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Review of COVID-19 policy responses for the GST distribution

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Final report to the Department of Treasury and Finance

by

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Contents

Executive Summary i
1. Introduction 1
2. Impact of COVID-19 in Victoria and comparison with other states and territories 4
2.1 Daily cases, hospitalisations, deaths and movement restrictions 4
Comparison with other states and territories 5
2.2 Economic impacts 9
State final demand 10
Employment 13
2.3 Impacts on health and healthcare 16
Public Hospitals 17
Comparison with New South Wales public hospital activities 19
Medicare services 22
Use of mental health services 23
2.4 Summary 24
3. Policy Response by governments 26
3.1 Types of policy response 26
3.2 Australia's policy responses to the pandemic 27
3.3 Policy responses by state/territory governments 28
Comparison with other states/territories 30
3.4 Victoria's second wave: External circumstances or policy decision? 33
3.5 Summary 35
4. Impacts of COVID-19 on fiscal capacity 36
4.1 Counterfactual scenarios 36
4.2 Impact on Victoria's fiscal capacity 37
4.3 Comparison with other states and territories 39
4.4 Summary 45
5. Options for GST distribution and implications 47
5.1 Differential impacts of COVID-19 on states/territories 47

5.2 The pandemic as a natural disaster 48
5.3 GST distribution 50
6. Conclusions 54
Appendix A 58
Appendix B 67

Executive Summary

Introduction

This work is commissioned by the Victorian Department of Treasury and Finance to examine the impact of the COVID-19 pandemic on Victoria's economy, with a view to inform the Department on policy options in relation to GST distribution and its implications.

The spread of COVID-19 was declared a pandemic by the World Health Organisation (WHO) on 11th March 2020. The pandemic is a health crisis that has wide ranging economic and social consequences. Australia has adopted a relatively stringent mobility restriction strategy in managing the crisis. The strategy has proven effective in containing the spread of the virus, but has imposed substantial costs on the economy in lost jobs and lower income. The economic repercussions require significant support measures from state and federal governments, leading to unprecedented public debt levels.

The pandemic is a natural disaster

The Australian Government Crisis Management Framework (AGCMF) published by the Department of Prime Minister and Cabinet defines pandemics as natural events. All states/territories have enacted emergency powers, some specific to public health but also specific to other ways to support communities, similar to other natural disasters such as bushfires and floods.

Differential impacts of COVID-19 on states/territories

The COVID-19 pandemic has had significant impacts on health and healthcare, and has caused major disruption to everyday activities. This was particularly the case in Victoria where, during 2020/21, about 82% of all confirmed COVID-19 cases were found and 99% of total COVID-19 related deaths in the country occurred in Victoria.

The economic disruption caused by COVID-19 in Victoria was severe. Consumption expenditures and employment in the state were impacted more than other states and territories in 2020/21. The extended lockdown in Victoria in 2020/21 also disrupted the healthcare sector, with mobility restrictions leading to significantly lower utilisation in primary and tertiary care services. Meanwhile, healthcare expenditures increased as through changes to healthcare infrastructure and procurement of necessary equipment and supplies to cope with COVID-19 and maintain hospital capacity.

Policy responses

Governments at all levels moved quickly to provide significant economic support to businesses and individuals. The response included implementing public health measures such as social distancing rules and strict lockdown measures. Contact tracing systems were also put in place as states and territories sought to regulate movements across state/territory borders, in line with the virus elimination strategy that prevailed at the time. These measures were universal across all states and territories, and had the affirmation and support of the Commonwealth government and the National Cabinet.

Given the more severe outbreaks in Victoria and the longer periods of lockdown in the state in 2020/21, the scale of Victoria's policy responses was necessarily more extensive. The Victorian Department of Treasury and Finance estimated that

spending on COVID-19 related policy initiatives in 2020/21 by Victoria amounted to $16b.

Differential impacts on Fiscal capacity

The more severe outbreak in Victoria in 2020/21 and longer periods of lockdown have necessitated more extensive public health and economic support measures that support the public health response. These policy initiatives have had major implications on the fiscal capacity of Victoria. Using counterfactual analysis, the impact of the pandemic on Victoria's budget expenses in 2020/21 is estimated to be $7.4b more than it would have been in the absence of the pandemic. This amount is more than six times larger than the corresponding estimate for other states and territories. The differential impact on fiscal capacity between Victoria and other states/territories was estimated to be $6.2b on average.

GST distribution

The distribution of GST pool among states/territories is based on the principles of horizontal equalisation. As such, GST monies received by a jurisdiction are based not on the actual level of expenditure or revenue incurred, but on the assessed expenditure and assessed revenue of the jurisdiction, which in turn is based on notions of average expenditure and revenue across all states and territories.

For the forthcoming update of GST distribution for the financial year 2020/21, two options for treating the differential impacts of the pandemic are applicable.

- Option 1 is business as usual, relying on the fiscal equalisation process; GST distribution will be based on assessed expenditures and revenues, with no adjustment for COVID-19 related spending by states/territories.

- Option 2 is to recognise the differential impacts in GST distribution by taking into account the actual expenditures incurred in response to the pandemic. This option effectively treats the pandemic like any other natural disaster.

Option 1 will not capture the differential impacts of the pandemic on states/territories, to the extent that the differential impacts are not reflected in the current methods of computing assessed expenditures and revenue. Option 1 would be favoured if spending in relation to COVID-19 policy initiatives were relatively small, or mostly driven by policy decisions of state/territory governments.

Option 2 is consistent with the view that the pandemic is a natural disaster. Under this option, the GST distribution would be adjusted for states/territories bearing the higher fiscal burden of the pandemic in 2020/21. Since states and territories responded to the pandemic within a nationally agreed policy framework, differences in fiscal burden are due not to policy choice but to the scale of outbreaks and specific local conditions that dictate the necessary health response and economic support. Under this option, a more equitable GST distribution is likely to result.

Conclusions

Victoria, with its more severe outbreaks, and longer periods in lockdown during the financial year 2020/21, has disproportionally borne the fiscal burden of the crisis relative to other states and territories. The differential impact should be recognised and accounted for in the forthcoming update of GST distribution. The pandemic is a natural disaster, as recognised in the Australian Government Crisis Management Framework. For a more equitable GST distribution, the pandemic ought to be treated like any other natural disaster.

1. Introduction

This report was commissioned by the Victorian Department of Treasury and Finance (henceforth the Department) to provide an analysis of the impacts of the SARS-CoV-2, or COVID-19, pandemic on Victoria's economy. The report will focus on the policy responses of Victoria and the impact on fiscal capacity of the state vis-à-vis other states and territories. The aim is to inform the Department on policy options in relation to the GST distribution process and its implications.

The first case of COVID-19 in Australia was reported in Victoria in January 2020. The spread of the virus was declared a pandemic by the World Health Organisation (WHO) on 11th March 2020. By then, much of Australia was in some form of lockdown, with varying degrees of mobility restrictions being put in place across states and territories to contain the spread of the virus.

Most countries responded to the pandemic in similar fashion, by mobility restrictions, coupled with organising and expanding the capacity of health services to cope, putting in place appropriate healthcare measures such as testing, screening and tracing procedures, and implementing care protocols for COVID-19 patients (Tartaglia et al., 2021). Australia and states/territories have followed similar management strategies as other advanced countries. Notably, Australia has adopted a relatively stringent mobility restriction strategy by closing international borders and implementing strict lockdowns, coupled with testing and contact tracing to prevent clusters of cases from escalating. These strategies have proven effective and have placed Australia among countries that have performed well in managing the pandemic, according to a study of 40 countries (Braithwaite et al., 2021). The strategies have been revised in recent months following the roll out of vaccines across the country. States and territories now adopt a 'living with COVID-19' strategy by gradually opening up as vaccination targets are reached.

The public health measures including lockdowns and the closure of international and interstate borders, however, cause significant disruptions to economic activities. Although it should be emphasised that the alternative of following low stringency or unmitigated strategies——the so-called herd immunity strategy——is not also without significantly higher costs and loss of life. The likely outcome of such a strategy includes high health costs, substantially more COVID-19 related deaths, and an overwhelmed health system as well as economic disruption, as borne out by experiences in the UK, Brazil, and several US states (Brett and Rohani, 2020; Ponce, 2020; Yarmol-Matusiak, 2021). Moreover, an unmitigated strategy would also

impose substantial economic losses, due to people reducing mobility for fear of contracting the virus (Kompas et al., 2021; Andersen et al, 2020; Goolsbee and Syverson, 2020; Chen et al., 2021).

States and territories that have more severe outbreaks, and consequently longer periods in lockdown, bear the bulk of the burden on economic costs of managing the pandemic. It should be emphasised that managing the spread of the virus within a state or territory not only confers benefits to residents in the state/territory, but also to residents in other states/territories, since an unconstrained outbreak would invariably lead to the virus spreading across state borders.

Key questions this research aims to address include:

- What are the impacts of the pandemic on Victoria's economy, its health care sector and residents' well-being relative to other states/territories?
- How do states/territories and the Commonwealth respond to the pandemic? How different or similar are the response?
- How different or similar are outcomes across states in terms of fiscal capacity?
- Are the differences a result of external circumstances or a consequence of policy choices?

The report will focus on events related to COVID-19 during the financial year 2020/21. The scope is set for practical reasons as dictated by the availability of data, as well as for the purpose of informing on the forthcoming updates on the process of GST distribution. Nonetheless, this report will make references to events in months prior to and after the financial year to provide context.

The report is structured as follows. The impact of the pandemic in Victoria will be discussed in Section 2, where the extent of the impact on the economy, and on health and healthcare will also be assessed. A comparison with other states and territories will also be made whenever data permit. In response to the pandemic, Commonwealth and state/territory governments have implemented a number of public health measures. For affected businesses and households, a range of support measures have also been announced to protect jobs and support economic activities. These policy responses will be discussed in Section 3. Policy responses have fiscal ramifications on state/territory budgets. Section 4 discusses how the fiscal capacity of the state government of Victoria is impacted, and how the impact on Victoria differs from other states and territories due to differences in the extent and severity of outbreaks. How GST distribution can be adjusted to account for the differential

impact on fiscal capacity will be discussed in Section 5. Some concluding remarks are given in Section 6.

2. Impact of COVID-19 in Victoria and comparison with other states and territories

The pandemic is a health crisis that has had, and continues to have, major consequences on economic and social activities. Until vaccines were developed and became available in December 2020, the only effective public health measure to contain the virus was by means of public health measures focused on mobility restrictions, including border closures, to reduce contact between people.

Stringent mobility restrictions, while effective in containing the spread of the virus, have caused major disruptions across all sectors of the society. This has affected all states and territories, and in proportion to the severity of their outbreaks. For Victoria, this is especially the case in the financial year 2020/21 because of severe outbreaks that resulted in an extended period of lockdown.

This section describes the timeline of major events associated with COVID-19 and gives an overview of the health and economic impacts on Victoria and in comparison to other states/territories.

2.1 Daily cases, hospitalisations, deaths and movement restrictions

Between March 2020 and July 2021, Victoria experienced five waves of COVID-19 infections and underwent five periods of lockdown of varying duration. Figure 2.1 shows the daily number of new infections, hospitalisations, and deaths due to COVID-19 in Victoria during 2020/21, with periods of stage-3 and stage-4 lockdown indicated as rectangular coloured blocks. The daily numbers are shown as moving seven-day averages.

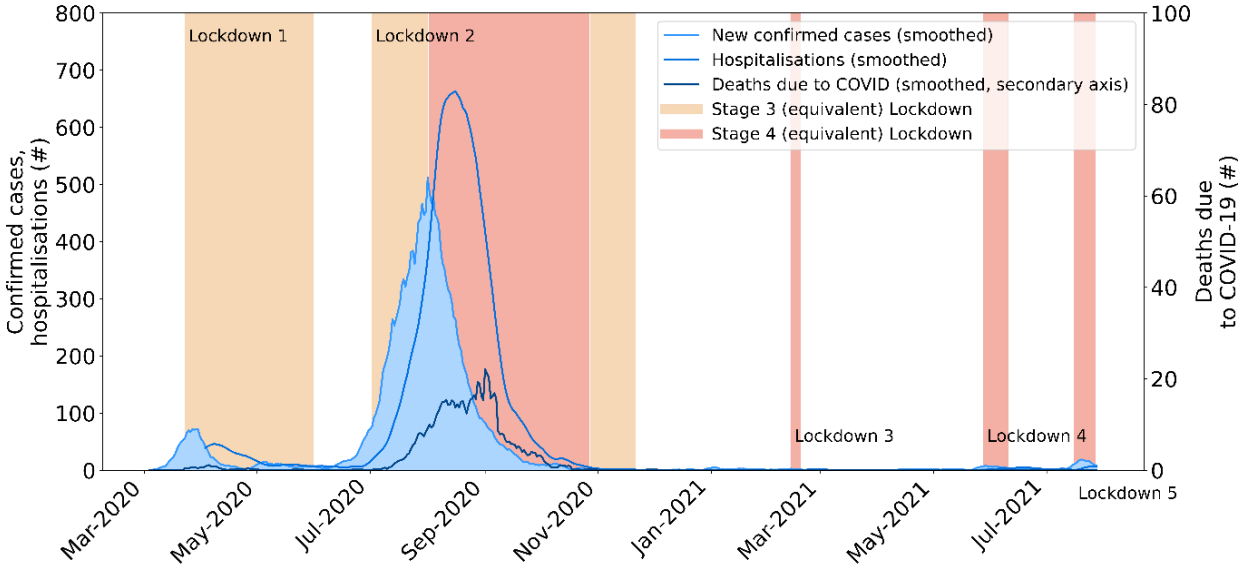
Similar to all other states and territories, Victoria first announced mobility restrictions, together with public health measures and economic support initiatives in March 2020. During this lockdown period (Lockdown 1), the seven-day average number of daily cases were fewer than 100 with few deaths reported. However, due to the high infection rate of the virus, and without effective treatment options for the infected, mobility restrictions were seen as the only effective public health measure. The first lockdown ended in June 2020, when most restrictions were lifted.

Although Lockdown 1 ended by June 2020, a second outbreak associated with returned international travellers occurred in Victoria in June 2020. The outbreak was

particularly severe and prompted an extended period of lockdown (Lockdown 2), with strict mobility restrictions imposed during July–September 2020. Toward the end of September, restrictions began to ease gradually, with most restrictions lifted by the end of November. During the height of the second wave, measured by seven-day averages, average daily cases reached 467 in August 2020, with more than 650 average hospitalisations and 22 average deaths per day.

Lockdown 2 was followed by three shorter periods of lockdown during February 2021 (Lockdown 3: five days), May 2021 (Lockdown 4: 14 days) and July 2021 (Lockdown 5: 12 days). This was followed by the most recent, sixth lockdown that began in August 2021 and is expected to last well into October 2021. Restrictions are being eased as vaccination targets are met during October.[1] In total, from March 2020 to June 2021, Victoria had more than 233 days in lockdown, of which 163 days had occurred during the financial year 2020/21.

Figure 2.1: New confirmed cases, hospitalisations, and deaths due to COVID-19, March 2020 to July 2021



Note: Cases, hospitalisations and Deaths due to COVID-19 presented are seven day moving averages.
Source: covid19data.com.au.

Comparison with other states and territories

Compared to other states and territories, the outbreaks in Victoria were the most severe in Australia during 2020/21. The comparison is illustrated in Figure 2.2, which shows the number of new cases, hospitalisations and deaths across all States and

[1]The roadmap for gradual easing of restrictions was announced on 19 September 2021 (www.premier.vic.gov.au/victorias-roadmap-delivering-national-plan).

Territories. While it is straightforward to compare case numbers and hospitalisations across states, it is not as simple to compare periods of lockdown, since states/territories may differ, not in the policies employed, but in how they implement national guidelines on public health restrictions in response to local conditions. Policy responses by the Commonwealth and state/territory governments will be discussed in the next section below.

To enable comparison across states and territories, we use the Public Health and Social Measures (PHSM) categorisation proposed by a report prepared by the Doherty Institute for the Australian Government (The Australian Government Treasury, 2021), which groups restrictions into four PHSM bundles:

1) High PHSM (Strict lockdown): Equivalent to Stage Four lockdowns in place in Victoria in August 2020
2) Medium PHSM (Moderate lockdown): Equivalent to Stage Three lockdowns in place nationally in May 2020
3) Low PHSM (Low level restrictions): Equivalent to restrictions in place in New South Wales in August 2020
4) Baseline PHSM (Baseline restrictions): Similar to the eased restrictions in place in New South Wales in March 2021

For ease of visualisation, we combine Low and Baseline PHSM together as minimal levels of restrictions and regard these as the default.

Table 2.1 presents a simple comparison of the number of days in lockdown across states/territories during our data period March 2020 to June 2021.

Table 2.1: Days in lockdown, by states and territories, March 2020 to June 2020 and July 2020 to June 2021

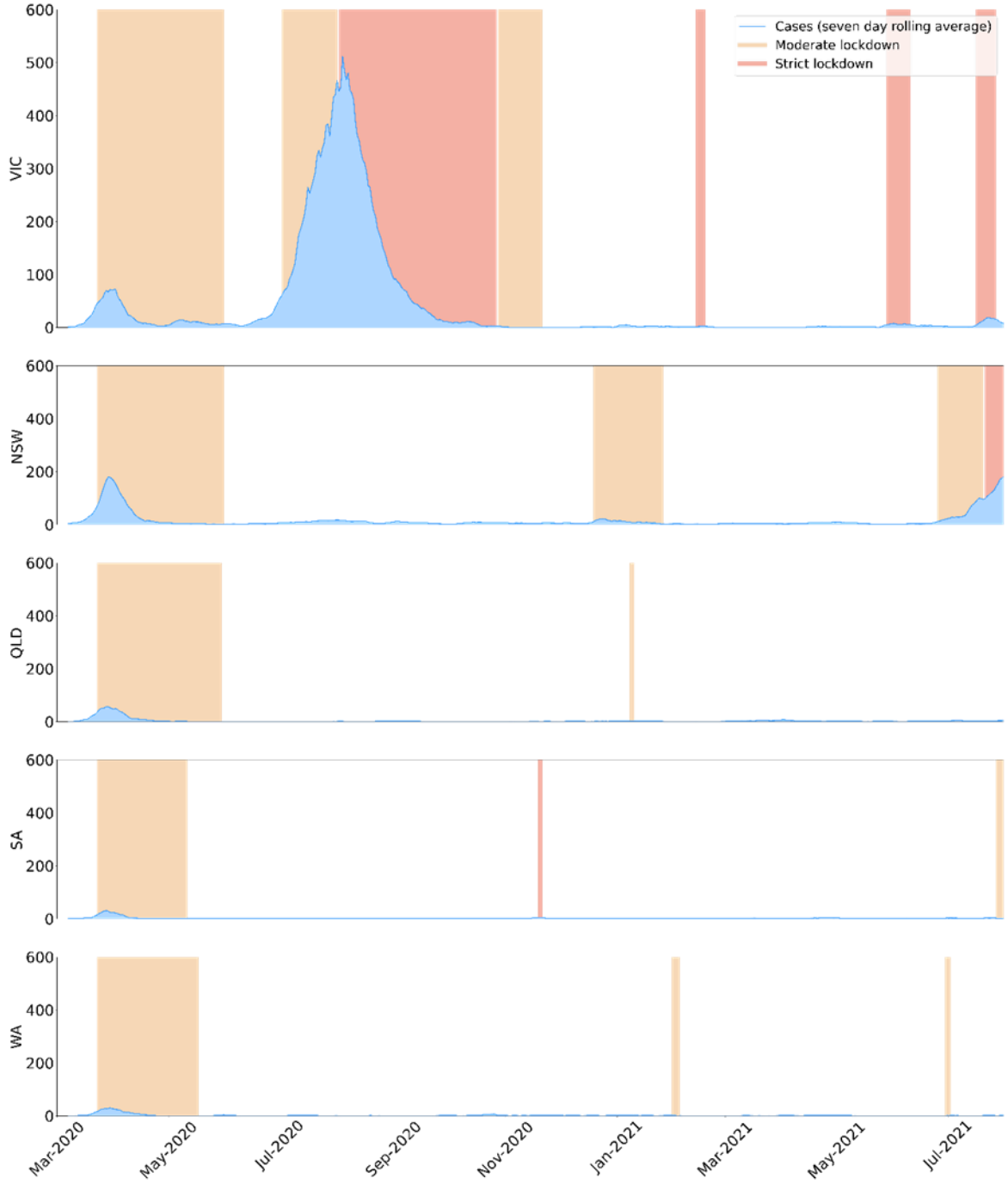
	VIC	NSW	QLD	SA	WA	NT	TAS	ACT
1 March 2020 - 30 June 2020								
Moderate Lockdown	70	70	69	50	56	54	57	40
Strict Lockdown	0	0	0	0	0	0	0	0
Total	70	70	69	50	56	54	57	40
1 July 2020 - 30 June 2021								
Moderate Lockdown	56	45	3	0	7	0	0	0
Strict Lockdown	107	0	0	3	0	4	0	0
Total	163	45	3	3	7	4	0	0
Total 1 March 2020 - 30 June 2021	**233**	**115**	**72**	**53**	**63**	**58**	**57**	**40**

Note: Periods of lockdown are categorised as in Figure 2.2.
Source: Department of Treasury and Finance, August 2021.

It can be seen in Table 2.1 that Victoria, with 163 days in lockdown during the financial year 2020/21, and with a total of 233 days for our data period, had the most days in lockdown among all states/territories. NSW, at 115 days (of which 45 days occurred during 2020/21) for the entire data period, had the next highest lockdown days, followed by Queensland at 72 days (of which 3 days were in 2020/21) in total for the period. It bears noting that the comparison does not take into account the prolonged period of lockdown in NSW in its most recent outbreak that was first started in July 2021 due to a breach in its hotel quarantine system.

Figure 2.2 illustrates the more severe nature of the outbreaks and longer periods of lockdown in Victoria vis-à-vis New South Wales, Queensland, South Australia, and Western Australia. The other smaller states/territories are not shown due to space restriction. A complete picture including all states/territories can be found in Appendix A.

Figure 2.2: New confirmed cases, hospitalisations, and deaths due to COVID-19, Victoria compared with other states/territories, March 2020 to July 2021



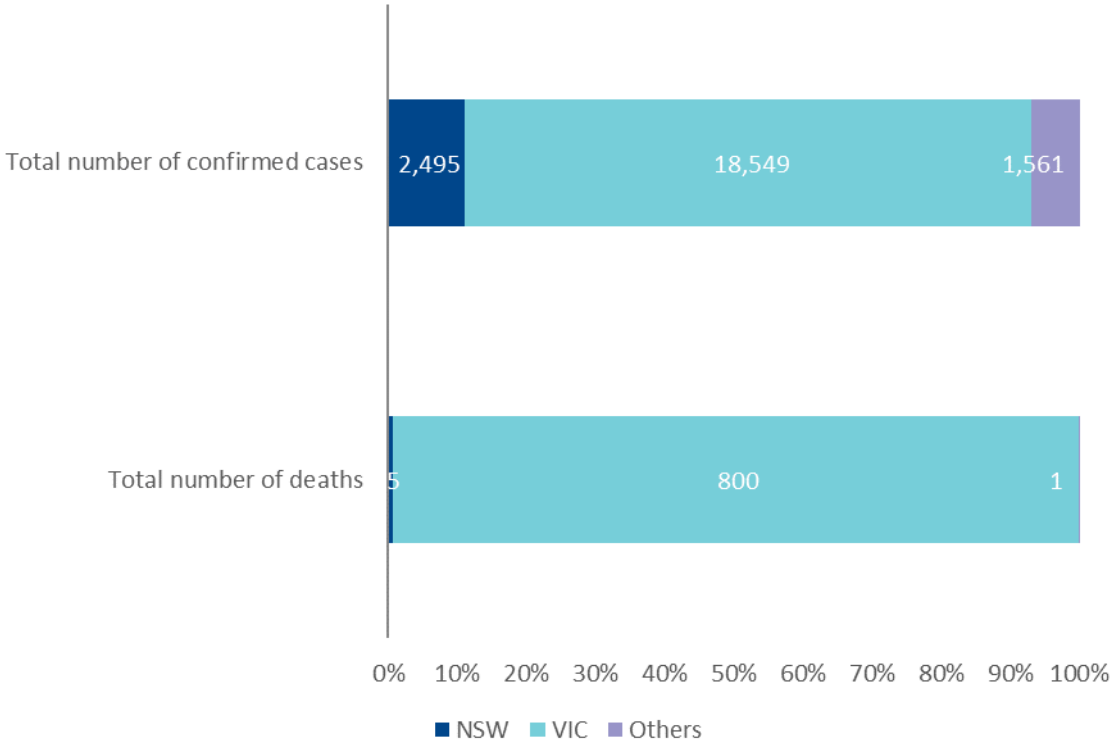
Note: Periods of lockdown are categorised as per the Doherty Modelling Report (The Australian Government the Treasury, 2021), with authors' re-groupings. Designation of lockdown periods in each state/territory refers to the most restrictive form of movement restrictions present anywhere in the state/territory during the period. New cases are seven-day moving averages.

Source: Department of Treasury and Finance, August 2021.

In the national context, Figure 2.3 shows the share of total confirmed cases and deaths from COVID-19 during the financial year 2020/21 by Victoria and in

comparison to NSW and other states/territories. During the period, Victoria recorded 18,549 total confirmed COVID-19 cases (82% of total cases in Australia) and 800 COVID-19 related deaths (99% of total COVID-19 related deaths in Australia). The share of Victoria is far in excess of its population share, which stood at about 26% of total population in Australia as at 30 December 2020.

Figure 2.3: Share of total confirmed cases and deaths from COVID-19 for 2020/21, Victoria, NSW and other states/territories



Source: covid19data.com.au.

2.2 Economic impacts

The pandemic has caused major disruptions to economic activities due to public health measures that restrict the mobility of the population. In addition, because of health concerns and the fear of getting infected, many people also consciously avoid crowded places and reduce contact with others. Evidence suggests that this fear is a significant contributory factor to the slowdown in economic activities in addition to the public health policies (Andersen et al, 2020; Goolsbee and Syverson, 2020). According to one estimate using mobile phone records data in the U.S., fear accounts for an overwhelming 88% of the decline in consumer traffic (Goolsbee and Syverson, 2020). Similar results were found from the comparison of economic activities in Denmark and Sweden at the beginning of the pandemic, where only Denmark

imposed stringent mobility restrictions. Andersen et al. (2020) reported that the more stringent public health measures in Denmark only caused a 14% decline in consumer spending when comparison is made with Sweden, which implemented far less stringent measures. Regardless of how it arises, the reduction in mobility has significant effects on economic activities across many sectors of the economy.

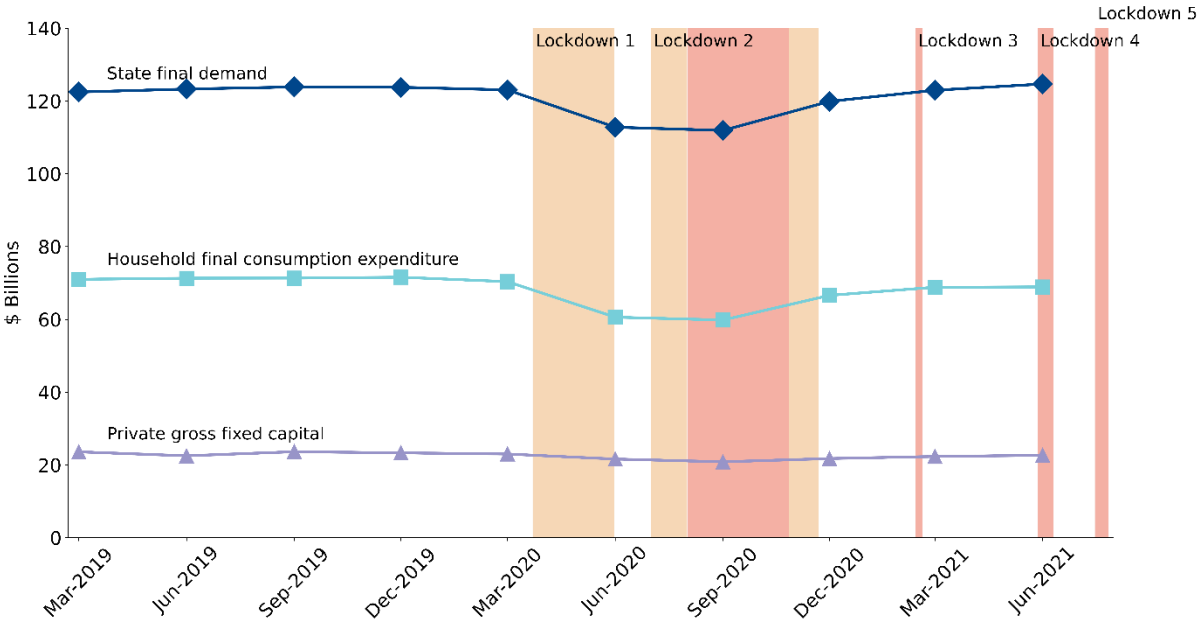
State final demand

For the purpose of assessing economic activities in states and territories, it is natural to use Gross State Product (GSP), a volume measure of all goods and services produced in a state/territory. However, GSP data are only available in annual series from the Australian Bureau of Statistics (ABS), no quarterly series are published (ABS, 2020). Instead, we examine an alternative volume measure known as state final demand. It is a measure of spending in a state/territory, comprising final consumption and investment expenditures by both private and government sectors within the state/territory.

Figure 2.4 presents seasonally adjusted quarterly state final demand data for Victoria during the period March-May 2019 to June-August 2021, with periods of lockdown superimposed and indicated by rectangular coloured blocks. The figure clearly illustrates the impact of outbreaks of the virus and resulting mobility restrictions on economic activities, with Lockdowns 1 and 2 during the period March-November 2020 having an especially severe impact on Victoria's state final demand and household consumption expenditure.

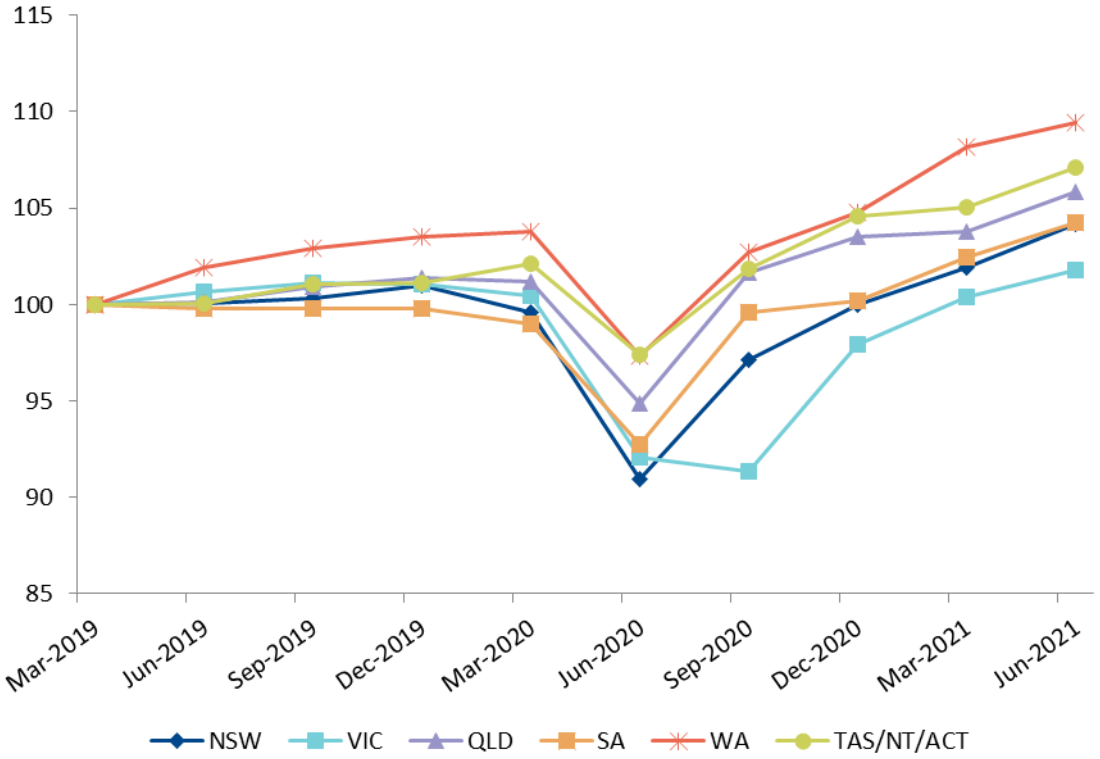
Figures 2.5 and 2.6 compare state final demand and private sector final demand across all states/territories. Private sector final demand is derived as the sum of household final consumption and private gross fixed capital expenditures. Note that the expenditures of Tasmania, Northern Territory, and Australian Capital Territory have been aggregated for clarity of presentation. All series have been indexed with reference to their respective levels at March quarter 2019.

Figure 2.4 State final demand, Victoria, quarterly seasonally adjusted, quarterly March 2019 to June 2021



Note: All series are quarterly seasonally adjusted chain volume measures.
Source: ABS (2021a, Cat. 5206.0).

Figure 2.5 State final demand, all states/territories, quarterly seasonally adjusted, March 2019 to June 2021



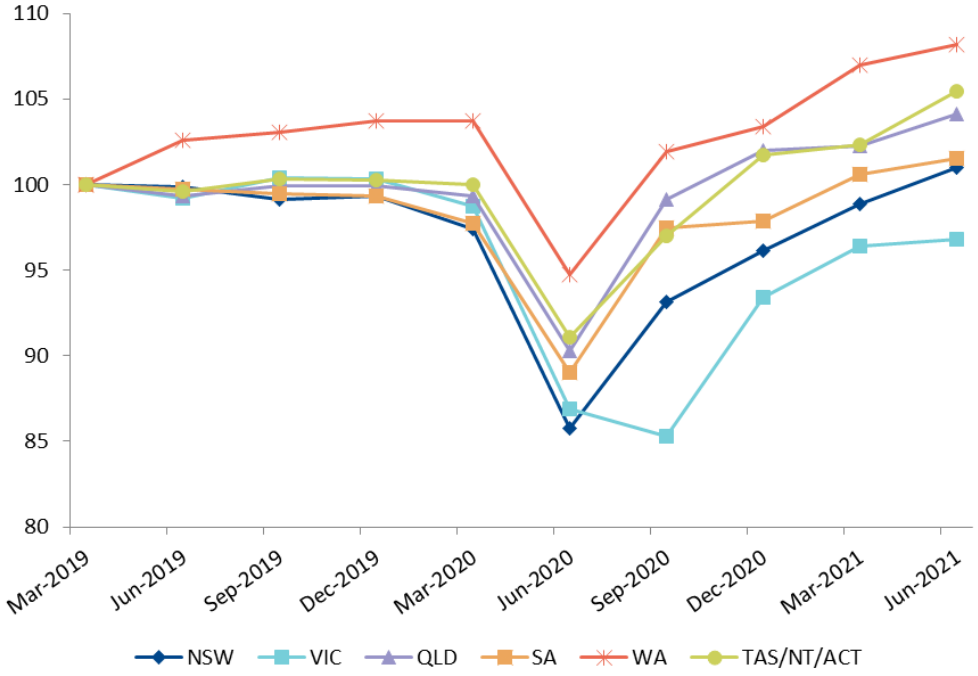
Note: All series are quarterly seasonally adjusted chain volume measures; quarterly series are indexed to March quarter 2019 by setting March quarter 2019 level at 100 for each state/territory.
Source: ABS (2021a, Cat. 5206.0).

Figure 2.5 shows that states whose economic activities were most severely impacted were Victoria, New South Wales, and Queensland. Other states/territories were affected to a lesser extent.

Like other states/territories, Victoria's state final demand fell during the March quarter 2020. For most states/territories, the recovery began in the next quarter with their state final demand returning to its usual pre-pandemic levels. However, unlike other states and territories, the recovery in Victoria did not happen in the September quarter 2020 due to the second outbreak in June-November 2020. Instead, state final demand in Victoria only recovered to its pre-pandemic level in the December quarter 2020.

A similar picture can be found on state private sector final demand, which is shown in Figure 2.6. Compared to other states/territories, Victoria's private sector demand was slower in recovery, it did not return to the usual pre-pandemic level until the December quarter 2020. Again, this is likely a consequence of the extended period of lockdown during the second outbreak in June-November 2020. More importantly, the recovery in Victoria was slower and lower in levels compared to other states/territories.

Figure 2.6 State private sector final demand, all states/territories, quarterly seasonally adjusted, March 2019 to June 2021



Note: All series are quarterly seasonally adjusted chain volume measures; quarterly series are indexed with reference to March quarter 2019 by setting March quarter 2019 level at 100 for each state/territory.

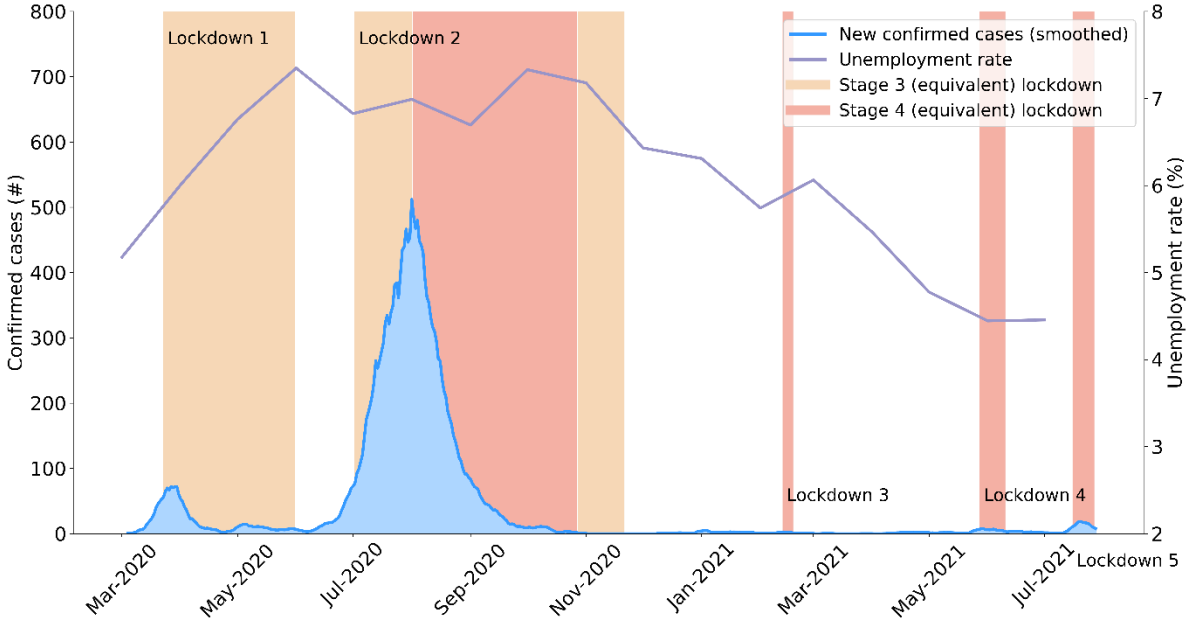
Source: ABS (2021a, Cat. 5206.0).

Employment

We further examine how economic activities are impacted by the pandemic by analysing how employment and unemployment are affected in different states/territories. Figure 2.7 presents the unemployment rate of Victoria for the period March 2020 to July 2021, with the lockdown periods and COVID-19 case number superimposed.

In tandem with the fall in state final demand, unemployment rate rose from 5.18% in March 2020, to 7.35% at the end of the first outbreak in June 2020. The announcement of JobKeeper and JobSeeker payments in March 2020 undoubtedly helped to maintain employment and soften the impact on the unemployed (and employed) (Cassells and Duncan, 2020; Raynor and Panza, 2021). Nonetheless, unemployment remained high in Victoria at around 6.50%–7.35% during the second outbreak between June and November 2020. Following the easing of restrictions in November 2020, employment steadily recovered, with the unemployment rate dropping to pre-COVID-19 levels at 4.44% in June 2021.

Figure 2.7: COVID-19 cases and unemployment rate, Victoria, March 2020 to July 2021

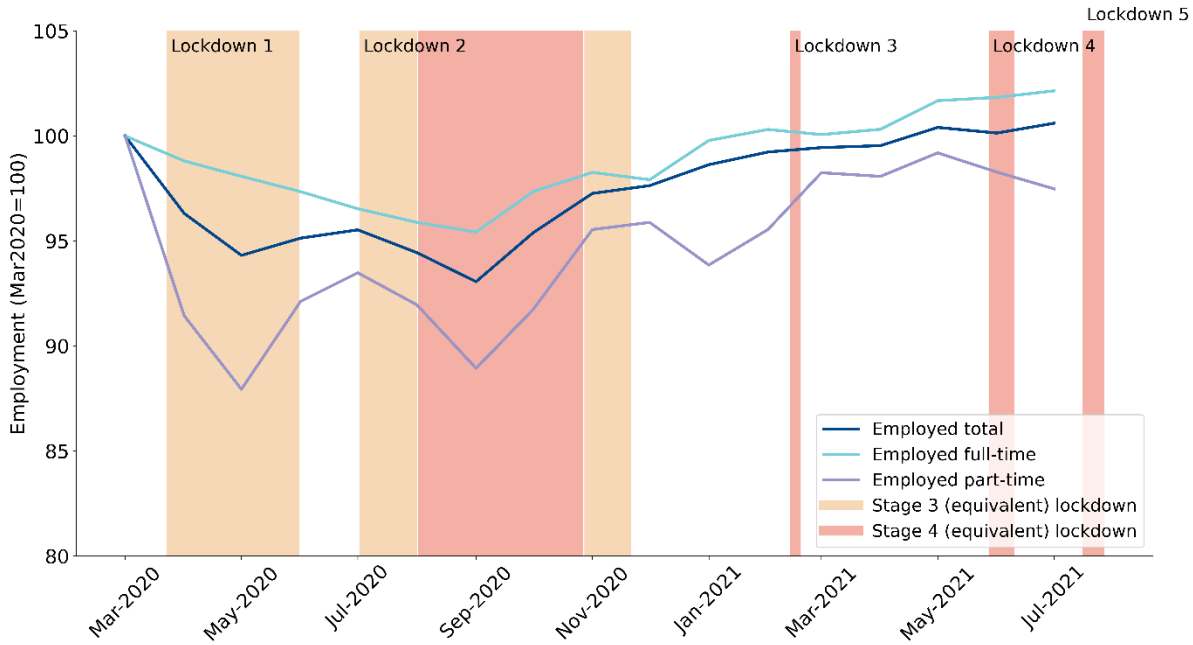


Source: ABS (2021b).

While the overall unemployment during the pandemic is a concern, of equal importance is the type of jobs that are affected by the pandemic. We distinguish between part-time and full-time employment in Figure 2.8. The employment series have been indexed with reference to March 2020 by setting the March 2020 employment levels at 100.

Figure 2.8 shows that workers in part-time employment were far more severely impacted than those in full-time employment. This is not surprising, given that part-time employment is more prevalent in service jobs such as retail sales, cafes and restaurants, the tourism sector, all of which were heavily affected by the mobility restrictions during the lockdown periods. Significantly, many part-time jobs were lost forever, as evident from the index of part-time employment remained below the March 2020 level even post Lockdown 2, after mobility restrictions were eased. This is in contrast to full-time employment, which recovered to their March 2020 level soon after Lockdown 2 ended, and even registered modest gain in employment in the first half of 2021.

Figure 2.8: COVID-19 cases, full- and part-time employment, Victoria, March 2020 to July 2021

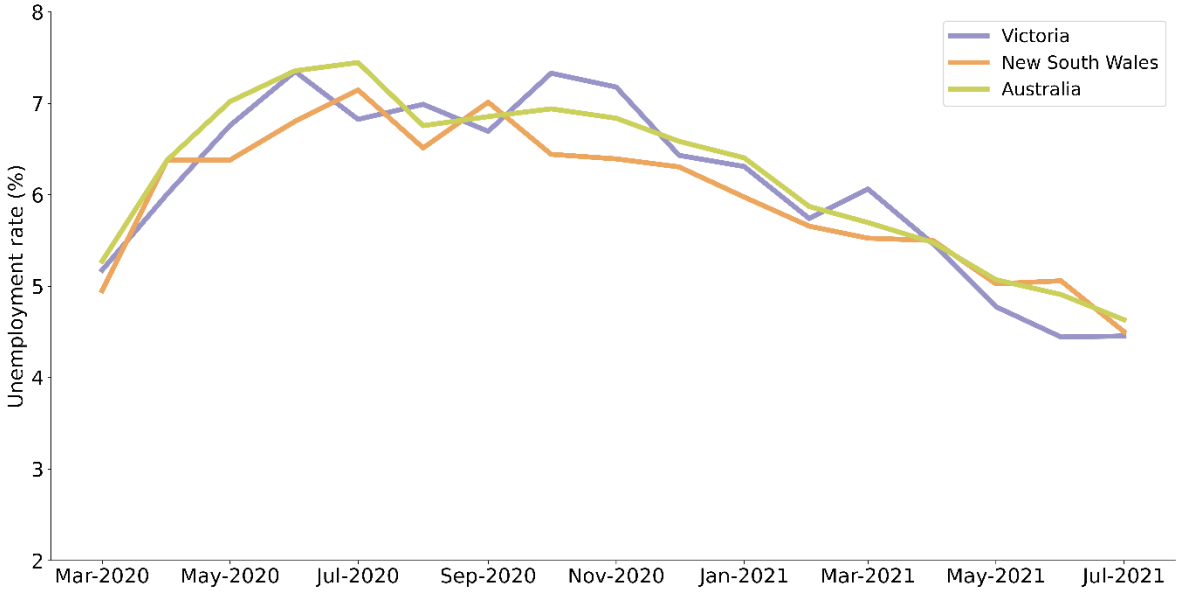


Note: Employment series are indexed with reference to March 2020 levels (by setting March 2020 levels at 100). Total and Full-time employment series are constructed using seasonally adjusted data; part-time employment series constructed using original data.

Source: ABS (2021b).

The unemployment rate in Victoria is compared to that in New South Wales and nationwide in Figure 2.9, which shows that unemployment was higher in Victoria than in NSW during the first wave between March and May 2020, when both states were in lockdown, although the unemployment rate in Victoria was no higher than the national rate during this period. However, during Victoria's second lockdown in June-November 2020, the unemployment rate in Victoria went beyond 7%, far higher than the rate in NSW and nationally, and remained higher than that of NSW until March 2021.

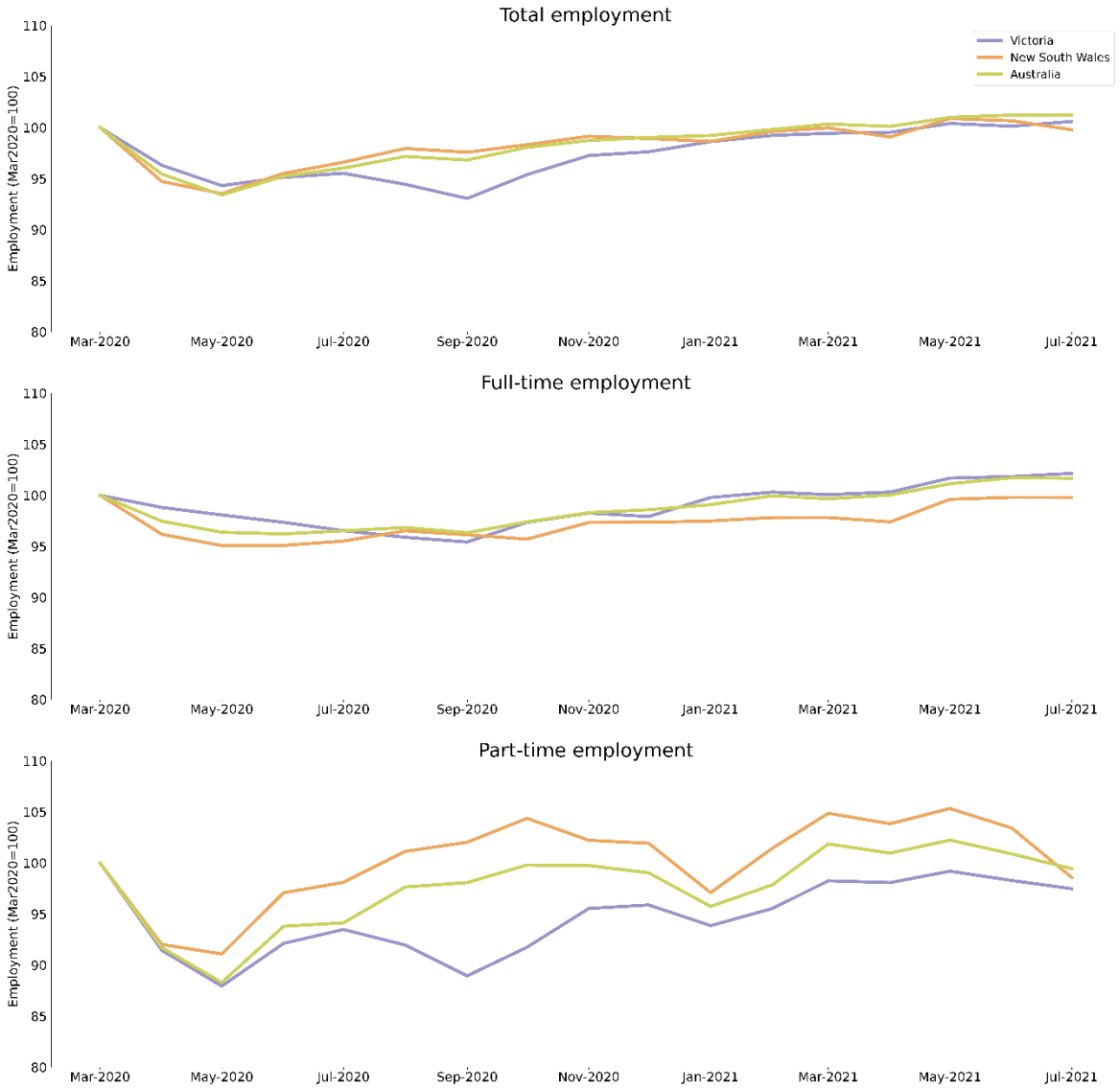
Figure 2.9: Unemployment rate, Victoria, New South Wales and Australia, March 2020 to July 2021



Note: Unemployment rates are seasonally adjusted.
Source: ABS (2021b).

Figure 2.10 further shows that the differences in unemployment rates between Victoria and NSW, and between Victoria and nationally, were attributable to the change in part-time employment as a result of COVID-19. The impact on full-time employment in Victoria was no different from that observed nationally, and Victoria even fared slightly better than NSW in this regard. However, it was part-time employment in Victoria that recorded a large decline when compared with NSW and nationally. The gap was most apparent during July-November 2020 when Lockdown 2 in Victoria was in force. Moreover, although part-time employment subsequently recovered in Victoria post Lockdown 2, it is also clear from Figure 2.10 that it never recovered as well as in NSW and nationally.

Figure 2.10: COVID-19 cases, full- and part-time employment, Victoria, New South Wales and Australia, March 2020 to July 2021



Note: Employment series are indexed with reference to March 2020 levels (by setting March 2020 levels at 100). Total and Full-time series are constructed using seasonally adjusted data, Part-time series constructed using original data.

Source: ABS (2021b).

2.3 Impacts on health and healthcare

Given the nature of the pandemic, it is reasonable to expect that the healthcare sector would bear the direct burden of the health crisis caused by COVID-19. This subsection examines how activities in public hospitals, primary care and private hospitals were impacted during the crisis.

Generally, people were less likely to visit a healthcare provider, not only because of the cancellation of elective surgery (to help maintain hospital capacity for COVID-19 cases), but also because of the fear of contracting the virus, in addition to mobility restrictions during periods of strict lockdown even though healthcare was one of the valid reasons to leave home.

However, a lower level of healthcare activities does not imply lower healthcare spending by government. On the contrary, healthcare expenditures were rising, not only due to the need to maintain capacity and staffing to prepare for the rapid rise in infections and hospitalisations, but also to strengthen and re-configure health services, to acquire and set up necessary infrastructure and equipment (e.g., ICU facilities and personal protective equipment), to retrain and re-deploy staff and to support and protect healthcare workers. Moreover, patients whose care had been delayed were likely to present at a later and more severe stage in their illness, leading to increased costs of treatment. For example, recent modelling suggests that a six-month delay in cancer diagnosis and treatment will increase health care spending in Victoria by $46m and lead to additional 350 deaths.[2]

Public Hospitals

Figure 2.11 shows the number of public hospital separations[3] and ED presentations in Victorian public hospitals between 2016/17 and 2020/21. The insert in Figure 2.11 shows the corresponding quarterly volume figures from the April quarter of 2020 to the April quarter of 2021. Public hospital separations and ED presentations fell in 2019/20, breaking the rising trend in the previous financial years. This fall in public hospital activities likely reflect the effect of Lockdown 1 between March and May 2020. In particular, the fall in admitted patient separations was mainly caused by the cancellation of non-urgent elective surgeries in all public hospitals during Lockdown 1.

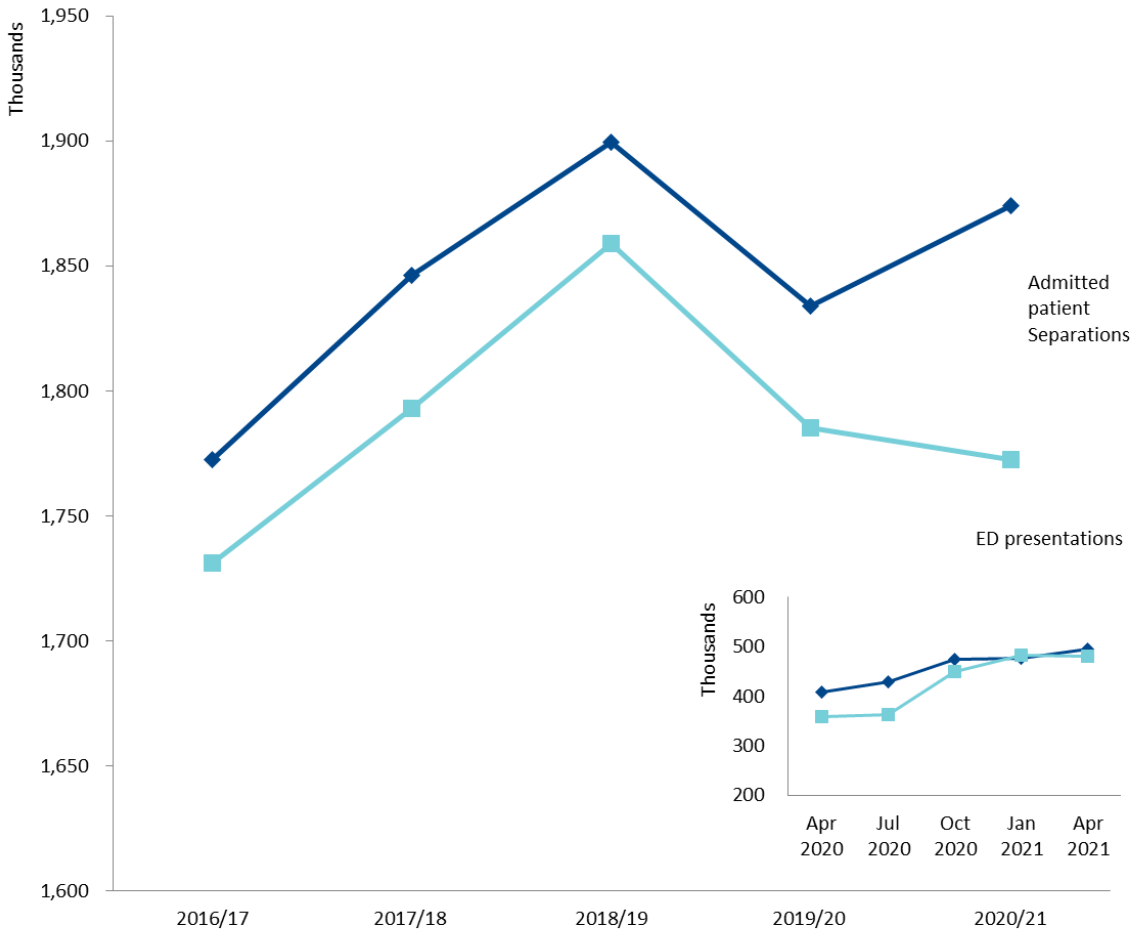
Quarterly data in the insert in Figure 2.11 show that both admitted patient separations and ED presentations began to rise in the October quarter 2020 and maintain at similar levels for the subsequent two quarters. The rise in admitted patient separations was probably due to the rise in elective surgery activities following the easing of Lockdown 2 in November 2020. The cancellation of non-

[2] https://mdhs.unimelb.edu.au/centre-for-cancer-research/news-and-events/research-estimates-additional-90-cancer-deaths-and-$12m-costs-in-australia-due-covid-19-induced-delay

[3] A separation denotes the completion of an episode of care for an admitted patient, i.e., the patient was formally discharged. See meteor.aihw.gov.au/content/index.phtml/itemId/327268.

urgent elective procedures during the lockdown period gave rise to higher demand subsequently as patients who postponed their procedures were resuming their care. The rise in ED presentations post Lockdown 2, on the other hand, probably reflected the rise in mobility of people following the easing of restrictions.

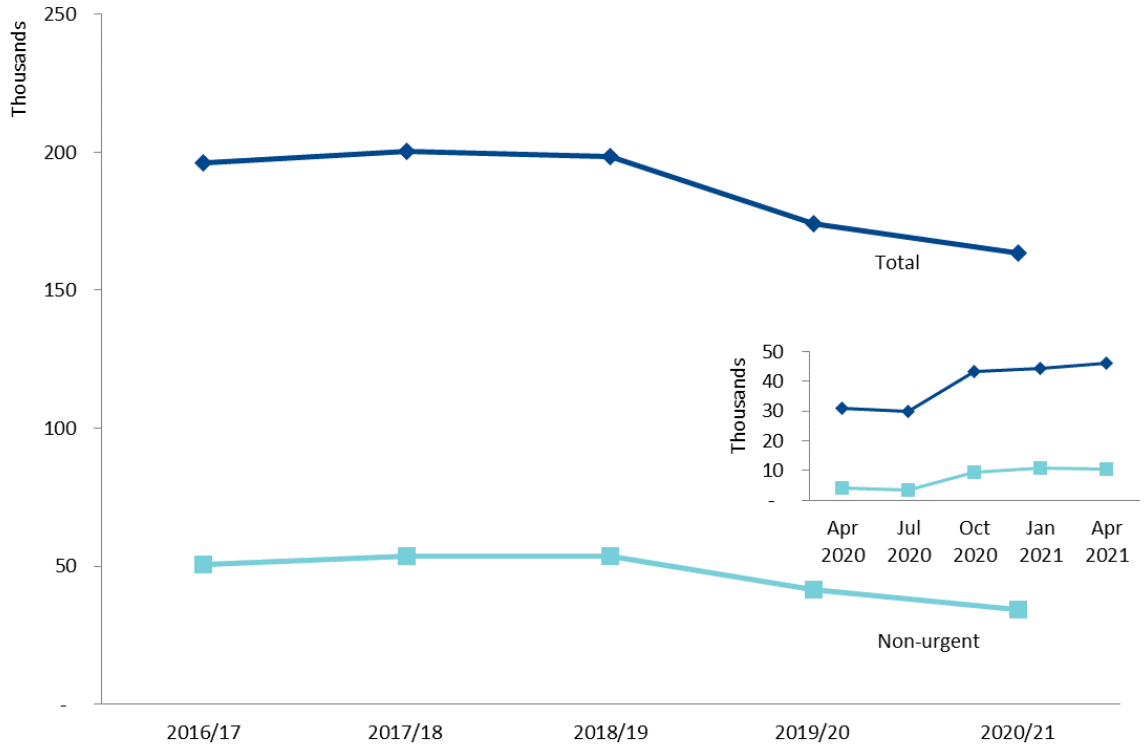
Figure 2.11: Public hospital separations and ED presentations, Victoria 2016/17 to 2020/21



Source: Victorian Agency for Health Information online data (vahi.vic.gov.au). AIHW reports, various years (aihw.gov.au/reports/).

Among the healthcare activities most affected by the pandemic were elective surgeries, especially those classified as non-urgent. Figure 2.12 presents the volume of non-urgent and total elective procedures performed between 2016/17 and 2020/21. Elective surgery volume declined sharply in 2019/20 and the trend continued on to 2020/21, and this happened across all categories of elective surgeries, not just for non-urgent procedures. From the available quarterly data, as shown in the insert in Figure 2.12, the volume of all elective surgeries and to a lesser extent non-urgent elective procedures rebounded in the October quarter 2020, with activities maintaining at similar levels throughout the remaining data period.

Figure 2.12: Elective surgery procedures performed in public hospitals, Victoria 2016/17 to 2020/21



Source: Victorian Agency for Health Information online data (vahi.vic.gov.au). AIHW reports, various years (aihw.gov.au/reports/).

The falling annual volume of elective procedures in 2020/21, together with the rebound in the quarterly figure of the October 2020 quarter indicates that although a recovery was underway, elective surgery activities did not return to the pre-pandemic level. This is likely the result of constraints on the capacity of hospitals because of some restrictions remaining in place, and the new COVID-safe protocol put in place in hospital settings. The slow recovery of elective surgeries would undoubtedly have contributed to the backlogs which will inevitably result in higher demand in the future. The quarterly data also show that the rise in non-urgent procedures was at a slower rate than that of other, more urgent, procedures. This likely reflected the scheduling priority of more urgent procedures and the possibility that some non-urgent cases may have increased in urgency due to delayed treatment.

Comparison with New South Wales public hospital activities

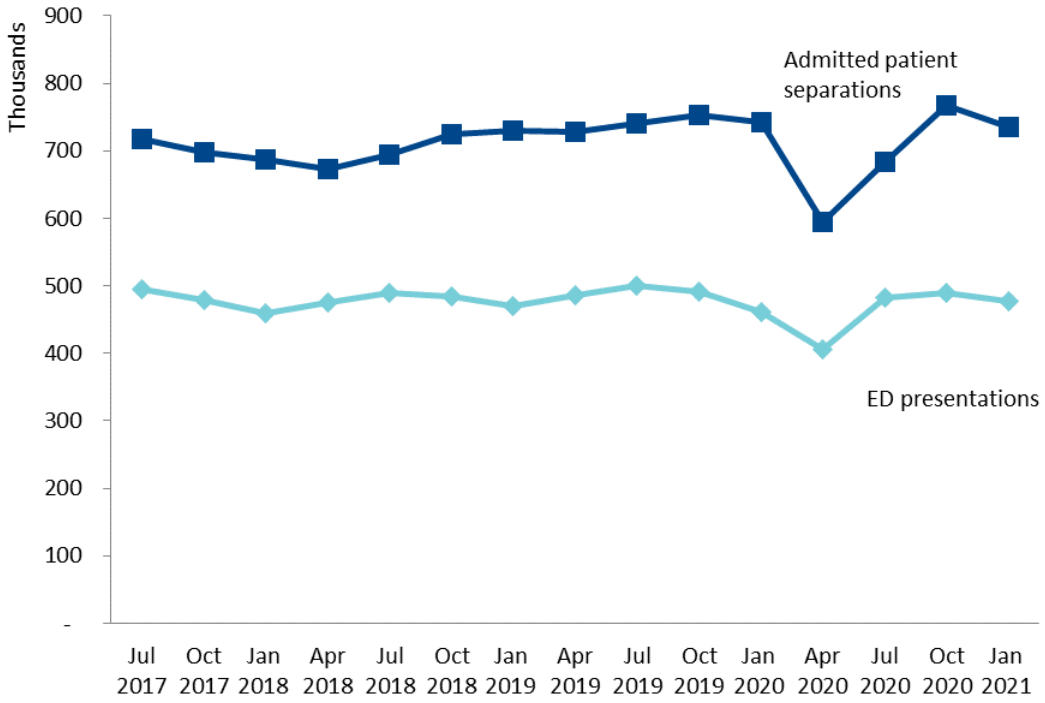
We compare Victorian public hospital activities with those in New South Wales. The lack of quarterly data has precluded a comparison with other states/territories.

Figure 2.13 shows the quarterly volume of public hospital separations and ED presentations in NSW between July-September 2017 and January-March 2021. As expected and similar to Victoria, in-patient separations and ED presentations in NSW public hospitals experienced a sharp decline in the April quarter 2020. However, unlike in Victoria, activities in NSW public hospitals soon recovered. By the October quarter 2020, activities have largely returned to the pre-pandemic level. Notably, the volume of in-patient separations exceeded the pre-pandemic level in the October quarter 2020, possibly a result of the catching up effect with previously postponed elective surgeries.

A similar pattern is observed in the volume of elective surgery procedures in NSW public hospitals, as shown in Figure 2.14. The volume of activities followed a strong seasonal pattern until the January quarter 2020, when activities fell sharply in the next quarter. However, elective surgery volume soon rebounded, and did so strongly in the July quarter 2020, with total elective procedures and non-urgent procedures both went above their pre-pandemic levels. The rebound likely reflected the easing of restrictions in NSW since June 2020 and remained so for the remaining of 2020, with NSW largely free of major outbreaks until December 2020. This allowed previously postponed elective surgeries to be re-scheduled with greater ease and flexibility than was the case in Victoria.

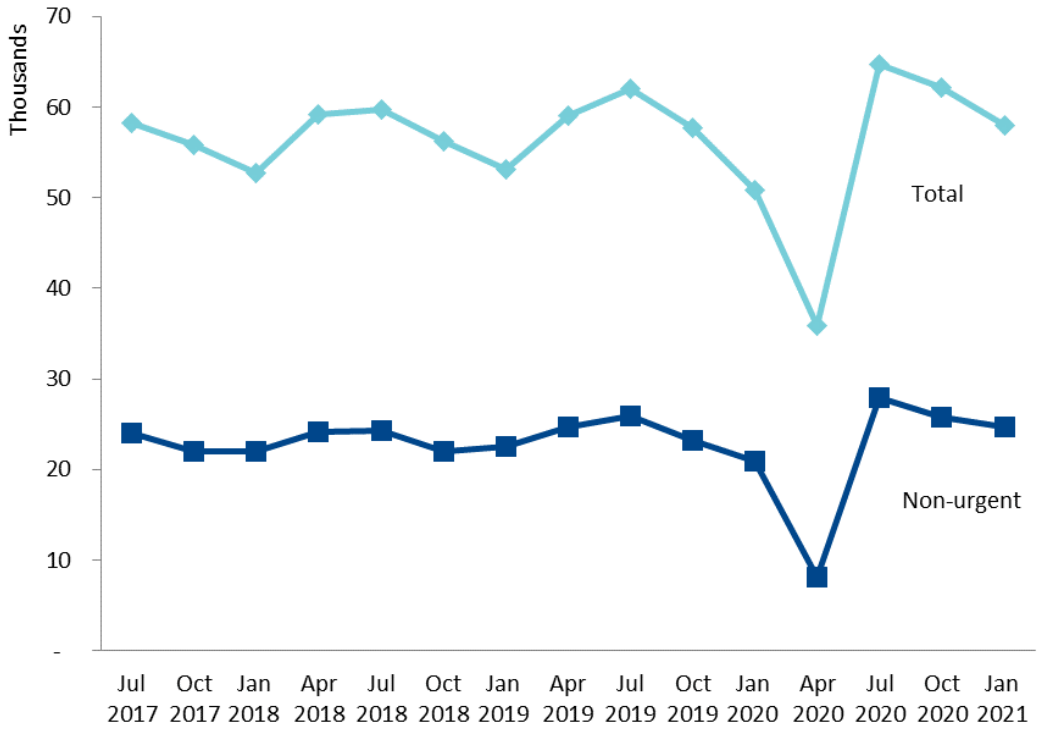
The strong rebound of elective surgeries in NSW is indicative of what would have happened in Victoria had there been no further outbreaks following the easing of restrictions in May 2020. The prolonged lockdown in Victoria during the second outbreak prevented public hospital activities returning to their pre-pandemic levels. For patients requiring elective surgeries during this period, their procedures were inevitably postponed. However, the postponement could not go on for too long before some of these patients would require care. It is also possible that some non-urgent cases would have to be upgraded in urgency to require more urgent treatment than before. Experiences in the UK suggest that hospitals will face many challenges in scheduling treatment of backlogs of cases, among which are the higher costs of treating patients with worsening conditions due to delayed care (Krelle et. al, 2021).

Figure 2.13: Public hospital separations and ED presentations, NSW Quarterly Jul-Sep 2017 to Jan-Mar 2021



Source: Bureau of Health Information (BHI), NSW. Healthcare Quarterly, various issues (bhi.nsw.gov.au/BHI_reports/).

Figure 2.14: Elective surgery procedures performed, NSW Quarterly Jul-Sep 2017 to Jan-Mar 2021

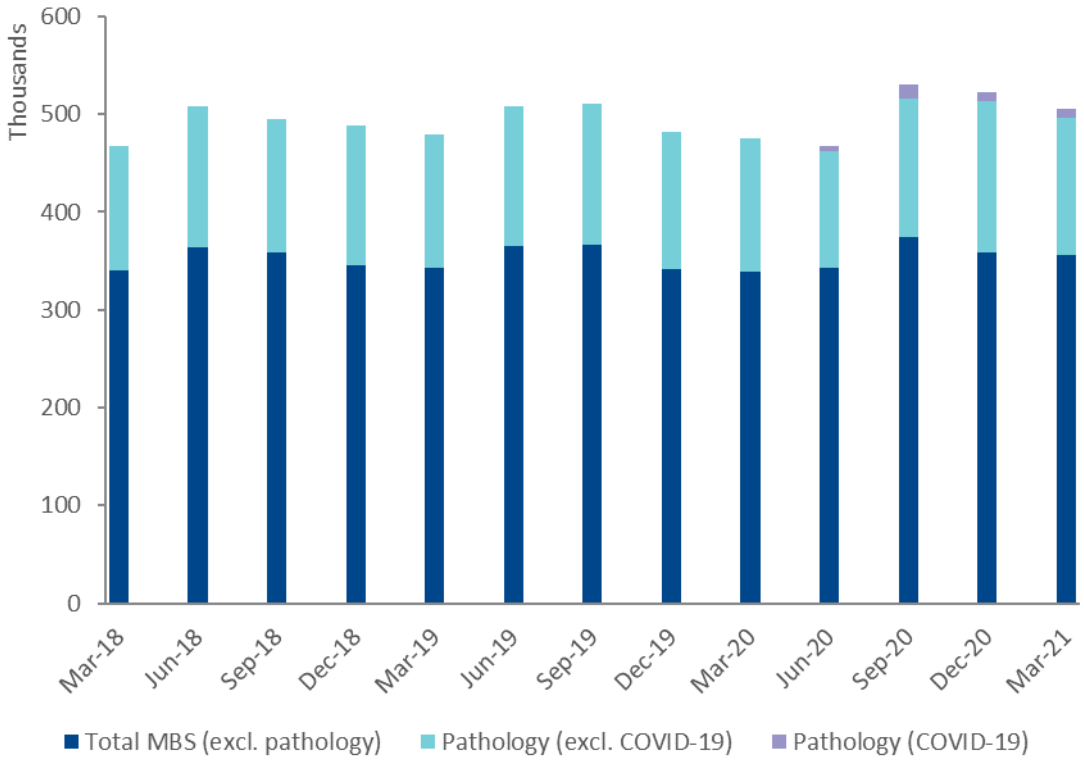


Source: Bureau of Health Information (BHI), NSW. Healthcare Quarterly, various issues (bhi.nsw.gov.au/BHI_reports/).

Medicare services

Besides public hospital activities, another major area of healthcare activities is medical services rendered through Medicare, which include GP and specialist consultations, pathology services, and inpatient services in private hospitals. Note that because of different funding arrangements, public hospital activities are not included in Medicare services. As expected, the pandemic has also had a major impact on Medicare services, as shown in Figure 2.15, where services were expressed in units of 100,000 population.

Figure 2.15: Total Medicare services, Victoria, March 2018 to March 2021



Source: MBS Quarterly Statistics, MBS Online item reports (mbsonline.gov.au/internet/mbsonline). Information on COVID-19 pathology test: servicesaustralia.gov.au/organisations/health-professionals/subjects/changes-mbs-items-during-coronavirus-covid-19-response#a1. ABS population statistics (ABS, 2021c).

Since quarterly data are shown in Figure 2.15, the graph captures seasonal effects in medical service use such as those associated with winter flu seasons and Christmas holidays. Overall, Figure 2.15 shows that Medicare services did not experience the usual rise in volume as in past years in the winter June quarter 2020; instead a slight decline in activities in comparison to the June quarter 2019, by about 8%, was reported. By the next quarter (September 2020), activities rebounded strongly, due to an increase in pathology testing services as a result of COVID-19 testing. From then on, the volume of Medicare services appeared to have maintained at its pre-

pandemic levels. Further analyses of the various components of Medicare services can be found in Appendix A.

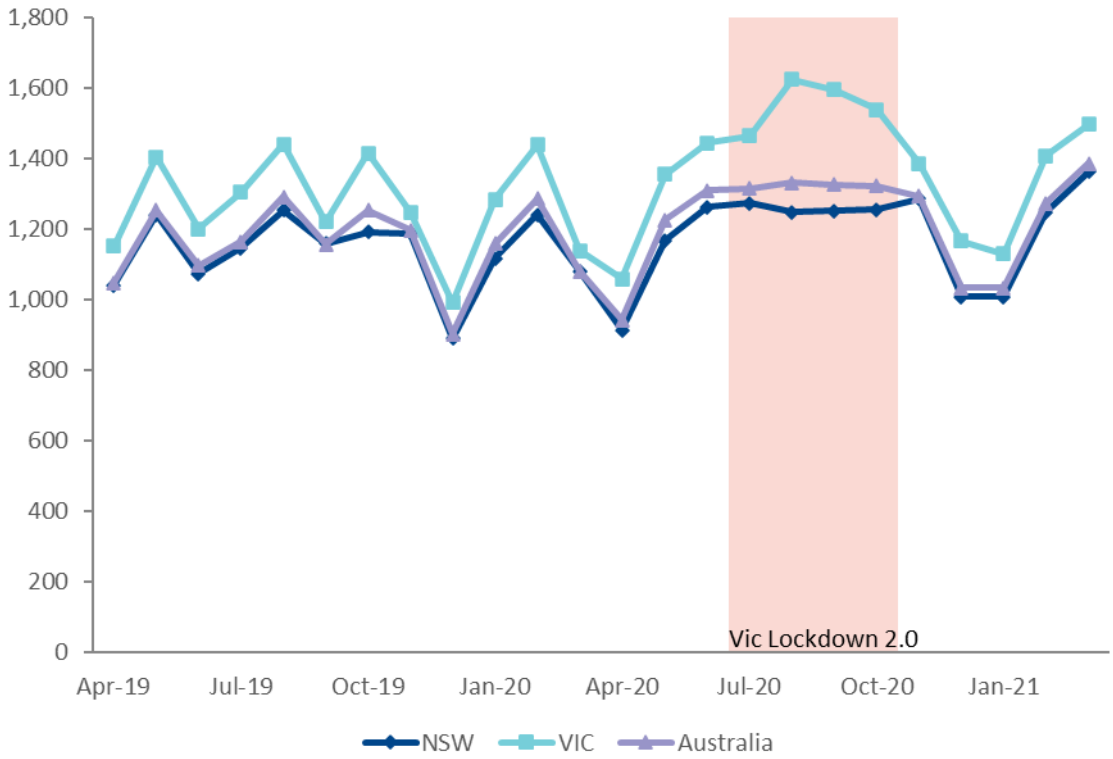
Note that due to the increase in COVID-19 testing, overall pathology services appeared to have increased during the September and December quarters 2020 as compared to the pre-pandemic levels. Note also that although pathology tests, including COVID-19 tests, are funded through Medicare, the setup and running costs of testing centres are the responsibility of state/territory governments, with contributions from the Commonwealth.

Use of mental health services

Mental wellbeing is a major health concern during the pandemic, especially for people confined by lockdown restrictions for a long period of time. Research has shown that mental wellbeing of people in many countries during the pandemic deteriorated, especially for people in areas affected by mobility restrictions, e.g., studies from Australia (Fisher et. al, 2020; Fisher et. al, 2021), India (Verma and Mishra, 2020), Israel (Shapiro et. al, 2020), and China (Zhao et. al, 2020), among others.

Figure 2.16 shows that, during Lockdown 2 in Victoria, between July and November 2020, the usage of GP mental health plans increased significantly by 11%, from 1,464 to 1,625 per 100,000 population. Utilisation started to decline from September 2020, but remained above the seasonal trend, and well above the national average. This suggests that the stress of dealing with COVID-19 and managing daily matters during lockdown may have caused the increase in utilisation of mental health services. Higher demand for mental health services is also likely to have implications for future demand for health and welfare services.

Figure 2.16: GP Mental Health Plan usage, per 100,000 population, NSW, VIC and Australia, April 2019 to March 2021, monthly



Note: Population as at December 2020.
Source: MBS Online item reports (mbsonline.gov.au/internet/mbsonline). ABS population statistics (ABS, 2021c).

2.4 Summary

Measured by the number COVID-19 infections and deaths, Australia has fared relatively well during the pandemic compared to many advanced countries. Key contributory factors include Australia's relatively stringent mobility restrictions and closure of international borders, coupled with health testing rates and other public health measures. However, these public health measures have imposed heavy costs on the Victorian economy. Extended periods of lockdown also have major implications on health, mental wellbeing and healthcare of individuals.

With more severe outbreaks and longer periods of lockdown in 2020/21, Victoria fared worse than other states and territories. Longer periods of stricter lockdown have caused major disruptions to everyday life and economic activities, adversely affecting businesses and workers. This is evident in consumption expenditures and employment in Victoria, which were impacted more than other states and territories in 2020/21. The extended lockdown periods also caused major disruptions to the

healthcare sector in Victoria, with significantly lower utilisation in primary and tertiary care, as many elective surgical procedures were postponed during this period. Lower levels of health care activities, however, did not translate into lower healthcare expenditure, as significant healthcare spending was incurred to prepare health services for COVID-19 and to maintain capacity in hospitals and intensive care units in preparation for a rapid rise in case number and hospitalisations. There are also significant expenditures in expanding healthcare infrastructure such as setting up new testing facilities and pathology laboratories, and acquiring appropriate protective equipment for healthcare workers.

The impacts of public health measures on the economy and the healthcare sector in particular present significant policy challenges for the Commonwealth and state/territory governments. The next section will examine the types of policy initiatives adopted by governments and the amount of budget spending in different policy areas.

3. Policy Response by governments

To contain the spread of the virus, National Cabinet agreed to a common approach to manage the pandemic. These include public health orders, mandatory movement restrictions and quarantines, strengthening of healthcare capacity, and economic measures designed to support businesses and workers affected by the pandemic. This section provides an overview of these measures and discusses how they were implemented in Australia by the Commonwealth and state/territory governments.

3.1 Types of policy response

From a public health perspective, policy responses to pandemics are set out in international[4,5], national[6], and sub-national pandemic plans and are focused around reducing human-to-human transmission. The WHO provides advice to countries on policy responses to pandemics. To control a pandemic, a variety of standard and evidence-based public health measures need to be taken to reduce transmission. These measures have a strong and comprehensive evidence base based on previous disease outbreaks, and the extent of their application depends on the specific circumstances of each pandemic such as the nature of virus, local geography and population density, and the resources available to implement effective public health measures.

Policy responses to control pandemics and support the population must also address the economic disruption arising from controlling the spread of the virus, as it is vital to reduce transmission by closing non-essential businesses and to reduce human to human contact through the workplace and in social settings. The impact of public health measures on reducing human-to-human contact, as well as impacts of the disease on individuals, have also had severe economic consequences. These include falls in consumer demand, more severe impacts on industries relying on human contact, on supply chains, international trade, and falls in immigration and international travel due to border closures and quarantine requirements.

The trade-off between the stringency of public health measures and the extent of disruptions to economic activities is a compromise that all governments have to face.

[4] https://www.euro.who.int/en/health-topics/communicable-diseases/influenza/pandemic-influenza/pandemic-preparedness
[5] https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance
[6] https://www1.health.gov.au/internet/main/publishing.nsf/Content/ohp-ahmppi.htm

In 2020, before vaccination was available, reducing human-to-human contact was the only effective means of containing the spread of the virus. After reviewing the performance of 40 national health systems, Braithwaite et al. (2021) found evidence that more stringent measures will result in fewer infections, hospitalisations and deaths, which will in turn avoid more stringent measures to be put in place in the future. Thus, the trade-off also involves weighing the level of current against future economic activities.

The economic stimulus policies have been broadly the same across all states and territories during the pandemic, as will be discussed below. A range of economic stimulus policies have been used to help support public health measures including income support for people unable to work and required to stay at home or isolate, business support to maintain supply chains and essential services and avoid unemployment, and additional support through the welfare system.

In addition, specific economic support has been made available to the healthcare system which can easily be overwhelmed during a pandemic. Public health and economic policies are common to any state or territory that has experienced an outbreak.

3.2 Australia's policy responses to the pandemic

The first Australian case on the 25th January 2020 led to 3,000 cases by the end of March. Australia's National Cabinet was established on 13th March to co-ordinate a national response based on a *standard* set of public health and economic policies agreed nationally[7]. The public health policies agreed by National Cabinet have been based on medical and epidemiological evidence and advice provided by the Commonwealth and State Chief Medical/Health Officers through the Australian Health Protection Principal Committee (AHPPC)[8,9].

In 2020 National Cabinet agreed to a COVID-19 elimination policy that implied aggressive and quick lockdowns that depended on the extent of known community transmission, which in turn relied on extensive testing and contact tracing[10]. The

[7] https://www.pm.gov.au/media/update-coronavirus-measures-0
[8] https://www.pm.gov.au/media/advice-coronavirus
[9] https://www.health.gov.au/committees-and-groups/australian-health-protection-principal-committee-ahppc
[10] https://www.health.gov.au/news/australian-health-protection-principal-committee-ahppc-statement-on-strategic-direction

policy response to the first outbreak across Australia between March and May 2020 was agreed upon nationally and implemented locally. Since then, a number of outbreaks, including Victoria's second outbreak between July and November 2020, have occurred at different times across most states and territories. National, not state- or territory-specific policy, was therefore used to define the necessary public health and economic policy responses to COVID-19.

The implementation of public health and economic policies is divided between the Commonwealth and state/territory governments. In March 2020, the Commonwealth introduced JobKeeper and JobSeeker Payments. The JobKeeper Payment was designed to support businesses and their employees significantly affected by the economic downturn to continue to employ their staff, while JobSeeker Payment was to assist workers who became unemployed because of the economic downturn. These measures have served to arrest further worsening of the downturn and helped to soften the unemployment impact. While Commonwealth policies have focused on supporting employment and workers, states and territories have directed efforts on supporting business activities through economic stimulus measures, tax relief and concessions on fees. This division of responsibilities has been formalised into a policy statement and was announced in July 2021.[11]

In general the types of public health measures implemented by state/territory governments (e.g. mask wearing, social distancing, testing) have been identical. Any variation in implementation across states/territories has largely been due to the differential spread of the virus across states and territories. The difference can arise from the number of international arrivals and the amount inter-state travel. Likewise, economic support policies have also been similar in nature across states/territories, although, as discussed in the next section, there is variation in implementation due to the extent of COVID-19 outbreaks and local conditions.

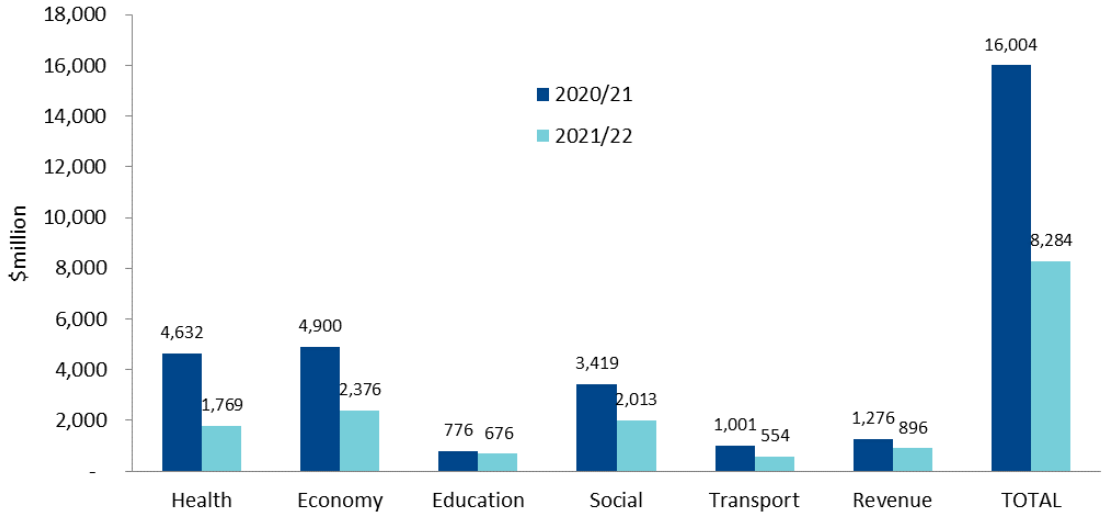
3.3 Policy responses by state/territory governments

In the financial year 2020/21, the Victorian government implemented a range of measures to help contain the spread of the virus and to support individuals and businesses adversely affected by the lockdown. Figure 3.1 gives an overview of the range of policy initiatives deployed by the state government of Victoria through its

[11] Media Statement, Prime Minister of Australia, 15 July 2021 (www.pm.gov.au/media/vic-covid-19-support-package)

budget statements. The categorisation of spending estimates was developed by the Victorian Department of Treasury and Finance.

Figure 3.1: COVID-19 related policy responses, budget spending by policy areas, Victoria 2020/21 & 2021/22



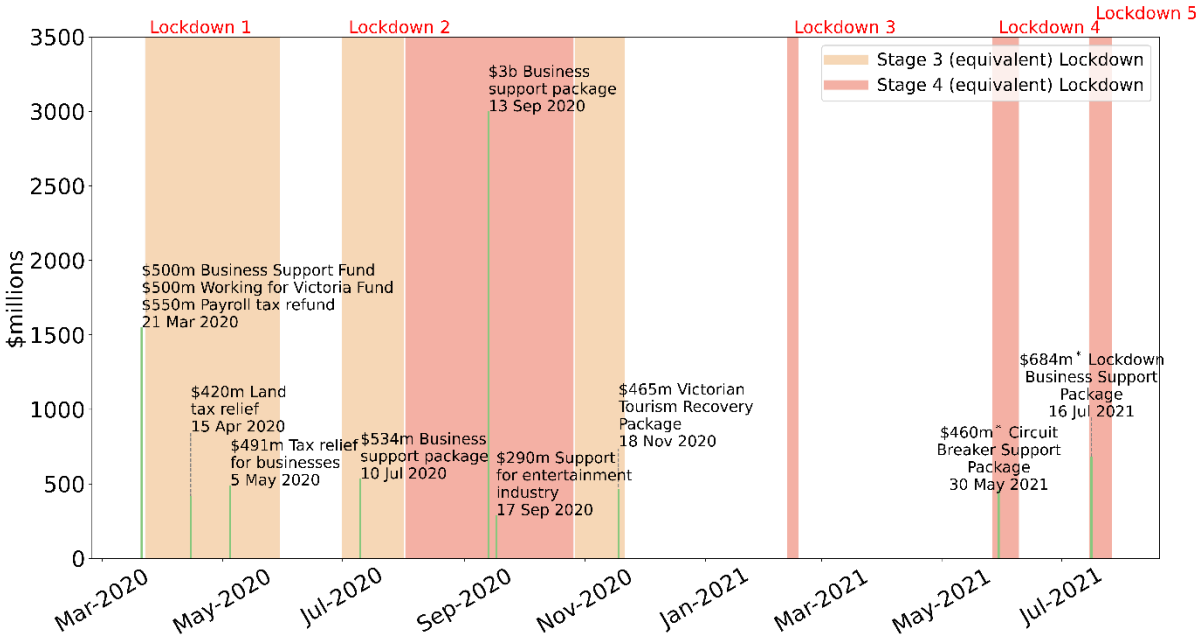
Source: Victorian Department of Treasury and Finance budget, September 2021/22

According to the budget estimates prepared by the Victorian Department of Treasury and Finance, the total amount for COVID-19 related initiatives was expected to cost $16.0b in 2020/21 and a further $8.3b in 2021/22. Major policy initiatives are in the areas of economic supports, health and healthcare, and social services, which together account for the largest share of the budget. Economic supports to industries and regions, including direct grants, promotional activities, and payroll tax relief, are expected to amount to $4.9b in 2020/21 and $2.4b in 2021/22.

Healthcare initiatives are likely to account for $4.6b of the budget in 2020/21, with a further $1.8b in 2021/22. Social services initiatives, including housing for the disadvantaged and engagement with multicultural communities, are expected to amount to $3.4b in 2020/21 and $2.0b in 2021/22. There are significant revenue related measures such as payroll tax and land tax relief and deferral, and various concessions on government fees and charges. These revenue-related measures are expected to cost the state budget $1.3b in 2020/21 and a further 0.9b in 2021/22. Other areas where significant budget amount is expected include transport, environment and planning, and education. The announcements of a number of these major support measures can be found in Figure 3.2, which lists the timeline of major support measures in Victoria during the period March 2020 and July 2021.

As shown in Figure 3.2, major support measures announced during Lockdown 1 (March to May 2020) include Business Support Fund, Working for Victoria Fund, payroll tax refund, land tax relief, and tax relief for businesses. Further support measures were announced during Lockdown 2 (July to November 2020), including industry specific support for the entertainment and tourism sectors. Similar support measures were also announced during subsequent lockdowns in May and July 2021.

Figure 3.2: Major economic support packages, Victoria, March 2020 to July 2021



Note: Amount represents the total announced, and includes initial announced amount and subsequent top-ups due to lockdown extensions. Chart presents measures with announced value of more than $200m.

Source: Victorian Department of Treasury and Finance, collation of information on economic support packages, September 2021.

Comparison with other states/territories

All states and territories have been impacted by the pandemic, although to a different extent depending on factors such as population characteristics and also random factors, i.e., luck, that often dictates the scale of COVID-19 outbreaks. States and territories have also responded with similar policy instruments, although the extent to which they were deployed varies depending on how much states/territories are impacted and the local situation or setting of each state/territory. These policies can also be categorised into health, economy, education, social, transport, and revenue-related measures, as per the classification shown in Figure 3.1 for Victoria. It is worth noting that, before vaccination became available in March 2021, all state/territory governments adopted a policy of elimination that included strict early lockdown.

Figure 3.3 presents the timeline of economic support measures announced by New South Wales, Queensland, South Australia, and Western Australia. Data limitations do not allow the construction of similar charts for Tasmania, ACT, and Northern Territory. The figure shows that New South Wales, the state with the second most days in lockdown next to Victoria (see Table 2.1), announced support measures that include payroll tax relief, Working for NSW Fund, Small Business Support Fund, payroll tax relief and other tax relieves and concessions in March-May 2020 during the first lockdown. These were followed with similar measures announced in subsequent months. Likewise, Queensland, South Australia, Western Australia also announced similar measures for businesses, job protection, economic recovery, and provide tax relieves and concessions to businesses.

Figure 3.3: Major economic support packages, NSW, Queensland, South Australia and Western Australia, March 2020 to July 2021

Note: Support measures with announced value of more than 200 million are presented.
Source: Victorian Department of Treasury and Finance, collation of information on economic support packages, September 2021.

3.4 Victoria's second wave: External circumstances or policy decision?

There are a number of causal pathways leading to the spread of the virus in communities. In Australia, the use of genetic sequencing shows that most of these can be traced to international arrivals. Strict border controls were the mainstay of Australia's elimination policy during 2020, and so the role of quarantine has been a key issue. Hotel quarantine for international arrivals of 14 days was introduced across all states/territories on 28th March 2020 and was implemented very quickly, over a few days in Victoria, with mass mandatory quarantine in hotels not included in national or state pandemic plans[12]. Each state developed policy quickly with no national guidance. The lack of planning for mass quarantine as a potential reason for Victoria's second wave was therefore common across all states/territories, and not specific to Victoria. The focus of pandemic plans at that time was on the voluntary isolation of people in their own homes rather than involuntary isolation in hotels.

Victoria's second wave started in late May/early June within hotel quarantine following transmission of the virus from international arrivals to hotel staff and security guards that directly led to the community outbreak. An inquiry was held to examine how hotel quarantine was implemented in Victoria that focused on the use of private security, training of staff, and governance[13].

At that time each state/territory had different approaches to the implementation of hotel quarantine policy because of the speed at which the policy had to be implemented, pre-existing differences in the internal organisation of their COVID-19 response, and the lack of national or state guidance around mass mandatory quarantine.

Given that involuntary hotel quarantine was not included in any pandemic plans, national guidelines were being developed as the pandemic itself advanced. On 26th June 2020 AHPCC released a statement recommending states/territories review and improve their testing of hotel quarantine workers[14]. On 13th July 2020 AHPCC recommended a national independent review of hotel quarantine arrangements, *recognising that the issues facing Victoria are common across all states/territories*. These reviews took place with recommendations being made nationally and in Victoria,

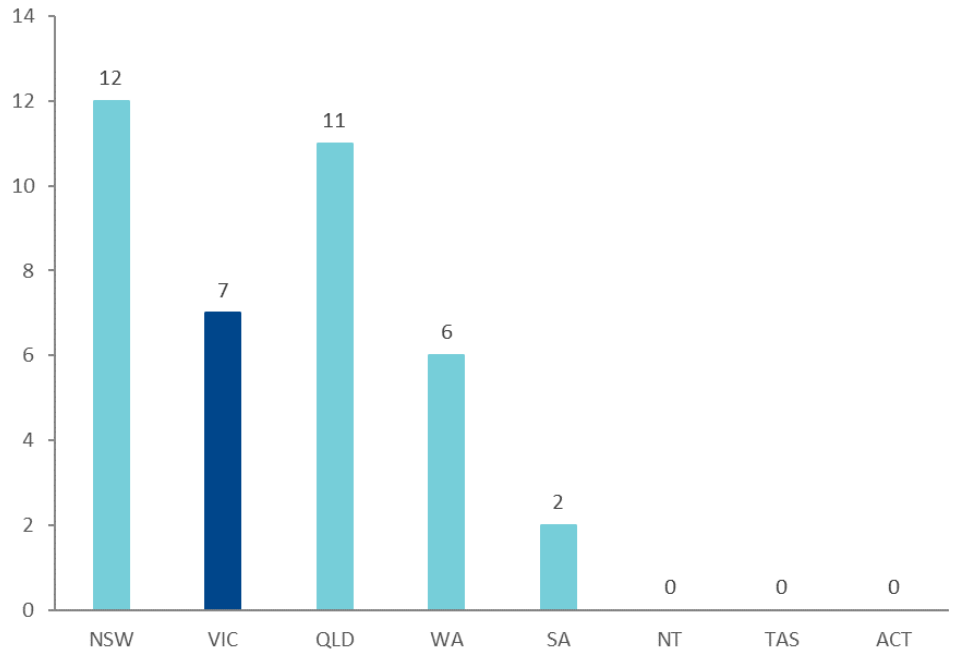
[12] https://www.pm.gov.au/media/update-coronavirus-measures-0
[13] COVID-19 Hotel Quarantine Inquiry, Final Report and Recommendations, Volume I. Parl paper no. 191 (2018–2020)
[14] https://www.health.gov.au/news/australian-health-protection-principal-committee-ahppc-statement-on-hotel-quarantine

during the last half of 2020 and with National Hotel Quarantine Principles being set out in December 2020[15] with a review and further guidance published in June 2021[16].

The hotel quarantine breach as the cause of Victoria's second wave also needs to be set in the context of a total of 38 hotel quarantine breaches to date, as shown in Figure 3.4, including two in Perth in April and May 2020, before the breaches in Victoria that began its second wave. Twenty (53 per cent) of these breaches have involved transmission from international arrivals to hotel/quarantine workers. NSW recorded the highest number of breaches (12). These data also exclude the earlier community outbreak in NSW caused by the outbreak on the cruise ship Ruby Princess, where infected passengers disembarked without going into hotel quarantine at all.

The data show that hotel quarantine breaches have occurred in other States even after national guidelines were published, and have continued into 2021. Breaches can occur in different settings and exhibit a degree of randomness that is beyond the control of governments at any level, and so are unrelated to the policy settings of state/territory governments.

Figure 3.4: Total number of quarantine breaches by State/Territory



Source: covidlive.com.au.

[15] https://www.health.gov.au/news/australian-health-protection-principal-committee-ahppc-statement-on-australias-national-hotel-quarantine-principles
[16] https://www.health.gov.au/news/ahppc-statement-on-national-principles-for-managed-quarantine

3.5 Summary

The pandemic is a health crisis with wide-ranging social and economic consequences. The Commonwealth and state/territory governments responded to the pandemic with appropriate public health measures, including mobility restrictions and closure of international borders. These measures are recommended by WHO and are consistent with current scientific evidence. However, these measures also disrupted economic activities. Economic support measures were necessary to lessen the burden of complying with public health orders and lockdown restrictions that have adversely affected businesses, workers and households. The types of policy initiatives are universal across states/territories, and with the affirmation and support of the Commonwealth government and the National Cabinet. With more severe outbreaks and longer lockdown periods in 2020/21, Victoria's policy responses were necessarily more extensive. This has implications on the state's fiscal capacity relative to other states/territories, a topic we shall examine in the next section.

4. Impacts of COVID-19 on fiscal capacity

The section assesses the impact of COVID-19 on the fiscal capacity of Victoria, i.e., the spending and taxation capacity of the state government of Victoria. We do so by creating a counterfactual scenario under which we assume that COVID-19 had not happened and the state's budget expenses and revenue would grow at their usual rates. We also compare the impact on Victoria vis-à-vis other states and territories by creating the counterfactual scenario for other states territories using the same approach. The differential impact of COVID-19 on Victoria in comparison to other states/territories is assessed using a "difference-in-differences" approach.

It bears emphasis that the assessed impact is made on the basis of an estimate, and like all estimates, are subject to errors. The estimated impacts produced will also be different from the budget spending on COVID-19 related policy initiatives discussed in the preceding section. Besides being an estimate, the impact assessed here also represents a 'net' increase or decrease in fiscal position, in that increases are offset against decreases in expenses (or revenue) in arriving at the impact estimates. In contrast, the earlier discussion on budget spending on COVID-19 related policy initiatives did not account for spending decrease (or revenue increase) in areas not directly related to COVID-19.

4.1 Counterfactual scenarios

We undertake to construct counterfactual scenarios for Victoria's and other states' and territories' fiscal capacity by asking what if COVID-19 did not happen. We make the key assumption that, without COVID-19 disruptions, states' and territories' budget expenses and revenues would have been growing according to past trends. By creating the counterfactual scenarios, we are able to apply a difference-in-differences approach to derive the estimated impacts of COVID-19 and assess its differential impacts on Victoria vis-à-vis other states/territories. The difference-in-differences methodology and how it is applied to the current context is described in Appendix B.

We make use of data from the budget statements of states and territories made available by the Victorian Department of Treasury and Finance. Data for the financial year 2020/21 are taken from 2020/21 and 2021/22 Budgets, with revised estimates on spending as Budgets were released during 2020/21. Data for previous

years are actual spending taken from annual financial reports of states and territories.

For simplicity, we compute the counterfactual expense and revenue amounts for the financial year 2020/21 using the average growth rates of the previous two financial years, i.e., a simple average of the growth rates from 2017/18 to 2018/19 and 2018/19 to 2019/20. The average growth rates are applied to the corresponding budget expense and revenue items of 2019/20, under the assumption that their growth from 2019/20 to 2020/21 would have followed the same trend had there been no COVID-19 disruption. Note that since the financial year 2019/20 includes the period March to June 2020, during which measures in relation to COVID-19 were being introduced and which may have affected revenue and spending. Since there is no reliable way to identify COVID-19 related spending, and given that the period affected is relatively short for 2019/20, we have not made any allowance in our construction of the counterfactual scenarios. The likely effect is that for states and territories more severely affected in 2019/20, their counterfactual spending amounts would tend to be overstated, resulting in an underestimation of the impact of COVID-19 on budget spending for 2020/21.

4.2 Impact on Victoria's fiscal capacity

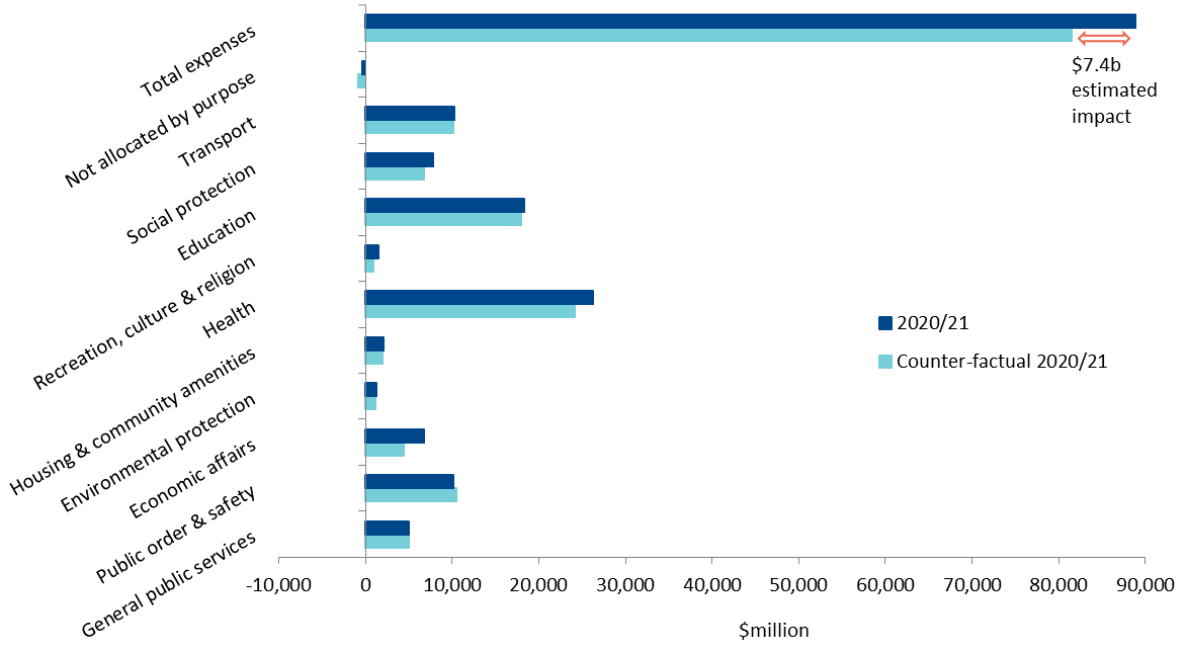
The counterfactual expense and revenue amounts for 2020/21 are depicted in Figure 4.1 and 4.2, alongside the actual 2020/21 budget expense and revenue amounts under individual budget categories. The difference between the actual and counterfactual amounts is taken as an estimate of the impact of COVID-19 on the fiscal capacity of the state.

A comparison of the counterfactual with actual budget expenses in Figure 4.1 shows that Victoria's total expenditure increased significantly by $7.4b under the pandemic environment. The main areas of increases were found in the broad areas of economic affairs ($2.3b), health ($2.1b) and social protection ($1.1b). These estimates can be interpreted as the additional expenses that were incurred because of COVID-19, they would not have otherwise been incurred in the absence of the pandemic.

Using the same approach of creating counterfactual scenarios, we also estimated the impact of COVID-19 on Victoria's budget revenue, as shown in Figure 4.2. The analysis here focuses on taxation revenue sources, since the pandemic is expected to affect the state's revenue raising capacity mainly through taxation rather than non-

tax related sources. The results suggest that the COVID-19 environment did not reduce Victorian state revenue from taxation; in fact, taxation revenue recorded a slight increase of about $0.17b compared to the projection under the condition of no pandemic. The increase was mainly due to the higher than expected increase in taxes on payroll and labour force.

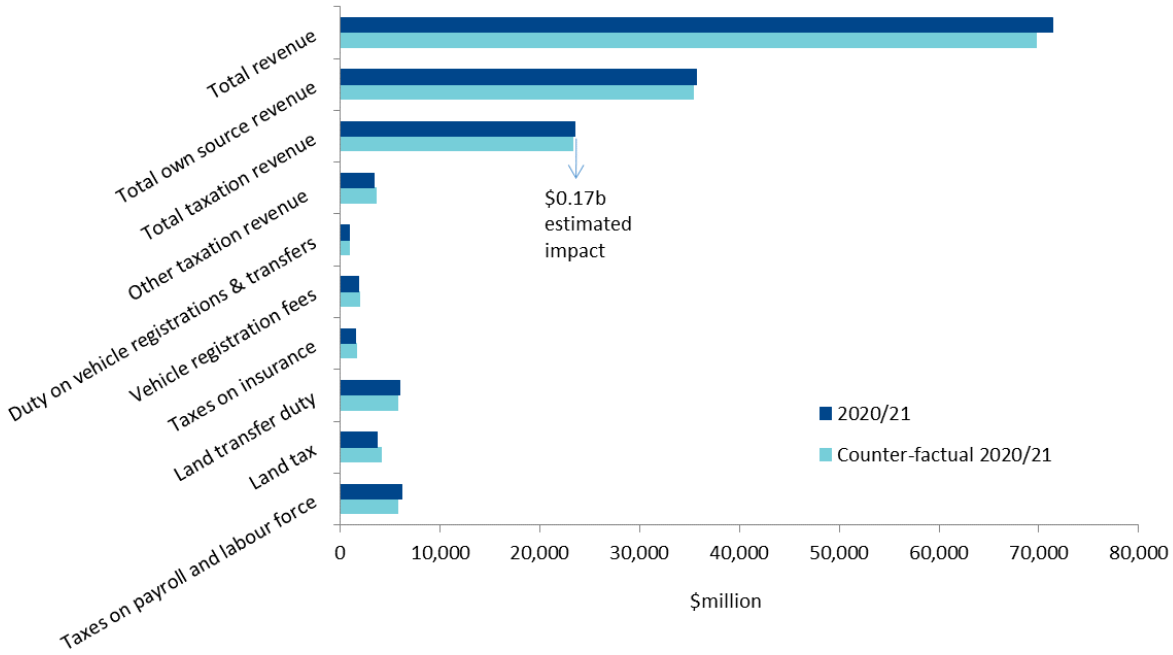
Figure 4.1: Estimated impact of COVID-19 on budget expenses, Victoria 2020/21



Source: Victorian budget statements, annual financial reports and authors' analysis.

There is no surprise that the impact on revenue was relatively small in magnitude compared with that on expenses. Given the nature of COVID-19, the state has had to increase spending in public health on testing, tracing and preventing infections, in shoring up healthcare capacity to provide care for infected patients, and in supporting economic activities to soften the impact on businesses and workers adversely affected by the pandemic. On this basis, we will focus our discussion on the impact of the pandemic on budget expenses when comparing the extent to which the fiscal capacity of different states/territories were impacted in 2020/21.

Figure 4.2: Estimated impact of COVID-19 on budget revenue, Victoria 2020/21



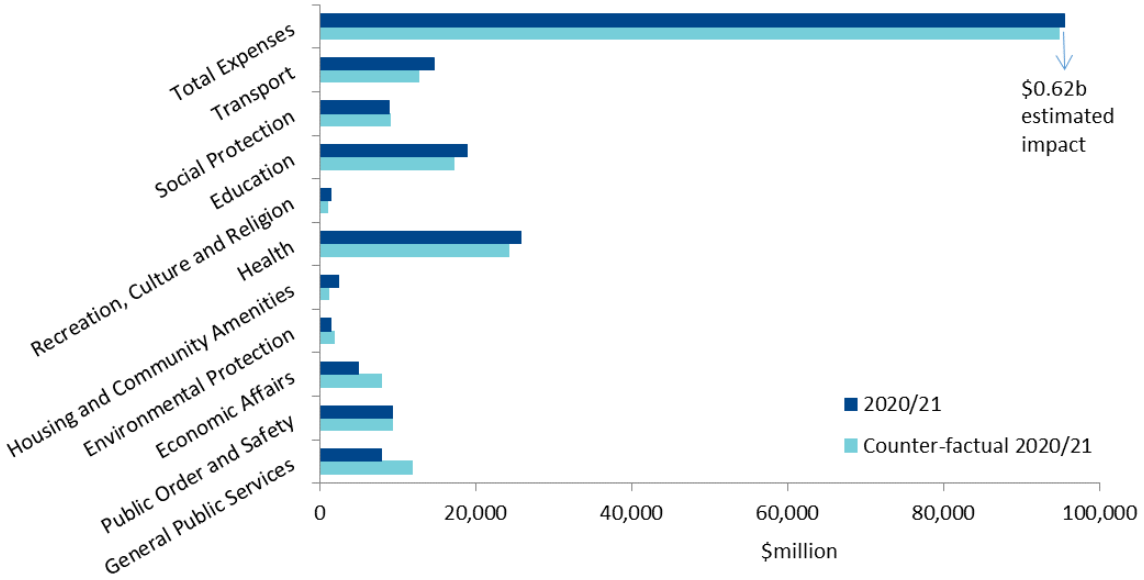
Source: Victorian budget statements, annual financial reports and authors' analysis.

4.3 Comparison with other states and territories

We apply the same approach of constructing counterfactual scenarios to the budget of other state and territory governments. Figure 4.3 presents the results for New South Wales, which in terms of population size, volume of economic activities, and the size of budget expenses, is the closest in similarity to Victoria. It is worth noting that NSW had fewer days in lockdown than Victoria during the financial year 2020/21 (as shown in Figure 2.2 in Section 2), notwithstanding the prolonged period of lockdown NSW experienced in the second half of 2021 associated with the spread of the Delta variant of the virus. Focusing on the financial year 2020/21, it is reasonable to expect that NSW was less severely impacted than Victoria. Indeed, as shown in Figure 4.3, the impact on NSW total budget expenses was $0.62b in 2020/21, with expenses on education, health and transport among the categories most affected by the pandemic.

Given that the pandemic affected Victoria more than NSW in 2020/21, it is possible to derive an estimate of the differential impact on the two states. The difference-in-differences estimate of $6.78b (the difference between the estimated impact of $7.4b for Victoria and $0.62b for NSW) represents an estimate of the pandemic on Victoria due to its more severe outbreaks and longer lockdown during 2020/21.

Figure 4.3: Estimated impact of COVID-19 on NSW budget expenses, 2020/21



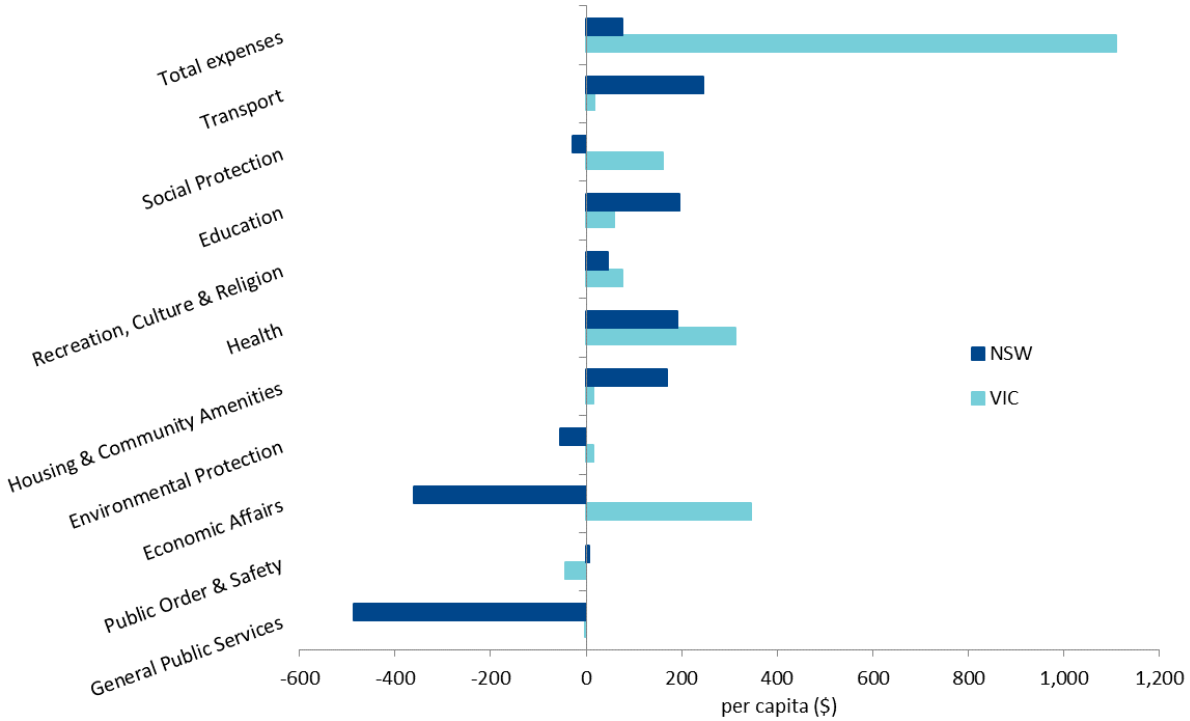
Source: Victorian and NSW budget statements, annual financial reports and authors' analysis.

To take into account the difference in population size between Victoria and NSW, Figure 4.4 shows the estimated impacts on budget expenses in per capita terms. The result suggests a sizeable differential impact on the two states—the impact on Victoria's total budget expenses, at $1,110 per capita, is more than 14 times larger than that of $76 per capita on NSW. Expense categories with notable differences in impacts include economic affairs, general public services and transport.

The plausibility of the differential impact estimates rests on whether it is reasonable to use NSW as the "control" or comparison state for Victoria. Another set of plausible estimates can also be obtained using the rest of Australia as the comparison for Victoria. We repeat the exercise of constructing counterfactual scenarios for every state/territory and derive the estimated impact. The results, expressed in per capita terms, are summarised in Table 4.1, where the last column shows the total per capita impact estimates across all states/territories, excluding Victoria.

Victoria, at $1,110 per capita, had the third largest per capita impact, behind the Northern Territory ($2,640) and Western Australia ($1,414). At the other extreme, ACT experienced a decline in expenses of $1,022 per capita during 2020/21. The per capita numbers, however, tend to be driven by small population size. When averaged across states and territories, but with Victoria excluded, the per capita impact on budget expenses amounted to $64 per person in the rest of Australia in 2020/21.

Figure 4.4: Estimated per capita impact of COVID-19 on budget expenses, Victoria vs NSW, 2020/21



Source: Victorian and NSW budget statements and annual financial reports, ABS population statistics as at 31 December 2020 (abs.gov.au/statistics/people/population), and authors' analysis.

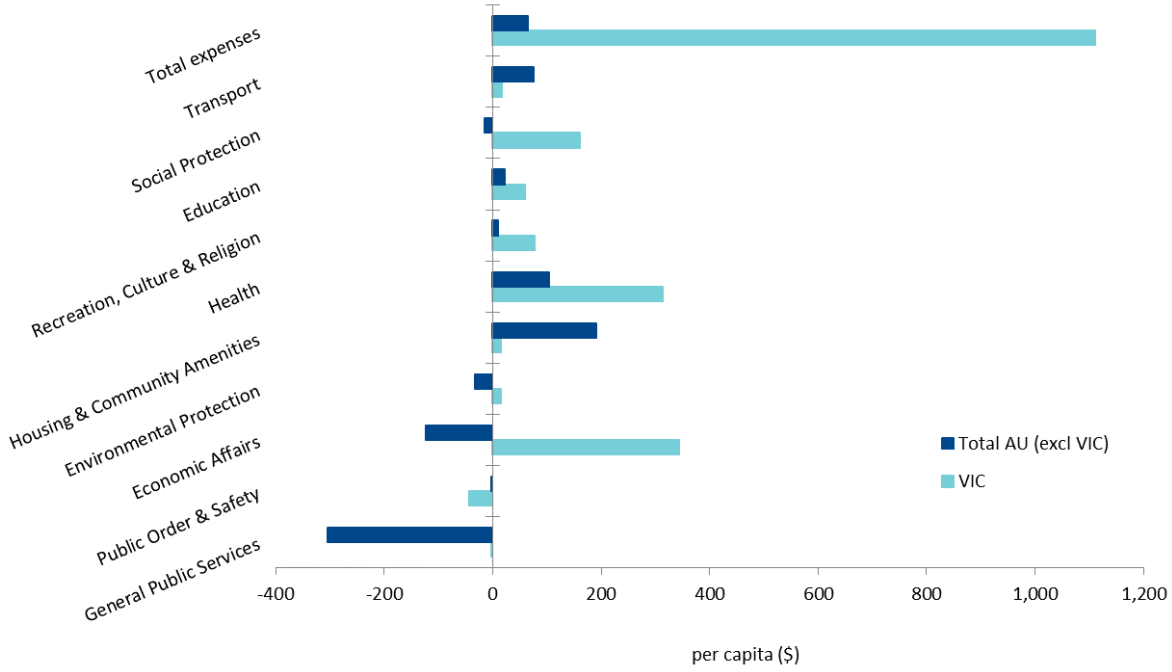
Table 4.1: Estimated per capita impacts of COVID-19 on budget expenses, all states and territories, 2020/21

	VIC	NSW	QLD	WA	SA	TAS	ACT	NT	Total AU (excl VIC)
Expenses by COFOG									
General Public Services	-2	-486	-458	78	31	327	185	116	-305
Public Order & Safety	-44	6	17	-62	32	-125	-93	185	-2
Economic Affairs	345	-361	16	121	96	-107	-43	403	-123
Environmental Protection	16	-54	-39	9	46	1	-183	49	-32
Housing & Community Amenities	16	169	13	742	113	-54	25	125	191
Health	314	191	-72	176	79	99	-397	1240	104
Recreation, Culture & Religion	77	45	11	-18	-121	26	-44	121	10
Education	59	196	-176	267	-460	-29	-360	25	22
Social Protection	161	-28	-9	-9	26	-64	-218	344	-16
Transport	17	246	11	10	-316	22	-218	-63	75
Total expenses	**1110**	**76**	**-620**	**1414**	**-138**	**152**	**-1022**	**2640**	**64**

Source: State and territory budget statements and annual financial reports, ABS population statistics as at 31 December 2020 (abs.gov.au/statistics/people/population), and authors' analysis.

Figure 4.5 compares the estimated per capita impacts on total budget expenses for Victoria with the rest of Australia. Compared to the rest of the country, Victoria's estimated impact on total expenses was in excess of $1,100 per capita, approximately 17 times that of the rest of the country. Expense categories showing the largest differential per capita impact on Victoria vis-à-vis the rest of the country include economic affairs ($345 versus negative $123 per capita), health ($314 versus $104 per capita), and housing and community amenities ($16 versus $194 per capita).

Figure 4.5: Per capita impacts of COVID-19 on budget expenses, Victoria compared with Rest of Australia, 2020/21



Source: State and territory budget statements and annual financial reports. ABS population statistics as at 31 December 2020 (abs.gov.au/statistics/people/population) and authors' analysis.

Although useful for comparison purposes, expressing the estimated impacts of the pandemic in per capita terms can be misleading, since states/territories with a small population will tend to show large per capita impacts due to the inherent difference in economies of scale between populous and smaller states/territories. The aggregate dollar amounts of the estimated impacts are shown in Table 4.2. The picture is somewhat different from the per capita estimates shown earlier.

The estimated impacts varied greatly across states and territories in 2020/21, ranging from $7.4b additional total expenses for Victoria, $3.8b for Western Australia to a decline in total expenses of $3.2b for Queensland. When aggregated across all states/territories, excluding Victoria, total budget expenses in the rest of the country

were higher by about $1.2b in total. The estimated impacts on aggregate expense categories varied greatly, ranging from increases of $3.6b for housing and community amenities, $2b for health and $1.4b for transport for the rest of the country. At the other extreme, categories showing a decline in expenses include general public services (decreased by $5.6b), and economic affairs (decreased by $2.3b).

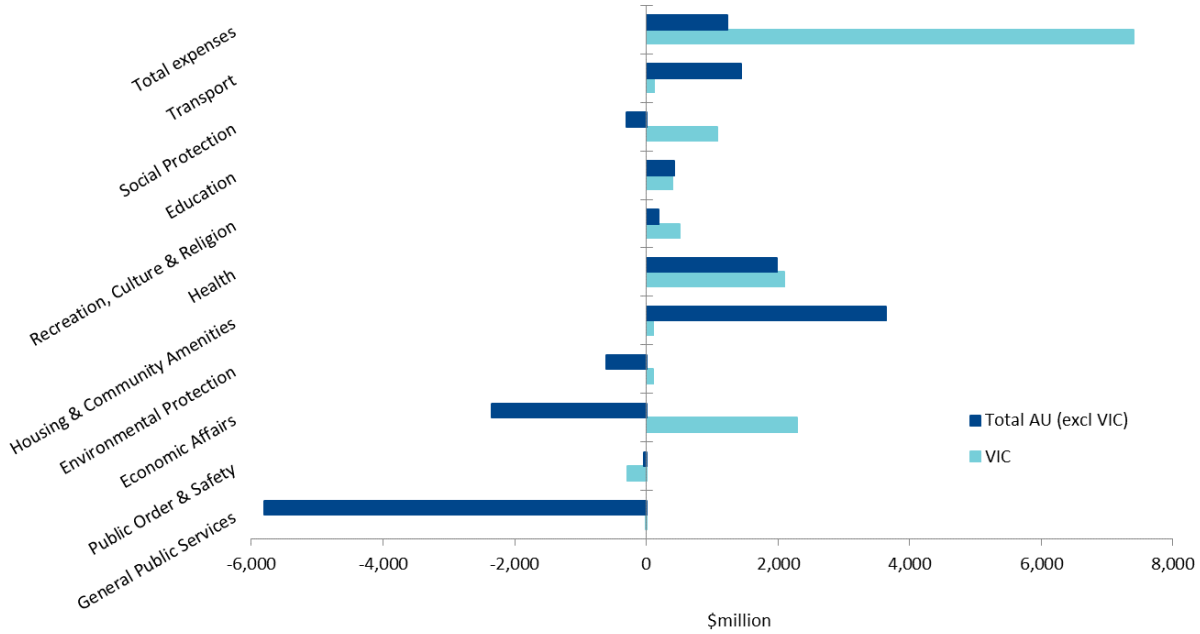
Table 4.2: Estimated Impacts of COVID-19 on budget expenses, all states/territories, 2020/21

	VIC	NSW	QLD	WA	SA	TAS	ACT	NT	Total AU (excl VIC)
Expenses by COFOG				$m					
General Public Services	-14	-3972	-2377	208	56	177	80	29	-5799
Public Order & Safety	-292	46	87	-165	57	-68	-40	46	-37
Economic Affairs	2295	-2948	85	324	170	-58	-18	99	-2345
Environmental Protection	104	-442	-205	23	82	0	-79	12	-607
Housing & Community Amenities	104	1380	66	1980	200	-30	11	31	3640
Health	2089	1557	-375	471	140	54	-171	306	1981
Recreation, Culture & Religion	513	366	58	-47	-215	14	-19	30	188
Education	394	1604	-914	712	-814	-16	-155	6	422
Social Protection	1076	-230	-46	-24	47	-34	-94	85	-297
Transport	112	2009	56	26	-560	12	-94	-15	1433
Total expenses	**7397**	**624**	**-3221**	**3775**	**-244**	**82**	**-441**	**651**	**1226**

Source: State and territory budget statements and annual financial reports and authors' analysis.

Figure 4.6 compares the estimated impacts on Victoria vis-à-vis the rest of Australia in aggregate. Estimated at $7.4b, the impact on Victoria's budget expenses was significantly larger, by more than six times, than that experienced by the rest of the country, which experienced an increase of $1.2b. The differential impact of COVID-19 between Victoria and the rest of the country was therefore $6.2b (being the difference between $7.4b and $1.2b). Categories of expenses where the impacts on Victoria have been noticeably different in comparison to the rest of the country include economic affairs ($2.3b versus negative $2.3b), general public services (negative $0.14b versus negative $5.8b), and social protection ($1.1b versus negative $0.3b).

Figure 4.6: Estimated impacts of COVID-19 on budget expenses, Victoria compared with Rest of Australia, 2020/21



Source: State and territory budget statements and annual financial reports and authors' analysis.

The impacts of COVID-19 on total budget expenses across states/territories for 2020/21 are shown in Figure 4.7. Also shown in the figure is the average impact, unweighted, across all states/territories, which at $1.1b, was indicated by the horizontal blue line drawn across all states/territories in the figure. It is clear from the figure that the magnitude of the impact on Victoria stood out in comparison to other states/territories and with reference to the national average.

Figure 4.7: Estimated impacts of COVID-19 on total budget expenses, Victoria compared with other states/territories, 2020/21

Source: State and territory budget statements, annual financial reports and authors' analysis.

4.4 Summary

We assess the impact of COVID-19 on the fiscal capacity of Victoria using an approach that involves the construction of counterfactual scenarios. For comparisons, the same approach is applied to other states/territories. The differential impact on Victoria relative to other states/territories is estimated by applying a difference-in-differences approach. The key assumption in constructing the counterfactual scenarios is that state budgets would have grown at the average growth rate of the past two financial years had there been no COVID-19 disruption.

Our results suggest that the impact on Victoria's budget expenses was $7.4b in 2020/21, while the impact on revenue was relatively small in comparison. The amount represents an estimate of the additional expenses incurred by the state in 2020/21 because of COVID-19; these expenses would not have been incurred under normal circumstances had there been no pandemic. As such, they could be regarded as a separate category of expenses distinguishable from normal budget expenses in the absence of COVID-19.

We further show that the impact on Victoria's budget expenses was substantially larger relative to other states and territories. The conclusion holds whether we use NSW or the rest of Australia for comparison, and likewise whether expenses were expressed in per capita terms or in aggregate. The additional expenses that would otherwise not have been incurred by Victoria, and the differential impact on the fiscal burden will have implications on the forthcoming update of the GST distribution for 2020/21. This will be the discussion of the next section.

5. Options for GST distribution and implications

The distribution of the GST revenue pool among states/territories is based on the principles of horizontal equalisation, under which the GST pool is allocated such that a person is able to receive similar levels of government services and pay a similar level of state-imposed taxes, regardless of the jurisdiction in which the individual lives (Commonwealth Grants Commission, 2020). Under this arrangement, the GST distribution for a state/territory is based not on actual expenditure or revenue incurred by the state or territory, rather on assessed expenditure and assessed revenue, which in turn are based on notions of average expenditure and revenue across all jurisdictions. For this reason, a state/territory can suffer a shortfall in GST distribution if its actual expenditure is larger than its assessed expenditure need, or its actual revenue is smaller than its assessed revenue raising capacity.

As we have shown in the preceding section, the pandemic has significantly impacted Victoria's fiscal position. Using the counterfactual scenario, we have shown that an additional $7.4b of expenditures were incurred in 2020/21, the majority of which were on policy initiatives in the areas of health, economic support, and social protection. In comparison to other states and territories, the impact on Victoria has been substantially larger, by more than six times on average.

The pandemic is a natural disaster that requires immediate and extensive policy response from all governments. Victoria's additional expenditures were necessary to contain the spread of the virus and to support the community from economic losses arising from the public health measures. However, the large and differential impact has placed Victoria at a significant disadvantage under the current methods of assessment for GST distribution. The forthcoming 2022 update and future updates should recognise the differential fiscal impact on states and territories and consider options to achieve an equitable GST distribution.

5.1 Differential impacts of COVID-19 on states/territories

The COVID-19 pandemic has had significant impacts on health and healthcare, and has caused major disruption to everyday activities in Australia. With more severe outbreaks and longer periods of lockdown in 2020/21, Victoria fared worse than other states/territories. As reported in Section 2 above (Figure 2.3), Victoria had

about 82% of the total number of confirmed COVID-19 cases and 99% of total COVID-19 related deaths in Australia during 2020/21.

Longer periods of stricter public health measures in Victoria have disrupted economic activities in the state, adversely affecting many businesses and workers. Section 2 above showed that consumption expenditures and employment in Victoria were impacted more than other states/territories during 2020/21. The extended periods of lockdown in Victoria also impacted the healthcare sector, with significantly lower utilisation in primary and tertiary care, as many elective surgical procedures were postponed during lockdown. Meanwhile, healthcare expenditure increased during this period, due to the need to maintain health service capacity and to strengthen the healthcare infrastructure during the pandemic. The disruption to the healthcare sector will have flow on effects on health and healthcare in the near future, since delayed treatment and missed diagnoses would likely to result in higher demand for care and more utilisation at a later time. This will have implications on the near-term healthcare expenditure of the state and Commonwealth governments.

Managing the pandemic has required strict public health measures which have had significant economic impacts. Government interventions have been necessary to provide economic support to businesses and individuals, and across many sectors of the economy. The nature of the policy response is universal across states/territories, and with the affirmation and support of the Commonwealth government and the National Cabinet. In this regard, Victoria's policy response was no different from other states/territories, although the scale of response was necessarily more extensive than in other states/territories due to the length of outbreaks and associated lockdown periods.

Implementing the policy response in Victoria has had major implications on the state's fiscal capacity. Section 4 shows that the impact on Victoria's budget expenses in 2020/21 was estimated to be an additional $7.4b, an amount substantially larger, by about six times, than the corresponding estimates for other states/territories.

5.2 The pandemic as a natural disaster

The incidence and spread of viruses in pandemics can be random and unpredictable. Standard epidemiological models assume there is a random component that captures randomness in individual behaviours that influence virus transmission, as

well as randomness due to uncertainty about the nature of the virus itself (Allen, 2008). Epidemiological studies have shown that a virus incursion incident may result in a range of different outcomes, ranging from no new infections to widespread outbreaks, even under similar circumstances (Abeysuriya et al., 2020; Baxter and Blakely, 2021). The evidence on hotel quarantine breaches presented earlier (Figure 3.4) suggests that the causes of outbreaks are random and not due to the policy actions of a single State/Territory (Grout et al., 2021). As such, pandemics share similar characteristics to natural disasters such as bushfire or floods, but with more widespread repercussions across all facets of society and the economy.

The Australian Government Crisis Management Framework (AGCMF) published by the Department of Prime Minister and Cabinet defines pandemics as natural events: *"including but not limited to bushfires, cyclonic or severe storms, floods, earthquakes, space weather, asteroid or extra-terrestrial body impacting on the earth,* ***pandemics*** *and other biosecurity incidents"*(Commonwealth of Australia, 2021).

All states/territories have enacted emergency powers, some specific to public health but also specific to other ways to support communities similar to natural disasters. These enable specific public health and other measures to be enforced to prevent transmission and support the community.

In Victoria a 'State of Emergency' was declared on 16th March 2020 under the Public Health and Wellbeing Act (2008). In addition, under the Emergency Management Act (2013), a 'State of Disaster' was introduced on 2nd August 2020 that focuses on 'significant danger to life or property'. This was necessary to enforce Stage 4 restrictions including the use of curfews and the 5km radius mobility restriction[17]. It is notable that this same Act was also used during the bushfires in early 2020 and can be used in other natural disasters. In this Act "a plague or an epidemic" is classified as emergencies alongside natural disasters (i.e. "an earthquake, flood, wind-storm or other natural event")[18]. This is the same in the NSW State Emergency and Rescue Act (1989)[19]. There were therefore precedents for a pandemic to be treated as a natural disaster.

Furthermore, at the beginning of the current outbreak in NSW and Victoria, the Commonwealth has recognised the pandemic as a natural disaster through the use

[17] https://www.abc.net.au/news/2020-08-16/victoria-state-of-emergency-disaster-explained-coronavirus/12563680
[18] https://www.legislation.vic.gov.au/in-force/acts/emergency-management-act-2013/019
[19] https://legislation.nsw.gov.au/

of the COVID Disaster Payment to individuals.[20] These payments, announced in June 2021, focused on assisting workers unable to earn an income due to state public health orders that restrict movement.[21] The disaster payments are administered through Services Australia and come from the National Recovery and Resilience Agency which provides financial support for communities also affected by bushfires, storms and floods.

5.3 GST distribution

We have shown above that the pandemic has had wide ranging health and economic consequences. The virus' impact on Victoria was particularly severe in 2020/21, and necessitated an extensive government response with health, economic and social support measures. These have affected the state's fiscal capacity relative to other states and territories. The differential impact has implications for the forthcoming 2022 update of the GST distribution, as recognised in the Commonwealth Grants Commission's Staff Discussion Paper (Commonwealth Grants Commission, 2021, p.2).

Several options can be considered to treat the differential impact of COVID-19 on fiscal capacities. One option is to adopt an equal per capita basis, essentially regarding the impact as equal across all states and territories. Another option is to allow for differential assessment based on COVID-19 specific drivers, essentially linking the assessment to the extent of COVID-19 prevalence such as the number of confirmed infections or hospitalisations. For the forthcoming 2022 update of GST relativities, the Commonwealth Grants Commission has noted two options which were considered by the Commission in the 2021 update for spending on health (Commonwealth Grants Commission, 2021, p.6). We discuss these two options below in relation to all expenditure, not just on health. As noted above, the impact of COVID-19 is wide ranging and requires government response not only in health but also in economic affairs, social protection and other policy areas.

- Option 1: The first option is business as usual, relying on the existing fiscal equalisation process for assessing expenditures and revenue, including all COVID-19 related spending of states and territories.

[20] https://www.servicesaustralia.gov.au/individuals/services/centrelink/covid-19-disaster-payment
[21] https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/rp2122/Quick_Guides/COVID-19DisasterPayments

- Option 2: The second option is to treat the pandemic like other natural disaster, with GST distribution adjusted to reflect the actual expenditures incurred in response to the pandemic.

Option 1 will not capture the differential impacts of the pandemic on states and territories, given that the differential impacts are not reflected in the current methods of assessing expenditures and revenue. For example, the current assessment takes into account demographic differences across states/territories, and will account for COVID-19 related spending provided the spending is correlated with those demographic characteristics in the same way. However, this does not appear to be the case with the pandemic, since infections, hospitalisations and deaths tend to happen in densely populated metropolitan areas, which means public health measures and the resulting expenditures tend to be higher in urban than in rural areas. This urban-rural difference is not accounted for in the current methods of assessment.

Option 1 would be favoured if spending in relation to COVID-19 policy initiatives is relatively small compared to other spending, or non-policy neutral, that is, if policy decisions were to drive the difference in spending. However, as argued before, states and territories have responded to the pandemic within a nationally agreed policy framework. Any differences are due not to policy choice but to the scale of outbreaks and specific local conditions that dictate the necessary response.

The implication for states and territories such as Victoria whose fiscal capacity was adversely affected by the pandemic in 2020/21 would be a shortfall in the GST distribution. The possibility that the shortfall might be balanced by surpluses in GST distribution in future years appears uncertain. Even if the economy fully recovers, there is no reason to expect that actual expenditures would fall below assessed expenditures for states and territories adversely affected by the pandemic. Another possibility is major outbreaks may also occur in other states and territories in future years, thereby even out the relativity of the fiscal position of states and territories in future GST distribution. This evening out will trigger the 'swings and roundabouts' feature of the fiscal equalisation process, ensuring that equalisation will occur over time (Commonwealth Grants Commission, 2020, p.4). However, there are considerations discussed below that suggest the incidence and burden of the pandemic cannot be expected to fall evenly across all states and territories.

Option 2, on the other hand, is consistent with the accepted view that the pandemic is a natural disaster, at least until the virus becomes endemic and aligned with the

existing health sector's drivers of disadvantage. This option recognises and treats the pandemic in the same way as other natural disasters such as bushfires and floods. Under this option, the GST distribution will be adjusted for states/territories bearing the higher burden of the pandemic in 2020/21, such that the higher expenditures incurred for managing the pandemic are accounted for in the adjustment.

There are several considerations to suggest that a more equitable distribution is more likely under Option 2 rather than Option 1, primarily because the current assessment methods in the fiscal equalisation process is unlikely to suffice for the current phase of the pandemic.

First, the high transmissibility of COVID-19 suggests that more densely populated cities will always have more outbreaks. Moreover, once an outbreak occurs in these cities, it will always be more difficult to contain. Thus, high density cities like Sydney and Melbourne will always have higher chances of longer lockdown periods. States like Victoria and NSW will likely be more exposed to the fiscal risk than other states and territories of responding and managing the health and economic repercussions of the pandemic.

Second, on health expenditure, it has been shown above that healthcare utilisation in all states and territories declined sharply with the lockdown in March-May 2020 and then rebounded, but in Victoria healthcare activities did not return to the pre-pandemic levels like in other states/territories. However, it is important to note that, as shown in the previous sections, healthcare expenditures in Victoria did not fall with lower activity levels during the period. On the contrary, spending on healthcare was substantially higher, due to the need to maintain capacity for the anticipated rise in COVID-19 patients, and to prepare and support health services during the pandemic, including supporting hospitals and healthcare workers, expanding testing and pathology services, enhancing mental health services, and the acquisition of specialised equipment, etc. With lower healthcare activity levels and higher spending, the mechanism of fiscal equalisation will fail to come into force for healthcare expenditure.

Moreover, there are also implications for future healthcare utilisation since delayed care can give rise to more complex health conditions, which in turn increase future healthcare demand. The postponement of elective surgical procedures will also present significant challenges to the healthcare sector for managing large backlogs of patients. The ongoing threat of the pandemic and the need to maintain a COVID-safe environment for patients and staff will only add to the challenge. From the state's

budget perspective, Victoria's healthcare utilisation and health expenditure is likely to be higher than in other states/territories, not just for current financial year but also for the foreseeable future years.

Third, the pandemic has given rise to an environment that is constantly in a state of flux. The potential for new variants of the virus is real, and scientific discoveries about vaccines, testing, and treatment for COVID-19 are taking place at an unprecedented rate. National strategies for managing the pandemic and its health and economic consequences are also changing as scientific knowledge advances. The availability of vaccination has moved Australia away from an elimination strategy to recognise that there may always be COVID-19 in the community. In this constantly evolving and dynamic environment, the degree of uncertainty is so high that the current methods of assessment for GST distribution, which are fixed and reviewed every five years, can no longer assure an equitable outcome over time.

The above considerations suggest that the process of fiscal equalisation under Option 1 is unlikely to provide adequate adjustments whereas Option 2 is able to better account for the differential fiscal incidence of COVID-19 on states and territories in light of the current epidemiological understanding of the virus.

6. Conclusions

This report examines the impacts of COVID-19 on Victoria's economy. The analysis focuses on the policy response of Victoria and the impact on its fiscal capacity relative to other states and territories.

COVID-19 was declared a pandemic by the WHO in March 2020. Australia, and the states and territories, have followed international best practices in managing the pandemic. By imposing strict international border controls and adopting stringent mobility restrictions, Australia has performed well in managing the pandemic relative to other advanced countries.

Although the pandemic is a health crisis, it has significant ramifications on everyday activities going beyond health and healthcare. Lockdowns and the closure of international and interstate borders cause significant disruption to economic activities.

Victoria, like all other states/territories, responded to the pandemic within the nationally agreed national policy framework. However, with its more severe outbreaks, and longer periods in lockdown during the financial year 2020/21, Victoria disproportionally bore the fiscal burden of the crisis relative to other states and territories.

The differential impact should be recognised and accounted for in the forthcoming 2022 update of GST relativities, and also in subsequent updates until the impact of COVID-19 becomes relatively inconsequential. The pandemic is a natural disaster, as recognised in the Australian Government Crisis Management Framework (AGCMF). For a more equitable GST distribution, the pandemic should be treated like any other natural disaster. The adjustment to the GST distribution ought to reflect the actual expenditures incurred in response to the pandemic rather than relying on the current methods of assessment.

This study has several data limitations to note. First, our assessment of the impact of COVID-19 can only be made with available data at the time of writing. As more data become available over time, updated assessment may provide a clearer picture of the impact. Second, in constructing our counterfactual scenarios, we make use of data from 2019/20 financial year which include a four-month period (March-June 2020) that were affected by COVID-19 outbreaks and lockdown. This would have an effect on the estimates, most likely resulting in understating the extent of expenditure predictions for the no-pandemic scenario.

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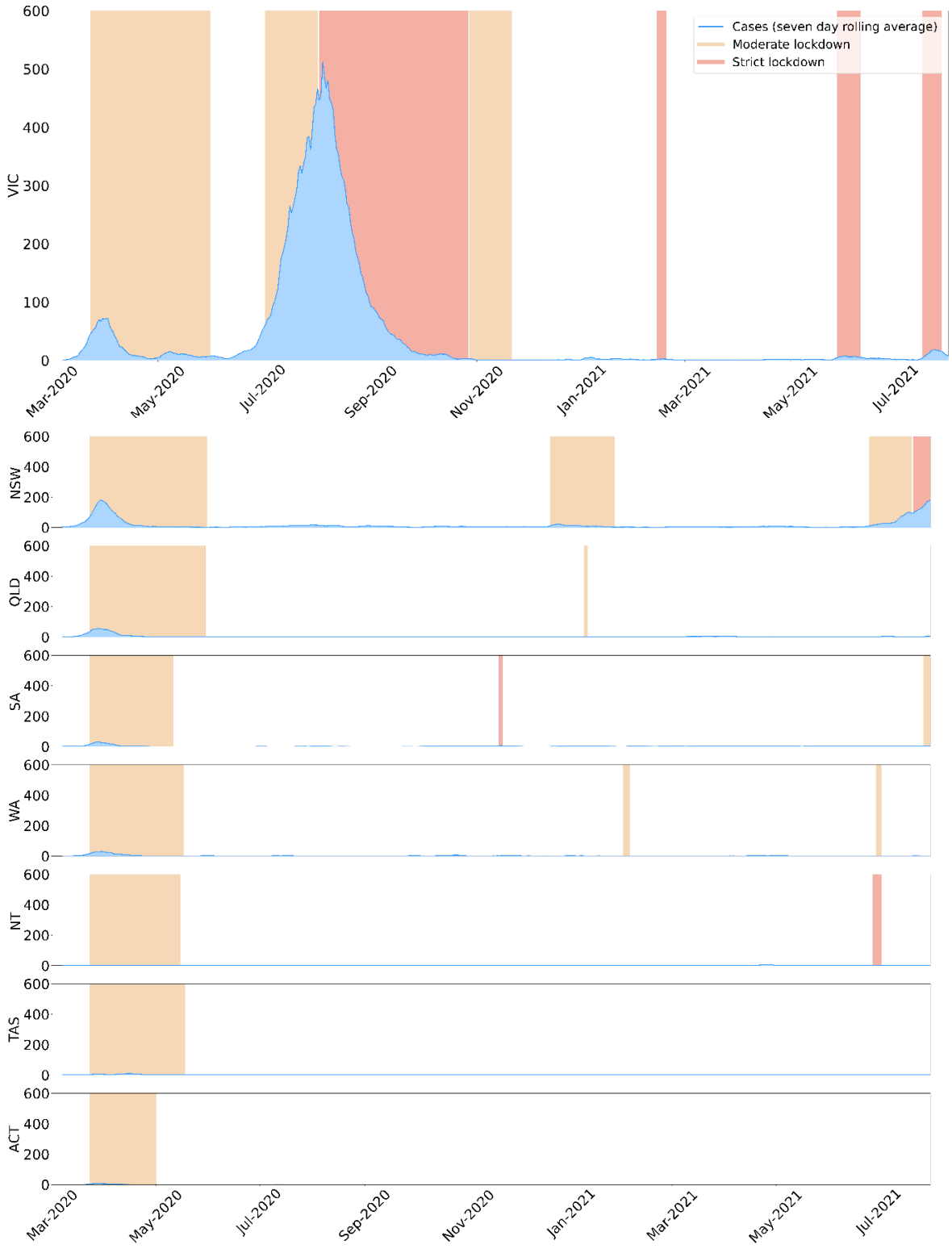
Appendix A

This Appendix contains

- The full figure depicting, for all states and territories, the lockdown periods, case number, hospitalisations, and deaths. (Figure A1).
- A discussion of components of Medicare services.

Figure A1: New confirmed cases, hospitalisations, and deaths due to COVID-19, all states and territories, March 2020 to July 2021



Note: Periods of lockdown are categorised as per the Doherty Modelling Report (The Australian Government the Treasury, 2021), with authors' re-groupings. Designation of lockdown periods in each state/territory refers to the most restrictive form of movement restrictions present anywhere in the state/territory during the period. New cases are seven-day moving averages.

Source: Department of Treasury and Finance COVID-19 Policy Response Tracking, August 2021.

Components of Medicare services

We further analyse the breakdown of Medicare services into GP services (excluding telehealth consultations), and non-GP services, which were further divided into pathology, out-of-hospital and in-hospital services.

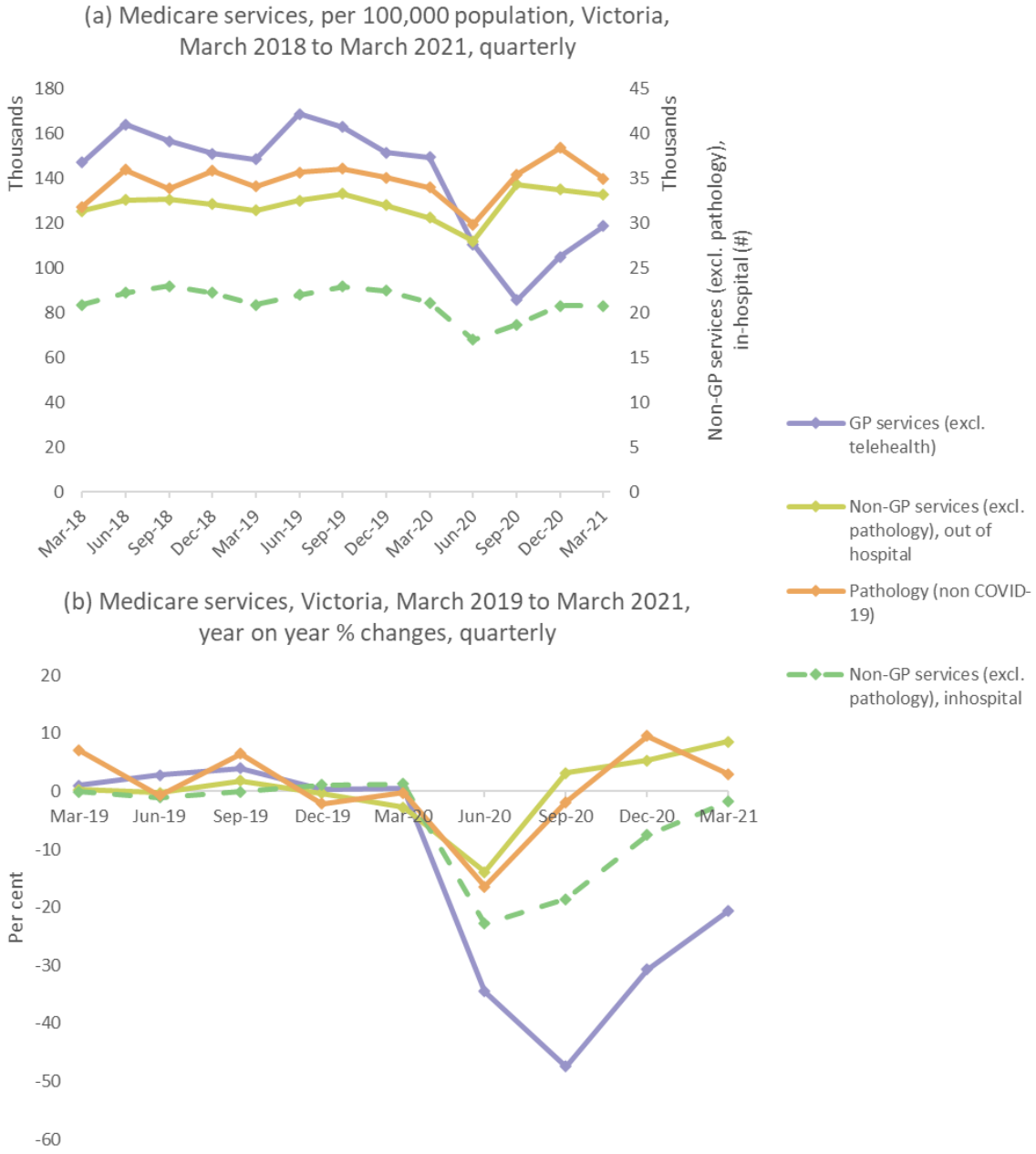
These components of Medicare services are shown in Figure A2, which contains two panels; panel (a) shows the volume measures in units per 100,000 population, while Panel (b) shows the percentage change over the previous year in the corresponding quarter. A positive value in Panel (b) indicates volume has increased over the same quarter in the previous year, while a negative value suggests volume has declined with reference to the same quarter in the previous year. GP telehealth services and COVID-19 pathology testing services are shown in a separate figure in Figure A3.

Figure A2 shows that GP services in Victoria, excluding telehealth consultations, declined sharply during the June quarter 2020, falling by some 50,000 services per 100,000 population or 34% compared to the same quarter in 2019. It declined even further in the September quarter 2020 when Victoria went into Lockdown 2, during which GP services (excluding telehealth services), fell by 77,000 services per 100,000 population or 47% compared to the same quarter in 2019. The level of activities did recover somewhat after restrictions were lifted in November 2020, the level however remained below the pre-pandemic level.

Figure A2 also shows that non-GP services delivered outside hospitals, excluding pathology, also declined during the June quarter 2020, although not to the same extent as GP services excluding telehealth. The level of activities fell by 18,000 per 100,000 population or 14% in comparison to the same quarter in 2019. However, levels of activities quickly recovered in the September quarter 2020, and have since remained above pre-pandemic levels.

The picture is somewhat different for non-GP services delivered in-hospitals, which include admitted private patient services. In the June quarter 2020, volume declined by 22% compared to the same quarter in 2019, and in the next quarter (September quarter 2020), it was still 18% below the same quarter in the previous year. The slowdown in activities was likely a result of the cancellation of non-urgent elective surgeries in all hospitals, including private hospitals, during Lockdowns 1 and 2. After November 2020, elective surgeries resumed and activity levels since then have recovered, albeit slowly, and by the March-May quarter, activities were still below the pre-pandemic level.

Figure A2: Types of Medicare services (excluding GP telehealth and COVID-19 pathology services), Victoria, March 2018 to March 2021



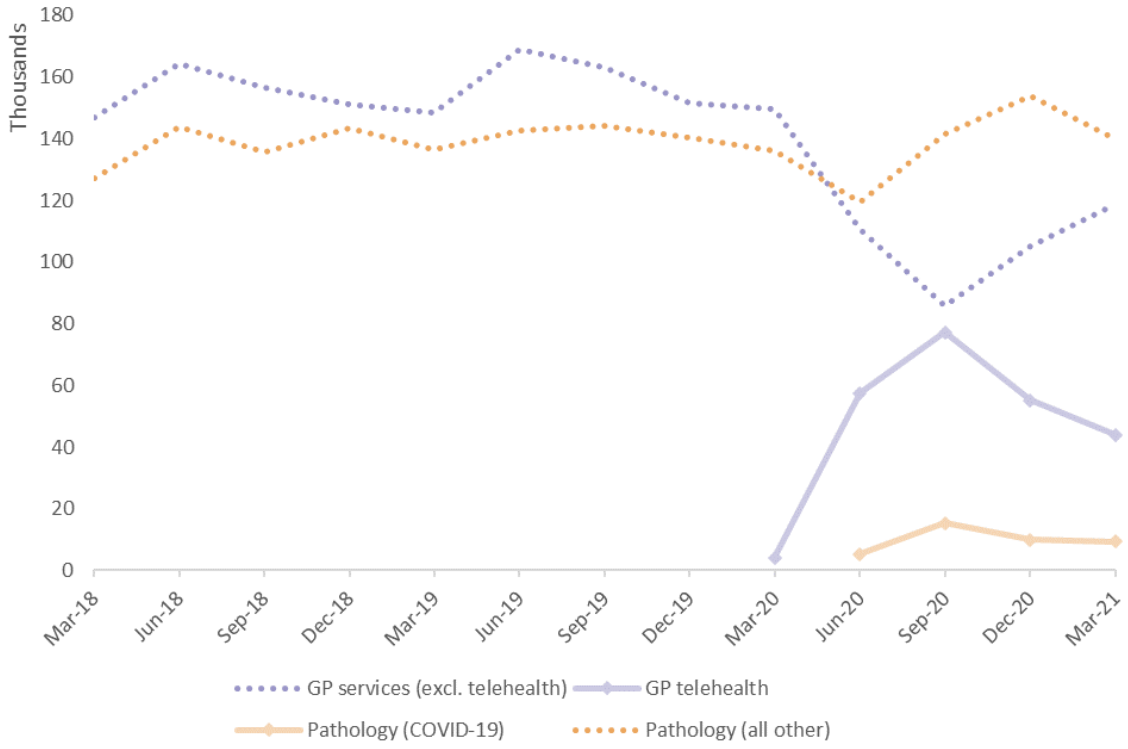
Note: Panel (a) presents number of services per 100,000 population; Panel (b) presents year on year percentage changes in number of Medicare services per 100,000 population each quarter. Population for March quarter 2021 is proxied using population as at 31 December 2020.

Source: MBS Quarterly Statistics, MBS Online item reports (mbsonline.gov.au/internet/mbsonline). Information on COVID-19 pathology test: servicesaustralia.gov.au/organisations/health-professionals/subjects/changes-mbs-items-during-coronavirus-covid-19-response#a1. ABS population statistics (ABS, 2021c).

The levels of GP telehealth consultations and pathology services are shown in Figure A3. As shown in the figure, telehealth consultations rose dramatically in Victoria from the March quarter 2020, the increase almost completely offset the decline in non-telehealth GP services. In the March quarter 2020, there were about 4,100

telehealth consultations per 100,000 population in Victoria. In the next quarter, the number increased to 57,000 per 100,000 population, reaching a peak of 77,000 per 100,000 population in the September quarter, before declining somewhat towards the end of 2020 and the beginning of 2021, likely because doctors resuming face-to-face consultations after restrictions were eased in November 2020, after Lockdown 2 ended.

Figure A3: GP telehealth and COVID-19 pathology services, Victoria, March 2018 to March 2021



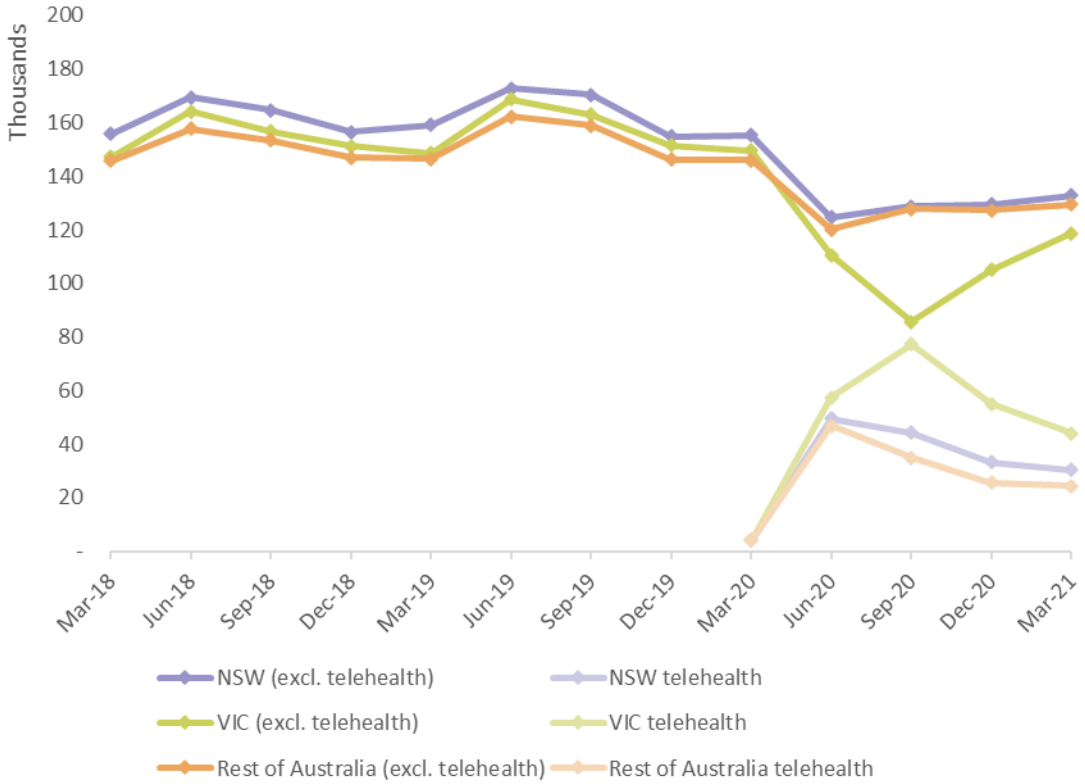
Note: Population for March quarter 2021 was approximated using population as at 31 December2020.
Source: MBS Quarterly Statistics, MBS Online item reports (mbsonline.gov.au/internet/mbsonline).
Information on COVID-19 pathology test: servicesaustralia.gov.au/organisations/health-professionals/subjects/changes-mbs-items-during-coronavirus-covid-19-response#a1
ABS population statistics (ABS, 2021c).

Figure A3 also shows that, for pathology services in Victoria, although volume fell during the June 2020 quarter, it soon recovered by the September quarter 2020, and by the December quarter 2020, activities were even higher than pre-pandemic levels. The growth was likely contributed by the increase in COVID-19 testing. In the June quarter 2020, 5,344 COVID-19 tests per 100,000 population were conducted, by the September quarter, the number of tests reached 15,408 per 100,000 population. From then the number declined slightly but maintained at around 9,000 tests per 100,000 population till the end of our data period.

Comparison with other states/territories

Figure A4 compares the volume of GP services across states/territories, focusing on how Victoria compares with NSW and the rest of Australia. The differences between Victoria and NSW, and between Victoria and the rest of the country are apparent. The fall in the volume of GP services, excluding telehealth, was far sharper in Victoria during the June quarter 2020 than what has happened in NSW and in other states/territories. Correspondingly, the rise in the volume of telehealth services in Victoria during the same period was equally more dramatic than the increase in NSW and in other states/territories. Overall, the rise in telehealth consultations in all states/territories was roughly sufficient to offset the fall in non-telehealth GP consultations such that the overall volume of GP services did not deviate much from the norm during 2020/21.

Figure A4: GP services, per 100,000 population, Victoria, NSW and Rest of Australia, quarterly March 2018 to March 2021



Note: Population for March quarter 2021 is approximated using population as at 31 December 2020.

Source: MBS Quarterly Statistics, MBS Online item reports (mbsonline.gov.au/internet/mbsonline).
Information on COVID-19 pathology test: servicesaustralia.gov.au/organisations/health-professionals/subjects/changes-mbs-items-during-coronavirus-covid-19-response#a1
ABS population statistics (ABS, 2021c).

An important area of healthcare where COVID-19 posed significant disruptions is private in-hospital non-GP services, which include most elective surgery procedures

performed in private hospitals, and for private patients in public hospitals. Figure A5 shows the volume of in-hospital non-GP Medicare services. As in other areas, the volume of services declined substantially in the March and June quarters 2020 in all states/territories, but soon recovered in the next quarter except for Victoria. Volume of services in Victoria did not recover until the end of 2020 and early 2021, and even then, unlike in other states/territories, the level of activities in Victoria remained below the pre-pandemic level during our data period. It is also notable that in-hospital services in NSW decline in the December quarter 2020 and March quarter 2021, likely due to the lockdown in NSW during this period.

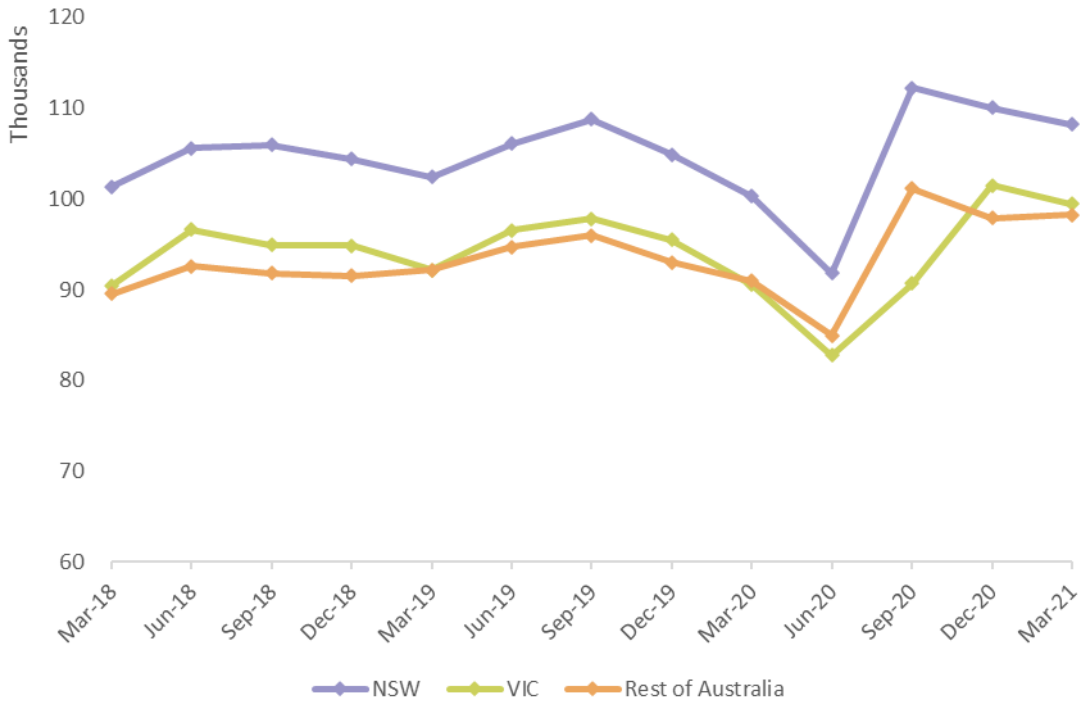
Figure A5: In-hospital non-GP Medicare services per 100,000 population, NSW, Victoria and Rest of Australia, March 2018 to March 2021, quarterly

Note: Population for March quarter 2021 is approximated using population as at 31 December 2020
Source: MBS Quarterly Statistics, MBS Online item reports (mbsonline.gov.au/internet/mbsonline).
Information on COVID-19 pathology test: servicesaustralia.gov.au/organisations/health-professionals/subjects/changes-mbs-items-during-coronavirus-covid-19-response#a1
ABS population statistics (ABS, 2021c).

The volume of out-of-hospital non-GP services, which include specialist consultations, allied health, dental and other services, is found to closely follow the pattern of in-hospital non-GP services, as shown in Figure A6. The volume of services declined in the June quarter 2020 for all states and territories, but for NSW and other states/territories, activities recovered to above the pre-pandemic levels in the next quarter, and from then on gradually tapered off. Victoria is again the

exception, with service volume not recovering until two quarters later, in the December quarter 2020 and March quarter 2021. Here, unlike the case of in-hospital services, the volume of out-of-hospital non-GP services rose to levels above the pre-pandemic level in Victoria, following a pattern similar to that in NSW and other states/territories.

Figure A6: Out of hospital non-GP Medicare services per 100,000 population, NSW, VIC and Rest of Australia, March 2018 to March 2021, quarterly



Note: Data include non-GP telehealth services. Population for March quarter 2021 is proxied using population as at 31 December 2020

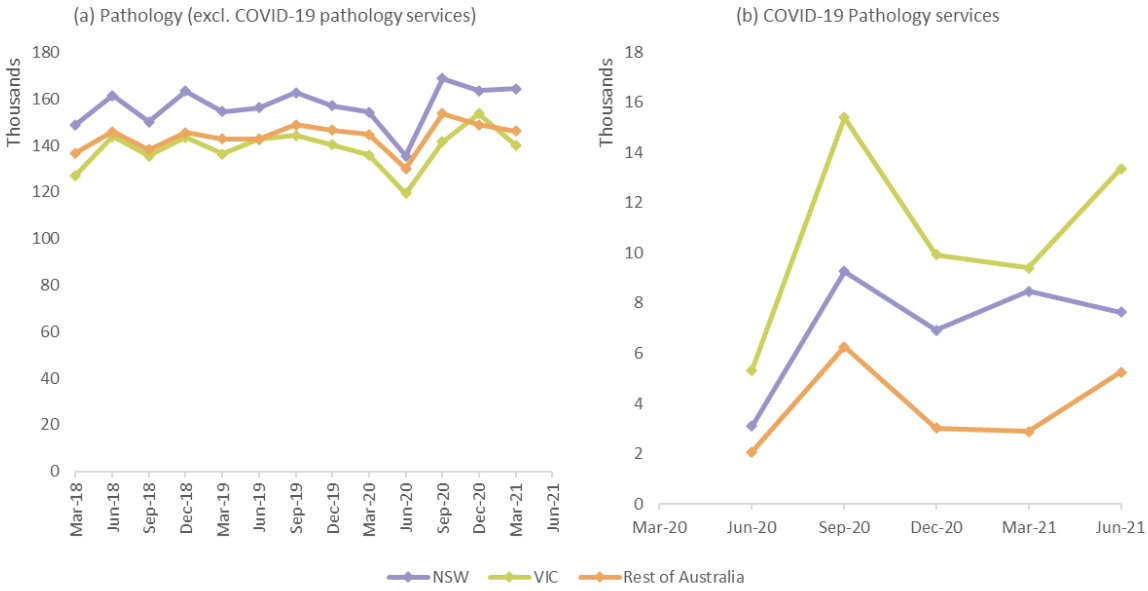
Source: MBS Quarterly Statistics, MBS Online item reports (mbsonline.gov.au/internet/mbsonline). Information on COVID-19 pathology test: servicesaustralia.gov.au/organisations/health-professionals/subjects/changes-mbs-items-during-coronavirus-covid-19-response#a1
ABS population statistics (ABS, 2021c).

Another area of Medicare services which the pandemic has had direct and varying degrees of impacts in different states/territories is pathology services, which from March 2020 onwards include COVID-19 testing services. Figure A7 presents the volume of pathology services, divided into COVID-19 testing (panel (b)) and other pathology services (panel (a)). The volume of non-COVID-19 pathology services per 100,000 population follows similar patterns as in other Medicare services. It fell sharply in all states/territories during the first wave of the pandemic in the March and June quarters of 2020, and then recovered strongly in the following quarter to reach levels above the pre-pandemic levels in all states/territories, except in Victoria

where the recovery was slower than other states/territories. The recovery likely reflects a catching up effect due to the delay of tests during the lockdown period.

For COVID-19 testing services, the opposite has occurred. The volume of services per 100,000 population rose sharply from the June quarter to September quarter 2020, with Victoria leading the nation with more testing per 100,000 population than all other states/territories, a reflection of the severe outbreak during the second wave in Victoria during the period.

Figure A7: Pathology services, per 100,000 population, NSW, Victoria and Rest of Australia, March 2018 to March 2021, quarterly



Note: Population for March quarter 2021 is approximated using population as at 31 December 2020

Source: MBS Quarterly Statistics, MBS Online item reports (mbsonline.gov.au/internet/mbsonline).
Information on COVID-19 pathology test: servicesaustralia.gov.au/organisations/health-professionals/subjects/changes-mbs-items-during-coronavirus-covid-19-response#a1
ABS population statistics (ABS, 2021c).

Appendix B

Difference-in-differences approach

This appendix gives an introductory exposition of the difference-in-differences approach, with emphases on applying the approach to the current context of analysing the effects of the pandemic on the fiscal capacity of Victoria.

The difference-in-differences method is an essential tool in the program-evaluation literature. It has been widely used in assessing the effect of public interventions and other treatments of interest in a variety of topics, ranging from assessing the effect on quality of care following the introduction of new hospital funding arrangements (Farrar et al., 2009), on unemployment duration and earnings arising from a job training program (Ashenfelter and Card, 1985), on smoking prevalence following the introduction of smoking cessation aids (Shen and Noguchi, 2021).

Study design

A difference-in-difference method makes use of a class of research designs that have longitudinal data on each unit that received the treatment (e.g. budget expense data of Victoria recorded at different points in time) and the same data for a comparison group. These designs are also referred to as 'controlled before and after analyses'. Difference-in-difference designs often have data from multiple time periods before and after the intervention so that changes in trends of primary outcomes can be observed relative to a comparison group.

The longitudinal nature of the data enables an evaluator to consider the impact of an event (e.g., COVID-19) occurring at a specific point or period of time on changes in the primary outcomes (e.g., budget expenses), and also enables the use of panel data econometric analysis to help control for observed confounding factors. The design helps moving from observing an association between an event and outcomes towards identifying causal effects.

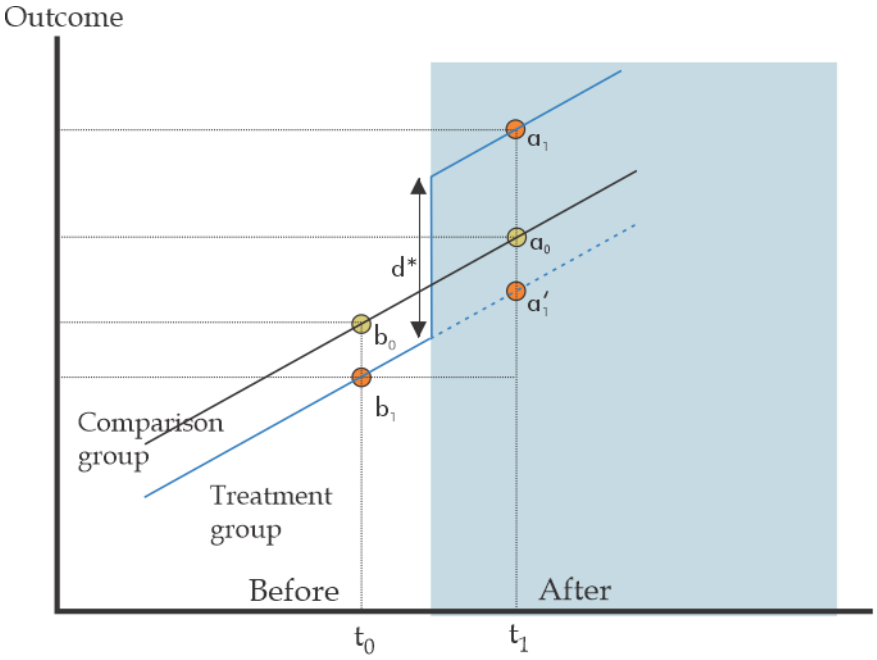
We first describe the working of an archetypical difference-in-differences setup, which we illustrate in Figure A1. We then modify the standard setting to suit our application of assessing the impact of COVID-19 on Victoria's budget expenses. In Figure A1, there is an event of interest or a policy intervention which may have affected some outcome of interest. The magnitude of this effect is labelled d^*. For example, we may be interested in the effect of banning smoking indoor on smoking pervalence in the population. Note that d^* is not directly observed by the analyst, it

has to be estimated. The difference-in-differences approach is designed to obtain a reasonably accurate estimate of d^*.

The design calls for two groups: a treatment group consisting of units that have experienced the event or been subjected to the policy intervention, and a control or comparison group consisting of units selected to act as control, i.e., units that have not experienced the event or been subjected to the policy intervention. For example, in the earlier example of the indoor smoking ban, we may wish to use states or countries that do not impose such ban.

There are two points in time, t_0 and t_1 in Figure A1, denoting before and after the event or intervention. The outcome of interest is observed at these two points in time. The outcomes before the event for the treatment and comparison group are labelled in Figure A1 as $b_1$and b_0. Likewise, outcomes after the event are labelled as $a_1$and a_0 for the treatment and control group. For the treatment group, the before-after difference is $(a_1 - b_1)$, while the before-after difference for the comparison group is $(a_0 - b_0)$.

Figure A1: An illustration of the difference-in-differences approach



The difference-in-differences estimate is simply the difference between the first and second differences just computed: $\hat{d} = (a_1 - b_1) - (a_0 - b_0)$, which can be rearranged as: $\hat{d} = (a_1 - a_0) + (b_0 - b_1) = (a_1 - a_0) + (a_0 - a_1')$, since $(b_0 - b_1) = (a_0 - a_1')$ by construction. Thus $\hat{d} = d^*$, the unobserved effect that we wish to estimate. Notice that the difference-in-differences estimate is more accurate than the

before-after difference, which gives $(a_1 - b_1)$, an overestimate of the true effect d^*. On the other hand, the treatment-control difference gives $(a_1 - a_0)$, an underestime of the true effect.

The difference-in-differences estimate works better because, by using the comparison group, it takes into account the influence of other factors, which influence the outcome but are otherwise unrelated to the event or intervention in question. For example, in the earlier example of indoor smoking ban, other factors that can affect smoking pervalence may include an increase in cigarette taxation, publication of the danger of smoking by the medical profession, and marketing of smoking cessation aids, among other possibilities.

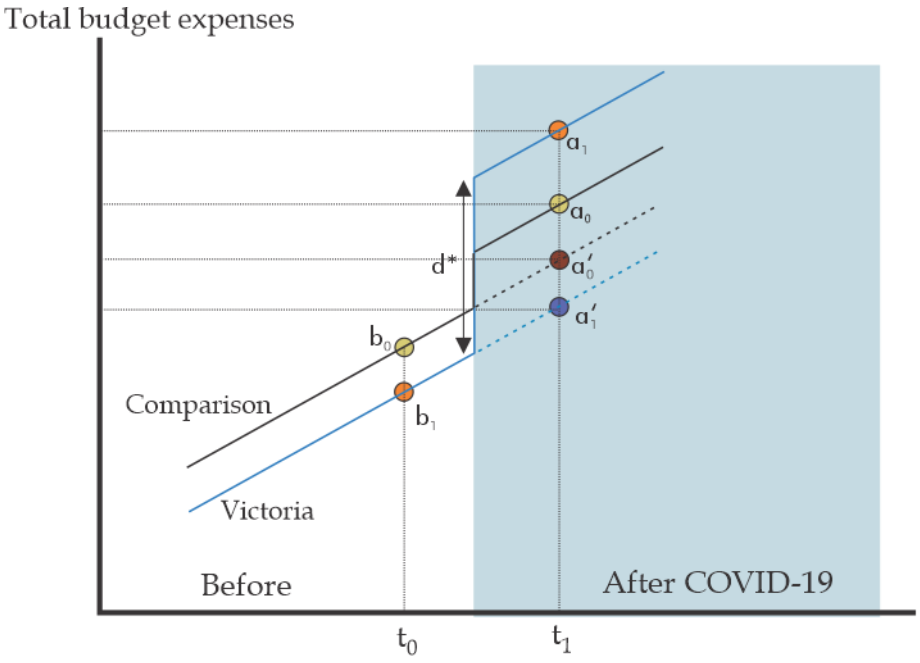
The application of the difference-in-differences approach to our context of studying the impact of COVID-19 on Victoria's fiscal capacity is however not straightforward. The complication arises from finding a comparison or control group. Since it is obvious that no state or territory is unaffected by the pandemic, it is not possible to find a state or territory to serve as a comparison or control. An alternative is to construct a hypothetical or counterfactual scenario that corresponds to the point a_1' in Figure A1. To construct the counterfactual scenario will involve imagining a world in which the event or intervention of interest did not happen. Then the estimate $(a_0 - a_1')$ will also serve as a reasonable estimate for the true effect d^* if a_1' can be acceptably approximated. In most real world applications this will be difficult, since besides the event or policy invervention under study, there can be many other factors that may change during the study period and it is difficult to accurately pinpoint where the point a_1' should have been had the event or intervention under study did not happen but all other relevant factors were to change in the same manner as they would. Fortunately in the case of COVID-19, the event is overwhelmingly dominant that all other factors paled into insignificance.

We illustrate the application in Figure A2. The event is the COVID-19 pandemic, while the outcome of interest is Victoria's budget expenses. The treatment group consists of Victoria, and the comparison group is another state/territory, e.g., NSW, or the rest of Australia as an aggregate entity. As before, outcomes before the pandemic are: b_1 and b_0, and outcomes after the pandemic are: a_1 and a_0, and the unobserved effect to be estimated is d^*.

The difference here from Figure A1 is the outcome for the comparison group is also affected by the event. If we were to apply the same difference-in-differences approach to this situation, we would obtain the estimate: $\hat{d} = (a_1 - a_0) +$

$(b_0 - b_1) = (a_1 - a_0) + (a_0' - a_1') < d^*$, an understimation of the true effect. The fact that the comparison group is also affected by the event has resulted in the underestimation. The alternative, using the counterfactual analysis mentioned above, would yield the estimate: : $\widehat{d'} = (a_1 - a_1') = d^*$, which works better than the straightforward application of the difference-in-differences approach, provided of course the counterfactual can be constructed with reasonable accuracy.

Figure A2: Application of difference-in-differences to current context



Besides estimating the impact of the event on the treatment group, we may also want to estimate the differential impact of the event on the treatment and control group. For example, we may want to know how the pandemic affects Victoria vis-à-vis NSW. Applying the counterfactual analysis to the treatment and comparison groups, we can estimate the impact of the event on each. The difference of the estimates will yield the differential impact: $\tilde{d} = (a_1 - a_1') - (a_0 - a_0') = (a_1 - a_0) + (a_0' - a_1') = \hat{d}$, which is identical to the difference-in-differences estimate derived earlier. Again, the important qualification here is provided the counterfactual scenarios are reasonably accurate.

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