

DATA & TRENDS

The contributions of past immigration to current age-sex structures of immigrant populations in Australia

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ABSTRACT Not all immigrant populations are the same. In this article, we decompose the age-sex structures of immigrant populations in Australia and its major cities in 2021 by periods of entry. The results show a wide array of differences among immigrant populations, as well as across major cities where the vast majority of immigrants reside. Not surprisingly, we find that immigrant groups with a longer history of immigration to Australia have a more varied age-sex profile than those with a shorter history. However, even within each immigrant group, we find substantial differences across cities that reflect the influences of policy and the preferences of the immigrants. By illustrating how historical immigration streams across areas in Australia have produced different population age-sex structures, we are able to better understand why they are different and what specific services they may require.

KEYWORDS Immigration • Migrant population • Age-sex composition • Australia

Introduction

Population inequality among immigrant groups in Australia is illustrated in this paper through the examination of population pyramids that capture the period of arrival. These pyramids show differences in the age-sex compositions of immigrant populations in 2021 for Australia as a whole and across major cities. To capture the period of arrival, we draw from a unique and detailed demographic data set that has been harmonised over time and across geographic areas to enable researchers to study immigrant population change in Australia from 1981 to 2021 (Raymer et al., 2018, 2020b). With this data set, it is possible to conduct counterfactual analyses to identify contributions made by specific immigration cohorts to the current age-sex compositions of immigrant populations.

Examining the age and sex compositions of immigrant populations is important, as both social cohesion and the welfare of immigrants depend to some extent on the age-sex profiles of the population and the time spent in the country. In other words, policies and services aimed at addressing inequalities within and across immigrant groups must grapple with the demographic diversity of the Australian population. As a product of immigration flows over several decades, current immigrant populations are comprised of people who are at all life course stages, and who have a wide range of priorities and needs related to both

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their biological age and the time since their arrival in the host country (Montes de Oca et al., 2011; Lauer et al., 2012; UNPD, 2020). For example, we expect immigrant populations who have recently arrived and are predominately at young adult ages to be concerned with inequalities in tertiary education, employment, visa application procedures, affordable rental housing and, in time, family formation and home ownership (Milewski, 2007; Lauer et al., 2012; Gusciute et al., 2022). By contrast, immigrants who have been present in the country for decades are more likely to be concerned about their children's education, caring for their parents and, eventually, their own health and elderly care (Montes de Oca et al., 2011). If immigrants are geographically isolated, they may face language and cultural challenges in accessing healthcare and other support systems.

Immigrant populations may differ substantially not just by age, but also by sex. Indeed, examining the sex patterns of migration is important for understanding migration in general (Donato and Gabaccia, 2015; Christou and Kofman, 2022). Women are often employed in different sectors than men, even if they have similar education levels. Low-skilled male migrants are frequently employed in construction, factories, harbours, mining, agriculture and sanitation (De Haas et al., 2020). Low-skilled female migrants, by contrast, tend to be employed in agriculture, manufacturing, textile, food processing, restaurants and hotels (UNDESA, 2006, pp. 30–32). Moreover, migrant women frequently work in occupations related to health, domestic service, and caring for children, elderly and disabled persons.

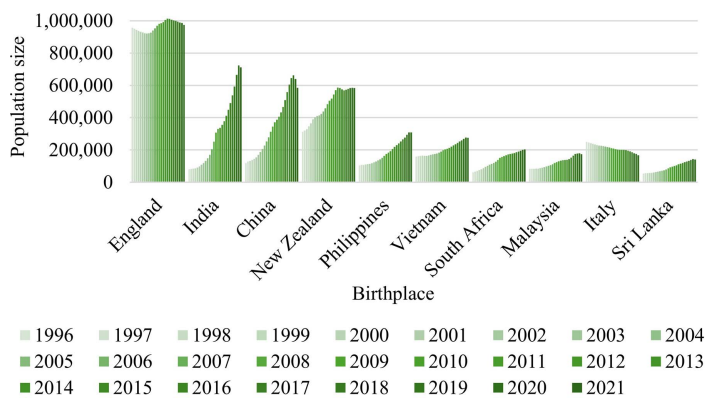
The main question driving this research is: How do the demographic characteristics and, by implication, the service needs, of immigrant populations differ nationally and subnationally? By needs, we refer to general services and activities that immigrants require. These needs are expected to vary by age and sex. For example, young adult immigrants are likely to need employment, education and affordable housing, whereas older immigrants are likely to need affordable living conditions and healthcare. Furthermore, examining the differences between men and women is important for understanding gender inequality and reproduction. As we do not expect the demand for services and activities to be the same in all areas, the examination is performed across cities.

Background

In Australia, international migration has changed the face of major cities and regions over the past several decades. Immigrants have arrived in these places from a wide range of origins that have shifted over time, and under a variety of social, economic, political and legal circumstances. Shifting migration patterns have introduced different traditions, cultures, languages and religions to Australia. The observed effects of these patterns in high immigration countries around the world have given rise to the concept of 'superdiversity' (Vertovec, 2007), which is based on the notion that multi-decadal migration has produced diversity not only in the ethnic and national origins of immigrants, but across all aspects and characteristics of populations.

In the 1970s, Australia ended its discriminatory 'White Australia' migration policy and replaced it with a policy approach that increasingly focused on skills (Richards, 2008; Wilson and Raymer, 2017). This resulted in more migrants to Australia coming from

Figure 1 Population change for the 10 largest overseas-born groups in Australia, 1996–2021



Source: ABS (2023), Table 1.1

countries outside Europe (Raymer et al., 2020a). In Figure 1, we show how the 10 largest overseas-born groups in Australia in 2021 have changed since 1996. These 10 groups represent a mixture of established and new immigrant groups. The largest immigrant population consists of persons born in England. This is an established group that has fluctuated between 900 thousand and one million persons over the past 25 years. Another established immigrant group is that of persons born in Italy. This population declined from 246 thousand persons in 1996 to 168 thousand persons in 2021, mainly due to the ageing and dying process, as most of these migrants arrived before the 1970s. Persons born in New Zealand have a special relationship with Australia and are free to move to Australia without a visa. This population grew from 312 thousand persons in 1996 to 584 thousand persons in 2021. The remaining seven immigrant populations represent new groups, all of which have grown considerably in size. Of these populations, the group of immigrants born in India exhibited the most growth, increasing from 80 thousand persons in 1996 to 712 thousand persons in 2021, and currently represents the second-largest immigrant population group in Australia.

Migrant diversity in Australia influences social and economic inequalities, and, ultimately, the cohesion and harmony of Australian society. Compared to their native-born counterparts, migrants tend to earn lower wages and to be employed in less desirable jobs, usually because they have recently arrived, have lower education levels, are subject to labour market discrimination or have lower status as foreign citizens (De Jong and Madamba, 2001; Le Grand and Szulkin, 2002; Ingwersen and Thomsen, 2021). Migrants and the communities in which they live often experience socioeconomic disadvantage, discrimination, cultural and linguistic barriers to integration, and lower levels of trust and cohesion in their neighbourhoods and local communities (Dinesen et al., 2020; Guscute et al., 2022; O'Donnell et al., 2023; O'Donnell, 2024). Paradoxically, there is evidence that migrants live longer on average than their native-born counterparts, although not always in better health (Garcia et al., 2017; Reus-Pons et al., 2017; Huang et al., 2024).

These differences point to important inequalities between immigrant populations and the Australia-born population, which we might expect to diminish through processes of assimilation, acculturation and intergroup contact (Berry, 2008; Pettigrew et al., 2011).

The changing social and policy environment has likewise influenced the geographic distribution and diversity of migrants. Historically, the largest Australian cities of Sydney and Melbourne have been important immigrant gateway cities, hosting a large share of immigrant arrivals and all of the most migrant-rich and ethnically diverse communities in Australia (O'Donnell and Evans, 2022; Raymer et al., 2020a). In both cities, more than one-third of the population were born outside of Australia, and continued and continuously diversifying migrant waves have led to newer and younger migrant cohorts being layered on top of more established and now ageing cohorts from earlier waves (O'Donnell and Evans, 2022). Government policy in recent decades has sought to counteract the geographic concentration of migrants, with the stated aim of dispersing immigrant arrivals more widely, including across smaller towns and cities (Boese, 2024; Hugo, 2008). Meanwhile, increasing numbers of immigrant arrivals have underpinned population growth in newer destination cities such as Brisbane and Perth, even as Sydney and Melbourne continue to be important destinations (Raymer et al., 2020a). This geographic dispersal has implications for migrant integration and social cohesion, as migrants are settling in newer locations that lack the migration history, variable integration services and infrastructure of the major gateway cities (Boese and Phillips, 2017; Schech, 2014), as well as for the ongoing growth, diversification and turnover of the populations of already diverse urban communities (O'Donnell, 2024).

Methodology

The analysis in this paper focuses on understanding the contributions of past immigration flows to current population age-sex distributions. These analyses are motivated by Edmonston and Passell (1992), who examined generational contributions by immigrants to the United States. Edmonston (2010) later used a similar methodology to study the contributions to population change attributable to immigration in Canada. Rogers et al. (1999) and Rogers and Raymer (2001) extended these ideas to the multiregional case for the total and the elderly foreign-born and native-born populations in the United States, respectively.

To create the population pyramids of immigrants, we commissioned detailed population and demographic component data from the Australian Bureau of Statistics. The population and demographic component data were disaggregated by age using five-year age groups (0–4, 5–9, . . . , 85+ years), sex (male and female), country of birth (mixture of 18 countries and regions and Australia) and geographic area of residence (11 areas comprising major cities and regions). Immigrant populations are defined according to country or region of birth (see Table S.1, supplementary material, available online at <https://doi.org/10.1553/p-7h5h-9j4m>) and are measured using censuses performed every five years starting in 1981 and ending in 2021. The demographic components of change are deaths (obtained from vital register statistics), emigration (obtained from border control statistics),

immigration (obtained from border control statistics) and origin-destination transitions of internal migration (obtained from quinquennial censuses using questions on place of residence and place of residence five years ago). Children who were born in Australia to immigrant parents are not included as they are considered part of the Australia-born resident population. These children are automatically considered Australia-born, and they may have become citizens if one of their parents was a citizen or permanent resident, or if they have remained in Australia for 10 years or more.¹

Over time, the demographic component data were smoothed and augmented to fill in any missing values or inconsistencies in measurement before inserting them into a multiregional cohort component projection model (Rogers, 1995). This model with reconciled demographic component data provides the basis for the counterfactual analyses used in this paper to construct the immigrant population pyramids by period of entry. For a description of the methodology used for processing and reconciling the detailed demographic accounts that underlies the figures presented in this paper, refer to Raymer et al. (2020a). For the estimation of multiregional survivorship probabilities for each immigrant group, we used the method developed by Baffour and Raymer (2019). The reconciled data underlying this research are available by request from the authors.

For the purposes of this paper, we focus on eight out of the 18 immigrant populations: United Kingdom-born, New Zealand-born, India-born, China-born, Vietnam-born, North Africa and the Middle East-born, Southeast Europe-born and Sub-Saharan Africa-born. In illustrating the differences across cities, we show the results for the state or territory capital cities of Sydney, Canberra (Australian Capital Territory), Melbourne, Brisbane, Adelaide, Perth and Hobart; as well as for Regional Australia, which represents an aggregation of areas outside the capital cities (see Figure S.1, supplementary material). For space reasons, we only show subnational pyramids for the United Kingdom-born, India-born, Vietnam-born and Southeast Europe-born populations. The above populations and areas were chosen to illustrate differences between immigrants in terms of both historical and current patterns. While they do not capture the full diversity of the immigrant data we have gathered, they provide an indication of how immigrant populations can differ. They also represent updated and expanded versions of the population pyramids presented in Raymer et al. (2018).

To distinguish different periods of arrival for immigrants, we ran five projections starting in 1981 and ending in 2021. The first projection included all of the demographic component information and reproduced the total immigrant population every five years from 1986 to 2021. The second projection set immigration levels to zero after 2011. The third projection set immigration levels to zero after 2001. The fourth projection set immigration levels to zero after 1991. Finally, the fifth projection set immigration levels to zero after 1981. In all five projections, immigrant populations were subjected to observed age-specific death and emigration rates and origin-destination probabilities of internal migration.

To identify the contributions of immigration that occurred between 2011 and 2021, we subtracted the projected 2021 populations that set immigration to zero after 2011 from

1 Australian Government Social Security Guide (Version 1.319) <https://guides.dss.gov.au/social-security-guide/3/7/2/80>

the corresponding observed 2021 estimated resident populations. Likewise, to identify the contributions of immigration that occurred between 2001 and 2011, we subtracted the projected 2021 populations that set immigration to zero after 2001 from the projected 2021 populations that set immigration to zero after 2011. We repeated this process until we had the following immigration categories: immigrants who entered before 1981, between 1981 and 1991, between 1991 and 2001, between 2001 and 2011, and between 2011 and 2021.

Analysis

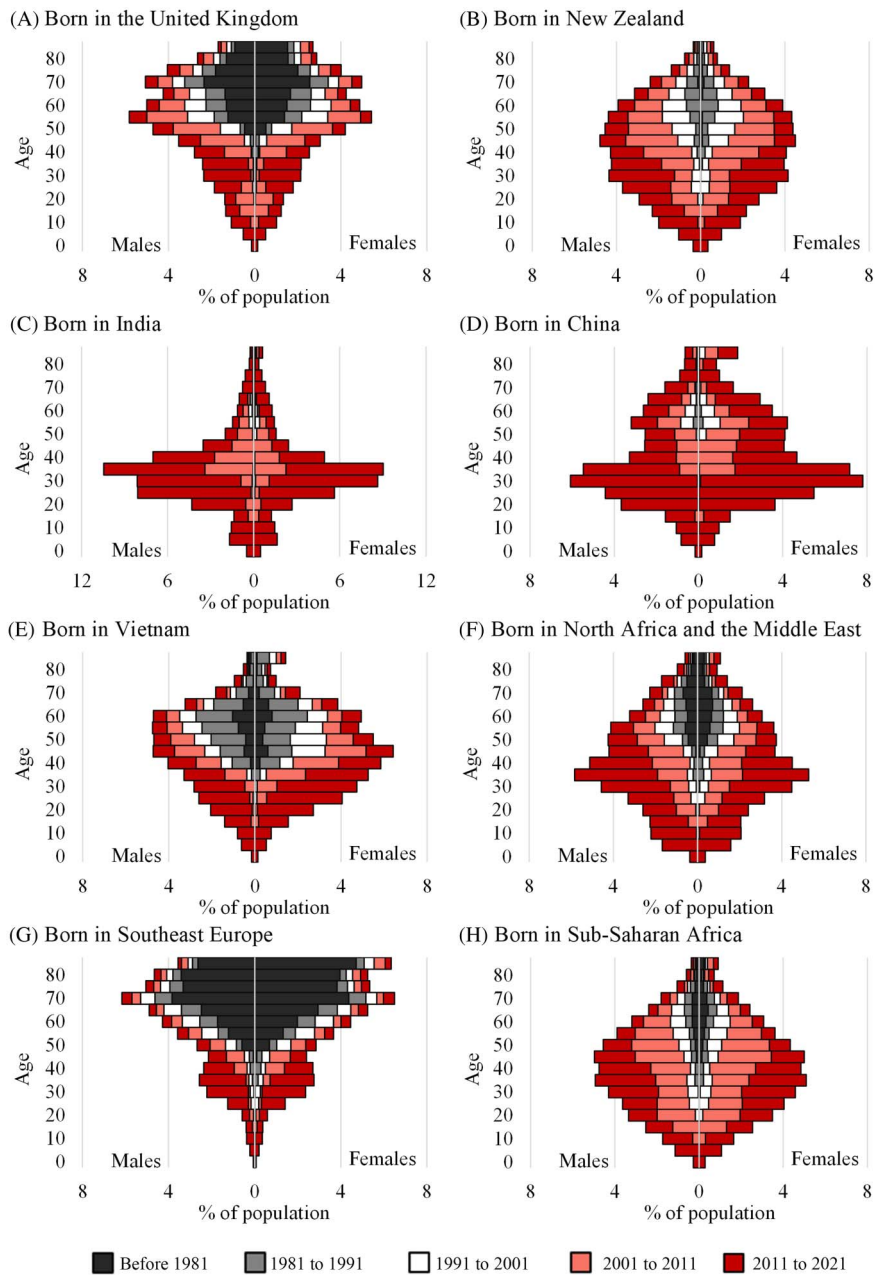
In this section, we first illustrate the differences in the population pyramids of eight immigrant groups living in Australia in 2021. The immigrant populations represent persons born in the United Kingdom, New Zealand, India, China, Vietnam, North Africa and the Middle East, Southeast Europe and Sub-Saharan Africa. Immigrants born in the United Kingdom, New Zealand and Southeast Europe come from countries with a long history of immigration to Australia, whereas the other immigrant groups started arriving more recently. Second, we show differences in the age-sex compositions across seven cities in Australia and Regional Australia for four of the immigrant groups listed above.

Australia

In Figure 2, we show how the eight immigrant population pyramids in Australia differ from each other. Here, we find three broad patterns in the age profiles. First, the population pyramids for persons born in China and India are highly concentrated in the young adult age groups. Second, persons born in New Zealand, Vietnam, North Africa and the Middle East and Sub-Saharan Africa have a broader age pattern, but are still primarily in the working age groups ranging from age 15 to 64 years. Third, persons born in the United Kingdom and Southeast Europe are mainly concentrated in the oldest age groups. While most of the immigrant populations are relatively balanced between males and females, there are some noticeable differences in the sex compositions. The Indian group has more males, whereas the Chinese and Vietnamese groups include more females, especially after 2001.

From the patterns shown in Figure 2, we can see that all of the age and sex profiles of immigrant populations have been greatly influenced by historical immigration flows. Large proportions of immigrants born in the United Kingdom and Southeast Europe came before 1981, contributing to higher shares of females in the older age groups, given that females live longer than males on average. There are also noticeable contributions by immigration before 1981 in the population pyramids for persons born in Vietnam, North Africa and the Middle East and Sub-Saharan Africa, but hardly any in the population pyramids for persons born in New Zealand, India and China, which in 2021 were the largest immigrant populations after the population of persons born in the United Kingdom.

Figure 2 Age-sex compositions of selected immigrant populations in Australia by period of arrival, 2021



Immigrant populations in major cities

Following from the previous section, we extend our analysis of immigrant population age-sex compositions to include different settlement areas in Australia. Out of the 11 geographic areas covered in the study, we selected eight areas that include seven cities and Regional Australia. Regional Australia is an aggregation of geographic areas outside Country Victoria and Coastal New South Wales (see [Figure S.1, supplementary material](#)). For space reasons, we only present the patterns for immigrants from four birthplaces: the United Kingdom, India, Vietnam and Southeast Europe. While not the focus of this section, we present in [Figure S.2 \(supplementary material\)](#) the share of selected overseas-born populations in Australia who are aged 65+ by period of arrival to show how population ageing is affecting different immigrant groups. This figure shows, for example, that elderly migrants born in Southeast Europe predominately came before 1991, while those born in China mostly arrived after 2011.

For immigrants born in the United Kingdom presented in [Figure 3](#), we see patterns across areas that are generally reflective of the national pattern presented in [Figure 2](#). That is, the immigrant populations at the subnational level also consist of large proportions of persons who are aged 50+ and arrived prior to 1981. In this regard, Adelaide and Hobart stand out as having particularly old United Kingdom-born populations. The periods of immigration for Canberra, Melbourne, Brisbane and Perth are more diverse, resulting in more rounded shapes in the age-sex profiles. Sydney also exhibits diverse patterns in the periods of arrival, but stands out as having relatively large numbers of young adult immigrants who arrived after 2011.

For the subnational India-born immigrant populations presented in [Figure 4](#), we see that the patterns across geographic areas are concentrated in the 20–24 to 45–49 age groups. Most of these individuals immigrated after 2011, with hardly any arriving prior to 2001. In both the 2001–2011 and 2011–2021 arrival periods, we see more male immigrants in the populations. However, in [Figure 5](#), we observe the opposite pattern for immigrants born in Vietnam, with females outnumbering males in the population after 1991. We also see a more diverse age pattern, with large proportions of immigrants over age 40 arriving prior to 1991, and Vietnam-born immigrants in Hobart and Regional Australia having substantially younger age profiles.

Finally, in [Figure 6](#), we see population pyramids of very old immigrants born in Southeast Europe. While there are relatively large numbers of recent arrivals in young adult age groups, their numbers are still much smaller than those of immigrants who came before 1981, except in Brisbane, and to a lesser extent in Perth and Hobart. Currently, the number of Southeast Europe-born immigrants is declining due to the deaths of persons in the oldest age groups.

Discussion

In this article, we have highlighted how the age and sex compositions of immigrant populations differ. We have argued that these age-sex compositions must be taken into account to

Figure 3 Age-sex compositions of United Kingdom-born populations in Australia by subnational area and period of arrival, 2021

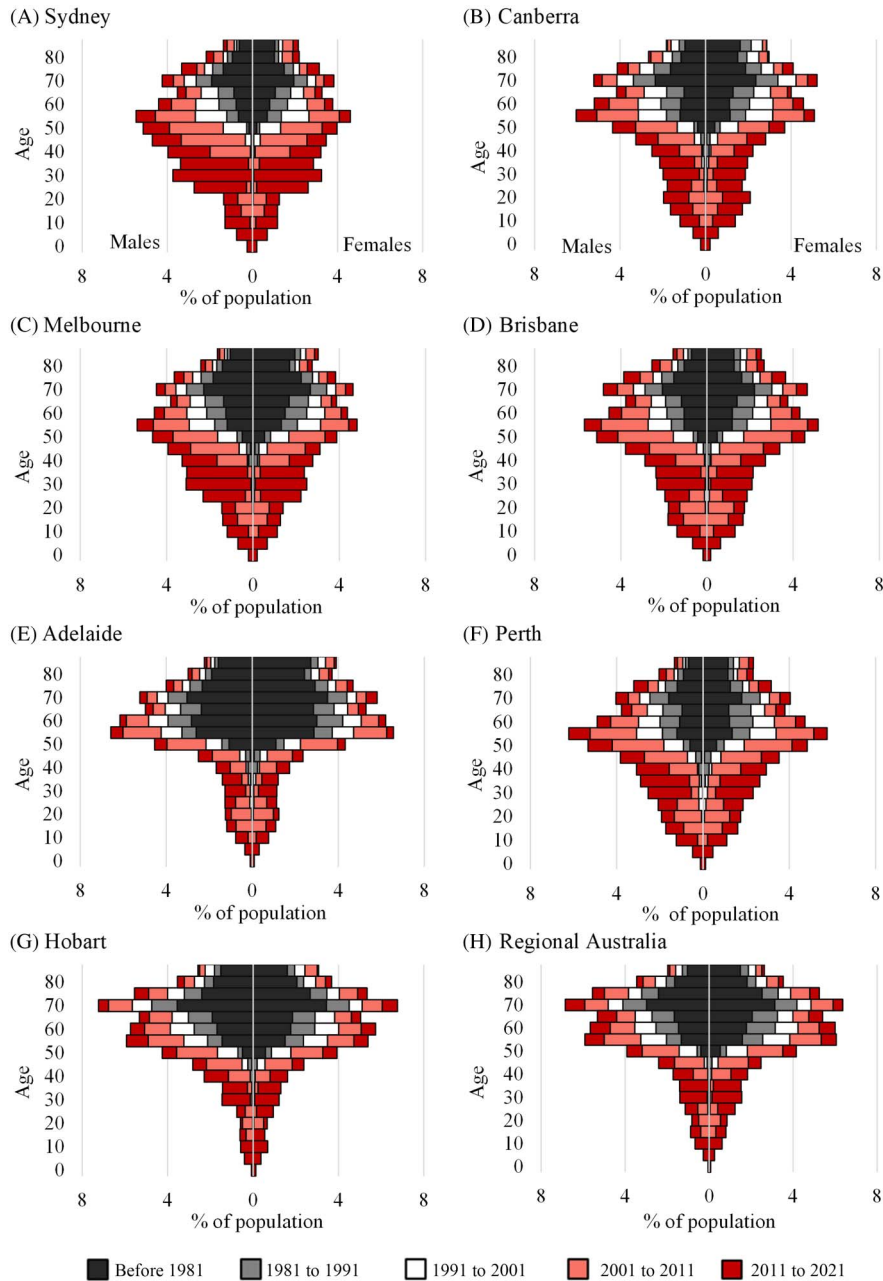


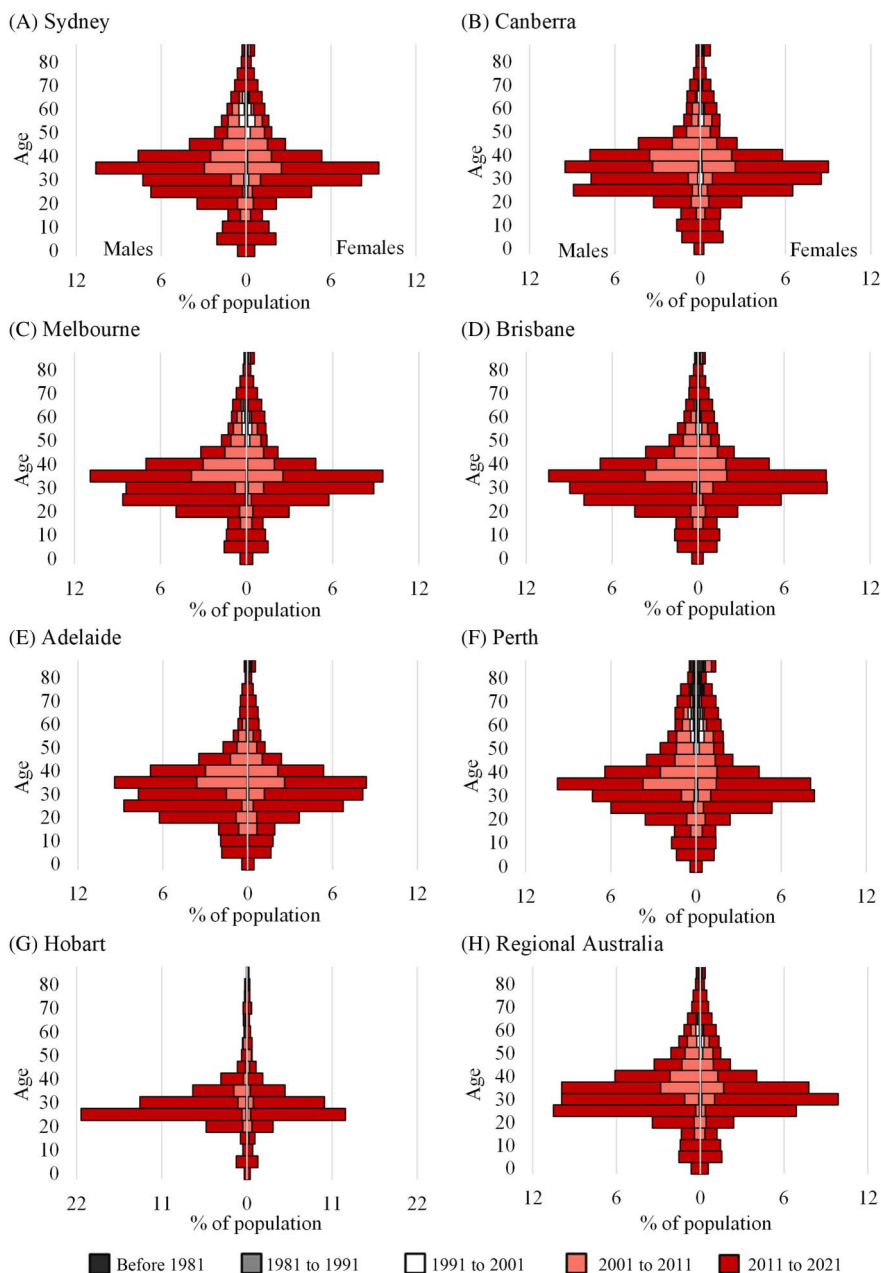
Figure 4 Age-sex compositions of India-born populations in Australia by subnational area and period of arrival, 2021

Figure 5 Age-sex compositions of Vietnam-born populations in Australia by subnational area and period of arrival, 2021

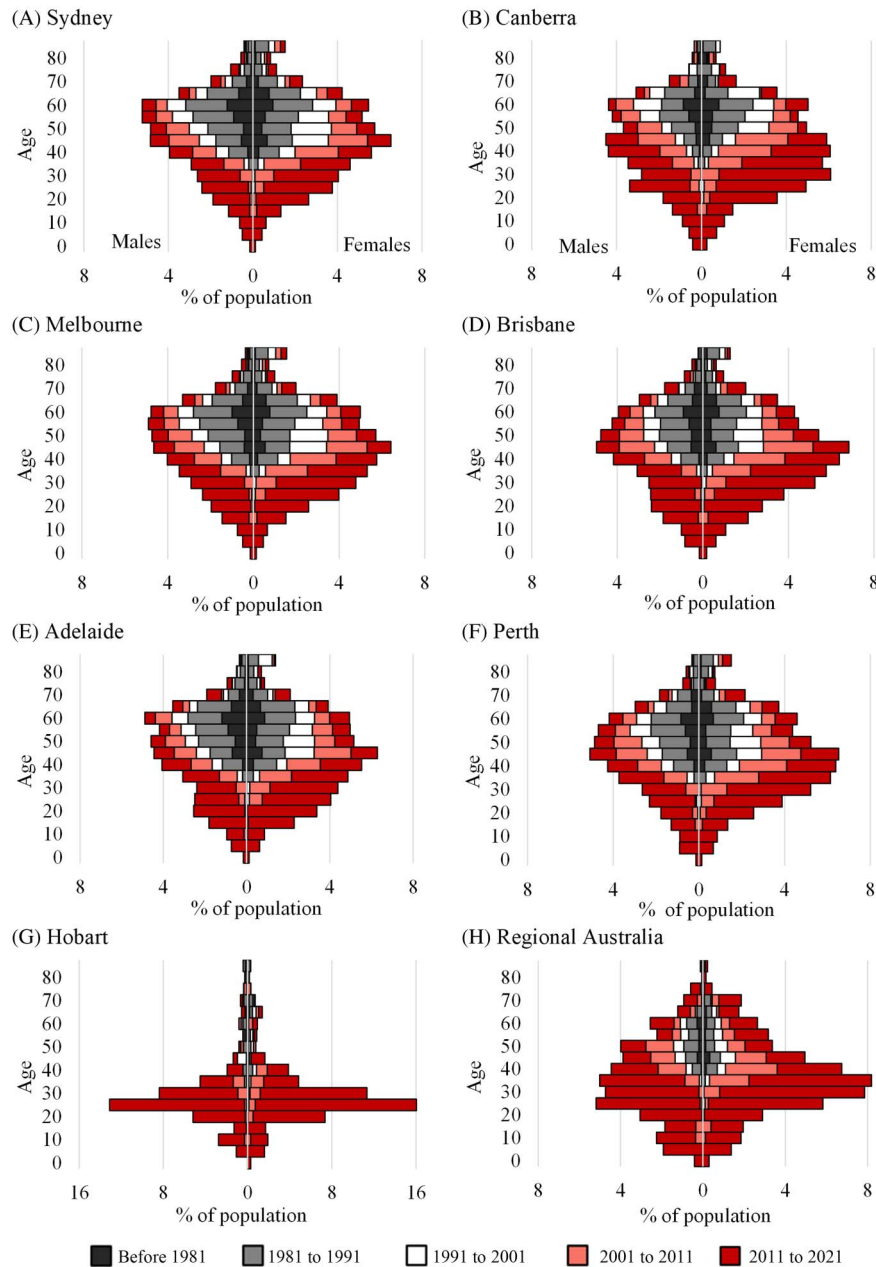
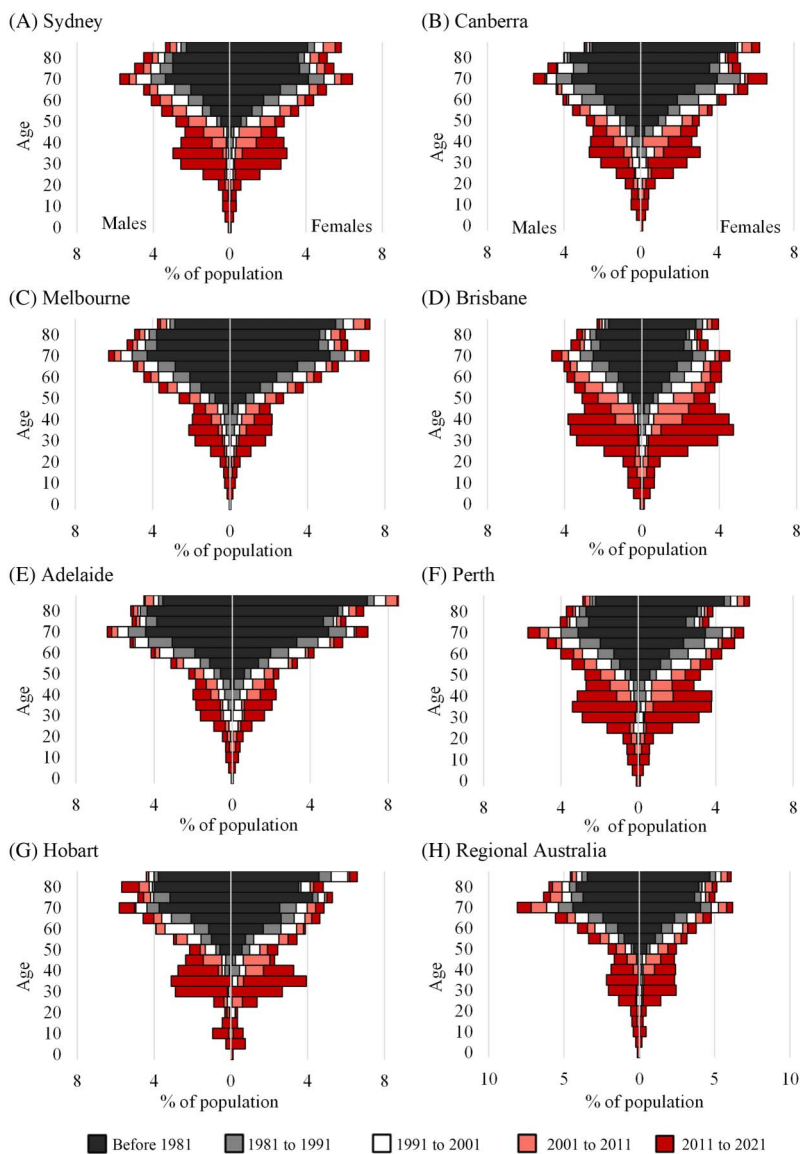


Figure 6 Age-sex compositions of Southeast Europe-born populations in Australia by subnational area and period of arrival, 2021



understand immigrant needs and population inequalities, not only between immigrants and the majority population, but also between different immigrant populations. Furthermore, we have shown that the age-sex compositions of immigrant populations are not static, but are constantly changing due to the varying levels of immigration and ageing over time.

Different age-sex profiles, such as those shown in the contrasting pyramids for immigrants born in India or China and for immigrants born in United Kingdom or Southeast Europe, reflect various stages of the migrant life course that can be linked to needs and priorities in their everyday lives.

To address social and economic inequalities and inequities, providers of public services and support across the lifespan need to consider the cultural and linguistic diversity of the current population. As shown in our population pyramids, European immigrants already have a relatively old age profile. Soon, large numbers of immigrants from more diverse origins, including Vietnam, China and parts of the Middle East (e.g., Lebanon), will enter older age groups. Health care and aged care services will need to take into account the growing number of older Australians and their diversity to reduce barriers and to prevent inequalities in the provision and access of such services (Chomik et al., 2024). Education, employment, housing, language, multicultural and community services for young immigrant adults, many of whom are more recent arrivals and come from Asian and African countries, are also needed to facilitate their transition and integration in the country, which can, in turn, boost economic vitality and social cohesion (Lalot et al., 2022; Orazani et al., 2023). Support for female immigrants, particularly given that there are more females than males in some new immigrant groups, is essential in addressing the potential intersectional disadvantage associated with both their gender and cultural background (Schieckoff and Sprengholz 2021).

The patterns we have uncovered illustrate that older immigrants arrived under different circumstances than younger immigrants. For example, a substantial share of older Vietnam-born migrants in the major cities arrived in Australia as part of large waves of humanitarian migration in the 1970s and 1980s that took place after the Vietnam war and the final dismantling of the 'White Australia' policy. These migrant waves have gone on to produce a vibrant and multigenerational diaspora that has helped to reshape Australian culture, despite the many challenges and disadvantages they have faced (Baldassar et al., 2017). Younger and later Vietnam-born migrants (from the 1990s onwards) have been much more likely to be young women, with many migrating at a time when Vietnam's political situation was changing and evolving, and family migration was prioritized in Australia. Starting in the late 1990s, the focus of Australian immigration policy shifted to student and skilled migration. The much younger age profile of recently arrived Vietnam-born immigrants in the small city of Hobart is reflective of this shift towards student and skilled migration and the opening up of new settlement areas outside of the larger cities. While this dispersion is in line with the Australian government's priorities (Massey and Parr, 2012), it also creates new challenges, as migrant wellbeing and integration levels may be lower in places without the same migration history, service infrastructure and established co-ethnic networks (Wulff and Dharmalingam, 2008).

Through our analysis of the age, sex and arrival profiles of several large immigrant groups in Australia, we have demonstrated the wide demographic diversity of the immigrant population at broad geographic scales, and have pointed to the importance of considering these differences when seeking to deliver services and address and prevent inequalities. Moreover, recognizing these differences is essential for understanding the overall effects of immigration and how Australia's immigrant population as a whole is changing. It would

also be interesting to apply this research approach to smaller geographic units, where we would expect to observe even more diversity. Upon entering a new country, migrant groups face varied challenges and inequities in many facets of their societal, economic and civic lives. A better understanding of these migrant groups' past and current demographic profiles can provide the basis for the design of welfare and social cohesion policies that aim to reduce inequalities at different stages and dimensions of their migration and life course experiences.

Supplementary Material

Available online at <https://doi.org/10.1553/p-7h5h-9j4m>

Supplementary file 1: [Table S.1](#), [Figures S.1–S.2](#)



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