DISCUSSION PAPER

Experimental Life Tables by Remoteness, Queensland, 2002-04 and 2005-07

Closing the gap between Indigenous and non-Indigenous Life Expectancy

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Preface

While the Council of Australian Governments (COAG) has committed to improve health outcomes and wellbeing of Indigenous[1] Australians, the principal measurable targets, for both adults and children, have been based on reductions in mortality. The adult target – to close the gap in life expectancy within a generation (25 years) - requires robust estimates of life expectancy across population groups. Life tables are essential to the calculation of these estimates.

The life tables provided here have been developed in order to:

- Produce retrospective mortality indices and life expectancy estimates in order to reconstruct recent mortality trends and establish trajectories to guide future policy interventions;
- Understand patterns of Indigenous mortality at sub-State level, particularly by remoteness, to help focus resources where they are needed most;
- Measure the gaps in life expectancy between the Indigenous and non-Indigenous people in Queensland by remoteness and the recent trends; and
- Examine the sources of improvements in life expectancy, in respect of age groups, gender and leading causes of deaths that have contributed to these improvements.

This work will contribute significantly to the above objectives, as life tables provide the most robust summary mortality indices. For the first time, Indigenous life tables are now available to enable direct comparison between the life expectancies of Indigenous people in urban and non-urban areas of the state, as well as with those of non-Indigenous Queenslanders.

Since its first restricted release, this paper has been presented and discussed in many forums including the Australia and New Zealand Population Workshop in Melbourne late last year. In addition, comments have been received from the Office of Economic and Statistical Research of Queensland Treasury, The Australian Institute of Health and Welfare and The Australian Bureau of Statistics. We would like to take this opportunity to thank those who provided comments on various versions of this paper. This version of the paper has been prepared taking into consideration the comments and views received. However, this paper is released here as a discussion paper to provide further opportunity for comments from the interested bodies and the research community before the final publication.

The Indigenous Information Strategy Team (IIST) considers these life tables to be experimental, since differentials in death under-registration by remoteness or age group are not well understood. As a consequence, no allowance has been made for these factors in constructing life tables. Furthermore, the late registration of 284 Indigenous deaths in 2010 in Qld, which occurred between 1992 and 2006[2], may have an impact on results especially those presented by remoteness areas. However, we could not incorporate these additional deaths in our calculations as no information on cause of death and age-sex composition is available at this stage.

The Team considers these abridged life tables will be useful to many decision makers in Queensland Health, within the Queensland Government, and beyond. The forthcoming release of mortality data for 2008, 2009 and 2010 will enable development of a further set of estimates and add additional data points to the Team's monitoring of progress towards *Closing the Gap* in Queensland.

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[1] In this publication the word 'Indigenous' refers to people of Aboriginal and Torres Strait Islander origin.
[2] ABS 2011, Deaths Australia 2010, Cat. 3302.0 p. 68.

Summary Outcomes

Eliminating gaps in life expectancy between Indigenous and non-Indigenous Queenslanders will require one of the greatest decreases in mortality for any population in human history. When the leading countries of the world, including Australia, have achieved improvements of between two and three months per year for many decades, *Closing the Gap* will require life expectancy gains for Aboriginal and Torres Strait Islander Australians of around three times that to be sustained from now until 2033.

This study demonstrates that although Indigenous people in Queensland have high mortality rates compared to their non-Indigenous counterparts in virtually all age groups, these inequalities are most pronounced in the middle age years. Indigenous females experience mortality rates 4 to 6 times those of non-Indigenous females in the age bracket from 20 to 49 years, while Indigenous males in the same age range have rates 3 to 4 times those of non-Indigenous males.

Nevertheless, these analyses show significant gains in life expectancy from 2002-04 to 2005-07 for Indigenous Queenslanders. The average annual gain in life expectancy at birth for females was 0.55 years, while for males it was 0.67 years. However, while major gains were achieved in the Major Cities in Queensland, gains in the rest of the state were more modest.

This study shows that life expectancy gradually declines with remoteness.

This work also provides evidence that the decline in adult mortality rates from ages 55 onwards has been the major force behind improvement in Indigenous life expectancy during this period. However, large gaps still exist, particularly from ages 35 onward. Since the bulk of those with established chronic conditions belong to these age groups, further improvement, particularly in the age band from 35 to 54 will be essential if mortality gaps between Indigenous and non-Indigenous Queenslanders are to be eliminated.

The gains recently achieved in the Major Cities and Regional areas of Queensland are of the order of magnitude required to be sustained to achieve the closing of the gap within a generation. This analysis suggests, however, that those in the Remote/Very Remote parts of the state are not. As a consequence, the Team has gone beyond the urban-regional-remote disaggregation used in earlier Burden of Disease studies and developed tables across all classifications in the Accessibility/Remoteness Index of Australia (ARIA+). These separate Inner and Outer Regional, and Remote and Very Remote areas, and despite some concerns around the quality and representativeness of the data, identify patterns of life expectancy that may reflect differences in health status or use of health services in these areas.

Introduction

Life Tables are essential for mortality analysis and are used by epidemiologists, researchers and planners. They can be considered as representing the mortality experience of a cohort (real or hypothetical) of newborn babies, usually 100,000, followed through their entire life, assuming that they are subject to the current observed age-specific death rates. Life tables are used for reconstructing mortality trends, examining spatial or sub-population patterns of mortality and analysing adult mortality. Because of the substantial differentials in mortality by sex, life tables are usually generated separately for males and females.

Life expectancy at birth is the most common measure used to compare the mortality level of various populations at international, national and sub-national levels. As a measure of mortality, life expectancy estimates offer several advantages over more frequently reported standardized mortality rates. Life tables do not require an arbitrary reference population, making estimates easily comparable with other populations and/or time periods. In addition, life expectancy is a concept that is widely recognized and reasonably well understood by the general public.

In 2009, the Australian Bureau of Statistics (ABS) published Experimental Life Tables for Aboriginal and Torres Strait Islander Australians for the period 2005-07, using a direct demographic method (ABS, Cat. 3302.0.55, 2009). Due to changes in the life table construction methodology, the new and previously published estimates can not be compared. With no comparative tool available, it is currently not possible to follow mortality trends or establish trajectories to monitor the COAG *Closing the Gap* targets for Queensland.

In health planning, life tables can be used to derive years of life lost, and as a basis for many other models, including quantifying the burden of disease for a population. With the shift towards health service planning at the local level, there is clearly a need for such data at sub-state levels, though the ABS-published Indigenous life tables

are only at the national, state and territory levels. However, the small number of Indigenous persons in some of Queensland's Health Service Districts, or in the proposed new Local Health and Hospital Networks (LHHNs)[3], means construction of Indigenous-specific life tables at that level is not practical.

A more feasible approach to local level life expectancy estimates is developing them by remoteness level. Unlike the small sample size problem at the district level, a sizeable number of Indigenous people reside in urban, regional and remote areas of Queensland to permit construction of Indigenous-specific life tables by broad remoteness categories. It is hoped that these life tables will help guide policy interventions adopted by the Queensland Government's "Making Tracks" policy document[4], which in turn informs health service planning at the local level.

Methods, Data & Definitions

Methods

Direct demographic method of life table construction was used in order to conform to the latest adapted methodologies by the ABS and the Australian Institute of Health and Welfare (AIHW, 2010).

The ABS Cause of Death Unit Record files and the Estimated Resident Population (ERP) data provided by the Office of Economic ad Statistical Research (OESR), Queensland Treasury, are used to construct life tables. Three years of deaths and population (2002–04 and 2005–07) were combined to increase the accuracy of the estimates and statistical power for remoteness level analysis.

The age-specific death rates (ASDRs), or $({}_nm_x)$ in life table terminology, were used to construct the life tables. They were derived based on the formula (nDx/nPx) where nDx refers to the deaths to persons in the age interval (x, x+n) and nPx refers to the midyear number of persons (ERPs) in the age interval (x, x+n).

Abridged[5] life tables were constructed for the periods 2002-04 and 2005-07 for the Indigenous and non-Indigenous populations of Queensland stratified by sex and remoteness categories (Appendix 1 and Appendix 2). As per a recommendation by the ABS, life tables were also constructed for the period 2000-02, where the Census 2001 year forms the mid point, and presented in Appendix 5 & 6.

The life tables were generated using the life table (LIFTB) procedure of the United Nations (2003) MORTPAK for Windows (Version 4). LIFTB procedure is based on a method developed by Thomas NE Greville (1943). The main difference among all methods lies in the transformation from the observed age-specific death rate to the conditional probability of death for each age group, given survival to the beginning of the age group. Greville's method assumes a constant change in the age-specific death rate and then applies Gompertz's law of mortality to estimate the probability of death.

The methodology for the generation of life tables is presented at the Explanatory Notes in Appendix 7.

The derived changes in expectation of life from 2002-04 to 2005-07 were further decomposed by age and causes using Arriaga's Method (E. Arriaga, 1984). The methodology is presented at the Explanatory Notes in Appendix 7.

The outcomes of the contributions of ages and causes in changes in life expectancies are presented respectively in Appendix 3 and Appendix 4.

Confidence Intervals (CI) of the estimated life expectancies at birth were calculated using the method developed by Chiang, CL. (1968, 1984). The method is presented at the Explanatory Notes in Appendix 7.

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[3] The new *Health and Hospitals Network Act 2011* will replace the current *Health Services Act 1991* from 1 July 2012. The changes take effect on 1 July 2012 throughout Queensland. Seventeen Local Health and Hospital Networks (LHHNs) will be created as statutory bodies. Each LHHN will be managed by a local governing council and be responsible for the delivery of public hospital services and the current range of community health services provided by districts.

[4] Queensland Health 2010, Making Tracks *towards closing the gap in health outcomes for Indigenous Queenslanders by 2033*.

[5] That displays the survival experience of a given population in abridged form, grouped ages, rather than complete life table which displays the survival experience of a given population in complete form by single years of age.

Data Sources

Mortality data for the periods 2002-04 and 2005-07 were extracted, based on year of registration, from the ABS Cause of Deaths Unit Record data held at the Health Statistics Centre (HSC), Queensland Health. Year of registration data were used instead of year of occurrence in order to be comparable with mortality indicators presented in various COAG reports including the National Indigenous Reform Agreement (NIRA), the National Healthcare Agreement (NHA) and other reports as all mortality indicators in those reports and agreements are based on year of registration (ABS 2011, p68). Comparison of the year of registration and year of occurrence showed little difference therefore, years of registration data were used. It should be noted that normally the number of deaths that are not registered in the year that they occur are compensated by deaths that occurred in previous years but were subsequently registered. Therefore, there is little difference between the number of deaths registered in a given year and the number of deaths occurred in the same year for Indigenous Australians (ABS 2011, p68). For the above periods population counts were sourced from the Estimated Resident Population (ERP) data provided by the Office of Economic and Statistical Research (OESR).

Adjustment of death data

Application of direct method of life table construction requires the use of death registration data and the Estimated Resident Population (ERP) by age groups to construct mortality schedules. This method requires adjusting death registration data for the estimated levels of Indigenous under-identification in death registration. Through a process of linking National Mortality Database (NMD) and National Death Index (NDI) with death records from the National Hospital Morbidity Data set, the National Perinatal Data Collection and the Residential Aged Care data set, AIHW found 252 additional death records for Queensland for the period 1 July 2001 to 30 June 2006, which is 9% of the total Indigenous deaths in Queensland during this period (AIHW, 2010, p. 13). The age distribution of the additional deaths found for Queensland was not included in the AIHW 2010 report. However, a national breakdown is available which shows that the additional deaths obtained were 12% for the 0-4, age group, 4% for the 5-19 age group, 3% for the 20-44 age group, 7% for the 45-64 age group and 19% for the age group 65+ years, as a result of the linkage. It seems that the age distribution, of the linked additional death records was influenced by the fact that the perinatal dataset and the residential aged care dataset were the main sources for the linkage process.

Meanwhile, ABS calculated the level of deaths under registration in Queensland to be about 6% (ABS, 2009, p.29). However, in constructing experimental Indigenous life tables, ABS applied the estimated identification rate to registered deaths uniformly across age and sex (ABS, 2009, p.30).

Consequently, for this exercise, we decided to apply 9%, the higher level of estimated deaths under-registration, rather than the lower estimate of 6% to correct for the under reporting of deaths in Queensland. This was largely due to the fact that the AIHW mortality data linkage study was based on a longer time frame, 1 July 2001 to 30 June 2006, compared to the identification rates observed by ABS for August 2006 to June 2007. Therefore, the number of deaths was adjusted for under-registration by a correction factor of 1.09. However, in the absence of more reliable age distribution of the estimated unregistered deaths, the correction factor was applied uniformly across age and sex. Similarly, while recognising that under-registration of death may differ by remoteness, we acknowledge that the magnitudes of such differentials are so far unknown. Therefore, no allowance has been made for remoteness in correcting death data for under-registration. The above 9% adjustment of the registered death data should also compensate for the 2010 surge in Qld registration of deaths for previously unregistered deaths that have occurred between 1992 and 2006 (ABS 2011, p69).

Due to the erratic nature of the derived death rates, age misreporting and to overcome irregularities in the death rates caused by the small numbers in many age categories, a simple smoothing technique of using three point moving averages was applied to both death and ERPs to conform with the expected pattern of the death function by age.

In order to minimise the impact of small numbers and annual random fluctuation of death numbers, three year aggregated death and population data for the periods 2002-04 and 2005-07 were used to construct life tables.

Remoteness

Remoteness is examined here in terms of Australian Remoteness Index of Areas (ARIA) as the following:

- Major Cities of Australia (MC), 28.4% of Indigenous population;
- Regional: combined Inner Regional (IR) and Outer Regional (OR) areas, 50.4% of Indigenous population; and

- Remote: combined Remote and Very Remote areas (R/VR), 21.2% of Indigenous population.

SLA to ARIA Assignment method

The Causes of Death data are SLA coded to the latest Australian Standard Geographic Classification (ASGC) version available for a particular year of registration. For example, the 2002 data are coded to ASGC2001, the 2003 data to ASGC2002, etc. This causes issues when using ARIA+ which is only available for Census years. Health Statistics Centre maintains its own version of ARIA+ for the SLA changes in the intercensal years. The 2001 Census based ARIA+ is maintained by HSC for SLAs in the different ASGC versions and has been used to assign death data and population (ERPs) to ARIA categories.

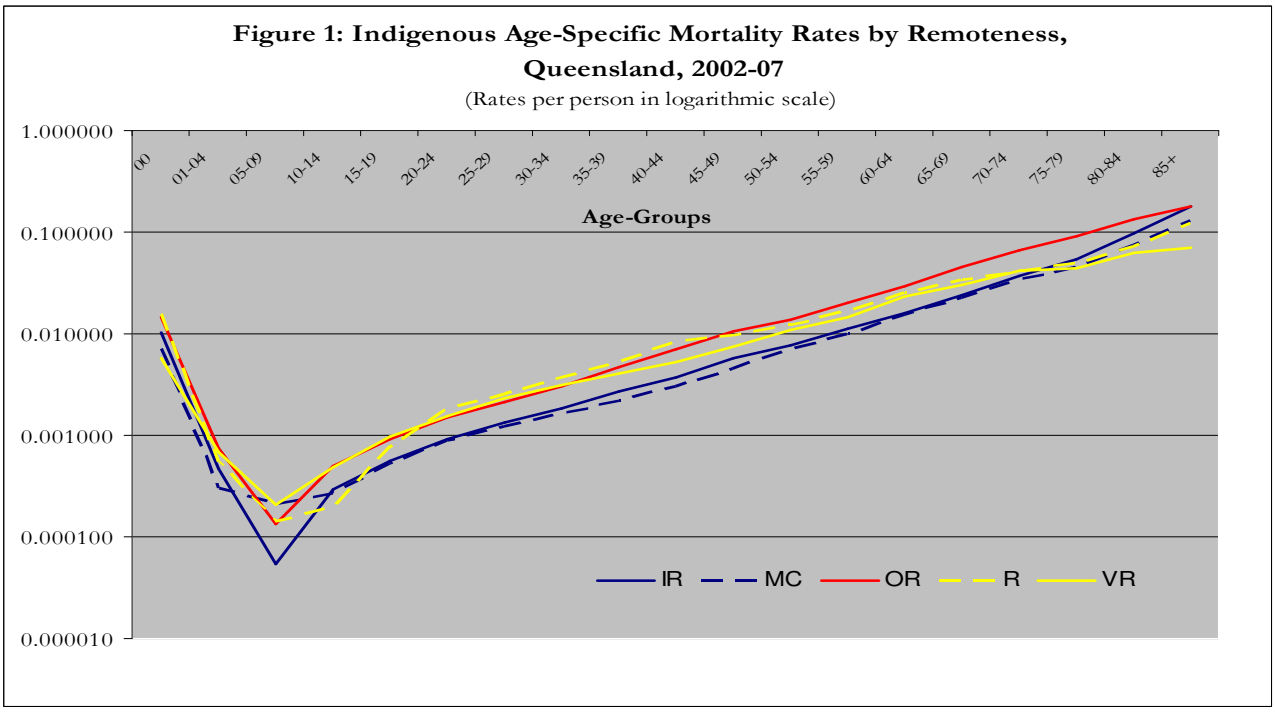
The 2001 ARIA+ was obtained from the ABS remoteness areas, so ARIA categories are assigned to SLAs based on population of component CDs. In the case of SLAs split between ARIA+ categories, the ABS provides a percentage split of the population (based on CDs) in the SLA that goes into the respective ARIA+ categories. HSC has assigned split SLAs completely to the ARIA+ category that most of the population falls into.

Mortality Patterns by Remoteness

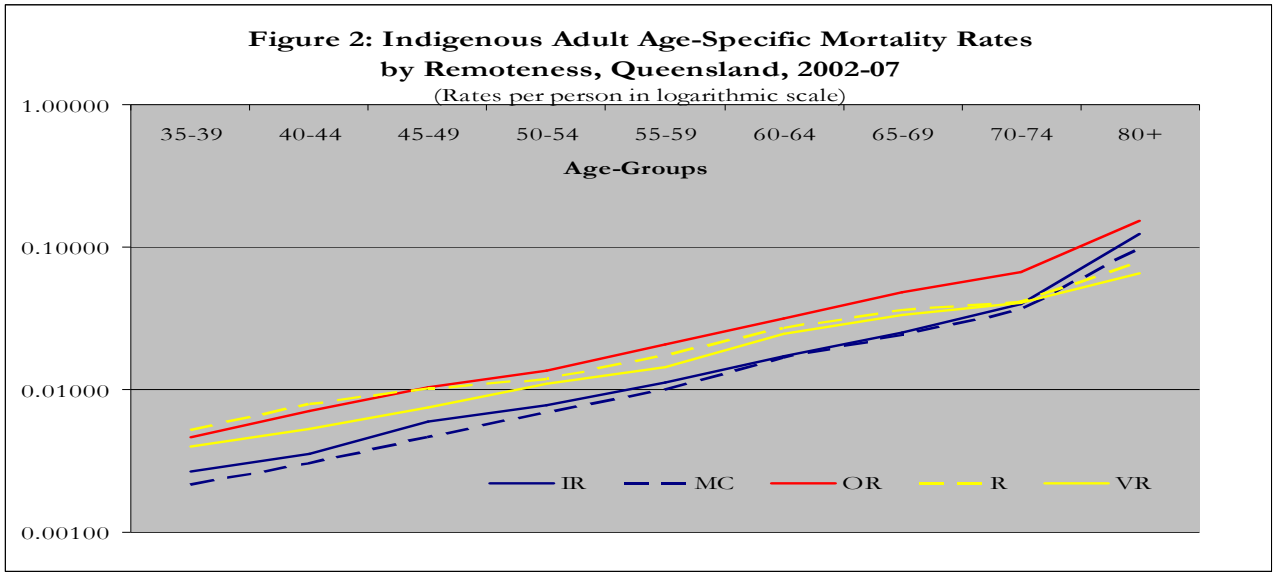
As shown in Figure 1, examination of the age-specific death rates by remoteness, reveal distinct mortality levels and patterns.

Figure 1: Indigenous Age-Specific Mortality Rates by Remoteness, Queensland, 2002-07

(Rates per person in logarithmic scale)



The observed higher level of Indigenous mortality for ages 45 onwards in Outer Regional areas in comparison to Remote and Very Remote areas seems peculiar and questionable. This is further highlighted in Figure 2. The Outer Regional areas include Mackay, Townsville and Cairns. These areas are not only well serviced in many aspects they also enjoy higher socio-economic status in comparison with the Remote and Very Remote areas. However the consistency of this peculiarity over time and the onset of rise of mortality rates, 45-49 age group, seem to suggest that people are moving from remote and very remote areas to access tertiary health services available in outer regional centres. As a result the adult mortality regime of outer regional areas may be very much affected by the arrival of very sick late adults and old people from the remote and very remote areas and the subsequent death of such people and registration of such deaths in outer regional areas.

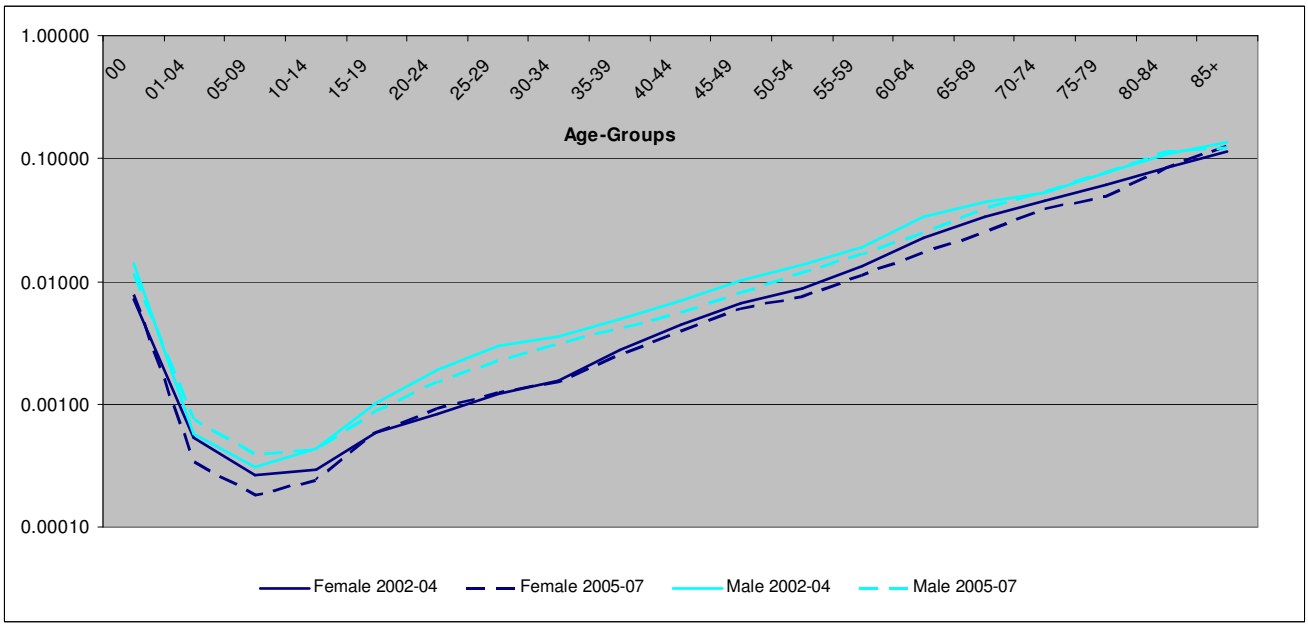


Mortality Changes Over Time

Figure 3 shows that Indigenous mortality has reduced in recent years, both for males and for females and in all age groups. Such improvement will manifest itself in improved life expectancy over the study period for Indigenous males as well as Indigenous females.

Figure 3: Changes in Qld Indigenous Age-Specific Mortality Rates from 2002-04 to 2005-07

(Rates are displayed per person in Logarithmic Scale)



Leading Causes of Mortality

For the period 2005-07, Indigenous age-cause specific mortality rates are presented in Appendices 4a and 4b and non-Indigenous-cause specific mortality rates are presented in Appendices 4c, 4d. Mortality Rate Ratios are presented in Appendices 4c & 4d. They show that for Indigenous females, diseases of the circulatory system (27.1%), Neoplasms (21.1%), Endocrine, nutritional & metabolic diseases (12.8%) and External causes of morbidity & mortality (9.5%), are the top four causes of mortality. It also shows that for Indigenous males, Diseases of the circulatory system (24.8%), External causes of morbidity & mortality (18.5%), Neoplasms (17.6%) and Endocrine, nutritional & metabolic diseases (8.2%) constitute the top four leading causes of death.

Derived Experimental Life Tables

Estimates of Indigenous and non-Indigenous life expectancy at birth for Queensland from this study are shown in Table 1 separately for females and males in comparison with various other available studies.

Table 1: Life Expectancy at Birth, Queensland

Reference Period	Source	Indigenous Females	Non-Indigenous Females	Indigenous Males	Non-Indigenous Males
2001	**AIHW**	70		66	
2000-02	**QH**	70	82	67	77
2002-04	**AIHW**	70		66	
2002-04	**QH**	72	83	67	78
2005-07	**ABS**	74	83	68	79
2005	**AIHW**	73		69	
2005-07	**QH**	74	83	69	79

These estimates demonstrate that female life expectancy is consistently higher compared to those for males. An Indigenous baby girl and an Indigenous baby boy born in the period 2005-07, were expected to live on average 74 years and 69 years respectively if the observed mortality regimes during 2005-07 were to continue throughout their lives.

As Table 1 shows, outcomes of this work are markedly consistent with those derived by the ABS and AIHW.

Table 2: Experimental Estimates of Indigenous Life Expectancies at Birth 2002-04 and 2005-07, Queensland

	Females			**Males**		
2002-04	**Life Expectancy at Birth**	Lower 95% confidence interval	Upper 95% confidence interval	**Life Expectancy at Birth**	Lower 95% confidence interval	Upper 95% confidence interval
Major Cities	**74.84**	72.14	76.04	**71.36**	68.08	72.27
Regional	**71.61**	71.32	73.87	**65.80**	65.40	67.84
Remote/Very Remote	**70.94**	69.11	73.29	**63.94**	62.13	65.81
Qld	**72.35**	71.40	73.23	**66.75**	65.83	67.62
2005-07						
Major Cities	**76.88**	75.42	79.10	**73.88**	72.50	77.67
Regional	**74.21**	73.32	75.79	**68.66**	67.59	69.85
Remote/Very Remote	**70.71**	69.31	73.25	**64.53**	63.13	66.85
Qld	**73.99**	73.51	75.35	**68.75**	68.00	69.81

These estimates also demonstrate that Indigenous life expectancy gradually declines with remoteness, both for the Indigenous females and Indigenous males. In 2005-07, life expectancy at birth for Indigenous females living in the Major Cities, Regional areas and Remote/Very Remote areas of Queensland were estimated at 76.88, 74.21 and 70.71 years. The estimates for the Indigenous males were in order 73.88, 68.66 and 64.53 years. However, it appears that while non-Indigenous life expectancies are higher in Major Cities compared to other areas of the State, there is little variation in the estimates for the Regional and Remote/Very Remote Areas.

These estimates also demonstrate significant improvement from 2002-04 to 2005-07 in expectation of life at birth for the Queensland Indigenous population, both for males and females and in all remoteness areas. Table 2 shows whilst Indigenous female life expectancy at birth has increased from 72.35 years to 73.99 years (1.64 year gain), the Indigenous male life expectancy increased from 66.75 to 68.7 years (2.0 year gain). However, the gains are more pronounced in Major Cities where Indigenous female life expectancy at birth gained 2.05 years and Indigenous male life expectancy gained 2.52 years over the study period.

Life expectancy, like most statistics, is an estimate which is subject to a margin of error. The accuracy of the results can be indicated by calculating a confidence interval which provides a range of values within which the true underlying life expectancy would lie (95 per cent of the time with infinite sampling). There is no simple 'rule of thumb' for the size of confidence intervals. But they largely depend on the size of the population, so confidence intervals for smaller populations tend to be wider. The life expectancy estimates are considered plausible if there is

minimal statistical variation. For the Indigenous population by remoteness in Qld, the standard errors ranged from a minimum 0.44 (in case of Indigenous males) to a maximum value of 0.99 (in case of Major Cities Indigenous females) across all areas. Table 2 also shows that the total males and total females life expectancy estimates fall within the acceptable range of confidence intervals (from a maximum lower limit of -0.94 years to a maximum upper limit of 0.88 years). This means the variation in confidence intervals are less than one year in life expectancy, which appears to be minimal. However, the confidence interval ranges are wider for various remoteness areas given the small number of deaths and small number of populations associated with the estimates.

Life Expectancy Gaps

Figure 4 below shows comparatively the Indigenous and non-Indigenous estimates of life Expectancy at birth by sex and remoteness categories in Queensland for the period 2005-07.

Figure 4: Indigenous and non-Indigenous Estimates of Life Expectancy at Birth by Sex and Remoteness Categories, Queensland 2005-07

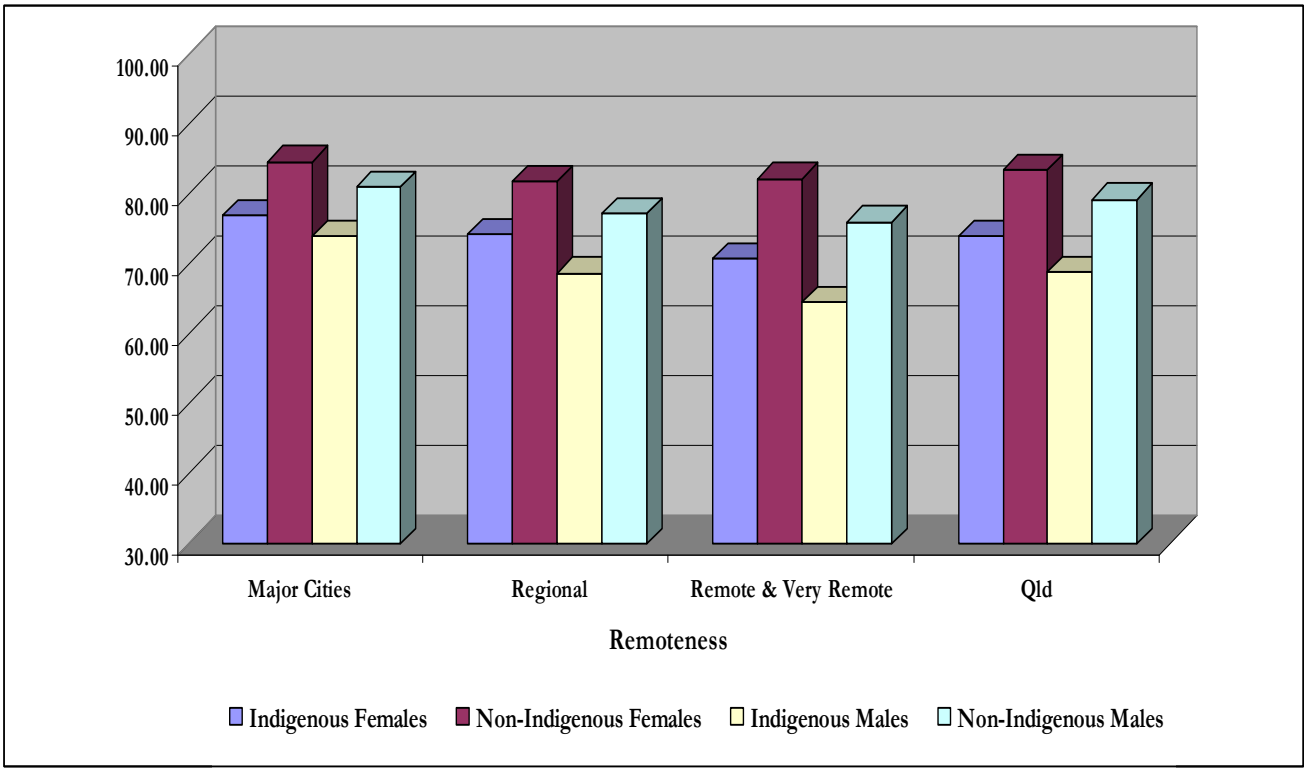


Figure 4 shows that gaps in life expectancy at birth exist between Indigenous and non-Indigenous people in Queensland in all remoteness categories and generally the gap increases with remoteness. However, comparisons with non-Indigenous Queenslanders also show noticeable improvements over time to close the gap (Table 3).

Table 3: Changes in Indigenous and Non-Indigenous Life Expectancies from 2002-04 to 2005-07

	2002-04		2005-07		Total 3 year change		Average Annual Change over 3 years	
	Females	Males	Females	Males	Females	Males	Females	Males
Major Cities								
Indigenous	74.84	71.36	76.88	73.88	2.05	2.52	0.68	0.84
Non-Indigenous	83.83	79.92	84.57	80.90	0.74	0.98	0.25	0.33
Gap (Years)	**-8.99**	**-8.56**	**-7.69**	**-7.02**				
Regional								
Indigenous	71.61	65.80	74.21	68.66	2.60	2.87	0.87	0.96
Non-Indigenous	81.07	75.86	81.68	77.07	0.61	1.22	0.20	0.41
Gap (Years)	**-9.46**	**-10.06**	**-7.48**	**-8.41**				
Remote/Very Remote								
Indigenous	70.94	63.94	70.71	64.53	-0.23	0.59	-0.08	0.20
Non-Indigenous	81.50	75.48	82.16	75.93	0.65	0.45	0.22	0.15
Gap (Years)	**-10.56**	**-11.54**	**-11.45**	**-11.40**				
Qld								
Indigenous	72.35	66.75	73.99	68.75	1.64	2.00	0.55	0.67
Non-Indigenous	82.71	78.12	83.38	79.17	0.67	1.05	0.22	0.35
Gap (Years)	**-10.36**	**-11.37**	**-9.39**	**-10.42**				

For Indigenous females, the gap decreased from 10.36 years to 9.39 years (0.55 year gain per year). For Indigenous males, the gap decreased from 11.37 years in 2002-04 to 10.42 years in 2005-07, (0.67 year gain per year). With an average annual gain of 0.96 years per year in life expectancy, Indigenous males living in Queensland Regional Areas recorded the greatest improvement in life expectancy.

As per recommendations by the ABS, estimates of life expectancy for the period 2000-2002 which include the Census 2001 year as mid point were also produced and are included in Table 4 below and life tables are presented in Appendix 5 and Appendix 6.

Table 4: Life Expectancy at Birth, Queensland

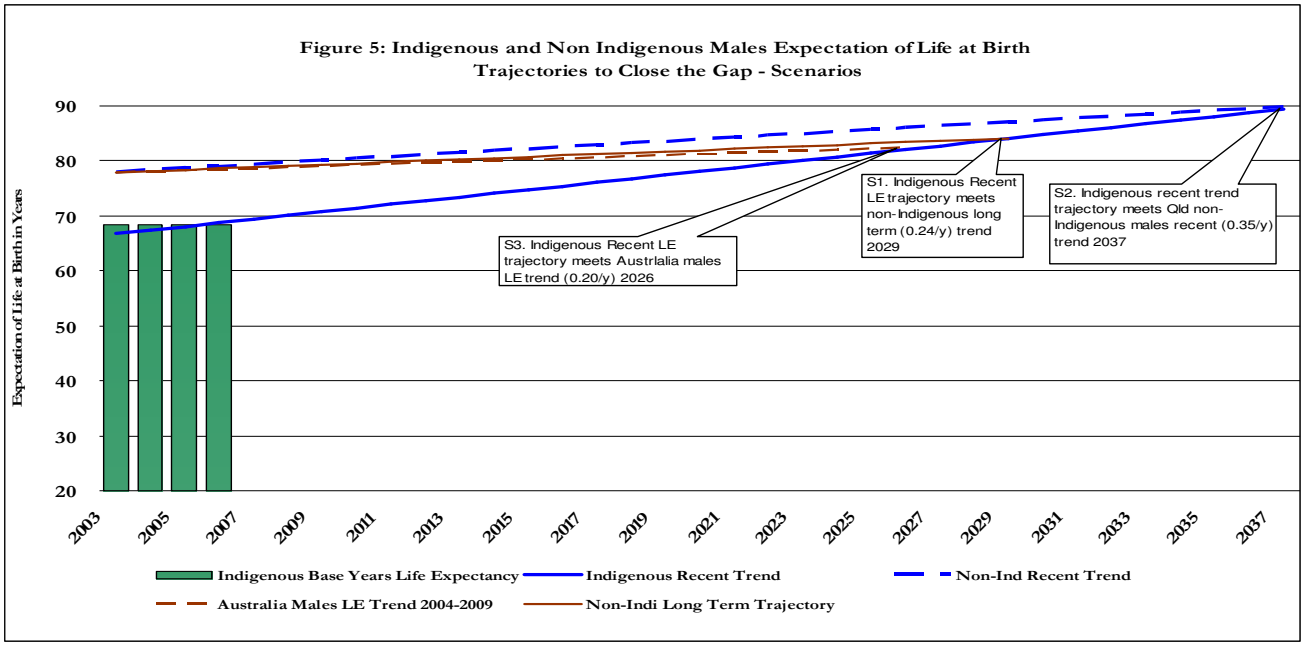
	AIHW 2001	QH 2000-02	AIHW 2002-04	QH 2002-04	ABS 2005-07	AIHW 2005	QH 2005-07
Indigenous Females	70.1	70.42	70.3	72.35	73.6	72.6	73.99
Non-Indigenous Females		82.13		82.71	82.5		83.38
Indigenous Males	65.7	67.33	66.1	66.75	68.3	68.5	68.75
Non-Indigenous Males		77.35		78.12	78.6		79.17

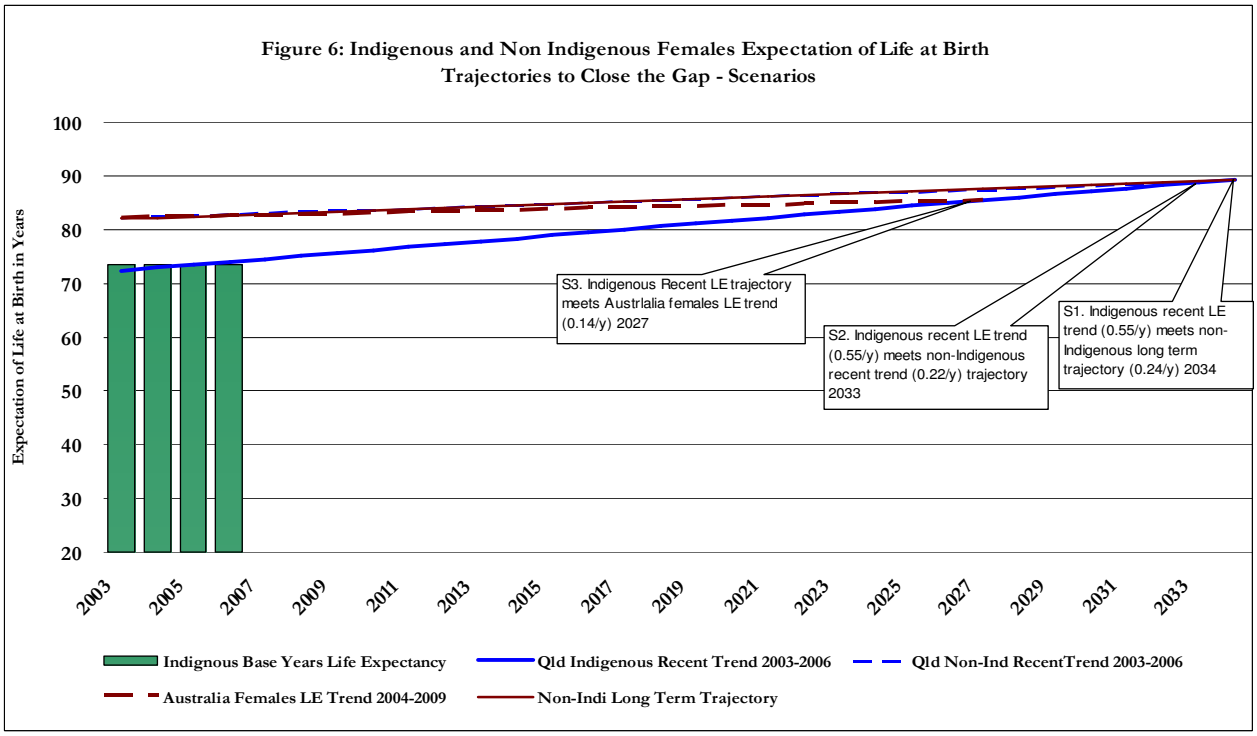
With the absence of comparable life expectancy estimates from ABS, Queensland Health (QH) Indigenous life expectancy outcomes for the retrospective periods can only be compared with the derived three year averages of the annual estimates produced by the AIHW. Given that death and population data used to construct life tables have been subjected to varying degrees of smoothing and graduation processes, the apparent small differences between the resultant estimates of life expectancy between all the above sources are negligible.

Closing the Life Expectancy Gap

Three possible scenarios are presented here:

1. To close the gap with the non-Indigenous life expectancy within a generation (2033), given the **non-Indigenous observed *long term*** annual increase increments of 0.24 a year continues into the future;
2. Queensland's **observed *recent* Indigenous life expectancy trends** (2003-2006) trajectories (Males 0.67/y, Females 0.55/y) meet Queensland's **observed *recent* non-Indigenous trends** (Males 0.35/y, Females 0.22/y); and
3. Queensland's **observed *recent* Indigenous life expectancy trends** trajectories meet **Australia's recent life expectancy trends** (ABS, 2011)[6] trajectories for 2004-2009, (Males 0.20/y, Females 0.14/y).





[6] Derived from ABS 2011, *Deaths Australia 2010*, Cat. 3302.0, p 43.

Given the observed recent Indigenous life expectancy gains are sustained into the future, achieving closing the gap targets are possible within a generation. However, Indigenous life expectancies are chasing moving targets. For Indigenous males, if the observed recent Indigenous life expectancy gains are sustained into the future, a possible higher annual increment for non-Indigenous males takes the closing the gap to year 2037. On the other hand, if the Queensland's non-Indigenous life expectancy trend follows the Australia males more recent trends, then the gap will be closed in 2026. Similarly in the case of Indigenous females, while a marginally slower annual increment will close the gap in 2033 if the Queensland's non-Indigenous females life expectancy trend follows the Australia females more recent trends, then the gap will be closed in 2027.

The area between the Indigenous and non-Indigenous trajectory lines is effectively years lost due to premature death. From a policy perspective, approaching the target linearly is one thing, however, the targets can be used more strategically - breaking the trajectories up into some 3- or 5-year plans that would be more relevant to particular policy development and implementation circumstances.

If we were to pick the lowest fruit in say Cardio Vascular Diseases (getting survivors of heart attacks into rehab, better management of hypertension in PHC, smoking prevention, better nutrition, etc.), Diabetes (earlier diagnosis, better monitoring and management, etc), and so on, we could aim to get above the linear approach earlier. It is not suggested that we should do away with the line, but it could be pointed out that getting above it saves lives, while falling below it equates to a double deficit - losing ground on inequalities that are already gross.

Sources of mortality improvements

Age Contribution

In Figure 3 we saw changes in the age-specific mortality rates for males and females. It showed improved mortality regimes in all ages. Here we discuss how these changes contributed to improvements in life expectancy at birth.

Evidence from this study suggests that the bulk of gains in Indigenous life expectancy at birth are largely due to mortality improvements in the adult ages of 55 years and over. Table 5 below shows contributions of various age groups in changes in life expectancy. It shows that the positive changes in expectation of life at birth for Indigenous females are mostly due to late adulthood ages of 45-59 and old ages of 60+. For Indigenous males, the improvement in life expectancy at birth, are more evenly distributed from age group 25-44 onwards and commences from the early adulthood ages of 15-24.

Table 5: Effect of mortality changes in various stages of life on changes in Indigenous life expectancy at birth, from 2002-04 to 2005-07, Qld

Stages of Life	Age-Groups	Absolute Effect on Life Expectancy at Birth		Percentage Effect of various Age Groups	
		Females	Males	Females	Males
Childhood	0-4	0.02	0.11	1.0%	5.6%
Adolescence	5-14	0.04	-0.03	2.6%	-1.2%
Early Adulthood	15-24	-0.02	0.12	-1.3%	6.2%
Middle Adulthood	25-44	0.12	0.52	7.5%	25.9%
Late Adulthood	45-59	0.44	0.58	26.6%	28.9%
Old Ages	60+	1.04	0.69	63.6%	34.6%
Changes in Life Expectancy at Birth		1.64	2.00	100.0%	100.0%

Cause Contribution

Cause contributions to changes in life expectancies from the period 2002-04 to 2005-07 are presented in Appendix 3. A summary of the outcomes are presented in Table 6 and Table 7 below. It should be noted from these tables that certain causes contributed negatively to life expectancy changes. Improvements in life expectancy would have been much larger if it was not for the worsening mortality rates from certain diseases. For females, diseases of the

digestive system, symptoms, signs & abnormal clinical findings not elsewhere classified and diabetes are among them. For Indigenous males, symptoms, signs & abnormal clinical findings, diseases of the genitourinary system and to a lesser extent, cancers are noticeable.

These analysis show that for Indigenous females in Queensland the 1.64 years improvement in life expectancy at birth was mainly due to mortality reductions from external causes, diseases of respiratory system, and diseases of the circulatory system.

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Table 6: Age-Cause Contribution to Changes in Life Expectancy at Birth from 2002-04 to 2005-07, Qld, Indigenous Females

Leading Causes of Mortality [a]	Life Stages						All Ages
	0-4	**5-14**	**15-24**	**25-44**	**45-59**	**60+**	
Chapter 20 - External causes of morbidity & mortality	-0.005	0.038	0.022	2.325	-0.087	0.016	2.309
Other Causes not defined here	-0.087	-0.031	-0.026	1.903	-0.049	0.060	1.770
Chapter 10 - Diseases of the respiratory system (J00-J99)	-0.010	-0.031	0.000	1.482	0.072	0.174	1.687
Chapter 09 - Diseases of the circulatory system (I00-I99)	0.005	0.065	-0.013	-0.508	0.769	0.345	0.664
Chapter 02 - Neoplasms (C00-D48)	0.010	0.001	0.000	0.300	-0.219	0.358	0.450
Chapter 16 - Conditions originating in the perinatal period	0.129	0.000	0.000	0.000	0.000	0.000	0.129
Chapter 04 - Endocrine, nutritional & metabolic diseases)	0.005	0.000	0.000	-0.504	-0.096	0.096	-0.500
Chapter 14 - Diseases of the genitourinary system	0.000	0.000	0.000	-0.821	-0.033	0.018	-0.837
Chapter 18 - Symptoms, signs & abnormal clinical & lab	-0.025	0.000	-0.004	-1.643	-0.054	-0.099	-1.825
Chapter 11 - Diseases of the digestive system	-0.005	0.000	0.000	-2.412	0.133	0.073	-2.210
All Causes Effect	**0.016**	**0.043**	**-0.021**	**0.123**	**0.436**	**1.042**	**1.637**

[a] Please refer to Appendix 3 for full description of the Codes.

For Indigenous males, improvement in mortality from diseases of the circulatory system for ages 25 and above and mortality reductions from diseases of certain infectious and parasitic diseases in the same age groups provided the bulk of the estimated 2 years improvement in life expectancy from 2002-04 to 2005-07.

Table 7: Age-Cause Contribution to Changes in Life Expectancy at Birth, from 2002-04 to 2005-07, Qld, Indigenous Males

Leading Causes of Mortality [a]	Life Stages						All Ages
	0-4	**5-14**	**15-24**	**25-44**	**45-59**	**60+**	
Chapter 09 - Diseases of the circulatory system	-0.030	0.000	0.006	0.387	0.436	0.519	1.319
Other Causes not defined here	0.637	0.000	0.026	-0.006	-0.018	-0.117	0.522
Chapter 01 - Certain infectious and parasitic diseases	0.121	0.000	0.023	0.194	0.081	0.082	0.501
Chapter 20 - External causes of morbidity & mortality	-0.148	-0.032	0.080	0.220	0.167	0.020	0.309
Chapter 04 - Endocrine, nutritional & metabolic diseases	-0.060	0.000	0.000	-0.013	0.120	0.238	0.285
Chapter 10 - Diseases of the respiratory system	-0.028	0.006	0.069	0.103	0.014	0.086	0.250
Chapter 11 - Diseases of the digestive system	0.030	0.006	0.000	-0.151	0.092	0.102	0.079
Chapter 16 - Conditions originating in the perinatal period	0.009	0.000	0.000	0.000	0.000	0.000	0.009
Chapter 02 - Neoplasms	-0.060	0.000	0.000	-0.030	-0.032	0.029	-0.092
Chapter 14 - Diseases of the genitourinary system	0.000	0.000	0.000	-0.069	-0.169	-0.169	-0.407
Chapter 18 - Symptoms, signs & abnormal clinical & lab	-0.359	-0.005	-0.080	-0.115	-0.113	-0.099	-0.771
All Causes Effect	**0.112**	**-0.025**	**0.125**	**0.519**	**0.579**	**0.692**	**2.003**

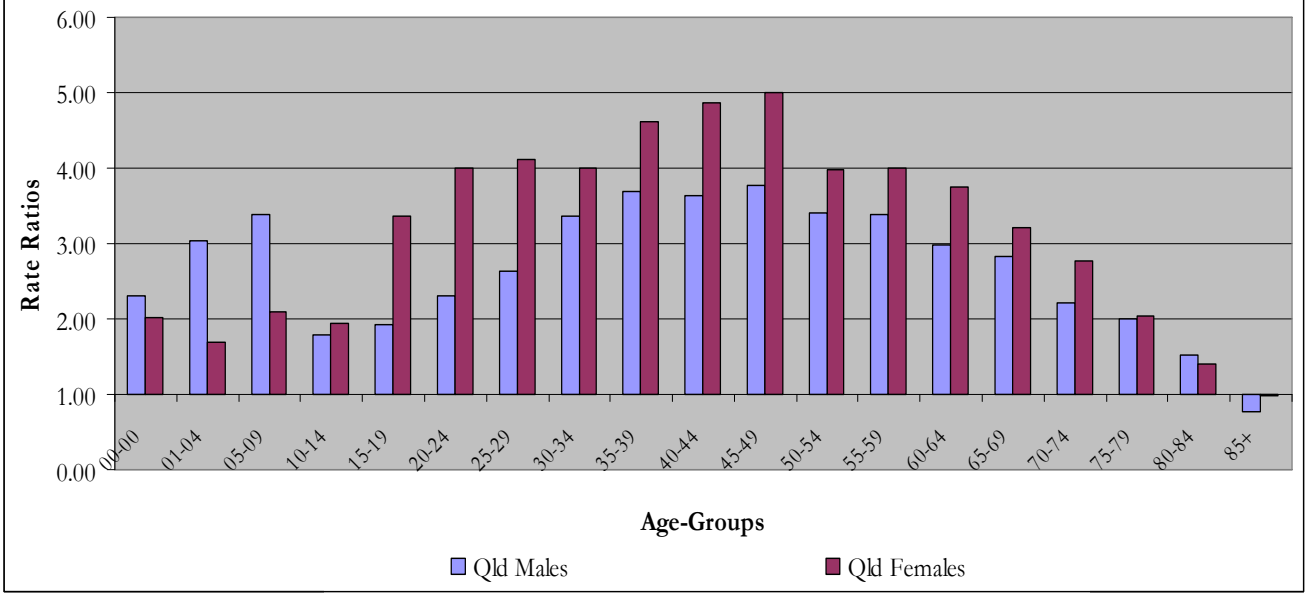
[a] Please refer to Appendix 3 for full description of the Codes.

Indigenous to non-Indigenous Mortality gaps

In spite of significant gains in mortality outcomes between Indigenous and non-Indigenous Queenslanders, large gaps remain between mortality rates of the two in all remoteness categories as depicted in figures 7 to 10 below. These figures show higher Indigenous to non-Indigenous mortality gaps exist in the adult ages. Consequently,

improvements in the adult mortality rates from 2002-04 to 2005-07 are reflected in gains in life expectancy for the latter period. Figure 7 shows higher rate ratios for Indigenous males in infancy and young children, however, in almost all other age groups Indigenous females have higher mortality rate ratios. This is mainly due to much lower mortality rates for non-Indigenous females.

Figure 7: Indigenous to non-Indigenous Age-Specific Mortality Rate Ratios, Queensland 2005-07



In Figures 8, 9 and 10 age-specific mortality rate ratios are presented by remoteness. These figures show that although Indigenous people have higher mortality rates compared to their non-Indigenous counterparts in virtually all ages and in all remoteness areas, in remote and very remote areas, Indigenous females experience up to 8 times the mortality rates of non-Indigenous females in the middle adult ages of 20 to 49 years. However, it needs to be acknowledged that analysis at the remote and very remote areas suffer from the limitations of small numbers.

Figure 8: Indigenous to non-Indigenous Age-Specific Mortality Rate Ratios, Queensland Major Cities, 2005-07

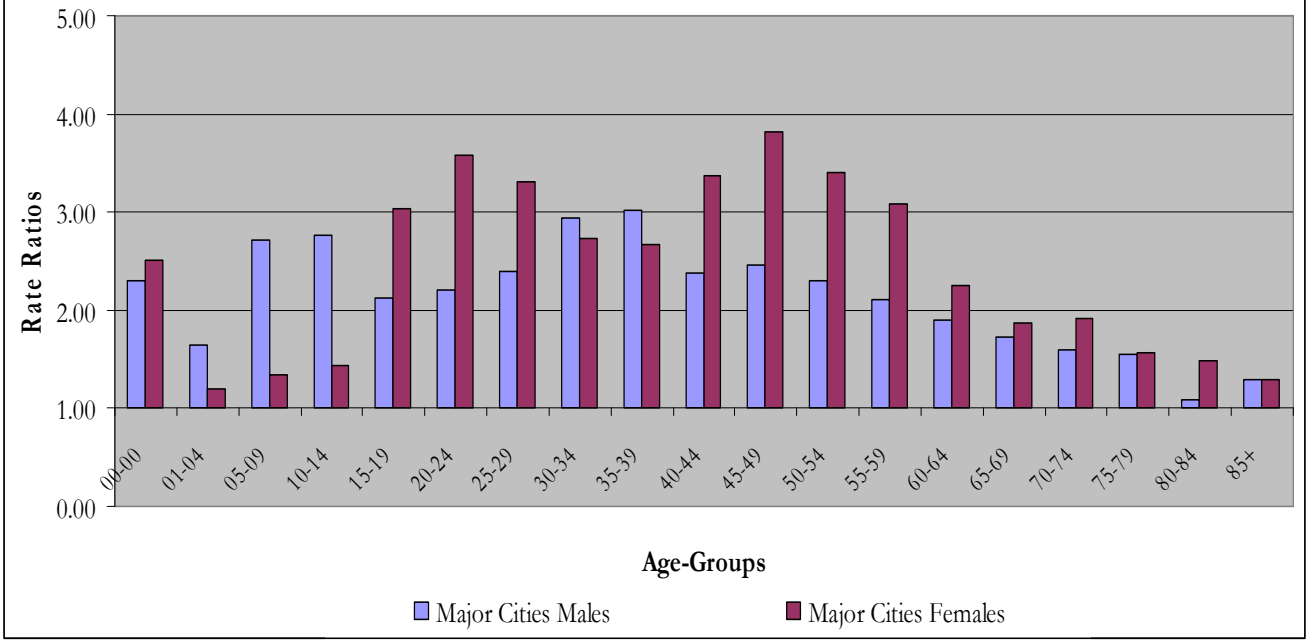


Figure 9: Indigenous to non-Indigenous Age-Specific Mortality Rate Ratios, Queensland Regional Areas, 2005-07

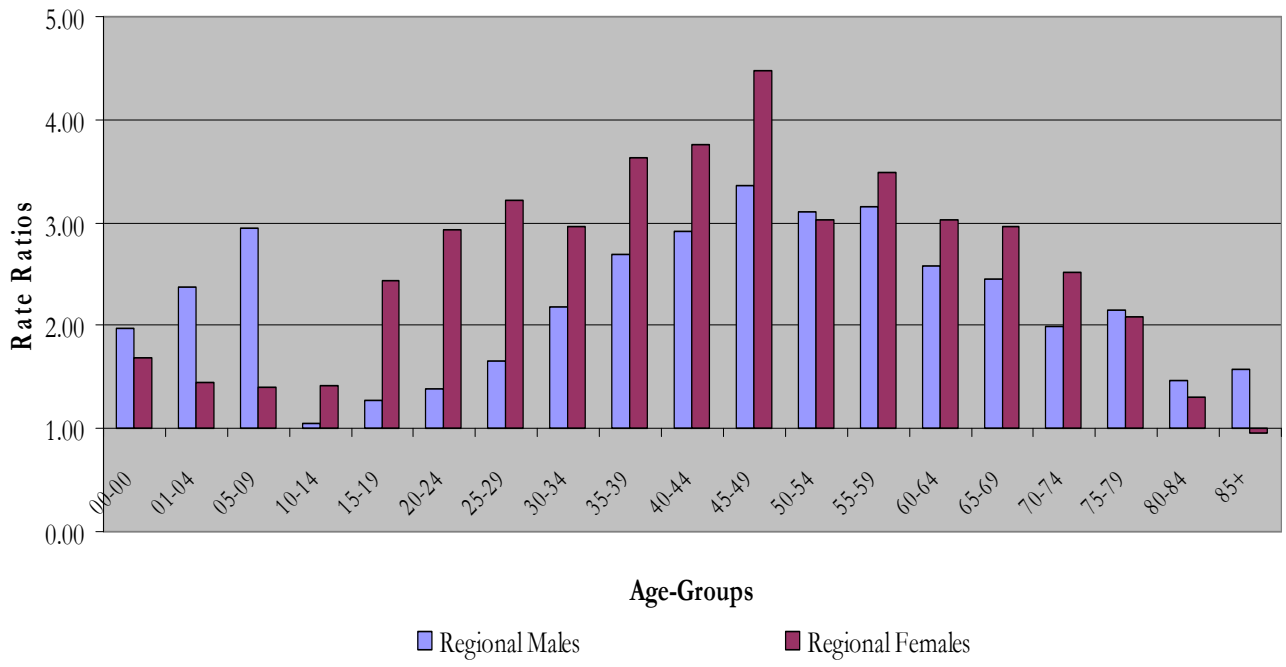
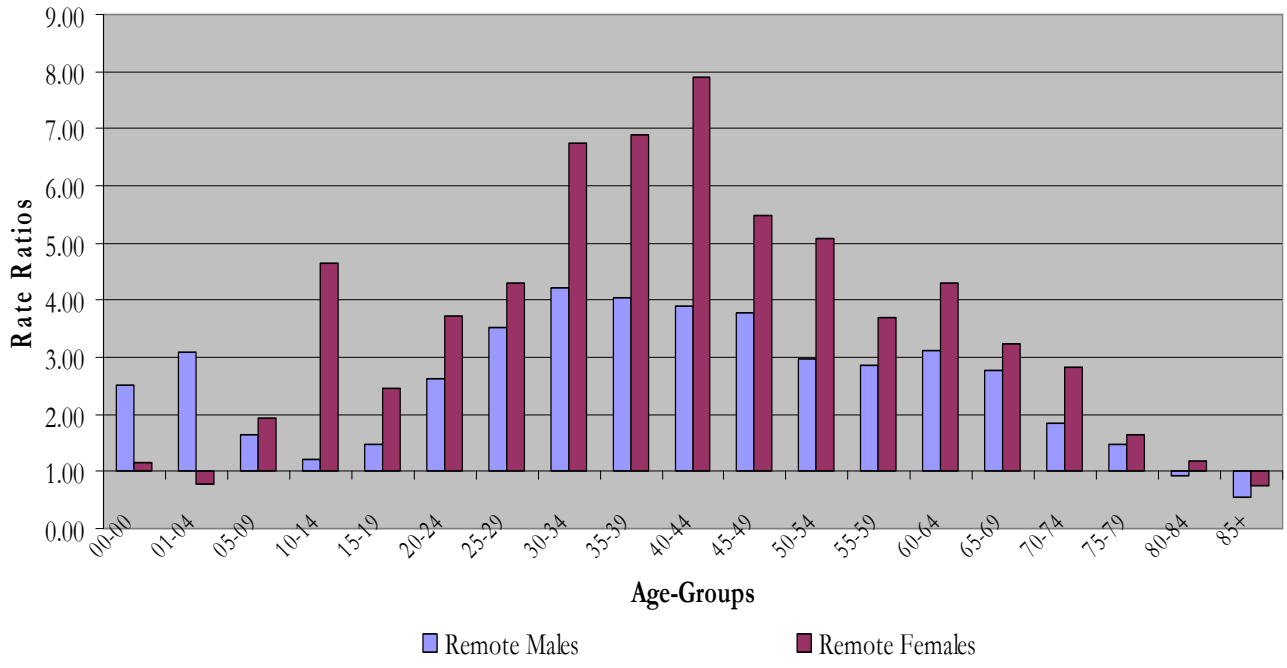


Figure 10: Indigenous to non-Indigenous Age-Specific Mortality Rate Ratios, Queensland Remote/Very Remote Areas, 2005-07



Conclusions

This study demonstrates that although Indigenous people have high mortality rates compared to their non-Indigenous counterparts in virtually all ages, these inequalities are most pronounced in the middle years of age. Indigenous females experience mortality rates 4 to 6 times those of non-Indigenous females in the age bracket 20 to 49 years, while Indigenous males in the same age range have rates 3 to 4 times those of their non-Indigenous counterparts.

Nevertheless, these analyses show significant gains in life expectancy from 2002-04 to 2005-07 for Indigenous Queenslanders. The average annual gain in life expectancy at birth for Indigenous females was 0.55 years while for Indigenous males it was 0.67 years. If these gains were to continue it would not be impossible to close the gap within a generation. It should be noted, major gains were achieved in urban areas, while those in remote areas were more modest.

This work provides evidence that the decline in adult mortality rates from ages 55 onwards seems to be the major force behind improvement in Indigenous life expectancy during this period in Queensland. However, large gaps still exist, particularly in adult Indigenous mortality from ages 35 onward. Due to the bulk of the population with established chronic conditions belonging to these age groups, any further improvement, particularly in ages 35 to 54 will go a long way to eliminating mortality gaps between Indigenous and non-Indigenous Queenslanders.

For Indigenous females in Queensland the observed improvement in life expectancy at birth was mainly due to mortality reductions from external causes, diseases of the circulatory system for ages 45 and above and mortality reductions from diseases of the respiratory system for ages 25 years and onwards.

For Indigenous males, improvement in mortality from diseases of the circulatory system for ages 25 and above and mortality reductions from diseases of certain infectious and parasitic diseases in the same age groups provided the bulk of the estimated 2 years improvement in life expectancy during the study period.

Improvements in life expectancy would have been much larger if it was not for the worsening mortality rates from certain diseases. For females this includes diseases of the digestive system, symptoms, signs & abnormal clinical findings and diabetes. For Indigenous males, increases in mortality related to symptoms, signs & abnormal clinical findings, diseases of the genitourinary system and to a lesser extend, cancers are noticeable.

Local health planners will find the derived life tables by remoteness very useful robust and unique tools for describing local mortality. Good (and improving) quality data and available methods for life table construction can be applied at the local level. Deriving life tables for the seventeen new Local Health and Hospital Networks (LHHN), or for other jurisdictions, primarily depends on the quality of the mortality and population data. While many of the local networks will not have a large enough Indigenous population to allow construction of Indigenous-specific life tables, generation of life tables for the general population will not suffer from such problems.

This study shows that life expectancy gradually declines with remoteness.

Appendices

Appendix 1: Derived Indigenous and non-Indigenous Experimental Life Tables, Death Rate Ratios and Life Expectancy Gaps, by Remoteness and Sex, Queensland, 2002-04

	Indigenous 2002-04 Major Cities, Females					Non-Indigenous 2002-04 Major Cities, Females					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Death Rate Ratios**	**Life Expectancy Gap (years)**
0 - 1	0.002680	0.002673	100000	99748	74.84	0.003806	0.003792	100000	99644	83.83	0.70	-8.99
1 - 5	0.000332	0.001327	99733	398602	74.04	0.000175	0.000700	99621	398310	83.15	1.90	-9.11
5 - 10	0.000092	0.000460	99600	497887	70.14	0.000065	0.000325	99551	497674	79.21	1.42	-9.07
10 - 15	0.000107	0.000535	99555	497640	65.17	0.000101	0.000505	99519	497468	74.23	1.06	-9.07
15 - 20	0.000321	0.001604	99501	497164	60.20	0.000159	0.000795	99468	497156	69.27	2.02	-9.07
20 - 25	0.000580	0.002896	99342	496039	55.29	0.000206	0.001029	99389	496703	64.32	2.82	-9.03
25 - 30	0.000746	0.003723	99054	494377	50.45	0.000273	0.001364	99287	496109	59.39	2.73	-8.94
30 - 35	0.000857	0.004276	98685	492433	45.62	0.000323	0.001614	99152	495380	54.46	2.65	-8.84
35 - 40	0.001521	0.007579	98263	489617	40.81	0.000522	0.002607	98992	494360	49.55	2.91	-8.74
40 - 45	0.002493	0.012393	97518	484791	36.10	0.000774	0.003863	98734	492782	44.67	3.22	-8.57
45 - 50	0.003735	0.018515	96310	477412	31.52	0.001233	0.006147	98352	490351	39.83	3.03	-8.31
50 - 55	0.006134	0.030246	94527	466100	27.06	0.001750	0.008714	97748	486734	35.06	3.51	-8.00
55 - 60	0.011131	0.054288	91668	447079	22.82	0.002553	0.012690	96896	481636	30.35	4.36	-7.53
60 - 65	0.021426	0.102051	86691	412905	18.98	0.004432	0.021939	95666	473550	25.70	4.83	-6.73
65 - 70	0.032252	0.149573	77844	361013	15.83	0.007751	0.038081	93567	459700	21.22	4.16	-5.39
70 - 75	0.042860	0.193797	66201	299336	13.16	0.013530	0.065603	90004	436407	16.95	3.17	-3.79
75 - 80	0.057621	0.252067	53371	233477	10.71	0.022549	0.107293	84100	400165	12.95	2.56	-2.24
80 - 85	0.083468	0.344765	39918	164882	8.47	0.055356	0.245724	75076	333262	9.18	1.51	-0.71
85 - 90	0.150873	1.000000	26156	173363	6.63	0.159130	1.000000	56628	355863	6.28	0.95	0.34

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous 2002-04 Regional, Females					Non-Indigenous 2002-04 Regional, Females					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	**Death Rate Ratios**	**Death Rate Ratios**	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Death Rate Ratios**	**Life Expectancy Gap (years)**
0 - 1	0.010138	0.010044	100000	99076	71.61	0.004338	0.004320	100000	99595	81.07	2.34	-9.46
1 - 5	0.000495	0.001978	98996	395494	71.34	0.000234	0.000935	99568	398041	80.43	2.12	-9.09
5 - 10	0.000316	0.001579	98800	493609	67.48	0.000092	0.000460	99475	497260	76.50	3.43	-9.02
10 - 15	0.000333	0.001664	98644	492809	62.58	0.000185	0.000925	99429	496916	71.53	1.80	-8.96
15 - 20	0.000665	0.003320	98480	491634	57.68	0.000269	0.001344	99337	496374	66.60	2.47	-8.92
20 - 25	0.000725	0.003619	98153	489920	52.86	0.000408	0.002038	99204	495533	61.68	1.78	-8.82
25 - 30	0.001208	0.006023	97798	487612	48.04	0.000441	0.002203	99001	494473	56.80	2.74	-8.76
30 - 35	0.001618	0.008060	97209	484238	43.32	0.000527	0.002632	98783	493295	51.92	3.07	-8.60
35 - 40	0.003147	0.015623	96425	478682	38.65	0.000745	0.003718	98523	491751	47.05	4.22	-8.40
40 - 45	0.004669	0.023092	94919	469456	34.22	0.001023	0.005103	98157	489608	42.22	4.56	-8.00
45 - 50	0.006989	0.034368	92727	455975	29.97	0.001540	0.007673	97656	486539	37.42	4.54	-7.46
50 - 55	0.007967	0.039089	89540	439320	25.94	0.002411	0.011988	96907	481830	32.69	3.30	-6.75
55 - 60	0.012579	0.061101	86040	417930	21.89	0.003601	0.017856	95745	474772	28.06	3.49	-6.17
60 - 65	0.020064	0.095802	80783	385724	18.14	0.006136	0.030255	94036	463661	23.52	3.27	-5.38
65 - 70	0.031529	0.146572	73044	339566	14.78	0.010462	0.051083	91191	445258	19.17	3.01	-4.39
70 - 75	0.045299	0.204064	62337	280819	11.87	0.018145	0.087082	86532	415287	15.05	2.50	-3.18
75 - 80	0.070558	0.300539	49617	211339	9.26	0.031883	0.148703	78997	368442	11.23	2.21	-1.97
80 - 85	0.109000	0.425686	34705	135536	7.14	0.079189	0.333945	67250	283597	7.71	1.38	-0.57
85 - 90	0.177309	1.000000	19931	112411	5.64	0.190441	1.000000	44792	235202	5.25	0.93	0.39

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous 2002-04 Remote/Very Remote, Females					Non-Indigenous 2002-04 Remote/Very Remote, Females					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Death Rate Ratios**	**Life Expectancy Gap (years)**
0 - 1	0.006290	0.006253	100000	99418	70.94	0.003559	0.003547	100000	99667	81.50	1.77	-10.56
1 - 5	0.000926	0.003695	99375	396586	70.38	0.000283	0.001131	99645	398301	80.79	3.27	-10.41
5 - 10	0.000381	0.001903	99007	494566	66.64	0.000466	0.002327	99533	497084	76.88	0.82	-10.24
10 - 15	0.000437	0.002183	98819	493556	61.76	0.000333	0.001664	99301	496092	72.06	1.31	-10.29
15 - 20	0.000753	0.003759	98603	492178	56.89	0.000171	0.000855	99136	495467	67.17	4.40	-10.28
20 - 25	0.001367	0.006813	98233	489606	52.10	0.000333	0.001664	99051	494866	62.23	4.11	-10.13
25 - 30	0.001746	0.008694	97563	485793	47.43	0.000331	0.001654	98886	494032	57.33	5.27	-9.89
30 - 35	0.002397	0.011918	96715	480863	42.83	0.000441	0.002203	98723	493090	52.42	5.44	-9.59
35 - 40	0.003603	0.017866	95563	473864	38.31	0.000515	0.002572	98505	491925	47.53	7.00	-9.21
40 - 45	0.006105	0.030099	93855	462733	33.96	0.000817	0.004077	98252	490346	42.64	7.47	-8.68
45 - 50	0.009249	0.045259	91030	445448	29.93	0.001491	0.007430	97851	487596	37.81	6.20	-7.87
50 - 55	0.013425	0.065031	86910	420995	26.22	0.002337	0.011622	97124	483012	33.07	5.74	-6.84
55 - 60	0.017209	0.082658	81258	390301	22.87	0.003769	0.018683	95995	475851	28.43	4.57	-5.56
60 - 65	0.028264	0.132370	74542	349103	19.69	0.006309	0.031097	94202	464321	23.92	4.48	-4.22
65 - 70	0.038276	0.174793	64675	295346	17.30	0.011346	0.055283	91273	444721	19.60	3.37	-2.30
70 - 75	0.045786	0.205118	53370	239094	15.43	0.017817	0.085540	86227	413979	15.58	2.57	-0.16
75 - 80	0.051030	0.225757	42423	187679	13.77	0.031285	0.146044	78851	368091	11.79	1.63	1.98
80 - 85	0.059587	0.258740	32846	142623	12.08	0.072788	0.310594	67335	287326	8.34	0.82	3.73
85 - 90	0.095829	1.000000	24347	254070	10.44	0.169163	1.000000	46421	274418	5.91	0.57	4.52

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous 2002-04 Qld, Females					Non-Indigenous 2002-04 Qld, Females					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Death Rate Ratios**	**Life Expectancy Gap (years)**
0 - 1	0.007098	0.007052	100000	99345	72.35	0.003994	0.003979	100000	99627	82.71	1.78	-10.36
1 - 5	0.000538	0.002149	99295	396649	71.86	0.000200	0.000798	99602	398211	82.04	2.69	-10.18
5 - 10	0.000265	0.001324	99081	495079	68.01	0.000084	0.000420	99523	497508	78.10	3.15	-10.09
10 - 15	0.000292	0.001459	98950	494390	63.10	0.000139	0.000694	99481	497231	73.13	2.10	-10.03
15 - 20	0.000582	0.002906	98806	493374	58.19	0.000202	0.001007	99412	496822	68.18	2.89	-9.99
20 - 25	0.000836	0.004172	98519	491628	53.35	0.000270	0.001351	99312	496236	63.25	3.09	-9.90
25 - 30	0.001207	0.006018	98108	489139	48.56	0.000329	0.001645	99177	495492	58.33	3.67	-9.77
30 - 35	0.001574	0.007841	97517	485806	43.84	0.000394	0.001969	99014	494608	53.42	3.99	-9.58
35 - 40	0.002796	0.013891	96753	480684	39.17	0.000605	0.003019	98819	493400	48.52	4.62	-9.36
40 - 45	0.004400	0.021777	95409	472202	34.68	0.000870	0.004339	98521	491607	43.66	5.06	-8.98
45 - 50	0.006605	0.032516	93331	459459	30.39	0.001353	0.006743	98094	488927	38.84	4.88	-8.45
50 - 55	0.008716	0.042698	90296	442342	26.33	0.002005	0.009978	97432	484885	34.09	4.35	-7.76
55 - 60	0.013412	0.065028	86441	419108	22.38	0.002971	0.014754	96460	479013	29.40	4.51	-7.02
60 - 65	0.022559	0.107102	80820	383702	18.75	0.005149	0.025444	95037	469665	24.80	4.38	-6.05
65 - 70	0.033485	0.154844	72164	333706	15.69	0.008889	0.043556	92619	453853	20.38	3.77	-4.69
70 - 75	0.044889	0.202054	60990	274526	13.09	0.015366	0.074196	88585	427751	16.18	2.92	-3.10
75 - 80	0.060967	0.264584	48666	211202	10.76	0.026007	0.122822	82012	387319	12.27	2.34	-1.50
80 - 85	0.084483	0.347629	35790	147268	8.73	0.063790	0.278042	71939	313560	8.60	1.32	0.13
85 - 90	0.141314	1.000000	23348	165223	7.08	0.170255	1.000000	51937	305054	5.87	0.83	1.20

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous 2002-04 Major Cities, Males					Non-Indigenous 2002-04 Major Cities, Males					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Death Rate Ratios**	**Life Expectancy Gap (years)**
0	0.005931	0.005898	100000	99445	71.36	0.004529	0.004510	100000	99574	79.92	1.31	-8.56
1	0.000339	0.001355	99410	397322	70.78	0.000250	0.000999	99549	397961	79.28	1.36	-8.50
5	0.000178	0.000890	99275	496157	66.88	0.000096	0.000480	99450	497128	75.36	1.85	-8.48
10	0.000296	0.001479	99187	495569	61.93	0.000191	0.000955	99402	496772	70.39	1.55	-8.46
15	0.000575	0.002871	99040	494572	57.02	0.000402	0.002008	99307	496083	65.46	1.43	-8.44
20	0.001149	0.005730	98756	492507	52.18	0.000596	0.002976	99108	494843	60.59	1.93	-8.41
25	0.001929	0.009601	98190	488728	47.46	0.000809	0.004037	98813	493093	55.76	2.38	-8.30
30	0.002315	0.011511	97247	483535	42.90	0.000834	0.004162	98414	491067	50.97	2.78	-8.08
35	0.002983	0.014810	96128	477242	38.37	0.001057	0.005272	98004	488777	46.18	2.82	-7.81
40	0.004096	0.020284	94704	468985	33.90	0.001320	0.006579	97487	485915	41.41	3.10	-7.50
45	0.006033	0.029742	92784	457418	29.55	0.001972	0.009815	96846	482007	36.66	3.06	-7.11
50	0.008712	0.042681	90024	441037	25.38	0.002908	0.014442	95896	476243	32.00	3.00	-6.63
55	0.012656	0.061489	86182	418710	21.39	0.004474	0.022143	94511	467751	27.43	2.83	-6.04
60	0.025587	0.120689	80882	381506	17.61	0.008140	0.039958	92418	453669	22.99	3.14	-5.38
65	0.034151	0.157559	71121	328123	14.67	0.013934	0.067491	88725	429747	18.84	2.45	-4.17
70	0.045240	0.203942	59915	270098	11.94	0.022460	0.106653	82737	392883	15.00	2.01	-3.07
75	0.081750	0.340257	47696	198518	9.33	0.034594	0.160011	73913	341876	11.48	2.36	-2.15
80	0.122748	0.461370	31467	118274	7.83	0.068060	0.293332	62086	267585	8.16	1.80	-0.33
85	0.132192	1.000000	16949	128216	7.56	0.183514	1.000000	43874	239077	5.45	0.72	2.12

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous 2002-04 Regional, Males					Non-Indigenous 2002-04 Regional, Males					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Death Rate Ratios**	**Life Expectancy Gap (years)**
0	0.018141	0.017848	100000	98383	65.80	0.005965	0.005932	100000	99442	75.86	3.04	-10.06
1	0.000755	0.003015	98215	392150	65.99	0.000411	0.001642	99407	397241	75.31	1.84	-9.32
5	0.000349	0.001743	97919	489169	62.19	0.000131	0.000655	99244	496055	71.43	2.66	-9.25
10	0.000493	0.002462	97748	488141	57.29	0.000365	0.001823	99179	495441	66.48	1.35	-9.19
15	0.000935	0.004665	97508	486525	52.42	0.000747	0.003729	98998	494157	61.59	1.25	-9.17
20	0.001836	0.009141	97053	483227	47.66	0.001210	0.006033	98629	491737	56.81	1.52	-9.16
25	0.002534	0.012594	96166	477944	43.07	0.001461	0.007279	98034	488402	52.14	1.73	-9.07
30	0.003327	0.016505	94955	471049	38.59	0.001383	0.006892	97320	484947	47.51	2.41	-8.92
35	0.004741	0.023445	93387	461806	34.19	0.001752	0.008723	96649	481204	42.82	2.71	-8.63
40	0.007388	0.036309	91198	448200	29.95	0.002033	0.010116	95806	476712	38.17	3.63	-8.22
45	0.010359	0.050549	87887	428861	25.98	0.002984	0.014816	94837	470890	33.53	3.47	-7.56
50	0.014598	0.070518	83444	403091	22.22	0.004392	0.021736	93432	462404	29.00	3.32	-6.78
55	0.019256	0.092093	77560	370934	18.71	0.006666	0.032823	91401	450058	24.58	2.89	-5.87
60	0.034477	0.159267	70417	325293	15.34	0.011367	0.055384	88401	430717	20.33	3.03	-4.99
65	0.046318	0.207710	59202	265487	12.75	0.018996	0.090959	83505	399851	16.36	2.44	-3.61
70	0.059675	0.259987	46905	204353	10.43	0.031546	0.146806	75910	353262	12.73	1.89	-2.30
75	0.095186	0.382948	34710	139645	8.21	0.051300	0.228835	64766	288901	9.47	1.86	-1.26
80	0.121111	0.458532	21418	81090	6.79	0.104846	0.417468	49945	198867	6.49	1.16	0.30
85	0.180307	1.000000	11597	64319	5.55	0.231996	1.000000	29095	125410	4.31	0.78	1.24

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous 2002-04 Remote/Very Remote, Males					Non-Indigenous 2002-04 Remote/Very Remote, Males					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Death Rate Ratios**	**Life Expectancy Gap (years)**
0	0.015053	0.014849	100000	98642	63.94	0.006745	0.006703	100000	99371	75.48	2.23	-11.54
1	0.000434	0.001734	98515	393652	63.91	0.000263	0.001051	99330	397072	74.99	1.65	-11.08
5	0.000367	0.001833	98344	491271	60.01	0.000471	0.002352	99225	495543	71.07	0.78	-11.05
10	0.000485	0.002422	98164	490226	55.12	0.000672	0.003354	98992	494129	66.23	0.72	-11.11
15	0.001872	0.009323	97926	487698	50.25	0.001261	0.006286	98660	491845	61.44	1.48	-11.19
20	0.003105	0.015415	97013	481626	45.69	0.001434	0.007144	98040	488448	56.82	2.17	-11.12
25	0.005027	0.024837	95518	471930	41.37	0.001286	0.006409	97339	485099	52.21	3.91	-10.84
30	0.005655	0.027891	93145	459401	37.35	0.001092	0.005445	96715	482259	47.53	5.18	-10.17
35	0.007269	0.035717	90548	444915	33.35	0.001280	0.006380	96189	479463	42.77	5.68	-9.42
40	0.008983	0.043972	87313	427400	29.49	0.001683	0.008382	95575	475989	38.03	5.34	-8.54
45	0.013629	0.065993	83474	404191	25.73	0.002612	0.012981	94774	471013	33.33	5.22	-7.60
50	0.017251	0.082815	77965	374278	22.36	0.004058	0.020102	93544	463374	28.73	4.25	-6.37
55	0.025163	0.118719	71509	337379	19.15	0.006757	0.033273	91663	451367	24.27	3.72	-5.12
60	0.040370	0.183684	63019	286739	16.37	0.012563	0.061068	88613	430747	20.01	3.21	-3.64
65	0.047949	0.213476	51444	229035	14.48	0.022388	0.106358	83202	395264	16.13	2.14	-1.65
70	0.047426	0.211333	40462	180300	12.75	0.033164	0.153629	74353	344432	12.74	1.43	0.02
75	0.054060	0.238318	31911	140675	10.52	0.052194	0.232394	62930	280196	9.58	1.04	0.94
80	0.088618	0.362436	24306	99408	8.02	0.111616	0.436855	48305	189063	6.68	0.79	1.35
85	0.162021	1.000000	15497	95645	6.17	0.203889	1.000000	27203	133420	4.90	0.79	1.27

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous 2002-04 Qld, Males					Non-Indigenous 2002-04 Qld, Males					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Death Rate Ratios**	**Life Expectancy Gap (years)**
0 - 1	0.013938	0.013762	100000	98737	66.75	0.005127	0.005102	100000	99519	78.12	2.72	-11.37
1 - 5	0.000569	0.002273	98624	393960	66.68	0.000312	0.001245	99490	397667	77.52	1.83	-10.84
5 - 10	0.000304	0.001519	98400	491625	62.83	0.000118	0.000590	99366	496683	73.62	2.57	-10.79
10 - 15	0.000437	0.002183	98250	490715	57.92	0.000271	0.001356	99307	496200	68.66	1.61	-10.74
15 - 20	0.001016	0.005069	98036	489088	53.04	0.000545	0.002720	99173	495250	63.75	1.87	-10.71
20 - 25	0.001903	0.009474	97539	485586	48.30	0.000810	0.004040	98903	493568	58.91	2.35	-10.62
25 - 30	0.002957	0.014682	96615	479707	43.73	0.001033	0.005150	98503	491273	54.14	2.86	-10.41
30 - 35	0.003592	0.017806	95196	471906	39.35	0.001032	0.005145	97996	488744	49.41	3.48	-10.06
35 - 40	0.004850	0.023974	93501	462183	35.01	0.001319	0.006576	97492	485913	44.65	3.68	-9.64
40 - 45	0.006888	0.033889	91260	448992	30.81	0.001607	0.008004	96851	482408	39.93	4.29	-9.12
45 - 50	0.010067	0.049159	88167	430533	26.80	0.002386	0.011863	96075	477708	35.23	4.22	-8.44
50 - 55	0.013756	0.066586	83833	405792	23.05	0.003519	0.017451	94936	470807	30.62	3.91	-7.58
55 - 60	0.019085	0.091326	78251	374448	19.50	0.005403	0.026682	93279	460663	26.12	3.53	-6.62
60 - 65	0.033929	0.156895	71104	328801	16.20	0.009573	0.046838	90790	444211	21.76	3.54	-5.56
65 - 70	0.044304	0.199438	59948	269862	13.73	0.016261	0.078346	86538	416944	17.70	2.72	-3.97
70 - 75	0.053057	0.234253	47992	211893	11.52	0.026432	0.124399	79758	375373	13.97	2.01	-2.45
75 - 80	0.076491	0.320863	36750	154159	9.28	0.041471	0.188942	69836	318172	10.59	1.84	-1.30
80 - 85	0.108915	0.424063	24958	97176	7.49	0.082203	0.343541	56641	236715	7.43	1.32	0.06
85 - 90	0.159927	1.000000	14374	89881	6.25	0.201710	1.000000	37183	184337	4.96	0.79	1.30

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

Appendix 2: Derived Indigenous and non-Indigenous Experimental Life Tables, Death Rate Ratios and Life Expectancy Gaps, by Remoteness and Sex, Queensland, 2005-07

	Indigenous 2005-07 Major Cities, Females					Non-Indigenous 2005-07 Major Cities, Females					Indigenous to non-Indigenous	
Age	**m(x,n)**	**q(x,n)**	**l(x)**	**L(x,n)**	**e(x)**	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Death Rate Ratios**	**Life Expectancy Gap (years)**
0 - 1	0.009356	0.009276	100000	99145	76.88	0.003303	0.003293	100000	99690	84.57	2.83	-7.69
1 - 5	0.000193	0.000772	99072	396099	76.60	0.000147	0.000588	99671	398538	83.85	1.31	-7.25
5 - 10	0.000104	0.000520	98996	494851	72.66	0.000070	0.000350	99612	497974	79.90	1.49	-7.24
10 - 15	0.000159	0.000795	98944	494526	67.70	0.000098	0.000490	99577	497764	74.93	1.62	-7.23
15 - 20	0.000492	0.002457	98866	493796	62.75	0.000143	0.000715	99528	497473	69.96	3.44	-7.22
20 - 25	0.000696	0.003474	98623	492303	57.90	0.000175	0.000875	99457	497080	65.01	3.98	-7.12
25 - 30	0.000931	0.004644	98280	490290	53.09	0.000259	0.001294	99370	496546	60.07	3.59	-6.98
30 - 35	0.000962	0.004799	97824	487984	48.33	0.000318	0.001589	99242	495834	55.14	3.03	-6.82
35 - 40	0.001394	0.006948	97354	485225	43.55	0.000466	0.002327	99084	494882	50.23	2.99	-6.68
40 - 45	0.002706	0.013448	96678	480456	38.83	0.000699	0.003489	98853	493465	45.34	3.87	-6.50
45 - 50	0.004601	0.022761	95378	471822	34.32	0.001077	0.005372	98509	491315	40.49	4.27	-6.16
50 - 55	0.006276	0.030917	93207	459161	30.06	0.001673	0.008332	97979	487991	35.69	3.75	-5.63
55 - 60	0.008496	0.041626	90325	442546	25.94	0.002420	0.012032	97163	483098	30.97	3.51	-5.03
60 - 65	0.010264	0.050078	86565	422356	21.95	0.003988	0.019759	95994	475622	26.31	2.57	-4.36
65 - 70	0.014126	0.068378	82230	398040	17.97	0.006829	0.033622	94097	463274	21.79	2.07	-3.82
70 - 75	0.026493	0.124638	76608	360405	14.10	0.012315	0.059882	90933	442165	17.45	2.15	-3.36
75 - 80	0.034301	0.158829	67059	310516	10.73	0.020573	0.098327	85488	408585	13.39	1.67	-2.66
80 - 85	0.085787	0.356994	56408	234738	7.25	0.051914	0.232170	77082	344728	9.55	1.65	-2.30
85 - 90	0.208225	...	36271	174191	4.80	0.151196	1.000000	59186	391453	6.61	1.38	-1.81

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous 2005-07 Regional, Females					Non-Indigenous 2005-07 Regional, Females					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Death Rate Ratios**	**Life Expectancy Gap (years)**
0 - 1	0.007214	0.007166	100000	99335	74.21	0.004549	0.004530	100000	99576	81.68	1.59	-7.48
1 - 5	0.000363	0.001451	99283	396775	73.74	0.000266	0.001063	99547	397925	81.05	1.36	-7.31
5 - 10	0.000142	0.000710	99139	495521	69.85	0.000108	0.000540	99441	497072	77.14	1.31	-7.29
10 - 15	0.000212	0.001059	99069	495083	64.90	0.000160	0.000800	99387	496739	72.18	1.33	-7.28
15 - 20	0.000511	0.002552	98964	494265	59.96	0.000225	0.001124	99308	496278	67.24	2.27	-7.27
20 - 25	0.000913	0.004555	98711	492514	55.11	0.000340	0.001699	99196	495581	62.31	2.69	-7.20
25 - 30	0.001218	0.006072	98262	489872	50.35	0.000401	0.002003	99028	494660	57.41	3.04	-7.06
30 - 35	0.001430	0.007126	97665	486677	45.64	0.000512	0.002557	98830	493544	52.52	2.79	-6.88
35 - 40	0.002322	0.011548	96969	482241	40.95	0.000686	0.003424	98577	492085	47.65	3.38	-6.70
40 - 45	0.003367	0.016704	95849	475531	36.40	0.000973	0.004854	98239	490070	42.80	3.46	-6.41
45 - 50	0.005664	0.027944	94248	464983	31.97	0.001351	0.006734	97762	487279	38.00	4.19	-6.03
50 - 55	0.006453	0.031776	91615	451137	27.81	0.002250	0.011192	97104	482999	33.24	2.87	-5.43
55 - 60	0.010615	0.051787	88703	432756	23.64	0.003275	0.016251	96017	476462	28.58	3.24	-4.94
60 - 65	0.015280	0.073752	84110	405970	19.78	0.005436	0.026844	94457	466451	24.01	2.81	-4.23
65 - 70	0.025387	0.119775	77907	367560	16.15	0.009007	0.044127	91921	450337	19.60	2.82	-3.45
70 - 75	0.039552	0.180512	68575	312971	12.99	0.016671	0.080290	87865	423169	15.38	2.37	-2.39
75 - 80	0.056459	0.248044	56197	246892	10.28	0.029127	0.136698	80810	379256	11.48	1.94	-1.21
80 - 85	0.090269	0.368096	42257	172316	7.83	0.075972	0.322837	69764	296456	7.87	1.19	-0.04
85 - 90	0.168611	...	26703	158368	5.93	0.187177	1.000000	47242	252390	5.34	0.90	0.59

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous 2005-07 Remote/Very Remote, Females					Non-Indigenous 2005-07 Remote/Very Remotel, Females					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Death Rate Ratios**	**Life Expectancy Gap (years)**
0 - 1	0.006877	0.006833	100000	99365	70.71	0.005874	0.005842	100000	99455	82.16	1.17	-11.45
1 - 5	0.000458	0.001830	99317	396815	70.19	0.000580	0.002317	99416	397091	81.64	0.79	-11.44
5 - 10	0.000400	0.001998	99135	495179	66.32	0.000205	0.001024	99185	495673	77.82	1.95	-11.50
10 - 15	0.000460	0.002297	98937	494116	61.45	0.000096	0.000480	99084	495300	72.90	4.79	-11.45
15 - 20	0.000950	0.004740	98710	492470	56.58	0.000381	0.001903	99036	494756	67.94	2.49	-11.35
20 - 25	0.001194	0.005953	98242	489818	51.84	0.000308	0.001539	98848	493860	63.06	3.88	-11.22
25 - 30	0.001735	0.008640	97657	486305	47.13	0.000395	0.001973	98696	492999	58.15	4.39	-11.02
30 - 35	0.002538	0.012616	96813	481239	42.52	0.000372	0.001858	98501	492064	53.26	6.82	-10.74
35 - 40	0.004343	0.021500	95592	473218	38.03	0.000618	0.003086	98318	490881	48.36	7.03	-10.33
40 - 45	0.006702	0.032982	93537	460320	33.81	0.000821	0.004097	98015	489139	43.50	8.16	-9.69
45 - 50	0.008006	0.039276	90451	443740	29.87	0.001443	0.007191	97613	486460	38.67	5.55	-8.79
50 - 55	0.011870	0.057707	86899	422469	25.99	0.002330	0.011588	96911	481975	33.93	5.09	-7.94
55 - 60	0.014706	0.071076	81884	395759	22.42	0.003897	0.019312	95788	474689	29.29	3.77	-6.87
60 - 65	0.028603	0.133908	76064	356103	18.93	0.006392	0.031497	93938	462885	24.82	4.47	-5.89
65 - 70	0.035218	0.162023	65879	303080	16.45	0.010832	0.052830	90979	443729	20.54	3.25	-4.08
70 - 75	0.048077	0.214277	55205	246044	14.14	0.016622	0.079999	86173	414735	16.53	2.89	-2.39
75 - 80	0.048298	0.215399	43376	193446	12.33	0.027595	0.129768	79279	372818	12.74	1.75	-0.41
80 - 85	0.075000	0.315275	34033	143062	10.03	0.059513	0.261186	68991	302784	9.23	1.26	0.79
85 - 90	0.117537	...	23303	198260	8.51	0.152468	...	50972	334312	6.56	0.77	1.95

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous Qld 2005-07, Females					Non-Indigenous 2005-07 Qld, Females					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Death Rate Ratios**	**Life Expectancy Gap (years)**
0 - 1	0.007654	0.007600	100000	99295	73.99	0.003802	0.003788	100000	99644	83.38	2.01	-9.39
1 - 5	0.000340	0.001359	99240	396624	73.55	0.000200	0.000799	99621	398287	82.69	1.70	-9.14
5 - 10	0.000183	0.000915	99105	495299	69.65	0.000087	0.000437	99542	497599	78.76	2.09	-9.11
10 - 15	0.000242	0.001209	99015	494773	64.71	0.000124	0.000621	99498	497336	73.79	1.95	-9.08
15 - 20	0.000589	0.002941	98895	493827	59.79	0.000175	0.000875	99436	496975	68.84	3.37	-9.05
20 - 25	0.000912	0.004550	98604	491968	54.95	0.000228	0.001139	99349	496477	63.89	4.00	-8.94
25 - 30	0.001257	0.006266	98155	489304	50.19	0.000306	0.001528	99236	495818	58.96	4.11	-8.77
30 - 35	0.001538	0.007662	97540	485938	45.49	0.000385	0.001925	99085	494969	54.05	3.99	-8.56
35 - 40	0.002518	0.012517	96793	481165	40.82	0.000547	0.002730	98894	493836	49.15	4.61	-8.32
40 - 45	0.003925	0.019447	95581	473576	36.31	0.000806	0.004022	98624	492191	44.28	4.87	-7.97
45 - 50	0.005930	0.029238	93722	462103	31.98	0.001186	0.005915	98227	489786	39.45	5.00	-7.47
50 - 55	0.007573	0.037193	90982	446837	27.86	0.001904	0.009478	97646	486077	34.66	3.98	-6.80
55 - 60	0.011065	0.053922	87598	426884	23.83	0.002768	0.013752	96721	480515	29.97	4.00	-6.14
60 - 65	0.017259	0.082909	82875	398115	20.04	0.004601	0.022765	95390	471970	25.35	3.75	-5.31
65 - 70	0.024978	0.117875	76004	358674	16.62	0.007770	0.038174	93219	457971	20.88	3.21	-4.26
70 - 75	0.038943	0.177806	67045	306112	13.49	0.014099	0.068285	89660	434247	16.60	2.76	-3.11
75 - 80	0.048694	0.217613	55124	246348	10.85	0.023864	0.113246	83538	396436	12.62	2.04	-1.77
80 - 85	0.084459	0.349238	43128	178335	8.16	0.060417	0.265311	74078	325299	8.88	1.40	-0.72
85 - 90	0.161861	...	28066	173397	6.18	0.163792	1.000000	54424	332274	6.11	0.99	0.07

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous 2005-07 Major Cities, Males					Non-Indigenous 2005-07 Major Cites, Males					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Death Rate Ratios**	**Life Expectancy Gap (years)**
0	0.011038	0.010926	100000	98988	73.88	0.004331	0.004313	100000	99592	80.90	2.55	-7.02
1	0.000375	0.001499	98907	395277	73.70	0.000201	0.000804	99569	398086	80.25	1.87	-6.55
5	0.000308	0.001539	98759	493416	69.81	0.000101	0.000505	99489	497318	76.32	3.05	-6.51
10	0.000509	0.002542	98607	492409	64.91	0.000164	0.000820	99438	496988	71.35	3.10	-6.44
15	0.000853	0.004257	98357	490812	60.07	0.000351	0.001754	99357	496390	66.41	2.43	-6.34
20	0.001226	0.006112	97938	488286	55.32	0.000506	0.002527	99183	495322	61.52	2.42	-6.21
25	0.001818	0.009051	97339	484617	50.64	0.000693	0.003459	98932	493833	56.67	2.62	-6.03
30	0.002452	0.012188	96458	479470	46.08	0.000755	0.003768	98590	492041	51.86	3.25	-5.78
35	0.003020	0.014990	95283	472933	41.61	0.000910	0.004540	98218	490025	47.05	3.32	-5.43
40	0.003427	0.016995	93854	465446	37.21	0.001275	0.006356	97772	487396	42.25	2.69	-5.04
45	0.005099	0.025194	92259	455845	32.81	0.001806	0.008992	97151	483717	37.50	2.82	-4.69
50	0.007578	0.037220	89935	441721	28.59	0.002896	0.014383	96277	478149	32.82	2.62	-4.23
55	0.009970	0.048698	86587	422933	24.59	0.004046	0.020041	94893	470042	28.26	2.46	-3.67
60	0.015431	0.074459	82371	397464	20.71	0.006993	0.034413	92991	457619	23.78	2.21	-3.07
65	0.024342	0.115126	76238	360567	17.17	0.011770	0.057302	89791	437146	19.53	2.07	-2.36
70	0.040544	0.184693	67461	307308	14.06	0.021055	0.100354	84646	403445	15.55	1.93	-1.50
75	0.056935	0.249204	55001	240739	11.65	0.033040	0.153351	76151	353445	11.99	1.72	-0.34
80	0.071643	0.303267	41295	174802	9.69	0.063583	0.276443	64473	280313	8.68	1.13	1.01
85	0.127662	...	28771	225371	7.83	0.166935	1.000000	46650	279449	5.99	0.76	1.84

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous 2005-07 Regional, Males					Non-Indigenous 2005-07 Regional, Males					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Death Rate Ratios**	**Life Expectancy Gap (years)**
0	0.011372	0.011254	100000	98959	68.66	0.006192	0.006156	100000	99421	77.07	1.84	-8.41
1	0.000696	0.002779	98875	394844	68.44	0.000318	0.001271	99384	397239	76.55	2.19	-8.11
5	0.000350	0.001748	98600	492568	64.63	0.000127	0.000635	99258	496133	72.65	2.76	-8.01
10	0.000329	0.001644	98427	491733	59.74	0.000332	0.001659	99195	495564	67.69	0.99	-7.95
15	0.000713	0.003559	98266	490550	54.83	0.000602	0.003006	99031	494474	62.80	1.18	-7.96
20	0.001244	0.006202	97916	488179	50.02	0.000958	0.004779	98733	492549	57.98	1.30	-7.96
25	0.001826	0.009091	97309	484460	45.31	0.001165	0.005808	98261	489908	53.25	1.57	-7.93
30	0.002545	0.012649	96424	479246	40.71	0.001245	0.006206	97690	486963	48.54	2.04	-7.83
35	0.003736	0.018517	95204	471859	36.19	0.001468	0.007314	97084	483705	43.83	2.54	-7.63
40	0.005145	0.025418	93441	461628	31.83	0.001893	0.009422	96374	479703	39.13	2.72	-7.31
45	0.008118	0.039833	91066	446841	27.59	0.002587	0.012857	95466	474454	34.48	3.14	-6.89
50	0.011986	0.058281	87439	425164	23.62	0.004138	0.020492	94238	466692	29.89	2.90	-6.27
55	0.017848	0.085583	82343	394841	19.92	0.006087	0.030009	92307	455083	25.46	2.93	-5.54
60	0.023794	0.112550	75296	356163	16.54	0.009970	0.048725	89537	437587	21.17	2.39	-4.63
65	0.037069	0.170132	66821	306683	13.31	0.016353	0.078781	85174	410330	17.12	2.27	-3.81
70	0.052541	0.233166	55453	246088	10.51	0.028370	0.132993	78464	367824	13.35	1.85	-2.84
75	0.096010	0.387164	42523	171476	7.91	0.045136	0.204072	68029	307578	9.99	2.13	-2.08
80	0.137997	0.503846	26060	95147	6.33	0.093353	0.381255	54146	221134	6.87	1.48	-0.54
85	0.184911	...	12930	69923	5.41	0.221943	1.000000	33503	150952	4.51	0.83	0.90

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous 2005-07 Remote/Very Remote, Males					Non-Indigenous 2005-07 Remote/Very Remote, Males					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Death Rate Ratios**	**Life Expectancy Gap (years)**
0	0.012685	0.012538	100000	98845	64.53	0.004848	0.004826	100000	99545	75.93	2.62	-11.40
1	0.001390	0.005542	98746	393680	64.35	0.000436	0.001742	99517	397660	75.29	3.19	-10.94
5	0.000609	0.003040	98199	490248	60.70	0.000361	0.001803	99344	496272	71.42	1.69	-10.72
10	0.000638	0.003185	97900	488722	55.88	0.000512	0.002557	99165	495191	66.55	1.25	-10.67
15	0.001411	0.007033	97589	486431	51.05	0.000926	0.004620	98911	493478	61.71	1.52	-10.66
20	0.002704	0.013437	96902	481524	46.39	0.001010	0.005037	98454	491048	56.99	2.68	-10.60
25	0.003897	0.019307	95600	473630	41.98	0.001097	0.005470	97958	488473	52.26	3.55	-10.28
30	0.005300	0.026167	93754	462873	37.76	0.001228	0.006122	97423	485666	47.54	4.32	-9.78
35	0.006497	0.031985	91301	449485	33.70	0.001587	0.007905	96826	482313	42.81	4.09	-9.11
40	0.008964	0.043873	88381	432572	29.73	0.002278	0.011329	96061	477713	38.13	3.94	-8.40
45	0.011115	0.054121	84503	411463	25.98	0.002885	0.014328	94973	471669	33.54	3.85	-7.56
50	0.014918	0.072007	79930	385809	22.32	0.004888	0.024166	93612	462808	28.99	3.05	-6.67
55	0.020379	0.097219	74174	353853	18.85	0.007147	0.035147	91350	449230	24.64	2.85	-5.79
60	0.035803	0.165071	66963	308736	15.59	0.011236	0.054761	88139	429566	20.44	3.19	-4.85
65	0.057253	0.250459	55910	244582	13.15	0.020319	0.097042	83312	397894	16.47	2.82	-3.32
70	0.064388	0.276102	41907	179699	11.71	0.034437	0.159177	75227	347722	12.95	1.87	-1.24
75	0.074804	0.313817	30336	127266	10.25	0.052739	0.234463	63253	281205	9.90	1.42	0.35
80	0.099789	0.395212	20816	82442	8.83	0.112056	0.436728	48423	188722	7.13	0.89	1.70
85	0.124303	...	12589	101280	8.04	0.174297	1.000000	27275	156486	5.74	0.71	2.31

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous Qld 2005-07, Males					Non-Indigenous 2005-07 Qld, Males					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	**e(x)**	m(x,n)	q(x,n)	l(x)	L(x,n)	**e(x)**	**Death Rate Ratios**	**Life Expectancy Gap (years)**
0 - 1	0.011549	0.011427	100000	98943	68.75	0.005023	0.004999	100000	99529	79.17	2.30	-10.42
1 - 5	0.000757	0.003023	98857	394718	68.55	0.000250	0.000999	99500	397766	78.57	3.03	-10.02
5 - 10	0.000393	0.001963	98559	492309	64.75	0.000117	0.000583	99401	496858	74.65	3.37	-9.89
10 - 15	0.000428	0.002138	98365	491299	59.87	0.000239	0.001193	99343	496417	69.69	1.79	-9.81
15 - 20	0.000872	0.004352	98155	489818	55.00	0.000452	0.002260	99224	495608	64.77	1.93	-9.77
20 - 25	0.001523	0.007588	97728	486928	50.22	0.000660	0.003295	99000	494227	59.91	2.31	-9.68
25 - 30	0.002247	0.011176	96986	482378	45.59	0.000854	0.004262	98674	492347	55.10	2.63	-9.51
30 - 35	0.003136	0.015564	95902	475961	41.07	0.000932	0.004651	98253	490149	50.32	3.36	-9.25
35 - 40	0.004159	0.020590	94410	467404	36.68	0.001127	0.005622	97796	487662	45.55	3.69	-8.86
40 - 45	0.005571	0.027492	92466	456295	32.40	0.001531	0.007628	97246	484475	40.79	3.64	-8.39
45 - 50	0.008077	0.039629	89924	441200	28.24	0.002145	0.010674	96505	480117	36.08	3.76	-7.84
50 - 55	0.011695	0.056896	86360	420140	24.30	0.003436	0.017044	95475	473575	31.44	3.40	-7.15
55 - 60	0.016698	0.080301	81446	391676	20.60	0.004931	0.024376	93847	463916	26.94	3.39	-6.34
60 - 65	0.024752	0.116895	74906	353756	17.17	0.008334	0.040884	91560	449184	22.55	2.97	-5.37
65 - 70	0.039402	0.179859	66150	301956	14.10	0.013916	0.067418	87816	425435	18.39	2.83	-4.29
70 - 75	0.053846	0.237576	54252	239369	11.62	0.024426	0.115526	81896	387340	14.53	2.20	-2.90
75 - 80	0.076331	0.320436	41363	173642	9.46	0.038276	0.175617	72435	332345	11.08	1.99	-1.62
80 - 85	0.113919	0.437999	28109	108074	7.74	0.075392	0.319620	59714	253156	7.87	1.51	-0.13
85 - 90	0.144174	...	15797	109571	6.94	0.187265	1.000000	40628	216956	5.34	0.77	1.60

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

Appendix 3: Age-Cause Contribution to Changes in Indigenous Life Expectancy at Birth from 2002-04 to 2005-07, Queensland

A. Indigenous Females, Qld

Life Stages	0-4	5-14	15-24	25-44	45-59	60+	All Ages
Chapter 01 - Certain infectious and parasitic diseases (A00–B99)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Chapter 02 - Neoplasms (C00-D48)	0.010	0.001	0.000	0.300	-0.219	0.358	0.450
Chapter 04 - Endocrine, nutritional & metabolic diseases (E00-E90)	0.005	0.000	0.000	-0.504	-0.096	0.096	-0.500
Chapter 05 - Mental, behavioural disorders (F00-F99)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Chapter 06 - Diseases of the nervous system (G00-G99)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Chapter 09 - Diseases of the circulatory system (I00-I99)	0.005	0.065	-0.013	-0.508	0.769	0.345	0.664
Chapter 10 - Diseases of the respiratory system (J00-J99)	-0.010	-0.031	0.000	1.482	0.072	0.174	1.687
Chapter 11 - Diseases of the digestive system (K00-K93)	-0.005	0.000	0.000	-2.412	0.133	0.073	-2.210
Chapter 14 - Diseases of the genitourinary system (N00-N99)	0.000	0.000	0.000	-0.821	-0.033	0.018	-0.837
Chapter 16 - Certain conditions originating in the perinatal period (P00-P96)	0.129	0.000	0.000	0.000	0.000	0.000	0.129
Chapter 18 - Symptoms, signs & abnormal clinical & lab findings, nec (R00-R99)	-0.025	0.000	-0.004	-1.643	-0.054	-0.099	-1.825
Chapter 20 - External causes of morbidity & mortality (V01-Y98)	-0.005	0.038	0.022	2.325	-0.087	0.016	2.309
Other Causes	-0.087	-0.031	-0.026	1.903	-0.049	0.060	1.770
All Causes/Ages Effect	**0.016**	**0.043**	**-0.021**	**0.123**	**0.436**	**1.042**	**1.637**

B. Indigenous Males, Qld

Life Stages	0-4	5-14	15-24	25-44	45-59	60+	All Ages
Chapter 01 - Certain infectious and parasitic diseases (A00–B99)	0.121	0.000	0.023	0.194	0.081	0.082	0.501
Chapter 02 - Neoplasms (C00-D48)	-0.060	0.000	0.000	-0.030	-0.032	0.029	-0.092
Chapter 04 - Endocrine, nutritional & metabolic diseases (E00-E90)	-0.060	0.000	0.000	-0.013	0.120	0.238	0.285
Chapter 05 - Mental, behavioural disorders (F00-F99)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Chapter 06 - Diseases of the nervous system (G00-G99)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Chapter 09 - Diseases of the circulatory system (I00-I99)	-0.030	0.000	0.006	0.387	0.436	0.519	1.319
Chapter 10 - Diseases of the respiratory system (J00-J99)	-0.028	0.006	0.069	0.103	0.014	0.086	0.250
Chapter 11 - Diseases of the digestive system (K00-K93)	0.030	0.006	0.000	-0.151	0.092	0.102	0.079
Chapter 14 - Diseases of the genitourinary system (N00-N99)	0.000	0.000	0.000	-0.069	-0.169	-0.169	-0.407
Chapter 16 - Certain conditions originating in the perinatal period (P00-P96)	0.009	0.000	0.000	0.000	0.000	0.000	0.009
Chapter 18 - Symptoms, signs & abnormal clinical & lab findings, nec (R00-R99)	-0.359	-0.005	-0.080	-0.115	-0.113	-0.099	-0.771
Chapter 20 - External causes of morbidity & mortality (V01-Y98)	-0.148	-0.032	0.080	0.220	0.167	0.020	0.309
Other	0.637	0.000	0.026	-0.006	-0.018	-0.117	0.522
All Causes/Ages Effect	**0.112**	**-0.025**	**0.125**	**0.519**	**0.579**	**0.692**	**2.003**

Appendix 4a: Age-Cause-Specific Death Rates, Indigenous byAge Groups and Sex, Queensland 2005-07, Females (Rates Per 1000)

Leading Causees of Death Chapters	0-4	5-14	15-24	25-44	45-59	60+	All Ages	% Total
Chapter 09 – Diseases of the circulatory system (I00-I99)	0.039	0.000	0.108	0.513	1.618	12.712	0.991	27.1%
Chapter 02 – Neoplasms (C00-D48)	0.077	0.020	0.000	0.422	2.318	7.489	0.772	21.1%
Chapter 04 – Endocrine, nutritional & metabolic diseases (E00-E90)	0.039	0.000	0.000	0.110	1.006	6.307	0.468	12.8%
Chapter 20 – External causes of morbidity & mortality (V01-Y98)	0.193	0.080	0.565	0.403	0.481	0.690	0.348	9.5%
Chapter 10 – Diseases of the respiratory system (J00-J99)	0.000	0.020	0.000	0.037	0.612	2.464	0.209	5.7%
Chapter 11 – Diseases of the digestive system (K00-K93)	0.000	0.000	0.000	0.293	0.437	0.985	0.179	4.9%
Chapter 18 – Symptoms, signs & abnormal clinical & lab findings, nec (R00-R99)	0.270	0.000	0.027	0.147	0.262	0.788	0.149	4.1%
Chapter 16 – Certain conditions originating in the perinatal period (P00-P96)	1.042	0.000	0.000	0.000	0.000	0.000	0.134	3.7%
Chapter 14 – Diseases of the genitourinary system (N00-N99)	0.000	0.000	0.000	0.073	0.219	1.478	0.119	3.3%
Chapter 01 – Certain infectious and parasitic diseases (A00–B99)	0.000	0.000	0.027	0.037	0.306	0.788	0.090	2.4%
Other Causes	0.193	0.020	0.134	0.183	0.350	1.084	0.199	5.4%
All Causes Total Females	1.852	0.139	0.861	2.218	7.610	34.786	3.659	100.0%

Appendix 4b: Age-Cause-Specific Death Rates, Indigenous byAge Groups and Sex, Queensland 2005-07, Males (Rates Per 1000)

Leading Causees of Death Chapters	0-4	5-14	15-24	25-44	45-59	60+	All Ages	% Total
Chapter 09 – Diseases of the circulatory system (I00-I99)	0.077	0.020	0.054	0.733	3.193	11.136	1.150	24.8%
Chapter 20 – External causes of morbidity & mortality (V01-Y98)	0.463	0.199	1.130	1.503	0.744	0.887	0.856	18.5%
Chapter 02 – Neoplasms (C00-D48)	0.077	0.040	0.000	0.275	2.624	8.376	0.816	17.6%
Chapter 04 – Endocrine, nutritional & metabolic diseases (E00-E90)	0.077	0.000	0.000	0.165	1.093	3.942	0.378	8.2%
Chapter 10 – Diseases of the respiratory system (J00-J99)	0.270	0.020	0.000	0.092	0.612	4.434	0.358	7.7%
Chapter 11 – Diseases of the digestive system (K00-K93)	0.000	0.000	0.000	0.275	0.875	1.577	0.254	5.5%
Chapter 18 – Symptoms, signs & abnormal clinical & lab findings, nec (R00-R99)	0.463	0.020	0.108	0.092	0.350	0.690	0.184	4.0%
Chapter 16 – Certain conditions originating in the perinatal period (P00-P96)	1.196	0.000	0.000	0.000	0.000	0.000	0.154	3.3%
Chapter 14 – Diseases of the genitourinary system (N00-N99)	0.000	0.000	0.000	0.055	0.525	1.183	0.134	2.9%
Chapter 06 – Diseases of the nervous system (G00-G99)	0.039	0.000	0.027	0.037	0.175	0.887	0.085	1.8%
Other Causes	0.386	0.020	0.000	0.238	0.437	1.872	0.264	5.7%
All Causes Total Males	3.048	0.318	1.318	3.465	10.628	34.983	4.634	100.0%

Appendix 4c: Age-Cause-Specific Death Rates, Non-Indigenous by Age Groups and Sex, Queensland 2005-07, Females (Rates Per 1000)

Leading Causees of Death Chapters	0-4	5-14	15-24	25-44	45-59	60+	All Ages	% Total
Chapter 09 – Diseases of the circulatory system (I00-I99)	0.019	0.004	0.014	0.049	0.252	11.686	2.201	38.7%
Chapter 02 – Neoplasms (C00-D48)	0.022	0.022	0.032	0.196	1.184	6.385	1.469	25.8%
Chapter 04 – Endocrine, nutritional & metabolic diseases (E00-E90)	0.011	0.009	0.002	0.012	0.043	1.071	0.210	3.7%
Chapter 20 – External causes of morbidity & mortality (V01-Y98)	0.099	0.027	0.124	0.136	0.138	0.723	0.225	4.0%
Chapter 10 – Diseases of the respiratory system (J00-J99)	0.027	0.004	0.005	0.016	0.086	2.455	0.473	8.3%
Chapter 11 – Diseases of the digestive system (K00-K93)	0.003	0.001	0.004	0.015	0.077	0.967	0.197	3.5%
Chapter 18 – Symptoms, signs & abnormal clinical & lab findings, nec (R00-R99)	0.115	0.009	0.025	0.047	0.083	0.407	0.116	2.0%
Chapter 16 – Certain conditions originating in the perinatal period (P00-P96)	0.426	0.001	0.000	0.000	0.000	0.000	0.026	0.5%
Chapter 14 – Diseases of the genitourinary system (N00-N99)	0.003	0.000	0.000	0.005	0.020	0.806	0.153	2.7%
Chapter 01 – Certain infectious and parasitic diseases (A00–B99)	0.014	0.001	0.001	0.009	0.028	0.274	0.059	1.0%
Other Causes	0.302	0.013	0.026	0.045	0.130	2.703	0.556	9.8%
All Causes Total Females	1.042	0.092	0.233	0.530	2.041	27.477	5.687	100.0%

Appendix 4d: Age-Cause-Specific Death Rates, Non-Indigenous by Age Groups and Sex, Queensland 2005-07, Males (Rates Per 1000)

Leading Causees of Death Chapters	0-4	5-14	15-24	25-44	45-59	60+	All Ages	% Total
Chapter 09 – Diseases of the circulatory system (I00-I99)	0.019	0.005	0.012	0.123	0.770	9.844	1.991	31.6%
Chapter 20 – External causes of morbidity & mortality (V01-Y98)	0.099	0.030	0.495	0.538	0.448	0.861	0.480	7.6%
Chapter 02 – Neoplasms (C00-D48)	0.044	0.022	0.041	0.155	1.412	9.371	2.051	32.6%
Chapter 04 – Endocrine, nutritional & metabolic diseases (E00-E90)	0.008	0.006	0.007	0.019	0.094	1.016	0.212	3.4%
Chapter 10 – Diseases of the respiratory system (J00-J99)	0.058	0.003	0.006	0.021	0.117	2.899	0.563	9.0%
Chapter 11 – Diseases of the digestive system (K00-K93)	0.014	0.000	0.005	0.030	0.213	0.837	0.206	3.3%
Chapter 18 – Symptoms, signs & abnormal clinical & lab findings, nec (R00-R99)	0.203	0.010	0.048	0.110	0.191	0.364	0.157	2.5%
Chapter 16 – Certain conditions originating in the perinatal period (P00-P96)	0.552	0.003	0.000	0.000	0.000	0.000	0.034	0.5%
Chapter 14 – Diseases of the genitourinary system (N00-N99)	0.003	0.000	0.001	0.004	0.013	0.610	0.115	1.8%
Chapter 06 – Diseases of the nervous system (G00-G99)	0.041	0.016	0.022	0.032	0.074	0.866	0.190	3.0%
Other Causes	0.327	0.014	0.021	0.042	0.134	1.268	0.295	4.7%
All Causes Total Males	1.369	0.109	0.658	1.073	3.466	27.936	6.294	100.0%

Appendix 4e: Age-Cause-Specific Indigenous to non-Indigenous Death Rate Ratios Females, Queensland 2005-07, (Rates Per 1000)

Leading Causees of Death Chapters	0-4	5-14	15-24	25-44	45-59	60+	All Ages
Chapter 09 - Diseases of the circulatory system (I00-I99)	2.01	0.00	7.95	10.55	6.43	1.09	0.45
Chapter 02 - Neoplasms (C00-D48)	3.51	0.90	0.00	2.15	1.96	1.17	0.53
Chapter 20 - External causes of morbidity & mortality (V01-Y98)	3.51	0.00	0.00	8.93	23.15	5.89	2.23
Chapter 04 - Endocrine, nutritional & metabolic diseases (E00-E90)	1.95	2.93	4.54	2.96	3.49	0.95	1.55
Chapter 10 - Diseases of the respiratory system (J00-J99)	0.00	5.12	0.00	2.23	7.11	1.00	0.44
Chapter 11 - Diseases of the digestive system (K00-K93)	0.00	0.00	0.00	20.01	5.69	1.02	0.91
Chapter 18 - Symptoms, signs & abnormal clinical & lab findings, nec (R00-R99)	2.34	0.00	1.09	3.09	3.17	1.94	1.28
Chapter 16 - Certain conditions originating in the perinatal period (P00-P96)	2.45	0.00					5.11
Chapter 14 - Diseases of the genitourinary system (N00-N99)	0.00			15.63	10.90	1.83	0.78
Chapter 01 - Certain infectious and parasitic diseases (A00–B99)	0.00	0.00	21.85	4.17	11.10	2.87	1.51
Other Causes	0.64	1.54	5.20	4.11	2.68	0.40	0.36
All Causes Both Sexes	1.78	1.52	3.70	4.19	3.73	1.27	

Appendix 4f: Age-Cause-Specific Indigenous to non-Indigenous Death Rate Ratios Males, Queensland 2005-07, (Rates Per 1000)

Leading Causees of Death Chapters	0-4	5-14	15-24	25-44	45-59	60+	All Ages
Chapter 09 - Diseases of the circulatory system (I00-I99)	4.01	3.84	4.37	5.98	4.15	1.13	0.58
Chapter 02 - Neoplasms (C00-D48)	4.68	6.68	2.28	2.80	1.66	1.03	1.78
Chapter 20 - External causes of morbidity & mortality (V01-Y98)	1.75	1.81	0.00	1.77	1.86	0.89	0.40
Chapter 04 - Endocrine, nutritional & metabolic diseases (E00-E90)	9.36	0.00	0.00	8.53	11.68	3.88	1.78
Chapter 10 - Diseases of the respiratory system (J00-J99)	4.68	7.69	0.00	4.47	5.23	1.53	0.64
Chapter 11 - Diseases of the digestive system (K00-K93)	0.00		0.00	9.20	4.11	1.88	1.23
Chapter 18 - Symptoms, signs & abnormal clinical & lab findings, nec (R00-R99)	2.28	1.92	2.24	0.83	1.83	1.90	1.17
Chapter 16 - Certain conditions originating in the perinatal period (P00-P96)	2.16	0.00					4.51
Chapter 14 - Diseases of the genitourinary system (N00-N99)	0.00		0.00	15.63	39.26	1.94	1.16
Chapter 01 - Certain infectious and parasitic diseases (A00–B99)	0.94	0.00	1.21	1.14	2.35	1.02	0.45
Other Causes	1.18	1.40	0.00	5.72	3.27	1.48	0.89
All Causes Both Sexes	2.23	2.93	2.00	3.23	3.07	1.25	

Appendix 5: Derived Indigenous and non-Indigenous Experimental Life Tables, Death Rate Ratios and Life Expectancy Gaps, by Remoteness and Sex, Queensland, 2000-02

	Indigenous 2000-02 Major Cities, Females					Non-Indigenous 2000-02 Major Cities, Females					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Age-Specific Death Rates (Rate Ratios)**	**Life Expectancy Gap (years)**
0 - 1	0.004916	0.004893	100000	99542	77.69	0.004801	0.004780	100000	99553	82.43	1.02	-4.75
1 - 5	0.000362	0.001447	99511	397685	77.07	0.000167	0.000668	99522	397923	81.83	2.17	-4.76
5 - 10	0.000161	0.000805	99367	496634	73.18	0.000108	0.000540	99456	497144	77.88	1.49	-4.70
10 - 15	0.000278	0.001389	99287	496089	68.23	0.000123	0.000615	99402	496857	72.92	2.26	-4.69
15 - 20	0.000309	0.001544	99149	495367	63.33	0.000161	0.000805	99341	496515	67.97	1.92	-4.64
20 - 25	0.000335	0.001674	98996	494559	58.42	0.000244	0.001219	99261	496017	63.02	1.37	-4.60
25 - 30	0.000263	0.001314	98830	493834	53.51	0.000298	0.001489	99140	495346	58.09	0.88	-4.58
30 - 35	0.000451	0.002253	98700	493031	48.58	0.000413	0.002063	98992	494479	53.18	1.09	-4.59
35 - 40	0.001675	0.008346	98478	490673	43.68	0.000580	0.002896	98788	493269	48.28	2.89	-4.60
40 - 45	0.003311	0.016429	97656	484560	39.03	0.000871	0.004346	98502	491517	43.41	3.80	-4.39
45 - 50	0.004133	0.020463	96052	475556	34.63	0.001401	0.006982	98074	488776	38.59	2.95	-3.96
50 - 55	0.005793	0.028570	94086	464021	30.30	0.002033	0.010117	97389	484654	33.84	2.85	-3.54
55 - 60	0.007622	0.037447	91398	449043	26.12	0.003315	0.016450	96404	478378	29.16	2.30	-3.04
60 - 65	0.014686	0.071121	87975	426046	22.03	0.005609	0.027690	94818	468095	24.60	2.62	-2.57
65 - 70	0.035425	0.163525	81719	377220	18.50	0.009933	0.048553	92192	450636	20.23	3.57	-1.72
70 - 75	0.043466	0.196176	68356	308511	16.60	0.015663	0.075552	87716	423107	16.12	2.78	0.48
75 - 80	0.060000	0.260111	54946	238200	15.04	0.025659	0.121270	81089	383244	12.22	2.34	2.82
80 - 85	0.060556	0.261597	40654	175621	14.47	0.064788	0.281875	71255	310013	8.53	0.93	5.94
85 - 90	0.072783	...	30019	412441	13.74	0.171832	...	51170	297793	5.82	0.42	7.92

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous 2000-02 Regional, Females					Non-Indigenous 2000-02 Regional, Females					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Age-Specific Death Rates (Rate Ratios)**	**Life Expectancy Gap (years)**
0 - 1	0.012156	0.012022	100000	98901	71.21	0.004710	0.004689	100000	99561	82.28	2.58	-11.07
1 - 5	0.000095	0.000380	98798	395097	71.07	0.000194	0.000776	99531	397933	81.67	0.49	-10.59
5 - 10	0.000250	0.001249	98760	493493	67.10	0.000090	0.000450	99454	497157	77.73	2.78	-10.63
10 - 15	0.000559	0.002791	98637	492496	62.18	0.000159	0.000795	99409	496848	72.76	3.52	-10.58
15 - 20	0.000840	0.004192	98362	490837	57.35	0.000236	0.001179	99330	496380	67.82	3.56	-10.47
20 - 25	0.001137	0.005670	97949	488423	52.58	0.000392	0.001958	99213	495601	62.89	2.90	-10.32
25 - 30	0.001488	0.007413	97394	485235	47.86	0.000408	0.002038	99019	494599	58.01	3.65	-10.15
30 - 35	0.001842	0.009170	96672	481254	43.20	0.000500	0.002497	98817	493492	53.13	3.68	-9.93
35 - 40	0.002757	0.013697	95785	475869	38.58	0.000660	0.003295	98570	492080	48.25	4.18	-9.68
40 - 45	0.004271	0.021146	94473	467734	34.08	0.000927	0.004625	98245	490166	43.40	4.61	-9.33
45 - 50	0.006855	0.033733	92476	455065	29.75	0.001469	0.007320	97791	487286	38.59	4.67	-8.84
50 - 55	0.009651	0.047171	89356	436742	25.70	0.002110	0.010498	97075	482993	33.86	4.57	-8.16
55 - 60	0.013308	0.064491	85141	412599	21.84	0.003257	0.016163	96056	476685	29.19	4.09	-7.35
60 - 65	0.018958	0.090736	79650	381219	18.17	0.005282	0.026094	94504	466867	24.62	3.59	-6.46
65 - 70	0.031981	0.148655	72423	336640	14.72	0.009344	0.045739	92038	450526	20.21	3.42	-5.49
70 - 75	0.049568	0.220873	61657	274742	11.83	0.015501	0.074824	87828	423951	16.05	3.20	-4.22
75 - 80	0.062669	0.271240	48039	207919	9.46	0.027012	0.127324	81256	383009	12.13	2.32	-2.67
80 - 85	0.103601	0.410700	35009	138783	7.04	0.067643	0.292310	70910	306429	8.50	1.53	-1.46
85 - 90	0.191465	...	20631	107751	5.22	0.169371	...	50183	296288	5.90	1.13	-0.68

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous 2000-02 Remote/Very Remote, Females					Non-Indigenous 2000-02 Remote/Very Remote, Females					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Age-Specific Death Rates (Rate Ratios)**	**Life Expectancy Gap (years)**
0 - 1	0.011266	0.011151	100000	98978	67.68	0.004531	0.004512	100000	99577	81.29	81.59	-13.60
1 - 5	0.000479	0.001914	98885	395068	67.45	0.000250	0.000999	99549	397948	80.66	80.86	-13.21
5 - 10	0.000191	0.000955	98696	493243	63.57	0.000304	0.001519	99449	496869	76.74	76.94	-13.16
10 - 15	0.000550	0.002746	98601	492330	58.63	0.000370	0.001848	99298	496033	71.85	72.10	-13.22
15 - 20	0.001167	0.005820	98331	490373	53.79	0.000362	0.001808	99115	495132	66.98	67.20	-13.19
20 - 25	0.001968	0.009794	97758	486526	49.08	0.000437	0.002183	98936	494126	62.09	62.26	-13.01
25 - 30	0.002262	0.011248	96801	481359	44.54	0.000280	0.001399	98720	493250	57.22	57.35	-12.68
30 - 35	0.002821	0.014010	95712	475353	40.02	0.000406	0.002028	98581	492431	52.30	52.43	-12.28
35 - 40	0.003912	0.019384	94371	467621	35.55	0.000489	0.002442	98382	491323	47.40	47.53	-11.85
40 - 45	0.007127	0.035053	92542	455146	31.20	0.000559	0.002791	98141	490059	42.51	42.64	-11.31
45 - 50	0.009435	0.046139	89298	436683	27.24	0.000951	0.004745	97867	488283	37.62	37.79	-10.38
50 - 55	0.013911	0.067348	85178	412377	23.43	0.001711	0.008523	97403	485165	32.79	33.03	-9.36
55 - 60	0.021692	0.103221	79441	378021	19.93	0.003570	0.017708	96573	479013	28.05	28.36	-8.12
60 - 65	0.037299	0.171057	71241	326720	16.92	0.005831	0.028772	94863	468082	23.50	23.83	-6.58
65 - 70	0.046319	0.207314	59055	264317	14.88	0.010704	0.052244	92133	449683	19.12	19.49	-4.24
70 - 75	0.051663	0.228129	46812	206709	13.12	0.018473	0.088595	87320	418780	15.02	15.46	-1.90
75 - 80	0.057890	0.251892	36133	157222	11.28	0.033075	0.153833	79584	370148	11.22	11.66	0.06
80 - 85	0.064118	0.276107	27031	116403	9.26	0.078168	0.330147	67341	284419	7.76	8.22	1.50
85 - 90	0.146090	...	19568	133943	6.85	0.189158	...	45109	238471	5.29	5.83	1.56

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous 2000-02 Qld, Females					Non-Indigenous 2000-02 Qld, Females					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Age-Specific Death Rates (Rate Ratios)**	**Life Expectancy Gap (years)**
0 - 1	0.010892	0.010784	100000	99010	70.42	0.004056	0.004040	100000	99621	82.13	2.69	-11.71
1 - 5	0.000269	0.001075	98922	395421	70.18	0.000205	0.000820	99596	398181	81.46	1.31	-11.28
5 - 10	0.000235	0.001174	98815	493786	66.26	0.000086	0.000431	99514	497464	77.53	2.73	-11.27
10 - 15	0.000535	0.002671	98699	492837	61.33	0.000145	0.000727	99471	497176	72.56	3.68	-11.22
15 - 20	0.000840	0.004192	98436	491215	56.49	0.000205	0.001024	99399	496756	67.61	4.10	-11.12
20 - 25	0.001211	0.006038	98023	488702	51.72	0.000288	0.001439	99297	496143	62.68	4.21	-10.96
25 - 30	0.001470	0.007324	97431	485434	47.02	0.000324	0.001616	99155	495385	57.76	4.54	-10.75
30 - 35	0.001868	0.009299	96717	481473	42.34	0.000421	0.002105	98994	494478	52.85	4.43	-10.51
35 - 40	0.003059	0.015188	95818	475751	37.72	0.000607	0.003033	98786	493229	47.96	5.04	-10.24
40 - 45	0.005159	0.025489	94363	466216	33.26	0.000924	0.004608	98486	491377	43.09	5.59	-9.84
45 - 50	0.007377	0.036252	91958	451903	29.06	0.001436	0.007156	98032	488526	38.28	5.14	-9.23
50 - 55	0.010607	0.051735	88624	432255	25.05	0.002094	0.010418	97331	484300	33.54	5.07	-8.49
55 - 60	0.015334	0.073999	84039	405558	21.27	0.003447	0.017099	96317	477800	28.86	4.45	-7.59
60 - 65	0.024966	0.117907	77820	367520	17.76	0.005712	0.028190	94670	467216	24.32	4.37	-6.56
65 - 70	0.040055	0.182539	68645	312828	14.78	0.009597	0.046941	92001	450021	19.95	4.17	-5.16
70 - 75	0.053230	0.234635	56114	247349	12.51	0.015492	0.074775	87683	423221	15.80	3.44	-3.29
75 - 80	0.060986	0.264225	42948	186074	10.58	0.026953	0.127090	81126	382528	11.86	2.26	-1.27
80 - 85	0.086431	0.354320	31600	129543	8.49	0.070396	0.302736	70816	304543	8.18	1.23	0.31
85 - 90	0.146916	...	20403	138878	6.81	0.179727	...	49377	274735	5.56	0.82	1.24

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous 2000-02 Major Cities, Males					Non-Indigenous 2000-02 Major Cities, Males					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Age-Specific Death Rates (Rate Ratios)**	**Life Expectancy Gap (years)**
0	0.007209	0.007161	100000	99329	69.65	0.005982	0.005949	100000	99441	77.99	1.21	-8.35
1	0.000189	0.000756	99284	396958	69.15	0.000307	0.001227	99405	397332	77.46	0.62	-8.31
5	0.000196	0.000980	99209	495802	65.20	0.000118	0.000590	99283	496269	73.55	1.66	-8.35
10	0.000389	0.001943	99112	495077	60.26	0.000252	0.001259	99225	495811	68.60	1.54	-8.33
15	0.000749	0.003739	98919	493747	55.37	0.000480	0.002397	99100	494959	63.68	1.56	-8.30
20	0.001046	0.005217	98549	491491	50.57	0.000768	0.003833	98862	493412	58.83	1.36	-8.25
25	0.000994	0.004958	98035	489007	45.82	0.000897	0.004475	98483	491339	54.04	1.11	-8.22
30	0.001668	0.008308	97549	485877	41.04	0.001020	0.005087	98042	488992	49.27	1.64	-8.23
35	0.002565	0.012750	96739	480879	36.36	0.001170	0.005833	97544	486342	44.51	2.19	-8.15
40	0.004884	0.024144	95505	472136	31.79	0.001529	0.007618	96975	483130	39.76	3.19	-7.96
45	0.005870	0.028943	93199	459536	27.52	0.002330	0.011587	96236	478564	35.04	2.52	-7.53
50	0.008573	0.042021	90502	443596	23.26	0.003286	0.016306	95121	472003	30.42	2.61	-7.16
55	0.013543	0.065720	86699	420725	19.16	0.005669	0.027983	93570	461868	25.88	2.39	-6.72
60	0.034014	0.157630	81001	375382	15.32	0.009792	0.047889	90952	444808	21.55	3.47	-6.23
65	0.045127	0.203317	68233	307419	12.68	0.017605	0.084571	86596	415989	17.50	2.56	-4.82
70	0.073864	0.311579	54360	229305	10.26	0.027704	0.129965	79272	371883	13.87	2.67	-3.60
75	0.090500	0.366011	37423	151349	8.78	0.042105	0.191523	68970	313723	10.54	2.15	-1.77
80	0.107137	0.418021	23725	92571	7.46	0.084104	0.349940	55761	232009	7.42	1.27	0.05
85	0.163335	...	13808	84536	6.12	0.199705	...	36248	181506	5.01	0.82	1.11

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous 2000-02 Regional, Males					Non-Indigenous 2000-02 Regional, Males					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Age-Specific Death Rates (Rate Ratios)**	**Life Expectancy Gap (years)**
0	0.011801	0.011674	100000	98921	65.70	0.005170	0.005145	100000	99515	77.20	2.28	-11.50
1	0.000355	0.001419	98833	394996	65.48	0.000317	0.001267	99486	397644	76.60	1.12	-11.13
5	0.000258	0.001289	98692	493144	61.57	0.000157	0.000785	99359	496602	72.70	1.64	-11.13
10	0.000478	0.002387	98565	492238	56.64	0.000390	0.001948	99281	495924	67.75	1.23	-11.11
15	0.000868	0.004332	98330	490706	51.77	0.000687	0.003430	99088	494666	62.88	1.26	-11.11
20	0.001884	0.009380	97904	487416	46.99	0.001134	0.005655	98748	492405	58.09	1.66	-11.10
25	0.002415	0.012006	96986	482142	42.41	0.001161	0.005788	98190	489537	53.40	2.08	-11.00
30	0.003226	0.016007	95821	475454	37.89	0.001230	0.006131	97622	486637	48.70	2.62	-10.81
35	0.004408	0.021813	94287	466577	33.46	0.001448	0.007215	97023	483416	43.98	3.04	-10.52
40	0.006494	0.031985	92231	454269	29.15	0.001778	0.008853	96323	479586	39.28	3.65	-10.13
45	0.010445	0.050979	89281	435755	25.02	0.002637	0.013104	95470	474421	34.61	3.96	-9.59
50	0.015566	0.075082	84729	408687	21.23	0.003888	0.019266	94219	466879	30.04	4.00	-8.81
55	0.024883	0.117518	78368	370116	17.73	0.006413	0.031597	92404	455281	25.57	3.88	-7.84
60	0.039349	0.179439	69158	315374	14.74	0.010413	0.050842	89484	436911	21.32	3.78	-6.58
65	0.046647	0.209006	56748	254266	12.41	0.017695	0.084961	84935	407808	17.32	2.64	-4.91
70	0.067353	0.287952	44888	191907	10.03	0.027151	0.127565	77719	365150	13.68	2.48	-3.65
75	0.084365	0.346921	31962	131433	8.08	0.044468	0.201379	67804	307060	10.29	1.90	-2.22
80	0.117838	0.452922	20874	80231	6.07	0.090956	0.372748	54150	221913	7.22	1.30	-1.15
85	0.245735	...	11420	46471	4.07	0.200982	...	33966	168999	4.98	1.22	-0.91

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous 2000-02 Remote/Very Remote, Males					Non-Indigenous 2000-02 Remote/Very Remote, Males					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Age-Specific Death Rates (Rate Ratios)**	**Life Expectancy Gap (years)**
0	0.015658	0.015437	100000	98590	62.54	0.006113	0.006078	100000	99429	75.85	2.56	-13.32
1	0.001142	0.004556	98456	392752	62.52	0.000403	0.001610	99392	397190	75.32	2.83	-12.80
5	0.000486	0.002427	98008	489444	58.79	0.000466	0.002327	99232	495583	71.44	1.04	-12.64
10	0.001485	0.007398	97770	487041	53.93	0.000780	0.003892	99001	494043	66.60	1.90	-12.66
15	0.002862	0.014218	97047	482098	49.32	0.001518	0.007563	98616	491325	61.85	1.89	-12.53
20	0.004563	0.022565	95667	473092	44.99	0.001617	0.008053	97870	487399	57.30	2.82	-12.31
25	0.004221	0.020886	93508	462694	40.97	0.001740	0.008663	97082	483330	52.74	2.43	-11.78
30	0.005194	0.025650	91555	452141	36.79	0.001880	0.009357	96241	478978	48.18	2.76	-11.39
35	0.007211	0.035450	89207	438553	32.69	0.002020	0.010050	95340	474327	43.61	3.57	-10.93
40	0.010643	0.051910	86044	419669	28.79	0.002126	0.010574	94382	469435	39.03	5.01	-10.24
45	0.015516	0.074746	81578	392986	25.22	0.002255	0.011215	93384	464453	34.42	6.88	-9.20
50	0.016259	0.078225	75480	363147	22.05	0.004330	0.021442	92337	457250	29.78	3.75	-7.73
55	0.027576	0.129424	69576	326545	18.71	0.008219	0.040347	90357	443561	25.37	3.36	-6.67
60	0.040133	0.182601	60571	275592	16.10	0.015167	0.073310	86711	419122	21.32	2.65	-5.23
65	0.048748	0.216879	49511	220272	14.13	0.028742	0.134565	80355	376207	17.79	1.70	-3.67
70	0.053765	0.236155	38773	170304	12.36	0.038759	0.176984	69542	317546	15.15	1.39	-2.80
75	0.058775	0.255808	29616	128900	10.43	0.053665	0.236708	57234	252450	12.86	1.10	-2.44
80	0.083048	0.343460	22040	91151	8.16	0.069903	0.296569	43686	185342	11.07	1.19	-2.91
85	0.163099	...	14470	88721	6.13	0.103016	...	30730	298304	9.71	1.58	-3.58

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

	Indigenous 2000-02 Qld, Males					Non-Indigenous 2000-02 Qld, Males					Indigenous to non-Indigenous	
Age	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	m(x,n)	q(x,n)	l(x)	L(x,n)	e(x)	**Age-Specific Death Rates (Rate Ratios)**	**Life Expectancy Gap (years)**
0 - 1	0.012468	0.012326	100000	98863	64.69	0.005234	0.005208	100000	99509	77.35	2.38	-12.67
1 - 5	0.000520	0.002077	98767	394580	64.49	0.000321	0.001282	99479	397615	76.76	1.62	-12.26
5 - 10	0.000316	0.001579	98562	492422	60.62	0.000120	0.000602	99352	496609	72.85	2.62	-12.23
10 - 15	0.000727	0.003628	98407	491140	55.72	0.000283	0.001415	99292	496108	67.90	2.57	-12.18
15 - 20	0.001376	0.006859	98050	488739	50.91	0.000566	0.002827	99151	495122	62.99	2.43	-12.08
20 - 25	0.002530	0.012575	97377	483997	46.24	0.000880	0.004390	98871	493324	58.16	2.88	-11.92
25 - 30	0.002780	0.013807	96153	477539	41.80	0.001034	0.005156	98437	490940	53.41	2.69	-11.61
30 - 35	0.003674	0.018211	94825	470014	37.35	0.001114	0.005554	97929	488317	48.67	3.30	-11.32
35 - 40	0.005111	0.025251	93098	459959	32.99	0.001353	0.006744	97386	485344	43.93	3.78	-10.94
40 - 45	0.007828	0.038434	90747	445555	28.78	0.001727	0.008599	96729	481670	39.21	4.53	-10.43
45 - 50	0.011589	0.056388	87259	424570	24.82	0.002526	0.012554	95897	476657	34.52	4.59	-9.70
50 - 55	0.015384	0.074212	82339	397200	21.15	0.003655	0.018123	94693	469485	29.93	4.21	-8.78
55 - 60	0.024957	0.117894	76229	360096	17.63	0.006227	0.030696	92977	458347	25.43	4.01	-7.80
60 - 65	0.042163	0.191165	67242	304871	14.63	0.010606	0.051766	90123	439872	21.15	3.98	-6.52
65 - 70	0.051251	0.227052	54387	240947	12.49	0.017848	0.085661	85458	410158	17.16	2.87	-4.67
70 - 75	0.067220	0.286911	42039	179431	10.42	0.027308	0.128249	78137	366961	13.52	2.46	-3.09
75 - 80	0.078772	0.327781	29977	124740	8.63	0.044288	0.200670	68116	308636	10.12	1.78	-1.49
80 - 85	0.111215	0.432541	20151	78373	6.65	0.092938	0.379720	54447	222459	6.99	1.20	-0.34
85 - 90	0.205513	...	11435	55642	4.87	0.213493	...	33773	158190	4.68	0.96	0.18

Definitions: m(x,n)= Age Specific Death Rate in the age interval, q(x,n)=Probability of Death in the age interval, l(x)=Survivors at age x, .
L(x)=Number of years lived in the age interval, e(x)=Life Expectancy at age x

Appendix 6: Changes in Indigenous and Non-Indigenous Life Expectancies from 2000-02 to 2005-07

	2000-02		2005-07		Average Annual Chnge 2001-2006	
	Females	**Males**	**Females**	**Males**	**Females**	**Males**
Major Cities						
Indigenous	77.69	69.65	76.88	73.90	-0.16	0.85
Non-Indigenous	82.43	77.99	83.37	79.40	0.19	0.28
Gap (Years)	**-4.75**	**-8.35**	**-6.49**	**-5.50**		
Regional						
Indigenous	71.21	65.70	74.21	68.66	0.60	0.59
Non-Indigenous	82.28	77.20	83.40	79.00	0.22	0.36
Gap (Years)	**-11.07**	**-11.50**	**-9.19**	**-10.34**		
Remote/Very Remote						
Indigenous	67.68	62.54	70.71	64.53	0.60	0.40
Non-Indigenous	81.29	75.85	81.30	76.42	0.00	0.11
Gap (Years)	**-13.60**	**-13.32**	**-10.60**	**-11.89**		
Qld						
Indigenous	70.42	67.33	73.99	68.75	0.71	0.28
Non-Indigenous	82.13	77.35	83.38	79.17	0.25	0.36
Gap (Years)	**-11.71**	**-10.03**	**-9.39**	**-10.42**		

Appendix 7: Explanatory Notes

Calculation of the Life Table Columns:

Life tables conceptually trace a cohort of newborn babies through their entire life under the Age Interval (x to x+n)

The period of life between two exact ages; e.g. "20 to 25" means the 5-year interval between the 20th and 25th birthdays.

Age Specific Mortality Rate (nMx)

The age specific mortality rate , ${}_nM_x = {}_nD_x/{}_nP_x$ where ${}_nD_x$ is the number of deaths occurring to persons aged n to x+n, and ${}_nP_x$ is the number of persons aged x to x+n alive at the mid-point of the period under consideration. Mortality rates are usually presented as deaths per x persons per year, where x is a convenient population base, e.g. 10,000. If a longer period is used to count the number of deaths (e.g. 5 years as in the life table template) then an adjustment must accordingly be made to calculate the annual age specific mortality rate by dividing the derived rate by the period of observation years.

Probability of Dying (nqx)

To estimate the exact **probability** of dying between age x and x+n (${}_nq_x$) the deaths to persons aged x to x+n must be related to the true population at risk. The mid-period population estimate must be adjusted by adding half the number of deaths occurring over the period to it. This assumes that deaths are evenly spread throughout the time period and across the period of life under consideration.

In general for age groups; ${}_nq_x = \underline{2 \times n({}_nM_x)} / 2 + n({}_nM_x)$

The assumption that deaths are spread evenly across the time period of life under consideration is particularly unrealistic in the case of infants, where the majority of deaths occur within the first few days of life. To calculate the probability of dying for infants therefore, the infant mortality rate is used, as the number of livebirths is an exact estimate of the population at risk of dying. Therefore for infant deaths we have;

$${}_1q_0 = {}_1D_0/B$$ where B = number of live births over period of consideration.

Another exception occurs in the final open-ended age group (85+ in the life table templates). As everybody within this age group must die, the probability of dying is equal to 1, i.e. ${}_\infty q_n = 1.000$.

Persons Alive (lx)

The number of persons living at the **beginning** of the indicated age interval (x) out of the total number of births assumed as the radix of the life table.

The number of persons alive at the beginning of an age interval (l_{x+n}) is equal to the number alive at the beginning of the previous age interval (l_x), minus the numbers of persons dying within that previous age interval over the time period considered (${}_nd_x$);

$$\text{i.e.} \quad l_{x+n} = l_x - {}_nd_x$$

Persons Dying (ndx)

The number of persons dying within the indicated age interval (x to x+n) out of the total number of births assumed in the table.

The number of persons dying within a particular age interval (${}_nd_x$) is equal to the number persons alive at the beginning of that age interval (l_x) multiplied by the probability of dying within that age interval (${}_nq_x$), i.e. ${}_nd_x = l_x \times {}_nq_x$

Person-Years Lived in Age Interval (nLx)

The number of person-years that would be lived within the indicated age interval (x to x+n) by the assumed cohort of 100,000 births. Again, assuming that deaths are spread equally across the age intervals and also across the period of consideration, then the number of person-years lived in an age interval is calculated as the mean of the populations at the beginning and end of each age interval, multiplied by the length of each age interval in years i.e. ${}_nL_x = n/2 \times (l_x + l_{x+n})$

A difficulty arises with the estimation of ${}_1L_0$,that is the average number of infants alive who have not yet reached their first birthday. Again the problem is that it cannot be assumed that infant deaths occur uniformly throughout the 0 to 1 age interval. For this reason 'separation factors' are used to weight the average of l_0 and l_1 as follows;

$${}_1L_0 = 0.3l_0 + 0.7l_1$$

An additional problem lies with ${}_\infty L_{85}$, the average number of persons alive over age 85. This is approximated from ${}_\infty L_{85} = {}_\infty d_{85}/{}_\infty M_{85.}$

Person Years Lived From Age x (Tx)

The total number of person-years that would be lived after the beginning of the indicated age interval by the assumed cohort of 100,000 births. This is calculated by simply cumulating the ${}_nL_x$ column from the oldest to the youngest age.

Life Expectancy (ex)

The average remaining lifetime (in years) for a person who survives to the beginning of the indicated age interval. Calculated by dividing the total number of person-years lived from age x (T_x) by the number of persons alive at age x (l_x)

$$\text{i.e. } e_x = T_x/l_x$$

Decomposition of changes in life expectancy

Several authors have attempted to disentangle the contributions by age-specific and age-cause-specific death rates to the difference between two expectations of life. By applying these methods we learn to interpret the dynamics of changes in the mortality.

Two methods to decompose changes in expectation of life at birth are more famous The method developed by Arriaga (Arriaga, E. 1984) and the second method was developed by Pollard (Pollard, J. H. 1988. "On the Decomposition of Changes in Expectation of Life and Differentials in Life Expectancy," *Demography* 25(2): 265-276). Pollard's method is an exact decomposition developed using a continuous modelling approach of the life table, whereas Arriaga's method is based on the discrete analysis approach. As such, Arriaga's method is an approximate method and is easier to compute. We have adapted Arriaga's method to explore the dynamics of changes in the mortality by age and cause in this paper.

Arriaga Method

We would like to compare the life expectancy in two points in time (2003 and 2006, for example). Designate the two groups as Group 1 and Group 2. The goal is to decompose the difference in the expectation of life at birth to reveal the differences in age-specific death rates (and age-cause-specific death rates). We approach this problem in two steps:

In Step 1, we will examine the contributions of the differences in age-specific death rates toward the changes in expectation of life at birth.

In Step 2, we will extend this to include age-cause-specific death rates.

Notation	*Definition*
e_0^{01}	~ expectation of life at birth for group 1
e_0^{02}	~ expectation of life at birth for group 2
e_x^{0i}	~ expectation of life at age x in group i (i = 1, 2)
l_x^i	~ number of survivors to age x in group i (i = 1, 2) *Note: The radix = 1 rather than 100,000. The result is that the terms expressed as proportions (per person, in other words) rather than as whole numbers (per 100,000 people, in other words.) Either way works fine as long as all the numbers are expressed the same way (all per person or all per 100,000 people).*
${}_nL_x^i$	~ person years of life contributed in the age group (x, x + n) in group i (i = 1, 2) *Note: This term is also expressed as a proportion.*

Step 1: Age-Specific Decomposition

Arriaga formulates the differences in the expectation of life at birth ($e_0^{02} - e_0^{01}$) due to differences in age-specific death rates as:

$e_0^{02} - e_0^{01}$

Total effect of age x = direct effect of age x + indirect effect of age x (summed over all age intervals)

where

direct effect of age (x , x + n)

$$(DE_x) = l_x^1 \left[\left({}_nL_x^2 / l_x^2 \right) - \left({}_nL_x^1 / l_x^1 \right) \right]$$

and

indirect effect of age (x , x + n)

$$(IE_x) = \{ l_x^1 [l_{x+n}^2 / l_x^2] - l_{x+n}^1 \} * e_{x+n}^{02}$$

The **direct effect** on life expectancy is due to the changes in life years within a particular age interval as a consequence of the mortality change in that age interval.

The **indirect effect** consists of the number of life years added to a life expectancy because of the changes in the number of survivors at the end of the age interval caused by the change in mortality within the age interval.

For an open-ended interval (x+), the contribution of the indirect effect is considered to be 0. Therefore, the total effect of this age interval is calculated as:

$$DE_{x+} = l_x^1 [e_{x+}^{02} - e_{x+}^{01}]$$

Step 2: Age-Cause-Specific Decomposition

This decomposition is accomplished by:

a. Calculating the proportion of change in the cause-specific mortality rates as a share of the total mortality change in the specific age interval.
b. Distributing the calculated total effect into specific cause contributions according to the proportions calculated in Step a.

Note that the contributions of each cause may be positive or negative. The contribution of each cause of death for all the age intervals is calculated in this manner and presented.

Note that summing over all age intervals for a specific cause yields the contribution of that cause to the total change in expectation of life at birth.

Calculation of the life expectancy confidence intervals

The calculation of the confidence intervals was made using the method developed by Chiang, CL. (1968, 1984). It is possible to compute the variance of
e0 [Var(e0)] from life table. The 95% confidence interval (CI) of e0 is calculated with the formula CI = e0 +/- 1.96*s.e.(e0).

Where s.e.(e0) = standard error(e0) = √Var(e0).
[SE(ex)= The standard error equals the square root of the variance, Var(ex)].
Var(ex)= Variance of the life expectancy.
var(qx)= Variance of the probability of death, using Chiang's method.

var(qx)
lx2[(1-ax)n1+ex+1]2var(qx)
sum(lx2[(1-ax)n1+ex+1]2var(qx))
Var(ex)

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