TREASURY MINISTERIAL SUBMISSION

22 November 2018 PDR No. MS18-003999

Treasurer

ABS POPULATION PROJECTIONS, AUSTRALIA 2017 (BASE) – 2066

Timing: Publication was publically released at 11:30am on Thursday 22 November 2018.

KEY POINTS

- Every five years the ABS publishes updated long-run projections of Australia's population going out 50 years. The ABS population projections are not predictions or forecasts. The projections illustrate the growth in the size, and changes in the composition, of Australia's population using a range of assumptions about future levels of fertility, mortality, overseas migration and internal migration over the projection period.
  - The ABS' population projections use Australia's preliminary estimated resident population at 30 June 2017 as a base year, which takes into account the 2016 Census of Population and Housing. Three main sets of assumptions are produced, Series A (higher assumptions), Series B (medium assumptions) and Series C (lower assumptions).
    - : Please see table 2 in additional information for a comparison of projection assumptions.
- Over the next decade, the ABS projects Australia's population will grow by 4.2 million to 28.8 million people (Series B - medium assumptions). Australia's estimated resident population at 30 June 2017 was 24.6 million people.
  - The ABS' updated population projections project Australia's population to increase to between 37.4 million (Series C – lower assumptions) and 49.2 million (Series A – higher assumptions) people by 30 June 2066. The Series B – medium assumptions projection is for Australia's population to increase to 42.6 million people in 2066.
    - : By comparison, the ABS 2013 projections estimated Australia's population would reach 43.2 million people by the same point.
  - Over the projection period Australia's population growth is estimated to average between 0.9 and 1.4 per cent over the three series of projections. Australia's population increased by 1.7 per cent annually over the 10 years to 30 June 2017.
  - The Series B - medium assumption projects slightly slower population growth than the central case in the 2013 ABS projections. This is, in part, due to a lower NOM assumption of 225,000 per year, compared to 240,000 per year in the 2013 projections.
    - : Under all projections, the slowing in the pace of population growth over the projections reflects the assumption of flat NOM assumptions over the various projection horizons, which results in NOM having a smaller influence over time.
- Australia's population is expected to continue to age over the projection period, reflecting sustained below-replacement fertility levels combined with increasing life expectancy at birth.
  - The median age of Australia's population (37.2 years at 30 June 2017) is projected to increase to between 39.5 years and 43.0 years in 2066.

- The proportion of Australia's population aged 65 years and over is projected to increase from 15 per cent in 2017 to between 21 and 23 per cent in 2066.
    - The number of people aged 85 years and over is projected to grow rapidly, climbing from 2 per cent of the population (493,000 people) in 2017 to between 3.6 per cent (1.5 million people) and 4.4 per cent (2.2 million people) in 2066.
- Please see additional information for further details on fertility and mortality assumptions.

- Net Overseas Migration (NOM) is assumed to range between 175,000 to 275,000 persons per annum. The Series B - medium assumption is for NOM of 225,000 persons per annum, which is 15,000 lower than the central assumption used in the 2013 projections. The lower NOM assumption reflects the ten year average NOM to 2017, compared to the five year average NOM to 2012 used in the 2013 projections.
    - Because the NOM assumptions are a fixed number of people, over time NOM represents a smaller proportion of a growing pool of Australian residents.

- In addition to the three main projection series, the ABS also produced projections assuming zero NOM. Under this projection scenario, Australia's population is projected to peak at 26.4 million in 2039 before falling to 25.1 million in 2066, only slightly above current population levels.
    - Under a zero NOM assumption, Australia's median age in 2066 is 5.6 years higher (46.3 years vs 40.7 in Series B - medium assumptions projection. The proportion of Australians aged 65 years and over is projected to increase to 28 per cent.

- From a regional perspective, Australia's capital cities – especially the 5 major capitals – are projected to increase their share of Australia's population. Under the Series B medium assumptions projection, the share of Australia's population living in capital cities is projected to rise from 67.3 per cent at 30 June 2017 to 75.3 per cent in 2066.
    - Melbourne is again projected to be the largest city in Australia by 2066, with a projected population between 8.6 and 12.2 million people (4.8 million at 30 June 2017). NSW is projected to remain the most populous state.
    - Projections for Sydney's population in 2066 range from 8.5 to 11.2 million people (5.1 million at 30 June 2017). Brisbane's population is projected to increase to 4.2 to 5.8 million people in 2066 (2.4 million at 30 June 2017). Perth's population is projected to increase to 3.7 to 4.3 million people in 2066 (2.0 million at 30 June 2017).
- Please see additional information for further details on the latest projections, and comparisons to previous ABS projections and the 2015 Intergenerational Report (IGR).

s 22

Contact Officer: s 22 Phone: s 22

Senior Adviser
Macroeconomic Conditions Division
Phone: s 22

Consultation: Social Policy Division

ADDITIONAL INFORMATION

Comparison of population projections

- These new population projections are largely comparable to previous estimates and the 2015 IGR. At 2035, the Series B - medium assumptions projection is 31.8 million persons, compared to 32.0 million for both the IGR and 2013 ABS projections.
  - Australia's projected annual population growth over the projection period is also broadly similar.
- Compared to the previous ABS projection (2013), Australia's projected population at 2066 is 0.6 million persons lower in the current Series B - medium assumptions projection. This reflects a lower migration assumption in the 2016 medium scenario, despite the 2017 base year being higher than in the previous projection (see table 2 below).
- In addition to the three projection series, the ABS has also estimated a set of projections assuming zero NOM. Under the zero NOM projections, Australia's population is expected to be broadly unchanged over the projection period.
  - Whilst annual average annual population growth under a zero NOM projection is zero, during the first 22 years of the projection period Australia's population continues to grow, before the rate of natural population increase turns negative from 2039-40. (See below for further details on the zero NOM projection.)

Table 1: Comparison of Population Projections

	Jun-17 (Mn people)	Jun-35 (Mn people)	Jun-55 (Mn people)	Jun-66 (Mn people)	Average annual growth (%)[a]
ABS, 2018 (Medium)	24.6	31.8	38.8	42.6	1.1
Low (Series C)	24.6	30.5	35.2	37.4	0.9
High (Series A)	24.6	33.2	43.2	49.2	1.4
Zero NOM	24.6	26.3	25.9	25.1	0
ABS, 2013 (central)[b]		32	39.4	43.2	1.2
IGR, 2015[c]		32	39.7		1.3

a: 2018 ABS projection is annual growth from 2017 to 2066
b: 2013 ABS projection is annual growth from 2012 to 2066.
c: IGR annual growth is from 2015 to 2055
Source: ABS cat. no. 3222.0, 2015 IGR.

Key projection assumptions

- The ABS population projections are not predictions or forecasts. The projections illustrate the growth in the size, and changes in the composition, of Australia's population using a range of assumptions about future levels of fertility, mortality, overseas migration and internal migration over the projection period.

Table 2: Comparison of key assumptions and key outputs

	Total Fertility Rate	NOM	Median age (2054-55)	Share of population age 65 and over (2054-55) (per cent)
ABS, 2018 (central)	1.8	225,000	40	19.6
Low	1.65	175,000	42	21.3
High	1.95	275,000	38.8	19.2
Zero NOM	1.8	0	45.2	26.9
ABS, 2013 (central)	1.8	240,000	42.5	21.7
IGR, 2015	1.9	215,000	40.4	22.5

Source: ABS cat. no. 3222.0, 2015 IGR.

- ***Net Overseas Migration***: The NOM assumption for the Series B medium assumptions projection is 15,000 persons lower than the assumption used in the ABS 2013 projections.
  - At 225,000 persons per annum, the lower NOM assumption reflects the ten year average NOM to 2017, compared to the five year average NOM to 2012 used in the 2013 projections.
  - NOM assumptions in the projections are a fixed number of people. Holding the number of persons constant means that over the projection period NOM represents a smaller proportion of a growing pool of Australian residents.

- Under the zero NOM projection scenario, Australia's population is projected to reach just 25.1 million in 2066, or just 2.1 per cent higher than the 30 June 2017 level.
  - The zero NOM projection illustrates the differing impacts on Australia's demographic profile and population dispersion (see table 3 below).
  - Under the zero NOM projection Australia's median age in 2066 is 5.6 years higher (46.3 years vs 40.7 in the Series B - medium assumptions projection). Dependency is also higher, with the proportion of Australians aged 65 years and over projected to increase to 28 per cent (compared to 20.9 in the Series B medium assumptions projection).
  - With zero NOM, changes in population are driven by assumptions regarding natural increase. As noted earlier, with zero NOM Australia's population is projected to begin declining from 2039-40 onwards under the Series B medium assumptions for fertility and mortality.
  - Changes in the dispersion of Australia's population are a noticeable outcome under the zero NOM projection. Under the zero NOM projection Australia's capital cities are less dominant, relative to rest of state populations, however the population in all non-capital regions except 'rest of Queensland' are projected to shrink by 2066. The three projection series assume 83-84 per cent of NOM is destined for capital cities, despite those cities making up just over 67 per cent of the total population as at 30 June 2017.
    - Under the zero NOM assumption Sydney's population is projected to decline from 5.1 million at 30 June 2017 to 4.7 million in 2066 (falling 0.2 per cent per annum, on average). Sydney and Melbourne are expected to account for a similar proportion of the nation's population (40.6 per cent), but with a more dominant position for Melbourne compared to the Series B medium assumptions projection.

Table 3: Comparison of projections (Series B versus Zero NOM)

	30-Jun-17 (million)		Population (2065-66) (Series B)		Population (2065-66) (Zero NOM)	
	(Million)	% of total	(Million)	% of total	(Million)	% of total
Australia (a)	24.6	100	42.6	100	25.1	100
Capital cities	16.6	67.3	32.1	75.3	17.4	69.4
Sydney	5.1	20.9	9.7	22.9	4.7	18.6
Melbourne	4.8	19.7	10.2	23.9	5.5	22
Brisbane	2.4	9.8	4.8	11.4	3.1	12.3
Adelaide	1.3	5.4	1.8	4.3	1	4
Perth	2	8.3	4	9.5	2.2	8.6
Hobart	0.2	0.9	0.3	0.8	0.2	0.9
Darwin	0.1	0.6	0.3	0.8	0.2	0.8
Canberra	0.4	1.7	0.8	1.8	0.5	2.1
Rest of Australia	8	32.7	10.5	24.7	7.7	30.6
Rest of NSW	2.7	11.1	3.3	7.8	2.5	10.1
Rest of Vic	1.5	6	1.9	4.3	1.4	5.7
Rest of Qld	2.5	10.2	3.9	9.1	2.7	10.7
Rest of SA	0.4	1.6	0.4	0.9	0.3	1.1
Rest of WA	0.5	2.2	0.7	1.7	0.5	1.9
Rest of Tas	0.3	1.2	0.3	0.6	0.2	0.8
Rest of NT	0.1	0.4	0.1	0.2	0.1	0.3
Median age	37.2		40.7		46.3	
Aged 65 years and older (per cent)	3.8	15.4	8.9	20.9	7	28
Aged 85 years (per cent)	0.5	2	1.5	3.6	1.5	5.8
Aged less than 15 years (per cent)	4.6	18.9	7.4	17.3	3.8	15.2

(a) Includes Other Territories comprising Jervis Bay Territory, Christmas Island, the Cocos (Keeling) Islands and Norfolk Island.
Source: ABS cat. no. 3222.0.

- ***Fertility:*** The fertility assumption for the Series B medium assumptions projection is broadly similar to the assumption used in the ABS' 2013 projections, and is slightly below the 1.9 babies per woman assumed in the 2015 IGR.
  - At 1.8 babies per woman, the assumption is consistent with the average observed for the 2014-2016 period.
  - Fertility rate assumptions are projected to be between 1.65 (Series C – lower assumptions) to 1.95 (Series A – higher assumptions) babies per woman over the projection period, reflecting fertility levels recorded since 1977 of between 1.7 and 2.0 babies per woman.
  - All of the projection assumptions are below the replacement rate of 2.1 babies per woman. The last time Australia's fertility rate was above the replacement rate was 1975.
    - As a result, the complete range of projections series have Australia's population growth from natural increase turning negative at differing points throughout the projection horizon.
    - The lower bound (Series C – lower assumptions) assumption is higher than OECD fertility rate estimates for many European countries, and higher-income Asian countries such as Singapore, Japan and the Republic of Korea.
- ***Mortality:*** Only two assumptions have been chosen for life expectancy at birth, as life expectancy has consistently shown an improving trend since Australian records began.
  - The higher life expectancy at birth assumption incorporates improvements in life expectancy at the average observed rate in 2012-16. The Series B - medium assumptions projection incorporates some slowing in the pace of improvements, consistent with 2014-16 observations.

- Average life expectancy at birth is expected to continue to increase, albeit at a slightly slower pace, in line with recent trends. Under the Series B medium assumptions projection male life expectancy at birth is assumed to reach 83 years (80.4 years over 2014-2016) and female life expectancy at birth would reach 86 years (84.6 years over 2014-16) in 2066.

- All three projection series incorporate an increase in average life expectancy at birth. The increase for males is faster than females, reflecting recent trends.

- Since the early 1920s life expectancy at birth for both males and females has increased by about 21 years. The ABS notes that since the 1980s, faster increases for males has narrowed the gap between male and female life expectancy at birth from 7 to 4 years.

  : This gap is assumed to decline further, to between 1.5 – 3 years.

- Over the decade to 2016 mortality rates for males aged 0-29, males aged 65-79 and females aged 0-9 have had the largest declines.

Regional population projections

- In addition to national aggregates, the projections also contain regional population estimates. These include projections for the capital cities and rest of state regions (see table 4 below)

- Melbourne is again projected to become Australia's largest city, with a projected population of 10.2 million in 2066 (range of 8.6 million to 12.2 million). Under the Series B medium assumptions Melbourne's population is projected to exceed Sydney's from 2036-37 onwards.

- Australia's capital cities are projected to grow faster than the rest of Australia, with average growth of 1.4 per cent for the capitals, compared to 0.5 per cent for non-capital regions.

  - Queensland is projected to remain the most decentralised mainland state, with Brisbane projected to account for 55.5 per cent of the state's population in 2066, compared to 49 per cent at 30 June 2017.

- NSW is projected to remain Australia's most populous state, with a population of 13.1 million in 2066 (11.8 million to 14.8 million). However, the state's share of national population is set to decline to 30.7 per cent in 2066, from 32 per cent at 30 June 2017.

  - Victoria is projected to be the fastest growing state, with the population projected to increase by more than 90 per cent (1.3 per cent annual average) between 30 June 2017 and 2066. This is closely followed by Western Australia, with projected growth of 84.8 per cent (1.3 per cent annual average).

Table 4: Regional population estimates (Series B medium assumptions projection)

	Population (2017)	Population (2034-35)	Population (2065-66)	Average annualised growth rate (2017-2066)
	(million)	(million)	(million)	(per cent)
Australia (a)	24.6	31.8	42.6	1.1
Capital cities	16.6	22.5	32.1	1.4
Sydney	5.1	6.9	9.7	1.3
Melbourne	4.8	6.9	10.2	1.5
Brisbane	2.4	3.3	4.8	1.4
Adelaide	1.3	1.5	1.8	0.7
Perth	2	2.7	4	1.4
Hobart	0.2	0.3	0.3	0.7
Darwin	0.1	0.2	0.3	1.7
Canberra	0.4	0.6	0.8	1.3
Rest of Australia	8	9.3	10.5	0.5
Rest of NSW	2.7	3.1	3.3	0.4
Rest of Vic	1.5	1.7	1.9	0.5
Rest of Qld	2.5	3.1	3.9	0.9
Rest of SA	0.4	0.4	0.4	-0.1
Rest of WA	0.5	0.6	0.7	0.6
Rest of Tas	0.3	0.3	0.3	-0.3
Rest of NT	0.1	0.1	0.1	0.1

(a) Includes Other Territories comprising Jervis Bay Territory, Christmas Island, the Cocos (Keeling) Islands and Norfolk Island.
Source: ABS cat. no. 3222.0.

Recent ABS data releases

Australian Bureau of Statistics

- *Australian Demographic Statistics, June 2018*
- *Population Projections, Australia, 2017 (base) – 2066*
- *Births, Australia, 2017*
- *Deaths, Australia, 2017*
- *Life Tables, States, Territories and Australia, 2015-2017*

Population Projections, 2017 (base) - 2066

Australian Bureau of Statistics

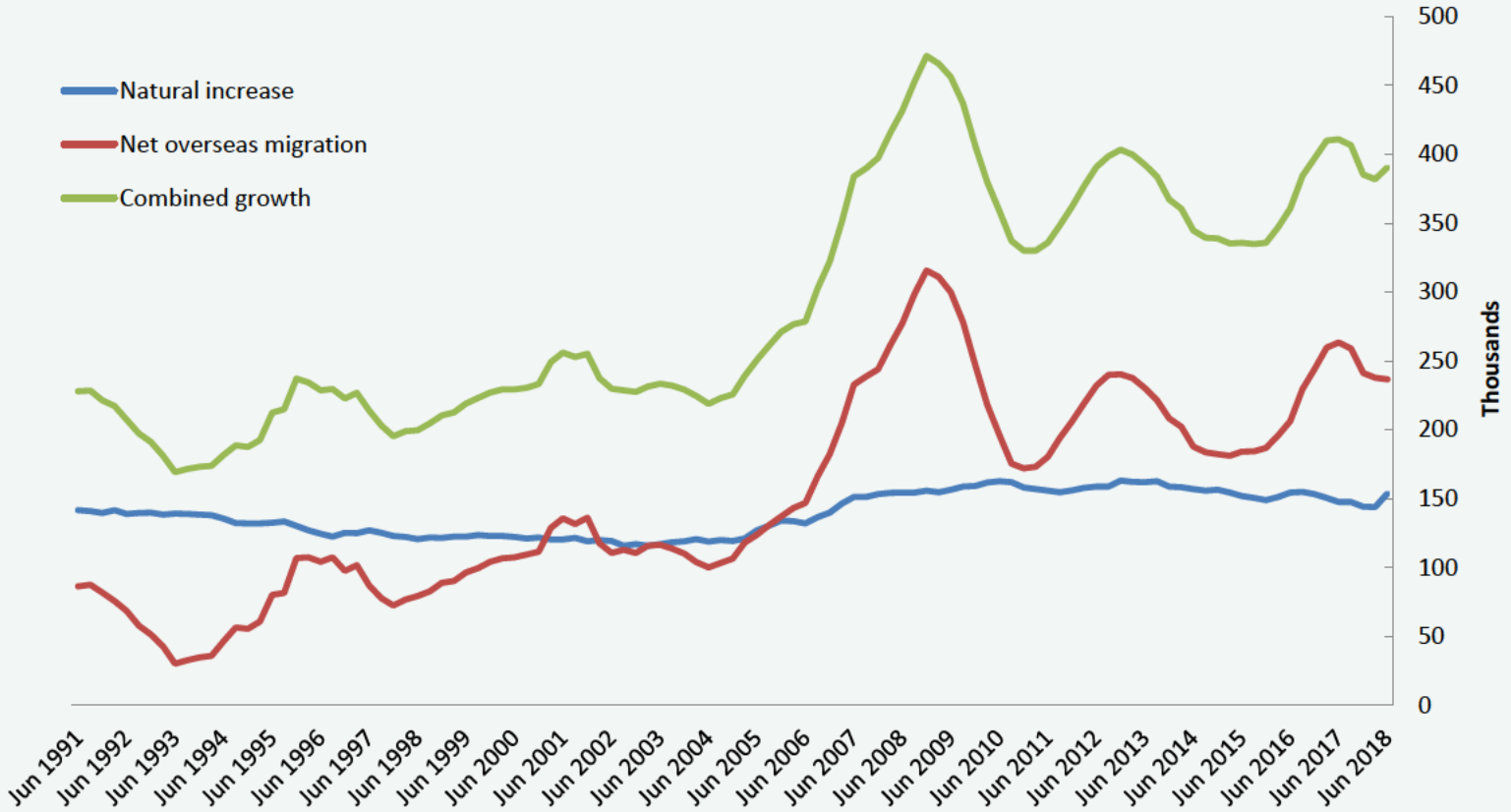
- Inputs are a range of assumptions of fertility, mortality and migration
- 72 permutations of the population component assumptions, resulting in 72 projected population series.
- Provides inputs for customised projections, replacing *Population Projections, 2012 (base) – 2101.*

Australian Demographic Statistics, June 2018

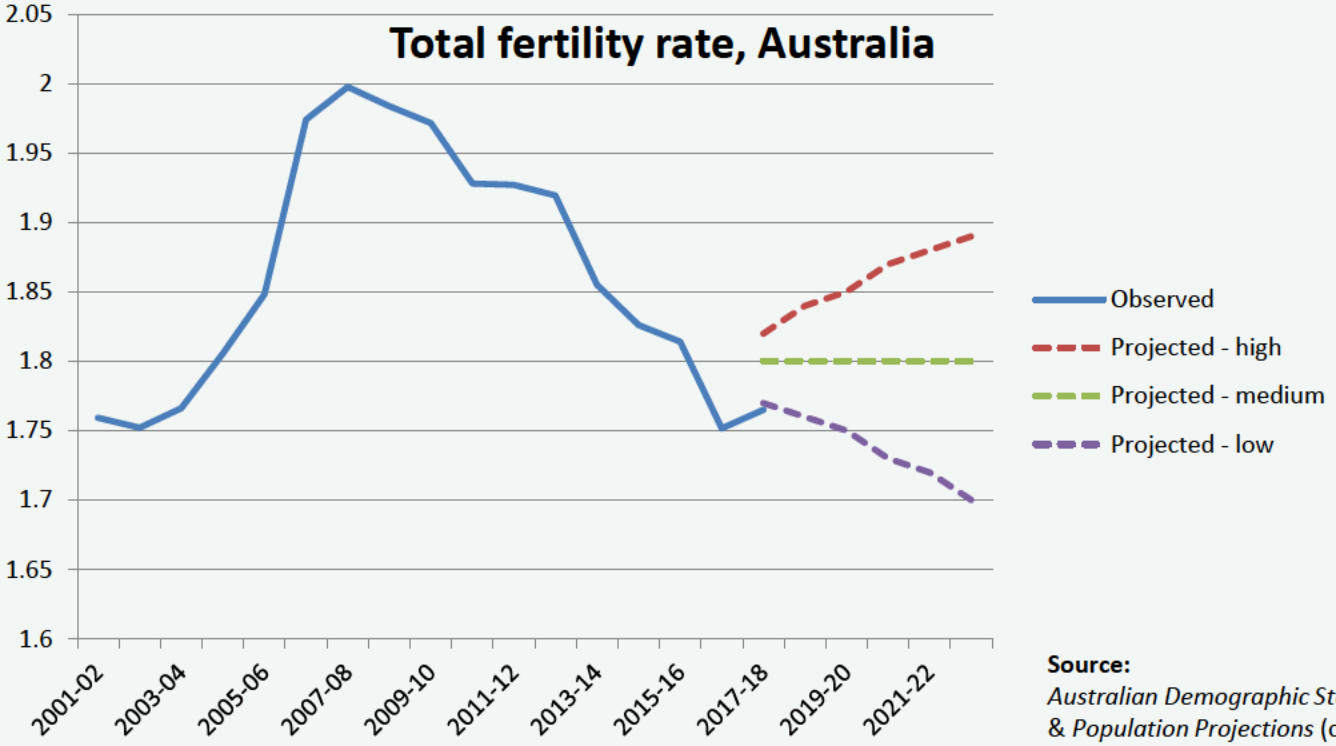
Australian Bureau of Statistics

- Includes population, births, deaths, interstate migration and overseas migration
- Feature article summarising Australia's ageing population over the last 20 years
- Feature article on overseas migration
- Preliminary fertility and mortality rates for the 2017-18 financial year

Components of annual population growth

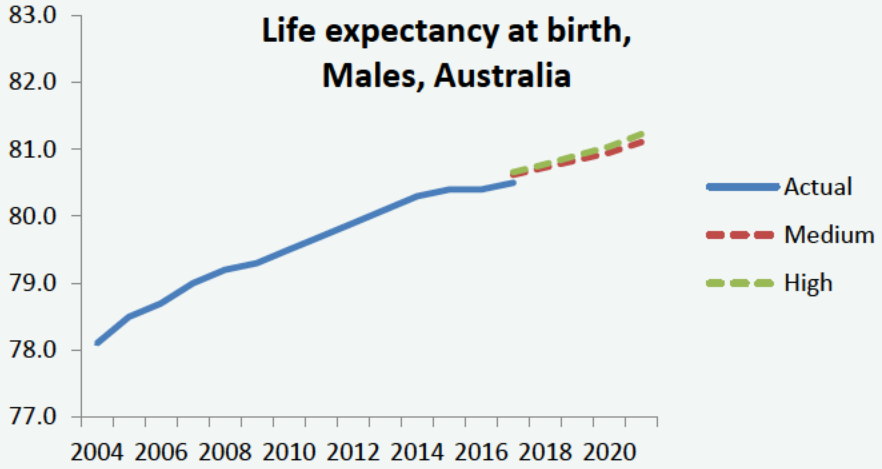


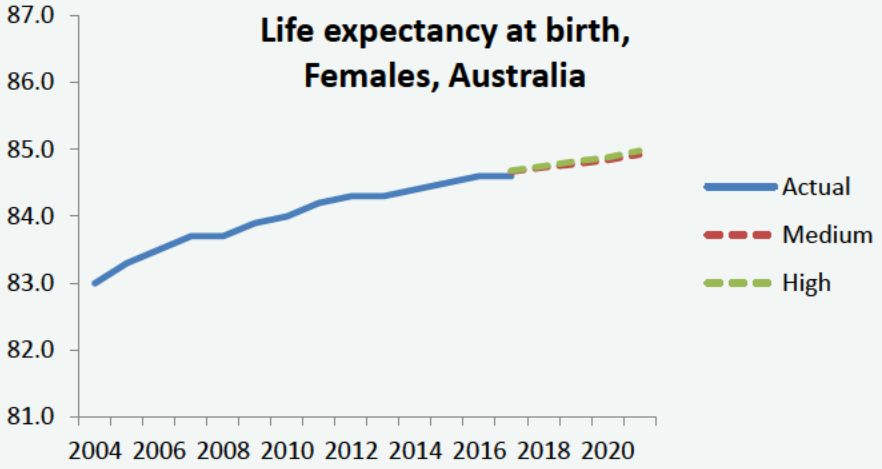
Fertility



Source:
Australian Demographic Statistics (cat. no. 3101.0)
& *Population Projections* (cat. no. 3222.0)

Mortality

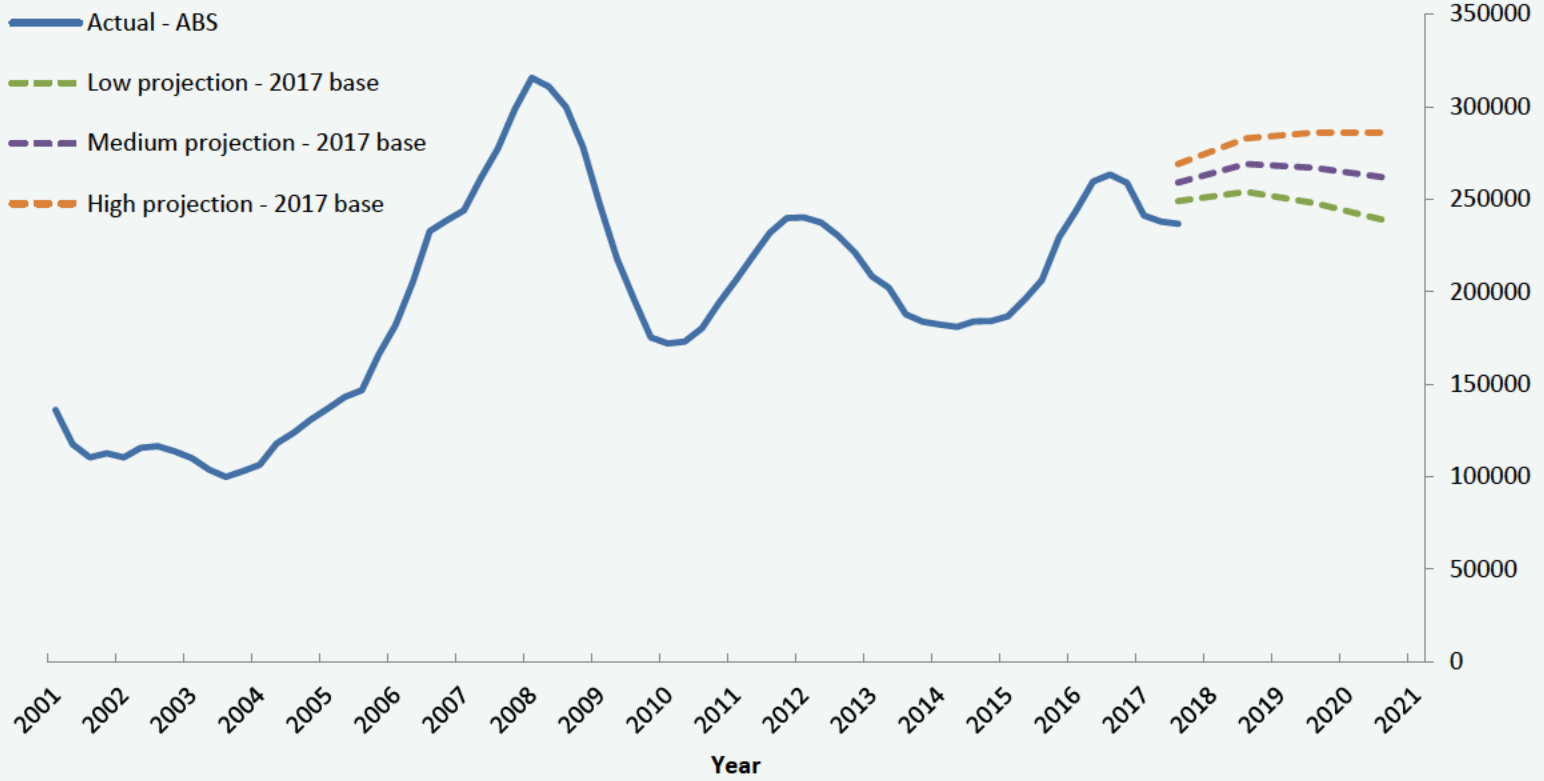

Life expectancy at birth, Males, Australia
83.0
82.0
81.0
80.0
79.0
78.0
77.0
2004 2006 2008 2010 2012 2014 2016 2018 2020
Actual
Medium
High


Life expectancy at birth, Females, Australia
87.0
86.0
85.0
84.0
83.0
82.0
81.0
2004 2006 2008 2010 2012 2014 2016 2018 2020
Actual
Medium
High

Net interstate migration

	Observed ('000)				Weighted average ('000)
State	**2015**	**2016**	**2017**	**2017-18**	**2015-17**
NSW	-8.9	-13.0	-19.3	-21.7	-16.0
Vic.	13.9	18.9	16.4	14.3	16.8
Qld	8.7	15.0	22.5	24.7	18.4
SA	-5.8	-7.7	-6.0	-5.2	-6.5
WA	-6.6	-13.1	-12.8	-11.3	-12.0
Tas.	0.6	1.2	1.9	2.4	1.5
NT	-2.0	-2.5	-3.3	-3.8	-2.9
ACT	0.0	1.2	0.7	0.6	0.7

Net overseas migration



Net overseas migration – state share

	Observed (%)				Weighted average (%)
State	**2015**	**2016**	**2017**	**2017-18**	**2015-17**
NSW	39.0	39.5	39.0	35.3	39.1
Vic.	34.4	34.0	35.6	34.9	35.0
Qld	10.4	13.3	11.7	15.3	12.0
SA	6.0	5.0	5.1	5.2	5.2
WA	6.8	4.9	5.3	5.6	5.4
Tas.	0.8	0.9	1.0	0.8	1.0
NT	0.8	0.9	0.5	0.8	0.6
ACT	1.8	1.6	1.8	2.1	1.7

Upcoming ABS demography releases

- *Household and Family Projections, Australia, 2016 to 2041*
  - Release on 14 March 2019

- *Australian Demographic Statistics, September 2018*
  - Release on 21 March 2019
  - Population at 30 Sep 2019
  - Components of population growth quarter ending 30 Sep 2019

Australian Government
The Treasury

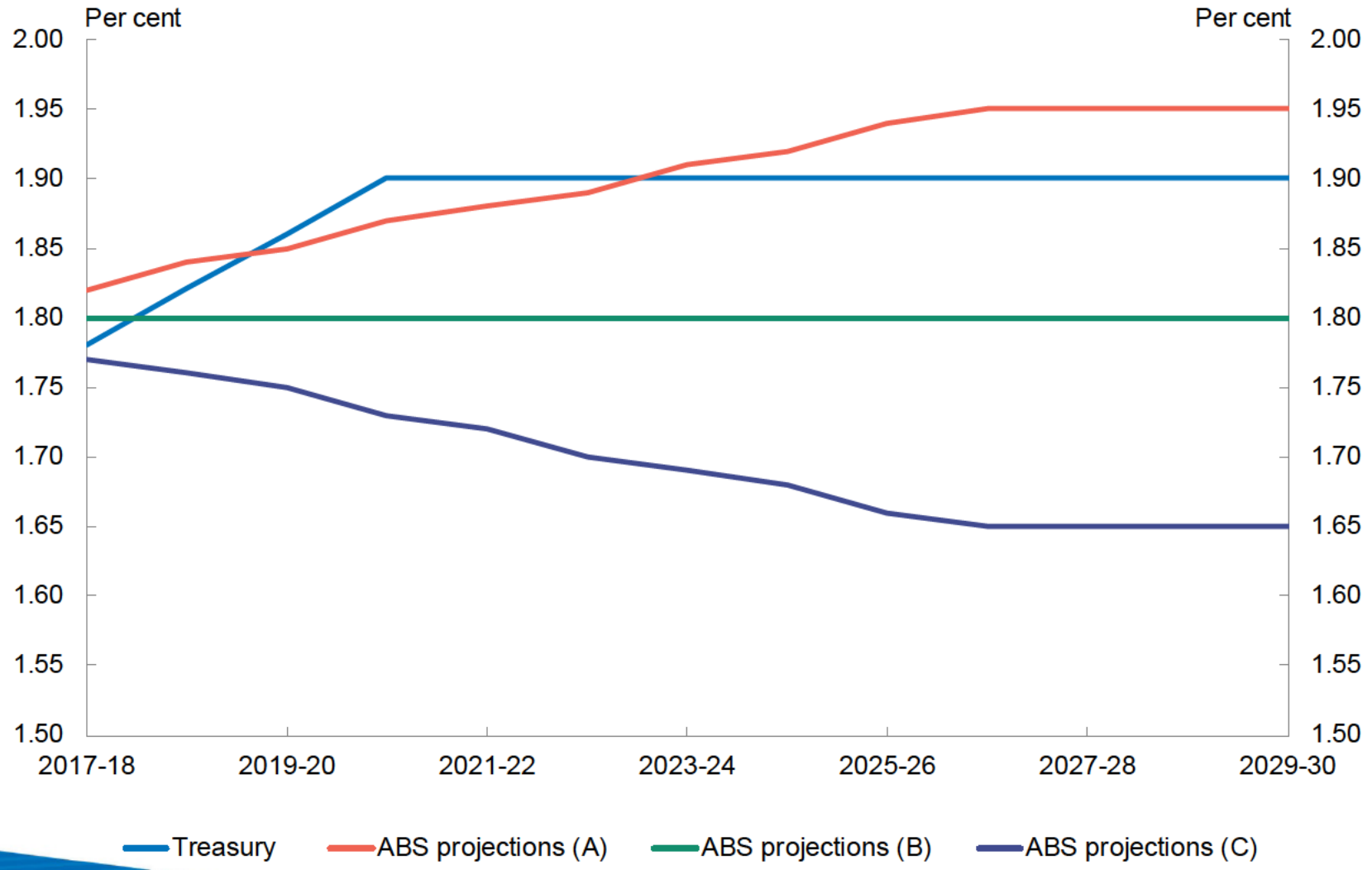
FOI 2514
Document 3

TSY/AU

Population Roundtable

21 January 2019

Fertility - comparison



Mortality - methodology

- Follows the 2015 IGR methodology
  - Assumes ongoing improvements to mortality
  - Uses historical improvements as a guide for future improvements
    - Based on 25 and 40 year improvement rates

Mortality - comparison

- 2015 IGR assumes greater improvements in mortality than recent ABS projections

Table: Comparison of life expectancy

	Male	Female	Year
2015 IGR	95.1	96.6	2055
2013 ABS (central)	85.2	88.3	2061
2013 ABS (low)	92.1	93.6	2061
2018 ABS (central)	83.0	86.0	2065-66
2018 ABS (low mortality)	87.7	89.2	2065-66

FOI 2509
Document 4

From: s 22
To:
Cc: Demography Section WDB; s 22
Subject: RE: Population update for Budget 19-20 [DLM=For-Official-Use-Only]
Date: Tuesday, 5 February 2019 4:21:12 PM
Attachments: Projections method for Treasury.docx

Hi s 22

I've put together a summary of the method and assumptions for the projection, updated from previous years. I've noted where we are waiting on your new assumptions. The main thing to note is the fact that this time around we are producing the projections earlier, and so don't have the 30 September 2018 population available. Please let me know if this is as expected, or if you have any queries.

(See attached file: Projections method for Treasury.docx)

Kind regards,
s 22

's 22 " ---01/02/2019 03:05:36 PM---RE: Population update for Budget 19-20 [DLM=For-Official-Use-Only] (Response to:)

RE: Population update for Budget 19-20 [DLM=For-Official-Use-Only] (Response to:)
Demography 2011+ WDB s 22 " 01/02/2019 03:05 PM

*

Basics

s 22 @treasury.gov.au 01/02/2019 03:05 PM

Send To	"s 22 @abs.gov.au>
cc	s 22 @TREASURY.GOV.AU>, s 22 @TREASURY.GOV.AU>, s 22 @treasury.gov.au>, s 22 @abs.gov.au>, s 22 @abs.gov.au>, "Demography Section WDB" <demography@abs.gov.au>
Subject	RE: Population update for Budget 19-20 [DLM=For-Official-Use-Only]
Protective Mark	
Categories	Requests* Treasury
Visibility	Limited Readers
Editors	s 22 /Staff/ABS, [Wkgroup], DemographyGeneral, PEP team, s 22 /Staff/ABS, s 22 /Staff/ABS, s 22 /Staff/ABS, s 22 /Staff/ABS, s 22 /Staff/ABS, s 22 /Staff/ABS
Readers	s 22 /Staff/ABS, DemographyGeneral, PEP team, s 22 /Staff/ABS, s 22 /Staff/ABS, s 22 /Staff/ABS, s 22 /Staff/ABS, s 22 /Staff/ABS, s 22 /Staff/ABS, s 22 /Staff/ABS
Document Id	DCOO-B8Y6UL

Hi s 22

Unfortunately we won't be able to provide you with assumptions today but we will try to get you something early next week.

Please let me know if there are any issues with this.

Kind regards,

s 22
National Accounts Unit
Macroeconomic Conditions Division
The Treasury, Langton Crescent, Parkes ACT 2600
Phone: +61 2 s 22
Email: s 22 @treasury.gov.au

From: s 22 @abs.gov.au]
Sent: Friday, 25 January 2019 2:03 PM
To: s 22
Cc: s 22 Demography Section WDB
Subject: RE: Population update for Budget 19-20 [DLM=For-Official-Use-Only]

Thanks s 22 that suits fine.

Cheers,
s 22

Demography | **Australian Bureau of Statistics**

(P) (02) s 22

(E) s 22 @abs.gov.au (W) www.abs.gov.au

s 22 ---25/01/2019 02:00:22 PM---Hi s 22 We should be able to give you assumptions by the end of next week.

From: s 22 @treasury.gov.au>
To: s 22 treasury.gov.au>
Cc: s 22 @abs.gov.au>, s 22 @TREASURY.GOV.AU>, s 22 @TREASURY.GOV.AU>
Date: 25/01/2019 02:00 PM
Subject: RE: Population update for Budget 19-20 [DLM=For-Official-Use-Only]

Hi s 22

We should be able to give you assumptions by the end of next week.

s 22 – does this suit your timeframe?

Regards,
s 22

From: s 22
Sent: Friday, 25 January 2019 1:57 PM
To: s 22
Cc: s 22
Subject: RE: Population update for Budget 19-20 [DLM=For-Official-Use-Only]

Hi s 22

We are aiming to getting population data from the ABS on **18 Feb.**

Could you please liaise with s 22 for a time that would enable us to meet this deadline?

Cheers,
s 22

From: s 22 @abs.gov.au]
Sent: Friday, 25 January 2019 1:34 PM
To: s
Subject: RE: Population update for Budget 19-20 [DLM=For-Official-Use-Only]

Hi s 22

Thanks for letting me know, we'll aim for 18 Feb and let you know how we are going. Do you know when you will be able to provide the assumptions by?

s 22

Demography | **Australian Bureau of Statistics**

(P) (02 s 22

(E s 22 @abs.gov.au (W) www.abs.gov.au

s 22 ---25/01/2019 01:30:17 PM---Hi s 22 Thanks for the email. I will arrange the sign off for you.

From: s 22 @treasury.gov.au>
To: "s 22 @abs.gov.au>
Date: 25/01/2019 01:30 PM
Subject: RE: Population update for Budget 19-20 [DLM=For-Official-Use-Only]

Hi s 22

Thanks for the email. I will arrange the sign off for you.

I have just found out that the CBMS system closes for data entry on 22 Feb. This would make the population input deadline of 20 Feb rather tricky.

I know you have a fair bit on but would be very grateful if we could receive the data on a few days earlier, on 18 Feb.

Let me know if this works.

Regards,
s 22

From: s 22 @abs.gov.au]
Sent: Friday, 25 January 2019 12:18 PM
To: s 22
Cc: Demography Section WDB; FG Federal Finances Unit; s 22
Subject: Re: Population update for Budget 19-20 [DLM=For-Official-Use-Only]

Hi s 22

Here is the agreement for the customised population projections. As agreed, we will provide them by 20/2/2019. If you are happy with it, please sign, scan and return by email.

(See attached file: CR-20190123-141731-nm.pdf)

Please also advise on population component assumptions, as per previous instances - net overseas migration for Aust and state share, total net interstate migration by state, total fertility rate for Australia, and a mortality assumption as published in the latest *Population Projections, Australia* (ABS cat. no. 3222.0). We will need the assumptions by 12/2/2019 at the latest.

Kind regards,
s 22

s 22 --22/01/2019 05:27:36 PM---Thanks s 22 I'll prepare a quote shortly. Kind regards,

*

Basics

s 22 /Staff/ABS 22/01/2019 05:27 PM

Send	To	's 22 @treasury.gov.au>
	cc	"FG Federal Finances Unit" <FGFFU@TREASURY.GOV.AU>, s 22 @abs.gov.au>, s 22 @treasury.gov.au>, s 22 @abs.gov.au'" s 22 @abs.gov.au>, Demography Section WDB@ABS

Subject	Re: Population update for Budget 19-20 [DLM=For-Official-Use-Only]
Protective Mark	
Categories	Requests* Treasury
Visibility	Limited Readers
Editors	s 22 /Staff/ABS, [Wkgroup], s 22 /Staff/ABS, DemographyGeneral, PEP team, s 22 /Staff/ABS, s 22 /Staff/ABS, s 22 /Staff/ABS, s 22 /Staff/ABS, s 22 /Staff/ABS, s 22 /Staff/ABS
Readers	s 22 /Staff/ABS, DemographyGeneral, PEP team, s 22 /Staff/ABS, s 22 /Staff/ABS, s 22 /Staff/ABS, s 22 /Staff/ABS, s 22 /Staff/ABS, s 22 /Staff/ABS, s 22 /Staff/ABS
Last modified	22/01/2019 05:42:41 PM By s 22 /Staff/ABS

Document Id	DCOO-B8N9MG

Thanks s 22 I'll prepare a quote shortly.

Kind regards,
s 22

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(P) (02) s 22

(E) s 22 @abs.gov.au (W) www.abs.gov.au

's 22 " ---22/01/2019 12:42:53 PM---Hi s 22 Treasury seeks your assistance in preparing population estimates and projections for Austral

From: 's 22 @treasury.gov.au>
To: s 22 @abs.gov.au>
Cc: "FG Federal Finances Unit" <FGFFU@TREASURY.GOV.AU>, 's 22 @treasury.gov.au>, s 22 @abs.gov.au>, s 22 @abs.gov.au s 22 @abs.gov.au>
Date: 22/01/2019 12:42 PM
Subject: Population update for Budget 19-20 [DLM=For-Official-Use-Only]

Hi s 22

Treasury seeks your assistance in preparing population estimates and projections for Australia and the States and Territories to be used during 2019. We will send also through the relevant information from Treasury's end

Our requirements are:

- an assumption-based projection of the population of Australia disaggregated by age, gender and State/Territory as at 31 December 2018; and;
- projections of the population of Australia disaggregated by age, gender and State/Territory as at 31 December 2019, 2020, 2021 and 2022.

This input will be used for the 2019-20 Budget. Consequently, as discussed, we would appreciate receiving this input by **20 February 2019**.

In addition, the *Federal Financial Relations Act 2009* requires the Australian Statistician to make a determination of the population of each State and Territory as at 31 December 2018 before 31 August 2019. Calculation of GST revenue provision to each State and Territory and the calculation of National Specific Purpose Payments for 2018-19 will utilise that determination. Grateful if the determination estimates are provided before **30 June 2019**. Upon the making of this determination could we also request that we be provided with population of Australia disaggregated by age, gender and State as at 31 December 2018 to calculate growth in population weighted for hospital utilisation.

By **31 August 2019**, we will also require updated projections of the population of Australia disaggregated by

age, gender and State/Territory as at 31 December 2019, 2020, 2021, 2022 and 2023 to update estimates for the 2019-20 Mid-Year Economic and Fiscal Outlook (MYEFO).

The Budget and MYEFO population projections should be consistent with assumptions provided by the Australian Treasury, and latest available Census and other population data which underpin the population estimates used for the Statistician's determination.

I would be grateful if you could advise us as to whether the ABS would be able to provide these data by the dates we have requested, and also provide an agreement to proceed with a GST exclusive quote.

Regards

s 22
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Commonwealth-State Relations Division | Fiscal Group
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FOI 2509
Document 5

Projection Method

The method employed for projecting the state and territory populations is the cohort-component method, widely accepted as the best way of producing age/sex population projections. It involves applying annual fertility and mortality rates and internal migration and overseas migration by age and sex to the base population to produce a projected population, which then became the base for projecting the next year and so on. This cycle is repeated until the projection horizon is reached.

All states and territories are independently projected, then constrained to sum to the Australian-level projection (by age and sex).

Overall Approach

ABS Demography takes the latest available demographic data and constructs population projections using assumptions that are based on recently observed trends. It is ultimately Treasury's responsibility to determine the assumptions used in the projections, including future State and Territory distributions of interstate and overseas migration.

Base Population

The required base population is as at 31 December 2018, which will not be published until June 2019. The base population is produced by combining:

(i) Assumed levels of births, deaths, net interstate migration and net overseas migration for the September quarter 2018, based on recent trends and historical September seasonality

- Births and deaths: the average difference between September quarter counts and ((March counts + June counts) / 2) over the past 3 years (2015-17). Add this difference to ((March '18 counts + June '18 counts) / 2).
- Interstate migration: 4:2:1 weighted average of 2017, 2016 and 2015 September quarter arrivals and departures
- Overseas migration: September quarter assumption provided by Treasury

s 22

(ii) Assumed levels of births, deaths, net interstate migration and net overseas migration for December quarter 2016 based on recent trends and historical December seasonality

- Births and deaths: see method for Sep '18 quarter, but referencing one quarter ahead.
- Interstate migration: see method for Sep '18 quarter, but referencing December quarters.
- Overseas migration: December quarter assumption provided by Treasury

s 22

s 22

Assumptions for projected population at 31 Dec 2019 - 2022

- Fertility and mortality based on medium assumptions from *Population Projections, Australia, 2017 (base) - 2066* (ABS cat. no. 3222.0)
- Total net overseas migration based on HA forecasts, with state shares determined by a 4:2:1 weighted average of state share for the last 3 calendar years with complete data (2015-17)
- Net interstate migration to be the 4:2:1 weighted average of last 3 calendar years with complete data (2015-17)

Commented S : A placeholder. Note that while ABS expect an assumed total fertility rate for Australia, there is no equivalent adjustment for mortality. In the past, projections for Budget and MYEFO have used a mortality assumption as defined in the ABS publication 3222.0.

FOI 2509
Document 6

From: s 22
To:
Cc:
Subject: RE: Population check [DLM=For-Official-Use-Only]
Date: Thursday, 21 March 2019 9:18:21 AM

Hi s 22

Yes, that's correct.

s 22

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(P) (02) s 22

(E) s 22 @abs.gov.au (W) www.abs.gov.au

's 22 " ---20/03/2019 05:48:08 PM---Hi s 22 Thanks for getting back to me so quickly. Based on your amended paragraph, we have drafted

From: s 22 @treasury.gov.au>
To: s 22 abs.gov.au>
Cc: s 22 @TREASURY.GOV.AU>, s 22 @TREASURY.GOV.AU>, s 22 @TREASURY.GOV.AU>, s 22 @treasury.gov.au>
Date: 20/03/2019 05:48 PM
Subject: RE: Population check [DLM=For-Official-Use-Only]

Hi s 22

Thanks for getting back to me so quickly. Based on your amended paragraph, we have drafted the following:

"The mortality assumptions are based on the medium assumptions used in the ABS Population Projections, Australia, 2017-2066 (cat. no. 3222.0). In these assumptions, life expectancy is projected to improve over time, but at a declining rate. The difference between life expectancies across the States and Territories is assumed to persist."

Could you please let me know if this is correct by lunchtime tomorrow. Apologies for the short turnaround.

Kind regards,
s 22

From: s 22 @abs.gov.au]
Sent: Wednesday, 20 March 2019 3:45 PM
To: s 22
Cc: s 22
Subject: RE: Population check [DLM=For-Official-Use-Only]

Hi s 22

Regarding the mortality assumption, here's some text from the ABS website:

"The higher life expectancy at birth assumption assumes that life expectancy will continue

to improve at the average rate observed in 2012-2016. The medium life expectancy at birth assumption assumes that life expectancy will also improve, but at a declining rate."

"The medium life expectancy assumption assumes male and female life expectancy at birth will increase at a slightly lower rate than the higher assumption for the first year, and then gradually slow. Based on this assumption, male life expectancy at birth would reach 83.00 years and female life expectancy at birth would reach 86.00 years in 2066."

I've amended your paragraph below to include this. You could add the actual assumed life expectancy at birth for 2020-21 (81.1 for males, 84.9 for females) and compare that to the base year data (2017: 80.5 for males, 84.6 for females) - but that is probably too much detail. While life expectancy and mortality rates are two side of the same coin, for simplicity I have only described the assumption in terms of the former.

The mortality assumptions are based on the medium assumptions used in the ABS *Population Projections, Australia, 2017-2066* (cat. no. 3222.0). Life expectancy is expected to improve over time, as has been the case, but at a declining rate. The historical average difference between state/territory life expectancy and Australian life expectancy is assumed to be constant.

The paragraph on interstate migration is correct.

Cheers,
s 22

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(P) (02) s 22

(E s 22 @abs.gov.au (W) www.abs.gov.au

's 22 " ---20/03/2019 03:14:04 PM---Hi s 22 Thanks for your comments. Would you be able to let us know what the correct words for the m

From: s 22 @treasury.gov.au>
To: s 22 @abs.gov.au>
Cc: s 22 @TREASURY.GOV.AU>, s 22 @TREASURY.GOV.AU>, s 22 @treasury.gov.au>, s 22 @TREASURY.GOV.AU>
Date: 20/03/2019 03:14 PM
Subject: RE: Population check [DLM=For-Official-Use-Only]

Hi s 22

Thanks for your comments. Would you be able to let us know what the correct words for the mortality section should be. The text s 22 sent you previously is as follows:

"The mortality assumptions are based on the medium assumptions used in the ABS Population Projections, Australia, 2017-2066 (cat. no. 3222.0). In these assumptions, a continuing decline in mortality rates across Australia, with state differentials persisting, is assumed. Overall, life expectancy is assumed to improve to the year 2016 and then continue to increase at declining rates over the projection period."

Would you also be able to check that the following section on interstate migration is correct:

"Similar to state shares of net overseas migration, the Treasury's estimates of net interstate migration are based on a weighted average of the three most recent observed years — 2015, 2016 and 2017 — with weights of one, two and four respectively. Due to data lags, the 2018 observation includes an assumption for the September and December quarters based on weighted averages of arrivals and departures for the September and December quarters 2015 to 2017."

Unfortunately we're on quite a tight timeline so it would be greatly appreciated if you could get back to me by lunchtime tomorrow. Please let me know if this will be an issue.

Kind regards,
s 22

From: s 22 @abs.gov.au]
Sent: Tuesday, 19 March 2019 4:12 PM
To: s 22
Subject: Re: Population check [SEC=UNCLASSIFIED]

Hi s 22

Please see my comments, added to the document. I sent the paper on method on 5/2, which describes how the population component data for the Sep and Dec 2018 quarters are created, but I have added to it here with the total net interstate migration figures for the 2018 calendar year.

(See attached file: Bp3 population check.docx)(See attached file: Projections method for Treasury.docx)

Kind regards,
s 22

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(E) s 22 @abs.gov.au (W) www.abs.gov.au

s 22 " ---19/03/2019 01:26:14 PM---Hi s 22 I hope this email comes through. Sorry, previous versions have bounced back

From: s 22 @treasury.gov.au>
To: s 22 @abs.gov.au>
Date: 19/03/2019 01:26 PM
Subject: Population check [SEC=UNCLASSIFIED]

Hi s 22

I hope this email comes through. Sorry, previous versions have bounced back

I am attaching our draft for Appendix A Parameters and Further Information and would be grateful if you could please review some text that I have marked. Of course, please not that this is a budget document and should not be distributed widely.

In particular, could you please cast your eyes over the mortality and NIM sections? Of course please let me know if anything else stands out, like the ABS catalogue reference in Further Information.

Regards,
s 22

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FOI 2509
Document 7

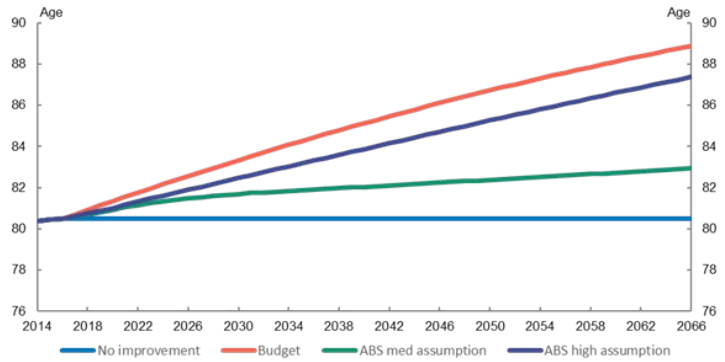
From: s 22
To:
Cc:
Subject: s 22 [SEC=PROTECTED]
Date: Tuesday, 7 May 2019 12:52 50 PM
Attachments: image006.png
image003.png
image007.png

Hi s

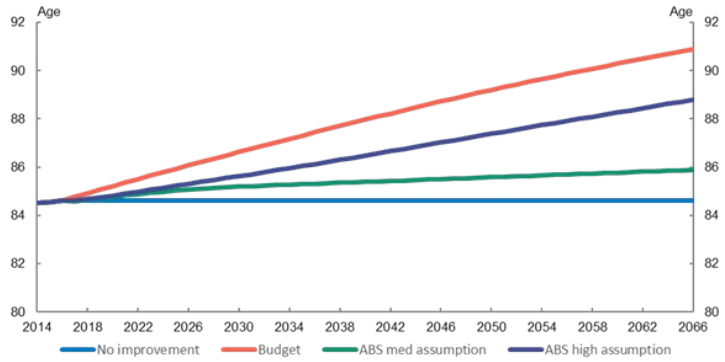
s 22

Also, I've done some charts which compare the Budget life expectancy with the no improvement and the ABS medium and high assumption.

Male life expectancy at birth



Female life expectancy at birth



Regards

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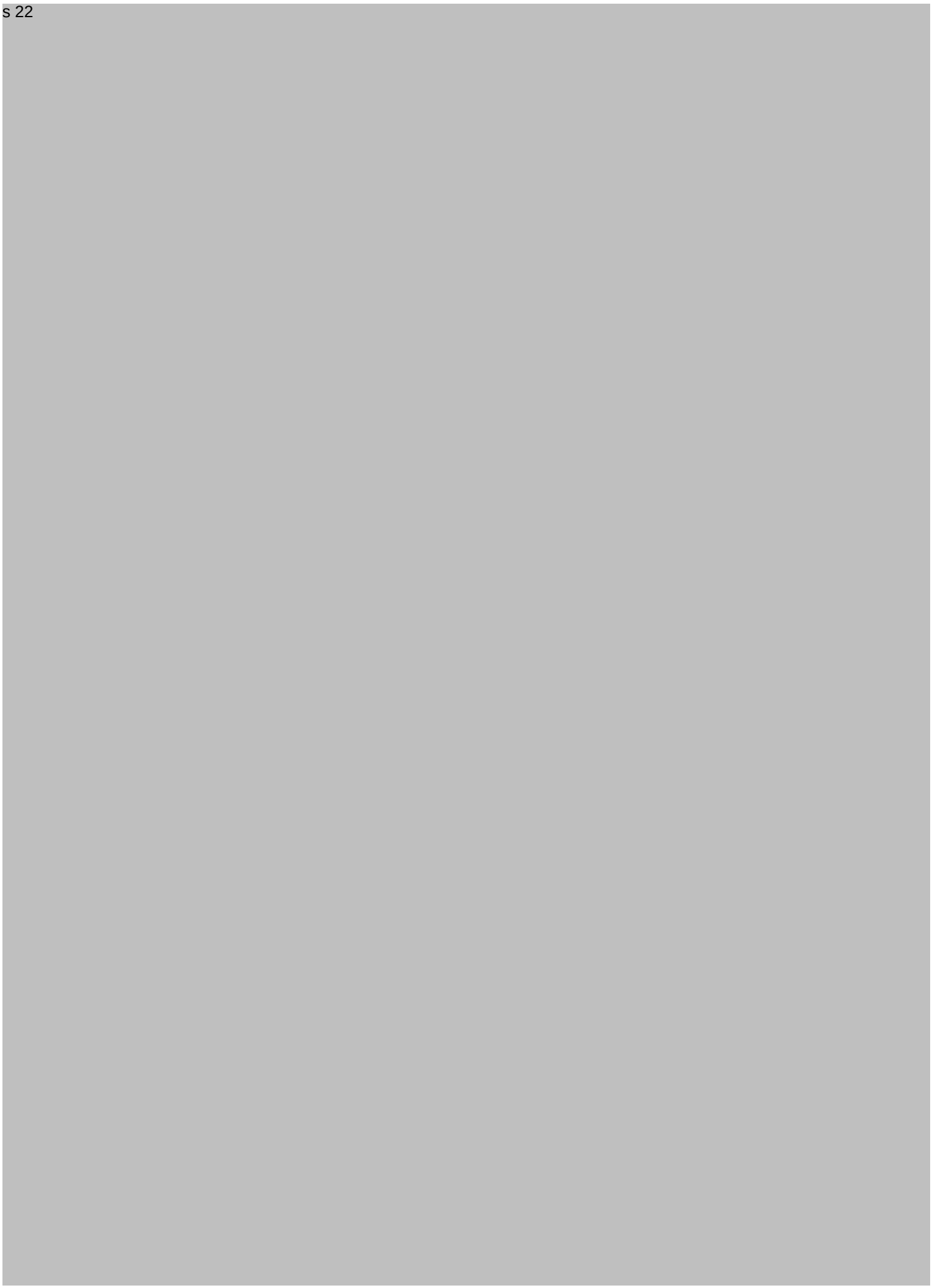

s 22