

COMPARATIVE CANCER INCIDENCE, MORTALITY AND SURVIVAL IN INDIGENOUS AND NON-INDIGENOUS RESIDENTS OF SOUTH AUSTRALIA AND THE NORTHERN TERRITORY

David Roder

The Cancer Council South Australia
Email: droder@cancersa.org.au

Introduction

Cancer incidence has been poorly defined by Indigenous status in Australia, due to difficulties encountered in all jurisdictions in obtaining accurate information on race. During 1988-1994, the Epidemiology Branch of the South Australian Health Commission implemented a special project, in which extensive attempts were made to record all cancers in Indigenous residents of that State and to validate Indigenous status.¹

A further collaborative project to estimate incidence by race was undertaken in 2003.² Collaborating partners included the Epidemiology Branch and Aboriginal Services Division of the Department of Human Services, the Aboriginal Health Council of South Australia, and The Cancer Council South Australia. In this project, incidence relativities (for all cancer sites combined) between Indigenous and non-Indigenous South Australians, as determined in the 1988-94 study,² were generalised to the broader 1977-2001 period. Incidence rates for Indigenous cases were apportioned by site according to the age-sex distribution by site for this broader period.

Meanwhile, the Northern Territory Cancer Registry completed a special project to assess relative rates of cancer in the Indigenous and non-Indigenous populations of the Northern Territory. These data were presented in a landmark publication that covered the 1991-2001 reporting period.³ This publication provides the most comprehensive and reliable data so far available on cancer epidemiology in Indigenous people in Australia.

Selected data from these Northern Territory and South Australian projects are presented now to indicate comparative rates of cancer in Indigenous and non-Indigenous Australians.

Methodological details of these studies are provided in the respective South Australian and Northern Territory reports.¹⁻³ In summary, incidence and mortality data were standardised by age, as specified in these publications, either using the World Population or 2001 Australian population as the standard.¹⁻³ Cancer stage was assessed using the summary staging system of the Surveillance Epidemiology End Results (SEER) program of the US National Cancer Institute, while cause-specific cancer survivals were calculated using the Kaplan-Meier product-limit estimate (univariate) or Cox proportional hazards regression (multivariable).¹⁻³

Incidence

Figure 1 shows comparative Indigenous and non-Indigenous incidence estimates for the two jurisdictions. In South Australia, the Indigenous incidence appeared to be about 6% lower than the non-Indigenous incidence for all cancer sites combined. It is evident, however, from 95% confidence intervals that this difference could have arisen by chance.

In the Northern Territory, the Indigenous incidence was found to be 15% lower than the non-Indigenous incidence. Yet it was estimated that the Indigenous figure could have been about 15% lower than actually occurring due to under-ascertainment and misclassification of race.

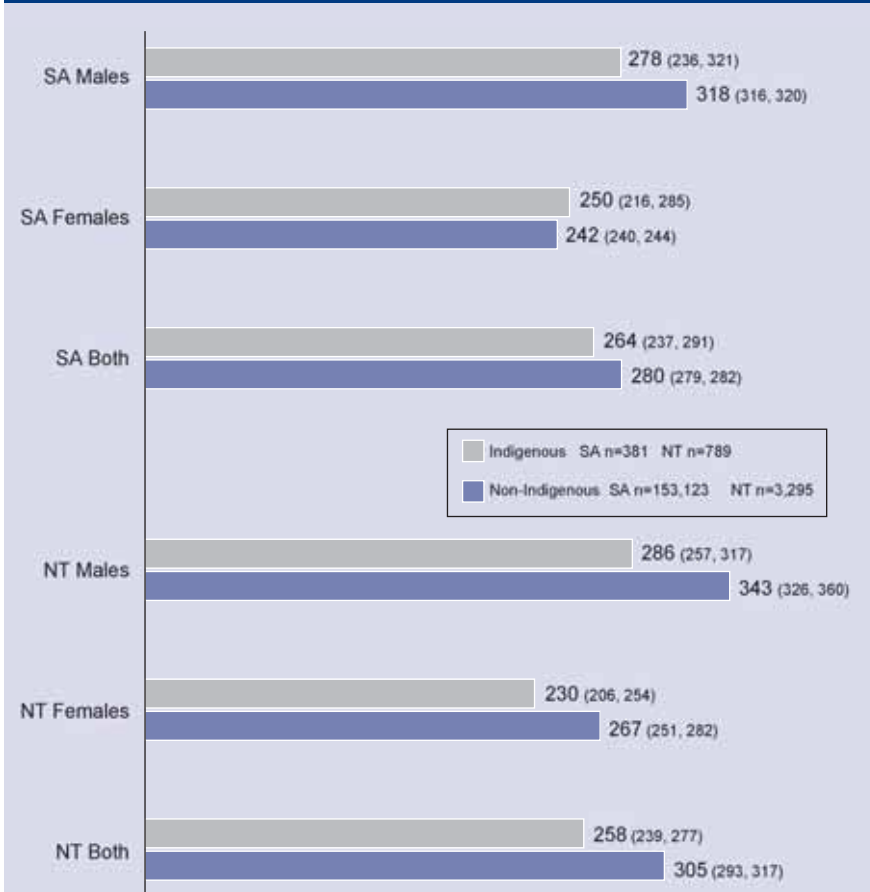
It would appear from these figures, after considering the potential for under-ascertainment of Indigenous cancer rates, that Indigenous and non-Indigenous Australians may have broadly similar susceptibilities to cancer – at least for all cancer sites combined.

Mortality

It is evident from Figure 2 that cancer mortality is higher in Indigenous than non-Indigenous Australians, both in South Australia and the Northern Territory. Broadly speaking, the rate appears to be about 40% higher in Indigenous residents.

The data therefore suggest that while Indigenous and non-Indigenous residents have a broadly similar risk of

Figure 1: Estimated annual age-standardised (World Population) cancer incidence per 100,000 (95% confidence limits) by race; SA circa 1977-2001 and NT 1991-2001



Data sources: SA and NT cancer registries.

getting cancer, Indigenous Australians have a much higher probability of dying as a consequence.

This raises the question of whether Indigenous people acquire more lethal types of cancers, or whether they fare worse from similar types. If they do fare worse from equivalent cancers, it follows that the reasons for this outcome would need to be addressed.

Cancer profiles

Cancers with an elevated incidence in Indigenous people

Both the Northern Territory and South Australian data show a relatively high incidence of cancers of the lung, oral cavity/pharynx/oesophagus, pancreas, liver, gallbladder, and unspecified organ sites, in Indigenous residents. Notably, these are all cancers with low case survivals.^{4,5} In addition, Indigenous people were observed to have a higher incidence of cancers of the cervix and related female organs (i.e., organs with ICD-9 codes of 180 & 184).

The international scientific literature points to a number of risk factors for these cancers.^{6,9} They include:

- **Lung** – predominantly tobacco smoking, but also inhalation of other environmental carcinogens.
- **Cervix** – a lack of screening for precancerous lesions and infection with carcinogenic human papilloma virus (HPV). It is likely that HPV infection also is a factor in cancer of the vulva.
- **Oral cavity/pharynx/oesophagus** – tobacco smoking, alcohol consumption and a low intake of fruit and vegetables.

- **Pancreas** – tobacco smoking and potentially diabetes and a low intake of fruit and vegetables.
- **Liver** – endemic infection with hepatitis B and C, and possibly cirrhosis from a high alcohol intake.
- **Gallbladder** – possibly a history of multiple pregnancies and high body weight.
- **Unspecified organs** – possibly:
 - delayed diagnoses when organs of origin are no longer readily apparent; and
 - a poor access to advanced diagnostic technologies.

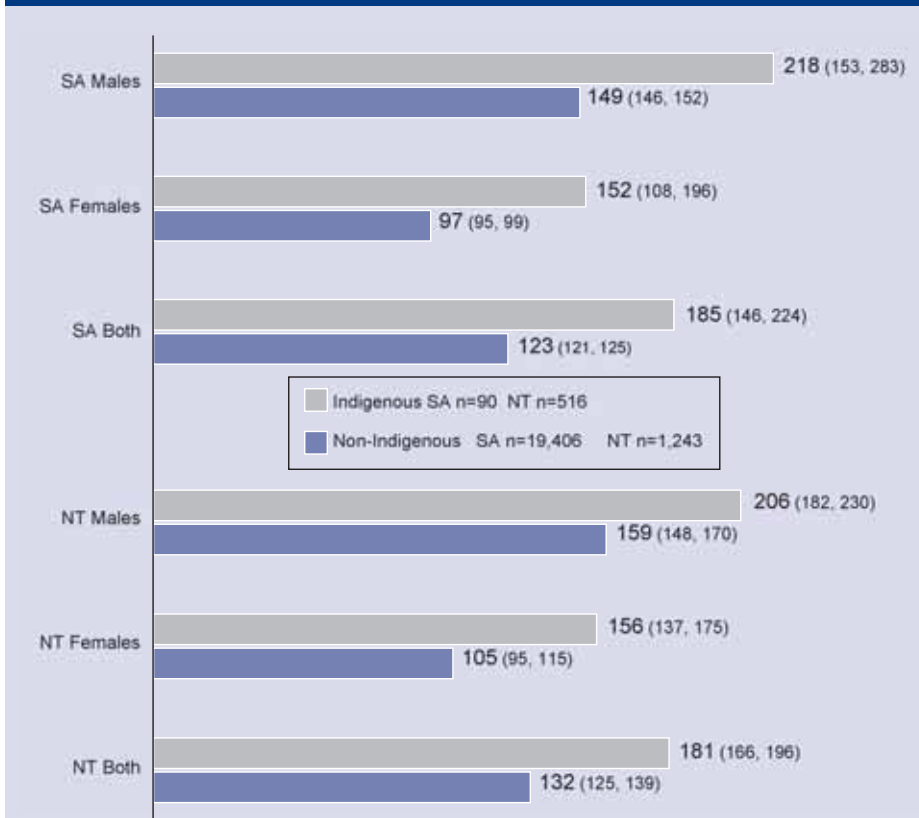
Cancers with a lower incidence in Indigenous people

Both the Northern Territory and South Australian data showed a lower incidence of cancers of the female breast, bowel and prostate, and cutaneous melanomas in Indigenous residents.

The international literature points to a number of protective factors.^{6,9} They include:

- **Female breast** – Early pregnancies and multiple pregnancies.
- **Bowel** – Among females, a history of multiple pregnancies. In addition, lower rates of these cancers generally have been found in the lower socio-economic sectors of population groups.
- **Prostate** – A low frequency of PSA (Prostate Specific Antigen) testing.
- **Melanoma** – Protective skin colouring.

Figure 2: Estimated annual age-standardised (World Population) cancer death rate per 100,000 (95% confidence limits) by race; SA circa 1988-1994 and NT 1991-2001



Data sources: SA and NT cancer registries.

In general, these cancers had relatively high survivals, in contrast to those cancers that were over-represented in Indigenous residents.^{4,5}

The Northern Territory data also showed a lower incidence of lymphoma in Indigenous people, whereas the South Australian data pointed to a lower incidence of haematological cancers (including lymphomas) in this sector of the population. These findings were unexpected. Although the reasons are unknown, it is possible that the immune system of Indigenous people may be more robust and more protective against these cancers.¹⁰

Survival

South Australian data have shown a lower Indigenous than non-Indigenous survival for cancers of equivalent type (Table 1). A corresponding comparison of survivals by race in the Northern Territory for the 1991-2001 diagnostic period revealed lower Indigenous than non-Indigenous

Table 1: Case survivals from primary cancers among Indigenous and non-Indigenous Australians; SA 1988-94*

Period from diagnosis (yrs.)	Indigenous (n=139)	Non-Indigenous (n=417)	SEER stage adjusted	
			Indigenous (n=139)	Non-Indigenous (n=417)
	100%	100%	100%	100%
1	55%	68%	60%	66%
2	50%	60%	52%	59%
3	45%	53%	46%	53%
4	40%	52%	43%	51%
5	37%	49%	40%	48%
P value	p=0.008		p=0.058	

* Disease-specific survivals.

3:1 matching of non-Indigenous to Indigenous patients by year of diagnosis, age, sex, primary site, and where feasible, morphology.

Date of censoring of live cases: December 31st, 1995.

Data source: SA Cancer Registry

survivals for 12 of the 13 cancer types studied (Condon J, unpublished data).

While Indigenous patients in South Australia presented with more advanced cancers at diagnosis, differences in survival were still suggested after adjusting for stage (Table 1).

Similar findings presented in the Northern Territory in a study of colorectal, lung, breast and cervical cancers and non-Hodgkin lymphomas that were diagnosed in 1991-2000 (Condon J, unpublished data).

The reasons for lower stage-adjusted survivals of Indigenous patients are not known, although it is possible that they could include poorer access to care or a higher prevalence of diabetes, respiratory and other diseases that lead to compromises in treatment and poorer treatment outcomes.

Conclusions

- Indigenous and non-Indigenous Australians appear to be at a broadly similar risk of cancer, but Indigenous patients are more likely to die from their disease.
- This higher case fatality is partly due to differences in cancer type, in that Indigenous patients tend to get more lethal types.
- The prognosis of Indigenous patients also is compromised, however, by more advanced stages at diagnosis.
- Apart from these influences, Indigenous Australians still appear to have worse outcomes. While the reasons are speculative, it is possible that poorer access to specialised services and a higher prevalence of co-morbidity reduce prospects for cure.

- Irrespective of race, major opportunities exist for cancer prevention through smoking cessation; improvements in diet, with increased intake of fruit and vegetables; reductions in prevalence of excess body weight; avoidance of excess alcohol consumption; and by achieving a better coverage of the population with cervical and other screening services.

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