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Closing the Gap on Indigenous Life Expectancies: What if we succeed?

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1. RESEARCH AIM

- To model the demographic impacts of success in closing the gap on Indigenous life expectancies within a generation.
- This research brief uses population projections modelling to compare and contrast demographic outcomes from varying future Indigenous life expectancies in the Northern Territory, including the scenario of success in the COAG target of 'closing the gap' within a generation.
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2. KEY FINDINGS

- Success in closing the gap will not add dramatically to the total Indigenous population of the NT, but will substantially alter Indigenous age-sex compositions.
- For both males and females, the projected increase in the population aged over 60 years is significant in absolute and percentage terms, growing by 281 percent under success in closing the gap, by 235 per cent if current life expectancy trends persist, and by 193 per cent if life expectancies remain at 2010 estimates.
- While age dependency ratios will increase over time, economic dependency ratios will fall initially before increasing significantly as total fertility rates decline over time.
- We can expect the pace of changes in Indigenous life expectancies to vary greatly across space and time.

3. INTRODUCTION

In 2007-2008 the Council of Australian Governments (COAG) agreed to six ambitious targets aimed at improving long standing disparities in health, education and employment outcomes between Indigenous and non-Indigenous Australians. Collectively these are the 'National Integrated Strategy for Closing the Gap on Indigenous Disadvantage' - or colloquially 'Closing the Gap' (CTG). The essence of CTG is an agreement signed by all States and Territories to work with the Australian Government to achieve six specific targets to close existing gaps in several indicators of wellbeing (FAHCSIA, 2009):

1. Close the life expectancy gap within a generation;
2. Halve the gap in mortality rates for Indigenous children under five within a decade;
3. Ensure access to early childhood education for all Indigenous four years olds in remote communities within five years;
4. Halve the gap in reading, writing and numeracy achievements for children within a decade;
5. Halve the gap for Indigenous students in year 12 attainment or equivalent attainment rates by 2020; and
6. Halve the gap in employment outcomes between Indigenous and non-Indigenous Australians within a decade.

This research brief focuses on the first target, outlining results and implications from modelling of population projections which simulate closing the gap and compares and contrasts the outcomes with other scenarios for Indigenous life expectancies.

Simply defined, life expectancies are a summary measure of the health of a population (Barnes, et al., 2008) and is usually expressed as the number of years a person can expect to live at birth based on their demographic, social or other characteristics (gender, ethnicity and so on). Life expectancies at all ages are lower for Indigenous Australians. In 2005-2007 these were estimated at 67.2 years for Indigenous males, compared to 78.7 for non-Indigenous males (a gap of 11.5 years), while for Indigenous females life expectancy at birth was estimated at 72.9 years compared to 82.6 years for non-Indigenous females (a gap of 9.7 years) (ABS, 2009a). The NT is estimated to have the largest Indigenous life expectancy gaps in Australia with at birth expectancies estimated at 61.5 years for men and 69.2 years for women (Ibid). Considerable variability is reported within States and Territories, and in particular between people residing in remote areas and those living in cities. Indigenous men living in remote areas in Australia can expect to live for just 60.5 years compared to 71.9 years in cities, while for Indigenous women life expectancies are 67.8 years versus 76.2 years for those in cities (author's calculation based on ABS, 2009a, Pg.26). Similar gaps have been or continue to be experienced in Canada (Cooke and Belanger, 2006), Alaska (Williams, 2010), and the Circumpolar nations including Greenland (Rasmussen, 2007).

For all levels of governments in Australia, knowledge about anticipated social and demographic changes under conditions of improved Indigenous life expectancies are vital for the effective allocation of finances and to ensure services and infrastructure programs are targeted according to anticipated changes in demand and need. But neither the COAG Strategy nor commentary on it have analysed how the Indigenous population would vary under different scenarios for changing life expectancies, including under the conditions of success in CTG. This means a vacuum exists in knowledge on which current and future policy settings, service demand modelling and infrastructure mix can be based. In this study we address the need for demographic projections which compare and contrast different scenarios for changing Indigenous life expectancies including CTG. The results illustrate the demographic and economic effects which will need to be considered by policy makers from even part progress towards the CTG target.

4. DATA AND METHODS

One way to model the impacts of changing life expectancies is to simulate changes using population projections software. The Northern Territory Population Projections model (NTPOP) is a cohort component model jointly developed by researchers at Charles Darwin University and Northern Territory Treasury staff. NTPOP allows for the separate modelling of Indigenous and non-Indigenous projections and has been used to generate 2006 and 2010 base year (or jump-off) projections which are used for planning across Northern Territory Government departments.

On the whole, NTPOP represents the best available intelligence about the age-sex-Indigenous composition of the population of the NT in 2010, and the most likely assumptions about fertility, mortality and migration into the future. Nonetheless, it suffers from issues common to all population projections models and these are magnified in the context of remote areas (see, Taylor, 2011 for a discussion). Broadly, these issues mean that the size and composition of the current and projected population at a given point in time is never truly known. The differences between the anticipated and actual population creates errors which propagate through the modelling process, such that projected populations never accord with the population which eventuates. In the case of the NT, past population projections have been subject to relatively large errors and quite soon into the forecast horizon.

The research outlined here used NTPOP to model impacts from varying Indigenous life expectancies in the NT according to three scenarios:

1. **Closing the gap scenario** (CTG) - this scenario models a complete closing of life expectancy gaps existing between Indigenous males and non-Indigenous males, and between Indigenous females and non-Indigenous females in 2010. Under CTG scenario, Indigenous life expectancies are increased using a natural logarithm to reach parity with non-Indigenous life expectancies by financial year 2036, or within a generation as targeted in the COAG policy. This assumes a generational period of 25 years.

2. **Current trends scenario** (Current trends) - under this scenario Indigenous life expectancies are changed according to the baseline scenario for the official NTPOP projections. This in turn was based on assumptions about current and anticipated life expectancies for States and Territories detailed by the ABS (2009a). The 2007 life expectancies in that publication have been extrapolated forward to derive 2010 jump off year life expectancies for modelling in this study. These represent the best available estimates for Indigenous (and non-Indigenous) life expectancies available at the time of writing, although they come with some limitations as explained below.
3. **No change scenario** (No change) - in this scenario Indigenous life expectancies are left unchanged (for the life of the projections) from those assumed in the NTPOP baseline scenario for the jump off year of 2010 (as applied to the first year of the current trends scenario). Non-Indigenous life expectancies change according to the baseline NTPOP scenario, as is the case for the other two scenarios.

Figures one and two compare and contrast changing life expectancies according to each scenario. Noteworthy is the very steep slope of the CTG curves, and particularly for males.

Figure 1 – Male Indigenous life expectancy trajectories for the three scenarios

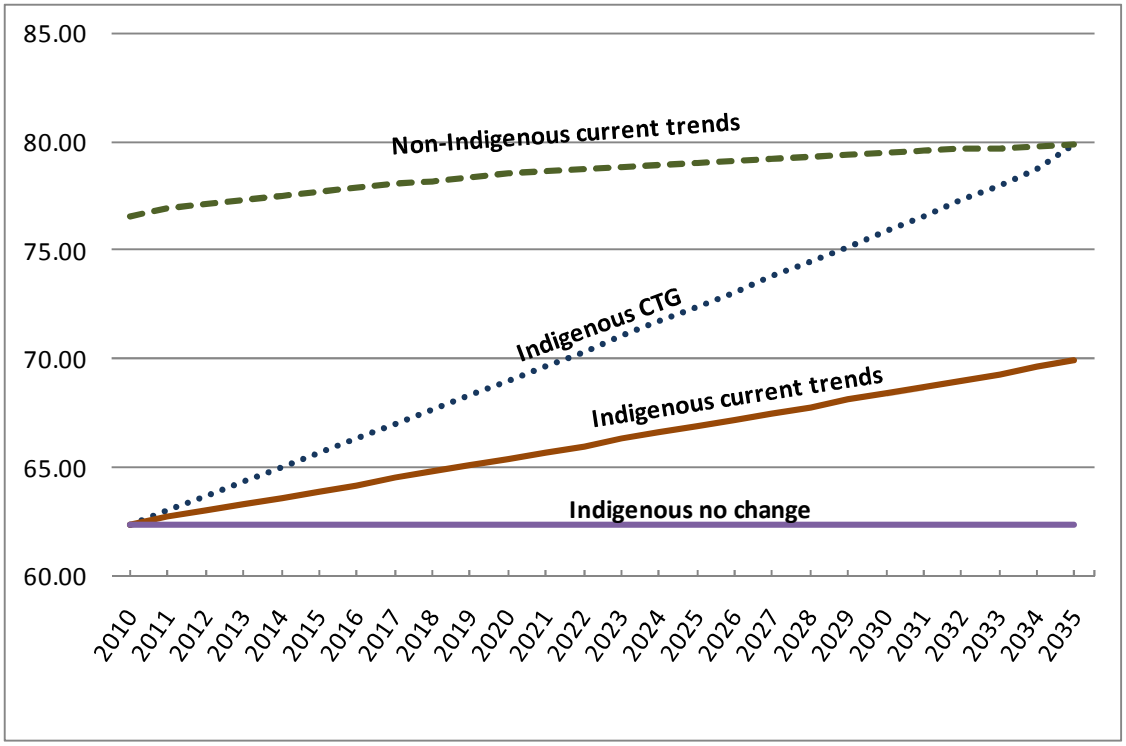
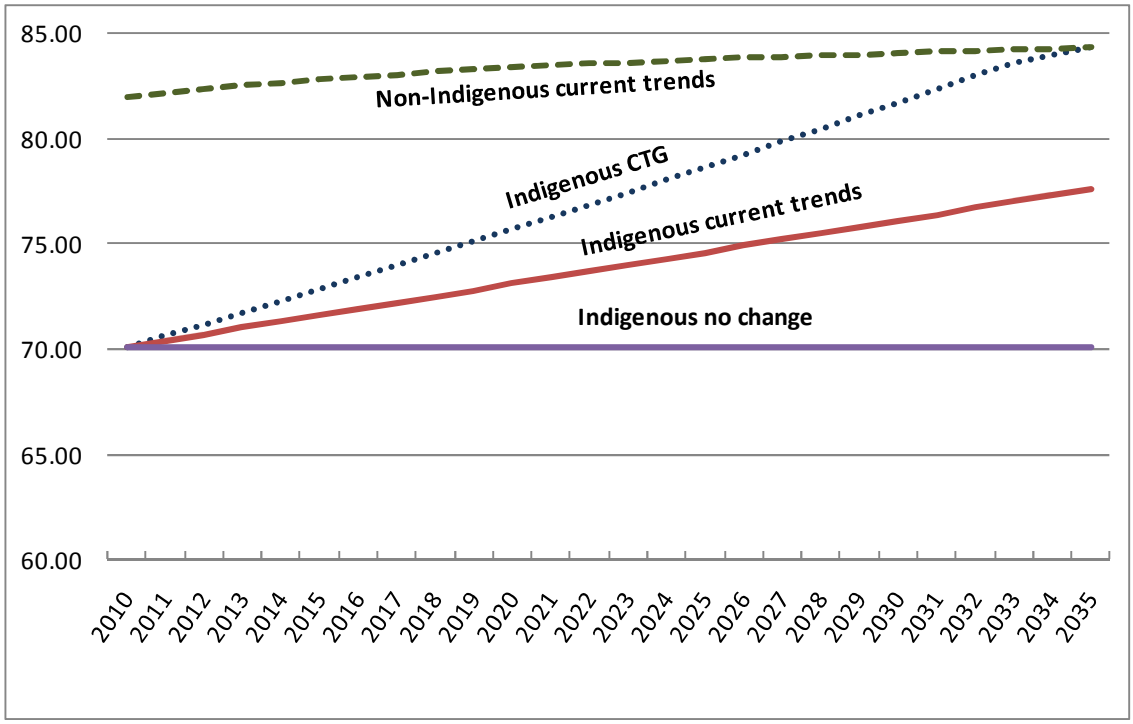


Figure 2 – Female Indigenous life expectancy trajectories for the three scenarios



The robustness of this research is challenged on several fronts. First, there can be no expectation that Indigenous life expectancies will change linearly, per the approach here. This is borne out in life expectancy data for recent years where significant year-on-year variability is observed (see, for example, Northern Territory Government, 2010). Nevertheless, attempting to synthetically model year-on-year change is not feasible and instead is likely to add significant complexity and introduce errors whose size and 'location' within the model cannot be determined. Secondly, the scenarios modelled here are at the NT level of geography. Life expectancies are known to vary across regions in the NT and elsewhere, but the nature of these is poorly understood and poorly documented. Insights into future life expectancies requires more fine grained approaches but these are simply not possible given the uncertainties and methodological issues surrounding the compilation of life expectancy estimates (see ABS, 2009b). On this basis, projected outcomes from this research should be considered as illustrative with their real value laying in comparisons and contrasts of demographic outcomes under each of the scenarios, and not so much in the actual numbers

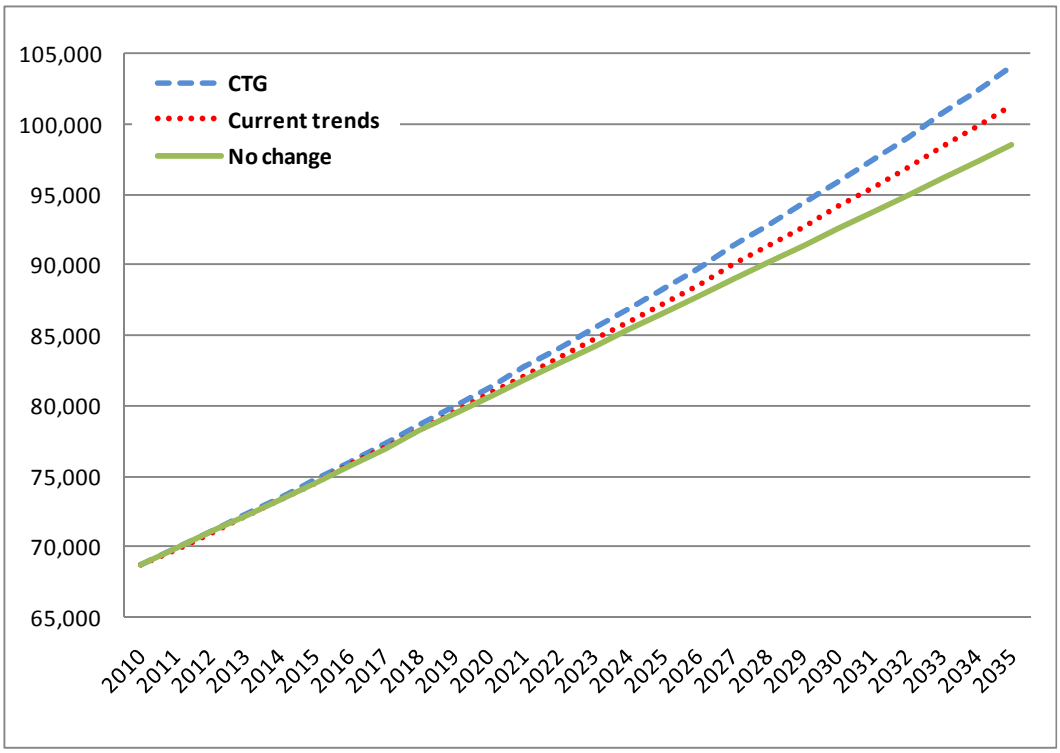
5. RESULTS

5.1. Demographic Impacts

5.1.1. Total population

Closing the gap in Indigenous life expectancies is projected to add around 35,500 Indigenous people to the population of the Northern Territory by 2035 compared to 32,600 based on current trends and 29,900 based on the no change scenario (Figure 3). Consequently CTG would grow the Indigenous population of the NT by 52 per cent, the current trends scenarios by 48 per cent and the no change scenario by 44 per cent. CTG will increase the Indigenous composition in the NT population from 29.9 per cent in 2010 to 30.7 per cent by 2035 and under the current trends scenario this proportion will remain at 29.9 per cent. However under the no change scenario, the proportion Indigenous in the NT population is projected to fall to 29.6 per cent.

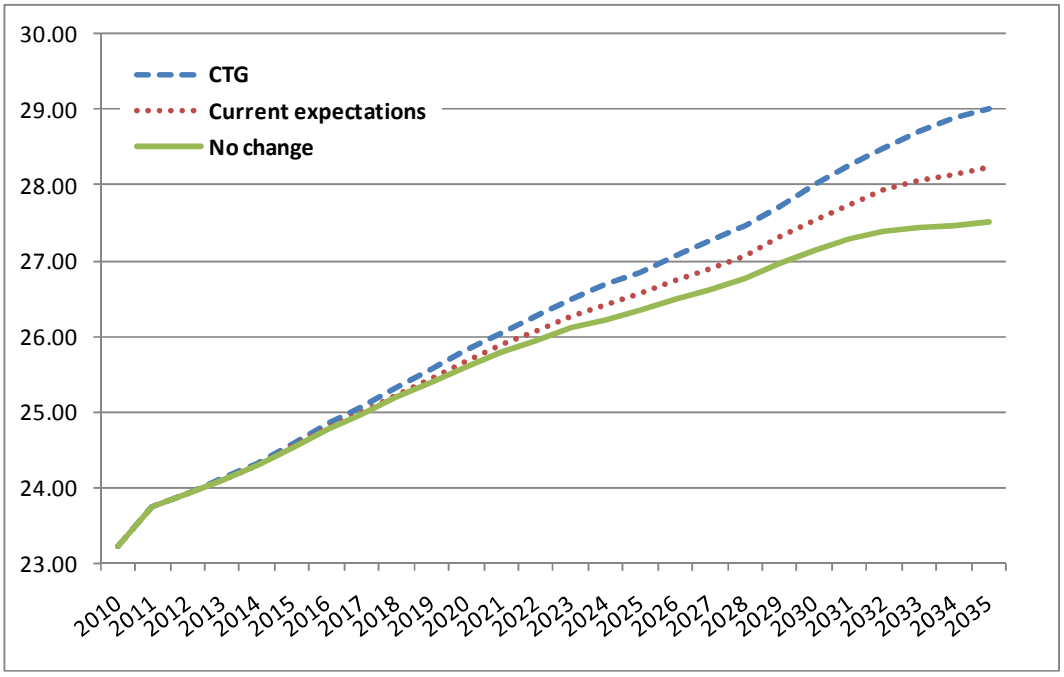
Figure 3 – Projected Indigenous population, NT



5.1.2. Median age

The median age of the Indigenous population of the Northern Territory is projected to increase under the CTG scenario by 5.8 years from 2010 to 2035, to reach 29.0 years. The current trends scenario sees median age increase by 5.0 years to 28.2 years, while under the no change scenario median age increases by 4.3 years to reach 27.5 years by 2035 (Figure 4).

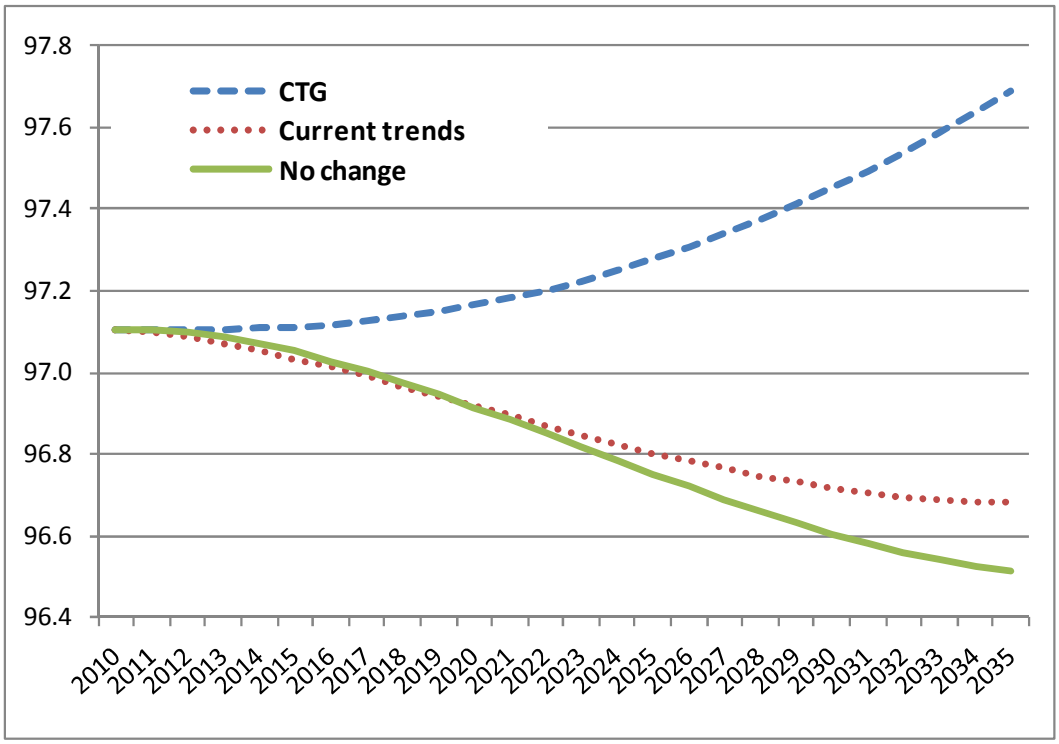
Figure 4 – Changes to Indigenous median age, NT



5.1.3. Sex ratios

Meanwhile, CTG is projected to raise the Indigenous sex ratio through the survival of relatively more males at each age under the CTG scenario (Figure 5). Meanwhile, the current trends and no change scenarios are projected to reduce the Indigenous sex ratio over time.

Figure 5 – Projected Indigenous sex ratios, NT

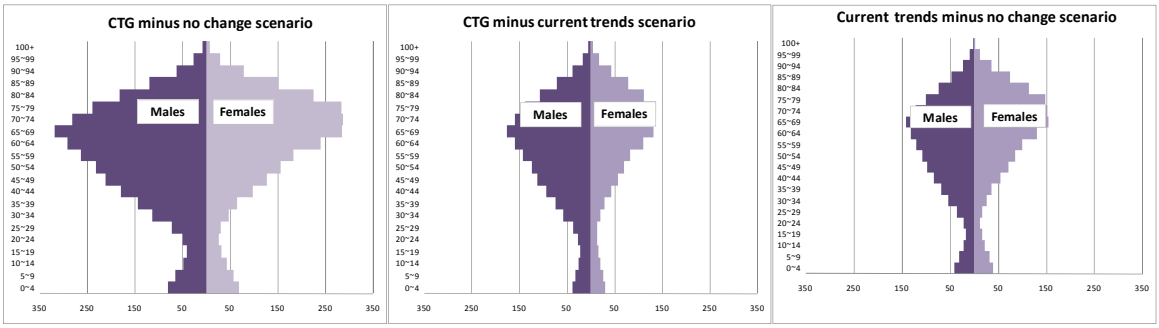


5.1.4. Age-sex distriubtion

Turning to changing age-sex distributions, the projected population aged 60 years and over for both males and females are anticipated to make the largest absolute and proportional contriubtions to overall Indigenous population growth (apart from males aged 0 to 14 years under the no change scenario) with these accounting for 25.3 per cent of all projected growth for males under the CTG scenario and 30.9 per cent for females. In proportional terms, those 60 years and over are also projected to exhibit the largest percentage growth from 2010 to 2035 at 281 per cent under CTG, 235 per cent under the current trends scenario and 193 per cent under the no change scenario. Population change rates for males aged 60 years and over (310.3 per cent) are projected to outstrip females considerably (260.1 per cent) under the CTG scenario between 2010 and 2035.

Comparing and contrasting the relative impacts under each scenario is possible by subtracting gross population additions by age and sex under one scenario away from another, and expressing these in abosolute terms. For example, the left hand age-sex pyramid in Figure 6 demonstrates the net additions to the population by age and sex by subtracting the no change scenario from the CTG scenario. Males between 45 years to 84 years account for significant 'contributions' to gross population change in this case, however female 'contributions' are more confined to ages 60 to 84 years.

Figure 6 – Comparative net age-sex contributions to popuation change



5.2. Demographic indices

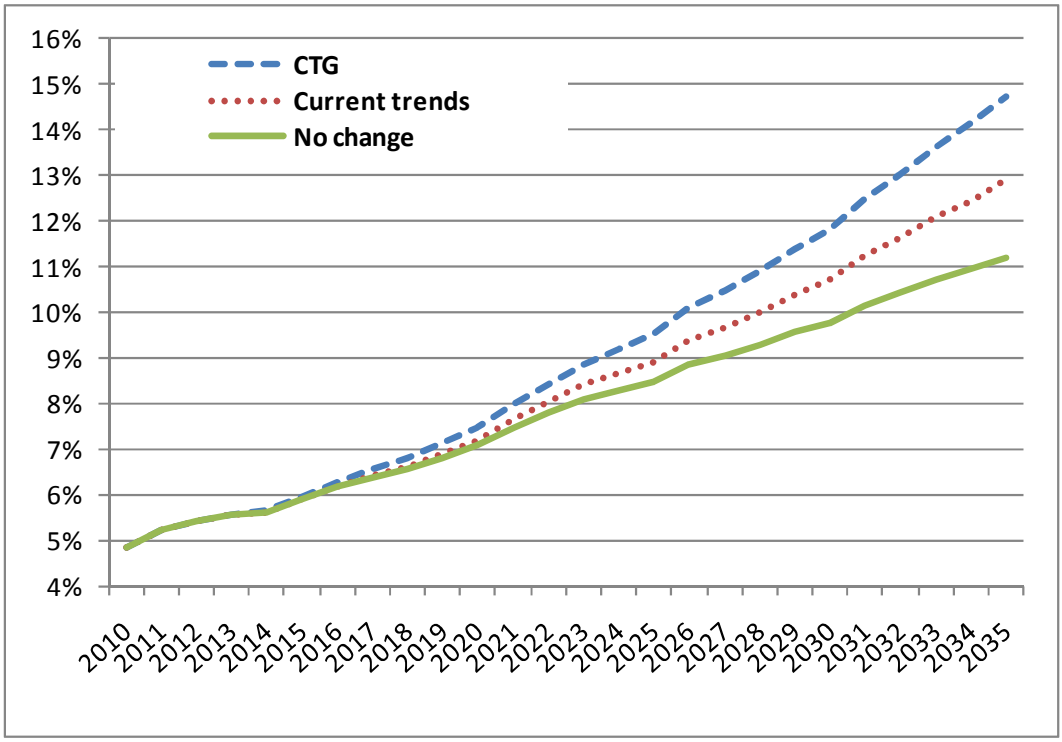
5.2.1. Child and age dependency ratios

Under CTG a relatively large decline in the child dependency and a large increase in age dependency ratios are projected, leading to an overall increase in the economic dependency ratio (EDR) (see Table 1 and Figure 7).

Table 1 – Projected changes in demographic indices, NT

Indicy	**Formula**	**2010 (all scenarios)**	**CTG, 2035**	**Current trends, 2035**	**No change, 2035**
Child dependency ratio	$\frac{persons\ 0-14\,yrs}{persons\ 15-64\,yrs}$	52.8%	45.4%	46.0%	46.7%
Age dependency ratio	$\frac{persons\ 65+\ yrs}{persons\ 15-64\,yrs}$	4.9%	14.7%	12.9%	11.2%
Economic dependency ratio	$\frac{persons\ 0-14\,yrs + persons\ 65+\ yrs}{persons\ 15-64\,yrs}$	57.6%	60.1%	58.9%	57.9%
Caretaker ratio	$\frac{females\ 50-64\,yrs}{persons\ 70+\ yrs}$	10.3	3.4	4.3	5.4

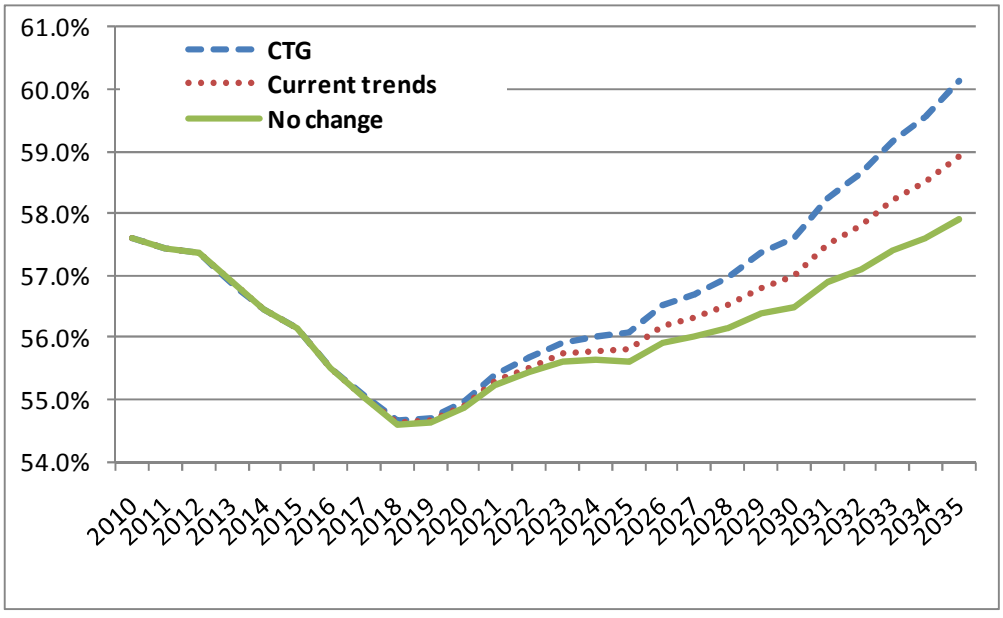
Figure 7 – Changing age dependency ratios, NT



5.2.2. Economic dependency ratio

While the age-dependcy ratio is projected to climb significanly under all three scenarios, the EDR is projected to decline from the period 2010 to around 2019 even under conditions of unchanged Indigenous life expectancies (Figure 8). This outcome would provide a demographic 'dividend' whereby a larger proportion of the Indigenous poipulation are temporarily (but only in theory) able to contribute economically to help support those outside of working ages. This transition downwards and then upwards in the EDR reflects anticipated reductions in Indigenous total fertility rates over the life of the projections. As fertility levels continue to decline, dependency ratios eventually increase because the proportion of working age people starts declining while the proportion of older persons continues to increase.

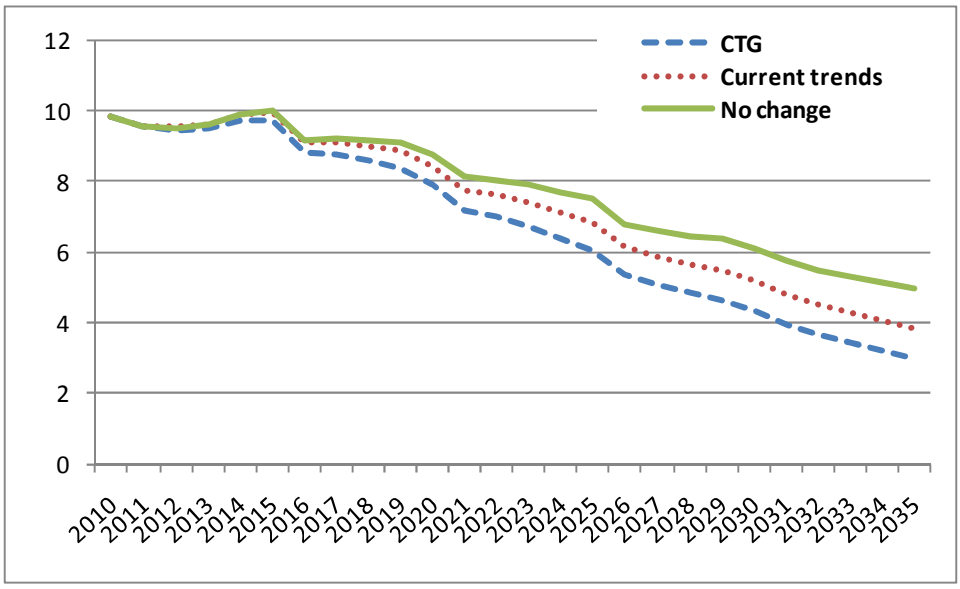
Figure 8 - Projected transitiong of the EDR, NT



5.2.3. Caretaker ratio

The caretaker ratio provides indications about older persons's access to informal support. This ratio measures the number of women aged between 50 and 64 for every person aged at least 80 (Department of Health and Ageing, 2004). While it's usefulness is diminshing in the modern context because of increasing female labour force participation rates, for Indigenous populations it remains more applicable because labour force participation rates continue to be very low (in the Northern Territory, and especially in remote areas) and because cultural practices encourage caring for older people. Under all three scenarios a marked decreases in the ratio are projected. These are greatest under the CTG scenario where the proportion of carers to those who might need caring for is projected to fall by around 75 per cent (Figure 9).

Figure 9 - Projected changes in the Indigenous caretaker ratio, NT



6. CONCLUSION

This study has modelled three population projection scenarios for changing Indigenous life expectancies in the Northern Territory for the purpose of comparing and contrasting demographic impacts. Modelling was conducted using the NTPOP projections model which was co-developed by the Northern Territory Treasury and researchers at Charles Darwin University. Three scenarios were modelled including successfully CTG between Indigenous and non-Indigenous life expectancies. While closing the gap is projected to add only an additional 2,900 Indigenous people to the population of the Northern Territory, over and above the current trends scenario, and 5,600 over and above the no change scenario, significant impacts on the age-sex constitution of the population are proposed. Not least, CTG would see a significant absolute and percentage increases in the number of Indigenous males aged 45 years and over, and especially those aged over 60 years. Meanwhile, CTG is projected to raise the median age and Indigenous composition in the population in the NT over and above the other scenarios, and send Indigenous sex ratio changes in opposite directions (increasing under CTG and decreasing under the other two scenarios).

Major impacts from CTG are demonstrable in the changes anticipated in a number of demographic indices. Notably, significant increases in the age dependency ratio are suggested under all scenarios, and these will be particularly large under CTG. The caretaker ratio is projected to fall under all scenarios, and fall significantly under conditions of CTG success. Meanwhile, the EDR is expected to transition through a period of decline and then to increase from about ten years into the projection (onwards) due to projected changes in fertility rates.

All else being equal, the greatest changes and impacts from Indigenous life expectancy changes will occur in places where there are currently larger gaps - essentially remote Australia and particularly across the north of the country. The comparative projections for the trajectory of the economic dependency ratio and the accompanying falls in the caretaker ratio in the NT are notable in the results of this study. While both of these point to a substantial increases in the economic 'burden' of the Indigenous population in the longer term, over the short to medium term there are demographic 'dividends' on offer in the form of a temporary increases in the proportion of the Indigenous population at working ages, at least for the Northern Territory and places with similar starting population profiles. But given that 80 per cent live in remote areas in the NT, where few jobs are on offer, this may simply mean an increased demand for income support in some form.

However unrealistic in practice the CTG target might be, the modelling here has brought to light the variability in relative demographic impacts which can be expected to unfold across space and time. For policy makers this emphasises there will be different rates of 'catch ups' as well as variable and localised shifts in the age-sex demand for health, education and other services which must be planned for and financed. These relate to pre-existing variability in the starting conditions and to the complex nature of shifting pre-cursors to improving the life expectancies of Indigenous Australians, including health, housing and especially education. Policy makers must not fall into the trap of assuming that success in one area can be replicated in others by the simple application of universal approaches.

Acknowledgement

NTPOP was initially conceived and developed by Dr Tom Wilson, now of Queensland University. The authors wish to thank Dr. Wilson for his valuable contribution to the understanding and forecasting of populations in the Northern Territory.

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