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Injury Mortality Amongst Aboriginal Australians

James Harrison & Jerry Moller

Introduction

The Australian Aboriginal population has been described as being part of a 'fourth world' of dispossessed indigenous minority populations, which also includes such peoples as Maoris and native American Indians.[1] While different in many ways, these populations share an experience of social disruption following imposed contact with an unfamiliar external culture. Dispossession and the consequent loss of control and autonomy manifest in many ways, and it has been argued that poor health is one. Poor health follows, according to this model, through sometimes complex mechanisms, from 'the physical conditions in which many are forced to live, the food they eat, the hazards of an impoverished or exploited environment, and the dwellings they inhabit'.[2] The spiritual and psychological consequences of social disruption both reflect and contribute to the environmental and health problems, with abuse of alcohol, other drugs, and narcotic inhalants as prominent factors.[3,4,5]

The health disadvantage of the Aboriginal population relative to the remainder of the Australian population has become well documented (particularly since the 1960s)[6] and a wide range of indicators show that this is accompanied with social and economic disadvantage.[7] Age-standardised mortality rates of Aboriginals are about three times those of non-Aboriginals for both sexes.[8] This differential is reflected in average life expectancies at birth: a newborn Aboriginal in 1990-92 had a life expectancy of up to 20 years shorter than a newborn non-Aboriginal.[8]

Injury in the non-Aboriginal population is a major public health problem and its impact in Aboriginal communities has in the past been hidden amongst the wider problems of the Aboriginal population. It is only in recent years that the greatly elevated injury rate of the Aboriginal population has begun to receive particular attention.[9,10]

While epidemiological data show the importance of the injury problem, it needs to be recognised that injury is but one of many possible priority issues for Aborigines. Moreover, any approach to the prevention of injury or, in general, promotion of health in Aboriginal people cannot be looked at in isolation from the wider social issues outlined above.

Injury experience of Aboriginals: mortality 1990–92

Overview

Presented in this section are figures showing mortality rates for all injuries and for particular categories of injuries, for Aboriginal and non-Aboriginal populations by age-group, for the triennium 1990-92. Note that the data include all states and territories except Queensland, where mortality data for this period did not indicate the Aboriginality of the deceased. The ratio of Aboriginal to non-Aboriginal age-specific mortality rates has been plotted as an aid to comparing the experience of the two populations.

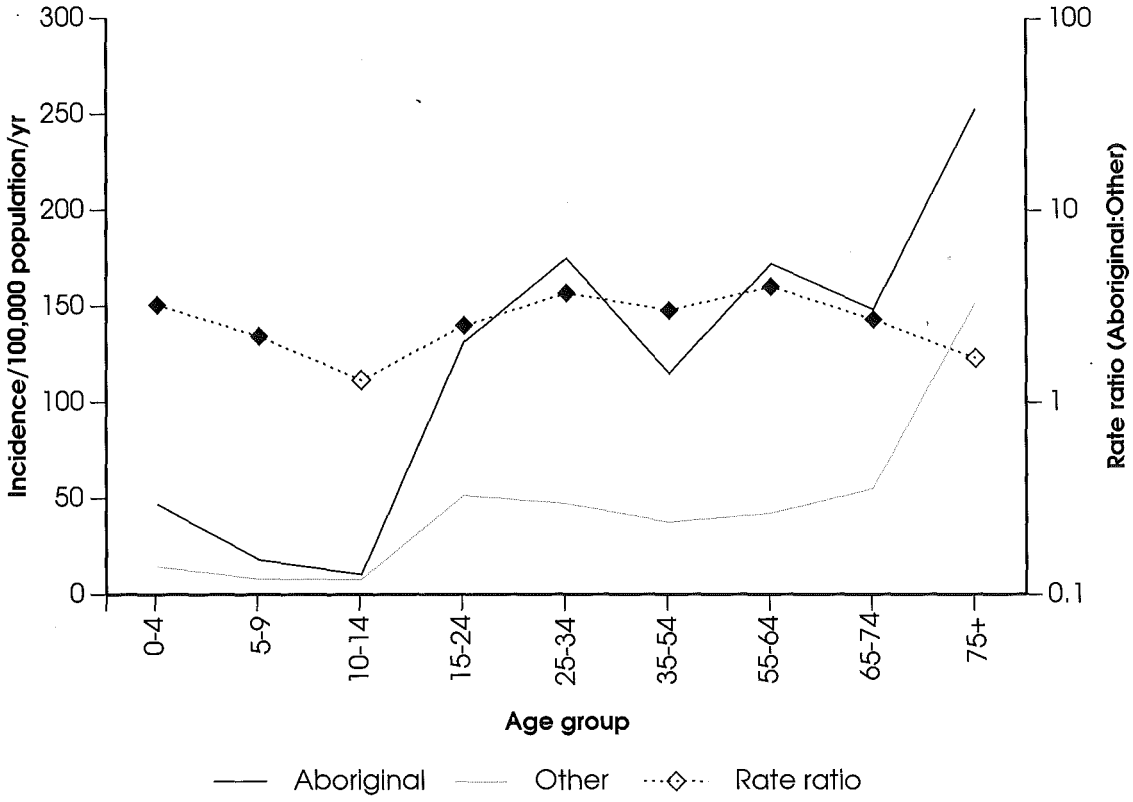
Injury mortality rates were higher for the Aboriginal population than for other Australians at every age group (Figure 1). The Aboriginal rate was higher by 2.9 times overall (Standardised Rate Ratio). The age-specific ratio was lowest in mid-childhood (1.3) and at ages 75 and above (1.7) and highest during mid-life. Variation of rates with age showed similarities in the two populations. In both population groups, rates were relatively low in childhood, and rose to a higher level in adolescence. This persisted until old age, when the highest rates occurred.

While Aboriginal injury mortality rates were highest in the oldest age groups, these accounted for few cases, reflecting the small size of the Aboriginal population in these age groups (Figure 2). In terms of absolute numbers, most cases occurred at ages 15 to 54, where population numbers are larger. Male rates were higher than female rates except in childhood where they were about equal. The age-standardised rate for Aboriginal males was 2.8 times higher than the rate for Aboriginal females, which is similar to the corresponding sex ratio of 2.7 to 1 in the non-Aboriginal population.

A marked difference is evident between Aboriginal and non-Aboriginal injury mortality in the proportions of cases which were attributed to suicide (high in non-Aboriginal population) and to inter-personal violence (high in Aboriginal population). Deaths recorded as non-intentional accounted for about two-thirds of Aboriginal and non-Aboriginal cases (Table 1).

Age-specific rate ratios indicate that the excess rates

Figure 1: *Injury mortality, Aboriginal and other: Australia (except QLD) 1990–92, persons.*



for the Aboriginal population are most marked in mid-life (Table 2).

The following sections will examine the mortality data on deaths from non-intentional injury, suicide and interpersonal violence in more detail.

Non-intentional injury deaths

The major categories of non-intentional injury deaths in the Aboriginal and non-Aboriginal populations are summarised in Table 3.

Transport related deaths

Transport related deaths accounted for more than half of the non-intentional injury deaths in each population group (Aboriginal: 59%; non-Aboriginal: 53%). Most of the transport cases involved motor vehicles in traffic (Aboriginal: 92%; non-Aboriginal: 88%).

Motor-vehicle related death rates were generally high throughout adulthood in the Aboriginal population in contrast with the peak at ages 15–24 for non-Aboriginals. Motor vehicle occupants (drivers and passengers) accounted for a similarly large proportion of the transport related deaths in both groups (Aboriginal: 59%; non-Aboriginal: 59%). Motor-cyclists (riders and passengers) made up a substantial (though minority) proportion of the non-Aboriginal transport related deaths but were uncommon among the Aboriginal transport deaths (Aboriginal: 1%; non-Aboriginal: 10%). Pedestrian mortality rates increased with age for both population groups; Aboriginal rates rose further and more rapidly than non-Aboriginal rates.

Drowning

Drowning accounted for 9 per cent of Aboriginal non-intentional injury deaths and for 6 per cent of the non-Aboriginal cases (this does not include drowning associated with water transport which is included in the 'transport' category). In both populations, rates were relatively high in the youngest age group. At older ages, the pattern in the two populations was very different: drowning rates rose sharply with age in the Aboriginal population but remained quite low in the non-Aboriginal population.

Poisoning

Non-intentional poisoning accounted for 11 per cent of Aboriginal injury deaths, and 5 per cent of non-Aboriginal cases. Most of the Aboriginal cases involved substances other than drugs and medications (27/41) in contrast with non-Aboriginal cases of which only 17 per cent involved substances other than drugs and medications. Opiates were prominent among drug poisoning related cases (Aboriginal 43%; non-Aboriginal 41%). More than half of the non-drug poisoning deaths in Aboriginals (almost all of which were in the 15-24 age group) were in a category which includes petroleum products and solvents - one of very

Figure 2: *Aboriginal injury mortality, Australia (except Qld) 1990–92: age specific case counts and rates.*

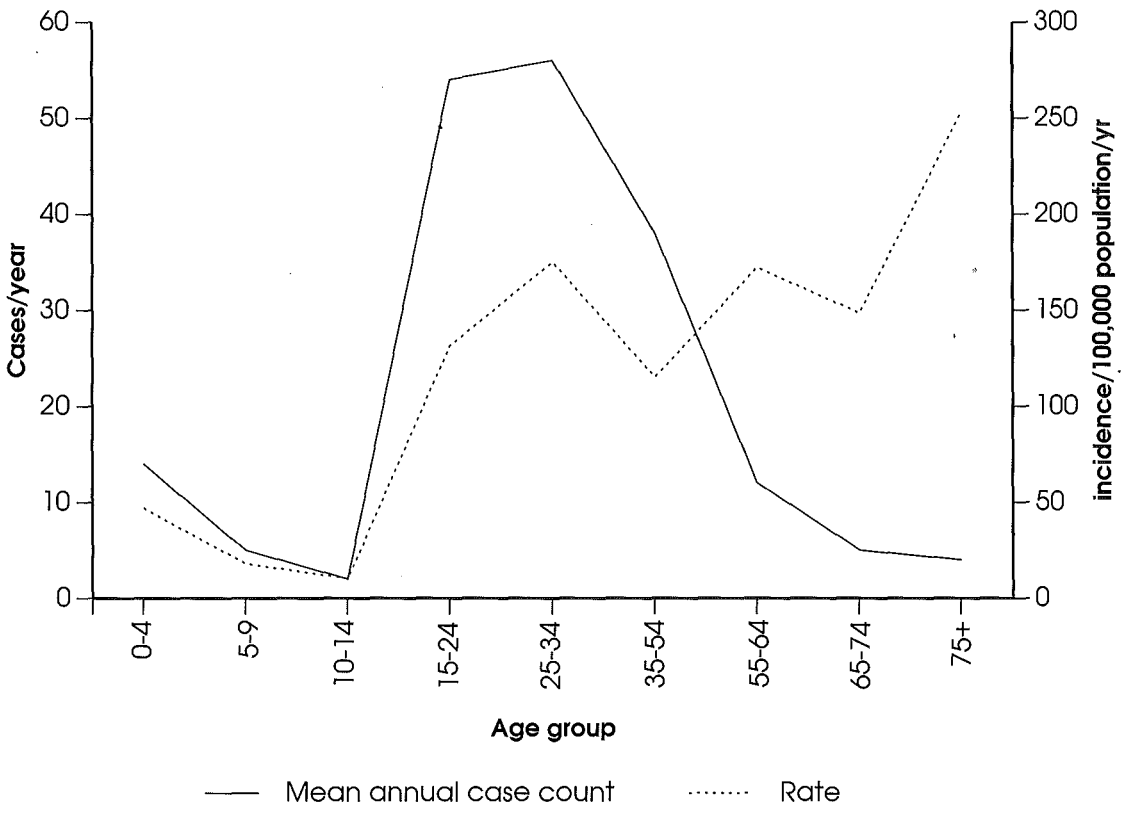


Table 1: *Aboriginal and non-Aboriginal, three year external causes mortality case counts, proportions and standardised rate ratios, Australia (except Qld) 1990–92, by attributed role of human intent.*

	Population sector				Aboriginal: non-Aboriginal standardised rate ratio
	Aboriginal		non-Aboriginal		
	Cases	Per cent	Cases	Per cent	
Non-intentional	380	67	11179	62	3.3 †
Suicide	67	12	5453	30	0.9
Interpersonal violence	101	18	756	4	10.8 †
Other and undetermined intent	19	3	667	4	2.6
All 'external causes'	**567**	**100**	**18055**	**100**	**2.9 †**

† Difference between Aboriginal and non-Aboriginal rates is statistically significant [See DATA ISSUES, page 8]

Table 2: *Aboriginal:non-Aboriginal injury mortality: rate ratios by age and attributed role of human intent, Australia (except Qld) 1990–1992.*

	Age group								
	0–4	5–9	10–14	15–24	25–34	35–54	55–64	65–74	75+
Non-intentional	**3.1**	**2.3**	1.3	**2.4**	**4.0**	**4.3**	**6.2**	**3.9**	1.8
Suicide	*	*	*	1.4	**1.7**	0.6	*	*	*
Interpersonal violence	4.0	*	*	**13.2**	**13.8**	**9.9**	**15.0**	*	*
Other/undetermined intent	*	*	*	2.7	4.1	4.1	*	*	*
All 'external causes'	**3.2**	**2.2**	1.3	**2.5**	**3.7**	**3.0**	**4.0**	**2.7**	1.7

* = 3 or fewer Aboriginal cases during the three years 1990–92
Bolded figures indicate a statistically significant difference between Aboriginal and non-Aboriginal rates [See DATA ISSUES, page 8]

few categories of injury deaths for which the number of recorded Aboriginal cases (n = 15) exceeded the number in the much larger non-Aboriginal population (n = 7).

Falls

Deaths from falls accounted for 21 per cent of non-intentional deaths in the non-Aboriginal population but for only 4 per cent of Aboriginal cases. The difference is likely to be due (for the most part) to differences in the age structure of the two populations. It is well recognised that much higher rates of falls deaths occur in old age. The proportion of the Aboriginal population in the older age groups is comparatively small, thus accounting for the observed difference. The actual rates of falls deaths in the age group 65 years and older were identical in the two populations (Aboriginal: 40/100,000; non-Aboriginal: 40/100,000) though the case number was very small in the Aboriginal group (n = 6).

Effects of fire, hot objects etc.

Fire, hot objects, etc. accounted for 5 per cent of Aboriginal non-intentional injury deaths and for 3 per cent of non-Aboriginal cases. In both groups, rates were highest in old age, the rise in rates being much more marked for Aborigines than non-Aborigines.

Suicide

Suicide accounted for 30 per cent of non-Aboriginal injury deaths, and for 12 per cent of Aboriginal injury deaths. The standardised rate of suicide was similar in the two populations (Aboriginal: 11/100,000; non-Aboriginal: 13/100,000). The distribution of suicide by age differed markedly, however, Aboriginal rates being relatively high in young adulthood and considerably lower in later adulthood (Figure 3). In both groups, male standardised rates were much higher than female (Aboriginal: male 20/100,000, female 3/100,000; non-Aboriginal: male 20/100,000, female 5/100,000).

Reported method of suicide differed for the two population groups. Considering ages 10–54 (all Aboriginal suicides were in this age range), hanging was relatively common in the Aboriginal cases, while poisoning was uncommon (Table 4).

Inter-personal violence

Recorded cases of death resulting from interpersonal violence were much higher proportionally in the Aboriginal population than in the non-Aboriginal population. The Aboriginal to non-Aboriginal rate ratio was around 10 through the age range 15 to 74 years (Figure 4). The standardised rate for Aboriginal females (16/100,000) was lower than that for males (23/100,000).

Recorded means of injury differed for the two population groups. Among Aboriginal deaths from interpersonal violence, stabbing and unarmed fights were relatively common and shooting was uncommon (Table 5).

Factors associated with Aboriginal injuries

Aboriginal injury mortality rates are very high compared with the remainder of the population. Furthermore, there is evidence that Aboriginals have considerably elevated rates of hospital admission due to injury.[8,11,12] There are also some marked differences in the circumstances and types of trauma experienced by the Aboriginal population. Systematic variations such as these are likely to be associated with variations in exposure to risks. For example, the risks of urban dwelling and remote dwelling Aborigines may be quite different. However, little research is available which directly measures many of the plausible differences in exposure to risk in Aboriginal populations or how these vary from community to community.

Of the risk factors contributing to Aboriginal injury, alcohol is the best researched. It is clear that alcohol plays a significant role in the high rate of injury of Aboriginal people, particularly with regard to motor vehicle and intentional injury inflicted on others. For example, over 83 per cent of Aboriginal people killed in road crashes in Western Australia during the period

Table 3: ***Aboriginal and non-Aboriginal non-intentional injury mortality, Australia (except Qld) 1990–1992: three year case counts, proportions, and standardised rate ratios.***

	Aboriginal		non-Aboriginal		Aboriginal: non-Aboriginal standardised rate ratio
	Cases	Per cent	Cases	Per cent	
Transport	224	59	5949	53	3.4 †
Drowning	33	9	621	6	4.8 †
Poison: medications, etc	14	4	456	4	2.2
Poison: other substances	27	7	95	1	17.5 †
Falls	14	4	2363	21	1.2
Fire, burns, scalds	20	5	336	3	10.5
Other non-intentional	48	13	1359	12	3.4 †
Total	**380**	**100**	**11179**	**100**	**3.3 †**

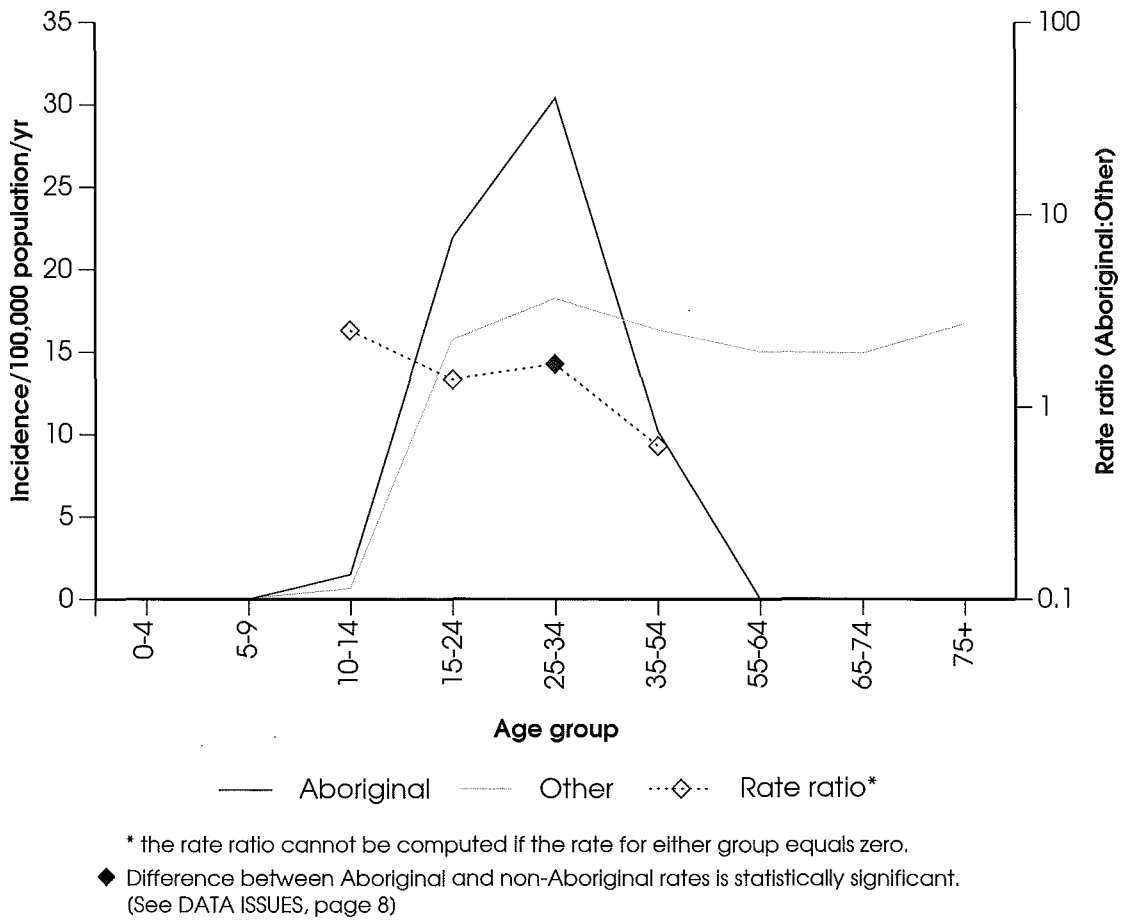
† Difference between Aboriginal and non-Aboriginal rates is statistically significant [See DATA ISSUES, page 8]

1980-89 had a blood alcohol content (BAC) equal to or greater than 0.08 g/100 ml.[13] Similarly in the Northern Territory, 82 per cent of Aboriginal pedestrian fatalities in the period 1985-89 had a BAC greater than 0.15 g/100 ml.[14]

The effects of alcohol are so damaging that it is often viewed as a singular cause instead of as a symptom of the more deeply rooted issues of poverty, unemployment, loss of land and culture as pointed out in the 1990 Royal Commission on Aboriginal deaths in custody.[15]

Other risk factors that need to be better understood include those associated with: living in rural areas (e.g. rural roads have higher vehicle travelling speeds, often on unsealed roads), living in poor urban areas, and local environmental risks. The high injury rate amongst Aborigines suggests a combination of risk factors which need to be better identified. At present, there is insufficient information to determine what these are. The fact that Aboriginal people can be identified allows specific injury rates to be calculated but it is not known how these compare to non-Aboriginal populations experiencing similar levels of poverty and alienation because it is harder to identify the population at risk. There is a need for better research

Figure 3: *Injury mortality (suicide), Aboriginal and other: Australia (except Qld) 1990–92, persons.*



* the rate ratio cannot be computed if the rate for either group equals zero.

◆ Difference between Aboriginal and non-Aboriginal rates is statistically significant. (See DATA ISSUES, page 8)

Table 4: *Suicide at ages 10–54 years, Aboriginal and non-Aboriginal, Australia (except Qld) 1990–92, three-year case counts and proportions, by method used.*

Method	Aboriginal		non-Aboriginal	
	Cases	Per cent	Cases	Per cent
Hanging	44	66	1314	24
Firearm	18	27	1038	19
Poison (solid, liquid)	2	3	967	18
Motor vehicle exhaust	1	1	1152	21
Other and unspecified	2	3	982	18
All methods	**67**	**100**	**5453**	**100**

Figure 4: *Injury mortality (interpersonal violence), Aborigines and other: Australia (except Qld) 1990–92, persons.*

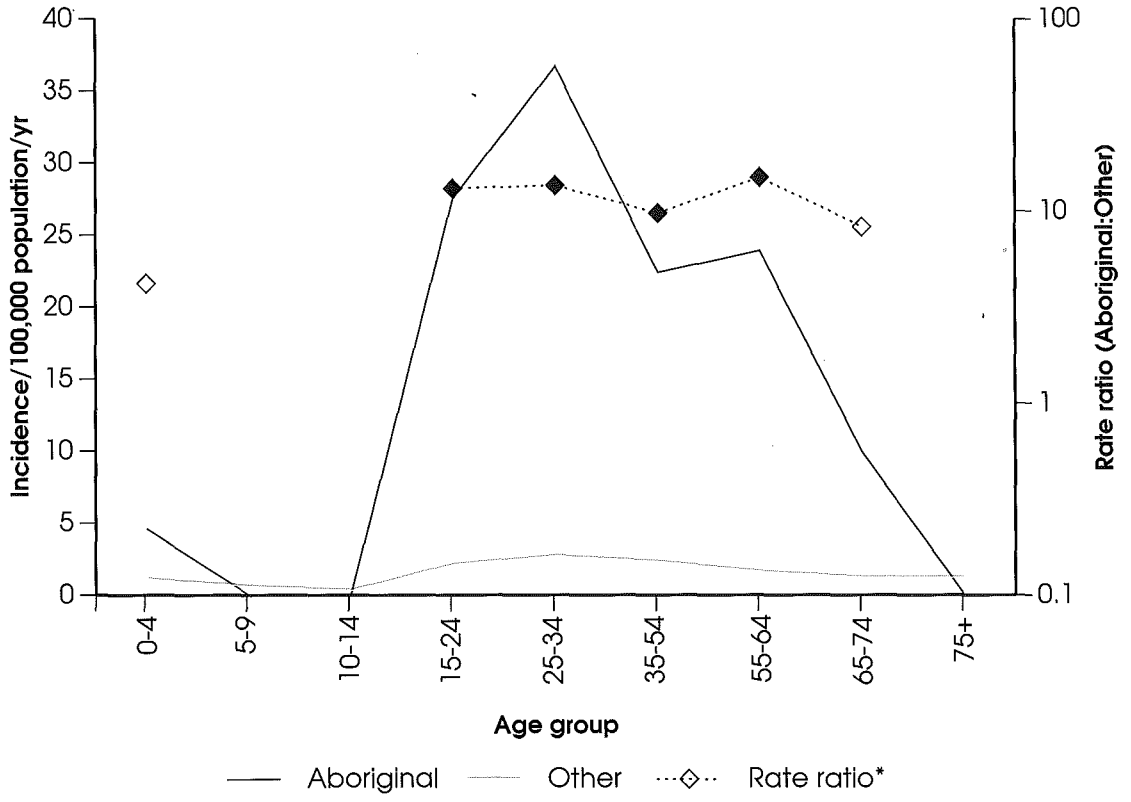


Table 5: ***Interpersonal violence, Aboriginal and non-Aboriginal, Australia (except Qld) 1990-1992, three-year case counts and proportions, by method used.***

Means of injury	Aboriginal		non-Aboriginal	
	Cases	Per cent	Cases	Per cent
Unarmed fight, etc	14	14	58	8
Firearm	2	2	186	25
Stabbing, etc	52	51	249	33
Child battering, etc	1	1	18	2
Other/unspecified	32	32	245	32
All methods	**101**	**100**	**756**	**100**

and a far wider understanding of the system of risks which result in elevated Aboriginal injury rates.

Summary

Aboriginal populations experience high rates of injury mortality. Actual rates are likely to have been higher than the estimates presented here because of underenumeration of Aboriginal deaths. Injury deaths from transport-related causes in middle age, drowning in adulthood, poisoning with non-pharmaceutical substances (particularly petroleum products and solvents) in early adulthood, effects of fire in later adulthood, suicide in early adulthood and (particularly) interpersonal violence throughout adulthood are particularly prominent compared with the mortality experience of non-Aboriginals.

The reasons for the elevated risk of injury among Aborigines are complex. The interaction of socioeconomic disadvantage, alcohol consumption and high risk environments is poorly understood. Injury control measures targeted at one risk factor may

provide a starting point for injury reduction but in the longer term more benefits are likely to be derived from a broad range of strategies which come to grips with the system of influences at work. A clearer understanding of the importance of injury to Aboriginal communities and variation in injury rates between different communities is required to form a firm basis for developing injury prevention strategies.

Differentials between the health of Aborigines and non-Aborigines are a matter of national concern. Mortality rates indicate that injury follows the pattern seen for other health issues and needs to be included as a key issue when developing strategies for improving Aboriginal health.

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DATA ISSUES

Data on Aboriginal injury deaths have been derived from the routine national mortality data collection. The cases were all those registered in the years 1990 to 1992 for which a data item titled 'Aboriginal' was set to 'yes' (n=567). The reliability of this indicator is not known but almost certainly results in underestimation of the number of Aboriginal deaths[16]. There may be systematic differences in the determination of Aboriginal status between injury and other causes of death, as most injury deaths are subject to coronial investigation. Annual average case numbers were calculated for various categories of deaths, and rates were calculated using 1991 Census population estimates. Similar case counts and rates were calculated for persons not recorded as Aboriginal (coded as 'other' and 'non-Aboriginal' in the ABS data; n=18055).

Information on Aboriginality was not available for deaths registered in Queensland, and injury deaths registered in that state were omitted from consideration (n=4337). In addition, because the general population estimates were of 'usual residents', persons usually resident in Queensland and registered elsewhere as injury deaths, were also omitted (n=168; none was recorded as being Aboriginal). As the Queensland-registered cases included a small proportion usually resident elsewhere (n=193), some of the rates reported here are under-estimates.

The available Aboriginal population data were by place of enumeration on census night, which was the same Statistical Local Area as place of usual residence for 95.4 percent.[7] (The proportion enumerated in their state of usual residence would have been higher than 95.4 per cent.)

Aboriginal population estimates have increased rapidly in recent years,[7] much more rapidly than the whole population.[17] Identification of Aboriginality in population censuses is on the basis of self-identification and part of the increase may be due to increasing willingness to identify as such.[10] Attribution of Aboriginality in sources such as deaths and hospitalisation records may be made on a different basis, such as the impression of a clinician, with the result that rate estimates based on these case counts and census population estimates may be somewhat distorted, most likely in the direction of under-enumeration of cases.

Statistical considerations

In this publication, age-group specific and age-standardised injury mortality rates have been computed for Aboriginal and non-Aboriginal populations. Since these rates are calculated from the injury mortality experience of the respective *populations* there are no sampling errors. However, just as a sample derived statistic is subject to chance variation, so too a population parameter may vary from time to time due to random variation. Thus random variation in the number of deaths experienced by populations has the potential to distort injury mortality rates, particularly when the number of deaths is small. This needs to be kept in mind when comparing Aboriginal and non-Aboriginal rates, especially in light of the great difference in the size of the two populations.

For the rates presented we have calculated 95% confidence intervals assuming that variation in the numbers of deaths will follow a Poisson probability distribution. Where the Aboriginal and non-Aboriginal rate intervals do not overlap, (meaning that the differences between the rates are statistically significant at the 5% probability level) this has been indicated for the corresponding rate ratios shown in the tables and figures. Details of the formulae used to calculate the confidence intervals are available upon request.

Further Information

Enquiries, comments, and letters to the Editor are welcome. Please address these to:

John Dolinis (Editor)
National Injury Surveillance Unit
Mark Oliphant Building
Laffer Drive, Bedford Park, South Australia 5042.

Phone: (08) 374 0970 Fax: (08) 201 7602

E-mail: nijd@flinders.edu.au