

## **Professor Theo Vos, University of Queensland**

Theo Vos is Director of the Centre for Burden of Disease and Cost-Effectiveness at the School of Population Health of the University of Queensland. The Centre aims to provide health policy makers with best available evidence to guide the allocation of resources. Theo has carried out burden of disease studies in Mauritius and Australia and has made major contributions to the studies in Zimbabwe, Thailand, South Africa, Malaysia and Vietnam. He was chief investigator on the recent update of the Australian Burden of Disease study including for the first time an Indigenous study. He is currently part of a core team of researcher directing an update of the Global Burden of Disease and is responsible for estimates of mental disorders, injuries, musculoskeletal disorders and neurological conditions as well as risk factors including alcohol, violence, occupational hazards, lead and osteoporosis.

He has also led cost-effectiveness studies in the areas of cardiovascular disease and mental disorders. He is currently directing two large economic evaluation projects: a) the ACE-Prevention project which will have evaluated the cost-effectiveness of 100 prevention options for non-communicable disease in Australia by the end of 2009; and b) the SPICE project in Thailand examining intervention options for tuberculosis, mental disorders, lifestyle risk factors and road traffic injuries.



# **Estimating Indigenous life expectancy**

## **Mortality data workshop QUT**

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**Stephen Begg and Alan Lopez**

# Background



Difficulties in ascertaining ‘mortality envelope’ for Indigenous people in Australia:

- ‘unexplained’ growth in population between censuses
- under-identification of Indigenous people in census counts
- under-identification of Indigenous people in death registration



# Indirect demographic methods

- Based on principle that between two census counts people survive (and grow older), die, migrate out or migrate in
  - ❖ Allows estimates of completeness of death registration in intercensal years relative to completeness of population counts
- ABS have used Preston-Hill method in past and more recently Bhat method
- For study on burden of disease in Aboriginal and Torres Strait Islander Peoples we decided to use Hill's Generalised Growth Balance method on 1996 and 2001 census data

# Assumptions of indirect demographic methods



- Misreporting of deaths is proportionately constant by age
- Census (or other source of population age distribution) coverage errors are proportionately constant by age (but not necessarily equal in each census)
- No in/out migration **or**
- if migration is accounted for by known level and age pattern of net migration: mortality experience of those migrating is same as in those not migrating

# ABS Bhat versus UQ GGB approach 1996-2001



	All Australians	Indigenous life expectancy at birth	
		ABS Bhat	UQ GGB
<b>Males</b>	76.7	59.4 <b>(17.3)</b>	64.2 <b>(12.5)</b>
<b>Females</b>	82.4	64.8 <b>(17.6)</b>	68.9 <b>(13.5)</b>

# Sensitivity analysis: 4 scenarios



- As advised by steering committee meeting & indicated by the ABS
  1. 1996-based & 2001-based ERPs in stead of actual population counts
  2. assume overall males, and for both sexes age groups 15–19 through 35–39 are more likely to be omitted from population counts (pattern found in PES )
  3. Double the excess omission of young adults in population counts
  4. Assume under-recording of deaths between the ages of 15 and 39 is 10% greater than at other ages & combine with 2.
- The estimated expectations of life at birth suggested our results were robust & our overall conclusions were not altered

# Sensitivity analysis: 4 scenarios



	Scenario				
	Baseline	1	2	3	4
Males	64.2	<b>65.6</b>	<b>64.5</b>	<b>64.9</b>	<b>64.2</b>
Females	68.9	<b>70.3</b>	<b>69.3</b>	<b>69.6</b>	<b>69.1</b>

1. ERP
2. excess population omission males and young adults
3. double excess population omission
4. scenario 2 + excess omission deaths



## UQ Indigenous Australian life expectancy at birth estimates by broad remote areas *adjusted for net migration*\*, 1996-2001

	All Australians	Indigenous life expectancy at birth	
		Non-remote	Remote
<b>Males</b>	76.7	66.2 <b>(10.5)</b>	58.4 <b>(18.3)</b>
<b>Females</b>	82.4	70.4 <b>(12)</b>	64.9 <b>(17.5)</b>

*\*Using ABS customised data from the 2001 census*



# Mortality of children

- Indirect methods do not provide information about mortality of children
- Assume differentials between WA Aboriginal & non-Aboriginal infants (1998-2001) and children aged 1-7 years (1980-1997) by broad remoteness areas from WA linked data hold true for all Indigenous children under five by broad remoteness areas

Patterns, trends, and increasing disparities in mortality for Aboriginal and non-Aboriginal infants born in Western Australia, 1980–2001: population database study

*Lancet 2006; 367: 1758–66*

*C Jane Freemantle, Anne W Read, Nicholas H de Klerk, Daniel McAullay, Ian P Anderson, Fiona J Stanley*

**Australasian Digital Thesis Program**

**Title:** Indicators of infant and childhood mortality for Indigenous and non-Indigenous infants and children born in Western Australia from 1980 to 1997 inclusive

**Author:** Freemantle, Cecily Jane

**Date:** 2003

- Note: Under-five mortality estimates have a small impact on life expectancy at birth overall

# Further assumption to estimate mortality for 2003



- Assume no trends over time 1996-2001 to 2003 based on Advisory Committee recommendations

**Northern Territory Indigenous life expectancy improvements, 1967-2004**

*(Aust N Z J Public Health. 2007; 31:184-8)*

| Tom Wilson

John R. Condon

Tony Barnes

- However in light of the NT paper we include in the report the difference in YLL (lower by 7%) and DALYs (lower by 4%) if NT trends were to hold true for the rest of the country

# Conclusions



We estimated:

- Large gap in Indigenous life expectancy of around 13 years that for total Australian population
- There is a large differential in mortality between remote and non-remote living Indigenous people

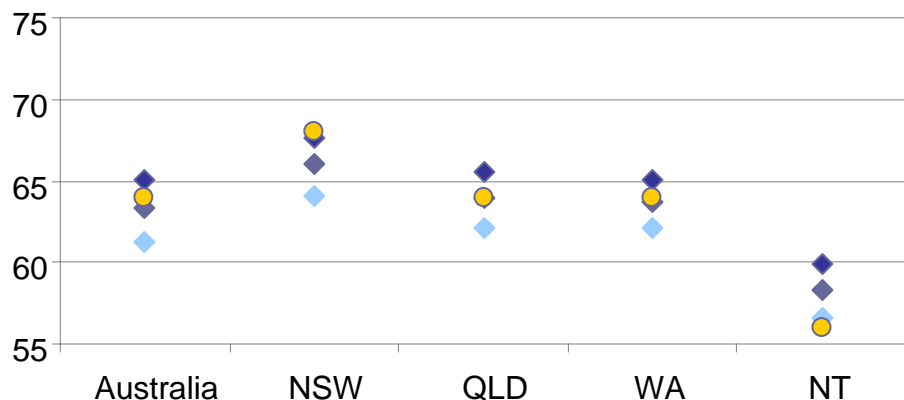
..... but

- Inherent uncertainty in methods
- Recent simulation modeling of countries with known complete registration of deaths shows weakness of methods
- Migration seems to be the main sticking point
  - ❖ For our national estimates a minor issue
  - ❖ We had fairly good data on net migration from remote to non-remote (but different mortality experience of migrants could still play a role)
- Sensitivity testing of realistic changes in age pattern of under-recording population and deaths: results are reasonably robust

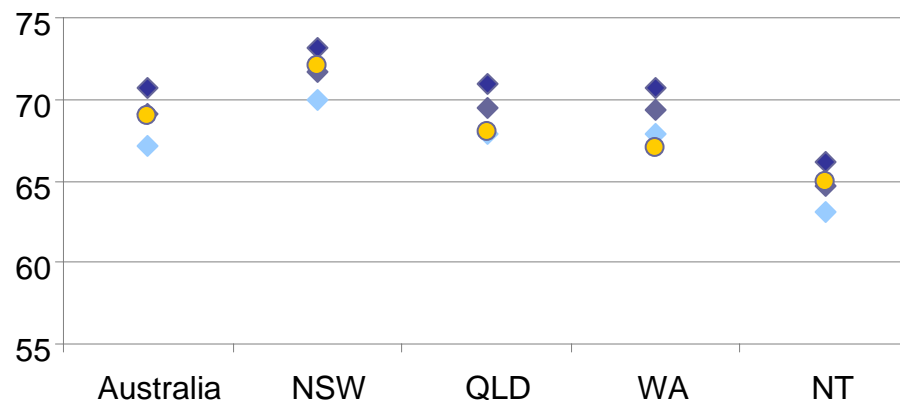
# Comparison of UQ GGB estimates with new ABS figures from linkage census and mortality data 2006-2007



## Males



## Females



● UQ GGB estimated life expectancy 1996-2001

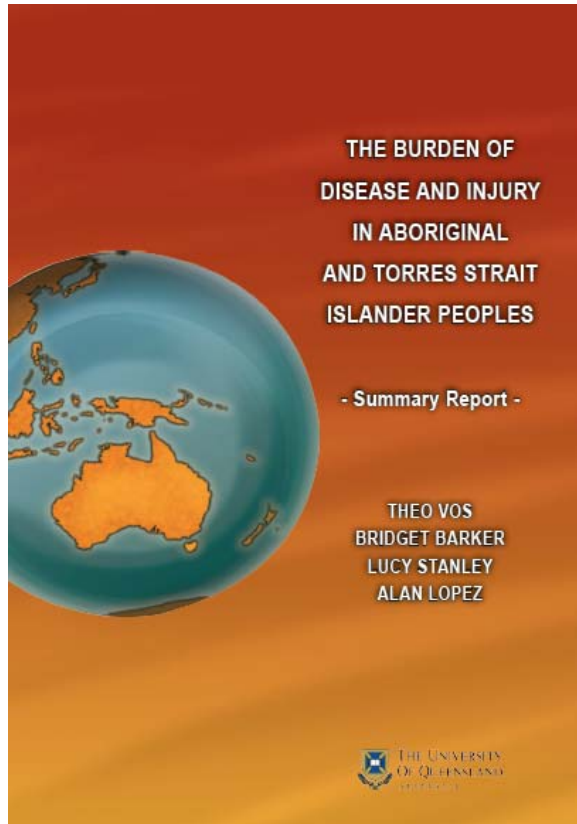
ABS estimated life expectancy 2000-2002 coverage assumption:

- ◆ same as 2006
- ◆ 10% lower
- ◆ 20% lower

# Comparison of UQ GGB estimates with new ABS figures from linkage census and mortality data 2006-2007



- UQ GGB estimates 'consistent' with new ABS estimated life expectancy estimates for (more or less) same time period
- UQ GGB State estimates not adjusted for internal migration
- New ABS a step forward ... but issue not yet fully resolved:
  - ❖ Worries about low linkage % achieved for Indigenous deaths
  - ❖ Population estimates subject to (sampling) errors in adjustment factors from Post-Enumeration Survey
  - ❖ Unfortunate that linkage is restricted to short period



Full report

Summary report

Policy brief

[www.uq.edu.au/bodce/2003-indigenous-burden-of-disease-report](http://www.uq.edu.au/bodce/2003-indigenous-burden-of-disease-report)