Australian Government
Centre for Population
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SUB-GROUP MORTALITY:

NEW INSIGHTS USING AUSTRALIAN MICRODATA

Microdata allows researchers to gain an in-depth understanding of an issue, which results in more informed policy decisions.

Introduction

The role of mortality rates in population change

The first annual Population Statement provides insight into how Australia's population has changed and how we expect it to change in the future. This informs government decisions and helps us better understand and analyse population and its distribution across the country.

Mortality rates measure the rate of death in the population and together with fertility rates and net overseas migration, are essential to projecting population change. Mortality rates also allow us to project life expectancies for a population.

Australian microdata and mortality rates

The Centre for Population has commissioned the Australian Government Actuary (AGA) to investigate mortality rates using microdata produced through the Multi-Agency Data Integration Project (MADIP). Microdata is de-identified information relating to one person, household or business. The microdata in MADIP combines information on health, education, government payments, income and taxation,

Microdata represents information relating to one person, household or business.

employment, and demographics over time to provide whole-of-life insights about various population groups.

Examples of research made possible through the new MADIP dataset can be viewed on the ABS website. Important limitations and disclaimers about using MADIP microdata, including how this data has been used to calculate morality rates, can be found on page five of this report.

Mortality rates at a sub-group level

The MADIP data was used to investigate potential differences in mortality rates within three sub-groups of the Australian population:

1. residents in each state and territory

2. Australian-born (non-migrants) and overseas-born (migrants) Australian residents, and

3. Australian residents by relative socio-economic advantage and disadvantage.

Similar sub-group analysis has been undertaken in the past. However, this past analysis has relied upon aggregate data. The expectation is that using MADIP, and microdata can provide further insight for policy makers.

Validation of the microdata approach to analysing mortality rates

The results of state and territory sub-group analysis of mortality rates mirrors past analysis from the AGA and ABS which were created using aggregate data methods. This is an important finding as it validates the new approach of using microdata to calculate mortality rates.

The remainder of this report focuses on the interesting insights from the migrant and Socio-Economic Indexes for Areas (SEIFA) sub-group analysis. Consideration is also being given to other sub-groups within the Australian population where the use of MADIP microdata may reveal important nuances in mortality rates that could inform policy development. Monitoring how these results change over time is another area of future consideration.

The full AGA reports contain further technical assumptions, caveats and detailed results. These reports can be accessed via www.population.gov.au.

Mortality by birthplace

Between the ages of 10 and 60, the mortality of those born overseas is clearly lower than those born in Australia.

Finding 1: Between the ages of 10 and 60, the mortality of residents born overseas is clearly lower than those born in Australia (Figures 1 and 2).

One likely explanation may be the presence of a selection effect for those moving to Australia, known as the 'healthy migrant effect':
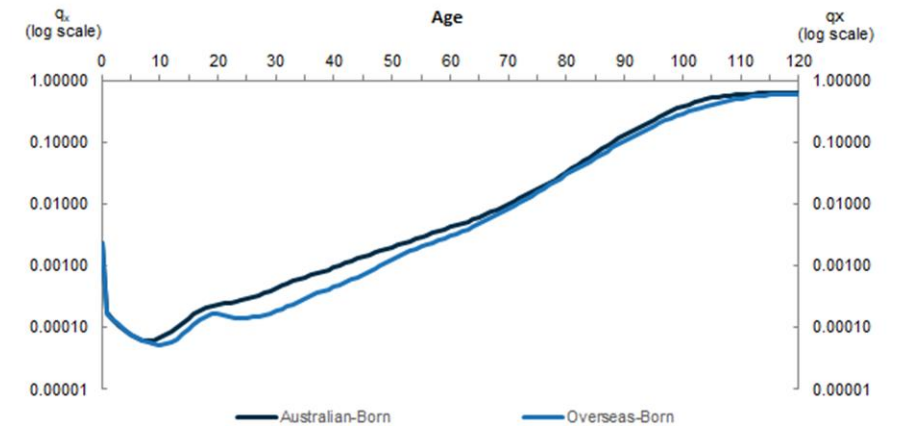
1. Healthy people are probably more inclined, and able, to relocate to a new country than those who are not healthy.

2. Those seeking permanent residency must pass minimum health requirements.

3. Many immigrants arrive on a work visa, often a skilled work visa.

Furthermore, residents who have significant ties with overseas families may also be more likely to relocate back to their country of birth when faced with serious illness. This may act to reduce the number of deaths amongst some Australian residents who are born overseas.
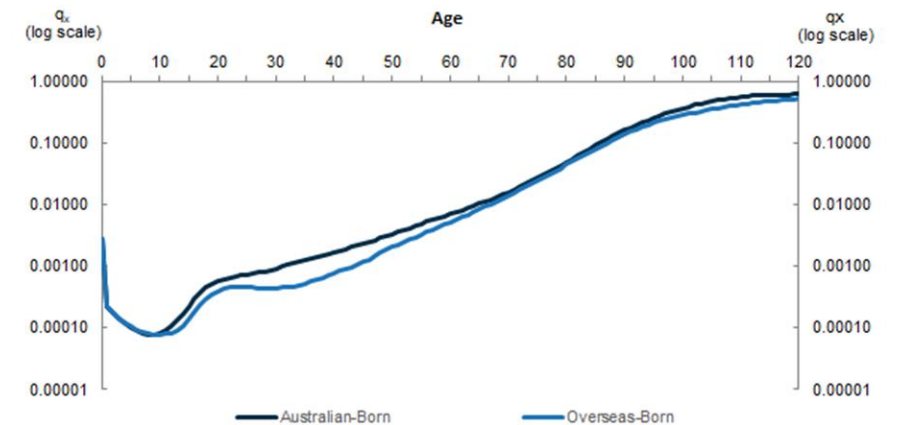
Finding 2: Residents born overseas exhibit something much closer to the traditional accident hump between ages 20 and 35. The accident hump refers to this period during young adulthood when mortality is higher, usually due to greater levels of risk-taking behaviour. In contrast, the accident hump is much less apparent amongst people born locally and has been declining over several years.

Discovering these differences between sub-groups further validates the microdata approach and supports the value of monitoring these features in the future to assess their persistence over time.

Figure 1: Mortality rates by birthplace, female, 30 June 2016

Figure 2: Mortality rates by birthplace, male, 30 June 2016

Source: AGA, 2021, 'Life tables by birthplace — A microdata approach to resident sub-group tables', Centre for Population research paper, the Australian Government, Canberra.

Mortality by birthplace

Reduced migration levels associated with COVID-19 could influence future national mortality rates and improvements.

Mortality improvements (that is, fewer deaths)

Mortality improvement measures the reduction in the rate of mortality over time. Rates of mortality have consistently decreased over many years, at all ages. However, as demonstrated in Figures 3 and 4, the AGA estimates that levels of mortality improvements for the Australian-born population have decreased from 2011-2016, for some ages.

What is apparent is that changes to the composition of Australia's population can contribute to the appearance of larger mortality improvements at the national level. As residents born overseas exhibit lower mortality rates in their 20s and 30s, it is likely that this changing mix of residents is contributing to the mortality improvement that is evident at the national level.

Policy questions and next steps

The AGA's analysis of migrant sub-group mortality rates using microdata raises numerous avenues of future inquiry including:

- What is driving the difference in the overseas vs Australian-born mortality in terms of causes of death?

- How do sub-group mortality rates differ by country of birth, visa type and year of arrival in Australia?

- How does the difference in overseas vs Australian-born mortality affect the apparent national rate of mortality improvement?

- How may the reduction in overseas migration associated with COVID-19 affect Australia's average mortality rate?

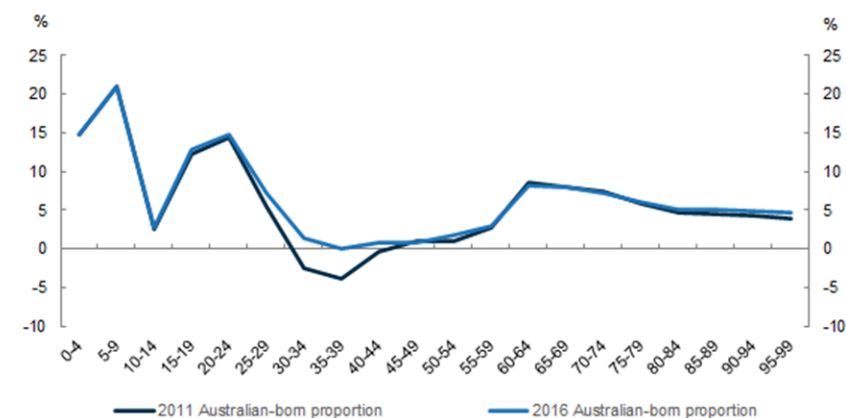**Figure 3: Improvements in mortality from 2011 – 2016, female (%)**

Figure 4: Improvements in mortality from 2011 – 2016, male (%)

Source: AGA, 2021, 'Life tables by birthplace — A microdata approach to resident sub-group tables', Centre for Population research paper, the Australian Government, Canberra.

Mortality by relative advantage and disadvantage

Life expectancies are higher in areas of relative economic and social advantage, especially for males.
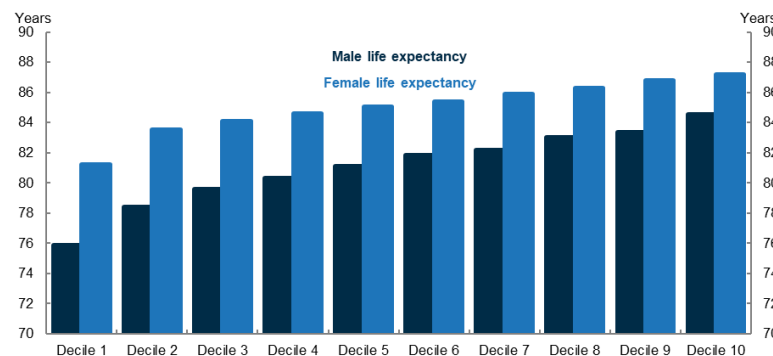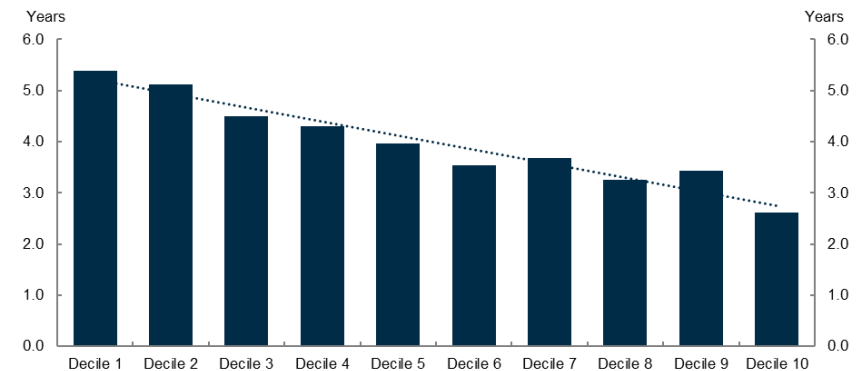
The Index of Relative Socio-Economic Advantage and Disadvantage (IRSAD) ranks the economic and social conditions of households. Decile 1 represents the most disadvantaged areas in Australia, while decile 10 represents the least disadvantaged areas. Household income is the strongest indicator of IRSAD.

Finding 1: Life expectancy improves when going from a lower to a higher IRSAD decile. This is particularly evident for males.

Finding 2: The largest improvement in life expectancies between neighbouring decile groups occurs between deciles 1 and 2, for both males and females (Figure 5).

- The gap in life expectancy of 2.4 and 2.3 years for males and females respectively, is **more than twice as large** as any other gaps between deciles. This highlights the significantly poorer outcomes of those in decile 1 relative to all others in higher deciles.

Finding 3: The life expectancy in decile 10 (the least disadvantaged areas) is 8.5 years and 5.8 years higher than decile 1 (the most disadvantaged area) for males and females, respectively.

Finding 4: Differences in life expectancy between males and females decrease in size as the IRSAD decile increases (Figure 6).

These findings pose interesting questions and areas for further potential investigation, including:

- What happens to mortality rates of people moving between different IRSAD deciles?

- How does cause of death vary by IRSAD decile, and what are the implications this has on policy decisions?

- What are the other individual characteristics, as opposed to locational characteristics in the MADIP dataset that could be used to calculate sub-group mortality rates?

Figure 5: Life expectancy at birth between adjacent decile groups

Source: AGA, 2021, 'Life tables by relative socio-economic advantage and disadvantage — A microdata approach to resident sub-group tables', Centre for Population research paper, the Australian Government, Canberra.

Figure 6: Life expectancy gap at birth between genders by IRSAD decile

Source: AGA, 2021, 'Life tables by relative socio-economic advantage and disadvantage — A microdata approach to resident sub-group tables', Centre for Population research paper, the Australian Government, Canberra.

More information on mortality rates
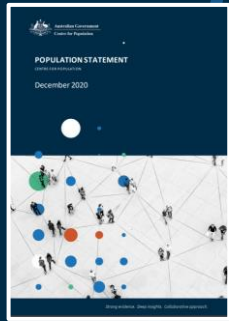
Population Statement 2021
(to be released late 2021)

AGA Sub-Group Life Tables Research Papers

The Centre for Population

Population change affects every aspect of Australians' lives. It is important to understand how Australia's population is changing and the implications of these changes. The Centre for Population strives to understand and communicate the nuances of population change.

The latest data, research and analysis on fertility, mortality and migration can be found at www.population.gov.au.

Microdata caveats and disclaimer

For access to MADIP (multi-agency data integration project) data under Section 16A of the ABS Act 1975 or enabled by section 15 of the Census and Statistics (Information Release and Access) Determination 2018, source data is de-identified. Data about specific individuals has not been viewed in conducting this analysis. In accordance with the Census and Statistics Act 1905, results have been treated where necessary to ensure that they are not likely to enable identification of a particular person or organisation.

The results of these studies are based, in part, on migration data supplied by Home Affairs to the ABS under the Australian Border Force Act 2015, which requires that such data is only used for the purposes of the Census and Statistics Act 1905 or performance of functions of the ABS as set out in section 6 of the Australian Bureau of Statistics Act 1975. Any discussion in this report of data limitations or weaknesses is in the context of using the data for this specific purpose, and not related to the ability of the data to support Home Affairs' core operational requirements.

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