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<sup>11</sup> The issue of both short-term and more long-term return migration of European migrants from North America is well summarized in W. Nugent, *Crossings: The Great Transatlantic Migrations, 1870-1914*, Bloomington, Indiana University Press, 1992 and D. Baines, *Emigration from Europe 1815-1930*, London, Methuen, 1991.

<sup>12</sup> The issue of Asian migration and the trafficking in drugs and people is reviewed in R. Skeldon, 'East Asian migration and the changing world order', in W.T.S. Gould and A.M. Findlay (eds.), *Population Migration and a Changing World Order*, London, Belhaven, 1944, pp. 173-193.

## MORTALITY PATTERNS OF URBAN, RURAL AND REMOTE POPULATIONS IN NORTHERN AUSTRALIA

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*There has recently been a movement of Aborigines to outlying settlements. This article, which is a revised version of a paper given at the North Australia Statistics Workshop in Darwin, May 17-19, examines the patterns of mortality in remote Aboriginal communities and compares these with rates for other locations in Australia's northern regions. The results indicate mortality rates several times higher in remote Aboriginal settlements than elsewhere in the north or in Australia as a whole*

### SUMMARY

Australian Bureau of Statistics' mortality data for Australia for the years 1990-1992 have been used, together with population estimates from the 1991 census, to compare the mortality experience of urban, rural and remote populations in North Australia with that of the total Australian population. Statistical local areas in remote regions of North Australia where more than 50 per cent of the population identified as Aboriginal or Torres Strait Islander in the 1991 population census have been identified as a regional category called *remote Aboriginal areas*.

Standardised mortality ratios are higher overall for North Australia than the rest of Australia. Compared with the total Australian population, people living in remote Aboriginal areas have substantially higher death rates overall (three times higher for males and four times higher for females) and dramatically higher death rates for a wide range of specific causes of death such as:

- infectious and parasitic diseases - 17.8 and 21.7 times higher for males and females respectively
- cancer of the cervix - 11.5 times higher
- diabetes - 18 and 22 times higher for males and females respectively
- respiratory diseases - 7.9 and 12.5 times higher for males and females respectively
- diseases of the genito-urinary system - 9.1 and 16.8 times higher for males and females respectively
- homicide - 15.4 and 7.8 times higher for males and females respectively.

Over the past two decades, there has been a significant improvement in some aspects of the health of Aboriginal and Torres Strait Islander peoples, but not in life expectancy, as mortality rates of adults have not improved. To improve Aboriginal mortality rates will require improved coordination and delivery of health and basic infrastructure services, as well as substantial efforts to eliminate the effects of socioeconomic disadvantage, unemployment, poor housing and social alienation.

### INTRODUCTION

Australia is one of the healthiest countries in the world and, according to available health measures, the health of Australians continues to improve.<sup>1</sup> At the same time, Australian health expenditure has been stable at around eight per cent of gross domestic product for the last 15 years. Nevertheless, there are health problems and there are population groups, particularly socioeconomically disadvantaged groups, where there are wide disparities in health and substantial room for improvements.<sup>2</sup> However, standing out from all other disadvantaged population groups are Aboriginal and Torres Strait Islander peoples, who continue to suffer substantially

higher mortality rates and much worse health status than any other Australian population group.<sup>3</sup>

Australia's indigenous people have life expectancies and patterns of health more comparable to those of fourth world countries than the developed countries of Asia (see Discussion below). Over the past two decades, there has been a significant improvement in many aspects of the health of Aboriginal and Torres Strait Islander people. Higher life expectancy, reduced infant mortality and a lower burden of infectious and parasitic diseases are all evidence of improvement. However, as reflected in rates of hospitalisation, maternal mortality and

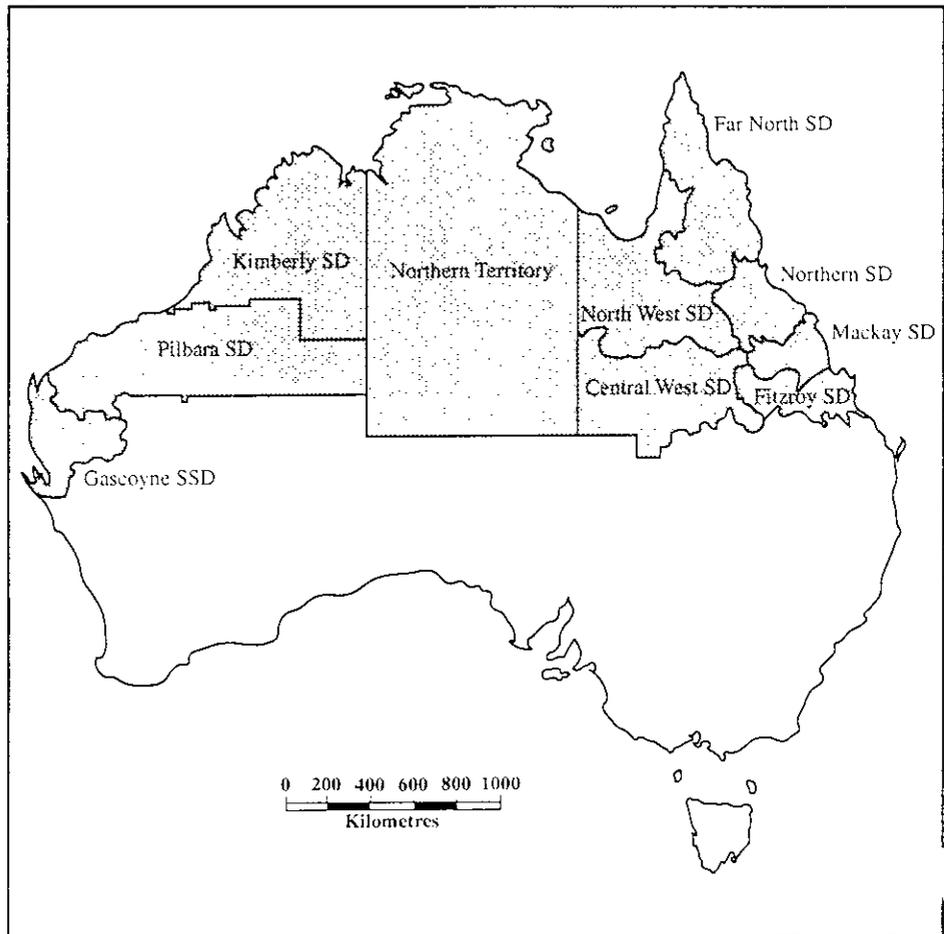
disability, and in continuing high mortality in adults, the burden of disease in Aboriginals continues to be higher than in non-Aboriginal Australians, and differentials are not narrowing. This burden is likely to continue until effects on Aboriginal health of social and economic factors such as unemployment, poor housing and discrimination can be eliminated.

Previous estimates of Aboriginal and Torres Strait Islander mortality rates have generally been based on numbers of deaths identified as Aboriginal or Torres Strait Islander on the death registration form. There is provision for Aboriginal and Torres Strait Islander identification on death certificates in all States and Territories apart from Queensland. However, the completeness of identification is only considered to be

adequate (more than 90 per cent of Aboriginal and Torres Strait Islander deaths so identified) in South Australia, Western Australia and the Northern Territory.<sup>4</sup> It is thus not yet possible to estimate the mortality of Aboriginal and Torres Strait Islander people from death registration data at the national level, or for quasi-national regions such as 'remote' Aboriginals, or for indigenous people living in North Australia.

This paper uses information on the place of usual residence of deceased persons to contrast the mortality experience of all Australians living in regions of North Australia with that of all Australians in the country as a whole. North Australia is defined as shown in Figure 1 in terms of Statistical Divisions and Subdivisions set out in the Australia Standard Geographical

Figure 1: Statistical Subdivisions and Divisions included in North Australia



Classification.<sup>5</sup> This approach provides a picture of mortality differentials between the total populations living in regions of North Australia with that of the total Australian population. While it does not specifically identify the Aboriginal and Torres Strait Islander populations in each region, the overall mortality rates of the populations in the remote regions are dominated by the high mortality rates of indigenous people and the mortality patterns presented below provide a stark profile of the health conditions experienced by the indigenous population in the north of Australia.

#### DATA SOURCES AND METHODS

##### Definition of regions in North Australia

North Australia is divided into a number of regional categories defined in terms of the Statistical Local Area (SLA) of place of usual residence at time of death. The categories used were developed by Birrell and Rapson<sup>6</sup> and are defined as follows:

**Cities:** The cities classification includes groups of SLAs which form part of, or neighbour, urban centres with populations of 80,000 or more. Darwin is included in this class on the basis of its capital city role in spite of its urban centre only having a population of 67,946. The only other 'city' in North Australia is Townsville (including Thuringowa).

**Rural:** The remaining SLAs are designated rural or remote, the prime determinant of rural being more intensive land use. Other characteristics such as population density are also associated with the delineation between rural and remote. Rural SLAs are further divided into *rural centres* (SLAs with urban centres of 10,000 or more) and *other rural areas*.

**Remote:** Remote SLAs with an urban centre of 5,000 people or more have been called *remote centres*. Other remote SLAs where more than 50 per cent of the population were Aboriginal in the 1991 census are designated as *remote Aboriginal areas*. The remaining remote SLAs are named *other remote areas*.

##### Data sources

Registration of deaths in Australia is the responsibility of the State and Territory Registrars of Births, Deaths and Marriages. Information on the cause of death is supplied by the medical practitioner certifying the death or by a coroner. Other information about the deceased is supplied by a relative

or other person acquainted with the deceased, or by an official of the institution where the death occurred. Registration of death is a legal requirement in Australia, and compliance is virtually complete.

The information is provided by the Registrars to the Australian Bureau of Statistics (ABS) for coding of information and compilation into national statistics. The data analysed in this paper were derived from the registration data coded by the ABS and provided to the Australian Institute of Health and Welfare by the State and Territory Registrars.

Mortality data analysed below relate to deaths registered in the three calendar years 1990, 1991 and 1992. These deaths were classified into the regions defined above according to the SLA of usual residence (of the deceased person) coded on the death certificate. As the regional classification system is based on 1991 SLA boundaries, deaths occurring in 1990 and 1992 in SLAs where the boundaries were not compatible with those existing in 1991 have been reclassified into the equivalent 1991 SLAs.

The estimated resident populations living in these regions in 1991 were derived from tabulations of estimated resident population by SLA of usual place of residence based on the 1991 Census of Population and Housing and provided by the Australian Bureau of Statistics.<sup>7</sup>

##### Methods

Standardised mortality ratios for each region were calculated using a technique known as indirect age standardisation. This provides an estimate of the number of deaths to be expected in the various regions if the populations in those regions were to experience the same age-specific death rates as the total Australian population. The ratio of the number of deaths observed to the number expected is known as the standardised mortality ratio (SMR).

Standardised mortality ratios were calculated for total deaths (from all causes) and for deaths due to specific groups of causes using categories based on the Chapters and disease groups specified in the International Classification of Diseases (9th Revision),<sup>8</sup> referred to below as ICD9.

It was possible to determine an SLA of usual residence for all except 114 deaths (0.4 per cent), all of which were either offshore and migratory or no fixed place of residence.

The usual residence population estimates indicated that approximately five per cent of the population had not been classified to SLAs in the 1991 Census. This varied from state to state with the Northern Territory showing the largest percentage of the population not classified to an SLA (eight per cent). As there was no rationale for determining how the underestimate is distributed across SLA, and gender and age, no correction was applied. The rates presented in this paper will therefore be slightly higher than those calculated on a national or state basis where full population enumeration is available.

Place of usual residence in the census is self-reported, while for deaths it is determined from the address recorded on the death registration form (usually by a funeral director, or in the case of injury deaths, sometimes by coronial investigators). It is therefore possible that there has been differential recording of place of usual residence in the two data sets. The size or nature of this is not known but is not likely to be large.

#### Interpretation of data

Despite the fact that these data represent population measures and therefore do not suffer from sampling variability, rate differences between some areas must be treated with caution. Where cause-specific rates are based on small numbers of deaths, they may be disturbed significantly by a cluster of deaths, such as that created by a multiple fatality vehicle collision or by the nature of underlying random processes. Care should be taken when drawing conclusions about differences between regions in North Australia with relatively low populations, or for causes resulting in small numbers of deaths.

## RESULTS

### Population

The total population of North Australia (as defined in Figure 1) was an estimated 939,910 persons or 5.4 per cent of the total Australian population (see Table 1). Nearly 74 per cent of the population of North Australia was resident in Queensland, and just over 12 per cent of the population of North Australia identified as Aboriginal or Torres Strait Islander people (See Table 2).

### Total mortality rates

Tables 3 and 4 show the standardised mortality ratios (SMRs) for males and females in

**Table 1: Estimated resident population in each region, North Australia, 1991**

	Regions						
	Cities		Rural		Remote		
	Darwin	Townsville	Centres	Other	Centres	Other	Aboriginal
Males	55,090	59,364	112,805	124,062	63,912	49,047	23,413
Females	49,399	56,796	111,697	113,453	56,898	41,908	22,066
Total	104,489	116,160	224,502	237,515	120,810	90,955	45,479

**Table 2: Estimated resident population, Aboriginal and Torres Strait Islander (TSI) and total, by State and Territory, North Australia, 1991**

	Queensland	Western Australia	Northern Territory	Total
Aboriginal and TSI	53,400	18,100	43,300	114,800
Total population	694,200	80,200	165,500	939,900

**Figure 2: Standardised mortality ratios for all causes of death, by sex and region, North Australia 1990-1992**

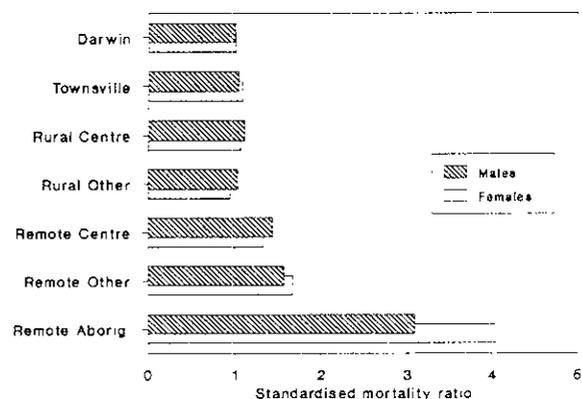


Table 3: Mortality differentials by cause of death, males resident in North Australia 1990-1992

Cause of death	Standardised mortality ratio						
	Cities		Rural		Remote		
	Darwin	Townsville	Centres	Other	Centres	Other	Aboriginal
Infectious & parasitic diseases	1.52	0.14	0.93	1.05	3.20	3.79	17.77
Cancers	0.88	1.02	1.12	0.99	1.25	1.09	1.18
Mental disorders	0.76	0.87	1.11	0.76	2.06	1.09	4.38
Diseases of the nervous system & sense organs	0.81	1.45	0.96	0.87	1.85	1.65	1.85
Diabetes mellitus	1.38	0.64	0.95	1.23	2.19	2.17	7.60
Circulatory system diseases	0.79	1.03	1.10	0.99	1.21	1.33	2.60
Respiratory system diseases	1.51	1.16	1.12	1.05	2.46	1.91	7.93
Digestive system diseases	1.77	1.10	1.26	1.11	1.23	1.76	2.99
Genito-urinary system diseases	1.89	1.20	1.37	1.19	2.96	1.80	9.10
Congenital anomalies	1.32	1.27	1.01	0.80	0.86	1.60	1.13
Perinatal conditions	0.82	1.01	1.33	0.83	1.19	2.46	3.68
Injury and poisoning	1.11	1.11	1.16	1.48	1.61	2.83	3.78

the regions of North Australia. These ratios, also shown in Figure 2, show how the deaths observed in 1990-1992 compare with those which would be expected if the region had experienced the average mortality rate at each age of the total Australian population of the relevant sex. Thus for example, the male population resident in the *remote Aboriginal areas* experienced 3.09 times as many deaths as they would have experienced if they had experienced the same risk of death at each age as the total male population of Australia.

It is apparent from Tables 3 and 4 that, overall, the population of Darwin and Other

Rural areas experienced mortality rates similar to those of the total Australian population. The SMRs for Townsville and *rural centres* were generally five to ten per cent higher than the national average, whereas those for remote areas were substantially elevated.

#### Mortality rates by cause of death

Tables 3 and 4 also provide SMRs for major cause of death groups in 1990 to 1992. It is clear that the mortality ratios are substantially higher than the national average in most regions of North Australia for causes of death such as infectious and parasitic

Table 4: Mortality differentials by cause of death, females resident in North Australia 1990-1992

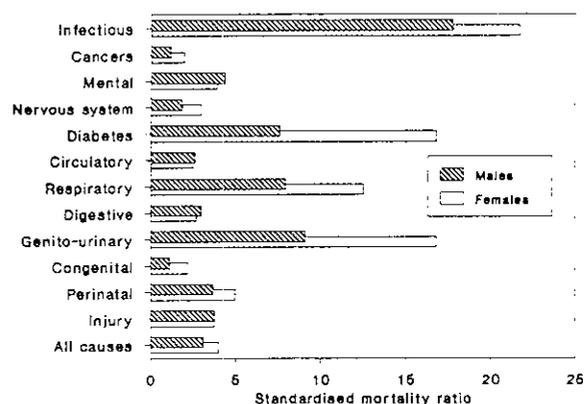
Cause of death	Standardised mortality ratio						
	Cities		Rural		Remote		
	Darwin	Townsville	Centres	Other	Centres	Other	Aboriginal
Infectious & parasitic diseases	1.37	1.27	1.28	1.13	3.17	2.55	21.69
Cancers	0.79	0.96	0.98	0.80	1.06	1.25	1.96
Mental disorders	0.69	1.94	0.80	0.85	1.80	2.07	3.92
Diseases of the nervous system & sense organs	0.44	1.67	0.83	0.90	0.60	1.50	2.92
Diabetes mellitus	2.31	1.11	1.56	1.09	2.65	3.54	16.80
Circulatory system diseases	0.83	1.06	1.14	1.01	1.18	1.41	2.49
Respiratory system diseases	1.67	0.86	0.85	0.74	2.06	2.48	12.51
Digestive system diseases	1.66	1.23	0.97	1.06	1.38	2.33	2.73
Genito-urinary system diseases	1.56	1.49	1.27	0.94	2.35	2.48	16.81
Congenital anomalies	1.04	1.31	1.11	1.43	1.74	1.33	2.20
Perinatal conditions	1.50	1.54	1.21	1.13	1.35	1.34	4.96
Injury and poisoning	1.19	1.19	1.22	1.27	1.64	2.91	3.78
All causes	1.01	1.09	1.07	0.95	1.33	1.67	4.03

diseases, diabetes, respiratory disorders, genito-urinary system diseases, perinatal conditions and injury and poisoning. Mortality rates for these causes are extraordinarily high, as shown in Figure 3, with standardised mortality ratios ranging up to 9.1 and 16.8 for genito-urinary diseases, and 17.8 and 21.7 for infectious and parasitic diseases, for males and females respectively.

Deaths in the perinatal period (up to one month after birth) are predominately due to congenital anomalies and perinatal conditions, for which standardised mortality ratios are given in Tables 3 and 4. Infant deaths in the postneonatal period (from one month to 12 months of age) are predominately due to respiratory conditions, infectious and parasitic diseases and sudden infant death syndrome (SIDS). The standardised mortality ratios for SIDS were less than 1.0 for Darwin and rural areas, but somewhat greater than 1 for Townsville (1.3), remote centre (1.4) and other remote areas (1.8), and substantially higher at 3.4 for *remote Aboriginal areas*.

Table 5 gives SMRs for some of the more common types of cancer. Male SMRs do not

Figure 3: Standardised mortality ratios for remote Aboriginal areas in North Australia, by sex and cause of death, 1990-1992



vary substantially from unity, except for skin cancer in *rural centres* (SMR 1.6) and *other remote areas* (SMR 1.5). Female SMRs for cancer are higher for these regions and also for Townsville. However, cancer of the cervix stands out as causing substantially higher death rates in nearly all regions of North Australia, and particularly for women in the *remote Aboriginal areas*, with an SMR of 11.5.

Table 6 gives SMRs for the major types of cardiovascular disease. Death rates for coronary heart disease (ischaemic heart

Table 5: Differentials in cancer mortality, North Australia 1990-1992

Cause of death	Standardised mortality ratio						
	Cities		Rural		Remote		
	Darwin	Townsville	Centres	Other	Centres	Other	Aboriginal
<b>Males</b>							
Digestive organs	0.72	0.93	1.04	0.85	1.30	1.00	1.29
Lung	1.01	1.06	1.17	1.08	1.29	1.12	1.18
Skin	1.04	1.20	1.62	1.27	0.85	1.49	1.08
Prostate	1.14	0.94	1.25	1.04	1.37	0.87	0.41
Lymph, leukemia etc	0.53	0.96	0.85	0.91	0.53	0.97	0.68
All cancers	0.88	1.02	1.12	0.99	1.25	1.09	1.18
<b>Females</b>							
Digestive organs	0.76	0.95	1.09	0.89	1.00	0.93	1.11
Lung	1.98	0.87	0.55	0.75	1.25	1.38	3.77
Skin	0.33	1.53	1.16	0.25	1.06	2.56	0.83
Breast	0.62	0.76	0.99	0.70	0.63	0.93	0.76
Cervix	1.24	1.15	1.77	0.84	2.64	3.33	11.47
Lymph, leukemia etc	0.36	0.96	0.72	0.97	0.80	1.25	0.53
All cancers	0.79	0.96	0.98	0.80	1.06	1.25	1.96

Table 6: Differentials in cardiovascular disease mortality, North Australia 1990-1992

Cause of death	Standardised mortality ratio						
	Cities		Rural		Remote		
	Darwin	Townsville	Centres	Other	Centres	Other	Aboriginal
<b>Males</b>							
Acute rheumatic fever	3.83	0.53	0.47	0.65	2.24	3.43	12.07
Ischaemic heart disease	0.84	1.03	1.15	1.00	1.09	1.34	2.24
Cerebrovascular disease	0.38	1.13	1.09	0.94	1.45	1.30	1.81
All cardiovascular diseases	0.79	1.03	1.10	0.99	1.21	1.33	2.60
<b>Females</b>							
Acute rheumatic fever	1.56	0.86	0.89	1.02	2.76	2.09	13.91
Ischaemic heart disease	0.48	1.20	1.30	1.10	1.22	1.19	2.13
Cerebrovascular disease	0.61	0.97	0.96	0.97	0.92	1.47	1.79
All cardiovascular diseases	0.83	1.06	1.14	1.01	1.18	1.41	2.49

disease) and stroke (cerebrovascular disease), the two leading causes of death in Australia, are substantially higher in remote regions of North Australia, with SMRs ranging up to around two in the *remote Aboriginal areas*. However, acute rheumatic heart disease, a disease which is fairly rare in non-Aboriginal Australians, has SMRs ranging up to 12.1 and 13.9 for males and females in the *remote Aboriginal areas*.

Table 7 gives SMRs for leading causes of fatal injury. Apart from Townsville, SMRs for motor vehicle accidents and production (work-related) injuries are substantially greater than unity in all regions of North

Australia. Accidental drowning rates are substantially higher for males and females in nearly all regions of North Australia, with SMRs ranging from around 1.5 for males in Darwin and 3.5 for females in Darwin up to 4.4 and 3.3 for males and females in the *remote Aboriginal areas*.

Suicide rates were not generally a great deal higher for males except in *other remote areas* (SMR of 2.0) and were generally lower than the national average for females, except in *rural centres* (SMR of 1.3). In contrast, homicide rates were substantially higher than the national average for males and females in most regions of North Australia, with SMRs

Table 7: Differentials in injury mortality, North Australia 1990-1992

Cause of death	Standardised mortality ratio						
	Cities		Rural		Remote		
	Darwin	Townsville	Centres	Other	Centres	Other	Aboriginal
<b>Males</b>							
Motor vehicle accidents	1.05	0.73	1.11	1.43	1.56	3.09	4.59
Production injuries*	1.10	1.02	1.77	3.40	1.63	4.53	2.99
Accidental drowning	1.48	1.84	1.59	1.66	1.88	2.44	4.40
Suicide	1.08	1.33	1.23	1.31	0.91	2.03	1.13
Homicide	2.17	1.83	1.24	1.38	3.21	6.16	15.41
All injury and poisoning	1.11	1.11	1.16	1.48	1.61	2.83	3.78
<b>Females</b>							
Motor vehicle accidents	1.42	1.02	1.29	1.48	1.42	3.64	2.97
Production injuries*	-	5.83	2.92	5.69	-	-	-
Accidental drowning	3.52	0.77	2.71	1.47	2.12	8.26	3.29
Suicide	0.41	0.69	1.32	0.70	0.50	0.99	1.07
Homicide	1.61	2.22	0.96	0.77	4.31	6.49	7.76
All injury and poisoning	1.19	1.19	1.22	1.27	1.64	2.91	3.78

\* A number of causes of death (being struck by a falling object, accidents involving machinery, falls from ladders, scaffolds, being caught or crushed, and deaths involving an electric current) are known to be mostly work-related. This combination of causes has been used as an indicator of production-related death.

ranging up to 15.4 for males in the *remote Aboriginal areas*. Based on national average rates, the expected numbers of homicides in the *remote Aboriginal areas* for 1990 to 1992 is small, 1.6 males and 1.0 females. The actual numbers of homicides in 1990 to 1993 were 24 males and eight females.

#### DISCUSSION AND CONCLUSIONS

In general, the population of North Australia has a substantially worse mortality experience than that of Australians as a whole. This almost certainly reflects the very much poorer health of the indigenous population of North Australia.

Analysis of data for those States and Territories where there is reasonable identification of the indigenous population on death registration certificates has shown that:

- Aboriginal death rates are between two and four times those of the total Australian population, with the exact ratio being dependent on the specific Aboriginal population.
- Aboriginal expectation of life at birth is between 16 and 18 years shorter for males than for non-Aboriginal Australians; the gap is slightly wider for Aboriginal females (see Table 8).
- Aboriginal infant mortality rates are between two to three times those for the whole of Australia.

These data, however, depend on death certificates where Aboriginality is not always reliably reported. The data analysed in this paper are different in that they provide a picture of mortality patterns for the population of North Australia in its entirety. Almost half the Aboriginal population of North Australia lives in Queensland, where there is no identification at present of Aboriginal and Torres Strait Islander people

on death certificates. The standardised mortality ratios presented above for remote Aboriginal areas, while relating to the entire population of those areas, provide a graphic picture of the appalling health conditions suffered by the indigenous population in North Australia. To the extent that there are non-Aboriginal people with substantially lower mortality rates who also live in the *remote Aboriginal areas*, the standardised mortality ratios presented in this paper understate the true differentials for indigenous people living in remote areas.

These results clearly point to the major illness conditions and factors resulting in the excess mortality of the indigenous population of North Australia. The Aboriginal and Torres Strait Islander people suffer from 'Third World' health problems of infectious and parasitic diseases, rheumatic heart disease and genito-urinary problems, as well as the degenerative diseases of 'civilisation' such as coronary heart disease and diabetes. Respiratory conditions and circulatory conditions are often associated with smoking. Smoking rates are significantly higher in the Aboriginal and Torres Strait Islander population than in the population as a whole.<sup>9</sup> This also results in substantially higher lung-cancer mortality rates among indigenous people. Alcohol consumption is one of the factors associated with higher levels of injury, particularly injuries resulting from motor vehicle accidents and interpersonal violence.

While there has been considerable improvement in infant mortality rates for indigenous people in Australia, there has been no improvement in the mortality rates of adults.<sup>10</sup> Because mortality rates for non-Aboriginal Australians have been steadily declining over the last twenty years, the gap between death rates for Aboriginal and Torres Strait Islander adults and other adults has widened in that time. Indeed, overall death rates for 'middle-aged' Aboriginal men aged 35 to 44 years in Western Australia, South Australia and the Northern Territory were 6.3 times higher than those for all Australian men aged 35 to 44 years in 1990 to 1992.<sup>11</sup>

Unpublished analyses carried out by the Australian Institute of Health and Welfare have shown that the excess mortality rates of the rural and remote populations of the Northern Territory, in comparison with those

Table 8: Life expectancy at birth, Aboriginals in Western Australia, South Australia and the Northern Territory, and total Australian population by sex, 1990-1992

	Aboriginals			Total Australia
	Western Australia	South Australia	Northern Territory	
Males	56.3	57.8	56.8	74.5
Females	64.2	63.7	60.6	80.4

Source: Australian Institute of Health and Welfare<sup>10</sup>

of people living in Darwin, is entirely explained by the higher mortality rates of the Aboriginal population.<sup>12</sup> There are no differences of any consequence in the mortality rates of the non-Aboriginal population living in urban, rural and remote regions of the Northern Territory.

Ring and Runciman<sup>13</sup> have noted that the lack of progress in reducing the mortality rates of indigenous Australians is unique. The World Bank has documented dramatic declines in mortality rates in nearly all regions of the World, including the under-developed countries, since the 1950s.<sup>14</sup> Unlike the indigenous population of Australia, those of New Zealand and North America have experienced significant declines in mortality in recent decades and now have substantially higher life expectancies than indigenous Australians.<sup>15</sup>

The fact that other indigenous populations with similar dispossession and depopulation experiences have been able to improve their health profiles suggests that health outcomes for Aboriginal populations can be improved significantly.<sup>16</sup> Particularly preventable are excess mortality and morbidity resulting from cardiovascular diseases, injuries and diabetes. There is also much room for improvement in the rates of infectious and parasitic diseases. Perinatal and maternal mortality as well as disability should also be reduced greatly.

Some of the reasons why the Aboriginal and Torres Strait Islander population have not experienced the kinds of gains seen in New Zealand and North America relate to differences in our history and relationships between indigenous and non-indigenous people, particularly in regard to landrights and civil rights. Also, during recent decades there have been considerable difficulties in defining the roles and responsibilities of Aboriginal and Torres Strait Islander Commission (ATSIC), Commonwealth, State and Local Governments in health and other social issues. These difficulties have resulted in a lack of co-ordination and effort in addressing basic infrastructure issues to do with housing, water supply, education, training and employment.

Over the past two decades there has been a significant trend to decentralisation of indigenous people living in North Australia, with movement to remote homelands and outstations. This has been a very positive

development for Aboriginal people in terms of commitment to Aboriginal lifestyle and culture with improved social cohesion and support. However, the results presented here emphasise the health problems experienced in such remote communities and underline the importance of ensuring that economic activity, infrastructure support and health services needs are adequately addressed and co-ordinated across all levels of government and community.

It is to be hoped that the impending transfer from ATSIC to the Department of Human Services and Health of the funding and delivery of primary health services for indigenous people will result in a co-ordinated, focused and increased effort to improve the health of Australia's indigenous people.

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## IMPACTS OF AUSTRALIA'S COASTAL POPULATION GROWTH

Neil T. M. Hamilton

*Most Australians live within a few kilometres of the sea and most population growth occurs in coastal areas. Neil Hamilton analyses this growth in New South Wales where, in some coastal regions, numbers have increased by more than 1,500 per cent since 1971. He finds that this growth is poorly managed and that it is damaging the environment.*

### INTRODUCTION

Australia's love of the coast, as a place to live and a place to recreate, is as undeniable as our slow but apparently inexorable growth in population. The coast is simply part of our psyche, a place which gives us meaning. Many other nations and cultures have a similar links with places or environments, but few have permitted the degradation of their icons as rapidly as Australia has to its coast, seemingly unaware of the cost of 'loving to death' a priceless and irreplaceable suite of biological and geomorphological environments.

This opening paragraph, full of value judgements and unsupported statements, is about the closest I can get in a scholarly forum to expressing the feelings that have come from studying coastal environments around the country over a period of time. So what causes these feelings? There are two fundamental and interacting factors: coastal zone management policies and strategies, and population. This brief discussion will touch on the first, but concentrate on the second as the foundation of so many of the actual symptoms we see, and the seed of the degradation our children will experience. Overall, the paper explores the notion of population as a significant driver of environmental change in the coastal zone.

### COASTAL ZONE MANAGEMENT: A FESTERING SORE

There have been no fewer than 30 Commonwealth inquiries or reviews of

coastal management since 1944,<sup>1</sup> culminating in the comprehensive Resource Assessment Commission (RAC) coastal zone inquiry in 1993.<sup>2</sup> Each state has had comparable inquiries, some focusing on particular issues or regions, some covering the entire state. There is a clear tendency in these reports, and in coastal management practice, to respond to coastal problems on a single-issue, state-by-state basis. A rational review of the Australian reports diplomatically concluded: 'Past Australian coastal management efforts often have been appropriate for the circumstances then presented.'<sup>3</sup> The Resource Assessment Commission was blunter, identifying the urgency which must be applied to the problem:

The quality of many of the resources of Australia's coastal zone is being diminished by the effects of human activities. If no action is taken to change the way in which coastal resources are managed, there is a very considerable risk that the benefits currently being enjoyed in using them will be curtailed.<sup>4</sup>

Most of these reports, including RAC, begin with an introduction espousing sustainable (ecological or economic?) development, biodiversity, inter- and intragenerational equity, the precautionary principle and integrated coastal zone management. They even include long and apparently meaningful debates about the definition of 'the coastal zone', before moving in on the 'real' business of economic development and single-issue recommendations. This is of course not to say that such investigations have achieved