

The growth of Australia's very elderly population: past estimates and probabilistic forecasts

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Introduction

Growth of 65+ population in Australia:

1.95 m in 1991

3.45 m in 2011

Growth of very elderly (aged 85+) proportionally greater

Specific needs of very elderly

e.g. health, accommodation, income support, and aged-care

Part of long-run demographic transition



Existing work on the 65+ population

Lots of research on growth of older population in Australia

Political awareness of trends and implications

Much less focus on very elderly (85+)

At least 3 limitations:

1. Official population estimates and projections
2. Often have final age group of 85+ or 90+
3. No indication of forecast uncertainty

2015 Intergenerational Report
Australia in 2055

Circulated by
The Honourable J. B. Hockey MP
Treasurer of the Commonwealth of Australia

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Aims

Present new estimates and forecasts of Australia's very elderly population which attempt to overcome the 3 limitations.

- More accurate estimates by single years of age up to highest ages
- Probabilistic forecasts



Data & methods: population estimates

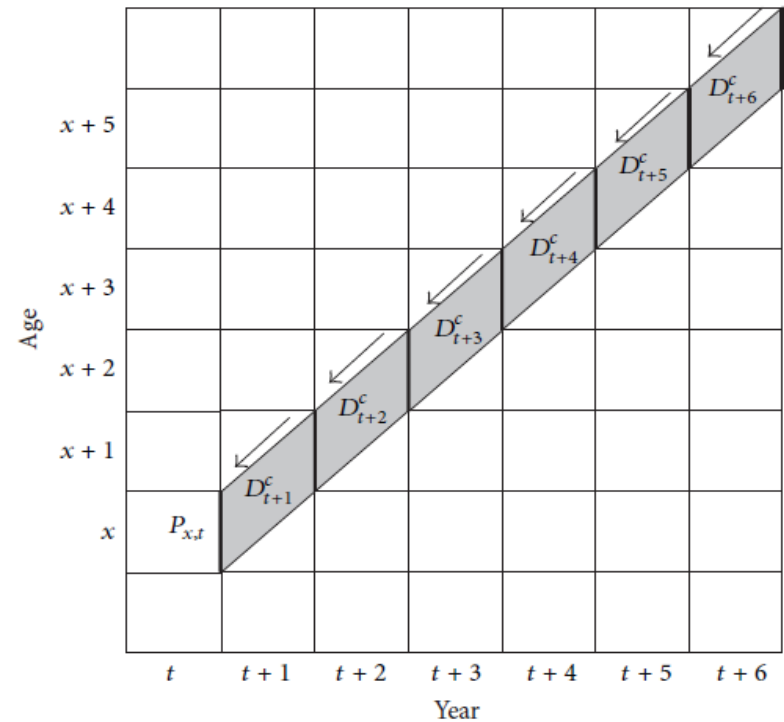
Estimates by sex and single years of age 85-109 & 110+ for 1971-2014

Extinct cohort method (Vincent 1951)

Population = sum of subsequent cohort deaths

Assumes accurate deaths data & no migration

Deaths data from ABS



Data & methods: population estimates

Constrained **Survivor Ratio** method (Thatcher et al. 2002)

R = ratio of a cohort's population at time t to its size k years ago

Pop at t = $R/(1-R) \times$ cohort deaths

Resulting populations constrained to official 85+ estimate

R: 5 year age ranges & average experience of 5 older cohorts

Deaths and 85+ estimates from ABS



Data & methods: population forecasts

Probabilistic cohort-component model

More accurate population estimates → more accurate death rates
→ more accurate death rate forecasts

Forecast horizon 2014-51; uncertain 2014 jump-off populations

Single year age groups to 109; 110+

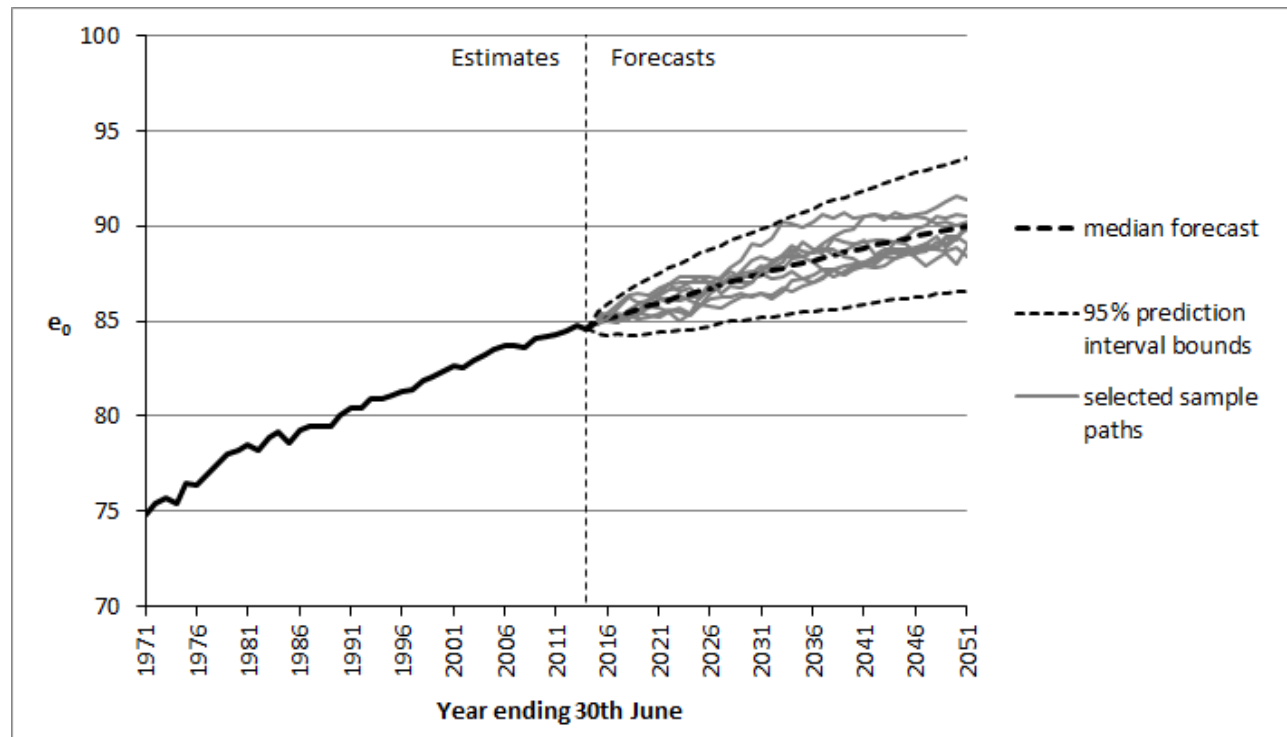
Time series models for TFR, e_0 , total immigration, total emigration

5,000 simulations



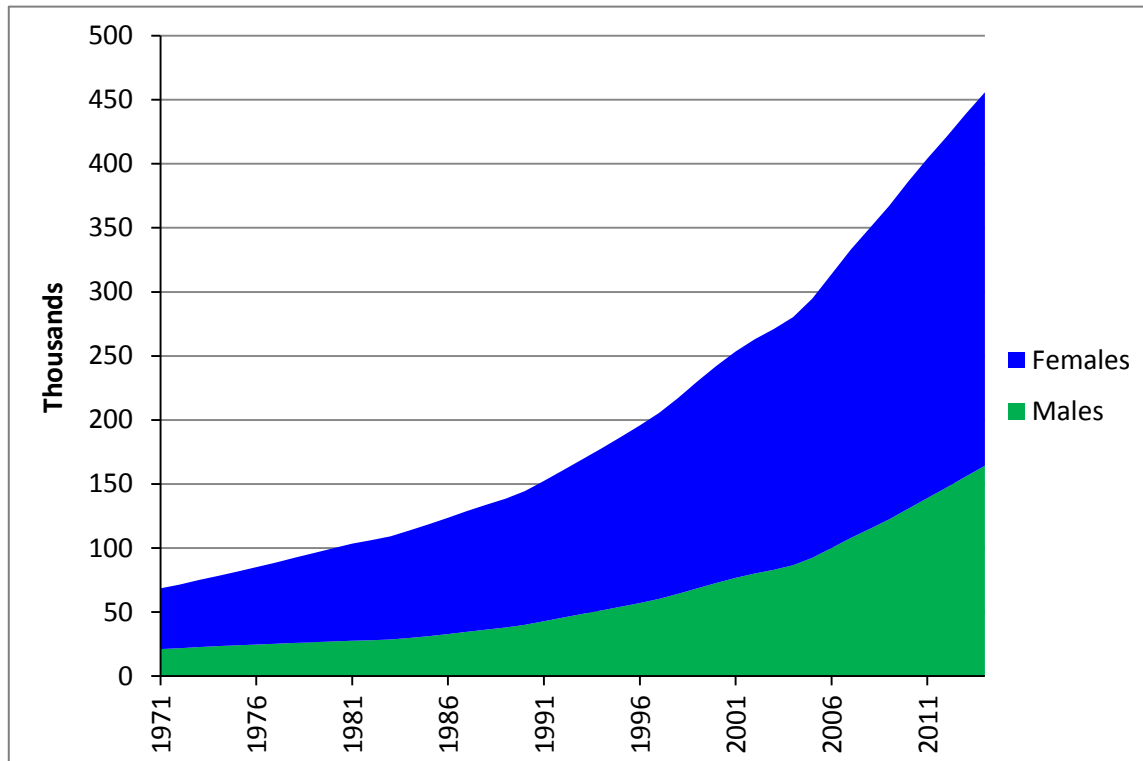
Data & methods: population forecasts

Female life expectancy at birth estimates & forecasts



Population estimates: 85+

Australia's 85+ population, 1971-2014

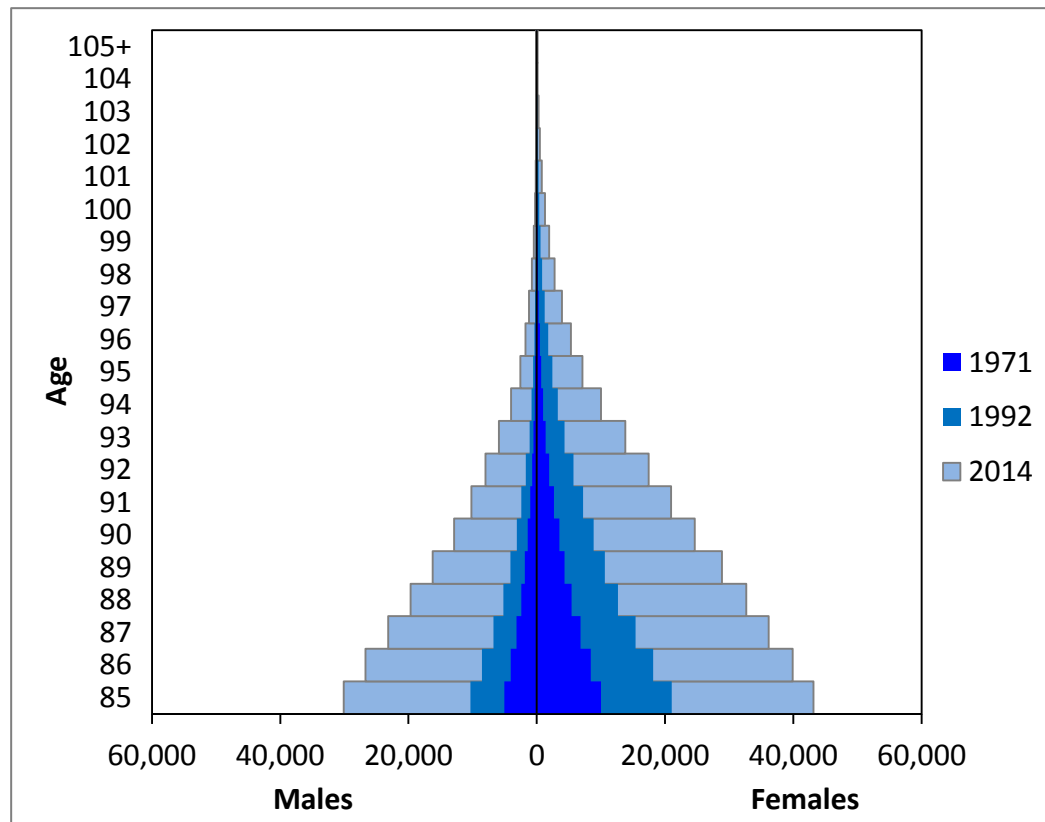


Source: ABS

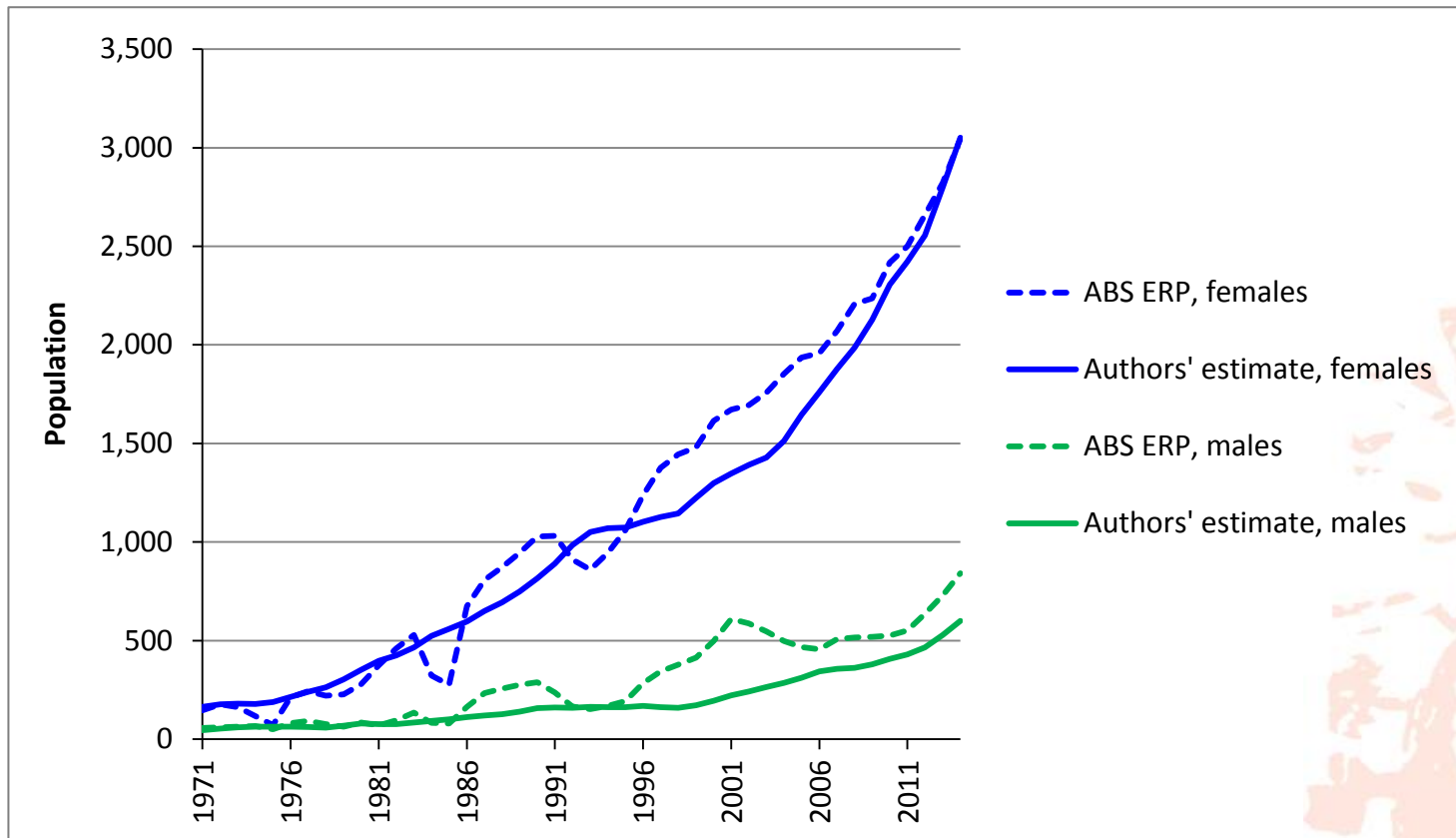


Population estimates: highest ages

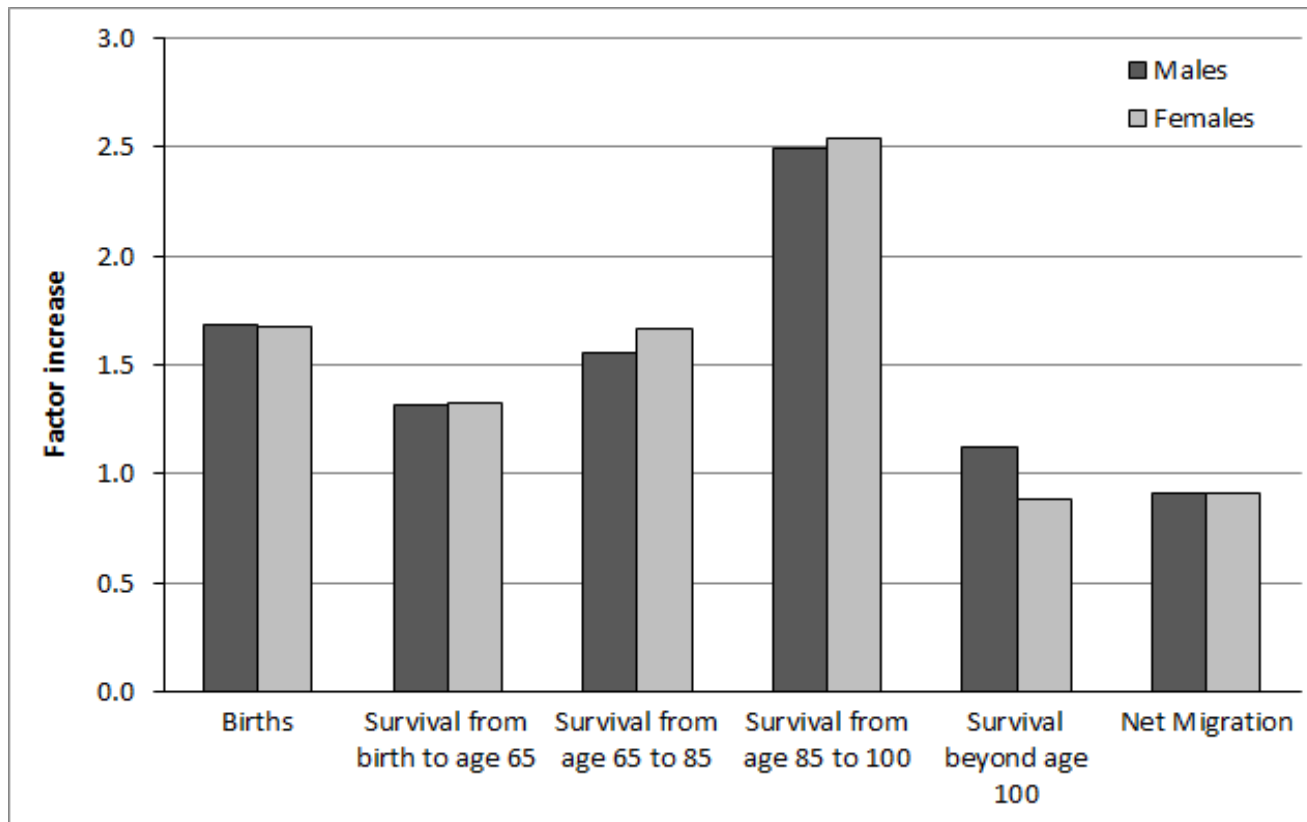
The top of Australia's population pyramid



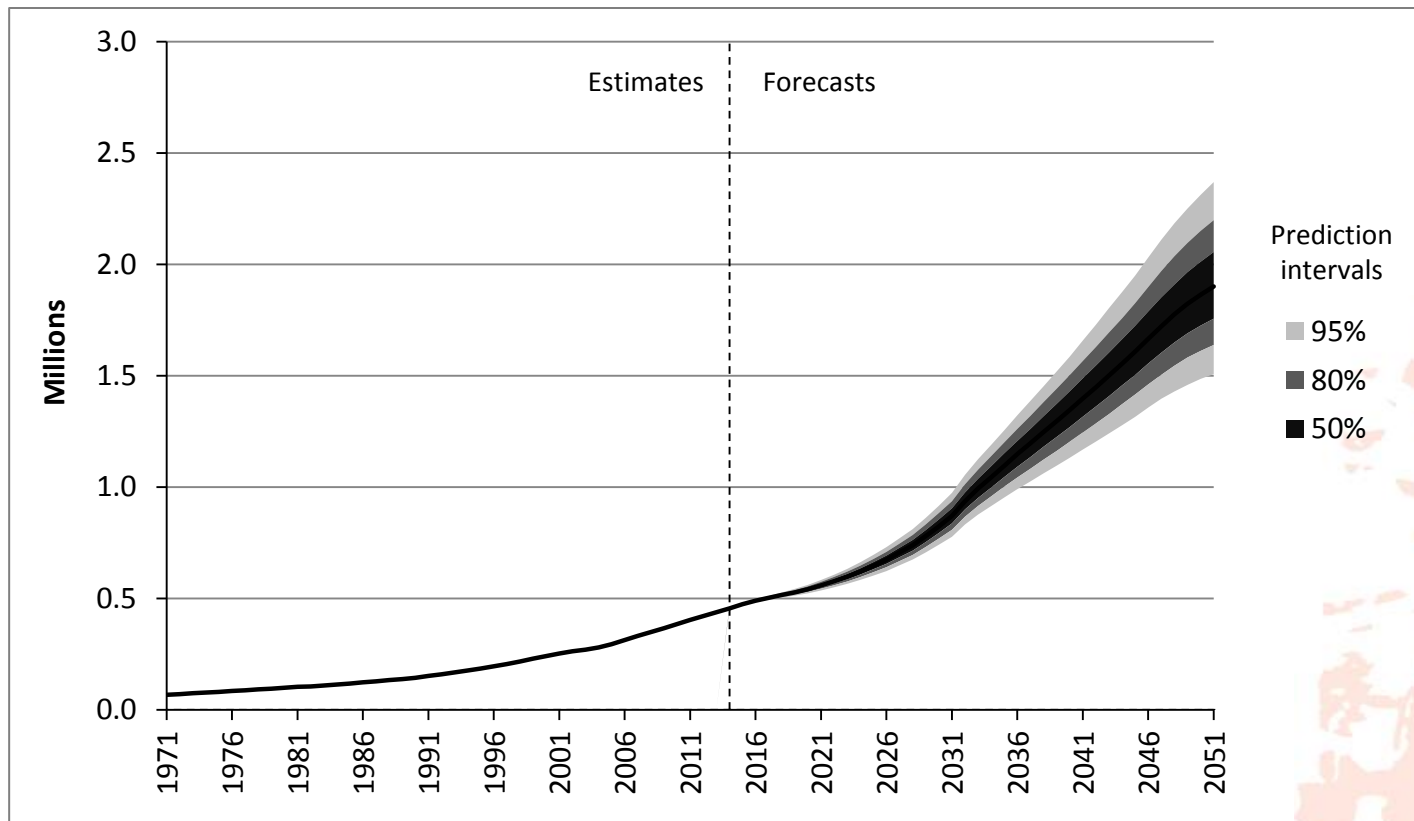
Population estimates: centenarians



Drivers of growth, centenarians, 1981-2014

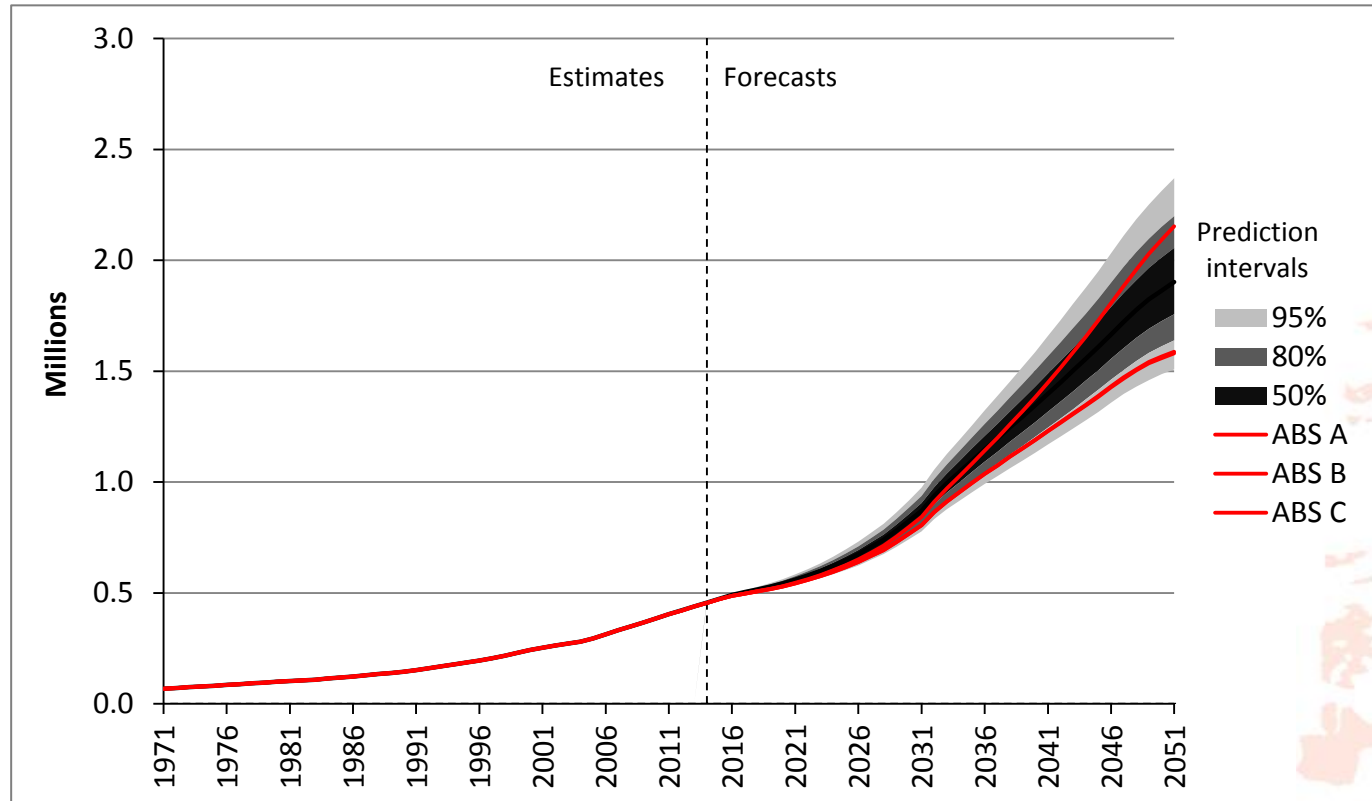


Population forecasts: 85+

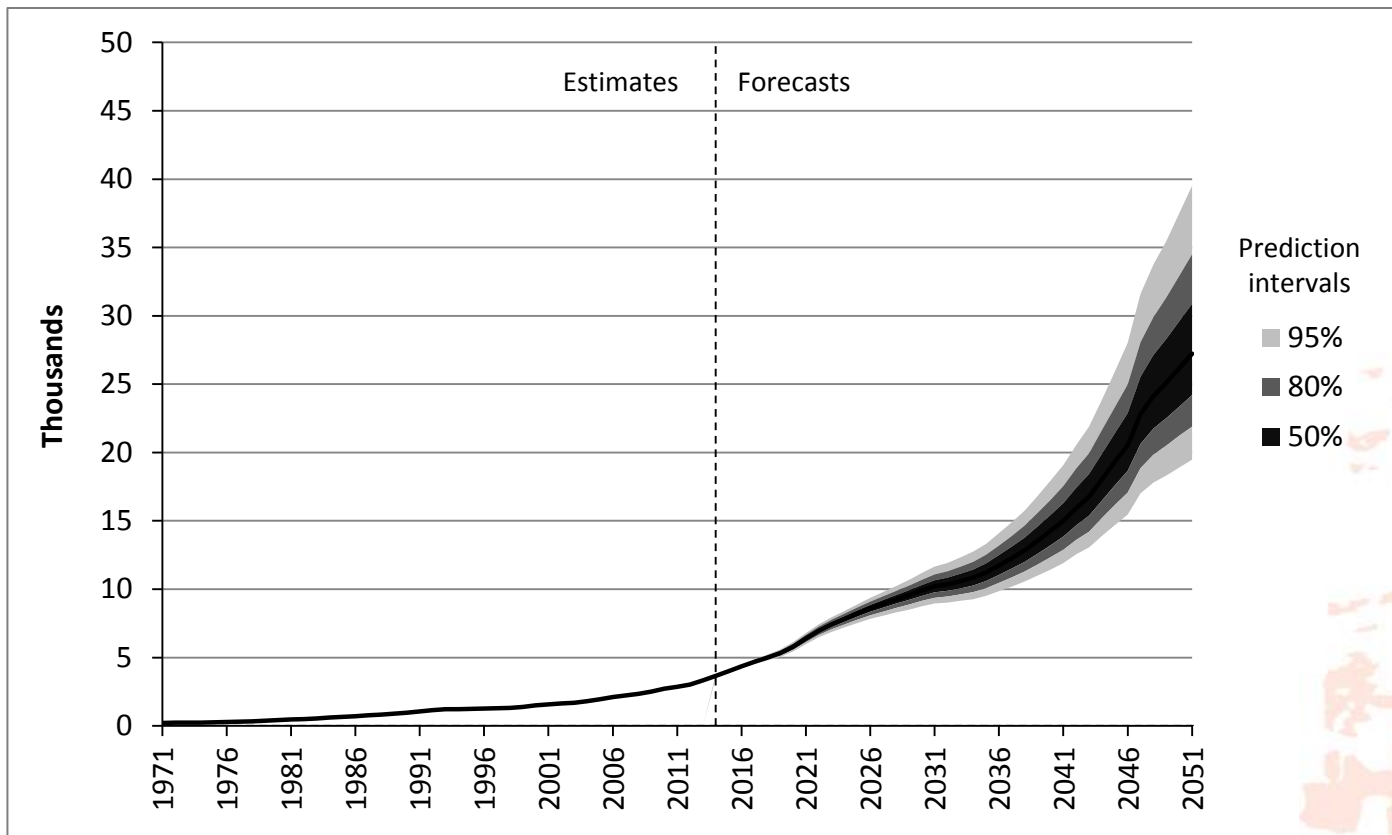


Population forecasts: 85+

Comparison with ABS projections

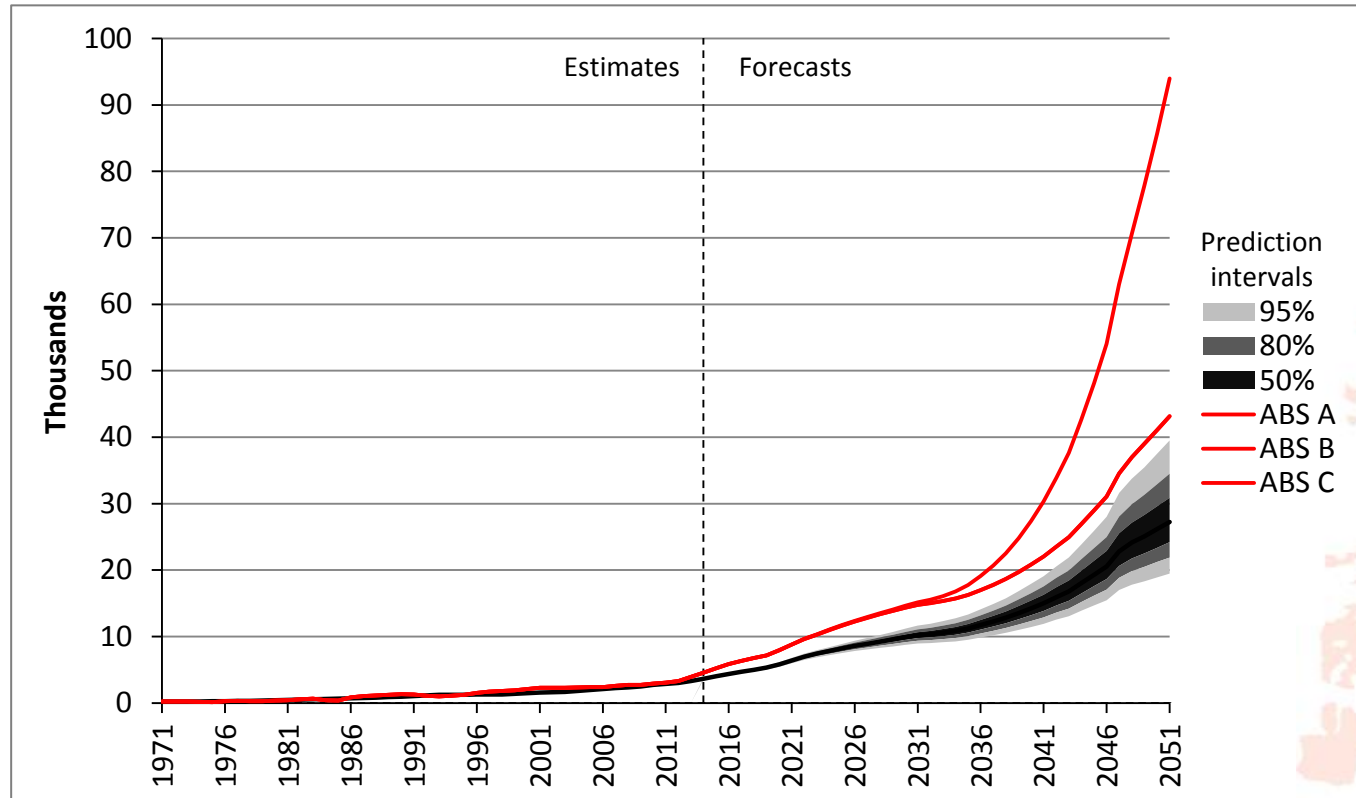


Population forecasts: centenarians

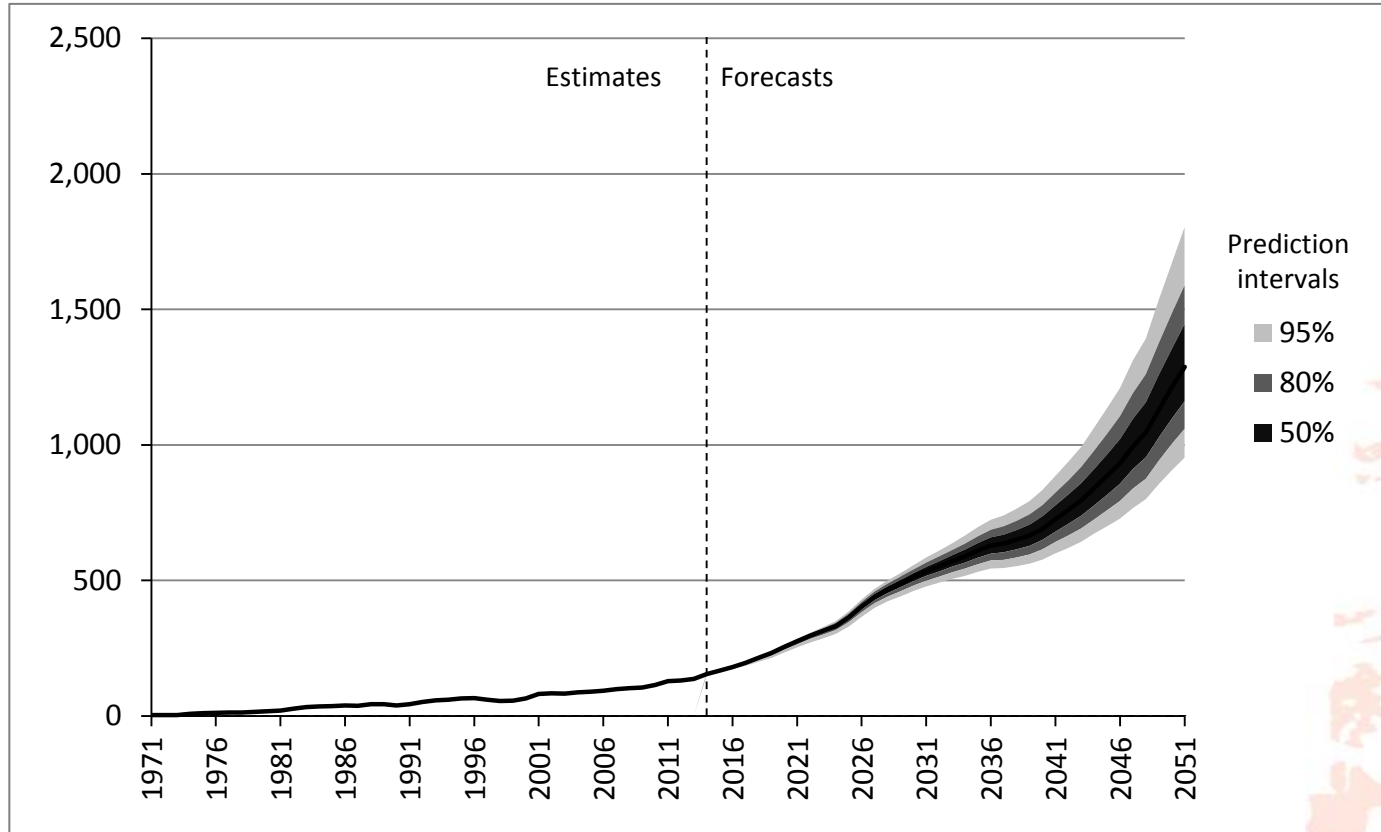


Population forecasts: centenarians

Comparison with ABS projections



Population forecasts: semi-supercentenarians



Persons
aged
105+

Conclusions

More accurate very elderly population estimates

More accurate death rates → more accurate death rate forecasts

Probabilistic population forecasts indicate uncertainty

Huge growth in very elderly numbers is certain

Differences with official ABS estimates & forecasts

