing on descriptive analysis of core labour market outcomes that have already been seen, I examine the differences in raw changes in jobs and wages during the window of observation across worker types and industries. In the second part of the paper, I produce a range of estimates of the impact of COVID-19-related school closures on children's later lifetime wages based on different assumptions about the equivalence of disrupted (online) learning to normal in-person learning, plus previous findings about the impact of additional years of schooling on later-life wages. Both sections of the paper deliver only partial, lower-bound estimates of the costs of the COVID-19 disruptions.

2. Gauging the impact on Australian jobs and wages

In Australia, COVID-19-related behavioural modifications – which could have affected both labour supply and, via its effect on consumer demand, labour demand – and government policy responses to the virus occurred between February and May 2020.[2] Government policy responses include both restrictions on economic activity, including lockdowns, and stimulus programs such as JobKeeper. States and territories were able to set their own preferred restrictions on activity (such as domestic border closures, social-distancing rules applicable to businesses, and rules about acceptable reasons to be outside one's home), meaning that policies with potential effects on the

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2   Effects of the renewed lockdowns in Victoria starting in July 2020 – or any further lockdowns beyond May in any state or territory – are excluded from the estimates in this paper.

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labour market varied across states and territories. Changes to individual behaviour may also have been different in different states and territories since signals of danger (e.g. rates of infection and death) that workers and employers may have reacted to were different in different areas. In addition, the labour market effects of behavioural and policy changes in response to the virus are likely to have been varied across industry and worker type.

I tabulate data from two sources – the Monthly Labour Force survey, and the new Weekly Payroll Jobs and Wages in Australia survey, both produced by the Australian Bureau of Statistics – to describe the impact of the first few months of COVID-19-related disruptions on Australian workers, bearing in mind the types of potential heterogeneity in impact discussed above. The advantage of the former data source is that it has been run for many years and hence comparative data are available that enable seasonal adjustment and year-over-year comparisons. The advantage of the latter data source is its weekly frequency, its inclusion of wage data, and its breakdown of data by detailed worker type (including granular age group) and by industry.

2a Monthly Labour Force survey

Table 1 captures the baseline impact on the Australian labour market month-by-month during the four-month window of February through May 2020. Panel A displays monthly employment figures and year-over-year per cent changes in the number of employed persons for the Australian labour force overall and for different subsets of workers defined by age, state, gender and full-time versus part-time status. Panel B shows unemployment and participation rates overall, for young workers, and separately for men and women.

Table 1: Changes in Employment, Unemployment, and Participation

	Total Labour Force				15-24 year olds			
	Feb-20	Mar-20	Apr-20	May-20	Feb-20	Mar-20	Apr-20	May-20
PANEL A								
Employed persons (000s)	12992.3	12989.2	12381.8	12154.1	1939.6	1955.4	1729.2	1626.2
% chg yr/yr in employed persons	1.9%	1.6%	-3.3%	-5.4%	-0.8%	0.3%	-11.3%	-16.8%
% chg yr/yr in employed males	1.2%	0.9%	-3.1%	-5.4%	-2.6%	-0.8%	-10.5%	-16.1%
% chg yr/yr in employed females	2.6%	2.4%	-3.6%	-5.4%	1.3%	1.4%	-12.1%	-17.3%
% chg yr/yr in full-time employed persons	1.5%	0.9%	-1.7%	-2.7%	-4.8%	-4.2%	-9.8%	-12.4%
% chg yr/yr in part-time employed persons	2.6%	3.1%	-6.9%	-11.2%	2.8%	4.1%	-12.5%	-20.2%
NSW employed persons (000s)	4128.1	4125.5	3900.3	3856.4	*624.8*	*630.2*	*541.1*	*504.1*
% chg yr/yr in NSW employed persons	0.9%	0.9%	-5.1%	-7.0%	*-1.5%*	*1.8%*	*-14.8%*	*-20.2%*
VIC employed persons (000s)	3434.7	3445.8	3317.8	3247.1	*509.0*	*501.0*	*457.6*	*429.8*
% chg yr/yr in VIC employed persons	1.8%	1.9%	-1.5%	-4.3%	*-3.3%*	*-3.6%*	*-9.6%*	*-17.4%*
QLD employed persons (000s)	2565.1	2558.9	2419.1	2390.9	*397.4*	*396.3*	*356.1*	*343.4*
% chg yr/yr in QLD employed persons	2.7%	1.9%	-3.8%	-5.2%	*-4.3%*	*-1.1%*	*-11.9%*	*-15.7%*
SA employed persons (000s)	849.6	854.4	817.3	806.1	*127.4*	*128.3*	*118.0*	*110.5*
% chg yr/yr in SA employed persons	0.7%	0.1%	-4.5%	-6.3%	*-0.8%*	*-2.7%*	*-8.8%*	*-15.6%*
WA employed persons (000s)	1376.1	1367.4	1302.2	1272.0	*208.6*	*204.3*	*176.4*	*166.2*
% chg yr/yr in WA employed persons	2.8%	2.0%	-3.3%	-5.4%	*13.1%*	*8.8%*	*-8.4%*	*-9.9%*
NT employed persons (000s)	133.0	135.7	132.1	129.9	*16.4*	*16.4*	*16.2*	*15.6*
% chg yr/yr in NT employed persons	1.2%	2.5%	2.6%	1.1%	*-10.4%*	*-4.2%*	*-7.3%*	*-3.4%*
ACT employed persons (000s)	237.3	238.3	231.1	227.5	*39.1*	*37.2*	*34.9*	*32.6*
% chg yr/yr in ACT employed persons	5.0%	5.3%	1.4%	-0.1%	*11.3%*	*5.4%*	*-1.2%*	*-7.6%*
PANEL B								
Unemployment rate	5.1%	5.2%	6.4%	7.1%	12.3%	11.6%	14.1%	16.1%
Male unemployment rate	5.2%	5.3%	6.6%	7.2%	13.6%	12.9%	15.4%	16.3%
Female unemployment rate	4.9%	5.1%	6.0%	6.9%	10.8%	10.2%	12.9%	15.4%
Participation rate	65.9%	65.9%	63.6%	62.9%	68.4%	68.4%	62.5%	59.9%
Male participation rate	70.8%	70.8%	68.9%	68.1%	67.6%	68.1%	63.1%	59.9%
Female participation rate	61.3%	61.2%	58.4%	57.8%	69.1%	68.7%	61.9%	60.0%

Source: Australian Bureau of Statistics Monthly Labour Force Survey. All data are seasonally adjusted except figures in italics.

The seasonally adjusted figures in the top portion of Panel A, for Australia overall, indicate that the impact of the COVID-19 phenomenon began seriously impacting the Australian labour market in April 2020, with year-over-year reductions in the number of employed persons in April and May of 3.3 per cent and 5.4 per cent respectively. For young (15-24 year old) Australian workers, for whom figures are shown on the right-hand side of the panel, the comparative year-over-year changes were almost three times as large, at -11.3 per cent and -16.8 per cent, respectively, in April and May. The year-over-year changes during these key months on male and female workers were reasonably comparable, though for younger workers the impact

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was slightly greater for women. Workers in full-time employment were far less impacted than those with part-time employment, with the former group reduced by 1.7 per cent and 2.7 per cent in April and May, respectively, while part-time workers reduced in number by 6.9 per cent and 11.2 per cent in the same months. For young workers this difference by full-time/part-time status was even more striking, with a staggering 20.2 per cent year-over-year drop in May 2020 in the seasonally adjusted number of young people in part-time employment.

The second part of Panel A of Table 1 breaks down these figures for workers overall, and for young workers (not seasonally adjusted), by state and territory. The total number of people in jobs was impacted negatively in April and May in all states, but in the Northern Territory and the ACT, negative and significant impacts were seen only for young people. In the Northern Territory, the year-over-year contractions in employed young people seen in April and May continued (though at a reduced rate) the downward trend evident in February and March, and hence are more likely to reflect underlying structural factors rather than COVID-19 disruptions.

Panel B of Table 1 shows the monthly unemployment and participation rates overall, for women and men, and for young workers during this period. The overall 2 percentage point increase in unemployment, coupled with a 3 percentage point drop in the overall participation rate, between February and May 2020 reflected similar trends in both series for both men and women. Young people began in February 2020 at a much higher rate of unemployment (12.3 per cent, compared to 5.1 per cent for the labour force overall), likely reflecting structural factors. Young men's unemployment rate climbed 3 percentage points and young women's climbed almost 5 percentage points between February and May, with drops in the participation rate for each group of roughly 8 and 9 percentage points, respectively. As a per cent of baseline rates, the unemployment rates of the young rose (31 per cent) even less than those of the Australian labour force overall (39 per cent), while participation rates of the young plunged much more starkly. These figures suggest that young workers responded disproportionately to the COVID-19 disruptions to employment security and opportunities by withdrawing from the labour force.

2b Weekly Payroll Jobs and Wages in Australia survey

The Weekly Payroll Jobs and Wages survey is a new product from the Australian Bureau of Statistics, produced from the observed submissions of employers to the Australian Taxation Office via the Single-Touch Payroll (STP) digital system. All employers that use the STP system are included in the survey.[3] The survey includes information on both the number of payroll jobs, and the total amount of wages paid, on a weekly basis and broken down by granular age group and industry.

Tables 2 and 3 present the per cent changes, each week and over the whole

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3   From the Explanatory Notes published by the ABS to accompany the survey data: "Approximately 99 per cent of employers the ATO classifies as 'substantial employers' (those with 20 or more employees) are reporting through STP. Small employers (those with 19 or less [sic] employees) began transitioning to STP on 1 July 2019 and over 80 per cent are reporting through STP. As a result, not all jobs in the Australian labour market are captured within these estimates."

period between 14 March and 30 May, in the number of jobs and amount of wages paid, respectively, reported by employers in this new survey. Each table tabulates figures for the labour force as a whole, for men and women separately, for each of seven age-range buckets, and for eleven selected industries. The included industries are ranked by total per cent decrease in the quantity in focus on each table (jobs for Table 2, and wages for Table 3) and are selected for inclusion based on either witnessing large reductions, being the least affected (*Financial & insurance services*), or being of particular interest due to the nature of the COVID-19 disruptions (e.g. *Health care & social assistance* and *Education & training*).

Table 2, tabulating losses in numbers of jobs, shows that aggregate losses commenced at the start of the period and continued to occur on a weekly basis through mid-April, after which job numbers began to recover. This basic pattern held true for both men and women, for each age group, and for most negatively affected industries. However, the magnitude of job loss varied substantially by age group and industry. While jobs of people aged 40-49 and 50-59 were lost week-over-week by a maximum of 1.7 per cent and 1.6 per cent, respectively (observed in the week of 28 March to 4 April), people in every other age group experienced far more dramatic maximum weekly job losses. Jobs in the youngest age group (aged under 20 years) fell week-over-week by 7.4 per cent, 9.9 per cent, and 7.6 per cent in succession between mid-March and mid-April. Total job losses over the 14 March to 30 May period were 3.9 per cent for those in their 50s, as compared with 16.5 per cent for workers under 20 years old, between 12 and 13 per cent for workers aged 20-29 or over 70, and in the mid-single digits for all other age ranges. Looking across industries, in the bottom section of Table 2, reveals that the largest job losses by far occurred in the *Accommodation & food services* industry, with a total net decline of 29.1 per cent over the period and the largest contractions in the final week of March and the first week in April. *Arts & recreation* was the second worst-off industry, with equivalent timing and a total net loss over the period of 26.3 per cent of jobs in existence as at 14 March. *Education & training* and *Health care & social assistance* both lost 4.7 per cent of jobs over the period, with the biggest week-over-week losses in the former industry (and in *Administrative & support services*) commencing about a week later in the observation window than jobs in the most affected industries. *Finance & insurance services*, the least-affected industry and one of only two industries not to lose jobs during the period (the other being *Electricity, gas, water & waste services*, for which figures are not separately tabulated on the table), gained on net 0.5 per cent more jobs.

Table 3 shows equivalent breakdowns by worker and industry type for per cent changes in total payroll wages paid week-by-week, and in total, over the same period – where the underlying wage totals feeding into the percentage changes in Table 3 include JobKeeper payments.[4] The top rows of Table 3 show a net decline in total wages of 8.3 per cent over the period, with a steeper decline for men (-9.8 per cent) than for women (-5.9 per cent). The pattern of loss in wages by age group contrasts with the pattern of job loss shown in Table 2, with wages declining most in mid-life age ranges (between 30 and 59) and rising for only one group: workers under 20.

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4   This is an unavoidable consequence of the way in which the data are provided by the ABS.

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Table 2: Percent change each week in number of payroll jobs

	14 - 21 Mar	21 - 28 Mar	28 Mar - 4 Apr	4 - 11 Apr	11 - 18 Apr	18 - 25 Apr	25 Apr - 2 May	2 - 9 May	9 - 16 May	16 - 23 May	23 - 30 May	Total percent change, 14 Mar - 30 May
Total	-0.4%	-2.5%	-3.0%	-2.4%	-0.9%	0.2%	0.4%	0.3%	0.3%	0.0%	0.4%	-7.5%
Male	-0.4%	-2.0%	-2.2%	-1.8%	-0.6%	0.1%	0.1%	0.0%	0.2%	-0.2%	0.4%	-6.3%
Female	-0.5%	-2.8%	-3.5%	-2.7%	-1.1%	0.3%	0.6%	0.6%	0.3%	0.2%	0.4%	-8.0%
By age group:												
Age <20	-1.1%	-7.4%	-9.9%	-7.6%	-1.1%	0.9%	2.5%	1.7%	2.3%	1.1%	2.0%	-16.5%
20-29	-0.7%	-4.1%	-5.1%	-3.6%	-1.4%	0.3%	0.3%	0.7%	0.6%	0.1%	0.1%	-12.2%
30-39	-0.3%	-1.9%	-2.2%	-1.7%	-0.8%	0.1%	0.2%	0.2%	0.2%	-0.1%	0.3%	-5.8%
40-49	-0.3%	-1.5%	-1.7%	-1.4%	-0.6%	0.2%	0.3%	0.2%	0.1%	-0.1%	0.5%	-4.2%
50-59	-0.3%	-1.5%	-1.6%	-1.4%	-0.6%	0.2%	0.4%	0.2%	0.0%	-0.1%	0.6%	-3.9%
60-69	-0.5%	-1.8%	-2.2%	-2.0%	-1.0%	0.1%	0.6%	0.4%	0.0%	0.1%	0.4%	-5.9%
70+	-0.3%	-1.6%	-3.3%	-3.6%	-1.1%	0.0%	-0.6%	-1.4%	-0.4%	-0.4%	-0.4%	-12.5%
In selected industries (sorted on total percent decrease in payroll jobs over the period):												
Accommodation & food services	-2.7%	-13.5%	-16.1%	-9.2%	-0.8%	3.6%	2.5%	1.1%	0.7%	1.1%	2.1%	-29.1%
Arts & recreation services	-3.9%	-8.8%	-9.5%	-5.3%	-3.7%	3.8%	0.9%	-0.5%	-0.8%	-1.5%	0.0%	-26.3%
Information media & telecommunications	-0.6%	-2.2%	-2.8%	-2.6%	-0.6%	0.5%	-0.5%	-3.0%	0.0%	0.0%	0.8%	-10.5%
Administrative & support services	-0.2%	-1.7%	-4.4%	-3.1%	-2.2%	0.3%	0.5%	0.5%	0.5%	-0.3%	-0.3%	-10.1%
Rental, hiring & real estate services	-1.1%	-2.8%	-3.6%	-2.5%	-1.3%	-0.2%	-0.1%	0.2%	0.3%	-0.3%	0.9%	-10.1%
Other services	-0.1%	-2.2%	-3.3%	-3.7%	-1.2%	-0.3%	-0.3%	1.2%	0.7%	-0.1%	-0.6%	-9.7%
Agriculture, forestry & fishing	0.6%	-0.2%	-2.3%	-3.0%	-0.7%	0.1%	-0.6%	-1.3%	-0.6%	-1.0%	-1.1%	-9.5%
Retail trade	0.4%	-3.8%	-2.8%	-3.6%	-0.3%	0.6%	0.2%	1.1%	0.9%	0.6%	0.5%	-6.3%
Education & training	0.8%	-0.7%	-2.1%	-3.1%	-3.2%	-1.3%	0.6%	1.5%	0.9%	0.6%	1.3%	-4.7%
Health care & social assistance	-0.3%	-1.3%	-1.8%	-1.8%	-0.8%	0.3%	0.9%	0.7%	-0.3%	0.2%	-0.5%	-4.7%
Financial & insurance services	0.4%	-0.5%	-0.6%	0.3%	0.1%	0.2%	0.5%	-0.4%	-0.1%	-0.2%	1.0%	0.5%

Source: Australian Bureau of Statistics Weekly Payroll Jobs and Wages Survey.

Table 3. Percent change each week in total wages paid

	14 - 21 Mar	21 - 28 Mar	28 Mar - 4 Apr	4 - 11 Apr	11 - 18 Apr	18 - 25 Apr	25 Apr - 2 May	2 - 9 May	9 - 16 May	16 - 23 May	23 - 30 May	Total percent change, 14 Mar - 30 May
Total	-0.1%	-1.1%	-1.8%	-2.7%	-0.3%	0.4%	0.3%	-2.0%	-1.3%	-0.7%	0.7%	-8.3%
Male	0.1%	-1.1%	-2.0%	-3.5%	-0.5%	0.0%	-0.1%	-2.1%	-0.8%	-1.0%	0.9%	-9.8%
Female	-0.4%	-1.2%	-1.4%	-1.3%	0.0%	0.9%	0.9%	-1.8%	-2.0%	-0.1%	0.3%	-5.9%
By age group:												
Age <20	-3.1%	-2.6%	0.9%	1.1%	4.9%	9.3%	0.7%	-2.0%	-4.5%	-1.3%	2.8%	5.4%
20-29	-1.1%	-2.6%	-1.7%	-2.3%	0.3%	1.9%	0.5%	-1.3%	-1.5%	-0.6%	0.8%	-7.5%
30-39	0.0%	-1.2%	-1.4%	-2.5%	-0.8%	-0.3%	0.6%	-1.9%	-1.1%	-0.7%	0.7%	-8.3%
40-49	0.2%	-1.0%	-2.3%	-2.8%	-0.6%	-0.5%	0.3%	-2.3%	-1.0%	-0.6%	0.6%	-9.5%
50-59	0.1%	-1.0%	-1.9%	-2.6%	-0.4%	-0.1%	0.3%	-2.0%	-1.3%	-0.6%	0.7%	-8.6%
60-69	-0.1%	-0.9%	-1.5%	-2.7%	-0.3%	0.6%	0.8%	-1.9%	-1.7%	-0.4%	0.2%	-7.7%
70+	1.3%	3.4%	-2.1%	-5.3%	0.8%	3.1%	-2.4%	-3.6%	-1.1%	-1.2%	-0.1%	-7.2%
In selected industries (sorted on total percent decrease in payroll jobs over the period):												
Accommodation & food services	-7.0%	-11.8%	-7.2%	-5.3%	1.9%	14.6%	-4.3%	-2.7%	-5.0%	-0.8%	0.9%	-25.4%
Arts & recreation services	-4.1%	-4.6%	-2.1%	-1.3%	15.7%	0.9%	-2.1%	-10.8%	-4.8%	-2.1%	2.4%	-14.0%
Information media & telecommunications	0.8%	0.1%	-3.0%	-3.0%	-2.0%	0.7%	0.5%	-7.8%	-0.6%	0.2%	1.7%	-12.0%
Administrative & support services	2.1%	0.9%	-3.3%	-6.0%	-3.5%	3.3%	5.6%	-0.5%	-3.8%	-2.3%	-0.1%	-8.1%
Rental, hiring & real estate services	-0.6%	-0.7%	-0.6%	-3.5%	-1.0%	1.2%	-0.2%	-6.3%	-0.7%	-2.9%	0.9%	-13.7%
Other services	0.7%	1.8%	1.0%	-4.0%	-1.2%	1.8%	-0.2%	-0.5%	-2.1%	-0.5%	-0.6%	-4.0%
Agriculture, forestry & fishing	2.2%	2.2%	-1.4%	-4.6%	-0.3%	2.6%	-0.9%	-2.1%	-1.1%	-1.3%	-1.7%	-6.4%
Retail trade	-0.6%	-2.5%	-1.7%	0.9%	1.2%	2.0%	-1.9%	-1.4%	-2.2%	-1.7%	3.6%	-4.3%
Education & training	2.2%	-0.3%	-1.3%	-1.8%	-1.8%	-1.0%	1.9%	1.0%	0.8%	-0.2%	1.2%	0.7%
Health care & social assistance	-0.8%	-0.9%	0.0%	1.0%	0.1%	-0.4%	0.7%	-0.4%	-2.0%	1.7%	-2.4%	-3.4%
Financial & insurance services	6.6%	0.9%	-7.1%	-1.7%	-2.9%	-3.5%	0.0%	-3.4%	0.1%	0.9%	2.4%	-8.1%

Source: Australian Bureau of Statistics Weekly Payroll Jobs and Wages Survey.

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Patterns in wage changes by industry are similar to the patterns in job losses shown in Table 2, except that the industry least affected by job losses (*Financial & Insurance Services*) did see a substantial wage contraction (-8.1 per cent), and that the *Education & Training* industry saw a net increase in wages paid (+0.7 per cent), in spite of job losses. Many education providers are likely to have responded to the COVID-19 disruptions by cancelling or failing to renew contracts for casual front-line teaching staff, but these data indicate that any such reductions did not translate into savings in terms of the total wage bill across the industry.

Figures 1 and 2 show graphically the patterns of movement in jobs and payroll wages, respectively, for selected worker types and industries over this period. Figure 1 demonstrates visually the disproportionate job losses for young workers and for workers in *Accommodation & Food Services* and *Arts & Recreation*. Figure 2 shows visual evidence in the series for young workers and for these two most heavily affected industries that JobKeeper payments kicked in (retroactively) around the second to third weeks in April, with total wages pushed higher than initial levels – and remaining higher than starting levels for the youngest workers even at the end of the period. The numbers in Figure 2 are underestimates of the gain in wages per employed young worker over this period, since the substantial job losses early in the period meant that the larger total wage payouts starting in mid-April were made to a smaller number of people (i.e., only to those still employed or on JobKeeper).

Figure 1: Trends in Number of Jobs for Selected Worker Types and Industries
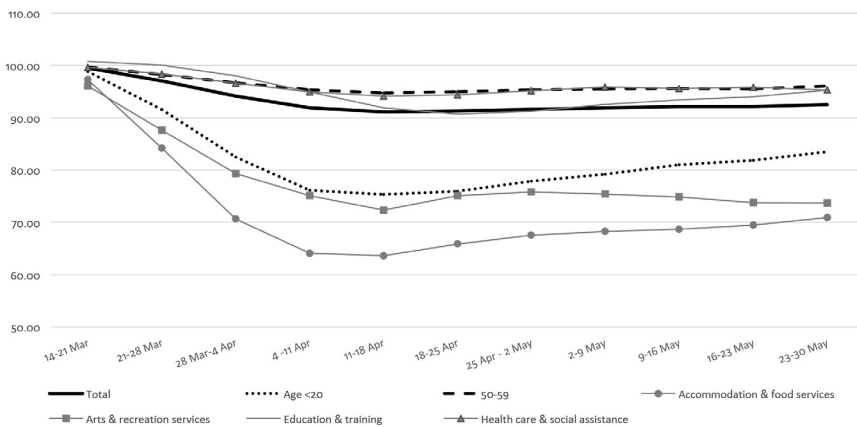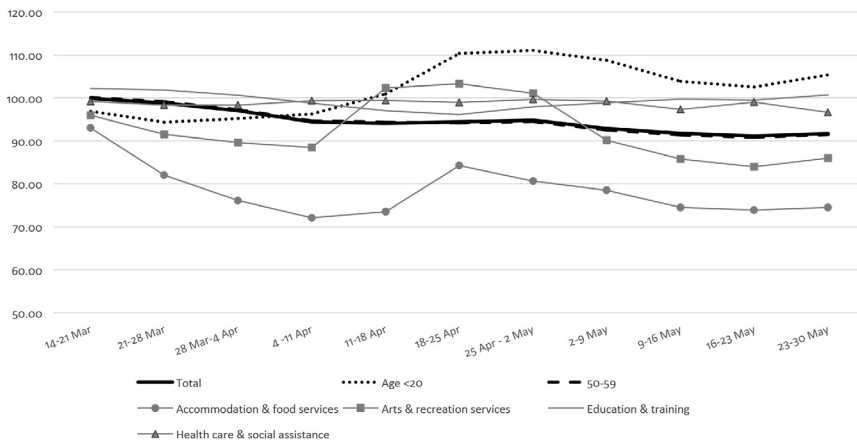
Figure 2: Trends in Total Payroll Wages for Selected Worker Types and Industries

The evidence reviewed in this section indicates that mid-life workers were mostly likely to hold on to their jobs during this period and young workers were most likely to lose their jobs, which often caused these latter workers to leave the labour force. The youngest workers who did remain in jobs saw a net rise in pay over the period, reflecting the impact of Jobkeeper's flat-payment structure that mechanically increased the wages of workers previously earning less than $1500 per fortnight. The impacts on both jobs (negatively) and wages (positively) were particularly dramatic for workers in *Accommodation & food services* and *Arts & recreation*, with the total wage bill in these industries still substantially lower at the end of the period notwithstanding JobKeeper, perhaps due not only to the smaller worker group but to the gradual re-ignition of some activity – accompanied by workers coming off JobKeeper and back onto their lower-income regular jobs – in these sectors starting in May.

3. Estimating the impact on schoolchildren's later-life wages

While immediate effects of COVID-19 policies on jobs and wages can be tabulated, we have yet to witness the longer-run impact on the Australian labour market of policy decisions made in the first half of 2020. One type of COVID-19 policymaking likely to have significant long-run effects on labour market outcomes is mandates to disrupt primary and secondary education for extended periods.

Gauging the likely size of the long-run impacts of these disruptions is challenging at best, given the far-future nature of the required projections and the multi-faceted nature of the impacts. For the purposes of this paper, I make no attempt to estimate anything but the impact on future wage outcomes, meaning that adult-

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era negative impacts from phenomena such as increased domestic violence, reduced mental health, or the development of less healthy habits due to the experiences of children during this period are completely excluded from my estimates.

To deliver rough estimates of the lifetime wage impact of COVID-19 disruptions on Australian schoolchildren, I proceed as follows.

1. Estimate the raw number of pupil-days conducted online, by state, recognising the potential for differences across school sector (public/independent/Catholic) where these can be reliably observed. Tabulate disrupted pupil-days by year level and by socio-economic advantage, the latter proxied imperfectly, due to data limitations, by Indigenous/TSI status.
2. Take the estimate from prior research, also used in Psacharopoulos *et al*. (2020), that every year of schooling yields approximately 9 per cent more future earnings, and assume a linear reduction in learning for each day disrupted. Using these figures together with the result of Step 1, plus conservative parameters for the length of working life (45 years), the appropriate yearly discount rate for wages earned across that working life (3 per cent), the initial annual wage (AUD$52,000) and the yearly increase in that wage (1 per cent), calculate a rough baseline estimate of the future earnings losses that will be suffered by the "coronavirus cohort" of Australian schoolchildren who have been directly impacted by the COVID-19-related school closures.
3. Explore the sensitivity of this baseline estimate to changes in the assumptions.

Because school closures are enacted and enforced at a state or territory level, and because the fraction of the student body that is advantaged differs across regions, I construct separate estimates for Step 1 for each state and territory.

Table 4: School Disruption Patterns by State and Territory

	(1) NSW	(2) VIC	(3) QLD	(4) TAS	(5) SA	(6) WA	(7) ACT	(8) NT
Date								
23-Mar								
24-Mar		HH						
25-Mar		HH						
26-Mar		HH						
27-Mar		HH						
30-Mar		H						
31-Mar		H						
1-Apr		H						
2-Apr		H						
3-Apr		H				HH		
6-Apr		H	H	HH**	**	HH		**
7-Apr		H	H	HH**	**	HH		**
8-Apr		H	H	HH**	**	HH		**
9-Apr		H	H	HH**	**	HH		**
10-Apr	H	H	H	H	H	H	H	H
13-Apr	H	H	H	H	H	H	H	H
14-Apr	H	*	H	H	H	H	H	H
15-Apr	H		H	H	H	H	H	H
16-Apr	H		H	H	H	H	H	
17-Apr	H		H	H	H	H	H	H
20-Apr	H			H	H	H	H	BACK
21-Apr	H			H	H	H	H	
22-Apr	H			H	H	H	H	
23-Apr	H			H	H	H	H	
24-Apr	H			H	H	H	H	
27-Apr	*			*	H	*	H	
28-Apr	*				BACK	*		
29-Apr						BACK		
30-Apr								
1-May								
4-May								
5-May								
6-May								
7-May								
8-May								
11-May								
12-May								
13-May								
14-May								
15-May								
18-May								
19-May								
20-May								
21-May								
22-May								
25-May	BACK	*	BACK					
26-May								
27-May								
28-May								
29-May								
1-Jun							H	
2-Jun							BACK	
3-Jun								
4-Jun								
5-Jun								
8-Jun								
9-Jun		BACK		BACK				

Notes: Dark shading indicates all children advised or required to learn online (with some exceptions for children of "essential workers"); light shading indicates phased return to school, with distinctions in fraction of learning online for different year levels (i.e., earliest and/or most advanced year levels versus other children); H = normal school or public holiday (public schools); HH = additional school holiday; * = normal pupil-free day (public schools); ** - additional pupil-free day (public schools); BACK = normal schooling resumes for all year levels

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Table 4 tabulates in a visual format, the main schooling disruptions in each Australian state and territory, based on data gathered from the websites of each of the eight state- and territory-level Departments of Education. The table shows that schooling in South Australia, Western Australia, and the Northern Territory was substantially less disrupted than schooling in other states and the ACT. Of the more affected states and the ACT, between 20 and 28 days were disrupted for students in all year levels, with an additional 10 to 12 days partially or fully disrupted for portions of students (defined by year level) before schools reopened for all year levels. By contrast, students in South Australia, Western Australia and Northern Territory each lost between 4 and 9 days of normal schooling, regardless of year level, across the whole period.

The full impact of the disruptions shown in broad brush on Table 4 depends on a number of factors. First, the detailed nature of the disruptions was slightly different in each state (e.g., during the partial school closures that followed wholesale closures in a number of states, some allowed only Year 11 and/or Year 12 students back, and others allowed back students in other selected years of schooling as well, most frequently including the youngest students). Second, the number and type of enrolments affected differed by state and territory, with different fractions of students socio-economic advantaged/disadvantaged, and different quantities of enrolment in different sectors (public, independent, and Catholic). Third, the impact of each disrupted pupil-day depends on the effectiveness with which the online learning on that day substituted for the in-person learning which would have occurred in the absence of the disruption.

On the first point, while for expositional simplicity not all idiosyncrasies of school disruptions are depicted on Table 4, the policy idiosyncrasies made public on the websites of the Departments of Education in each state and territory inform estimates in the sub-sections below of the state- or territory-level impact of disruptions on students of different types, and are available in detailed form upon request from the author. On the second point, Table 5 shows student enrolment levels by state and territory in 2019, grouping together student numbers for the least-affected regions of South Australia, Western Australia, and the Northern Territory. The enrolment numbers shown in Table 5 are used (with breakouts by school sector when appropriate) in each sub-section below.

On the final point – to what extent does online learning substitute for in-person learning? – I apply a range of estimates in Section 2G in order to generate rough whole-of-country estimates for the future wage losses of the Australian schooling disruptions during this period. To be conservative, I assume that extra holidays are equivalent to disrupted school days in terms of their net effect on children relative to the counterfactual benefit of school (though in reality, extra holidays are unlikely to replace normal schooling as completely as does disrupted schooling).

Table 5: Enrolment figures by state/territory and A/TSI status

Grade	NSW		VIC		QLD		TAS		ACT		SA / WA / NT	
	A/TSI	Non-A/TSI	A/TSI	Non-A/TSI	A/TSI	Non-A/TSI	A/TSI	Non-A/TSI	A/TSI	Non-A/TSI	A/TSI	Non-A/TSI
Pre-year 1	6,800	93,476	1,584	79,510	6,070	60,709	580	5,781	193	5,972	4,862	128,011
Year 1	6,706	94,385	1,484	80,222	6,063	60,988	612	5,701	204	5,810	4,819	129,020
Year 2	6,323	93,277	1,347	77,765	6,054	60,809	576	5,904	182	5,681	4,893	127,466
Year 3	6,015	92,730	1,347	77,251	6,029	61,932	620	5,772	195	5,653	4,935	126,903
Year 4	6,042	92,257	1,367	77,436	6,019	63,748	659	5,993	182	5,711	4,872	126,385
Year 5	5,951	91,872	1,398	76,521	5,966	62,925	715	6,147	164	5,447	5,013	125,477
Year 6	6,104	92,312	1,350	77,443	5,989	63,383	668	6,100	169	5,321	4,725	126,795
Ungraded primary	1,784	10,097	311	5,595	4	175	0	11	0	0	975	10,134
Year 7	6,088	89,503	1,342	75,430	5,865	62,724	621	6,030	193	5,558	4,065	122,962
Year 8	5,635	86,334	1,290	72,918	5,426	61,216	612	5,864	172	5,343	4,458	118,478
Year 9	5,467	83,328	1,181	70,334	5,211	58,647	561	5,449	182	5,063	3,965	113,921
Year 10	5,203	83,461	1,127	70,772	4,619	58,063	508	5,584	161	5,106	3,575	113,218
Year 11	3,557	73,447	985	65,529	3,866	51,802	414	4,967	143	4,904	3,358	102,098
Year 12	2,364	63,955	680	56,818	2,208	36,145	326	4,309	117	4,383	2,309	89,204
Ungraded secondary	2,561	13,378	391	6,680	3	51	0	10	0	0	157	13,548
TOTAL	76,600	1,153,812	17,184	970,224	69,392	763,317	7,472	73,622	2,257	69,952	56,981	1,573,620

Source: Australian Bureau of Statistics, 4221.0 Schools, Australia, 2019, Table 42b.

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3a New South Wales

Table 4 shows that New South Wales was the first state to move students online, on 23 March. Starting earlier in March, a smattering of individual schools in the state had closed due to local diagnoses of the virus, and on 15 March the state's Department of Education had banned assemblies, gatherings, excursions, and inter-school sports and activities involving more than three schools. Starting on 23 March, parents were encouraged (though not required) to keep their children home to learn online, and online platforms were also used for pupils who attended school in person.

In terms of differences between school sectors, while there may have been individual variation in the choices of principals in independent and Catholic schools, during the period only a single day (28 April) was clearly scheduled as in session for private schools but not for public schools, with no impact on this difference due to the virus.

The partial reopening of New South Wales schools shown on Table 4 as spanning the period 7 to 22 May involved Year 12 students attending school for 2 days per week and all other students attending 1 day per week.

Conservatively ignoring all impacts on normal schooling prior to 23 March and the evidently small differences between sectors, and multiplying the appropriate number of disrupted days by the pupils enrolled in each year level in New South Wales schools, yields a total of approximately 35 million pupil-days disrupted for non-ATSI students and 2.3 million days disrupted for ATSI students. These totals and the breakdown of disrupted days by year level are shown in the first two columns of Table 6.

Table 6: Disrupted School Days, by Year Level and State/Territory

Grade	NSW		VIC		QLD		TAS		ACT		SA		WA		NT	
	A/TSI	NOT-A/TSI	A/TSI	NOT-A/TSI	A/TSI	NOT-A/TSI	A/TSI	NOT-A/TSI	A/TSI	NOT-A/TSI	A/TSI	NOT-A/TSI	A/TSI	NOT-A/TSI	A/TSI	NOT-A/TSI
Pre-year 1	205943	2830987	49104	2464810	121400	1214180	11020	109839	5211	161244	4188	82320	22284	290538	5356	9012
Year 1	203096	2858517	46004	2486882	121260	1219760	11628	108319	5508	156870	4104	79288	22212	292221	5300	8664
Year 2	191497	2824961	41757	2410715	181620	1307040	10944	112176	4914	153387	4352	79032	21609	288009	5616	8752
Year 3	182169	2808394	55227	3167291	180870	1330350	11780	109668	6240	180896	4072	77460	22275	288936	5768	8276
Year 4	182986	2794069	56047	3174876	180570	1361040	12521	113867	5824	182752	4156	78916	21465	288531	5792	8276
Year 5	180230	2782409	57318	3137361	178980	1329030	13585	116793	6068	201539	4480	79120	22113	284778	5744	7852
Year 6	184864	2795735	55350	3175163	179670	1334850	12692	115900	6253	196877	4032	80612	21384	291753	5364	8264
U Prim	54030	305795	12751	229395	120	120		209	0	0	3900	77944	0	333	0	0
Year 7	184379	2710662	55022	3092630	175950	1180440	18630	180900	5211	150066	1192	12480	21726	284733	5412	7288
Year 8	170660	2614687	52890	2989638	162780	1161900	18360	175920	6364	197691	3952	77084	20511	272799	4764	7332
Year 9	165572	2523648	48421	2883694	156330	1104540	16830	163470	6734	187331	3656	73056	17793	260424	4296	6628
Year 10	157577	2527676	46207	2901652	138570	1091220	15240	167520	5152	163392	3396	77508	14949	253143	4260	6520
Year 11	107726	2224395	30535	2031399	77320	1036040	7866	94373	3861	132408	3960	79076	13518	243081	3464	6568
Year 12	67543	1827286	21080	1761358	44160	722900	6194	81871	3159	118341	2760	68580	10179	215640	1952	5156
U Sec	77562	405162	16031	273880	90	90	0	90	0	0	596	7808	0	927	32	268
TOTAL	2,315,833	34,834,383	643,744	36,180,744	1,899,690	15,393,500	167,290	1,650,915	70,499	2,182,794	52,796	1,030,284	252,018	3,555,846	63,120	98,856

Source: Australian Bureau of Statistics, 4221.0 Schools, Australia, 2019, Table 42b.

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3b Victoria

As in the case of New South Wales, a couple of Victorian schools were closed in early- to mid-March prior to whole-of-sector closures, due to outbreaks of the virus at those schools. Victoria then commenced school holidays early, on 24 March, and then began Term 2 on 15 April with no on-site classes. The partial re-opening beginning on 28 May involved the full-time return to school of students in all years up to and including Year 2, plus students in Year 11 and Year 12. There were no clear scheduled differences between school sectors in days disrupted.

Again ignoring any differences across sectors and all disruptions prior to the sector-wide early onset of school holidays on 24 March, and multiplying the number of disrupted days by the quantity of students enrolled in each year level, yields a total of roughly 36 million disrupted days for non-ATSI students and 643,744 disrupted pupil-days for A/TSI students in Victoria. Disrupted days by year level are shown in the Victoria-specific columns of Table 6.

3c Queensland

One school in Queensland was closed prior to sector-wide closures on 30 March due to a virus diagnosis at the school. On 30 March, schools went "student-free", with children of "front-line" workers still permitted to attend. On 20 April, Term 2 began with no on-site classes. The partial re-opening that began on 11 May involved students in pre-Year 1 and Year 1, plus Year 11 and 12, returning to school full-time, with other years still learning online. As with Victoria, no scheduled differences in virus-related disruptions between sectors were publicly announced in Queensland.

Applying the method described above for New South Wales and Victoria to Queensland yields a total of over 15 million disrupted pupil-days for non-A/TSI students, and almost 2 million disrupted pupil-days for A/TSI students, in Queensland, as shown in the Queensland-specific columns of Table 6.

3d Tasmania

A few independent schools in Tasmania switched to online learning on 30 March, a few days before the sector-wide early start of school holidays ("pupil-free days") on 6 April. Term 2 started on 28 April for government schools and a day earlier for Catholic and independent schools, in both cases with all classes online. Partial re-opening then began on 25 May with students in kindergarten through Year 6, Year 11, and Year 12 returning to school full-time.

Conservatively ignoring the excess disruption at non-government schools associated with the smattering of early closures on 30 March and the online learning on 27 April, a total of over 1.5 million pupil-days were disrupted in Tasmania for non-A/TSI students, and 167,290 days for A/TSI students, as shown in the Tasmania-specific columns of Table 6.

3e Australian Capital Territory

One school in the Australian Capital Territory closed on 23 March due to a student testing positive for the virus. On 23 March, schools went "student-free" for all years

and types of students. Partial re-opening commenced on 18 May with students in kindergarten through Year 2, Year 7, and Years 11 and 12 returning to school full-time. On 25 May, Years 3, 4, and 10 returned full-time, and on 2 June, all students returned to school.

The Australian Capital Territory-specific columns of Table 6 show the breakdown by year level of total disrupted pupil-days, which total just over 2 million days for non-A/TSI students and 70,499 days for A/TSI students.

3f Remaining states and territories

Analogous figures calculated for South Australia, Western Australia and the Northern Territory are separately enumerated in the final columns of Table 6. Across South Australia, Western Australia, and the Northern Territory, a total of just over 4.5 million disrupted pupil-days affected non-A/TSI students, and 367,934 pupil-days were disrupted for A/TSI students.

3g Aggregate estimated effects on schoolchildren (baseline and alternative estimates)

Based on the calculations above, the total number of disrupted pupil-days across Australia – adding up the state- and territory-level totals in the final row of Table 6 – comes to just over 100 million. Dividing this number by the product of 38 (approximate weeks of school in a normal year) and 5 (days per week of normal school when school is in session) yields an estimate of 528,381 pupil-years disrupted in Australia. Of these disrupted pupil-years, approximately 29,000, or 5.4 per cent, affected A/TSI students.

These 528,381 disrupted pupil-years can be translated into future wages of current schoolchildren foregone due to the disruptions, under assumptions about the severity of the disruptions to the value of schooling and the translation of years of schooling to future wages. On the latter, to recover a baseline figure I use the estimate used by Psacharopoulos *et al.* (2020) that an additional year of schooling translates into 9 per cent more wages per working year for the one receiving that schooling. Also, in a similar vein as Psacharopoulos *et al.* (2020), I assume that each foregone pupil-year will feed into 45 years of working life and wages, discounted at 3 per cent each year. I also assume conservatively that school-leavers' starting wage will be AUD$52,000 (slightly below the annualised average wage for young workers[5]) and will grow at 1 per cent per year in real terms.

Naturally, these assumptions are not inviolable. Psacharopoulos's (2020) assumption of 45 years of working life on average per child implies participation rates and unemployment rates that are higher and lower, respectively, than what this cohort may experience in Australia. For that reason, I reduce the average number of future years of working life to 35 in a robustness check below. Also, it may be argued that a portion of the return to years of schooling reflects relative rather than absolute years of education. To the extent that the entire Australian coronavirus cohort ends up in

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5   The average weekly wage for workers aged 21-34 was AUD$1,127.60 according to the May 2018 Employee Earnings and Hours report of the Australian Bureau of Statistics (https://www.abs.gov.au/ausstats/abs@.nsf/mf/6306.0).

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competition with itself, and if labour markets and related institutions do not bring about a reduction in wages to accommodate the reduction in absolute productivity that the schooling reductions for this cohort implies, Psacharopoulos's (2020) assumption of a 9 per cent wage return per year of schooling may be an over-estimate. To address this possibility, I run another robustness check below using a rate of return of 6 per cent rather than 9 per cent per year of schooling.

Applying these assumptions together with the assumption also used in Psacharopoulos *et al*. (2020) that 90 per cent of the value of a normal school-day is achieved on a disrupted day, and assuming that all students were to begin working tomorrow, yields a first-pass ballpark estimated value for foregone lifetime wages due to coronavirus-related schooling disruptions in Australia of approximately AUD$75 million. This number is highly sensitive to the assumption of how well online learning replaces normal schooling, jumping to almost AUD$150 million if disrupted school days have only 80 per cent of the value of normal school days, and AUD$373 million if disrupted days have only 50 per cent of the value of normal days. Using the initial 90 per cent equivalence figure and incorporating the differential timing of labour-market entry for secondary-school students and primary-school students, where the former are expected to enter three years from now on average and the latter eight years from now on average, the losses affecting each group are roughly AUD$30 million and AUD$37 million, respectively, for a total loss attributable to the disruptions of about AUD$67 million.

The baseline estimate of the unseen future wage cost of virus-related schooling disruptions is also sensitive to assumptions about the size and duration of future returns to schooling. The baseline estimate reduces by 50 per cent, from AUD$75 million to approximately AUD$50 million if the returns to schooling are assumed to be 6 per cent rather than 9 per cent. It falls to approximately AUD$63 million when children are assumed to work on average 35 years rather than 45 years as adults.

These estimates omit any impact of disruptions to aspects of students' learning apart from school – such as elevated risk of domestic violence due to confinement at home, elevated mental stress due to isolation from peers, uncertainty regarding how examination procedures or schedules will be modified, or any other impact on the value of schooling moving forward beyond this time period. The economics literature has long recognised that investments in education build on themselves – as Tian and Chen (2020) state in the title of their recent book chapter, "advantage begets advantage" – and so disruptions to children's learning in their early schooling years are likely to have a larger impact on lifetime wages, via their impact on the ability of those children to catch up to the education levels they otherwise would have achieved, than disruptions to children's learning in their later years of schooling.

Applying different fractional values to disrupted school days depending on the schooling year captures this idea very roughly. Assuming 80 per cent equivalence of disrupted to normal school days for primary schoolchildren and 90 per cent equivalence for secondary school children, and again assuming differential points of entry into the labour market, yields an estimate of approximately AUD$74 million in losses for primary-school students, and the previously estimated roughly AUD$30 million for secondary-school students, for a total estimated loss of just over AUD$100

million from COVID-19-related school disruptions. As noted above, an estimated approximately 5 per cent of these losses will be suffered by A/TSI students.

4. Concluding remarks

Australia's labour force has felt significant and regressive immediate effects from COVID-19 disruptions, with particularly acute negative impacts on young workers' participation rates and on workers in particular industries. The economic impact of these changes will continue to be felt for months and years to come, as the economy continues to lag the position it would have enjoyed, were it not for COVID-19 and responses to it.

The longer-run impacts of what has happened between February and May 2020 are myriad and complex, and therefore difficult to estimate precisely. Those who write history will eventually be in a position to judge the full set of trade-offs Australia has made during this crisis. In an attempt to peek forward into the future despite the inherent challenges of doing so, in the second part of this paper I provide an order-of-magnitude estimate of one aspect of the longer-run impact of COVID-19 disruptions: the impact on lifetime wages of Australian school children denied normal schooling during this period. The estimated future losses, using conservative assumptions, are on the order of AUD$50-$100 million.

Neither section of this paper has accounted for the decrease in labour productivity associated with keeping children at home, or for the costs of the considerable disruptions to universities (Chrysanthos 2020). Neither have I accounted for the likely within-year-level heterogeneity in impact of school closures, whereby less-advantaged students are likely to have been more negatively affected than advantaged students because the latter have more suitable home workspaces, more support from parents, and more of many other favourable resources to support their online learning compared to the former. The general equilibrium effects that are likely to afflict labour markets have also not been modelled here.

What is shown here is both a simple tabulation of (regressive) immediate impacts, and a method for estimating one small part of the less-obvious longer-run impacts, of our policy choices during this period. In future crisis moments faced by our country, losses such as these should be acknowledged, estimated at least roughly, and used to inform all policy-making that impacts the Australian economy.

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