



Do Asian Immigrants Have Better Mental Health? An Examination of Arrival Cohort and Gender in Australia

Rennie Lee¹ · Laxman Bablani²

Received: 24 March 2022 / Accepted: 12 December 2022 / Published online: 21 April 2023
© The Author(s) 2023

Abstract

This study examines how arrival cohort and duration of time in Australia affect the long-term mental health trajectories of Asian immigrants relative to native-born individuals in Australia. We also examine how these relationships differ by gender. Using nationally representative panel data from The Household, Income and Labour Dynamics in Australia Survey for 2002–2018, we find limited evidence that Asian immigrants experience declining mental health over time in Australia. Rather, we find that arrival cohort is an important predictor of long-term mental health, specifically for Asian immigrant women and recent cohorts of immigrants. By tracking mental health trajectories over time in Australia, we find variation between Asian immigrants and native-born individuals and by gender. We find that the majority of Asian immigrants in Australia report increases in their mental health over time in Australia. We also find within- and between-gender differences in mental health trajectories. Our study illustrates the importance of longitudinal data and reference categories for understanding immigrants' health in their host countries. The findings have implications for immigration policy and its role in shaping immigrant composition and immigrants' mental health over time in the host country.

Keywords Immigrant health · Australia · Mental health · Asian immigrants · Immigration policy

✉ Rennie Lee
Rennie.lee@uq.edu.au

Laxman Bablani
laxman@bablani.org

¹ University of Queensland, Brisbane, Australia

² The University of Melbourne, Melbourne, Australia

Introduction

The foreign-born population in Australia is at an all-time high, comprising nearly 30% of Australia's population (Australian Bureau of Statistics, 2021). Understanding immigrants' health outcomes is important for overall population well-being but also for understanding whether some subgroups are at greater risk. There is widespread support that immigrants have better health upon arrival to the host country, but their health advantage declines over time in the host country, a phenomenon also referred to as the healthy immigrant effect (review in Malmusi et al., 2010). According to the healthy immigrant perspective, recent immigrants arrive with better health than the native-born population, but immigrants' health declines as they reside in the host country, resulting in lower health than the native-born population. This trend has been demonstrated in Australia and several other host country contexts, including the United States, Canada, and the United Kingdom. However, evidence of the healthy immigrant effect in Australia has focused primarily on physical health and health behaviors as opposed to mental health (Biddle et al., 2007; Jatrana et al., 2014; Kennedy et al., 2015).

To date, our understanding of the healthy immigrant effect, specifically immigrants' better health upon arrival, is limited in several ways. First, the healthy immigrant effect has focused on two aspects—immigrants' health upon arrival and immigrants' health over time in the host country—though the two are conflated. To illustrate, immigrants' mental health typically focuses on immigrants from different cohorts, who differ in their age at arrival, duration in the host country, and selection via immigration policy (Lee, 2019; Missinne & Bracke, 2012; Singh & Siahpush, 2002). Additionally, this evidence typically relies on cross-sectional and/or retrospective data that only shows immigrant health outcomes at one point in time. Therefore, such findings are confounded by time and arrival cohort effects so it is unclear whether it is duration of residence in the host country or arrival cohort that is driving immigrants' health patterns over time (Jasso, 2003).

Second, it is unclear whether the healthy immigrant effect extends to the mental health outcomes of Asian immigrants. To date, our knowledge on immigrants' mental health has primarily focused on White and European immigrants, with a noticeable absence among Asian immigrants despite their dominance in contemporary migration flows in Australia and other immigrant-receiving countries. Rather, Australian studies often focus on aggregated groups based on the official language in the region of birth, such as Not English-Speaking Background (NESB), a few Culturally and Linguistically Diverse groups, or English-Speaking Background (ESB) groups, to capture the large number of English-speaking migrants from New Zealand, the UK, the US, and Canada (Straiton et al., 2014; Ting et al., 2016; Wohler & Dantas, 2017).

However, these approaches overlook the diversity from Asian groups, who comprise a substantial proportion of incoming immigrants and the second generation population in Australia (Simon-Davies, 2018). Additionally, the distinction between NESB and ESB may reflect greater cultural and racial differences than language differences (Hawthorne, 1997). Asians are an important group to study as they

represent one of Australia's largest and growing immigrant populations. Examining their experiences will vastly improve our understanding of immigrant integration, which has focused on a few broad groups, namely ESB versus NESB. Our study extends previous studies on the healthy immigrant effect in Australia by focusing on Asian immigrants.

Third, arguments about immigrants' declining mental health over time in the host country often compare immigrants without reference to native-born individuals (Hurrh & Kim, 1990; Mirsky et al., 2007; Pernice et al., 2009). This is a shortcoming since the native-born population is an important reference group to understand how immigrant health outcomes change relative to the overall population. This study extends previous knowledge of the healthy immigrant effect by examining immigrants' mental health trajectories over time relative to those of native-born individuals.

This study addresses these gaps and asks the following questions: (1) Do Asian immigrants experience a healthy immigrant effect in their mental health outcomes over time in Australia? (2) What is the role of arrival cohort on Asian immigrants' mental health over time relative to native-born individuals? (3) Do Asian immigrants exhibit different mental health trajectories over time, relative to native-born individuals? We also explore variations by gender. Using nationally representative panel data from The Household, Income and Labour Dynamics in Australia (HILDA) Survey for 2002–2018, we find limited evidence that Asian immigrants experience declining mental health over time. Rather, we find that arrival cohort is an important predictor of long-term mental health, specifically for Asian immigrant women and recent cohorts of immigrants. By tracking mental health trajectories over time, we find variation between Asian immigrants and native-born individuals and by gender.

Theoretical Background

Duration of Residence in Australia and Health

From the perspective of the healthy immigrant effect, immigrants' declining health over time and convergence with native-born individuals is associated with environmental exposure or acculturation in the host country (Jasso et al., 2004). Specifically, immigrants' healthy behaviors and norms deteriorate toward those of the host country as time passes (Ro & Bostean, 2015). Therefore, specific behaviors or environmental factors underlie immigrants' deteriorating mental health over time, such as unhealthy behaviors, smoking, access and quality of medical care, and family and social support (Escarce et al., 2006; Jasso et al., 2004; Singh & Siahpush, 2002). Related, time in the host country may also be associated with increased exposure to institutionalized hostility and discrimination and lower immigrants' mental health over time (Safi, 2010). Thus, time in the host country is an important structural dimension shaping immigrants' health integration into the

host society. From the perspective of the healthy immigrant effect, immigrants not only experience worse health over time, but also experience steeper declines in health than native-born individuals (Lu et al., 2017).

Hypothesis 1 Immigrants experience declining mental health over time in Australia.

Hypothesis 2 Immigrants experience steeper declines in mental health in Australia than their native-born counterparts.

Yet, even though the healthy immigrant effect specifies two hypotheses regarding time in the host country, they have not been accurately captured. This is primarily due to data limitations with studies relying on cross-sectional data that only allows them to focus on immigrants' health at a single time point (Biddle et al., 2007; Missinne & Bracke, 2012; Singh & Siapush, 2002). Even when Kim et al. (2013) and Straiton et al. (2014) use longitudinal data, they do not examine change over time or the shape of the trajectories, perhaps assuming that individual health changes monotonically or in a linear fashion. In contrast, Teitler et al. (2017) and Lu et al. (2017) find that this is not the case, suggesting the need to consider non-linear trajectories in immigrants' health assimilation in the host country.

Arrival Cohort Health Differences

In addition to declining health and environmental exposure, immigrants' superior health upon arrival is associated with immigrant selection. This explanation posits that immigrants are inherently different from the host population in their overall health. According to this explanation, immigrants represent a selective group who have successfully undergone the migration process. For instance, some immigrants are selected on their human capital and health via national immigration policies (e.g., educational attainment, English language skills, and physical health screenings) that, in turn, are positively correlated with their mental health. More selective immigrants may, in turn, possess protective effects of culture and norms that protect against risky behaviors and encourage healthy ones (Jasso et al., 2004). Therefore, this explanation focuses on the compositional differences between new immigrants and native-born individuals.

One way to understand differences in immigrant composition is to focus on immigrant's arrival cohort or the year in which they arrive. Immigrants who arrive in a particular year are influenced by year-specific circumstances, such as the economic conditions and population health of the host and origin countries and changes in immigration policies (Acevedo-Garcia et al., 2010; Jasso, 2003; Jasso et al., 2004). For instance, changes in immigration policy in the host country can create differences in composition between early and later migrants from the same region and alter the financial and psychological costs associated with migration (Hamilton et al., 2015; Massey et al., 2002). Thus, examining immigrant arrival cohorts can shed light on immigrants' health by capturing changes in origin and destination countries as well as immigration policy. Hamilton et al. (2015) found that excluding

arrival cohorts overestimates the downward health trajectory that immigrants experience with duration in the host country.

Arrival cohorts can shape immigrants' health, even when immigrants are from the same sending countries or regions. Conditions in origin countries can also change over time, which could create health variations in arrival cohorts among immigrants from the same sending country or region (Hamilton et al., 2015). Many of Australia's contemporary immigrants are from Asian countries that are advancing through the epidemiological transition. For instance, China faces a new epidemiological phase characterized by increasing life expectancy and diseases of affluence along with the re-emergence of infectious diseases (Cook & Dummer, 2004). Likewise, in India, the rates of epidemiological transition have changed rapidly in the last two decades (Dandona et al., 2017). Therefore, earlier cohorts of Asian immigrants may have a different health composition than those from later cohorts. This suggests some variation by arrival cohorts among immigrants arriving from Asian countries in Australia.

While there is some evidence that immigrants exhibit different health patterns by arrival cohorts, these have primarily focused on the US (Antecol & Bedard, 2006; Hamilton & Hummer, 2011; Hamilton et al., 2015; Kaushal, 2009) and Canada (McDonald & Kennedy, 2004). These studies also rely on cross-sectional data and so they are unable to capture whether differences in health outcomes by arrival cohort persist for long periods of time. The most comprehensive assessment of immigrant cohorts in Australia is by Biddle et al. (2007), who found that arrival cohort was important for chronic health diseases, though they examine older immigrant waves (1970–1991 or after) and English-speaking Europeans and non-Europeans (Biddle et al., 2007). Focusing on recent arrival cohorts is important given major shifts in Australian immigration policy since the 1990s, which shapes the health, national origin, and gender composition of incoming immigrants (Hugo, 2014). This study improves on previous work by using panel data to examine Asian immigrants for long periods of time across different arrival cohorts in Australia.

Hypothesis 3 Immigrants arriving in more recent cohorts will show better mental health.

Gender and Implications for Immigrant Health

The effects of duration in host country and arrival cohorts on immigrants' health outcomes will likely differ by gender, which has been obscured because immigrant selection and health behaviors have focused primarily on immigrant men (Preston & Grimes, 2019; Read and Reynolds, 2012). In general, immigrant and minority adolescents and women show worse mental health than their native-born and immigrant men counterparts (Hargrove et al., 2020; Hurh & Kim, 1990; Kwak, 2016). Several mechanisms may drive gender differences in health even for immigrants from the sending countries and cohorts, including motivations for migrating, gendered social roles, sexism, and racism. First, immigrant men and women tend to migrate for different reasons, which can affect their health differently. Men are more likely

to migrate for employment, whereas women are more likely to migrate for family reunification, even in countries with skill-based immigration policies (Flippen & Parrado, 2015; Hamilton et al., 2015). Different motivations for migration may, in turn, affect how men and women are selected. If immigrants moving for employment are more selective than those who migrate for family, then immigrant men may be more positively selected than immigrant women.

Second, gender norms may affect the mental health of immigrant women and men differently in the host country. Migration often disrupts gender dynamics and traditional gender roles may negatively affect immigrant women's mental health in the host country. Immigrant men and women occupy different social roles in the host country that have different implications for their mental health. There are different predictions about how gender norms create gendered disparities in immigrants' mental health. For instance, immigrant men are often charged with the economic security of the family, whereas immigrant women are responsible for domestic life including caring for the well-being of household members (Read and Reynolds, 2012). Immigrant women often experience an escalation of traditional gender norms in the host country that in turn increases their domestic and childcare responsibilities and decreases their labor force participation (Ho, 2006; Raghuram & Kofman, 2004). For instance, Hurh and Kim (1990) found that immigrant women were more likely to experience lower mental health due to family, whereas men's mental health was affected by occupations. In turn, immigrant women's concentration in the domestic sphere can lead to lower mental health because of their greater social isolation (Shin, 1994) and lack of independence (Ho, 2006). Immigrant women's mental health may also be negatively shaped by racism and sexism (Museus & Truong, 2013; Seng et al., 2012).

Hypothesis 4 Given the role of gendered selection processes, motivations for migration, and sexism, this suggests that immigrant men exhibit better mental health than immigrant women, even when they share the same birth region.

Examining Immigrants' Mental Health in Australia

Like other immigrant-receiving countries, immigration in Australia is a primary source of labor supply and population and economic growth. One difference is that Australia has a highly controlled and closely managed migration program and nearly 68% of incoming immigrants are admitted on a points-based immigration policy that screens immigrants on their education, skills, and English language proficiency (Spinks, 2010). Nonetheless, Australia has undergone major shifts in immigration policy and national origin composition over its long immigration history dating back to the nineteenth century. Australia's early migration, which lasted until the 1970s, was influenced by the White Australia Policy. Immigration policy in this period favored 'whites' primarily from Britain and subsequently European countries and excluded 'non-white' immigrants.

Contemporary migration in Australia started around the 1990s when Australian immigration policy shifted to a skilled migration system with a 'multicultural' bias

that increased overall migration levels and drew heavily from Asian migration arriving via skilled and family categories (Collins, 2013). In 1996, the Australian Government created a new visa program for temporary skilled workers (subclass 457) that drastically simplified the procedures for admitting skilled foreign workers to Australia. This subsequently increased migration from the Asia–Pacific region, specifically China, India, and Japan, which continue to be some of Australia’s top sending countries (Hugo, 2003; Jupp, 1995; Simon-Davies, 2018). Together, the region accounts for over one-third of skilled temporary migration to Australia (Chiou, 2017; Khoo et al., 2009).

In the 2000s, the Australian Government implemented a revised point system that set more stringent requirements for English and skills and awarded additional points to those with an occupation in short supply and for those with an Australian degree (Tani, 2012). In turn, the prioritization of educated and skilled immigrants was fulfilled via increases in temporary skilled migration and international students (Hugo, 2014). Meanwhile, immigrants who were at risk of delayed employment or underemployment tended to be eliminated in the selection process (Chiou, 2017; Klappdor et al., 2009; Spinks, 2010). This period marked an increase in temporary skilled migration to fill specific skills shortages (Boucher & Davidson, 2019). One feature of Australian immigration since the 2000s is a two-step policy where immigrants arrive on temporary status and later apply for permanent residency. This process may inadvertently improve immigrant selection as temporary immigrants may “try out” Australia before transitioning to permanent residency and less successful migrants may leave Australia (Gregory, 2015).

In the 2010s, as skilled temporary immigration continued to grow, selection criteria also became more stringent. In contrast to immigration policy in the previous decade, immigration policy in this decade became more selective with fewer occupations being accepted. To qualify, new immigrants must belong to select occupations list, pass a points test based on English language skills and work experience, and applicants are ranked against one another rather than assessed on a benchmark. This decade is also characterized by greater precarity and an increased reliance on temporary visas with limited options for permanent residency (Boucher & Davidson, 2019). For temporary migrants, this means no pathways to permanent legal status and no access to welfare and government-subsidized medical costs, which may negatively affect immigrants’ well-being. In sum, while permanent economic migration has long been a feature in Australia’s migration history, there has been continuous refinement in its criteria within each decade, making it more stringent and selective over time.

In addition to changes in skill selection in immigration policy during this period, there have also been changes in attitudes and immigrant composition, which could facilitate immigrant integration and mental health. From the 1990s to the present, public opinion on immigration levels has become more favorable. For instance, in 1996, 65% felt that immigration was “too high” compared with 39% in 2011. Additionally, there has been an increase in the population of non-White immigrants, specifically Asian immigrants. In 1991, the Asian population represented 4% of Australia’s population, whereas in 2020, they represented 12% of the population (Hugo, 2003; McDougall, 2019). Nonetheless, immigrants in Australia still encounter

challenges with unemployment, degree devaluation, and securing employment commensurate with their education, especially those with non-English-speaking backgrounds, which could negatively affect their mental health (Hawthorne, 2015). However, more stringent immigration policies that select on education and occupation are likely to reduce overeducation (Tani, 2012). Taken together, this suggests a warmer context toward immigrants over time in Australia that could facilitate their integration.

All individuals living in Australia have access to medical care. Thus, any differences in health outcomes between native-born and foreign-born individuals are more likely to reflect different utilization rates rather than access to health services (Clarke & Ispording, 2017). Immigrants with less English proficiency typically have lower access to healthcare in developed English-speaking countries (Jatrana et al., 2018). However, since Australia's skilled migration program demands a minimum level of English proficiency, this suggests that language proficiency would have a minor effect on immigrants' utilization of health services (Berg, 2011). Related, the Australian Government implements several policies to protect the public from large health risks associated with migration, including minimum health requirements for immigrants to obtain permanent residency. To illustrate, the Australian Government implements a Significant Cost Threshold; if a visa applicant is expected to cost the public system more than \$35,000, their visa application may be denied (Smith, 2015). Overall, Australia's immigration policy and expansive medical coverage for all individuals would suggest small mental health disparities between immigrant and native-born individuals.

Data

We analyze 2002–2018 waves of Household Income and Labour Dynamics in Australia (HILDA) panel survey, an annual nationally representative longitudinal study of adults in Australia, with a large probability sample of 7682 households. It is based on a complex, probabilistic design and its sample is representative of the Australian population aged 15 and older since 2001. A general top-up of 4000 individuals in 2011 significantly increased the immigrant sample. By international standards, attrition remains very low at around 5% (Summerfield et al., 2020). New respondents are included if they move into a household with an existing respondent or turn 15 years old in a participating household. We restrict our sample to working age individuals between 25 and 60 years across the survey period. Our sample includes all eligible individuals from the household.

We distinguish between Asian immigrants, Asian native-born individuals, and other native-born Australian individuals. The Asian native-born population consists of individuals born in Australia with at least one parent who is born in an Asian country (Lee, 2019). We include native-born Australians in the analysis sample as a reference group in our study since they are unaffected by changes in immigration policy and provide precision for the economy-wide trends in our analysis.

The ideal data set would include a large sample of racial and ethnic minorities and immigrants from multiple national origins with information on their age and year of arrival, socioeconomic and health characteristics, health behaviors, networks, and neighborhood characteristics over time. To our knowledge, this data set does not exist. To date, HILDA is the best available nationally representative data source examining mental health outcomes over time and offers a moderate sample of immigrants with detailed information about their year of arrival and socioeconomic characteristics.

While it would be ideal to include specific national origin groups, the cell sizes for specific groups are too small, and HILDA does not ask questions about race or ethnicity. We focus on immigrants from Asian sending countries.¹ Despite these limitations, HILDA provides a rare opportunity to examine the mental health outcomes of Asian immigrants over long periods of time, a group whose mental health is often understudied (review in Tsai & Kong, 2012). We follow a similar strategy as Biddle et al. (2007), John et al. (2012), Ro and Bostean (2015), and Wu et al. (2021) who focus on the outcomes of Asians as a panethnic group. We also extend these approaches by comparing the health outcomes of Asian immigrants relative to native-born Asians and the native-born Australian population.

We acknowledge that Asian immigrants are a diverse group from over 20 countries with different linguistic backgrounds and reasons for migration (Morey et al., 2020; Tran et al., 2018). Despite the heterogeneity and diversity within the larger Asian panethnicity, we draw on a body of work showing that Asian immigrants encounter a shared experience of discrimination, racialization, and adjustment to new environments which affect their quality of life (Gee and Ponce, 2010; Sue et al., 2007). Crucially, Asian immigrants may encounter experiences that are more similar than those of their White immigrant counterparts. To illustrate, Asian immigrants encounter greater labor market discrimination than White immigrants in Australia (Carangio et al., 2020). Over 80% of Asian Australians reported discrimination across a range of settings, such as work, education, restaurants and shops, housing, and banking, among others (Biddle et al., 2019). Additionally, our approach builds on scholarship showing that panethnic Asian identities are meaningful labels for individuals in response to prejudice and discrimination (review in Lee and Kye, 2016). Overall, Asian immigrants represent a meaningful group for understanding immigrants' health integration in Australia.

¹ The Asian sample comprises individuals from East Asia (China, Hong Kong, Taiwan, Japan, South Korea, North Korea, East Timor), Southeast Asia (Myanmar, Cambodia, Laos, Thailand, Vietnam, Indonesia, Malaysia, Philippines, Singapore, and South Asia (Bangladesh, India, Nepal, Pakistan, Sri Lanka, and Afghanistan). The largest Asian countries are China, India, Vietnam, Philippines, and Sri Lanka.

Dependent Variable

Our dependent variable is the Mental Component Summary (MCS) score which is collected in each wave and drawn from a patient-reported Short Form 36 (SF-36) consisting of 36 questions (see Ware, 2000). It is a widely used and reliable measure of health status that is created from several subscales measuring the role limitations caused by mental health, emotional problems, and social functioning.² The scale ranges between 0 and 100 with a higher score representing better mental health.

Independent Variables

Our key independent variables are length of time in Australia and arrival cohort. Length of time in Australia is a categorical variable: less than 5 years (reference category), 5–9 years, 10–14 years, and 15 or more years. Given large changes in Australian immigration policy within each decade (noted above), we capture cohort effects through their year of arrival in a categorical variable: before 1990, 1990–1999, 2000–2009, and 2010 and after (reference category), native-born Asians, and other native-born individuals.

Control Variables

All multivariate models described below include a set of covariates that are associated with mental health. We include controls for age and age-squared as well as a control for educational attainment (high school degree or less, diploma or certificate, bachelor's degree, and graduate/postgraduate degree as the reference category) because higher education is positively associated with mental health (Belo et al., 2020). Employment status (unemployed, not in the labor force, and employed as the reference category) is included as a control given the relationship between unemployment and underemployment and lower mental health (Perreault et al., 2017). We include marital status (married, widowed, single, and divorced/separated as the reference category) given that on average, married individuals enjoy better mental health than unmarried individuals (Lamb et al., 2003). We also include a control variable for area remoteness (rural, remote, and urban as the reference category) as remote and rural areas in Australia are associated with worse mental health outcomes and resources (Rajkumar & Hoolahan, 2004). A measure for state/territory (Victoria, Queensland, South Australia, Western Australia, Tasmania, Northern Territory, Australian Capital City, and New South Wales as the reference category) is included to control for state and territory level variation in socioeconomic

² The mental health component of the SF-36 includes questions relating to four broad themes: vitality (feels full of pep/life, energy, worn out, tired all of the time), social functioning (interference with normal social activities due to physical and emotional problems), role emotional (problems with work or other activities as a result of emotional problems, cut down time, accomplished less, not careful), and mental health (feeling nervous, down in dumps, peaceful, blue/sad, happy). For more detail, see Ware (2000) and Ware et al. (1994).

environment that could shape population health (Le & Nguyen, 2018). Survey year dummies are included to control for population wide trends that may affect mental health in each year.

Analytic Strategy

We use two longitudinal methods to address our research questions. First, we use longitudinal linear regressions with random effects to capture the effects of years since arrival and arrival cohorts on the mental health score of immigrants relative to native-born individuals. The advantage of a random effects model is that it can estimate group level differences that are generalizable to the population level, which is not possible with fixed effects models (Florian, 2018). Random effects models exploit within-and-between individual variation and estimate the coefficients on the explanatory variables, which allows us to estimate the effects of covariates that do not change over time, such as arrival cohort and nativity, which are a key focus of this paper (Rabe-Hesketh & Skrondal, 2008). We use random effects in our regression models to address the fact that panel data include repeated measures of variables over time within individuals that are positively correlated (Monsalves et al., 2020).

Second, to model growth or change over time, we use growth curve models to assess whether (1) individuals experience changes in their mental health over time; and (2) how individual mental health trajectories vary over time by gender, nativity, and arrival cohort. Growth curve models generate a mean growth trajectory for all observations but estimate a unique growth curve for each individual in the data. We use growth curve models with random slopes and intercepts to allow individuals to vary in their rates of health change and their starting points. These models account for within-person change over time and between-person variation in individual change over time (Singer and Willet, 2003). To examine whether the mental health trajectories of immigrant and native-born individuals differ over time and by gender, we include an interaction term between time, nativity, and gender. We also examine whether immigrants' mental health trajectories differ by arrival cohort and gender over time and do so by including an interaction between arrival cohort and age. We specify a curvilinear functional form in intra-individual change.³

Results

Table 1 presents the descriptive statistics for native-born Australians and Asian immigrants by gender. Asian immigrant women have slightly higher mental health scores (72.4) than native-born women (72.3) and Asian native-born women (70.8). Asian immigrant men show higher mental health (73.8) than native-born Asian men (73.5) but lower than native-born men (74.6), who show the highest average mental

³ In separate analyses, we tested linear and curvilinear models and found that the latter was a better fit.

Table 1 Summary statistics by ethnic group and gender

Variables	Women			Men		
	Other native-born	Asian immigrant	Asian native-born	Other native-born	Asian immigrant	Asian native-born
Mental health score	72.314 (17.817)	72.4 07 (16.303)	70.797 (16.319)	74.599 (16.907)	73.788 (16.536)	73.491 (16.787)
Arrival cohort						
Arrived before 1990	-	0.316	-	-	0.417	-
Arrived 1990–1999	-	0.376	-	-	0.312	-
Arrived 2000–2009	-	0.241	-	-	0.220	-
Arrived 2010 or later	-	0.067	-	-	0.051	-
Age at arrival						
Arrived ages 0–12	-	0.166	-	-	0.227	-
Arrived ages 13–18	-	0.090	-	-	0.120	-
Arrived ages 19–32	-	0.538	-	-	0.447	-
Arrived age 33 or older	-	0.205	-	-	0.206	-
Years since arrival						
0–4 years since arrival	-	0.109	-	-	0.078	-
5–9 years since arrival	-	0.157	-	-	0.141	-
10–14 years since arrival	-	0.173	-	-	0.158	-
15 or more years since arrival	-	0.561	-	-	0.623	-
Age (average)	40.134 (13.000)	40.499 (11.709)	30.086 (9.989)	40.141 (13.02)	40.852 (11.998)	30.535 (9.954)
Marital status						
Married	0.486	0.683	0.264	0.490	0.689	0.324
Divorced/Separated	0.147	0.094	0.109	0.113	0.054	0.012
Widowed	0.020	0.023	0	0.005	0.003	0
Single	0.346	0.2	0.627	0.392	0.254	0.664

Table 1 (continued)

	Women				Men			
	Other native-born	Asian immigrant	Asian native-born		Other native-born	Asian immigrant	Asian native-born	
Educational attainment								
High school Degree or less	0.433	0.311	0.362	0.377	0.221	0.403		
Diploma or certificate	0.292	0.192	0.218	0.402	0.236	0.309		
Bachelor's degree	0.164	0.315	0.276	0.132	0.300	0.228		
Graduate/Postgrad degree	0.11	0.182	0.144	0.090	0.243	0.059		
Remoteness								
Urban	0.627	0.897	0.822	0.627	0.951	0.880		
Rural	0.356	0.093	0.178	0.356	0.047	0.120		
Remote	0.017	0.01	0	0.017	0.002	0		
Employment status								
Employed	0.713	0.658	0.807	0.835	0.846	0.854		
Unemployed	0.033	0.042	0.046	0.041	0.042	0.052		
Not in labor Force	0.254	0.3	0.147	0.124	0.112	0.093		
State								
NSW	0.283	0.402	0.238	0.278	0.449	0.222		
VIC	0.249	0.298	0.367	0.247	0.307	0.429		
QLD	0.227	0.105	0.146	0.227	0.068	0.107		
SA	0.095	0.045	0.034	0.100	0.036	0.048		
WA	0.082	0.092	0.159	0.084	0.089	0.143		
TAS	0.038	0.009	0.004	0.037	0.003	0.021		
NT	0.008	0.015	0.011	0.007	0.009	0.001		
ACT	0.019	0.033	0.042	0.020	0.039	0.029		
N	72,185	5583	1140	63,366	3848	1222		

health in our sample. Overall, Table 1 shows that most immigrants arrived as young adults in 1999 or before. Most immigrants are concentrated in the states of New South Wales, Victoria, and Queensland. Immigrants show higher educational attainment than native-born individuals, though immigrant women show lower employment levels (65.8) relative to native-born women (71.3) and native-born Asian women (80.7). Despite comparable education levels, Asian immigrant women's employment (65.8) is much lower than Asian immigrant men (84.6). Asian immigrant women have the lowest employment rates in the sample.

Regression Analysis

In Table 2, we fit linear regression models with random effects to predict mental health scores of Asian immigrants, Asian native-born individuals, and other native-born individuals. Table 2 presents the regression coefficients for our entire sample presented separately for women and men. Table 2 shows the coefficients for age at arrival and duration of residence in Australia relative to native-born individuals, along with control variables. In Table 2, we assess whether there are patterns of declining mental health with duration of residence for women and men separately. Among women, the coefficients for years since arrival are not significant. When we look at men, we also find that the coefficients for years since arrival are not significant.

In Table 3, we add arrival cohort to the equation. We present the results in separate models by gender for ease of interpretation.⁴ The arrival cohort variables represent the differences in health between Asian immigrants, native-born Asians, and other native-born Australians relative to the most recent cohort. Among women, the coefficient for the cohort arriving before 1990 is -5.801 , $p < 0.01$. This indicates that Asian women who immigrated before 1990 show a lower mental health score than their counterparts who immigrated between 2010 and 2018 by approximately 5.8 points. Likewise, we find that immigrant women arriving between 1990 and 1999 (-4.765), native-born Asians (-4.19), and other native-born Australians (-4.263) have lower mental health than the most recent arrival cohort. This shows support of increasing selectivity among immigrant women that is positively associated with their mental health. This supports *Hypothesis 3*, which posits that immigrants from more recent arrival cohorts exhibit higher mental health scores. In contrast, we do not find a significant effect of arrival cohort on Asian immigrant men's mental health.

To better understand the results in Table 3, Fig. 1 shows predicted mental health scores by immigrant arrival cohort and gender. The left panel of Fig. 1 clearly shows a trend of increasing mental health scores with subsequent cohorts among Asian immigrant women. To illustrate, immigrant women who arrive before 1990 have the lowest mental health score (70.2), followed by those arriving between 1990–1999 (71.2), 2000–2009 (74.2), and since 2010 (76). Figure 1 also shows that the two

⁴ In separate analyses, we tested for the significance of the coefficients across gender and do not find evidence that the effect of arrival cohort on mental health is the same for men and women.

Table 2 Random effects linear models of years since arrival effects on mental health

	Women	Men
Age at arrival		
Arrived 13–18 (Ref.: Arrived 0–12)	2.166 (1.873)	0.808 (2.171)
Arrived 19–32 (1.309)	1.812 (1.309)	– 0.225 (1.512)
Arrived 33 or older (1.534)	1.145 (1.534)	1.381 (1.785)
Years since arrival		
0–4 years since arrival (Ref.: Native-born Asian)	0.086 (1.695)	– 0.899 (1.983)
5–9 years since arrival (1.618)	– 0.968 (1.618)	– 0.190 (1.820)
10–14 years since arrival (1.544)	– 1.508 (1.544)	– 0.715 (1.669)
15 or more years since arrival (1.406)	– 1.028 (1.406)	– 1.132 (1.514)
Native-born (0.955)	– 0.026 (0.955)	0.790 (0.970)
Age	– 0.343*** (0.059)	– 0.695*** (0.059)
Age squared	0.006*** (0.001)	0.009*** (0.001)
<i>N</i>	78,908	68,436

Standard errors in parentheses

The models control for educational attainment, employment status, remoteness, marital status, survey year, and state

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

most recent cohorts (2000–2009 and 2010–2018) have higher mental health than native-born Australian women (71.7) and native-born Asian women (71.8), illustrating the mental health advantage of more recent cohorts of immigrant women.

In contrast, Fig. 1 shows that among Asian immigrant men, the effect of arrival cohort on predicted mental health is not nearly as strong as among Asian immigrant women. Asian immigrant men who arrived before 1990 have a predicted mental health score of 72.1 and this is fairly consistent for those who arrived between 1990–1999 (72.5) and 2000–2009 (72). In contrast, those arriving in 2010 or later show the highest mental health scores (75.9), surpassing native-born individuals (74.1) and native-born Asian men (73.3). For both Asian immigrant women and men, the most recent cohorts show the highest mental health scores, which is consistent with *Hypothesis 3*.

Together, Table 3 and Fig. 1 show that for Asian immigrant women, arrival cohort is a significant predictor of mental health over long periods of time in

Table 3 Random effects linear models of years since arrival effects on mental health

	Women	Men
Arrival cohort		
Native-born	- 4.263* (1.929)	- 1.761 (2.639)
Arrive before 1990 (Ref.: Arrive 2010–2018)	- 5.801** (1.839)	- 3.816 (2.536)
Arrive 1990–1999	- 4.765** (1.625)	- 3.397 (2.380)
Arrive 2000–2009	- 1.789 (1.432)	- 3.840 (2.176)
Native-born Asians	- 4.190* (2.125)	- 2.542 (2.796)
Age at arrival		
Arrived 13–18 (Ref.: Arrived 0–12)	1.258 (1.912)	0.906 (2.187)
Arrived 19–32	0.368 (1.352)	- 0.528 (1.548)
Arrived 33 or older	- 0.182 (1.547)	1.077 (1.781)
Years since arrival		
5–9 years since arrival (Ref.: Less than 5 years)	- 0.525 (0.901)	1.207 (1.277)
10–14 years since arrival	- 0.594 (1.001)	0.826 (1.481)
15 or more years since arrival	0.336 (1.126)	0.483 (1.592)
Age	- 0.341*** (0.059)	- 0.694*** (0.059)
Age squared	0.006*** (0.001)	0.009*** (0.001)
<i>N</i>	78,908	68,436

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Australia. Our findings underscore the need to consider gender in our understanding of immigrants' health assimilation as immigrant men and women vary in their health outcomes upon arrival and over time. Neither immigrant men nor women's mental health is shaped by duration of residence in Australia, showing little support for the healthy immigrant effect's hypothesis of declining mental health with longer duration in Australia (*Hypothesis 1*).

Thus far, we have shown that arrival cohorts are important for Asian immigrant women's mental health. We take a step further to explore these findings by examining whether and how an individual's mental health trajectory changes and whether

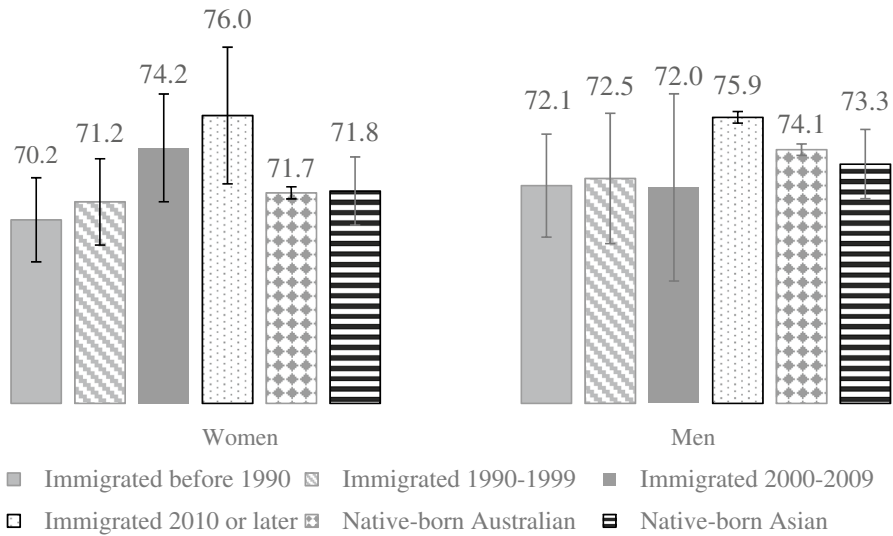


Fig. 1 Predicted mental health score by arrival cohort and gender

changes occur at different rates for Asian immigrants and native-born individuals and by gender in Table 4.

Table 4 displays the coefficients from growth curve models to assess the mental health trajectories of native-born individuals and Asian immigrants over time. Table 4 includes an interaction term between nativity and gender, and age, net of controls. Given the interaction terms in the equation, models are best interpreted using the predicted margins presented in Fig. 2.

Figure 2 displays the trajectories for other native-born men, other native-born women, Asian immigrant men, Asian immigrant women, Asian native-born men, and Asian native-born women. Figure 2 shows that the mental health trajectories of native-born individuals and Asian immigrants take on different shapes over time. For native-born men and women, their health trajectories are curvilinear and u-shaped, reaching its nadir around early 30–40 s and increasing again around age 47. In contrast, the mental health trajectories of immigrant men and women are more linear with lower mental health at younger ages that increases over time. Immigrant women show the lowest mental health at age 22 and this increases over time, ultimately surpassing all other groups starting at age 42. Among Asian native-born men, the trajectory is more curvilinear showing higher mental health scores at the later ages. For Asian native-born women, their mental health is linear and fairly consistent across time.

Overall, Table 4 and Fig. 2 show that while all groups show increasing mental health scores over time, the rate of their increasing mental health differs by nativity and gender, with immigrants showing higher rates of increasing mental health over time. Immigrant men and women show lower mental health than their native-born counterparts when they are younger but this increases over time, with immigrant women clearly surpassing native-born women. Immigrant men show similar mental

Table 4 Curvilinear models of mental health for Asian immigrants and native-borns

Other native-born women (Ref.: Other native-born men)	- 8.530*** (1.229)
Asian immigrant men	- 17.44*** (4.655)
Asian immigrant women	- 22.89*** (4.186)
Asian native-born men	7.102 (6.205)
Asian native-born women	- 14.41* (6.336)
Age	- 0.648*** (0.048)
Other native-born women × Age (Ref.: Other native-born men × Age)	0.282*** (0.062)
Asian immigrant men × Age	0.666** (0.221)
Asian immigrant women × Age	0.892*** (0.197)
Asian native-born men × Age	- 0.538 (0.375)
Asian native-born women × Age	0.670 (0.379)
Age × Age	0.009*** (0.001)
Other native-born women × Age × Age (Ref.: Other native-born men × Age × Age)	- 0.003*** (0.001)
Asian immigrant men × Age × Age	- 0.007* (0.003)
Asian immigrant women × Age × Age	- 0.008*** (0.002)
Asian native-born men × Age × Age	0.008 (0.006)
Asian native-born women × Age × Age	- 0.008 (0.006)
<i>N</i>	147,344

Standard errors in parentheses

The models control for years since arrival, age at arrival, arrival cohort, educational attainment, employment, remoteness, marital status, survey year, and state

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

health scores as native-born men starting around age 47, though Asian native-born men show larger increases in later ages. By observing individual trajectories, we show how mental health trajectories differ over time. We do not find support for

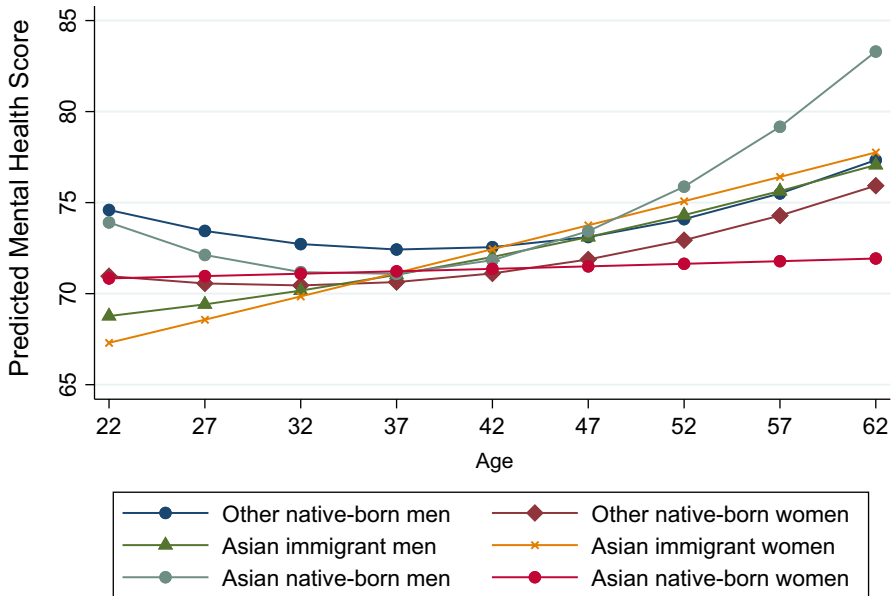


Fig. 2 Predicted mental health score by for native-born individuals and Asian immigrants

Hypothesis 4 that Asian immigrant men show better mental health than Asian immigrant women.

In Table 5, we consider the mental health trajectories of immigrants from different arrival cohorts and native-born population for women and men separately. Given the interactions in the models, results are best interpreted using predicted margins or predicted mental health scores presented in Fig. 3.

Figure 3 shows graphically that Asian immigrant women from the most recent cohort (2010 and later) show the highest mental health score and this is consistent over time, which is consistent with *Hypothesis 3*. Immigrant women who arrived from 2000 to 2009 follow behind but the gap between the two cohorts widens with time. In contrast, immigrant women from earlier cohorts, especially those arriving from 1990 to 1999, have worse mental health at age 22 though their mental health improves over time. Among the oldest cohort (those arriving before 1990), their mental health is similar to those of native-born women but it increases over time. Although other native-born women show increasing mental health over time, they still show lower mental health than all cohorts of Asian immigrant women. Native-born Asian women consistently show the lowest mental health scores over time. While all women increase their mental health over time, they differ in the rates that their mental health increases. Additionally, the more recent cohorts, especially those who arrived since 2010, enjoy better mental health for the bulk of adulthood and for longer periods of their lives. Although Asian immigrant women show higher average mental health scores than native-born women, including native-born Asian women, Fig. 3 shows that this is driven partially by the better mental health of the most recent cohort and the more rapid increases in mental health over time among all other groups. Overall, Fig. 3 shows little evidence of the healthy immigrant

Table 5 Curvilinear models of arrival cohort effects on mental health

	Women	Men
Arrival cohort		
Arrive before 1990 (Ref.: Arrive 2010–2018)	11.72 (17.34)	– 7.274 (19.25)
Arrive 1990–1999	12.63 (16.00)	– 20.91 (18.57)
Arrive 2000–2009	– 2.975 (17.02)	– 37.06 (19.53)
Other native-born	24.21 (15.11)	– 6.555 (17.42)
Native-born Asian	18.85 (16.38)	1.150 (18.39)
Age		
Arrive before 1990 × Age (Ref.: Arrive 2010–2018 × Age)	– 0.941 (0.924)	0.352 (1.008)
Arrive 1990–1999 × Age	– 0.980 (0.892)	0.861 (0.998)
Arrive 2000–2009 × Age	0.073 (0.962)	1.924 (1.075)
Other native-born × Age	– 1.457 (0.848)	0.344 (0.942)
Native-born Asian × Age	– 1.102 (0.930)	– 0.226 (1.008)
Age × Age	– 0.010 (0.011)	0.014 (0.012)
Arrive before 1990 × Age × Age (Ref.: Arrive 2010–2018 × Age × Age)	0.011 (0.012)	– 0.006 (0.012)
Arrive 1990–1999 × Age × Age	0.013 (0.012)	– 0.009 (0.012)
Arrive 2000–2009 × Age × Age	– 0.001 (0.013)	– 0.025 (0.014)
Other native-born × Age × Age	0.016 (0.011)	– 0.005 (0.012)
Native-born Asian × Age × Age	0.010 (0.013)	0.003 (0.013)
<i>N</i>	78,908	68,436

Standard errors in parentheses

The models control for years since arrival, age at arrival, educational attainment, employment, remoteness, marital status, survey year, and state

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

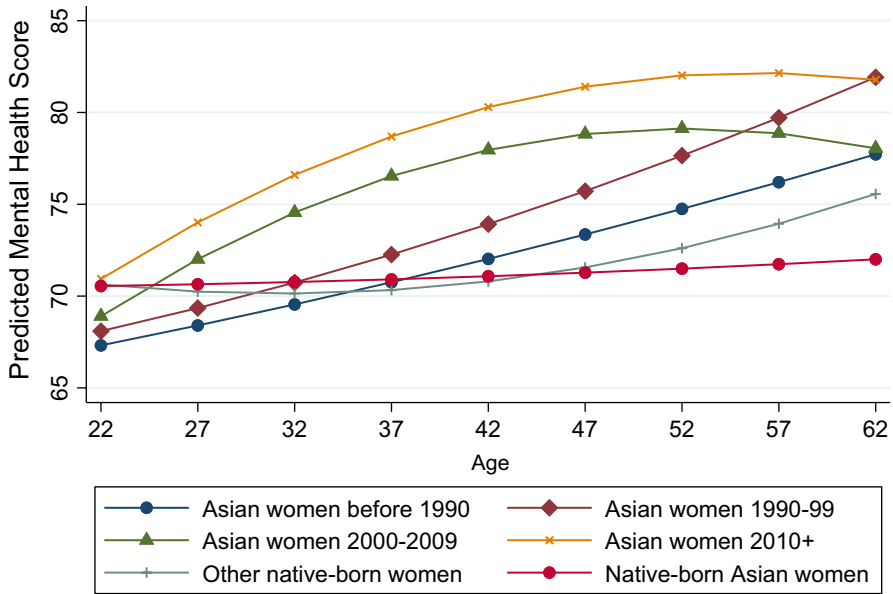


Fig. 3 Predicted mental health score for women by arrival cohort

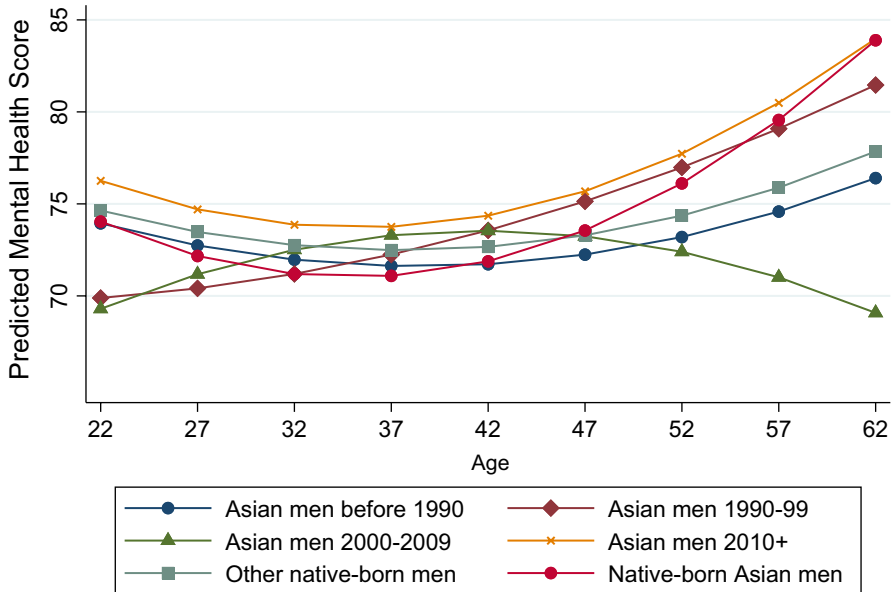


Fig. 4 Predicted mental health score for men by arrival cohort

effect, specifically *Hypothesis 1* that immigrants will show lower health over time and *Hypothesis 2* that immigrants' mental health will converge with that of native-born individuals.

Figure 4 displays the mental health trajectories for immigrant men by arrival cohort and native-born men. Similar to women, immigrant men arriving in the most recent cohort since 2010 show the greatest mental health and this health advantage widens over time, showing support for *Hypothesis 3*. Asian immigrant men who arrived in the 1990–1999 cohort show a more linear trajectory with more rapid increasing mental health over time. Native-born men, who show higher mental health scores at younger ages, experience steady declines in mental health over time. Figure 4 shows that starting around age 32, all men share similar predicted mental health scores but the divergence in men's mental health outcomes begins to widen around age 52. Overall, we see little evidence of immigrants' decreasing mental health over time (*Hypothesis 1*) and convergence with native-born men's health, especially among the most recent cohorts (*Hypothesis 2*).

Discussion and Conclusion

This study delves into the complexities of Asian immigrants' mental health by drawing on 17 years of longitudinal data to (1) examine whether Asian immigrants experience declining mental health over time and relative to native-born Australians and native-born Asians; (2) examine how duration of residence and immigrant arrival cohort affect Asian immigrants' mental health; and (3) examine how mental health trajectories differ by gender and nativity in Australia.

Firstly, we find that the majority of Asian immigrants in Australia report increases in their mental health over time from 2002 to 2018, and this is consistent even when compared to their native-born counterparts. Among Asian immigrants who initially show lower mental health than native-born individuals, they either increase their mental health over time or show declining mental health at similar rates as native-born individuals over time. In sum, we find limited evidence that longer residence in Australia is associated with declining mental health over time nor a steeper decline in health than native-born individuals. In contrast with a main hypothesis of the healthy immigrant effect, our results do not indicate widespread convergence to native-born mental health trajectories over time in Australia. Similar to Lu et al. (2017), our findings highlight the importance of longitudinal data for measuring and assessing the longitudinal component of the healthy immigrant effect, both how health changes for the same immigrants over time and relative to native-born individuals. One possible reason why we find limited support for the healthy immigrant effect is because mental health trajectories may work in different ways than self-rated health trajectories, which is primarily how the healthy immigrant effect has been assessed (Biddle et al., 2007; Jatrana et al., 2014; Kennedy et al., 2015).

A second finding of our study is that arrival cohorts are significantly associated with Asian immigrant women's mental health. Among Asian immigrant women, older cohorts arriving before 2000 show lower mental health scores and the more recent cohorts arriving since 2000 are surpassing those of their native-born

counterparts. We find this continues over time, indicating immigrants' persistent advantage over time in Australia. Our findings indicate that immigrants' mental health outcomes are structured by the context of migration, such as the social structures and historical period in which migration occurs (Acevedo-Garcia et al., 2010; Jasso et al., 2004; Wingens et al., 2011). We find that the historical timing of migration, which is captured by immigrant arrival cohorts, is crucial for understanding Asian immigrant women's mental health (Jasso, 2003). Our findings are consistent with Antecol and Bedard (2006); Kaushal (2009); Hamilton and Hummer (2011); Hamilton et al. (2015); McDonald and Kennedy (2004); and Newbold (2005) who found that immigrant arrival cohorts represent an important component that has been overlooked in the examination of the healthy immigrant effect and could potentially explain the negative effect of residence on immigrants' mental health.

Although it is beyond the scope of this study to identify mechanisms underlying arrival cohort effects, we suggest several potential explanations. The significance of immigrant arrival cohorts on immigrant women's mental health may reflect changes in Australian immigration policy that have contributed to the changing composition of incoming Asian immigrant women to Australia. In particular, this includes several refinements in Australian immigration policy aimed at increasing the number of highly educated and skilled migrants, inadvertently increasing migration flows from the Asia Pacific region. Around the same time, Australia's greater recognition of overseas credentials also increased the skill of incoming immigrants (Hugo, 2014) and raised the level of English competency (Chiou, 2017). Likewise, there has been a feminization of Asian migration that has not occurred for other migration flows (Hugo, 2003). These broad policy changes have benefitted immigrants from Asian and other non-English-speaking countries, who have long had difficulty with securing accreditation for overseas degrees (Hawthorne, 2015). In sum, an increased acceptance of overseas credentials and the feminization of Asian migration could contribute to the higher mental health of recent Asian immigrants, especially women.

Additionally, Asian immigrant women's higher mental health scores may reflect the growing representation of immigrant women as primary applicants in the migration process. Although immigrant women were traditionally more likely to arrive as secondary applicants under skilled migration regimes, there is an increasing presence of immigrant women as primary applicants under skilled and family migration regimes (Meares, 2010; Raghuram & Kofman, 2004; Ressa et al., 2017). To illustrate, about 25% of primary skilled applicants in Australia were women in the early 1990s and this increased to about 33% in 2014 (Department of Home Affairs, 2017; Rudd, 2004). Increased representation of women as primary applicants may contribute to Asian immigrant women's higher mental health scores as they are permitted entry on their own skills or occupations, establish independence and are not dependent on their husbands, and may face fewer conflicts in balancing work and family commitments (Ho, 2006; Ong & Shah, 2012; Raghuram, 2000).

A third finding of this study is a pattern of within- and between-gender differences in mental health trajectories. Our findings show that Asian immigrant women consistently exhibit better mental health than native-born women including native-born Asian women, a trend which we do not see among Asian immigrant men. Related,

we find that whereas native-born men consistently show better mental health scores than native-born women, we find the reverse is true among Asian immigrants in Australia. Our findings show that immigrant women at younger ages show lower mental health, but this increases over time and surpasses Asian immigrant men's mental health. Some of the increase in Asian immigrant women's mental health is influenced by the higher mental health scores of more recent arrival cohorts. Yet, we find that Asian immigrant women maintain their higher mental health scores over time. This suggests that Asian immigrant women's increasing mental health scores are not only driven by recent cohorts as older cohorts also exhibit higher mental health scores over time. Overall, while selection may partially account for Asian immigrant women's better mental health upon arrival, our study finds that their health advantage persists beyond initial entry.

Future research may further explore mechanisms driving between- and within-gender differences in immigrants' health trajectories. Our findings on mental health trajectories illustrate the importance of reference group in our understanding of the healthy immigrant effect. Our findings differ from Hargrove et al. (2020); Hurr and Kim (1990); and Kwak (2016), who found that immigrant and minority adolescents and women experience more depressive symptoms and more psychological illnesses than their male counterparts. One reason may be because these studies mainly capture mental health for a particular stage of the life course, namely adolescence until early 30s, when girls and young women are particularly vulnerable to lower mental health. As these studies do not observe women's mental health in middle age and beyond, this creates an incomplete picture of mental health trajectories. This is also less informative for fully understanding whether the healthy immigrant effect persists for long periods of time in the host country. To fully explore the healthy immigrant effect and variations in mental health trajectories over time, including from early adulthood into late adulthood, we need additional research using longitudinal data to better understand the complexity of immigrants' mental health trajectories over time and life course stages.

Nonetheless, there are some limitations of our study. Our study uses panel data to simultaneously study the effects of immigrants' arrival cohort and time in Australia. A shortcoming of this approach is that a relatively stable panel of individuals is surveyed over time so immigrants who have arrived earlier tend to be followed for longer periods of time than immigrants from later cohorts. As such, earlier arriving immigrant cohorts are more likely to contribute to the residence effects among immigrants who have lived in Australia longer, and more recent cohorts are also more likely to contribute to the years since arrival effects for immigrants who have lived in Australia for shorter periods. Nonetheless, we find that our analyses are robust even after conducting sensitivity analyses.⁵ Notwithstanding these limitations, to

⁵ In separate analyses we conducted Variance Inflation Factor (VIF) to assess the amount of multicollinearity among these variables. We found that the overall mean VIF and the VIF for the individual variables are within a normal range. Likewise, other indicators suggest that multicollinearity is not an issue. The coefficients for cohort and years in Australia are stable, there are no drastic changes in direction of effects for the two measures, and the sample size is large and so it is unlikely the results are some sort of sampling fluke.

our knowledge, there is no existing data set with sufficient observations to observe health differences by birth region, arrival cohort, and years in Australia. Therefore, the strengths of HILDA outweigh this limitation.

Another shortcoming of our study is that it focuses on a broad group of Asians in Australia. To the extent possible, future research should try to disaggregate these groups to understand variation within the Asian immigrant population. While this study highlights immigrant and native-born differences in the Asian population, more work in this area is needed. In the Australian context, this is partly driven by the fact that there is no national standard on collecting race or ethnicity; this information is not available in the Australian Census. Nonetheless, there is evidence that panethnic categories such as Asian or Asian Australian are still meaningful identities among those in the Asian population. To illustrate, numerous Australian community organizations, networks, and professional associations are geared toward its Asian population and rely on panethnic labels, such as Asian Australian. Overall, this study's focus on Asian mental health has relevance for community organizations and service provisions that target the broader Asian population in Australia.

Another limitation is that our findings are based on an immigrant-receiving country with a skilled immigration policy. In turn, the mental health outcomes that we observe may be related to the fact that immigrants are screened on a rigorous selection process based on their skills, education, and physical health and have access to health care. In turn, these results may be less applicable in the US context, which has a family-based immigration policy and greater variation in access to health care. Nonetheless, the results have implications for several immigrant-receiving countries, such as Canada and New Zealand. Future research may further assess the role of skill- and family-based immigration policies on immigrants' health outcomes in the host country.

Our findings indicate that whether intentional or not, changes in immigration policy have shaped the composition of immigrant women arriving from Asian countries. This has implications for policymakers for understanding how policy modifications have created unintended outcomes in immigrant selection, group composition, and immigrants' mental health. In theory, selection processes via a skilled immigration policy should minimize health disparities, but we find variations in mental health outcomes still remain and differ by gender. This suggests that selection based on skill, education, or human capital may work in different ways to shape the integration of immigrant men and women.

Acknowledgement This project was supported by the Australian Research Council Centre of Excellence for Children and Families over the Life Course (CE200100025).

Funding Open Access funding enabled and organized by CAUL and its Member Institutions.

Data availability HILDA data is available to approved researchers from government, academic institutions and non-profit organisations. Data access is granted by the Australian Government Department of Social Services (DSS).

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative

Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

- Acevedo-Garcia, D., Bates, L. M., Osypuk, T. L., & McArdle, N. (2010). The effect of immigrant generation and duration on self-rated health among US adults 2003–2007. *Social Science and Medicine*, *71*(6), 1161–1172.
- Antecol, H., & Bedard, K. (2006). Unhealthy assimilation: Why do immigrants converge to American health status levels? *Demography*, *43*(2), 337–360.
- Australian bureau of statistics (2021). *Australia's population by country of birth*. Retrieved at <https://www.abs.gov.au/statistics/people/population/australias-population-country-birth/latest-release>
- Belo, P., Navarro-Pardo, E., Pocinho, R., Carrana, P., & Margarido, C. (2020). Relationship between mental health and the education level in elderly people: Mediation of leisure attitude. *Frontiers in Psychology*. <https://doi.org/10.3389/fpsyg.2020.00573>
- Berg, L. (2011). 'Mate speak English, you're in Australia now': English language requirements in skilled migration. *Alternative Law Journal*, *36*(2), 110–115.
- Biddle, N, Gray, M, Herz, D & Lo, J. (2019) Asian-Australian experiences of discrimination. ANU Centre for Social Research and Methods Working Papers Series. Accessed at: <https://csrm.cass.anu.edu.au/research/publications/research-note-asian-australian-experiencesdiscrimination-0>
- Biddle, N., Kennedy, S., & McDonald, J. T. (2007). Health assimilation patterns amongst Australian immigrants. *Economic Record*, *83*(260), 16–30.
- Boucher, A., & Davidson, A. (2019). *The evolution of the Australian system for selecting economic immigrants*. Migration Policy Institute.
- Carangio, V., Farquharson, K., Bertone, S., & Rajendran, D. (2020). Racism and white privilege: Highly skilled immigrant women workers in Australia. *Ethnic and Racial Studies*, *44*(1), 77–96.
- Chiou, B. (2017). Two-step migration: A comparison of Australia's and New Zealand's policy development between 1998 and 2010. *Asian and Pacific Migration Journal*, *26*(1), 84–107.
- Clarke, A., & Isphording, I. E. (2017). Language barriers and immigrant health. *Health Economics*, *26*(6), 765–778.
- Collins, J. (2013). Rethinking Australian immigration and immigrant settlement policy. *Journal of Intercultural Studies*, *34*(2), 160–177.
- Cook, I. G., & Dummer, T. J. B. (2004). Changing health in China: Re-evaluating the epidemiological transition model. *Health Policy*, *67*(3), 329–343.
- Dandona, L., et al. (2017). Nations within a nation: Variations in epidemiological transition across the states of India, 1990–2016 in the global burden of disease study. *The Lancet*, *390*(10111), 2437–2460.
- Department of home affairs (2017). *Australian migration statistics*
- Escarce, J. J., Morales, L. S., & Rumbaut, R. G. (2006). The health status and health behaviors of hispanics. In M. Tienda & F. Mitchell (Eds.), *Hispanics and the future of America* (pp. 362–409). The National Academies Press.
- Flippen, C. A., & Parrado, E. A. (2015). A tale of two contexts: U.S. migration and the labor force trajectories of Mexican women. *International Migration Review*, *49*(1), 232–259.
- Florian, S. M. (2018). Motherhood and employment among whites, Hispanics, and blacks: A life course approach. *Journal of Marriage and Family*, *80*(1), 134–149.
- Gee, G. C., & Ponce, N. (2010). Associations between racial discrimination, limited English proficiency, and health-related quality of life among 6 Asian ethnic groups in California. *American journal of public health*, *100*(5), 888–895.
- Gregory, R. G. (2015). The two-step Australian immigration policy and its impact on immigrant employment outcomes. In Barry R. Chiswick & Paul W. Miller (Eds.), *Handbook of the economics of international migration*. Elsevier.

- Hamilton, T. G., & Hummer, R. A. (2011). Immigration and the health of U.S. black adults: does country of origin matter? *Social Science and Medicine*, 73(10), 1551–1560.
- Hamilton, T. G., Palermo, T., & Green, T. L. (2015). Health assimilation among Hispanic immigrants in the United States: The impact of ignoring arrival-cohort effects. *Journal of Health and Social Behavior*, 56(4), 460–477.
- Hargrove, T., Halpem, C. T., Gaydos, L., Hussey, J. M., Whitsel, E. A., Dole, N., Hummer, R. A., & Harris, K. M. (2020). Race/ethnicity, gender, and trajectories of depressive symptoms across early- and mid-life among the add health cohort. *Journal of Racial and Ethnic Health Disparities*, 7, 619–629.
- Hawthorne, L. (1997). The question of discrimination: Skilled migrants' access to Australian employment. *International Migration*, 35(3), 395–420.
- Hawthorne, L. (2015). The impact of skilled migration on foreign qualification recognition reform in Australia. *Canadian Public Policy*, 41, s173–s187.
- Ho, C. (2006). Migration as feminisation? Chinese women's experiences of work and family in Australia. *Journal of Ethnic and Migration Studies*, 32(3), 497–514.
- Hugo, G. (2003). Asian migration to Australia: Changing trends and implications. *Scottish Geographical Journal*, 119(3), 247–264.
- Hugo, G. (2014). Change and continuity in Australian international migration policy. *International Migration Review*, 48(3), 868–890.
- Hurh, W. M., & Kim, K. C. (1990). Adaptation stages and mental health of Korean male immigrants in the United States. *International Migration Review*, 24(3), 456–479.
- Jasso, G. (2003). Migration, human development and the life course. In J. T. Mortimer & M. J. Shanahan (Eds.), *Handbook of the life course*. Kluwer Academic/Plenum Publishers.
- Jasso, G., Douglas, S. M., Rosenzweig, M., & Smith, J. (2004). *Immigrant health selectivity and acculturation*. IFS Working Papers.
- Jatrana, S., Pasupuleti, S. S. R., & Richardson, K. (2014). Nativity, duration of residence and chronic health conditions in Australia: Do trends converge towards the native-born population? *Social Science and Medicine*, 119, 53–63.
- Jatrana, S., Richardson, K., & Pasupuleti, S. S. R. (2018). Investigating the dynamics of migration and health in Australia: A longitudinal study. *European Journal of Population*, 34(4), 519–565.
- John, D. A., De Castro, A. B., Martin, D. P., Duran, B., & Takeuchi, D. T. (2012). Does an immigrant health paradox exist among Asian Americans? Associations of nativity and occupational class with self-rated health and mental disorders. *Social science & medicine*, 75(12), 2085–2098.
- Jupp, J. (1995). From 'white Australia' to 'Part of Asia': Recent shifts in Australian immigration policy towards the region. *International Migration Review*, 29(1), 207–228.
- Kaushal, N. (2009). Adversities of acculturation? Prevalence of obesity among immigrants. *Health Economics*, 18(3), 291–303.
- Kennedy, S., Kidd, M. P., McDonald, J. T., & Biddle, N. (2015). The healthy immigrant effect: Patterns and evidence from four countries. *Journal of International Migration and Integration*, 16(2), 317–332.
- Khoo, S. E., McDonald, P., & Hugo, G. (2009). Skilled temporary migration from Asia-Pacific countries to Australia. *Asian and Pacific Migration Journal*, 18(2), 255–281.
- Kim, I.-H., Carrasco, C., Muntaner, C., McKenzie, K., & Noh, S. (2013). Ethnicity and postmigration health trajectory in new immigrants to Canada. *American Journal of Public Health*, 103(4), e96–e104.
- Klapdor, M., Coombs, M., & Bohm, C. (2009). Australian citizenship: A chronology of major developments in policy and law. *Parliamentary Library*, 1, 1–23.
- Kwak, K. (2016). An evaluation of the healthy immigrant effect with adolescents in Canada: Examinations of gender and length of residence. *Social Science Medicine*, 157, 87–95.
- Lamb, K. A., Lee, G. R., & DeMaris, A. (2003). Union formation and depression: Selection and relationship effects. *Journal of Marriage and Family*, 65(4), 953–962.
- Le, H. T., & Nguyen, H. T. (2018). The impact of maternal mental health shocks on child health: Estimates from fixed-effects instrumental variables models for two cohorts of Australian children. *American Journal of Health Economics*, 4(2), 185–225.
- Lee, R. (2019). Does the healthy immigrant effect apply to mental health? Examining the effects of immigrant generation and racial and ethnic background among Australian adults. *SSM—Population Health*, 7, 100311.

- Lee, J. C., & Kye, S. (2016). Racialized Assimilation of Asian Americans. *Annual Review of Sociology*, 42, 253–273.
- Lu, Y., Denier, N., Wang, J.-H., & Kaushal, N. (2017). Unhealthy assimilation or persistent health advantage? A longitudinal analysis of immigrant health in the United States. *Social Science and Medicine*, 195, 105–114.
- Malmusi, D., Borrell, C., & Benach, J. (2010). Migration-related health inequalities: Showing the complex interactions between gender, social class and place of origin. *Social Science and Medicine*, 71(9), 1610–1619.
- Massey, D. S., Durand, J., & Malone, N. J. (2002). *Beyond smoke and mirrors: Mexican immigration in an era of economic integration*. Russell Sage Foundation.
- McDonald, J. T., & Kennedy, S. (2004). Insights into the ‘healthy immigrant effect’: Health status and health service use of immigrants to Canada. *Social Science and Medicine*, 59(8), 1613–1627.
- McDougall, D. (2019). *Australia’s growing asian minority: The impact on foreign policy*. Australian institute of international affairs. Accessed at <https://www.internationalaffairs.org.au/australianoutlook/australias-growing-asian-minority-impact-foreign-policy/>
- Meares, C. (2010). A fine balance: Women, work and skilled migration. *Women’s Studies International Forum*, 33(5), 473–481.
- Mirsky, J., Slonim-Nevo, V., & Rubinstein, L. (2007). Psychological wellness and distress among recent immigrants: A four-year longitudinal study in Israel and Germany. *International Migration*, 45(1), 151–175.
- Missinne, S., & Bracke, P. (2012). Depressive symptoms among immigrants and ethnic minorities: A population based study in 23 European countries. *Social Psychiatry and Psychiatric Epidemiology*, 47(1), 97–109.
- Monsalves, M. J., Bangdiwala, A. S., Thabane, A., & Bangdiwala, S. I. (2020). LEVEL (Logical Explanations & Visualizations of Estimates in Linear mixed models): recommendations for reporting multilevel data and analyses. *BMC Medical Research Methodology*, 20, 1–9.
- Morey, B. N., Bacong, A. M., Hing, A. K., de Castro, A. B., & Gee, G. C. (2020). Heterogeneity in migrant health selection: The role of immigrant visas. *Journal of Health and Social Behavior*, 61(3), 359–376.
- Museum, S. D., & Truong, K. A. (2013). Racism and sexism in cyberspace: Engaging stereotypes of Asian American women and men to facilitate student learning and development. *About Campus: Enriching the Student Learning Experience*, 18, 14–21.
- Newbold, K. B. (2005). Self-rated health within the Canadian immigrant population: Risk and the healthy immigrant effect. *Social Science and Medicine*, 60(6), 1359–1370.
- Ong, R., & Shah, S. (2012). Job security satisfaction in Australia: Do migrant characteristics and gender matter? *Australian Journal of Labour Economics*, 15(2), 123–139.
- Pernice, R., Trlin, A., Henderson, A., North, N., & Skinner, M. (2009). Employment status, duration of residence and mental health among skilled migrants to New Zealand: Results of a longitudinal study. *International Journal of Social Psychiatry*, 55(3), 272–287.
- Perreault, M., Touré, E. H., Perreault, N., & Caron, J. (2017). Employment status and mental health: Mediating roles of social support and coping strategies. *Psychiatry Quarterly*, 88, 501–514.
- Preston, K., & Grimes, A. (2019). Migration, gender, wages and wellbeing: Who gains and in which ways? *Social Indicators Research*, 144(3), 1415–1452.
- Rabe-Hesketh, S., & Skrondal, A. (2008). *Multilevel and longitudinal modeling using Stata* (2nd ed.). Stata Press.
- Raghuram, P. (2000). Gendering skilled migratory streams: Implications for conceptualizations of migration. *Asian and Pacific Migration Journal*, 9(4), 429–457.
- Raghuram, P., & Kofman, E. (2004). Out of Asia: Skilling, re-skilling and deskilling of female migrants. *Women’s Studies International Forum*, 27(2), 95–100.
- Rajkumar, S., & Hoolahan, B. (2004). Remoteness and issues in mental health care: Experience from rural Australia. *Epidemiologia e Psichiatria Sociale*, 13(2), 78–82.
- Read, J. N. G., & Reynolds, M. M. (2012). Gender differences in immigrant health: The case of Mexican and middle eastern immigrants. *Journal of Health and Social Behavior*, 53(1), 99–123.
- Ressia, S., Strachan, G., & Bailey, J. (2017). Going up or going down? Occupational mobility of skilled migrants in Australia. *Asia Pacific Journal of Human Resources*, 55(1), 64–85.
- Ro, A., & Bostean, G. (2015). Duration of U.S. stay and Body Mass index among Latino and Asian immigrants: A test of theoretical pathways. *Social Science and Medicine*, 144, 39–47.
- Rudd, D. (2004). *Women and migration: Internal and international migration in Australia*. The University of Adelaide.

- Safi, M. (2010). Immigrants' life satisfaction in Europe: Between assimilation and discrimination. *European Sociological Review*, 26(2), 159–176.
- Seng, J. S., Lopez, W. D., Sperlich, M., Hamama, L., Reed, C. D., & Meldrum. (2012). Marginalized identities, discrimination burden, and mental health: Empirical exploration of an interpersonal-level approach to modeling intersectionality. *Social Science Medicine*, 75(12), 2437–2445.
- Shin, K. R. (1994). Psychosocial predictors of depressive symptoms in Korean-American women in New York City. *Women and Health*, 21(1), 73–82.
- Simon-Davies, J. (2018). *Population and migration statistics in Australia*. Canberra.
- Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence*. Oxford University Press.
- Singh, G. K., & Siahpush, M. (2002). Ethnic-immigrant differentials in health behaviors, morbidity, and cause-specific mortality in the United States: An analysis of two national data bases. *Human Biology*, 74(1), 83–109.
- Smith, L. (2015). *The health outcomes of migrants: A literature review*
- Spinks, H. (2010). *Australia's Migration Program*. Department of Parliamentary Services.
- Straiton, M., Grant, J. F., Winefield, H. R., & Taylor, A. (2014). Mental health in immigrant men and women in Australia: The north west Adelaide health study. *BMC Public Health*, 14(1), 1111.
- Sue, D. W., Bucceri, J., Lin, A. I., Nadal, K. L., & Torino, G. C. (2007). Racial microaggressions and the Asian American experience. *Cultural diversity and ethnic minority psychology*, 13(1), 72–81.
- Summerfield, M., Garrard, B., Hahn, M., Jin, Y., Kamath, R., Macalalad, N., Watson, N., Wilkins, R., & Wooden, M. (2020). "HILDA User Manual—Release 19." Accessed at https://melbourneinstitute.unimelb.edu.au/_data/assets/pdf_file/0009/3562857/HILDA-User-Manual-Release-19.0.pdf
- Tani, M. (2012). Does immigration policy affect the education-occupation mismatch? Evidence from Australia. *Australian Bulletin of Labour*, 38(2), 111–140.
- Teitler, J., Martinson, M., & Reichman, N. E. (2017). Does life in the United States take a toll on health? Duration of residence and birthweight among six decades of immigrants. *International Migration Review*, 51(1), 37–66.
- Ting, S., Perales, F., & Baxter, J. (2016). Gender, ethnicity and the division of household labour within heterosexual couples in Australia. *Journal of Sociology*, 52(4), 693–710.
- Tsai, J., & Kong, G. (2012). Mental health of Asian American and pacific islander military veterans: Brief review of an understudied group. *Military Medicine*, 177(11), 1438–1444.
- Van Tran, C., Lee, J., Khachikian, O., & Lee, J. (2018). Hyper-selectivity, racial mobility, and the remaking of race. *The Russell Sage Foundation Journal of the Social Sciences*, 4(5), 188–209.
- Ware, J. E. (2000). SF-36 Health survey update. *Spine*, 25(24), 3130–3139.
- Ware, J. E., Kosinski, M., & Keller, S. D. (1994). *SF-36 Physical and mental health summary scales: A user's manual*. Health Assessment Lab, New England Medical Center.
- Wingens, M., Windzio, M., de Valk, H., & Aybek, C. (2011). *A life-course perspective on migration and integration*. Springer.
- Wohler, Y., & Dantas, J. A. (2017). Barriers accessing mental health services among culturally and linguistically diverse (CALD) immigrant women in Australia: Policy implications. *Journal of Immigrant and Minority Health*, 19(3), 697–701.
- Wu, C., Qian, Y., & Wilkes, R. (2021). Anti-Asian discrimination and the Asian-white mental health gap during COVID-19. *Ethnic and Racial Studies*, 44(5), 819–835.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.