Australian Government
Centre for Population

POPULATION STATEMENT

CENTRE FOR POPULATION

December 2021

Strong evidence. Deep insights. Collaborative approach.

CONTENTS

The Hon Michael Sukkar MP

Assistant Treasurer, Minister for Housing and Minister for Homelessness, Social and Community Housing

A detailed understanding of the size and distribution of our population is fundamental to support economic and fiscal management and good policy making by all levels of government.

The Population Statement outlines how the Australian population has changed and details how we expect it to change in the future.

The 2021 Statement analyses the extraordinary impact the COVID-19 pandemic continues to have on Australia's population. Australia's population has already recorded the slowest growth in over 100 years and growth is forecast to remain low at 0.3 per cent in 2021-22. This largely reflects the restrictions placed on international borders over this period. Overseas migration, which in recent years has been the main source of Australia's population growth, is forecast to be a net outflow for the first time since just after World War II.

The Statement also analyses the impact of the pandemic on internal migration as state governments temporarily closed domestic borders, locked down major cities and restricted travel in some regional areas. Interstate migration between states fell by 9 per cent nationally in 2019-20 compared to its peak in 2018-19.

The Statement provides a sound and transparent evidence base that will assist decision making as Australia reopens and recovers from the pandemic. It will help us better understand changes in the distribution of the population across the country, and provide a clearer picture of the infrastructure, housing and services that different communities need. The Statement's analysis of long-term trends will help Australia prepare for demographic changes of an ageing population over the decades ahead.

Michael Sukkar

Damien White
Executive Director
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The Australian Government established the Centre for Population in 2019 to assess, monitor and project changes to the size and distribution of Australia's population.

The Population Statement is the Centre for Population's flagship annual publication. It describes how Australia's population has recently changed and projects future population changes. This is the second edition of the Statement, building on the detailed historical analysis and projections in the 2020 Population Statement.

The 2021 Statement looks at population change over the past year and includes projections of the population over the next decade. It describes and analyses the role of the different drivers of population change – overseas migration, natural increase and internal migration. The analysis spans states and territories, capital cities and rest-of-state areas, age and gender.

Over the course of 2021, the Centre has continued to enrich the population evidence base with insights into the impacts of the COVID-19 pandemic. In this time we have commissioned and published research to better understand factors that drive internal migration, investigated sub-group mortality rates using microdata, and examined how the pause in overseas migration is affecting states, cities and regions. We continue to publish regular notes analysing Australian Bureau of Statistics' data, including the relatively new Provisional regional internal migration estimates (PRIME) series, and Provisional Mortality Statistics.

Responses by governments and individuals to the COVID-19 pandemic have resulted in nearly unprecedented effects on Australia's population. Consequently, it is difficult to confidently analyse recent population trends and there is significant uncertainty around projections of future population. The Centre has used its best professional judgement in its analysis, but, like everyone interested in demographics, will continue to watch as Australia progresses through 2022 and beyond.

The release of National, state and territory population for the 2021 June quarter will contain revisions to overseas and internal migration for the March 2021, December 2020 and September 2020 quarters. These revisions were not available in time to be taken into account in this Statement's projections.

In preparing the 2021 Population Statement, the Centre has drawn on external input and expertise from academics and population experts. The Statement has also been developed in consultation with the states, territories and the Australian Local Government Association. I thank all those involved in its preparation.

SUMMARY

The 2021 Population Statement details the early impacts of the COVID-19 pandemic on Australia's population and projects its impact over the next decade. These estimates were developed just as the Omicron variant was emerging in early December 2021 and prior to the release in mid-December 2021 of Australian Bureau of Statistics' population data for 2020-21.

Part 1 of the Statement outlines detailed population projections at the national level from 2020-21 to 2031-32. Australia's population is estimated to have been 25.7 million at 30 June 2020, and is projected to increase to 29.3 million by 30 June 2032. Population growth over this period is forecast to increase from 0.3 per cent in 2021-22 to 1.4 per cent by 2024-25 before declining slightly to 1.2 per cent by 2031-32. The size of the population is expected to be around 1.5 million people or 4.9 per cent smaller by 2030-31 compared with what was projected in the MYEFO 2019-20, prior to the onset of the pandemic.

Overseas migration to Australia, which in recent years has been the largest contributor to population growth, has been significantly affected by the COVID-19 pandemic. The introduction of international travel restrictions and quarantine arrangements has led to the first net overseas migration loss from Australia since just after World War II. Overseas migration is forecast to hit a low in 2020-21 with a net outflow of 100,000 people. As border restrictions and quarantine arrangements are relaxed, net overseas migration is forecast to recover to a smaller net outflow of 41,000 in 2021-22. It is then forecast to return to net inflows of 180,000 in 2022-23 and 213,000 in 2023-24 before returning to pre-COVID-19 trends of net inflows of 235,000 from 2024-25 onward.

In contrast to the experience of other developed countries, COVID-19 has had minimal impact on Australia's births and deaths thus far. Early data suggest that Australia's fertility rate has not been adversely affected by the pandemic, although activity restrictions and lockdowns have led to delays in birth registrations in some places. Australia's future fertility rate is assumed to be 1.62 babies per woman in 2030-31, reflecting a long-running trend of Australian women having children later in life, and having fewer children when they do. Australia has recorded just over 2,100 deaths from COVID-19 since the pandemic began (Department of Health, 2021). Future mortality rates are assumed not to be affected by the pandemic, and to continue to improve at the annualised rate observed over the last 3 decades.

Part 2 of the Statement outlines population projections for each state. Other than the Northern Territory, all states are forecast to experience a drop in population growth in 2020-21 compared to 2019-20. For most states, this slower growth is mainly due to the national net outflow of overseas migration. Victoria is forecast to have a population change of -0.5 per cent in 2020-21. This is due to forecast negative net overseas migration, alongside negative net interstate migration for the first time since 2008. Activity and movement restrictions to contain the spread of the pandemic led to a 9 per cent drop in interstate movements nationally, decreasing from 404,000 interstate moves in 2018-19 to 369,000 in 2019-20.

Part 3 of the Statement outlines population projections for Australia's capital cities and rest-of-state areas. The population growth rate for all combined capital cities is forecast to decline from 1.4 per cent in 2019-20 to -0.1 per cent in 2020-21. The population growth rate in all combined rest-of-state areas is forecast to fall from 1.0 per cent in 2019-20 to 0.5 per cent in 2020-21. As travel and activity restrictions are relaxed further and net overseas migration returns to pre-COVID-19 trends, capital cities are forecast to return to higher growth rates than rest-of-state areas from 2022-23. Melbourne is projected to be the fastest growing capital city from 2023-24, overtaking Sydney to become the nation's largest city in 2029-30 at just over 5.9 million people.

Part 4 of the Statement details the assumptions and methodology applied to the projections in this Statement. Data for the projections in the Statement are available to download at www.population.gov.au.

1. NATIONAL POPULATION

1.1 SUMMARY

The population of Australia is projected to increase from 25.7 million in 2020-21 to 29.3 million in 2031-32. Australia's low population growth is forecast to continue through 2020-21 and 2021-22 as a result of the international border restrictions and quarantine requirements to limit the transmission of COVID-19. Net overseas migration is forecast to fall from a net inflow of 193,000 in 2019-20 to net outflows of 100,000 in 2020-21 and 41,000 in 2021-22. Natural increase is forecast to remain stable, adding around 136,000 people in 2020-21 and 130,000 in 2021-22.

The size of the population is expected to be around 1.5 million people or 4.9 per cent smaller by 2030-31 compared with what was projected in the MYEFO 2019-20, prior to the onset of the pandemic. Around 40 per cent of this difference is attributable directly to lower overseas migration, and the remainder is largely the result of lower fertility assumptions (including interactions with the lower migration – i.e. fewer births attributable to migrants).

Annual population growth is projected to increase from 0.3 per cent in 2021-22 to 1.4 per cent by 2024-25 as net overseas migration recovers to long-run levels of 235,000 (Chart 1 and Table 1). Growth is then projected to gradually decline to 1.2 per cent in 2031-32. This gradual decline in population growth over the medium term results from assumptions that net overseas migration remains steady at 235,000 and the total fertility rate goes to 1.62 babies per woman from 2030-31 onward.

Chart 1. POPULATION GROWTH AND COMPONENTS, AUSTRALIA
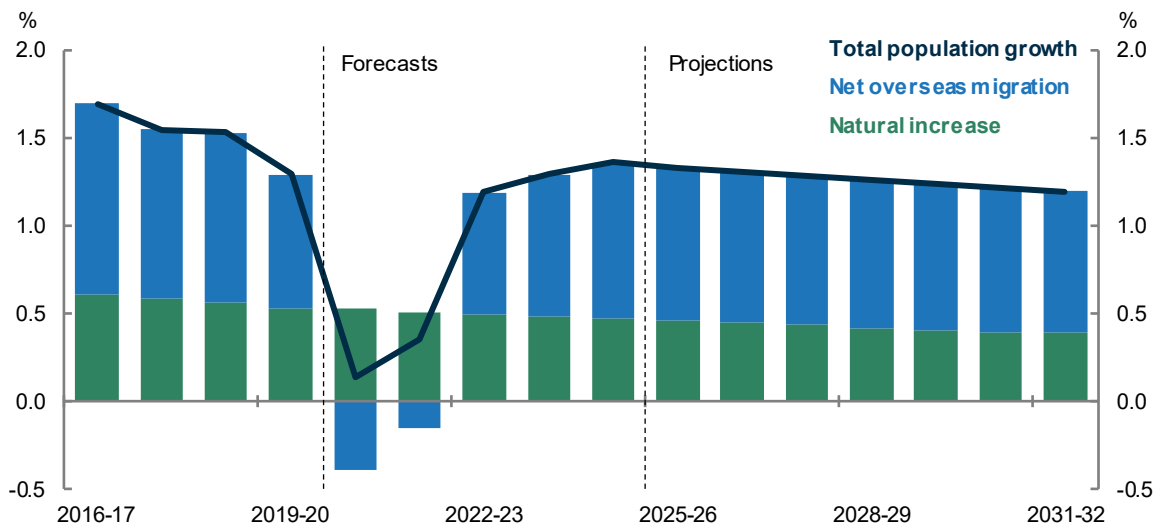
Source: (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre for Population projections.

Table 1. SUMMARY OF POPULATION PROJECTIONS

	2020-21	2021-22	2022-23	2023-24	2024-25	2031-32
Population at start of year (m)	**25.7**	**25.7**	**25.8**	**26.1**	**26.5**	**28.9**
Births ('000s)	*308*	*304*	*304*	*305*	*307*	*322*
Deaths ('000s)	*172*	*174*	*177*	*180*	*183*	*210*
Natural increase ('000s)	136	130	127	125	124	113
Arrivals ('000s)	*143*	*197*	*458*	*530*	*556*	*603*
Departures ('000s)	*243*	*238*	*278*	*317*	*321*	*368*
Net overseas migration ('000s)	-100	-41	180	213	235	235
Population at end of year (m)	**25.7**	**25.8**	**26.1**	**26.5**	**26.8**	**29.3**
Population growth (%)	0.1	0.3	1.2	1.3	1.4	1.2

Source: Centre for Population projections.

The projections in the 2021 Population Statement are consistent with the 2021-22 Mid-Year Economic and Fiscal Outlook (MYEFO 2021-22) and use the same contextual assumptions (Box 1).

BOX 1. KEY ASSUMPTIONS AND DATA

Population projections are uncertain under normal conditions and are more uncertain during unprecedented shocks such as the COVID-19 pandemic. The data used to underpin the analysis in the Statement will also be superseded by new data and revisions to previous reference periods. The key assumptions that underpin the economic forecasts are set out below. Outcomes could be substantially different to the forecasts, depending upon the extent to which these assumptions hold.

- It is expected that Australia's COVID-19 vaccination program will see over 90 per cent of Australia's 16+ population fully vaccinated (two doses) by the end of 2021.

- With state and territory vaccination rates having already passed 80 per cent double dose to those aged 16 and older, it is assumed that lockdowns are no longer required to manage COVID-19 transmission in the community. Most domestic activity restrictions will be lifted by the beginning of 2022 with only baseline levels of physical distancing and density restrictions continuing over the first half of 2022.

- A temporary strengthening of activity restrictions may be required to respond to rising case numbers, or to contain localised outbreaks in areas of lower vaccination coverage, but these are not expected to materially affect the economic outlook.

- Remaining state border restrictions are assumed to be lifted by early 2022, in line with state reopening roadmaps.

- The Omicron variant is not assumed to significantly alter current reopening plans or require a reimposition of widespread health and activity restrictions.

- After a pause in the reopening of international borders in response to uncertainty around the Omicron variant, a gradual return of temporary and permanent migrants is assumed to occur from early 2022, with international students expected to return in readiness for the first semester of 2022.

- A gradual recovery in outbound international tourism began in November 2021. Inbound international tourism recommenced in late 2021 through travel bubble arrangements and a more broad-based recovery is assumed to occur from early 2022.

Analysis for the projections is based on Australian Bureau of Statistics' population statistics up to and including the National, state and territory population, March 2021, released in September 2021. Further information about the policies and data considered is in Technical Appendix.

The introduction of international travel restrictions and quarantine arrangements in response to COVID-19 led to the first net outflow of overseas migrants from Australia since just after World War II. Net overseas migration is forecast to be at a historic low in 2020-21 with a net outflow of 100,000 (Chart 2). Overseas migration is forecast to recover to a net outflow of 41,000 in 2021-22 as border restrictions and quarantine arrangements are relaxed. In 2022-23 it is then forecast to return to net inflows of 180,000, reaching 213,000 in 2023-24. A full return to pre-COVID-19 trends of 235,000 is projected from 2024-25 onwards.

Chart 2. NET OVERSEAS MIGRATION BY VISA
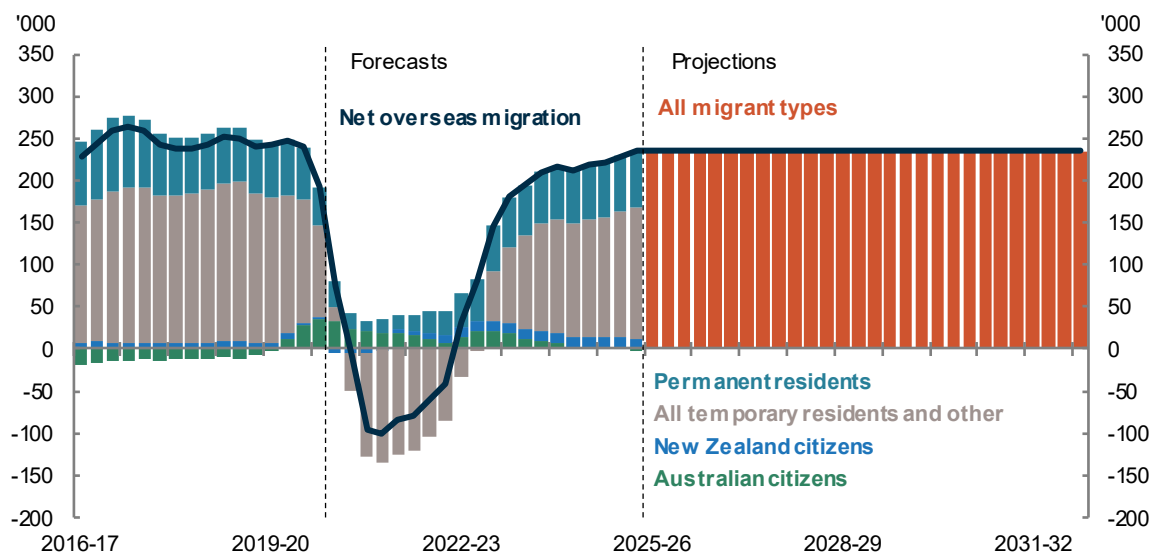
Note: Quarterly data presented on a year-ending basis. Migrant arrivals and departures are categorised based on the visa type at the time of a traveller's arrival or departure. Care should be taken attributing net flows to specific groups of migrants as subsequent transfers to other visa types while onshore are not captured.
Source: Centre for Population calculations based on unpublished Department of Home Affairs data and Centre for Population forecasts and projections.

High vaccination take-up rates have contributed to a substantial relaxation of border restrictions earlier than assumed at Budget 2021-22. Net overseas migration is therefore forecast to recover earlier and faster than in Budget 2021-22. Across 2021-22 to 2023-24, the net overseas migration forecasts have been increased by a cumulative 132,000 persons.

These forecasts incorporate all policy announcements included in MYEFO 2021-22. The Australian Government has made several policy decisions to support the recovery in migration, including doubling the scale of the Pacific Worker Programs and consolidating these programs into a new streamlined, integrated and flexible Pacific Australia Labour Mobility Scheme, as well as the introduction of the Australian Agriculture Visa and measures to support the return of international students and graduates (Section 4.3.2).

However, the improved outlook in 2021-22 has been partially offset by restrictions to control the spread of the COVID-19 Delta variant over much of the second half of 2021. This includes the halving of hotel quarantine caps from 14 July 2021 for incoming migrants and the temporary suspension of the Safe Travel Zone established with New Zealand.

After a pause in reopening of international borders at the end of 2021 in response to the Omicron variant, a gradual return of temporary and permanent migrants is assumed to occur from early 2022. International students are expected to begin returning in readiness for the first semester of 2022. While there is much

uncertainty around the characteristics of the Omicron variant and potential policy responses, Australia's high vaccination coverage is expected to assist in the reopening of international borders.

Ongoing uncertainty about the COVID-19 pandemic poses a significant risk to the net overseas migration outlook. Estimates of future net overseas migration are highly dependent on policy decisions, and outcomes could be significantly different to the forecasts depending on future circumstances – 2 alternative scenarios have been prepared to illustrate the magnitude of variations from this forecast of Australia's population (Box 2).

BOX 2.   NET OVERSEAS MIGRATION SCENARIOS

As international border restrictions ease, net overseas migration is assumed to recover strongly and return to pre-pandemic trends by 2024-25. However, future net overseas migration is highly uncertain due to the unpredictability of COVID-19, and the nature and timing of the relaxation of the measures taken to contain its transmission. Further uncertainty arises from the extent to which people's desire to migrate has been affected, both during and following the pandemic.

Global migration flows, including to Australia, could increase more quickly if there is a more rapid containment of COVID-19 worldwide. Alternatively, a slower containment of COVID-19, the emergence of new variants or sustained hesitancy to travel could result in a slower recovery in global migration flows. This box presents an upside and a downside scenario as alternatives to the net overseas migration forecast.

In the upside scenario, migration flows are assumed to return to pre-COVID-19 trends from the March quarter of 2022, so that net overseas migration is positive in 2021-22 and reaches 235,000 persons per year from 2022-23 onwards. In the upside scenario, net overseas migration is higher by 120,000 persons in 2021-22, by 55,000 in 2022-23 and by 22,000 in 2023-24 (Chart 3).

Chart 3.   NET OVERSEAS MIGRATION, SCENARIOS
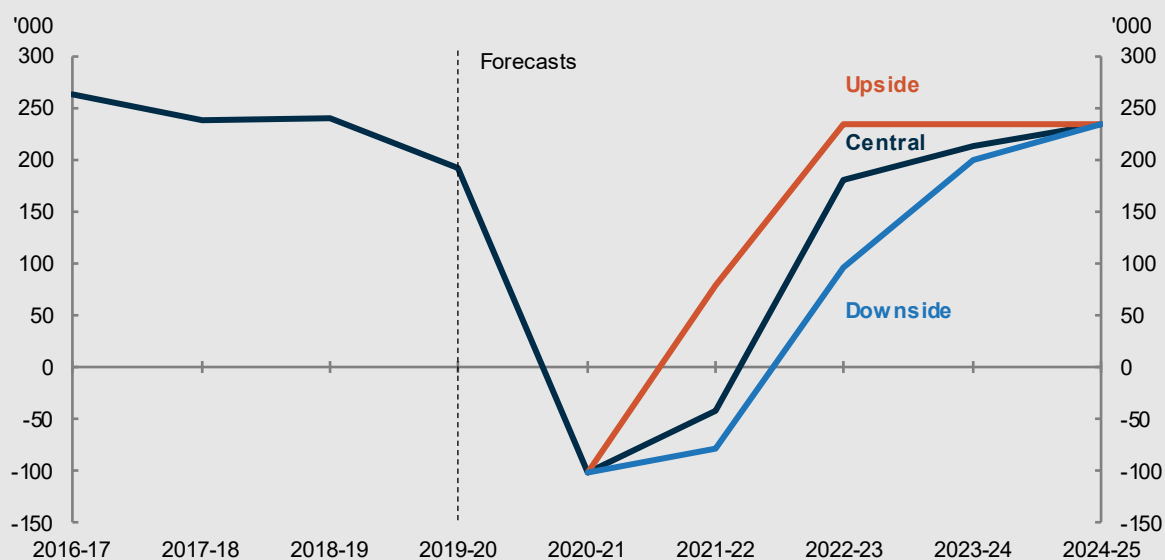
Source: (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre for Population projections.

The downside scenario is based on net overseas migration forecasts in Budget 2021-22, which assumed international border restrictions would remain in place until mid-2022 and the recovery in

net overseas migration would be more gradual. In the downside scenario, net overseas migration is lower by 36,000 persons in 2021-22, by 84,000 in 2022-23 and by 12,000 in 2023-24.

Australia's population is projected to reach 29.3 million in 2031-32 under the central case, and 29.5 million in the upside scenario. In the downside scenario, Australia's population is projected to reach 29.1 million by 2031-32 – a level that it is projected to reach about half a year earlier in the central case, and about a year earlier in the upside scenario (Chart 4).
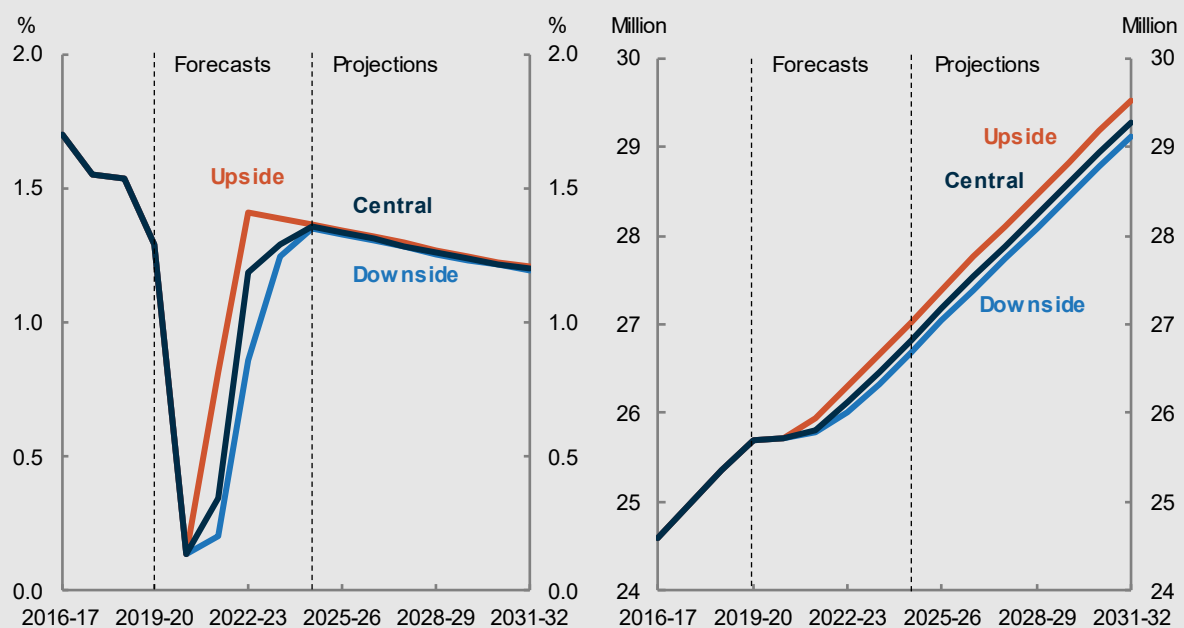
Chart 4.   POPULATION GROWTH (LHS) AND POPULATION (RHS), SCENARIOS

Source: (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre for Population projections.

Australia experienced one of the largest changes in population growth by a developed country during the COVID-19 pandemic. Population growth fell from 1.5 per cent for the year ending March 2020 to 0.1 per cent in the year ending March 2021. This drop in population growth was entirely due to the fall in net overseas migration, which in the decade prior to the pandemic contributed around 1 percentage point of Australia's annual population growth (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021).

Measures taken to contain the pandemic in Australia in 2020 and 2021 also led to a change in the composition of net overseas migration. This was due to travel and quarantine restrictions, and priority that was given to the return of Australian citizens, permanent residents and New Zealand citizens normally residing in Australia. These restrictions meant there were limited opportunities for temporary migrants to travel to Australia.

The fall in net overseas migration was partially offset by an increased number of returning Australian citizens, resulting in a net overseas migration gain of citizens rather than the usual migration loss. Arrivals of Australian citizens reached a historic peak of 106,000 in the year ending March 2020, up from 76,000 in the year ending March 2019. Arrivals have since fallen below pre-pandemic levels (Customised data consultancy, Australian Bureau of Statistics, 2021).

Overseas departures have also fallen due to the pandemic, but not by enough to offset falling arrivals. Temporary visa holders have been allowed to depart as usual, while the departure of Australian citizens and permanent residents has been at times subject to exemption requirements. This has seen relatively higher departures of temporary migrants than citizens or permanent residents, compared with their usual rates of departure.

Over recent decades, net migration flows have helped to slow Australia's rate of population ageing. This is because migrants are, on average, younger than the resident population of Australia and they add substantial numbers of births to the population each year (Australian Bureau of Statistics, Births, Australia, 2021).

The pandemic, however, has had a material impact on the age structure of net overseas migration (Australian Bureau of Statistics, Migration, Australia, 2021). There was a 57 per cent decrease in the net number of people aged 15 to 34 migrating into Australia between 2018-19 and 2019-20. This is mostly due to temporary migrants, particularly international students, departing Australia at the start of the pandemic. Over the same period, there was a more than five-fold increase in the net number of people aged 65 and over migrating to Australia, likely related to Australian citizens and permanent migrants returning during the early stages of the pandemic (Chart 5). Between 2018-19 and 2019-20, the net migrant cohort aged 65 and over went from being the smallest adult cohort to the largest, increasing from 2.1 to 13.6 per cent of net overseas migration.

Chart 5.   NET OVERSEAS MIGRATION BY SELECTED AGE GROUPS
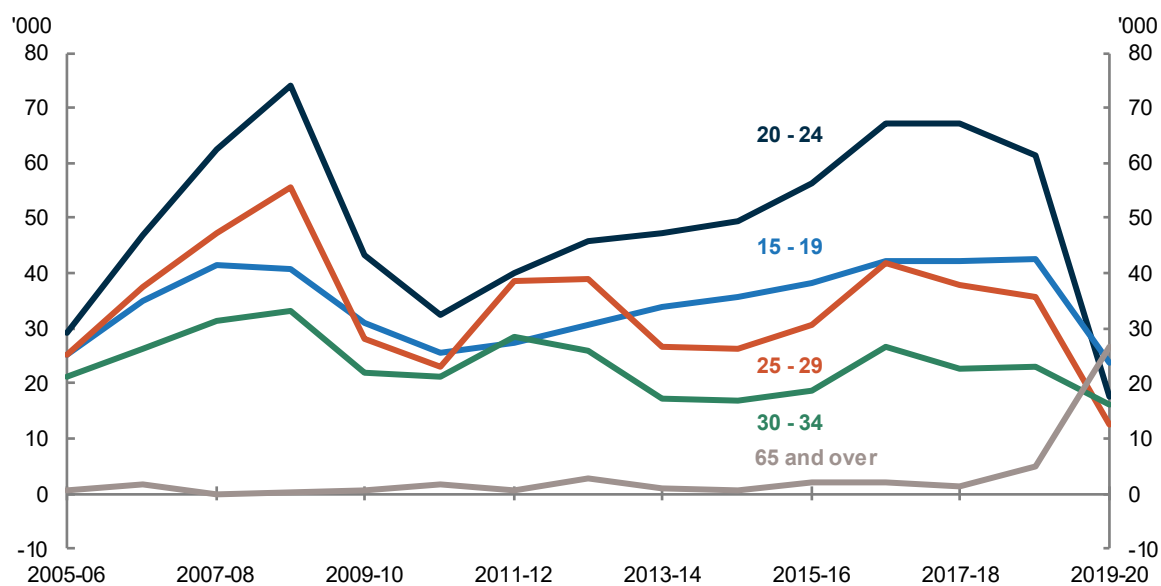
Source: (Australian Bureau of Statistics, Migration, Australia, 2021).

1.3 NATURAL INCREASE

Natural increase is projected to drive all of Australia's population growth in 2020-21 and 2021-22, with net overseas migration forecast to be negative during these years. Natural increase is forecast to grow slightly from around 135,000 in 2019-20 to 136,000 in 2020-21 then decline to 112,000 by 2031-32. This decline is due to a smaller increase in the number of births compared to the increase in the number of deaths in an ageing population. The number of births is projected to remain relatively stable at 308,000 in 2020-21 and 307,000 in 2024-25 before increasing to 321,000 by 2031-32. The number of deaths is projected to increase from 172,000 in 2020-21 to 210,000 deaths by 2031-32 (Chart 6).

Chart 6.   NATURAL INCREASE AND COMPONENTS, AUSTRALIA
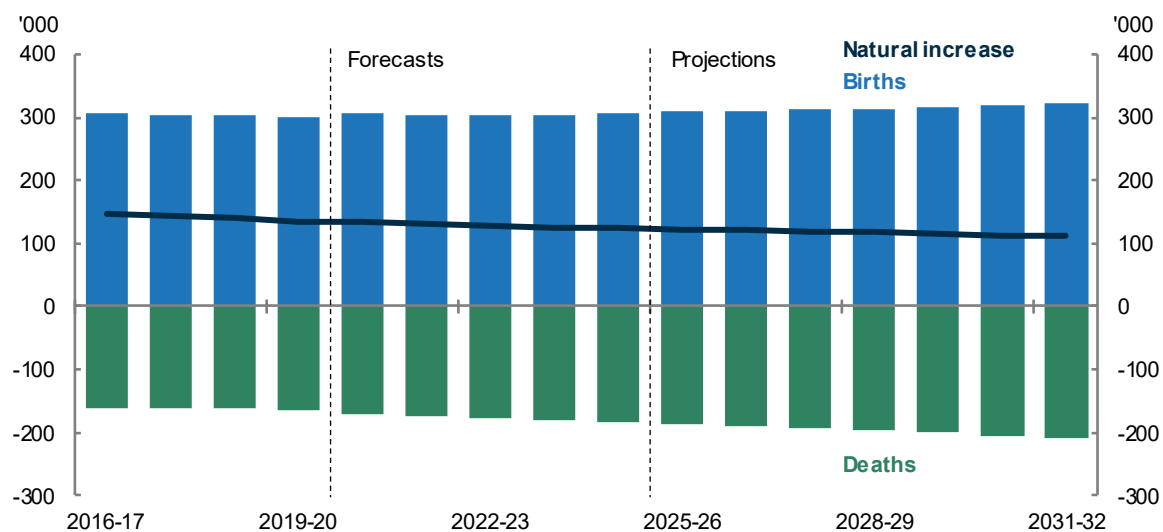
Source: (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre for Population projections.

Australia's total fertility rate is assumed not to be impacted by the COVID-19 pandemic. While the total fertility rate of 1.61 babies per woman for 2019-20 was lower than 1.66 observed in 2018-19, this cannot be attributed to the pandemic as babies born in 2019-20 were conceived prior to the pandemic.

The Australian Bureau of Statistics recently reported a total fertility rate of 1.58 babies per woman in 2020, with fewer births and birth registrations in most jurisdictions. However, births registered in the March 2021 quarter were higher than both the December 2020 quarter and the March 2020 quarter (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021). In addition, early Medicare data indicate that births for 2020-21 are likely to return to levels similar to 2018-19. Therefore, the total fertility rate for 2020-21 is forecast to be similar to 2018-19 at 1.66 babies per woman. See Technical Appendix for further detail.

The future fertility rate is assumed to decline slightly from 1.66 in 2021-22 to 1.65 by 2024-25. Thereafter, the fertility rate is assumed to be 1.62 babies per woman by 2031-32, in line with the 'no COVID-19 impact' scenario in the 2020 Population Statement (Chart 7). This is consistent with the observed, long-running trend of Australian women having children later in life and having fewer children (Section 4.3.1).

Chart 7.   TOTAL FERTILITY RATE, AUSTRALIA

Births per woman

Source: (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre for Population projections.

Australia's future mortality is assumed not to be affected by the COVID-19 pandemic, due to the relatively low number of deaths attributed to COVID-19 in Australia, and high take-up of vaccines. Future mortality rates are assumed to continue to improve at the annualised rate observed over the past 3 decades (Section 4.3.1).

Over 2020, the 5 leading causes of death – ischaemic heart disease, dementia including Alzheimer's disease, cerebrovascular diseases, lung cancer and chronic lower respiratory diseases – remained the same as in 2019. However, the number of deaths and age standardised death rates declined in 2020. Deaths due to chronic lower respiratory diseases had the largest proportional decrease in age standardised death rates, and the largest decrease recorded for 10 years. There were fewer deaths nationally from preventable causes, such as suicide, drug overdoses and motor vehicle accidents in 2020 compared to 2019. COVID-19 was the 38th leading cause of death in 2020, with 898 deaths (Australian Bureau of Statistics, Causes of Death, Australia, 2021).

Provisional mortality data released by the Australian Bureau of Statistics suggests that the number of doctor-certified deaths from January to August 2021 was higher than in 2020 and the 2015-19 average. However, age standardised death rates for this period in 2021 have been consistently lower than the 2015-19 average (Australian Bureau of Statistics, Provisional Mortality Statistics, 2021). This suggests that the increase in the number of deaths is in line with an increase in population size and population ageing.[1]

The impact of COVID-19 on Australia's births and deaths has, so far, been well below that observed in other developed countries. Early data for the United States and many European countries for the period late 2020 to early 2021 show declines in births and fertility intentions (United Nations Population Fund, 2021). As at 7 December 2021, the United States has recorded around 240 deaths per hundred thousand, and the United Kingdom around 220 deaths per hundred thousand from COVID-19 (Johns Hopkins Coronavirus Resource Center, 2021). This compares to around 8 per hundred thousand in Australia. Provisional estimates show life expectancy has fallen in all but 6 OECD countries in 2020. The annual reduction is particularly large in the United States, with an estimated decrease of 1.6 years in 2020 alone (Woolf, Masters, & Aron, 2021). In the United Kingdom, Italy and Spain, life expectancy for 2020 is now around levels seen in 2010 (OECD, 2021).

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1   See the Centre's analysis of the Australian Bureau of Statistics' Provisional Mortality Statistics for further information.

2. STATE AND TERRITORY POPULATIONS

2.1 SUMMARY

All states except for the Northern Territory are forecast to experience a drop in population growth in 2020-21 compared to 2019-20 (Chart 8). This is mainly due to the forecast national net outflow of overseas migration. Lower net overseas and net interstate migration mean that Victoria is forecast to have negative growth of -0.5 per cent in 2020-21 and New South Wales is forecast to have no growth in 2020-21, and -0.1 per cent growth in 2021-22. Negative net overseas migration for the Northern Territory is forecast to be offset by natural increase and smaller net interstate outflows than in 2019-20. South Australia and Western Australia are similarly forecast to benefit from higher interstate migration, although not sufficient to offset negative net overseas migration.

Chart 8.   POPULATION GROWTH BY STATE
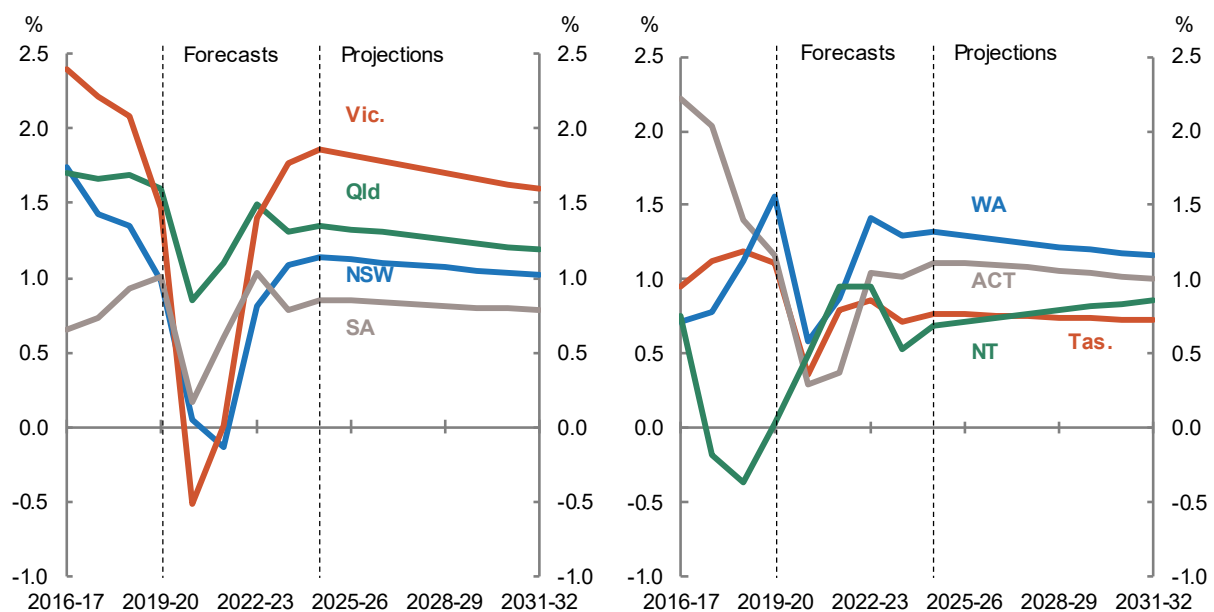
Source: (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre for Population projections.

Net interstate migration rates and net overseas migration levels are assumed to return to their long-run trends by 2023-24 and 2024-25 respectively. Most states are forecast to return to close to pre-COVID-19 population growth rates by around 2024-25. Victoria is forecast to become the fastest growing state by 2023-24. Tasmania is forecast to become the slowest growing state from 2027-28 onwards, with slowing growth driven by declining contributions from net overseas migration and natural increase.

Net overseas migration

Some states have historically received a larger share of their population growth from net overseas migration than others. Those that have been the greatest recipients of net overseas migration are forecast to experience greater falls in population growth as a result of the COVID-19 pandemic. As international border restrictions begin to relax, net overseas migration is forecast to begin recovering, and to contribute positively to population growth in all states from 2022-23 onwards, before returning to pre-COVID-19 levels by 2024-25 (Chart 9).

The projected distribution of net overseas migration across jurisdictions is based on historical distributions and trends across different visa groups. Each state is forecast to return to pre-COVID-19 trends as national net overseas migration recovers. The greatest shares of net overseas migration flows are projected to go to Victoria and New South Wales.

Chart 9. NET OVERSEAS MIGRATION BY STATE

Source: (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre for Population projections.
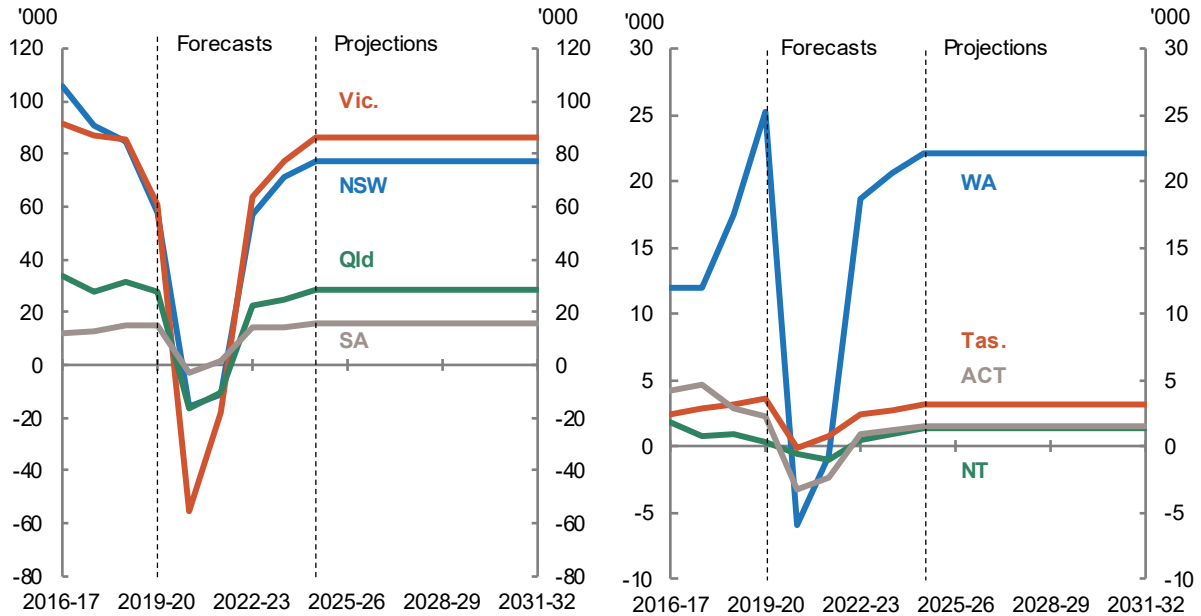
Net interstate migration

Activity and movement restrictions to contain the spread of COVID-19 led to a 9 per cent drop in the number of interstate movements, from 404,000 moves in 2018-19 to 369,000 in 2019-20. The drop in total interstate migration at the national level was mainly driven by the second Melbourne lockdown.[2] This is in line with falls in net interstate migration during past economic downturns (Chart 10).

The Australian Bureau of Statistics' preliminary estimates of interstate migration around the time of the second Melbourne lockdown show that Victoria experienced a drop in arrivals and an increase in departures when the lockdown ended (Box 3). This corresponded with higher net interstate migration in some other states – notably in South Australia and Western Australia – which reversed recent trends of negative net interstate migration (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021). A similar impact is forecast to occur across Australia due to the extended Delta lockdowns in place in the latter half of 2021 in Victoria, New South Wales and the Australian Capital Territory (Chart 11).

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2   The second Melbourne lockdown refers to the lockdown experienced in Melbourne between early July 2020 and late October 2020.

Chart 10. NET INTERSTATE MIGRATION, AUSTRALIA

Source: (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre for Population projections.

Chart 11. NET INTERSTATE MIGRATION BY STATE
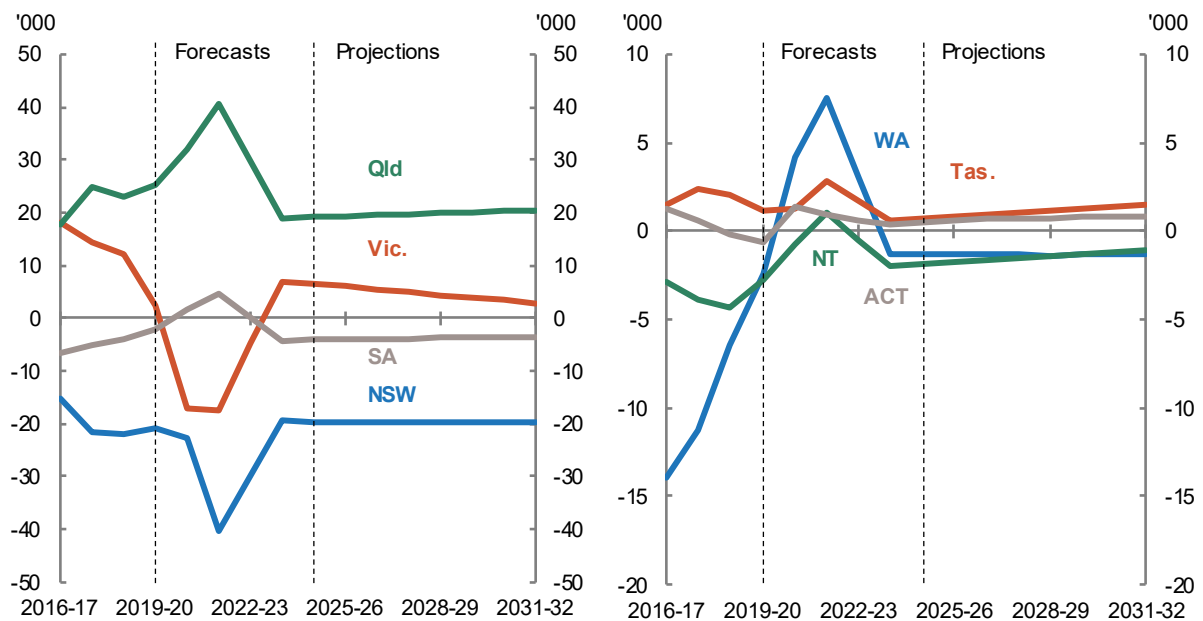
Source: (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre for Population projections.
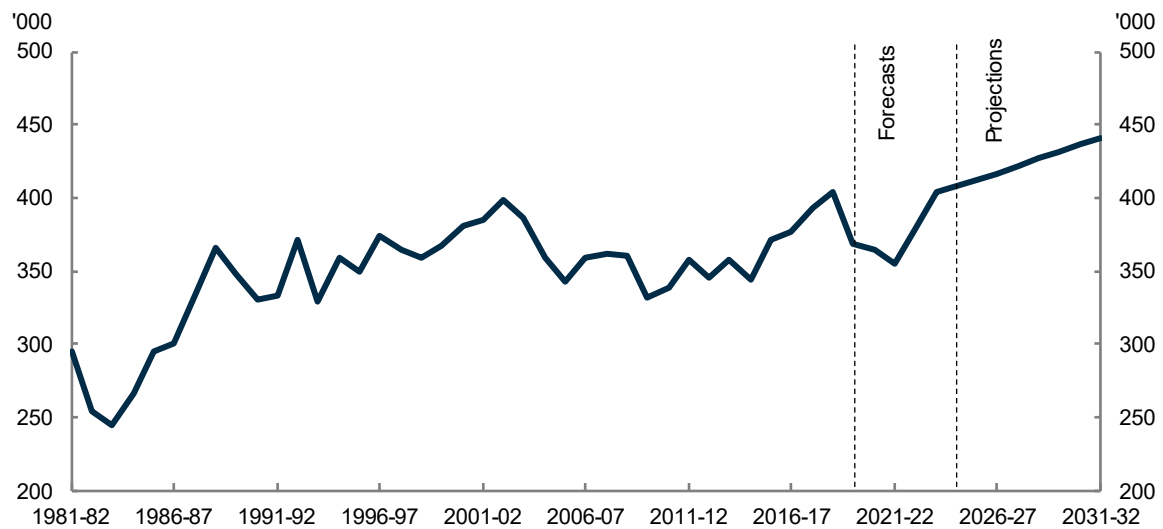
Net interstate migration is forecast to increase for all states except New South Wales and Victoria in 2020-21 and 2021-22. This increase is expected to be driven by migration from New South Wales and Victoria to other states. Queensland is forecast to continue to experience the largest net interstate migration gains as it has avoided extended lockdowns and has historically been a popular destination for interstate migrants. Longer-term impacts of the pandemic are more uncertain, but it is assumed that the shock to interstate migration from the pandemic will be temporary. As such, interstate migration patterns are assumed to return to a historical distribution from 2023-24 onward. Victoria is projected to once again be a net gainer of interstate migrants, while Western Australia, South Australia and the Northern Territory will return to trends of small net losses.

2.2   NEW SOUTH WALES

The population of New South Wales is projected to increase from 8.2 million in 2020-21 to 9.1 million in 2031-32. Population growth in New South Wales is forecast to fall from 0.9 per cent in 2019-20 to zero per cent in 2020-21, and -0.1 per cent in 2021-22 (Chart 12). This would be the lowest rate of population growth in over 100 years.

Chart 12.   POPULATION GROWTH AND COMPONENTS, NEW SOUTH WALES

Source: (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre for Population projections.

The forecast low growth is due to lower net overseas migration and lower net interstate migration. Net interstate migration is assumed to reach historically high outflows in 2021-22 due to extended Delta lockdowns in the second half of 2021.

Consistent with national forecasts, New South Wales is forecast to have negative net overseas migration in 2020-21 and 2021-22. This is primarily due to fewer migrant arrivals and the departure of temporary migrants. Net overseas migration is forecast to begin to recover in 2022-23 driven by increased arrivals of international students and temporary visa holders.

New South Wales' population is projected to grow by 1.1 per cent in 2023-24. This recovery is projected to be mainly driven by net overseas migration and a return of net interstate migration to pre-COVID-19 levels. The population growth rate is projected to slow to 1.0 per cent by 2031-32, consistent with the national trend.

2.3 VICTORIA

The population of Victoria is projected to increase from 6.7 million in 2020-21 to 7.9 million in 2031-32. Victoria experienced the largest impact on population growth from the COVID-19 pandemic. Prior to the pandemic, Victoria was the fastest growing state, consistently recording growth above 2 per cent per year. In 2020-21, Victoria is forecast to record negative growth of -0.5 per cent, due to negative net overseas migration and negative net interstate migration (Chart 13). As travel restrictions ease and the economy recovers, Victoria's population growth rate is projected to recover to 0 per cent in 2021-22 and then to 1.9 per cent by 2024-25, making it once again the fastest growing state.
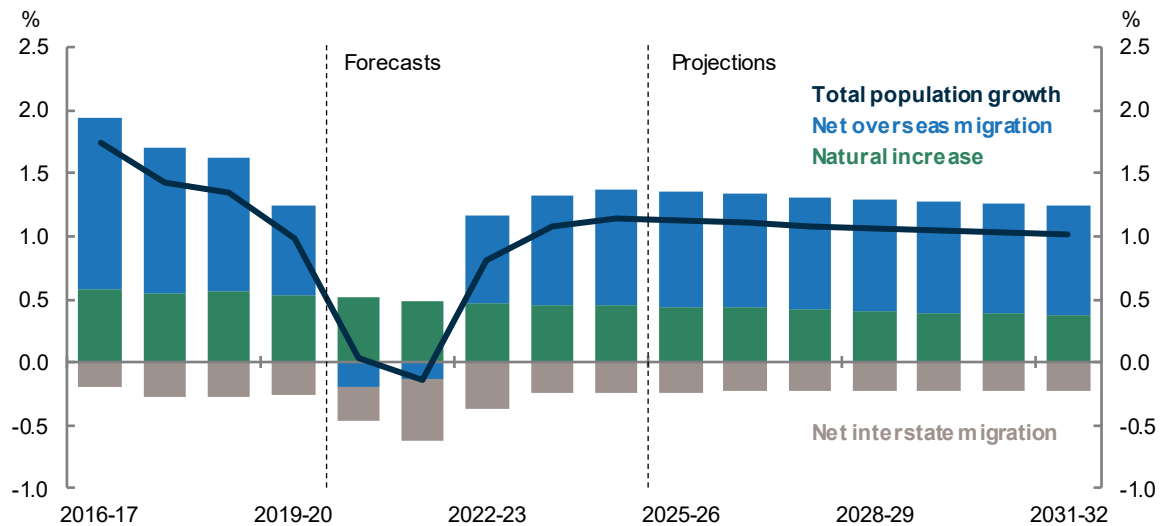
Chart 13.   POPULATION GROWTH AND COMPONENTS, VICTORIA
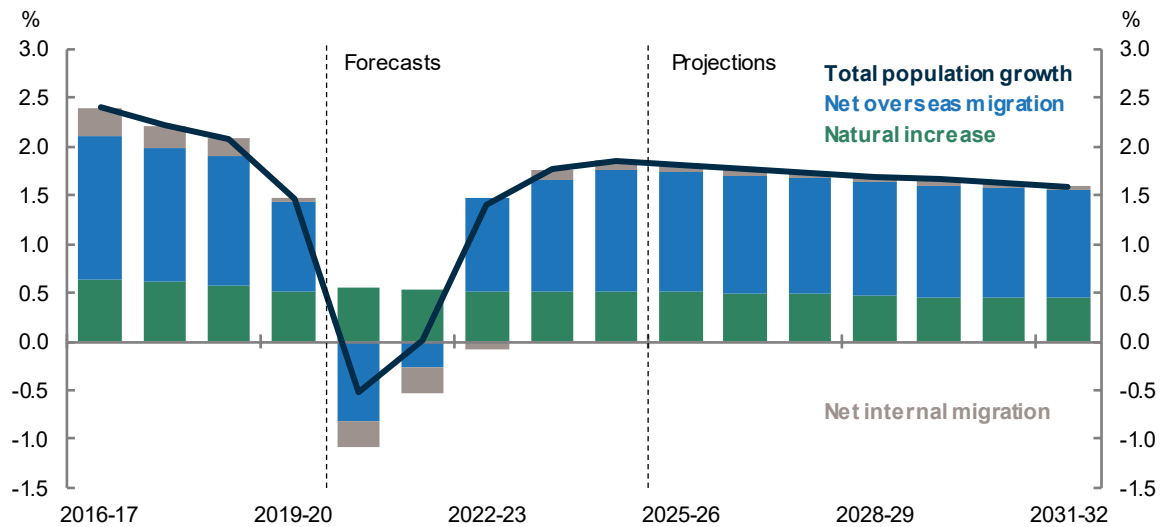
Source: (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre for Population projections.

The pandemic and localised lockdowns have had a significant impact on net interstate migration. Victoria experienced negative net interstate migration in 2020-21 for the first time since 2008. This was driven by a large drop in arrivals to Victoria during the second Melbourne lockdown and a large outflow of people from Victoria after the lockdown ended in November 2020. Victoria is forecast to experience similar negative net interstate migration in 2021-22 due to the extended Delta lockdowns.

Net overseas migration is forecast to be negative in 2020-21 and 2021-22, driven by the departure of international students and temporary migrants. However, this trend is expected to reverse from 2022-23 onwards, consistent with the national trend.

2.4   QUEENSLAND

The population of Queensland is projected to increase from 5.2 million in 2020-21 to 6.0 million in 2031-32. The population growth rate in Queensland is forecast to reach a low of 0.8 per cent in 2020-21, the lowest rate of growth recorded for the state since World War II. Notwithstanding this, Queensland is forecast to be the fastest growing state until 2023-24, before being overtaken by Victoria. Queensland is projected to continue to experience the largest net interstate migration gains of any state. Net interstate migration is projected to peak in 2021-22 and continue to be the main driver of Queensland's population growth until 2023-24 (Chart 14).

Chart 14.   POPULATION GROWTH AND COMPONENTS, QUEENSLAND
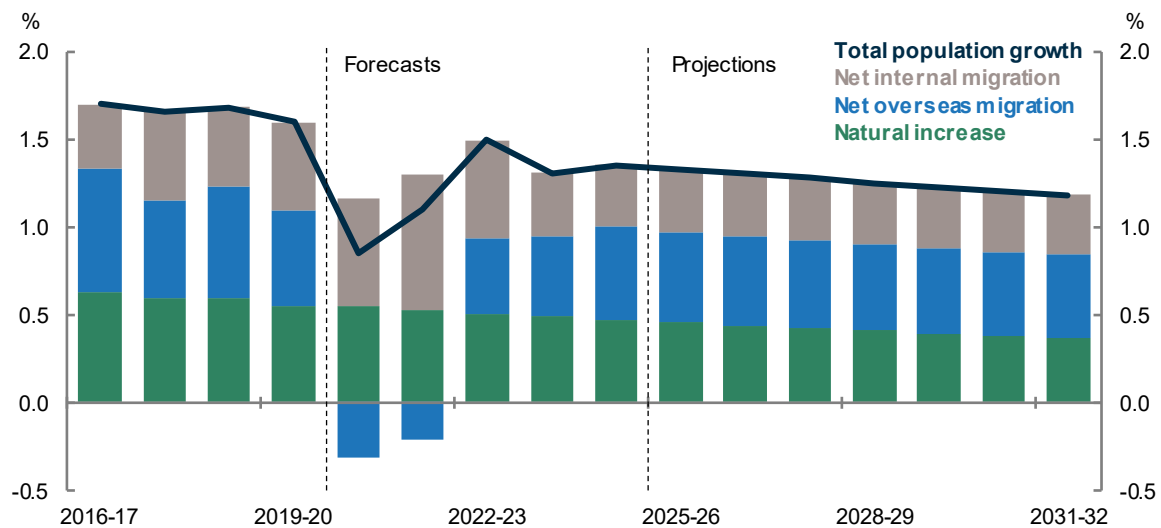
Source (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre for Population projections.

Consistent with national forecasts, Queensland's net overseas migration is forecast to be negative in 2020-21 and 2021-22 but is expected to recover in 2024-25 with an inflow of students, working holiday makers and New Zealand citizens. Queensland has historically relied less on overseas migration than New South Wales and Victoria, so international border restrictions in response to the COVID-19 pandemic have had a smaller impact on Queensland's population.

2.5   SOUTH AUSTRALIA

The population of South Australia is projected to increase from 1.8 million in 2020-21 to 1.9 million in 2031-32. South Australia has been one of Australia's slowest growing states and is forecast to continue to experience low population growth. Despite historically low growth of 0.2 per cent in 2020-21, South Australia's rate of growth in that year is still above that of New South Wales and Victoria. South Australia's population growth rate is projected to peak at 1.0 per cent in 2022-23 and fall to 0.8 per cent for most of the rest of the projection period (Chart 15).

Chart 15.   POPULATION GROWTH AND COMPONENTS, SOUTH AUSTRALIA

Source: (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre for Population projections.

Net interstate migration has contributed positively to South Australia's population growth for the first time since 1990-91. Gains are forecast in 2020-21 and 2021-22 due to fewer departures from South Australia associated with the second Melbourne and extended Delta lockdowns. South Australia is expected to return to pre-COVID-19 levels of net losses from interstate migration from 2023-24 onwards.

Net overseas migration in South Australia is forecast to be negative for only one year, 2020-21, in contrast to the national forecasts of 2 consecutive years of net outflows. The faster recovery in migration results from South Australia's greater share of permanent migration compared to most other states. Prior to the pandemic, net overseas migration contributed over two thirds of South Australia's total population growth. Like most states, South Australia experienced sharp falls in arrivals of international students, visitors and other temporary migrants during the pandemic. Skilled permanent migrants were also down significantly compared with levels prior to the pandemic.

2.6 WESTERN AUSTRALIA

The population of Western Australia is projected to increase from 2.7 million in 2020-21 to 3.1 million in 2031-32. Western Australia's annual population growth rate is forecast to fall to 0.6 per cent in 2020-21 from 1.6 per cent the previous year. However, population growth is projected to recover quickly, driven by positive net interstate migration in 2021-22 and 2022-23, and the return of positive net overseas migrants from 2022-23 (Chart 16). Western Australia is forecast to be the second fastest growing state in 2020-21, but will drop to the third fastest by 2024-25 as Victoria recovers from the pandemic.

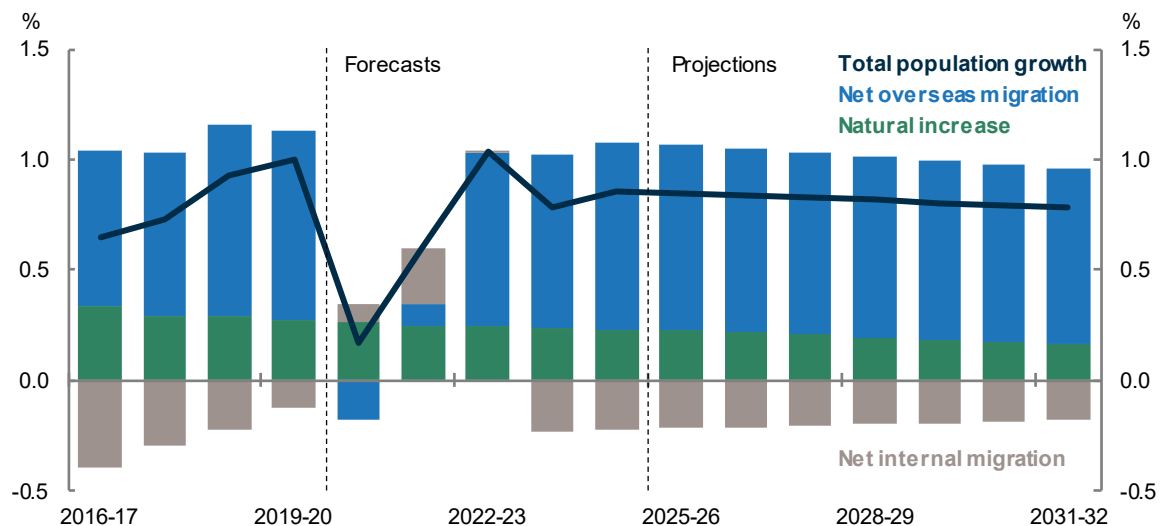**Chart 16.** POPULATION GROWTH AND COMPONENTS, WESTERN AUSTRALIA

Source: (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre for Population projections.

Net interstate migration for 2020-21 is forecast to be positive, which would be the first time since the end of the last mining construction cycle in 2012-13. Like South Australia, pandemic related restrictions have led to a decline in interstate departures from Western Australia. Net interstate migration is assumed to return to pre-COVID-19 trends of net outflows from 2023-24 onwards.

Immediately prior to the pandemic, net overseas migration was the main driver of Western Australia's population growth. However, Western Australia's net overseas migration is not forecast to drop as sharply in 2020-21 compared to the drop in the largest states. This is primarily due to the smaller contribution of international students to migration flows in Western Australia.

2.7 TASMANIA

The population of Tasmania is projected to increase from 542,000 in 2020-21 to 589,000 in 2031-32.
Tasmania's population growth rate is forecast to fall to 0.4 per cent in 2020-21, compared to 1.1 per cent in the
previous year. Population is then forecast to grow by 0.7 per cent in 2024-25 and remain around this rate
thereafter (Chart 17).

Chart 17. POPULATION GROWTH AND COMPONENTS, TASMANIA
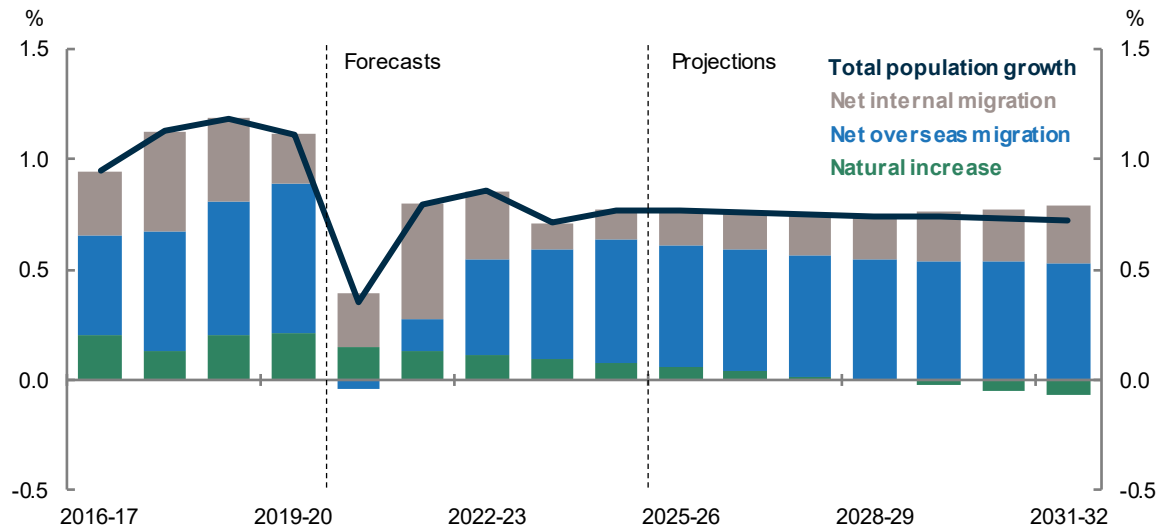
Source: (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre for
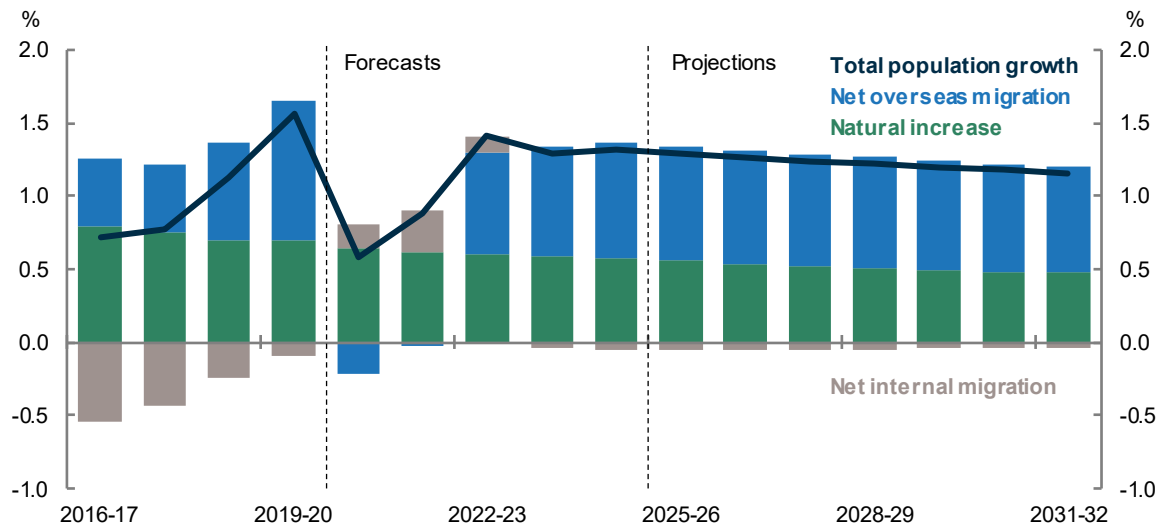Population projections.

Tasmania is projected to continue to record increases in interstate migration in 2020-21 and 2021-22.
Net overseas migration is projected to be the primary driver of Tasmania's population growth from 2022-23
onwards. Tasmania has a more diverse composition of migrants than other states, with relatively few
temporary migrants that have been affected by travel restrictions. As a result, Tasmania is forecast to
experience a relatively modest net outflow of overseas migrants in 2020-21 and return to a net inflow of
overseas migrants in 2021-22, ahead of the national trend.

Tasmania is the only state projected to experience negative natural increase. Declining fertility rates and
population ageing are projected to result in the number of deaths surpassing the number of births from
2028-29 onwards.

2.8 NORTHERN TERRITORY

The population of the Northern Territory is projected to increase from 247,000 in 2020-21 to 270,000 in 2031-32. The Northern Territory typically experiences a high rate of population turnover because of interstate migration, with inflows and outflows linked to economic conditions and major projects. Population growth in the Northern Territory was negative prior to the pandemic, driven by negative net interstate migration.

However, the Northern Territory is forecast to be the third fastest growing state in Australia in 2020-21, with growth of 0.5 per cent. This is due to smaller net interstate outflows. As a result, the Northern Territory is forecast to be the only jurisdiction to have higher population growth in 2020-21 than in 2019-20 (Chart 18).

Chart 18.   POPULATION GROWTH AND COMPONENTS, NORTHERN TERRITORY
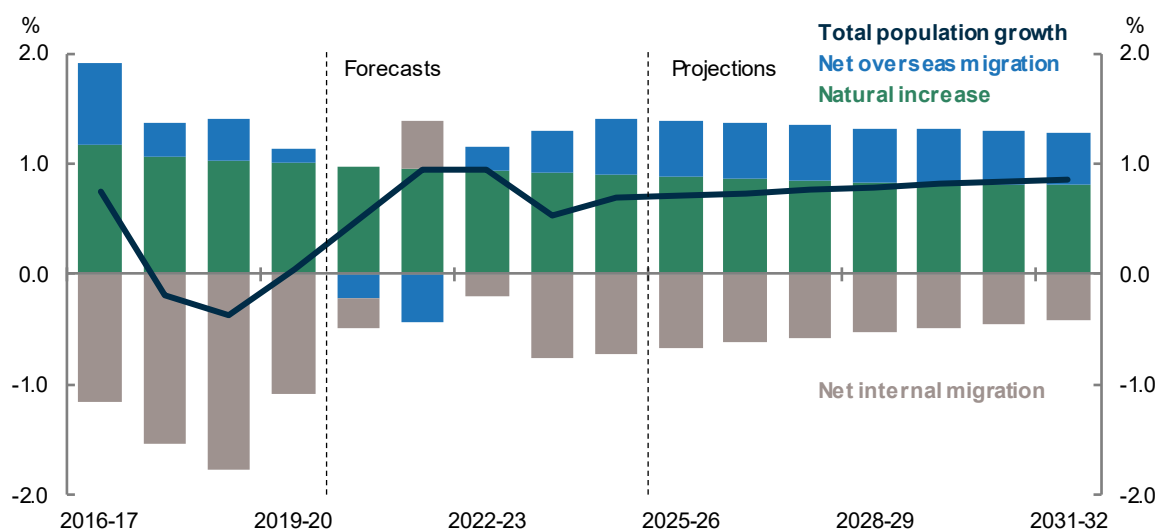
Source: (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre for Population projections.

Natural increase generally makes the largest contribution to the Northern Territory's population growth and is projected to continue to do so, due to the Northern Territory having the highest fertility rate of all the states. It is the only state where natural increase is expected to outpace contributions from net interstate and net overseas migration over the entire projection period. Moreover, the Northern Territory has the highest projected contribution from natural increase of all states.

Unlike most other states, the Northern Territory is forecast to experience relatively modest outflows in net overseas migration. Net overseas migration made only a small positive contribution to the Northern Territory's population growth prior to the pandemic.

The Northern Territory has observed smaller net outflows of interstate migrants in 2020-21 than in the past. Net interstate migration is forecast to become positive in 2021-22. However, historical trends of net interstate outflows are projected to return from 2022-23 onwards.

The Northern Territory is forecast to experience a fall in its population growth rate to 0.5 per cent in 2023-24 driven by negative net interstate migration, before recovering to 0.7 per cent growth from 2024-25 as net overseas migration returns to long-run levels. Growth remains at around this rate until the end of the projection period.

2.9 AUSTRALIAN CAPITAL TERRITORY

The population of the Australian Capital Territory is projected to increase from 432,000 in 2020-21 to 482,000 in 2031-32. The population growth rate in the Australian Capital Territory is forecast to fall from 1.2 per cent in 2019-20 to 0.3 per cent in 2020-21 before improving to 1 per cent in 2022-23 and then remaining around this rate to 2031-32 (Chart 19).

Chart 19. POPULATION GROWTH AND COMPONENTS, AUSTRALIAN CAPITAL TERRITORY
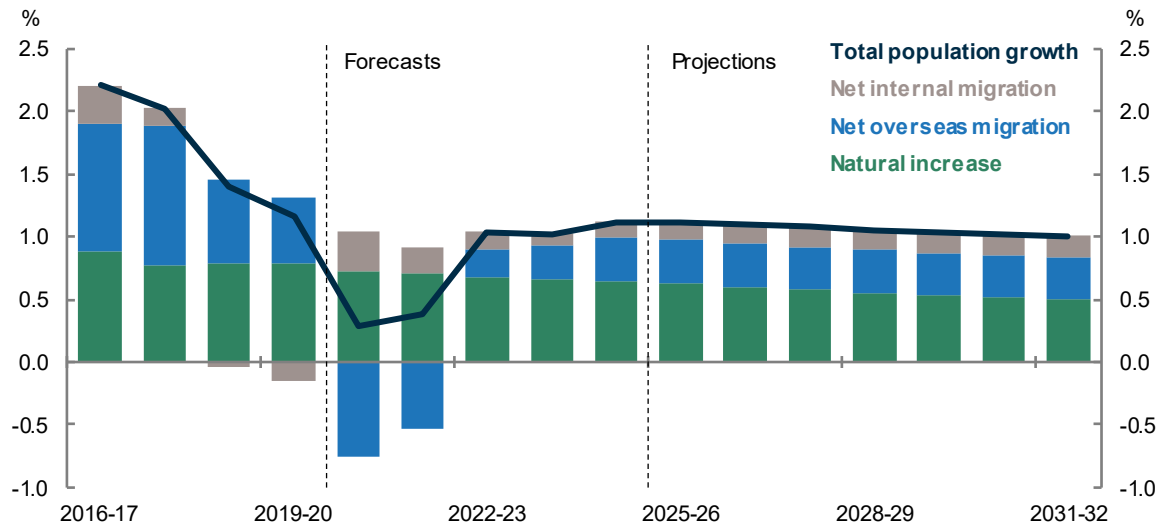
Source: (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre for Population projections

The extended lockdown in the Australian Capital Territory is not expected to have a significant impact on net interstate migration for the Territory, unlike the forecast impacts of lockdowns in New South Wales and Victoria. This is because movements to and from the Australian Capital Territory are much smaller in scale and may to be due to factors which are less affected by COVID-19 restrictions (for example, taking up employment within the Australian Public Service or Australian Defence Force). Net interstate migration is forecast to remain positive across the projections, with the Australian Capital Territory remaining at long run trends of a net gain of around 700 interstate migrants per year.

Net overseas migration in the Australian Capital Territory is forecast to make a negative contribution to growth in 2020-21 and 2021-22. A halt in migrant arrivals and gradual recovery in student arrivals is the main driver of negative net overseas migration to 2022-23.

3. CAPITAL CITY AND REST-OF-STATE POPULATIONS

3.1 SUMMARY

The population of combined capital cities is projected to increase from 17.4 million in 2020-21 to 20.1 million in 2031-32. The population of rest-of-state areas is projected to increase from 8.3 million in 2020-21 to 9.2 million in 2031-32. The population growth rate for combined capital cities is forecast to decline from 1.4 per cent in 2019-20 to a low of -0.1 per cent in 2020-21.[3] Population growth for combined rest-of-state areas is forecast to fall significantly less, from 1.0 per cent in 2019-20 to 0.5 per cent in 2020-21. As travel and activity restrictions are relaxed further, capital cities are forecast to return to higher growth rates than rest-of-state areas from 2022-23 onwards (Chart 20).

Chart 20. POPULATION GROWTH IN CAPITAL CITIES AND REST-OF-STATE AREAS
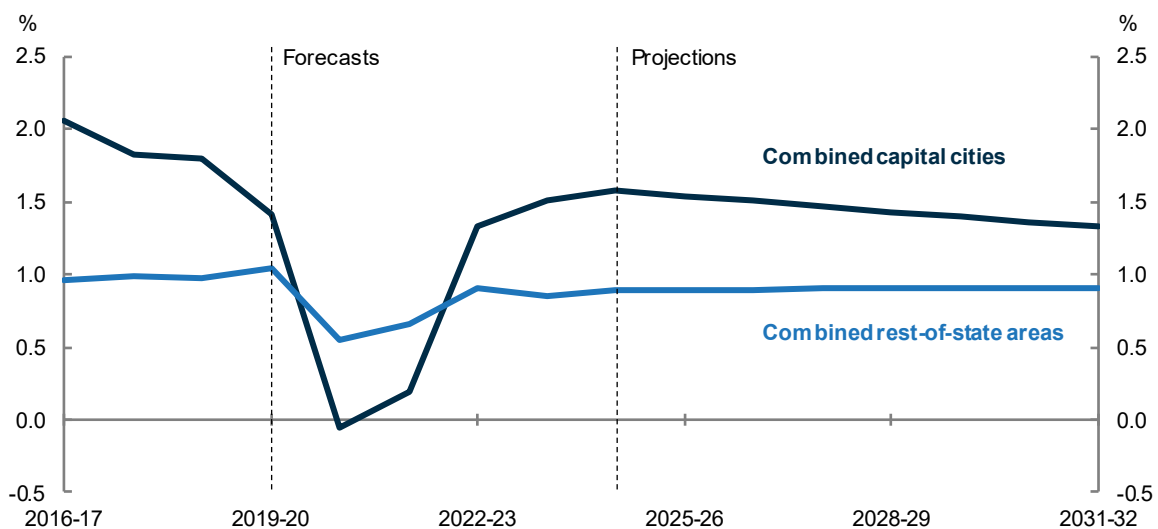
Source: (Australian Bureau of Statistics, Regional population, 2019-20, 2021) and Centre for Population projections.

Based on historical trends, capital cities are assumed to continue to grow faster than rest-of-state areas (Chart 21 and Chart 22). The population of most states is projected to be concentrated in their respective capital cities in 2031-32. Hobart, the only exception to this trend, is projected to house a smaller share of Tasmania's population than the rest of Tasmania in 2031-32. Darwin is projected to experience the largest increase to its share of state population, increasing by 1.4 percentage points over the projection period.

Melbourne and Sydney are forecast to experience negative population growth in 2020-21 and 2021-22, owing to restrictions on international and domestic movements that are assumed to dampen overseas and internal migration. The return of overseas migration is forecast to facilitate a recovery in their population growth from 2022-23 onwards. Hobart is also forecast to experience negative growth in 2020-21, driven by falls in net internal migration as people leave Hobart for other parts of Australia, as well as an outflow of overseas migrants. All other capital cities are forecast to continue growing in 2020-21.

Melbourne is projected to be the fastest growing capital city from 2023-24 onwards, and to overtake Sydney as the nation's largest city in 2029-30 with just over 5.9 million people in that year. Melbourne's growth over the projection period is driven by slightly stronger net overseas migration and stronger net internal migration than Sydney.

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3   Capital cities and rest-of-states are defined using the Australian Bureau of Statistics' Greater Capital City Statistical Areas (GCCSA) classification.

Chart 21. POPULATION AND POPULATION GROWTH IN CAPITAL CITIES

Note: Under the Australian Bureau of Statistics' Greater Capital City Statistical Area classification, all states but the Australian Capital Territory are separated into the capital city and rest-of-state areas.

Source: (Australian Bureau of Statistics, Regional population, 2019-20, 2021) and Centre for Population projections.

The contribution of net overseas migration and net internal migration to population growth in the rest-of-state areas varies across states. Net overseas migration is projected to drive population growth across most capital cities from 2022-23 onwards, with the exception of Darwin and the Australian Capital Territory, where natural increase is projected to be the main driver of growth. Net internal migration is forecast to contribute negatively to population growth in the rest of Western Australia outside Perth and rest of Northern Territory outside Darwin over most of the projection period, reflecting historical averages. The rest of Northern Territory outside Darwin is the only rest-of-state area forecast to experience negative population growth in 2020-21, driven by a fall in net overseas migration. Like Darwin, the rest of the Northern Territory's population growth is driven by natural increase.

Chart 22. POPULATION AND POPULATION GROWTH IN REST-OF-STATE AREAS

Note: Under the Australian Bureau of Statistics' Greater Capital City Statistical Area classification, all states but the Australian Capital Territory are separated into the capital city and rest-of-state areas.

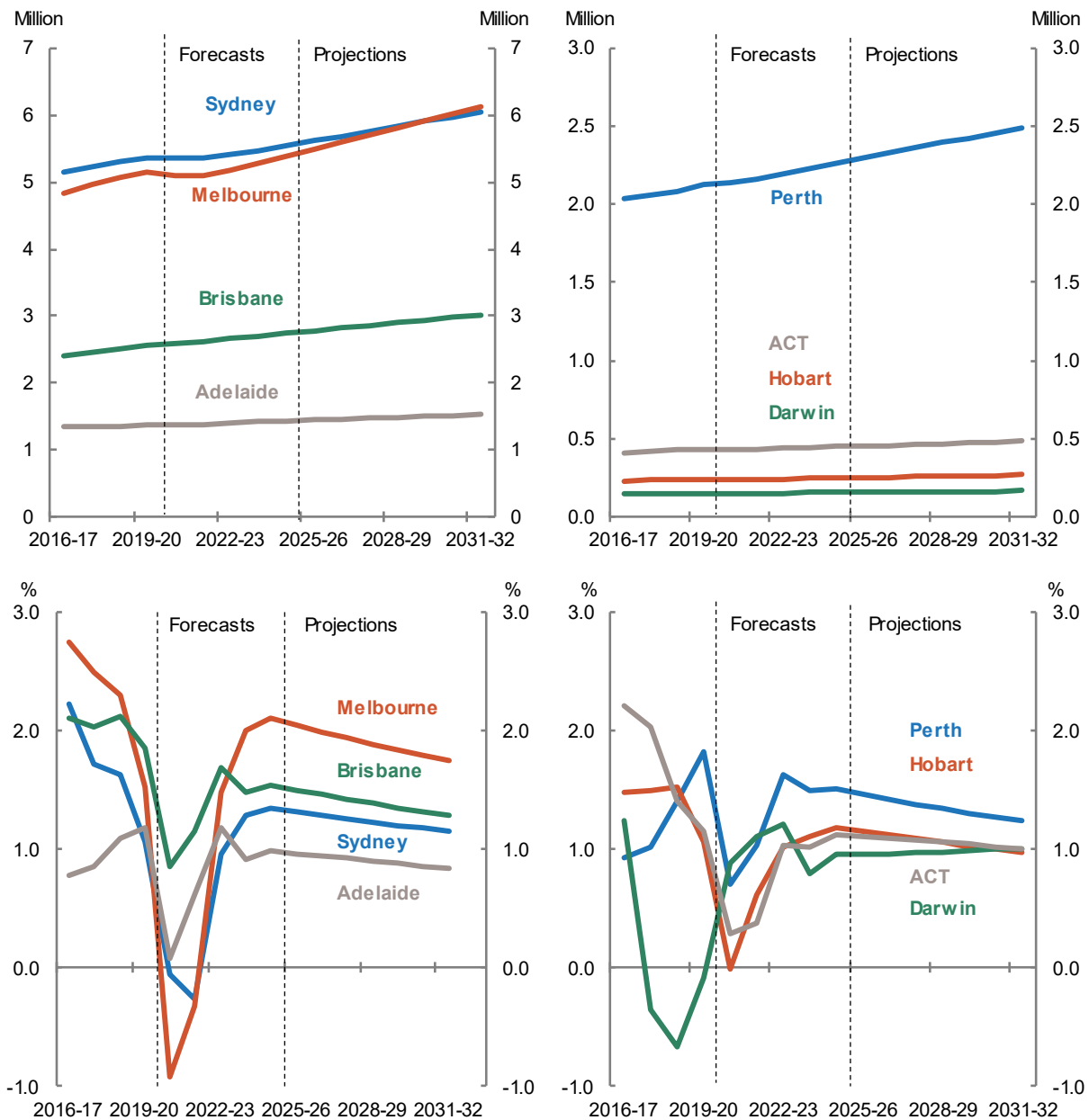Source: (Australian Bureau of Statistics, Regional population, 2019-20, 2021) and Centre for Population projections.

Darwin and the rest of South Australia outside Adelaide are the only 2 areas forecast to experience an increase in population growth from 2019-20 to 2020-21, mainly owing to fewer interstate departures. Darwin also had an increase in interstate arrivals in 2020-21. Darwin's population growth rate is forecast to increase from -0.1 per cent in 2019-20 to 0.9 per cent in 2020-21, before reaching a high of 1.2 per cent in 2021-22. Population growth in the rest of South Australia outside Adelaide is also forecast to experience a modest increase from 0.4 per cent in 2019-20 to 0.5 per cent in 2021-22. Darwin's and the rest of South Australia's population growth is forecast to return to pre-COVID-19 trends as travel restrictions ease.

3.2 NET OVERSEAS MIGRATION

In line with national and state projections, net overseas migration is anticipated to be a significant driver of population change at both the capital city and rest-of-state level (Chart 23). Net overseas migration is projected to contribute over half of total capital city population growth from 2023-24 in every capital city area except Brisbane and the Australia Capital Territory.

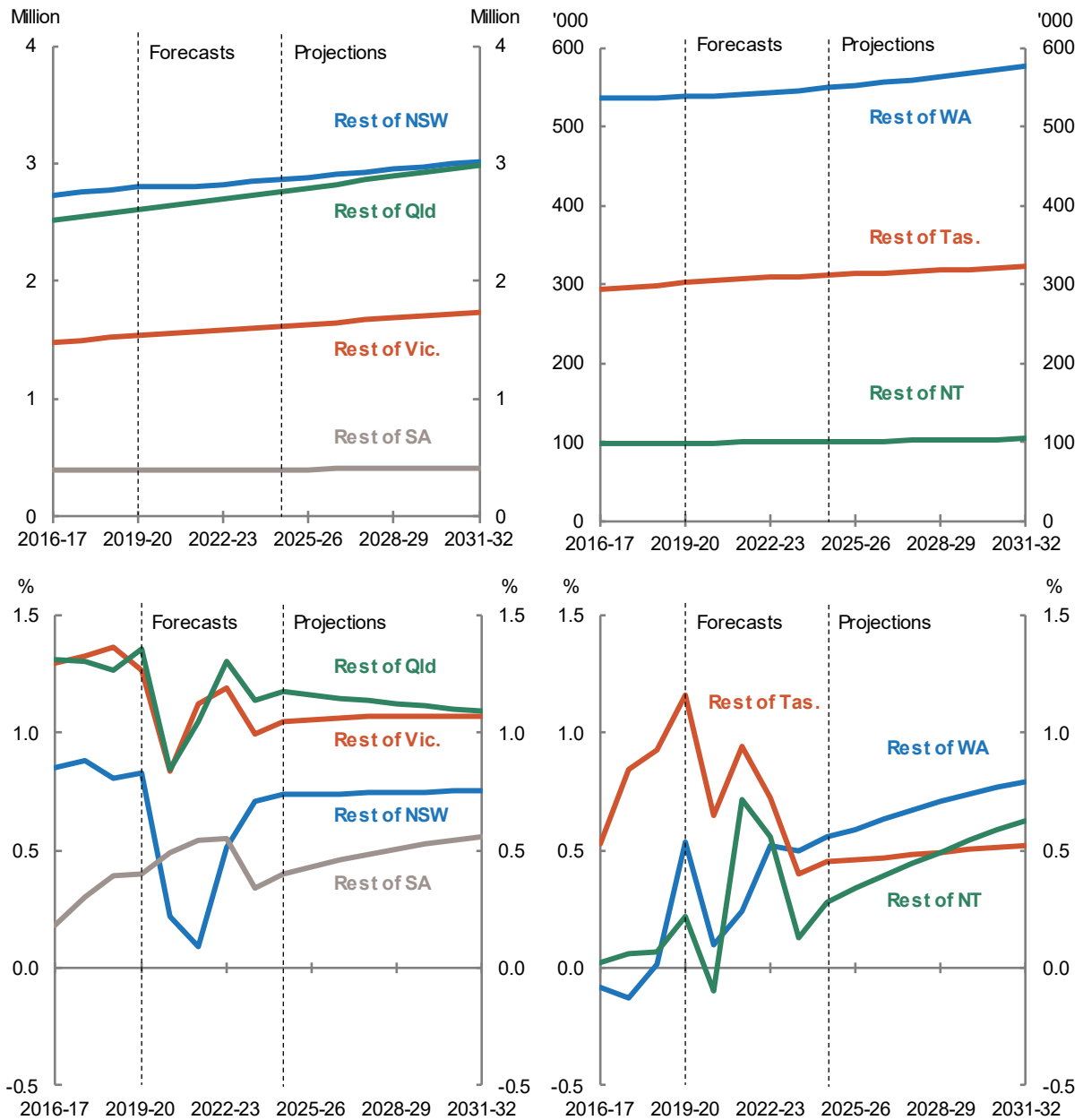**Chart 23.** NET OVERSEAS MIGRATION TO CAPITAL CITIES AND REST-OF-STATE AREAS
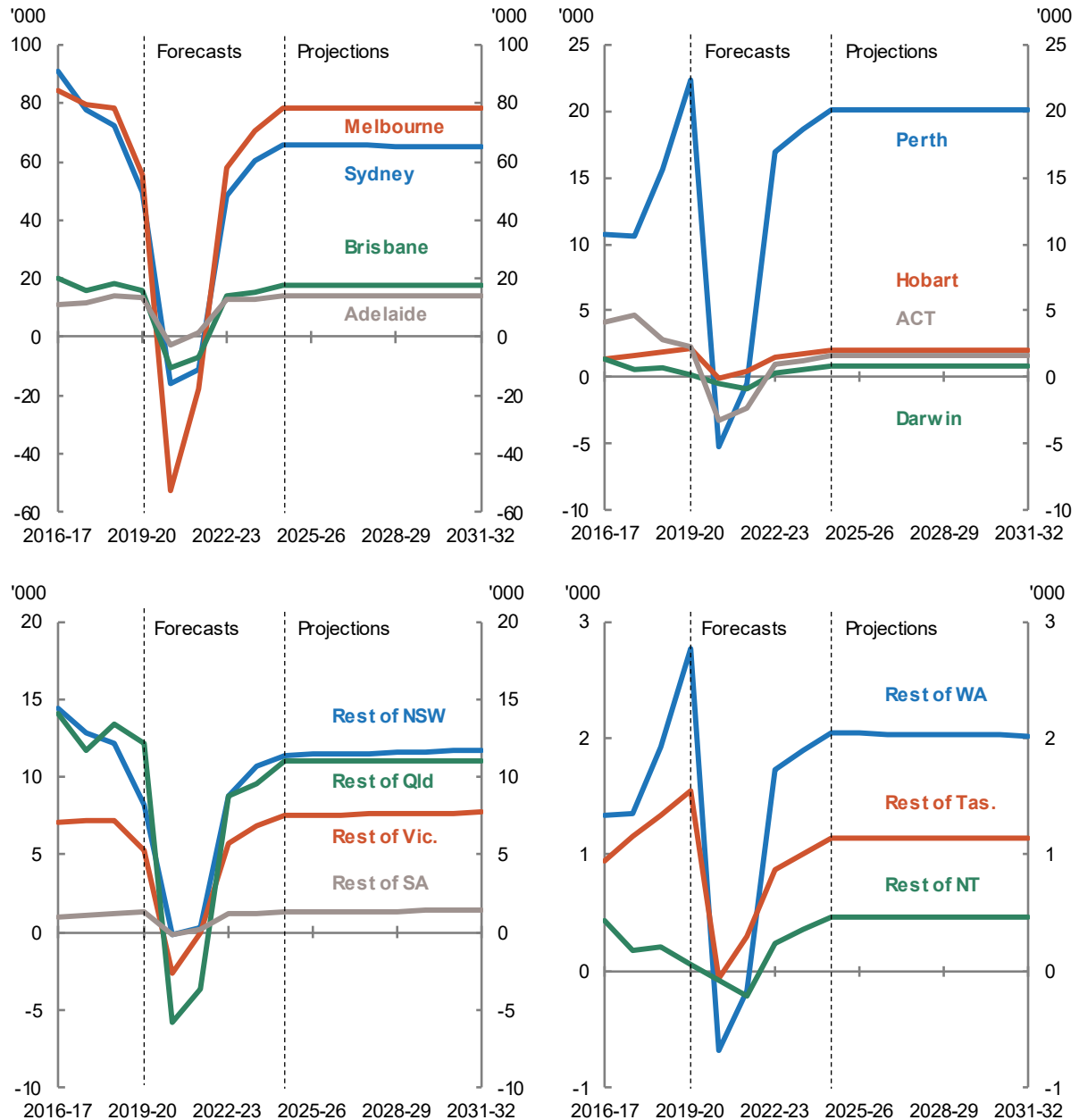
Note: Under the Australian Bureau of Statistics' Greater Capital City Statistical Area classification, all states but the Australian Capital Territory are separated into the capital city and rest-of-state areas.

Source: (Australian Bureau of Statistics, Regional population, 2019-20, 2021) and Centre for Population projections.

Net overseas migration is a smaller contributor to population growth in rest-of-state areas compared to capital cities. Historically, skilled migrants, international students attending regional universities and working holiday makers have dominated flows of migrants to rest-of-state areas. These groups support labour needs in

regional areas, particularly in seasonal industries such as hospitality and agriculture. This has offset, to some degree, internal migration flows from rest-of-state areas to capital cities, as many working-age Australians move to capital cities for study and employment. While these flows have slowed throughout the pandemic, some employers in rest-of-state areas have reported greater difficulties in filling vacancies as fewer migrants have travelled to Australia. The National Skills Commission found that 2020 was the first time employers in areas outside of capital cities more frequently had recruitment difficulty than their capital city counterparts (National Skills Commission, 2021).

Net overseas migration in rest-of-state areas is projected to recover in line with the broader return of net overseas migration at the state and national level. Net overseas migration is projected to make the largest contribution to population growth in the rest of Tasmania outside Hobart and the rest of New South Wales outside Sydney. In the rest-of-state areas in Queensland and Victoria, net overseas migration is projected to make a smaller contribution to population growth than net internal migration, in line with historical regional migration trends.

3.3 NET INTERNAL MIGRATION

Net internal migration is assumed to be affected in the near term by the extended Delta lockdowns of 2021, although the overall impact is expected to be milder than the second Melbourne lockdown of 2020 (Box 3). This is because 3 states imposed extended lockdowns in response to the Delta variant in 2021, compared with only one state for the second Melbourne lockdown in 2020. This is assumed to have reduced the potential locations to which people could relocate, so departures from these states are assumed to fall by a smaller percentage than seen in Victoria after the second Melbourne lockdown ended in November 2020. The high vaccination rates achieved over 2021 are expected to avoid the need for future extended lockdowns and improve people's confidence to move.

Sydney and Melbourne are assumed to see a greater decline in net internal migration than other parts of the country due to the extended activity and movement restrictions imposed in these cities early in 2021-22. Interstate arrivals into Sydney, Melbourne, the rest of New South Wales and rest of Victoria are assumed to decline in 2021-22 due to lockdowns in these areas. Interstate departures from Sydney and the rest of New South Wales are expected to increase. However, departures are expected to remain relatively stable in Melbourne and the rest of Victoria. This is because New South Wales has historically been one of the main destinations for people departing Victoria, but parts of New South Wales were also locked down at similar times in 2021. Interstate arrivals and departures for areas that did not experience a lockdown in 2021 are expected to have similar patterns to those seen during, and following, the second Melbourne lockdown in 2020.

Intrastate moves – moves that occur within a state between the capital city and the rest-of-state area – in Victoria and New South Wales are assumed to increase in 2021-22 in favour of rest-of-state areas given the observed trends after the second lockdown in Melbourne. Intrastate moves in 2021-22 in states that have not experienced an extended lockdown are assumed to be less impacted by the pandemic and more broadly align with recent history.

These assumptions have led to a forecast of the largest ever annual net outflow of residents for Sydney in 2021-22 of 38,900 people. Melbourne is forecast to record a net outflow of around 32,000 people. These net losses are due to fewer arrivals from other parts of the country – especially from places where net internal outflows have historically detracted from population growth. Although COVID-19 caused some changes in where people choose to move to – particularly for Melbourne around the time of its second 2020 lockdown – it is assumed that these changes will be temporary.

Patterns of internal migration are assumed to return to historical distributions in 2023-24 and remain constant over the rest of the projection period (Chart 24). This long-run assumption takes into consideration that rest-of-state areas have typically gained people from capital cities in net terms. This results in downward trends in the level of net migration for the 5 largest capital cities. It also accounts for small upwards trends for Hobart, Darwin and the Australian Capital Territory, and larger upwards trends in all rest-of-state areas. This is assumed to be driven, in part, by an older population retiring in regional and coastal areas.

Chart 24. NET INTERNAL MIGRATION TO CAPITAL CITIES AND REST OF STATE AREAS
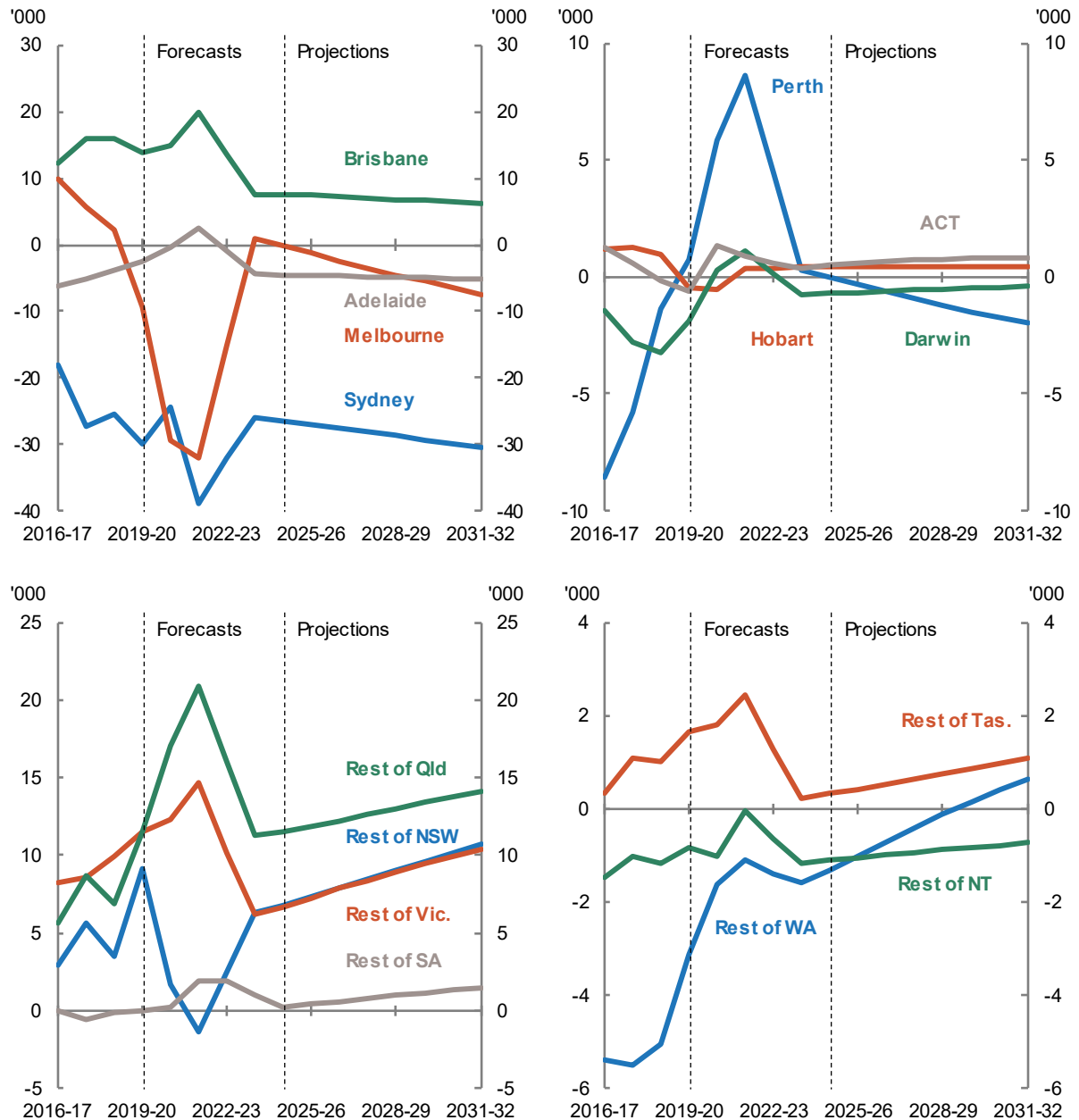
Note: Under the Australian Bureau of Statistics' Greater Capital City Statistical Area classification, all states but the Australian Capital Territory are separated into the capital city and rest-of-state areas.
Source: (Australian Bureau of Statistics, Regional population, 2019-20, 2021) and Centre for Population projections.

Rest-of-state areas are forecast to continue to experience an older age structure of internal migration arrivals compared to capital cities. Internal arrivals to capital cities are high for people aged 18-21, due to education purposes (Wilson, The impact of education-bound mobility on inter-regional migration age profiles in Australia,

2015). In contrast, rest-of-state areas have not recorded as high a spike in university-aged internal arrivals. Instead, rest-of-state areas attract a larger number of retirement-age arrivals than capital cities. This results in a median age of internal arrivals into capital cities of around 27 years compared to 31 years for rest-of-state areas. Consistent with observations to date, the age composition of internal migration is assumed to lead to faster population ageing in the rest-of-state areas compared to capital cities (Australian Bureau of Statistics, Regional population by age and sex, 2021).

BOX 3.   THE IMPACT OF LOCKDOWNS ON NET INTERNAL MIGRATION

Assumptions in this Statement about the impact of the extended Delta lockdowns of 2021 are based on observations during and following the second Melbourne lockdown in mid-late 2020. Australian Bureau of Statistics data on the internal migration impacts of the extended Delta lockdowns will be available in March 2022.

Net internal migration to Melbourne fell from a net outflow of 2,600 in the year ending March 2020 to an outflow of 32,200 in the year ending March 2021. This was the result of fewer arrivals to Melbourne in each quarter between December 2019 and December 2020 and increased departures from Melbourne in the June 2020 to March 2021 quarters (Chart 25).

Australian Bureau of Statistics' internal migration estimates are based on Medicare change of address data, allowing for a 3-month lag between the actual movement and update of the Medicare address. This assumption may have led to movements that actually occurred in the September quarter being assigned to the June quarter, which likely explain why Melbourne recorded a drop in net internal migration prior to commencement of the second lockdown. This analysis should, therefore, not be used to determine the onset of time-specific events like the imposition of restrictions or border closures between states.

Chart 25.   INTERNAL MIGRATION FOR MELBOURNE
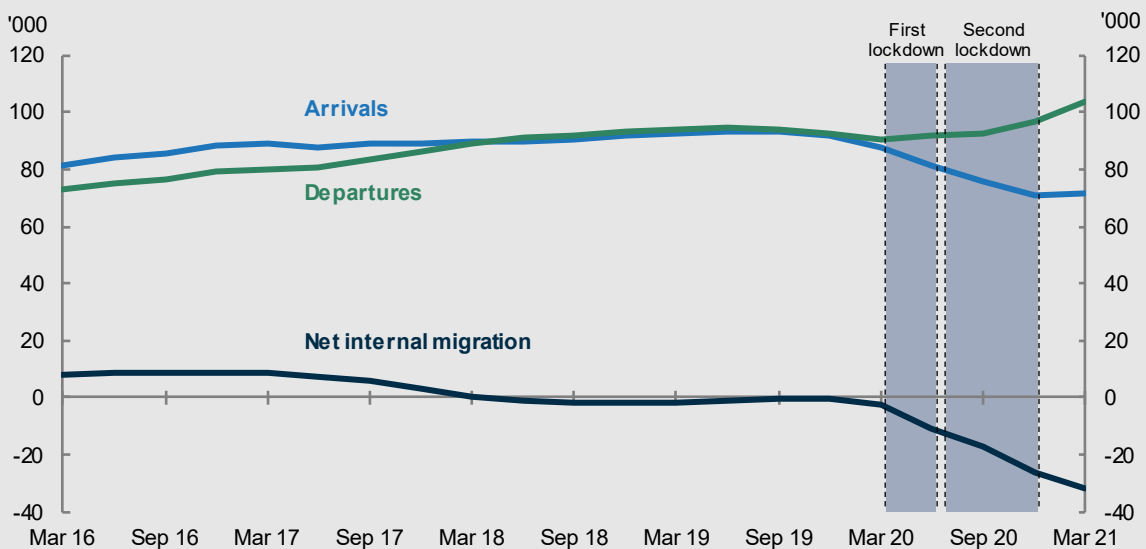
Note: Quarterly data presented on a year-ending basis.

Source: (Australian Bureau of Statistics, Regional internal migration estimates, provisional, 2021)

Residents departing from Melbourne in the year ending March 2021 were most likely to settle in the rest of Victoria (44,100 people), but there were also large flows to Queensland (20,300 people) and New South Wales (19,900 people). The distribution of departures from Melbourne broadly followed historical

patterns, although slightly more Melbourne residents chose to settle in the rest of Victoria than capital cities in other states compared to the previous year (Chart 26).

It is likely that similar patterns of movement have occurred in relation to the extended Delta lockdowns of Sydney, Melbourne, the Australian Capital Territory, and other parts of New South Wales and Victoria in 2021. These are yet to be observed in the official statistics.

Chart 26. ORIGIN AND DESTINATION OF MELBOURNE'S INTERNAL MIGRATION, QUARTERLY, MARCH 2020 AND MARCH 2021
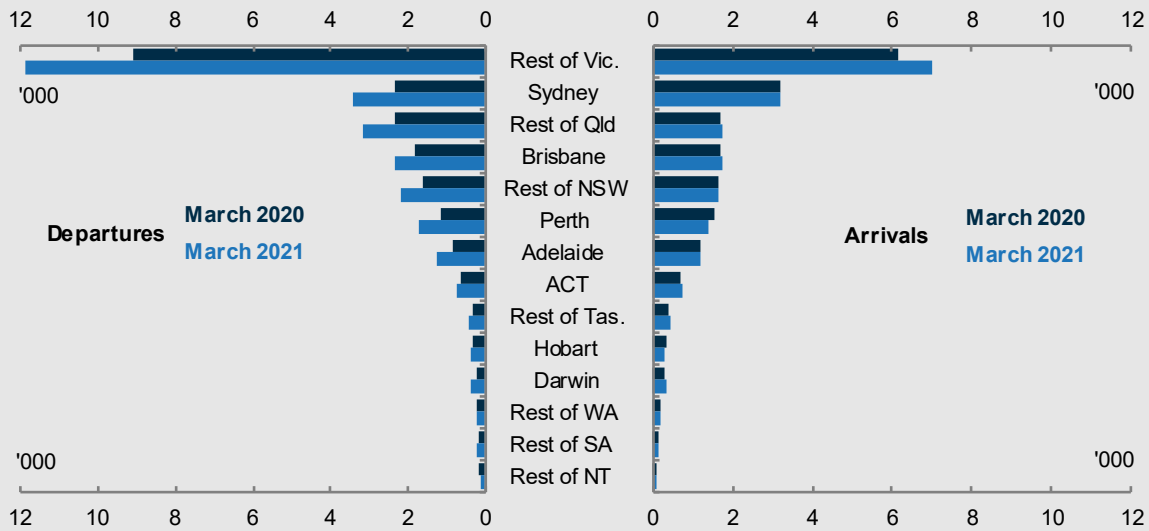
Source: (Australian Bureau of Statistics, Regional internal migration estimates, provisional, 2021)

3.4 NATURAL INCREASE

In contrast to net overseas and internal migration, natural increase is relatively stable over time within different parts of the country. Forecasts and projections of natural increase are affected not just by assumed future fertility and mortality rates, but also by the age composition of the population to which those rates are applied. As a result, parts of the country with relatively older populations such as the rest of South Australia outside Adelaide and the rest of Tasmania outside Hobart are projected to experience more deaths than births from 2022-23 and 2024-25 respectively (Chart 27). The rest of Victoria and the rest of New South Wales are projected to come close to zero natural increase by the end of the projection period.

Hobart is the only capital city projected to come close to zero natural increase. By contrast, Melbourne's natural increase is projected to grow from 32,000 in 2022-23 to 34,100 in 2031-32. This is assumed to occur as net overseas and internal migration return to normal and bring relatively younger people into Melbourne. Although the level of Melbourne's natural increase is projected to rise, natural increase as a share of population growth is projected to remain steady, at around 30 per cent from 2023-24.

Chart 27. NATURAL INCREASE IN CAPITAL CITIES AND REST OF STATE AREAS
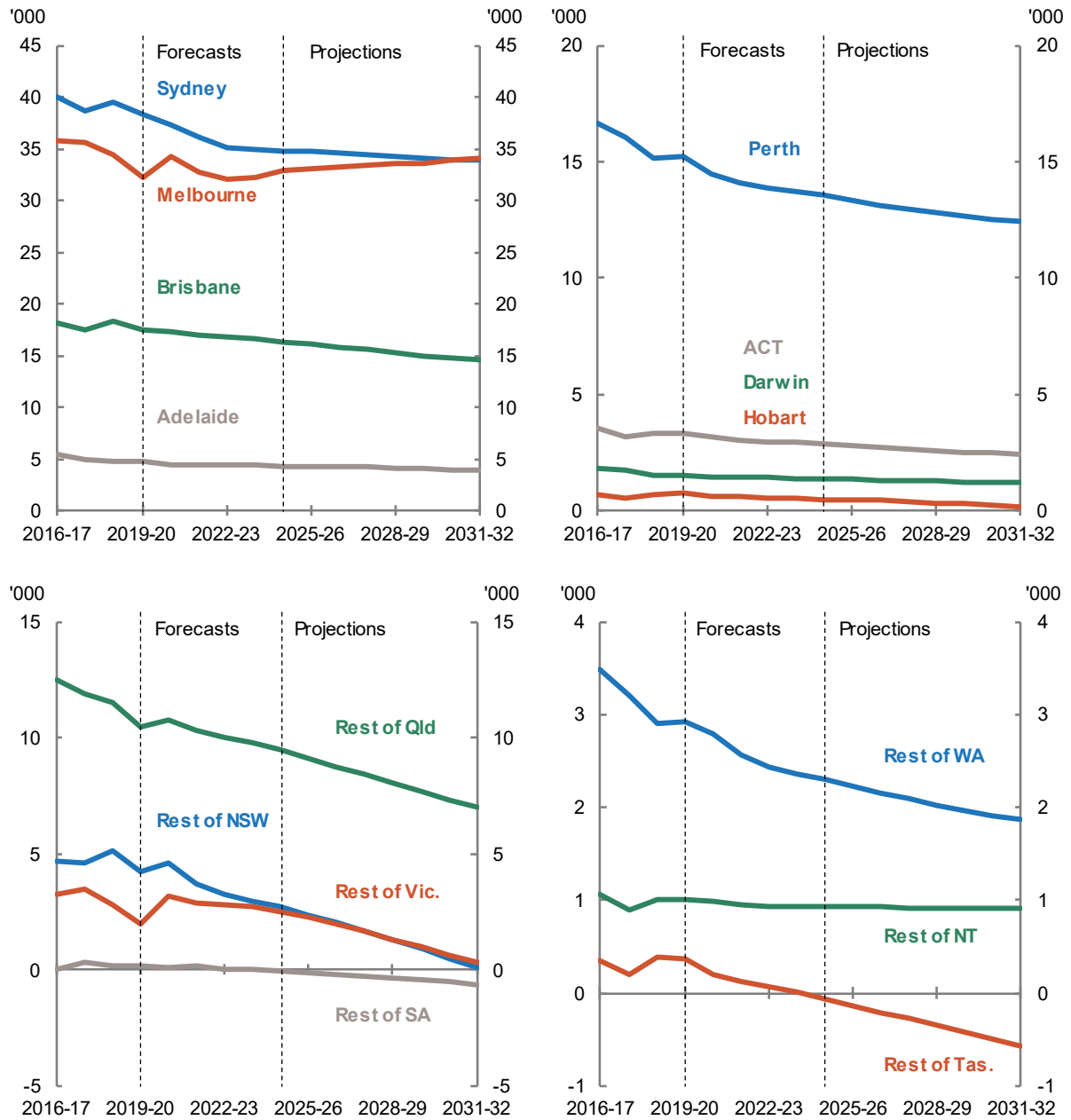
Note: Under the Australian Bureau of Statistics' Greater Capital City Statistical Area classification, all states but the Australian Capital Territory are separated into the capital city and rest-of-state areas.

Source: (Australian Bureau of Statistics, Regional population, 2019-20, 2021) and Centre for Population projections.

TECHNICAL APPENDIX
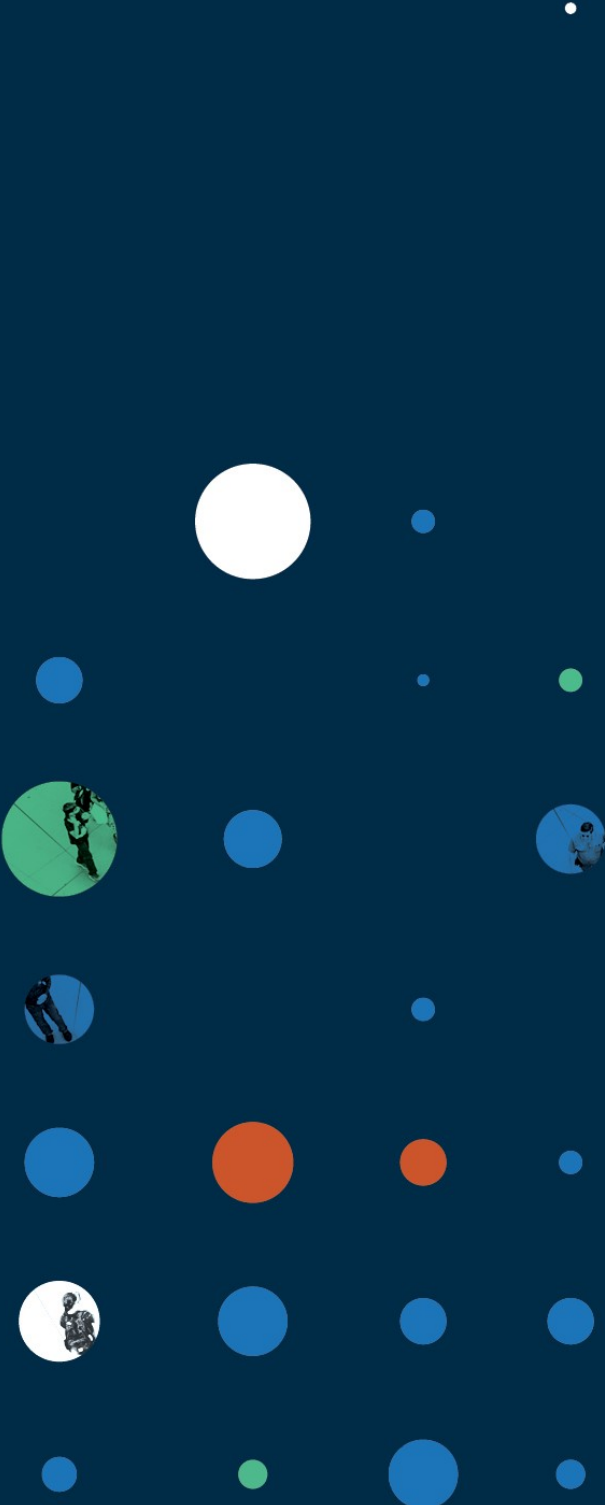
4. TECHNICAL APPENDIX

The Centre for Population prepares an annual Population Statement under the National Population and Planning Framework as part of national efforts to increase understanding about populations, population change and the implications for all levels of government.

The best way for the analysis and estimates in the Population Statement to serve the information needs of users is when methodology and assumptions are transparent, and when projections are regularly updated, including by taking account of new data or other information as it becomes available.

This section details the approach and assumptions used to estimate future population, and the associated limitations, for the central case and scenarios. New information has become available as the Statement has been prepared, and we have noted where this has been able to be reflected and where it has not.

4.1 FORECAST CONTEXT AND LIMITATIONS

Population projections are uncertain under normal conditions and are more uncertain during unprecedented shocks such as COVID-19. Population projections depend on the availability and quality of input data, assumptions based on historical trends and expert judgment, as well as the methodology used to bring these elements together. The uncertainty of population projections increases as the projection horizon extends and the smaller the size of the population they cover. For example, smaller geographies are more difficult to project than larger ones, as is the projection of specific age groups compared to the total population. The smaller the geography, the less timely the data are. For example, population numbers at the Greater Capital City Statistical Area (GCCSA) level are only updated and revised annually. As a result, the starting populations at the GCCSA level used for the projections are constrained to the state populations for 30 June 2020 from the latest quarterly release of National, state and territory population to ensure coherence.

The full impact of the pandemic on components of population change are not yet fully observable in the official statistics. For example, the impact of the extended Delta lockdowns on net interstate migration will not be reported until the September 2021 quarter release of National, state and territory population in March 2022. The impact of the pandemic on Australia's fertility as measured in birth occurrences will not be reported until the March 2022 quarter release of National, state and territory population is released in September 2022.

The projections in this Statement use the preliminary 30 June 2020 estimated resident population from the Australian Bureau of Statistics as the starting population for projections. Assumptions about components of change take account of information in subsequent quarters, up to and including March 2021. The preliminary, quarterly population data depend on more timely administrative information and predictive modelling techniques to capture expected behaviour around the components of population change. The Australian Bureau of Statistics will revise these quarters as more information becomes available, and all population data back to 30 June 2016 will be rebased to the 2021 Census.

The Centre's projections are based on an annual model that uses 2019-20 population as a projection start point. Figures for subsequent quarters are incorporated into assumptions for 2020-21. The release of the National, state and territory population by the Australian Bureau of Statistics on the 16th of December 2021 has not been reflected in the projections in this Population Statement.

BOX 4. DATA AVAILABILITY

In producing the 2021 Population Statement, the Centre for Population has aimed to use the most recent data available to analyse the likely impacts of COVID-19 on Australia's population. Some data released during the preparation of the Population Statement were not able to be taken into account.

Table 2. AUSTRALIAN BUREAU OF STATISTICS DATA SOURCES USED IN THE 2021 POPULATION STATEMENT

RELEASE	LAST RELEASE DATE	NEXT RELEASE DATE
National, state and territory population (quarterly)	March 2021, release date 16 September 2021	June 2021, release date 16 December 2021
Regional population (financial year)	2019-20, release date 30 March 2021	2020-21, release date 29 March 2022
Regional population by age and sex (calendar year)	2020, release date 27 August 2021	2021, release date 30 August 2022
Regional internal migration estimates, provisional (quarterly)	March 2021, release date 3 August 2021	N/A
Migration, Australia (financial year)	2019-20, release date 23 April 2021	2020-21, release date 17 December 2021
Births, Australia (calendar year)	2020, release date 8 December 2021	N/A
Deaths, Australia (calendar year)	2020, release date 29 September 2021	N/A
Causes of Death, Australia (calendar year)	2020, release date 29 September 2021	N/A
Life tables (three-yearly)	2018-20, release date 4 November 2021	N/A
Provisional Mortality Statistics (monthly)	August 2021, release date 24 November 2021	September 2021, release date 22 December 2021

4.1.1 NATURAL INCREASE

Fertility

Official births and fertility statistics are published by the Australian Bureau of Statistics based on information provided by each state registry of births, deaths and marriages. There are 2 conceptual bases for measuring births – period of registration and period of occurrence. There is usually an interval between the occurrence and registration of a birth (referred to as a registration lag). As a result, some births occurring in one period are not registered until the following period or later. This can be caused by:

• delays in parents in submitting a completed form to the registry,

• delays by the registry in processing the birth, and

• delays in the Australian Bureau of Statistics receiving complete information from the registry.

The Australian Bureau of Statistics revises the most recent financial year of births from a registration basis to an occurrence basis in the March quarter release of National, state and territory population. The March 2021 population statistics that were released in September 2021 included downward revisions to births numbers for 2019-20. This resulted in lower births and a lower total fertility rate in 2019-20 than was originally estimated in December 2020 — from 304,100 revised down to 299,300 (the rate of 1.65 babies per woman was revised down to 1.61 babies per woman).

Mortality

The Australian Government Actuary's projections of state mortality rates apply the same national future mortality improvements to all states. This application of the same mortality improvement factors to each state implies that present differences between state and national mortality will be predominantly maintained into the future. Although the national age-specific mortality improvements may not be exactly representative of age-specific state improvements, they provide a good approximation of them over the short and medium term.

4.1.2   NET OVERSEAS MIGRATION

Net overseas migration forecasts are based on unpublished Australian Bureau of Statistics data of quarterly migrant arrivals and departures by visa group and by state. These forecasts are subject to several data limitations and significant uncertainty due to the COVID-19 pandemic.

The Australian Bureau of Statistics estimates net overseas migration based on the 12/16-month rule where an inbound traveller is included in the resident population if they are in Australia for a total of at least 12 out of 16 consecutive months, or conversely, subtracted from the population if they are away for a total of 12 months or more over 16 consecutive months. This definition was introduced from the September quarter of 2006 to take into consideration short-term interruptions to a longer period of stay/absence. As a result, the time series of historical migration data exists only for 54 quarters (approximately 13 financial years) prior to impacts of the COVID-19 pandemic. This is a significantly shorter time series compared to other population components and may introduce error into estimates when used as the basis for forecasting net overseas migration over the next 17 quarters.

Historical estimates of net overseas migration are also subject to revision for up to 21 months after the relevant reference period. The use of the '12/16-month rule' methodology means that net overseas migration estimates are not finalised until 18 months after the end of the reference quarter. To provide more up-to-date statistics on Australia's population, the Australian Bureau of Statistics publishes preliminary estimates, which are first released around 6 months after the relevant reference period.

There is potential for future revisions to these preliminary estimates to be larger than in the years leading up to the COVID-19 pandemic. Preliminary estimates are determined by applying the behaviour of similar travellers from earlier periods. There is an increased level of uncertainty around these provisional estimates as the pandemic has changed traveller behaviour in many ways.

At the time of these forecasts, preliminary historical estimates were only available until the March quarter of 2021 due to the lagged nature of migration data. To account for this, the Australian Bureau of Statistics provides unpublished data of permanent and long-term overseas arrivals and departures by visa group and state, based on data from the Department of Home Affairs which is available for an additional quarter beyond National state and territory population. While this data does not align with net overseas migration, it provides some guidance for the next quarter's net overseas migration.

The Centre also uses visa grants data from the Department of Home Affairs' and international student enrolment data from the Department of Education, Skills and Employment as indicators for overseas arrivals. The predictability of these indicators and estimates of propensity for arrivals becoming migrants has been

significantly impacted by behavioural changes caused by the pandemic. Unknown responses to changing global health and economic conditions introduce downside and upside uncertainty around the accuracy of these indicators.

Previous net overseas migration levels are allocated to states based on Department of Home Affairs administrative data primarily from incoming passenger cards. Regional movements of overseas migrants cannot be directly measured and are estimated by breaking down overseas migrant arrivals and departures at the state level to sub-state areas, using information from the most recent Census. Sub-state estimates are therefore likely to incorporate some error as Census data becomes less current, especially for areas with very small populations. The distribution of overseas migrants to the sub-state level will in future be updated with proportions determined by the 2021 Census.

Net overseas migration forecasts are also guided by an assumption that migration flows will eventually return to pre-COVID-19 trends. However, even in the absence of the pandemic, trends in migration flows would have been affected by other factors – such as changes to demand from international students – which the shock of the pandemic has obscured. It is also not clear whether and how the pandemic might have enduring effects on global migration flows even after the pandemic has passed.

4.1.3   NET INTERNAL MIGRATION

The Australian Bureau of Statistics uses Medicare address information to form estimates of internal migration, as it has the most complete scope and coverage of all available administrative data sources (Australian Bureau of Statistics, National, state and territory population methodology, 2021). The 3 key limitations of Medicare data are:

* underestimating total moves due to individuals not updating their Medicare details when they move, especially young adults (Australian Bureau of Statistics, National, state and territory population methodology, 2021)

* incomplete population coverage, as there are people counted in the estimated resident population who may not be fully captured by Medicare (for example temporary migrants or Defence force personnel who do not frequently interact with Medicare), and

* that the observed change of address in the data does not always align with when the move occurred, creating a lag between occurrence and observation.

The Australian Bureau of Statistics applies a range of treatments to the data to account for these limitations. They calculate and apply expansion factors to account for the inherent underestimate and calibrate the data to the interstate migration levels and patterns seen every 5 years in the Census. These factors are applied by age, sex, state and move type (arrival or departure) (Australian Bureau of Statistics, National, state and territory population methodology, 2021). The Australian Bureau of Statistics account for the delay between occurrence of the move and updating Medicare addresses by assuming there is a 3-month delay between move occurrence and the updating of the Medicare address.

The Centre considers 2 main impacts of the lag when forecasting net internal migration. The first is that the age and sex distribution of Medicare address data is not as reliable as the age and sex distribution of the Census data. As noted above, the interstate migration estimates, based on Medicare address data, are revised by the Australian Bureau of Statistics following each Census to incorporate data from both sources. The Australian Bureau of Statistics are yet to undertake this process of rebasing internal migration estimates for the 2021 Census. Until these revised figures become available, the Centre has applied another method to create a smoothed Census derived age and sex distribution for internal migration (Section 4.2.3).

The second major factor considered by the Centre when analysing address-change data is the delay between moving residence and updating Medicare address details. Despite the Australian Bureau of Statistics applying a lag assumption to account for this, people's behaviour changed during the pandemic, leading to the impact of the second Melbourne lockdown – which started in early July 2020 – being able to be seen in the provisional internal migration statistics for the June 2020 quarter.

The difficulty in accurately matching the occurrence of a move to the time of updating address details with Medicare was also highlighted with the vaccination rollout which saw many residents updating their details to indicate a change of address. This represents an improvement in the estimate of the current stock of population, but is harder to attribute to internal migration in the prior quarters. The Centre has made no adjustments on top of those made by the Australian Bureau of Statistics in the March 2021 quarter release of National, state and territory population.

4.2 METHODOLOGY

Projections of future population are produced using the cohort-component method, where age and sex cohort-specific assumptions about future fertility, mortality and migration are applied to a base population to calculate the components of population change (births, deaths and migration). These components are added to the population at the start of a period to calculate the size and composition of the population at the end of the period, by single year of age and sex. This process is repeated until the end of the projection period.

Population projections for this Statement have been developed at the national, state, and Greater Capital City Statistical Area classification (GCCSA). A top-down approach is used for consistency across the projections at different geographic levels. This means components of population change at the GCCSA level are constrained to components at the state level which, in turn, have been constrained to components of change at the national level. The starting population for GCCSA projections is also 30 June 2020. The GCCSA populations published in Regional population by age and sex are constrained to the state populations for 30 June 2020 published in the March quarter 2021 release of National, state and territory populations. The key population accounting equations are shown below.

National population accounting equation

For all period cohorts except newly born infants the national population accounting equation is:

$$Pop_{s,a+1}^{Aus}(t+1) = Pop_{s,a}^{Aus}(t) - Deaths_{s,pc}^{Aus} - NOM\ departures_{s,pc}^{Aus} + NOM\ arrivals_{s,pc}^{Aus}$$

For newly born infants:

$$Pop_{s,0}^{Aus}(t+1) = Births_{s}^{Aus} - Deaths_{s,b}^{Aus} - NOM\ departures_{s,b}^{Aus} + NOM\ arrivals_{s,b}^{Aus}$$

where:

t – time t

$(t+1)$ – time 1 year after t

s – sex

a – age group

pc – period cohort

b – newly born period cohort

NOM – net overseas migration

State population accounting equation

For all period cohorts except newly born infants, the population accounting equation for each state is:

$$Pop_{s,a+1}^{ST}(t+1) = Pop_{s,a}^{ST}(t) - Deaths_{s,pc}^{ST} - NOM\ departures_{s,pc}^{ST} + NOM\ arrivals_{s,pc}^{ST}$$
$$- NIM\ departures_{s,pc}^{ST} + NIM\ arrivals_{s,pc}^{ST}$$

For newly born infants:

$$Pop_{s,0}^{ST}(t+1) = Births_{s}^{ST} - Deaths_{s,b}^{ST} - NOM\ departures_{s,b}^{ST} + NOM\ arrivals_{s,b}^{ST}$$
$$- NIM\ departures_{s,b}^{ST} + NIM\ arrivals_{s,b}^{ST}$$

where:

NIM – net interstate migration

ST – state

Capital city and rest-of-state population accounting equation

For all period cohorts except newly born infants the population accounting equation for each GCCSA is:

$$Pop_{s,a+1}^{GCCSA}(t+1) = Pop_{s,a}^{GCCSA}(t) - Deaths_{s,pc}^{GCCSA} - NOM\ departures_{s,pc}^{GCCSA} + NOM\ arrivals_{s,pc}^{GCCSA}$$
$$- NIM\ departures_{s,pc}^{GCSA} + NIM\ arrivals_{s,pc}^{GCCSA} - RIM\ departures_{s,pc}^{GCCSA} + RIM\ arrivals_{s,pc}^{GCCSA}$$

For newly born infants:

$$Pop_{s,0}^{GCCSA}(t+1) = Births_{s}^{GCCSA} - Deaths_{s,b}^{GCCSA} - NOM\ departures_{s,b}^{GCCSA} + NOM\ arrivals_{s,b}^{GCCSA}$$
$$- NIM\ departures_{s,b}^{GCCSA} + NIM\ arrivals_{s,b}^{GCCSA} - RIM\ departures_{s,b}^{GCCSA} + RIM\ arrivals_{s,b}^{GCCSA}$$

where:

RIM – regional intrastate migration

4.2.1 NATURAL INCREASE

The number of projected births and deaths is estimated by applying the projected national, state and GCCSA age-specific rates to the respective populations at risk. The total number of births is calculated by applying the age-sex specific fertility rates, $ASFR_a$, to the mid-point population at risk using the following equation.

$$Births_s\ (t, t+1) = r_s \times \sum_{a=15}^{49} [ASFR_a(t, t+1) \times \frac{Pop_{f,a}(t) + Pop_{f,a}(t+1)}{2}]$$

where:

t – time t

$(t+1)$ – time one year after t

f – female

a – age

s – sex at birth

$ASFR_a$ – female fertility rate at age a

$Pop_{f,a}(t)$ – female population at age a at time t

r_s – sex ratio at birth

The female fertility rates, $ASFR_a$, refers to the number of births to females in a particular age group ($Births_a$) in a particular year compared to the number of females in that age group.

$$ASFR_a(t, t+1) = \frac{Births_a\,(t, t+1)}{\frac{1}{2} \times [Pop_{f,a}(t) + Pop_{f,a}\,(t+1)]}$$

Similarly, the number of deaths is derived by applying the projected period-cohort mortality rates for a given sex to the population at risk.

$$Deaths_{s,pc}(t, t+1) = ASDR_{pc,s}\,(t, t+1) \times \frac{Pop_{s,a}(t) + Pop_{s,a+1}(t+1)}{2}$$

where:

pc – period-cohort

$ASDR_{pc,s}$ – mortality rate for a given sex and period cohort

$Pop_{s,a}(t)$ – population at age a and sex s at time t

For newly born infants, deaths are calculated using a population at risk approximated by half the end-of-interval population aged 0.

$$Deaths_{s,b}(t, t+1) = ASDR_{b,s}\,(t, t+1) \times \frac{Pop_{s,0}(t+1)}{2}$$

where:

b – newly born period-cohort

Mortality rates, $ASDR_{pc,s}$, are calculated using the number of 'person years'[4] lived by a person of sex s, within an age interval a to a+1 at time t ($Lx_{a,s,t}$)

For newly born infants

$$ASDR_{b,s,}(t, t+1) = \frac{100{,}000 - Lx_{0,s}(t)}{0.5 \times Lx_{0,s}(t)}$$

for ages 0 to 119

$$ASDR_{pc,s}\,(t, t+1) = \frac{Lx_{a,s}\,(t) - Lx_{a+1,s,}(t)}{0.5 \times (Lx_{a,s}(t) + Lx_{a+1,s}(t))}$$

for age 120

$$ASDR_{120,s}\,(t, t+1) = \frac{(Lx_{120,s}(t) + Lx_{121,s}(t)) - Lx_{121,s}(t)}{0.5 \times (Lx_{120,s}\,(t) + 2Lx_{121,s}\,(t))}$$

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4 'Person years' is a demographic measure frequently used in calculation of demographic 'occurrence/exposure' rates and life tables which represents the number of persons in the population and the length of time they were exposed to a given demographic event.

4.2.2 NET OVERSEAS MIGRATION

Forecasts for net overseas migration are produced over the forward estimates period (to 2024-25). The forecasts draw on detailed historical data on international arrivals and departures, offshore visa grants data and contextual assumptions regarding the easing of international travel restrictions by different states (Section 4.3.2).

Initial net overseas migration forecasts are estimated based on arrivals and departures of broad migrant categories based on trends observed prior to the COVID-19 pandemic. These initial net overseas migration forecasts are then adjusted to account for technical assumptions that capture likely impacts of the COVID-19 pandemic, and the measures taken to control its spread, by broad visa type.

4.2.3 NET INTERNAL MIGRATION

The 2021 Population Statement constructs internal migration rates by single year of age and sex and for arrivals and departures, also called gross migraproduction rates. Gross migraproduction rates are the sum of single year of age and sex migration rates for a period of time, for movements into, or out of, a location. They are expressed as the average numbers of moves that a person could expect to make in a lifetime to, or from, an area if they were subject to the age-specific migration rates of a given year (Bell, et al., 2002).

Age and sex-specific arrival and departure internal migration rates are often used when projecting internal migration over time because they account for changes in the underlying age structure of the population. This is important as migration rates are highly age specific and Australia's changing age structure has an impact on the number of overall internal moves.

Gross migraproduction rates to, or from, an area are calculated using the below formula:

$$GMR = \sum_{as} m_{as}$$

Where:

m_{as} – age and sex specific migration rate to, or from, an area for age a and sex s

The age and sex specific migration rate for internal migration arrivals and departures is calculated for each state's and GCCSA's population by dividing the number of movers to, or from, the region by the appropriate population at risk. For example, the age and sex specific departure rate for 20-year-old women from Sydney is calculated by dividing the number of 20-year-old women leaving Sydney over a year by the mid-year population of 20-year-old women in Sydney. Conversely, the age sex specific arrival rate for 20-year-old women arriving in Sydney is calculated by dividing the number of 20-year-old women arriving in Sydney over a year by the mid-year population of all 20-year-old women who live in Australia but outside of Sydney.

The Centre for Population uses a model migration schedule adapted from Wilson (2020) to build smoothed age and sex migration profiles to produce the age and sex structures of internal migration for each geographic area. These are then calibrated to the most recent Australian Bureau of Statistics' internal migration totals. The calibrated age and sex structure for internal migration does not use the Australian Bureau of Statistics' Medicare change-of-address age profile, as there is evidence of under-coverage in certain parts of the age profile. For example, due to under-count, the Medicare age profile does not show a pronounced bump in the 18 to 25-year-old age group which is expected as people finish their secondary education and move away from their childhood homes for tertiary education or work (Chart 28).

Chart 28.   AGE PROFILE OF ARRIVALS TO SYDNEY, PERSONS, 2019-20
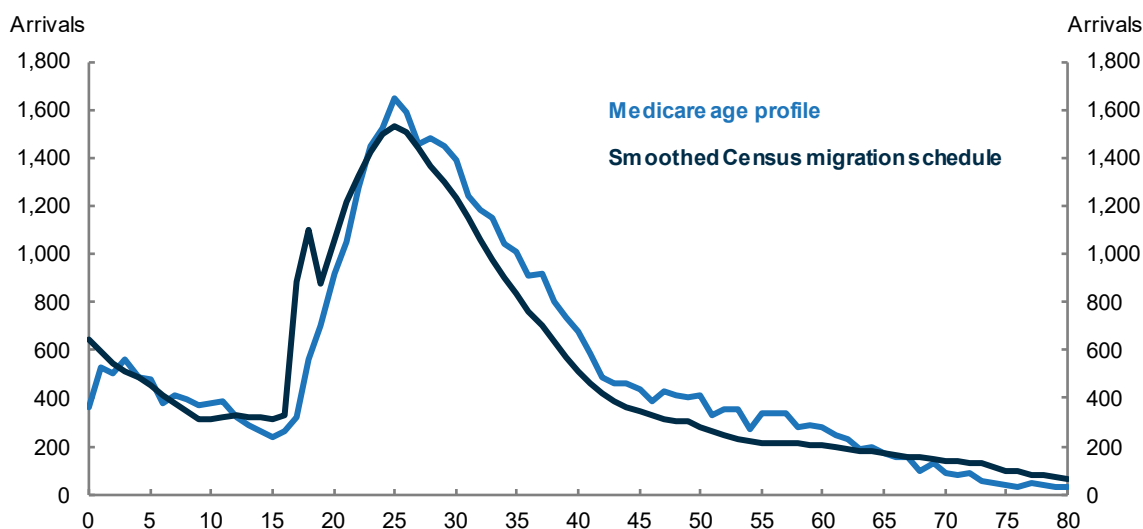
Source: (Australian Bureau of Statistics data request, Centre for Population calculation)

With the age and sex rates of migration calculated, the internal migration assumptions are then applied to generate projected arrivals and departures for each geography. The migration projections are generated by a bi-regional model that only considers arrivals to and departures from each jurisdiction. This is opposed to a multi-regional model that produces projections of migration between every origin and every destination. The data requirements for a multi-regional model are high. Data limitations already apply to bi-regional analysis, and a multi-regional analysis would be even more sensitive to these limitations. For these reasons, the Centre has implemented a bi-regional approach for its practicality and ability to produce more robust internal migration forecasts.

4.3   ASSUMPTIONS

The Centre's projections of future population are based on judgements formed in consultation with other population analysts and experts. Estimates of future net overseas migration are based on current government policy and assumptions about the nature and duration of future policies to contain the spread of COVID-19 at home and abroad, which are highly uncertain and can change at short notice. For insight into future net overseas migration, the Department of Home Affairs and the Department of Education, Skills and Employment were consulted.

The forecasts reflect the National Plan to Transition Australia's National COVID-19 Response (the National Plan) in our assumptions by easing the impact of the pandemic on net overseas and internal migration over 2021-22 (Australian Government, 2021). It is assumed, due to high vaccination rates, that future lockdowns will be highly targeted from late November 2021 and that both domestic and international movement restrictions will ease. The forecasts assume that the relaxation of restrictions on net overseas migration will take place within the timeframe as currently announced in the National Plan.

- In summary:

   – the total fertility rate is forecast for the period between 2020-21 and 2023-24 (inclusive), and assumed to revert to the projections prepared by Professor McDonald from 2024-25 onward

   – mortality probabilities are generally projected to improve at the rate observed over the past 3 decades

— net overseas migration is forecast for the period between 2020-21 and 2024-25 (inclusive), and the level of net overseas migration is assumed to remain at 235,000 from 2024-25 onward based on analysis of past trends, and

— net internal migration rates are forecast for the period between 2020-21 and 2022-23 (inclusive), and age and sex specific rates of internal migration are projected to be stable from 2023-24 onward.

4.3.1 NATURAL INCREASE

Fertility

Future fertility rate assumptions are based on analysis undertaken and commissioned by the Centre. The national total fertility rate in 2019-20 was 1.61 babies per woman, which is lower than the long-run assumption of 1.62. This is mainly attributable to Victoria's total fertility rate for 2019-20 being lower than its long-run assumed rate (Chart 29).

Chart 29. 2019-20 TOTAL FERTILITY RATE COMPARED TO LONG-RUN ASSUMPTION, BY STATE
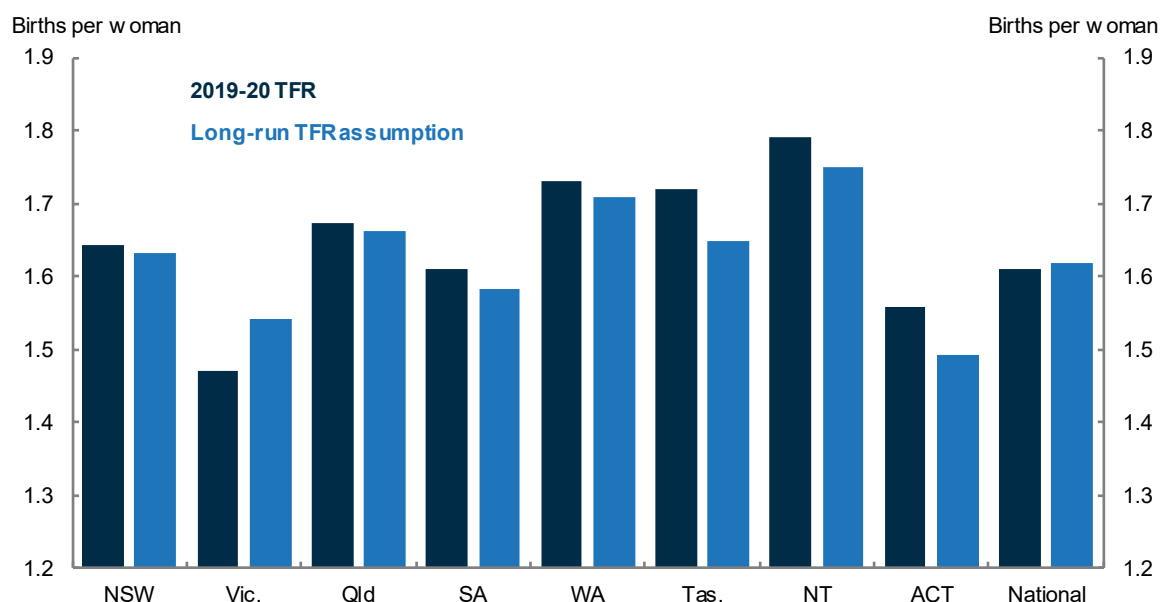
Source: (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre for Population assumptions.

The Australian Bureau of Statistics recently reported a total fertility rate of 1.58 babies per woman in 2020, with fewer births and birth registrations in most jurisdictions. However, births registered in the March 2021 quarter were higher than both the December 2020 quarter and the March 2020 quarter (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021). In addition, early Medicare data indicates that births for 2020-21 are likely to return to levels similar to 2018-19. For example, there were 295,000 babies born in 2020-21 and registered in Medicare by 31 October 2021. This compares with 291,000 babies in 2019-20 and 298,000 babies in 2018-19. Further, the number of births reported by the Australian Bureau of Statistics for the March quarter of 2021 was 76,000, compared with 75,000 in March 2020 and 76,000 in March 2019 (Chart 30). Therefore, the total fertility rate for 2020-21 is forecast to be similar to 2018-19 at 1.66 babies per woman.

As a result, the long-run national total fertility assumption is retained, but with some updates to near-term future fertility rates. The total fertility rate is assumed to be higher in 2020-21 than in 2019-20 but to decline thereafter. The national total fertility rate is now assumed to decrease slightly from 1.66 babies per woman in

2020-21 to 1.65 by 2024-25. From then on, it is assumed to go to 1.62 babies per woman by 2030-31, following the 'no COVID-19 impact' scenario from A Projection of Australia's Future Fertility Rates (McDonald, 2020).

The same approach has been used at the state level, with state relativities to the national total fertility rate assumed to remain constant. At the Greater Capital City Statistical Area (GCCSA) level, the recent ratios (2015 to 2019 calendar years) of location-specific fertility rates to the state total fertility rate are assumed to remain constant. The fertility rates for these areas are also constrained to state fertility rates.

Chart 30. NUMBER OF BABIES REGISTERED IN MEDICARE AND REPORTED IN OFFICIAL STATISTICS

QUARTERLY, SEPTEMBER 2016 TO JUNE 2021   ANNUAL, 2016-17 TO 2020-21

Note: Number of babies registered in Medicare is shown based on the date of birth, and includes babies born up to 30 June 2021, that were registered in Medicare by 31 October 2021. As there is a delay between the time of birth and time of registration, the number of births in 2020-21 may be higher than shown.

Source: (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and unreleased Services Australia data.

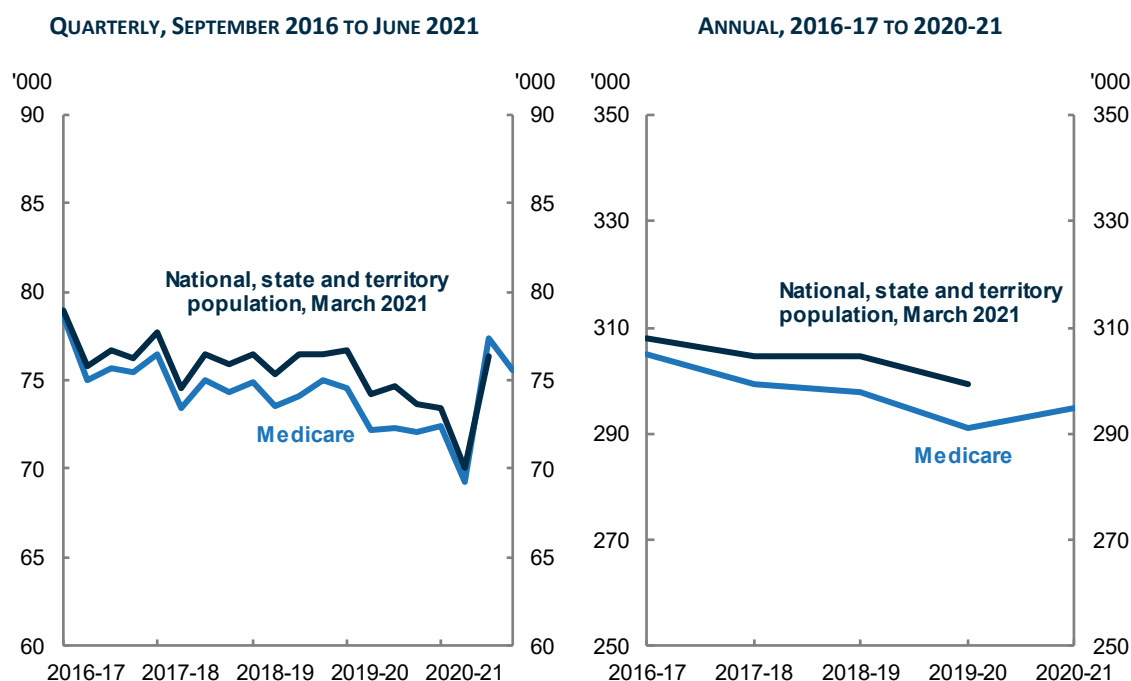### *Mortality*

Assumptions about future mortality rates are based on life tables produced by the Australian Government Actuary and the Australian Bureau of Statistics (Australian Bureau of Statistics, Life tables, 2021). For national mortality, the mortality rates from the Australian Bureau of Statistics' 2017-19 national life tables (by single year of age and sex) have been used with allowance for future improvement by applying the Australian Government Actuary's improvement factors to these mortality rates. The same approach has been used at the state level, but with the Australian Bureau of Statistics 2017-19 state life tables.

At the GCCSA level, abridged life tables were constructed based on Australian Bureau of Statistics' deaths and estimated resident population data from calendar years 1988 to 2019. The approach for future GCCSA mortality rates assumes that average ratios of GCCSA to state mortality rates over the calendar years 2015 to 2019 apply from 30 June 2023 onwards. For the period up to 30 June 2023, the ratios are smoothed from recent values to the 5-year average. Projected mortality rates for GCCSAs are then calculated by multiplying projected state mortality rates prepared by the Australian Government Actuary by the GCCSA-to-state mortality ratios.

The future mortality improvement factors, estimated by the Australian Government Actuary, assume that the annualised trend of improvement observed nationally over the past 3 decades for men and women will persist out to 2031-32 (Chart 31). They also assume that given the small number of COVID-19 related deaths to date, the pandemic will not have a material impact on future mortality. In estimating the improvement factors, the Australian Government Actuary applies the following constraints:

- female mortality rates are lower than males (except at very old ages, where they are currently higher)

- no mortality deterioration is assumed at very old ages (although deterioration has been historically observed in the available data, applying this constraint ensures a continuation of the trend of improving life expectancies), and

- no mortality improvement is assumed for centenarians or supercentenarians (based on the very small sample sizes available to assess historical trends).

Chart 31. IMPROVEMENTS TO MORTALITY OVER TIME, MALES (LHS) AND FEMALES (RHS)
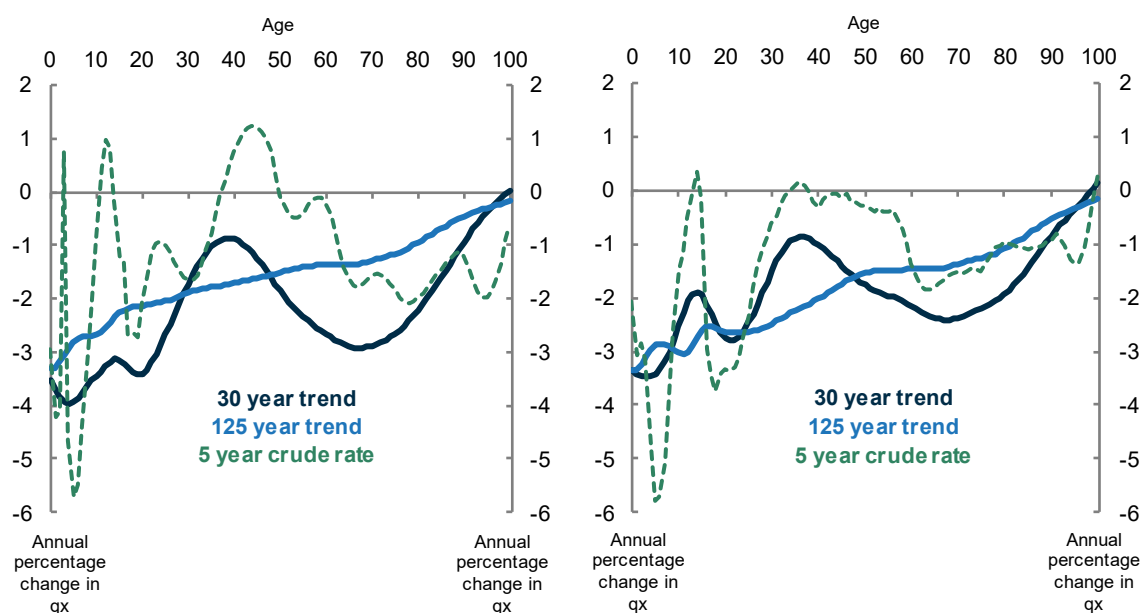
Note: 'qx' is a measure of the probability of dying – see glossary for more information.
Source: (Australian Government Actuary, 2019)

4.3.2 NET OVERSEAS MIGRATION

Ongoing uncertainty surrounding COVID-19 in Australia and globally is a significant risk for the net overseas migration outlook. Estimates of future net overseas migration are heavily assumptions based, and outcomes could be significantly different to the forecasts depending on the extent to which these assumptions hold.

From 1 November 2021, fully vaccinated Australian citizens, parents of Australian citizens, and permanent residents were permitted to enter Australia without a travel exemption. The Australian Government announced on 22 November that fully vaccinated, eligible visa holders would be permitted to enter Australia from 1 December 2021 without applying for a travel exemption. This was paused for 2 weeks due to uncertainty about the Omicron variant and is now scheduled to begin from 15 December 2021. Eligible visa holders include skilled and student cohorts, as well as humanitarian, temporary, working holiday maker and provisional family visa holders.

It is assumed the staggered lifting of state quarantine requirements will occur in accordance with the relevant state reopening roadmaps as they stand at the time of release of this Statement. All states are assumed to have substantially eased quarantine requirements for most fully vaccinated travellers by early 2022.

It is also assumed that two-way Safe Travel Zones with specific countries will remain in place until broader restrictions have eased in 2022. These arrangements include quarantine-free travel for vaccinated, eligible visa holders from Singapore beginning 21 November 2021, and for South Korean and Japanese citizens beginning 15 December 2021.

Small, phased programs for international students commenced in late 2021 in some states. It is assumed these programs will gradually increase from the end of 2021 through to the start of the 2022 academic year.

Since Budget 2021-22, the Australian Government and state governments have announced several policy measures to limit the spread and impact of the COVID-19 Delta variant. This includes measures such as the halving of quarantine capacity caps and the temporary suspension of the Safe Travel Zone with New Zealand. These measures have been incorporated into the net overseas migration forecasts.

The Australian Government has also announced measures to support the reopening of Australia as vaccination rates have increased. Notably, this includes doubling the scale of the Pacific Worker Programs and consolidating these programs into a new streamlined, integrated and flexible Pacific Australia Labour Mobility Scheme, as well as the introduction of the Australian Agriculture Visa and measures to support the return of international students and recent graduates. These measures have also been incorporated into the net overseas migration forecasts.

Long-run net overseas migration assumption

The long-run net overseas migration assumption at the national level is 235,000 people per year. This long-run assumption is based on historical averages and adjusted to reflect government policy. The assumption reflects the contribution of 4 distinct migration groupings that cover all arrivals and departures through time:

- the contribution of the Government's planning levels of the permanent (190,000 people per year from 2023-24[5]) and humanitarian migration (13,750 people per year[6]) programs to migrant arrivals— these migration planning levels are revised by the Government on a yearly basis

- the flows of arriving and departing temporary migrants who reside in Australia for several years but never transition to permanent residency (a net inflow of 66,000 people per year)

- the flows of departing and returning Australia citizens (a net outflow of 15,000 people per year), and

- the number of permanent residents who subsequently emigrate (a net outflow of 20,000 people per year).

The long-run net overseas migration assumption is the summation of those components – the planning levels, temporary flows, along with Australian and permanent resident emigrants – to be 235,000. The current long-run net overseas migration assumption is derived from the 14-year average from 2004-05 to 2017-18, adjusted for a higher combined planning level for the permanent and humanitarian migration programs. This

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5   Consistent with the Government's decision as announced in Budget 2019-20, to cut the permanent program by 120,000 over 4 years.

6   Consistent with Government's decision as announced in Budget 2020-21, which set the humanitarian program level at an ongoing level of 13,750 places from 2020-21 onwards.

period utilises the full historical sample from the Australian Bureau of Statistics' Migration, Australia release, which has the longest available history of net overseas migration using the 12/16-month rule for residence.

The decomposition of the long-run net overseas migration assumption was derived by its constituent components to allow for an adjustment to a now higher combined planning level for the permanent and humanitarian Migration Programs. However, the long-run assumption is only used at an aggregate level: beyond 2024-25, the projections do not incorporate information on net overseas migration by visa group.

With government planning levels accounting for the largest component to the long-run assumption, it is highly sensitive to any future decisions by the Australian Government to increase or decrease the planning levels for the migration program. This use of the program levels in the assumption also incorporates those migrants who first enter Australia as temporary residents and subsequently transition to permanent residency.

State arrivals and departures to 2024-25 reflect trends in the historical and forecast data, incorporating differing visa group and compositional effects. These state shares aggregate to a national net overseas migration long-run assumption of 235,000 by 2024-25. Beyond 2024-25, state net overseas migration shares are held constant.

Within states, the contribution to capital city and rest-of-state areas was prepared using the average share observed from 2016-17 to 2018-19, which is the extent of data available at the GCCSA level. These intrastate shares are assumed to be invariant throughout the forecast and projection horizon. The age by sex disaggregation for net overseas migration on the national, state, capital city and rest-of-state levels are based on historical proportionality.

4.3.3   NET INTERNAL MIGRATION

Net interstate migration is assumed to be affected by COVID-19 in 2021-22. The effects are assumed to ease toward the end of 2021-22 and into 2022-23 as it is expected that over 90 per cent of the Australian population, aged 16 and over, will be vaccinated. The total number of interstate moves is assumed to return to pre-pandemic levels of around 400,000 moves by 2023-24. The pattern of interstate flows, or the direction in which people move, is assumed to return to the 19-year long-run average in 2023-24.

The forecast impact of the extended Delta lockdowns on internal migration is based on the observed impact of the second Melbourne lockdown. The net internal migration forecasts are sensitive to the contextual assumption that there will be no future, large-scale, internal movement restrictions and lockdowns. Assumptions for internal migration at the state and GCCSA levels were developed for the 3 main dimensions of internal migration:

• level – how many people move

• patterns – where people move to and from, and

• composition – who is moving (including their basic demographic characteristics such as age and sex).

Level
Based on the available Australian Bureau of Statistics' Provisional regional internal migration estimates data covering the first 3 quarters of 2020-21, the contextual assumptions outlined above and stakeholder engagement, it is assumed that the national level of interstate migration will fall by around 2 per cent in 2021-22 compared to 2020-21. It is then assumed to grow in 2022-23 with a 6 per cent increase in interstate moves before increasing again by 6 per cent in 2023-24 to return to a pre-pandemic level of around 400,000 annual, national interstate moves. The national level of intrastate moves follows a similar trajectory, falling to 280,000 moves in 2020-21 and then recovering to around 300,000 moves in 2023-24. From 2023-24 onwards the single year of age and sex migration rates which make up the gross migraproduction rates are held

constant. This allows the national level of internal migration to move in line with national population growth and reflect the age composition of the population.

Patterns

The assumed future patterns of net internal migration in Australia generally follow established trends between states and GCCSAs. Young adults generally migrate to the capital cities and older Australians generally move out of the capital cities. The lockdowns have disrupted this pattern in a number of states, although there are as yet no official statistics on how net internal migration has been affected by the extended Delta lockdowns.

Assumptions about the patterns of forecast net internal migration are based on observations of changes to net internal migration patterns during and following the second Melbourne lockdown of 2020, released by the Australian Bureau of Statistics up to and including the March 2021 quarter release of National, state and territory population. It is assumed that:

- states that experienced the extended Delta lockdowns in 2021 (New South Wales, Victoria and the Australian Capital Territory) will experience impacts to internal migration similar to Victoria after the second Melbourne lockdown in 2020 (differences in impacts between and within these states vary due to the contextual assumptions and size of each geography), and

- net internal migration patterns return to a 19-year, long-run average by 2023-24.

The next release of National, state and territory population for the 2021 June quarter will contain revisions to internal migration for the March 2021, December 2020 and September 2020 quarters. These revisions were not available in time to be taken into account in this Statement's projections.

The internal migration assumptions in this Statement are for a large impact in 2021-22, with areas affected by lockdowns experiencing a similar shock to the second Melbourne lockdown. In 2021-22 the pattern of internal migration for states and GCCSAs not experiencing a lockdown is assumed to reflect the pattern of internal migration observed for those states and GCCSAs during Melbourne's second lockdown.

In 2022-23 and 2023-24 it is assumed that internal migration will begin to recover from the impact of the pandemic, with patterns converging to a long-run distribution that is calculated from the average pattern of internal migration between 2001-02 and 2019-20. This covers the full regional migration series at the GCCSA level.

Returning to an observed historical average in 2023-24 reflects the uncertainty regarding lingering impacts of the pandemic and possible structural changes this may have brought to the flow of internal migration. The Centre will continue to identify internal migration patterns as more data become available.

Composition

It is assumed that the composition of net internal migration – the age and sex distribution of people who move – will remain stable during the projections period. The Centre uses a consistent smoothed age and sex distribution for internal migration (detailed in Section 4.2.3). Currently, there is not enough evidence to suggest a structural change to the age and sex distribution of internal migration due to COVID-19.

4.4 COMPARING PAST PROJECTIONS TO OUTCOMES

The accuracy of population projections depends on the quality of the input data and the assumptions made about the course of future change. Population projections will differ from subsequent observed outcomes for many reasons, including but not limited to changes in behaviour, changes in government policy, and revisions to the input data.

Table 3 compares the performance of population projections published in the 2020 Population Statement against the unrebased estimates reported by the Australian Bureau of Statistics. The 2020 Population Statement included a similar assessment of projections in the 2015 Intergenerational Report and the Australian Bureau of Statistics' 'medium series', which are also included below.

Table 3. COMPARISON OF POPULATION PROJECTIONS TO OUTCOMES (% DIFFERENCE OF TOTAL POPULATION PROJECTIONS TO OUTCOME, AT 30 JUNE OF EACH YEAR)

|	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Intergenerational Report, 2015						
Australia	-0.4	-0.5	-0.6	-0.8	-0.8	-1.1
ABS Projections (Series B), 2018						
Australia	-	-	-	-0.1	-0.3	-0.7
New South Wales	-	-	-	-0.3	-0.6	-1.3
Victoria	-	-	-	-0.1	-0.3	-1.0
Queensland	-	-	-	-0.1	-0.1	-0.2
South Australia	-	-	-	0.1	0.3	0.6
Western Australia	-	-	-	-0.2	-0.1	0.3
Tasmania	-	-	-	0.3	0.5	0.9
Northern Territory	-	-	-	-1.1	-2.4	-3.3
Australian Capital Territory	-	-	-	-0.1	-0.8	-1.6
Population Statement, 2020						
Australia	-	-	-	-	-	0.1
New South Wales	-	-	-	-	-	0.1
Victoria	-	-	-	-	-	-0.2
Queensland	-	-	-	-	-	0.3
South Australia	-	-	-	-	-	0.3
Western Australia	-	-	-	-	-	0.6
Tasmania	-	-	-	-	-	0.1
Northern Territory	-	-	-	-	-	1.4
Australian Capital Territory	-	-	-	-	-	0.3

Note: Positive numbers refer to underestimates, and negative numbers overestimates, when compared to the actual result.

Source: (The Treasury, 2015), (Australian Bureau of Statistics, Population Projections, Australia, 2018), (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre of Population projections.

Breaking the results out by state, nearly three quarters of the difference between the national forecast for 2019-20 and the actual result was due to Queensland's and Western Australia's populations being higher than forecast. This was somewhat offset by the reported outcome for Victoria being lower than forecast. At the Greater Capital City Statistical Area (GCCSA) level, the largest forecast differences were for Perth, where forecasts were lower than official statistics. The smallest difference compared to the reported outcome was for Sydney, where the forecast was around 100 persons higher than the official statistics.

For 2019-20, the estimated resident population was 36,400 higher than forecast in the 2020 Population Statement. This difference expressed as a percentage of the 2019-20 estimated resident population was 0.1 per cent. This underestimation of the estimated resident population translated into a lower projected growth rate in 2019-20 of 1.1 per cent instead of the reported growth rate of 1.3 per cent (Chart 32).

Chart 32. ACTUAL AND PROJECTED POPULATION GROWTH RATES, AUSTRALIA
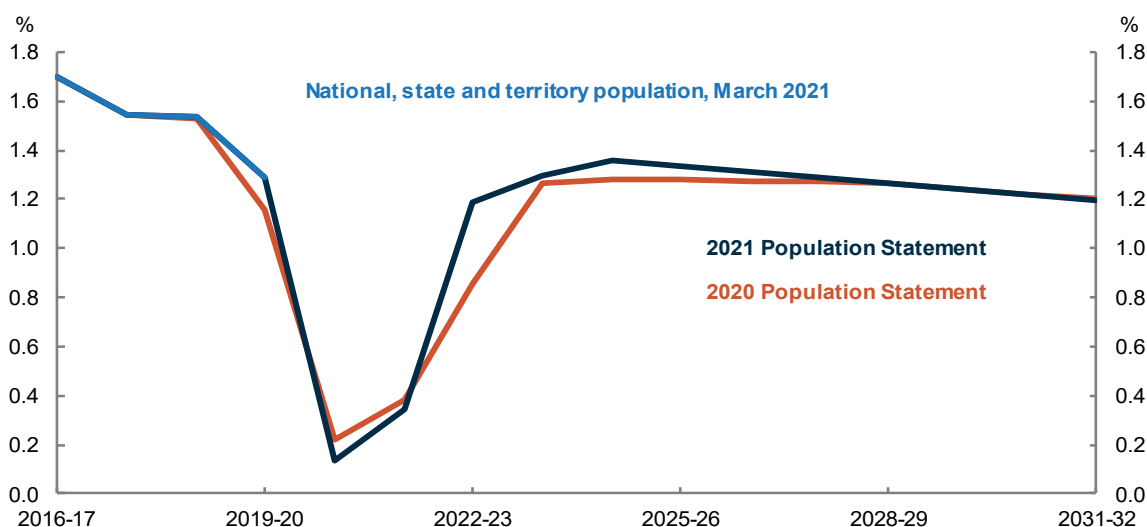
Source: (Australian Bureau of Statistics, National, state and territory population, March 2021, 2021) and Centre for Population projections.

Contributing to part of the forecast errors in the 2020 Population Statement was the Australian Bureau of Statistics' revisions of 2018-19 estimated resident population figures used as the starting population for forecasts. The estimated resident population for 2018-19 was revised up slightly by 1,600 people since the release of the 2020 Population Statement, accounting for 4.5 per cent of the forecast error. This revision was solely driven by net overseas migration with an upward revision of overseas arrivals and departures. This also means that revisions for state estimated resident populations were greater for states like New South Wales and Victoria that typically receive greater shares of net overseas migration. Revisions to New South Wales' estimated resident population contributed a third of total revisions to national estimated resident population and accounted for 6.1 per cent of New South Wales' forecast error.

The 2020 Statement projections slightly overestimated the number of births. The projected national number of births was 10,700 higher than the actual. This difference relative to the actual total number of births in 2019-20 was 3.6 per cent. Over 50 per cent of the difference in the projected numbers was due to overestimation of births in Victoria where the projected births were 6,100 higher compared to the actual. At the GCCSA level, the biggest difference from the actuals was in Sydney (4,100), Melbourne (3,700) and the rest of New South Wales (-2,600). The higher number of the projected births was due to the assumption of the national total fertility rate being 1.69 children per woman in 2019-20. The Australian Bureau of Statistics reported the total fertility rate for 2019-20 as 1.65 in the June 2020 release of National state and territory population, and then revised it down to 1.61 babies per woman in the March 2021 release.

The national forecast number of deaths was 6,800 higher than the 2019-20 outcome, or 4.1 per cent higher. In terms of the state distribution, the biggest differences were for New South Wales, Western Australia and Queensland, which together accounted for over 70 per cent of the national difference, although all states recorded lower observed deaths than forecast for 2019-20. At the GCCSA level, the largest difference was for Sydney, with around 1,300 more deaths forecast for 2019-20 than were recorded. Recorded deaths were lower than forecast deaths for all GCCSAs except Melbourne, where the forecast was 100 persons lower.

The net internal migration forecasts for 2019-20 were different from the recorded outcomes for all states. The forecast for Victoria was just under 9,300 persons higher than recorded. The forecasts for Queensland and Western Australia were lower than recorded outcomes by around 3,700 each. At the GCCSA level, the largest gap was recorded for Melbourne which was forecast to have positive net internal migration of 1,600 in 2019-20 but recorded a net outflow of 9,300. Smaller disparities were recorded for the rest of Queensland and the rest of New South Wales where forecast net internal migration was 5,400 and 5,200 persons higher respectively.

Net overseas migration has historically been the most volatile component of national population growth and consequently the most difficult to forecast. Ongoing uncertainty throughout the year resulting from changing travel, health and economic conditions has further lowered the predictability of migration patterns.

The net overseas migration outcome for 2019-20 was 39,000 higher than projected in the 2020 Population Statement. The most significant contributor was around 60,000 additional temporary visa holder arrivals than forecast, offset by around 30,000 additional temporary migrant departures (Chart 33). Net migration of Australian citizens also contributed to the higher outcome, with 13,000 additional arrivals and 6,000 fewer departures. Around 45 per cent of this difference is attributable to revisions to historical data,[7] with the remainder attributable to a difference between the forecast for the June 2020 quarter and the outcome.

Chart 33. DIFFERENCES BETWEEN REPORTED AND FORECAST NET OVERSEAS MIGRATION, 2019-20
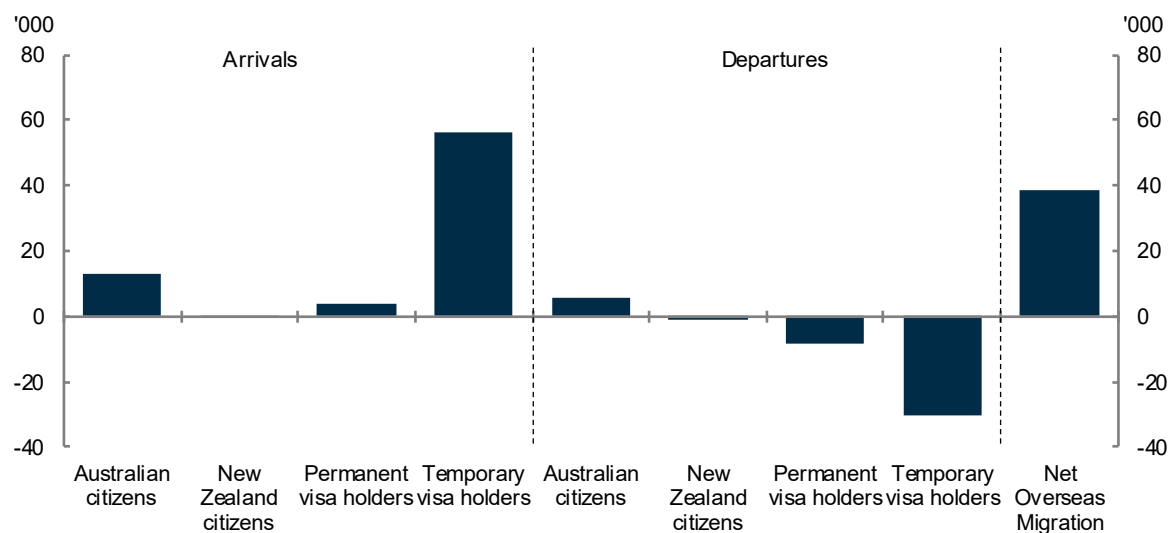
Note: Higher arrivals than forecast contribute positively to the difference between reported and forecast net overseas migration, higher departures contribute negatively.

Source: Customised data consultancy, Australian Bureau of Statistics, and Centre for Population projections.

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7   At the time a person arrives in (or departs from) Australia, it is not empirically known how long they will stay in Australia (or overseas).

Preliminary estimates of net overseas migration are modelled based on traveller behaviour from one year earlier and are revised as the passage of time reveals whether they stayed (or departed) for a sufficient period to be categorised a migrant.

Net overseas migration forecasts for 2019-20 were lower than recorded outcomes for most states. The magnitude of the underestimation was dependent on the composition of migrant flows to the state. The largest underestimate was in Western Australia (10,600) and the smallest was in the Australian Capital Territory (1,600). At the GCCSA level, the largest differences between forecast and actual net overseas migration were recorded for Perth, Sydney, and Brisbane (underestimates of 9,200, 8,100 and 6,000 respectively).

The COVID-19 pandemic caused great disruption to traveller behaviour, with a greater proportion of arrivals and departures being of sufficient length to be classified as migrations that met the 12/16 rule. Permanent and long-term arrivals and departures have historically been a useful guide to assess the near-term outlook for net overseas migration, as overseas arrivals and departures data is available much earlier than net overseas migration data for the corresponding period. The relationship between these 2 series has been relatively stable over history. Over the 10 years to 2018-19 around 70 per cent of all permanent or long-term arrivals stayed in Australia for a sufficient length of time to be classified as net overseas migration arrivals, while around 60 per cent of all permanent and long-term departures left Australia for a sufficient length of time to be classified as net overseas migration departures. The onset of the COVID-19 pandemic saw a dramatic shift in this behaviour. These ratios increased significantly from the June quarter of 2020, resulting in more net overseas migration arrivals and departures than forecast in the 2020 Population Statement (Chart 34).

Chart 34. RATIO OF NET OVERSEAS MIGRATION TO PERMANENT AND LONG-TERM MOVES, BY DIRECTION
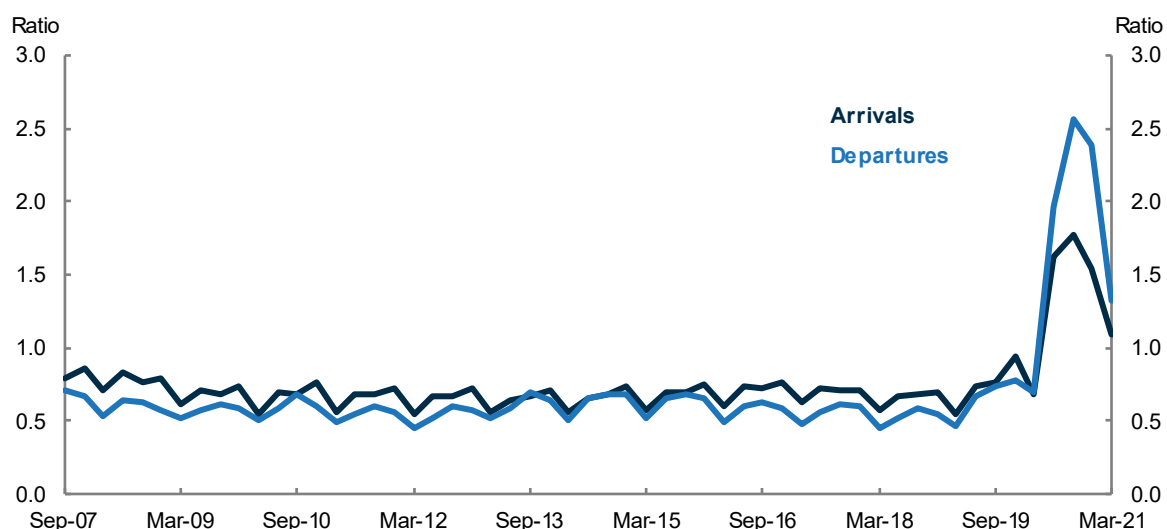
Note: Permanent and long-term arrivals and departures are classified based on individual self-assessments, as recorded by travellers on passenger cards, or derived with reference to previous border crossings. Whereas net overseas migration arrivals and departures are so classified based on individuals' observed (or imputed) actual duration of stay or departure. Source: (Australian Bureau of Statistics, Overseas Arrivals and Departures, Australia, 2021) and customised data consultancy, Australian Bureau of Statistics.

NOTES, GLOSSARY AND REFERENCES

References to years are all on a financial year basis (1 July to 30 June) unless otherwise stated. Population stocks for a year refer to stocks as at 30 June of that year (for example, 'Australia's population was 25.7 million in 2019-20' means that Australia's population was 25.7 million as at 30 June 2020). Population flows for a year refer to flows during the financial year (for example, 'Australia's natural increase was 135,000 in 2019-20' means the natural increase in Australia's population from 1 July 2019 to 30 June 2020 was 135,000).

References to the 'states' or 'each state' includes the Northern Territory and the Australian Capital Territory.

Figures in tables and in the text have been rounded. Transformations (for example, shares or rates of change) are calculated using unrounded numbers. Discrepancies between totals and sums of components are due to rounding. In general, the rounding conventions used include:

• most rates are rounded to one decimal place

• estimates over 1 million are rounded to the nearest thousand

• estimates between 10,000 and 999,999 are rounded to the nearest 100, and

• estimates midway between rounding points are rounded up.

Estimates of future population and components of change are either forecasts or projections.

• **Forecasts** are predictions about what may happen in the near term based on analysis and modelling in relation to current circumstances.

• **Projections** are based on analysis and modelling of long-term trends when rates or levels are stable. Projections may also include a transition from the last forecast to the assumed stable level or rate.

GLOSSARY

COVID-19

COVID-19 refers to the coronavirus disease caused by the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that was first identified in December 2019.

Estimated resident population

The **estimated resident population** is the official measure of Australia's population based on the concept of usual residence. It refers to all people, regardless of nationality or citizenship, who usually live in Australia, except foreign diplomatic personnel and their families. It includes usual residents who are overseas for less than 12 months. It excludes overseas visitors who are in Australia for less than 12 months (see 'overseas migration' definition below) (Australian Bureau of Statistics, National, state and territory population methodology, 2021).

Extended Delta lockdowns of 2021

The **extended Delta lockdowns of 2021** refer to the lockdowns experienced by New South Wales, Victoria and the Australian Capital Territory in the latter part of 2021.

Greater Capital City Statistical Areas

Greater Capital City Statistical Areas (GCCSA) represent the socio-economic extent of the capital cities as defined by the Australian Bureau of Statistics. GCCSAs are derived from Statistical Areas Level 4 (SA4) (Australian Bureau of Statistics, Australian Statistical Geography Standard (ASGS): Volume 1 - Main Structure and Greater Capital City Statistical Areas, 2016).

Gross migraproduction rates

Gross migraproduction rates are the sum of single year of age and sex migration rates. GMRs are expressed as the average number of moves that a person could expect to make in a lifetime if they were subject to the age-specific migration rates of a given year (Bell, et al., 2002).

Internal migration – composition

The **composition of net internal migration** refers to the specific groups of people who migrate. This could be measured by age, sex, ethnicity and place of birth.

Internal migration – internal, interstate, intrastate

Internal migration refers to the movement of people across a specified boundary within Australia involving a change in place of usual residence.

Interstate migration refers to the movement of people over a state boundary involving a change in place of usual residence. Net interstate migration is the difference between arrivals and departures and can be either positive or negative.

Intrastate migration refers to the movement of people across a specified boundary within a state (Australian Bureau of Statistics, Regional population, 2019-20, 2021).

Internal migration – level

The **level of net internal migration** refers to the overall number of people moving between locations. This can be measured by the numbers of people leaving and entering a location.

Internal migration – patterns

Patterns of net internal migration refer to the origins and destination locations for migration.

Life expectancy

Life expectancy measures how long a person is expected to live if the rest of their life follows the age and sex-specific mortality rates for the relevant year. This is the expectation of the average years that a person lives at a specific age. In the Statement, 'life expectancy' usually refers to 'life expectancy at birth' unless otherwise specified (Australian Government Actuary, 2019).

Newly born period cohort

Refers to a cohort born during the projection interval which is aged 0 at the end.

Overseas migrant – permanent resident

For population purposes, an **Australian permanent resident** is a non-citizen who holds an Australian permanent visa and is considered to be usually resident in Australia (see 'overseas migration' definition below). Generally, permanent residents can live, work and study with much fewer restrictions than temporary visa holders in Australia.

Overseas migrant – temporary resident

A temporary resident is a non-citizen who holds a temporary visa that grants authority for travel to and from Australia within a specific period for a specific purpose (such as work or study) and is usually resident in Australia (see 'overseas migration' definition below). Temporary visa holders may have other conditions tied to their stay in Australia. Not all temporary visa holders are considered residents as they may not meet the 'usually resident in Australia' criterion.

Overseas migration

Overseas migration is defined using a 12/16 month rule. Under this rule, incoming overseas travellers (who are not currently counted in the population) must be resident in Australia for a total period of 12 months or more during a 16-month period to be included in the estimated resident population. Similarly, those travellers departing Australia (who are currently counted in the population) must be absent from Australia for a total of 12 months or more during a 16-month period to then be subtracted from the estimated resident population.

The 12/16-month rule, therefore, takes account of those people who may have left Australia briefly and returned, while still being resident for 12 months out of 16. Similarly, it accounts for Australian citizens who live most of the time overseas but periodically return to Australia for short periods.

Period cohort

Period cohort refers to a cohort aged a at the start of the projection interval and a+1 at the end.

Person years

Person years is a demographic measure frequently used in calculation of demographic 'occurrence/exposure' rates and life tables which represents the number of persons in the population and the length of time they were exposed to a given demographic event.

Probability of dying (qx)

A demographic measure used in life tables referring to a probability of death between age x and age x+1.

Second Melbourne lockdown

The **second Melbourne lockdown** refers to the lockdown experienced in Melbourne between early July 2020 and late October 2020.

Standardised death rate

The age **standardised death rate** allows for comparison of mortality trends across populations of different size and age structure. It is a weighted average of the age-specific mortality rates per 100,000 (or 1,000) persons, where the weights are the proportions of persons in the corresponding age groups of the standard population.

Rest-of-state area

Within each state, the area not defined as being part of the Greater Capital City is represented by a **rest-of-state area** (Australian Bureau of Statistics, Australian Statistical Geography Standard (ASGS): Volume 1 - Main Structure and Greater Capital City Statistical Areas, 2016).

Total fertility rate (TFR)

The **total fertility rate** is the sum of age-specific fertility rates (divided by 1,000). It represents the number of children a woman would bear during her lifetime if she experienced current age-specific fertility rates at each age of her reproductive life. Age-specific fertility rates are the annual number of babies in a specific age group (Australian Bureau of Statistics, Births, Australia, 2021).

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