

Understanding national injury data regarding Aboriginal and Torres Strait Islander peoples

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Background

In 1994, Harrison and Moller reported on injury mortality among Aboriginal Australians (1). They showed that Aboriginal and Torres Strait Islander people had a much higher risk of injury-related death than their non-Aboriginal counterparts. More recently, the National Injury Surveillance Unit (NISU) has explored injury hospitalisation data and produced a working paper on the subject: *Aboriginal and Torres Strait Islander Peoples Injury-Related Hospitalisations 1991/92: A Comparative Overview* (2). The working paper shows that a higher rate of injury hospitalisation occurs among Aboriginal and Torres Strait Islander peoples across a wide range of causes. Difficulties with the data mean that the findings need to be treated with caution.

Introduction

This Bulletin sets out to discuss issues of data quality and availability as they relate to data on injury among Aboriginal and Torres Strait Islander peoples, and presents a brief summary of national death and hospitalisation data. For those readers interested in getting more detail, a copy of the working paper *Aboriginal and Torres Strait Islander Peoples Injury-Related Hospitalisations 1991/92: A Comparative Overview* (2) can be obtained by contacting NISU.

The limitations of data about the general health of the Aboriginal and Torres Strait Islander peoples is the subject of current attention by the Australian Institute of Health and Welfare and other health agencies across Australia. This paper focuses on the issues that affect assessment of injury patterns. For example, deaths data are likely to identify Aboriginality more accurately for injuries due to the coroner's involvement and there are particular limitations of the International Classification of Diseases external causes coding system (3) for accurately reflecting the causes of injury among Aboriginal and Torres Strait Islander peoples.

The importance of national data

National analyses have the potential to bridge gaps in information and understanding that is not possible on a state by state basis. There are of course differences between the states that must be understood and it is important that states undertake their own research. Regional and local level information is also important but analysis at this level is troubled even more by the limited number of cases. A combination of national information to provide an overview of injury patterns, state information for priority setting and determining the unique issues for the state, and detailed descriptive information at regional and local level to flesh out issues for program implementation is needed.

The number of Aboriginal and Torres Strait Islander people in any one state or territory is relatively small (Table 1). Even though injury rates are high, the numbers of cases of injury in any individual area is small and it is difficult to undertake detailed analysis by, for example, cause, age and sex. This can only be reliably done for a single state or territory by combining several years of data, but this masks trends and for some important issues still provides too few cases for reliable interpretation of the results. Aggregation at a national level provides more cases and increased interpretability of results at finer levels of disaggregation. Individual state or territory information can then be viewed in the context of the national picture.

The administrative boundaries formed by the states and territories often provide artificial divisions that are not relevant for some analyses. If, for example, an analysis considers the injury patterns of remote dwelling, rural town dwelling and urban dwelling Aboriginal and Torres Strait Islander peoples, it is only realistic to use a national aggregation of these areas such as the Rural and Remote Area Classification (4). At an individual state level there will be too few cases for any in-depth assessment of causal patterns.

Table 1: Aboriginal and Torres Strait Islander Census count, 30 June 1991

State or territory	Number of Aboriginal and Torres Strait Islander persons	Percentage of total state or territory population
New South Wales	75,020	1.3
Victoria	17,890	0.4
Queensland	74,214	2.5
South Australia	17,239	1.2
Western Australia	44,082	2.7
Tasmania	9,461	2.0
Northern Territory	43,273	26.1
Australian Capital Territory	1,616	0.6
Australia (includes other territories)	282,979	1.6

Source: Australian Bureau of Statistics, 1994

Available national data

Deaths

Deaths data are produced by the Australian Bureau of Statistics (ABS) from information supplied by coroners and death certificates. Injury-related deaths are coded according to ICD9 external causes codes (3) but there is no coding of the anatomical nature of injury. ABS reports these data in aggregated tables in Deaths Australia (ABS Cat No. 3302.0) and in more detail in Causes of Death Australia (ABS Cat No. 3303.0). These tables do not include specific information on Aboriginal and Torres Strait Islander deaths. The summary data is aggregated based on year of registration of the death and is released approximately nine months into the following year.

Unit record level deaths data is provided to a number of agencies across Australia with strict confidentiality controls. These agencies, including NISU, undertake more detailed analyses. For example, Harrison and Moller (1) reported on Aboriginal and Torres Strait Islander injury deaths data for 1990-1992. At the time of writing, numbers of injury deaths among Aboriginal and Torres Strait Islander peoples were available for subsequent years to 1994.

Hospitalisations

Each state and territory collects data on episodes of hospitalisation according to definitions in the Australian Institute of Health and Welfare's National Health Data Dictionary. These data are forwarded to the Australian Institute of Health and Welfare. The latest injury-related data available to NISU is for the financial year 1992/93. All states and territories identify Aboriginality. The reliability of this variable is known to vary from state to state. While the extent of under-identification of Aboriginality is unknown, it is

likely to be higher in states with a low Aboriginal population. Detailed injury data have not been available from the Northern Territory because of difficulties in extracting fourth digit level external causes codes. Given the high number of Aboriginal or Torres Strait Islander peoples living in the Northern Territory and the predominance of more traditional lifestyles, this represents an important gap in the data.

Populations

The Aboriginal and Torres Strait Islander population is determined at each Census. Post enumeration surveys have indicated that the Census underestimates the Aboriginal and Torres Strait Islander population. In 1994, ABS published experimental estimates of the Aboriginal and Torres Strait Islander population which updated 1991 population figures (5). Data were presented for each state and territory by five year age-groups and sex. Table 2 shows the extent and patterns of underestimation of the Aboriginal and Torres Strait Islander population by the 1991 Census.

Since that time, projections for subsequent years have been published and provide estimates to the year 2001 (6). Three scenarios are used based on different assumptions of fertility and mortality and estimates are made for each state and territory either by five year age-groups or sex but not both at once. The most recent population data at finer than state level is based on unadjusted 1991 Census figures.

Issues of identification of Aboriginality

The study of Aboriginal and Torres Strait Islander peoples' injury requires calculations based on data systems that may not uniformly identify the individual's Aboriginality. This could lead to discrepancies. It is important to understand how the determination is made.

Deaths

The Aboriginality of the deceased is determined by the coroner in the case of a sudden or possibly unnatural death. Coroners obtain information from investigating police officers, including interviews with relatives and witnesses. Coroners are increasingly aware of the importance of death in Aboriginal and Torres Strait Islander communities and ensure that identification of Aboriginality is made so that the proper arrangements with relatives can be made. The majority of injuries, with the exception of some fall-related deaths among the elderly, are certified by coroners. Funeral directors, after contact with families of the deceased, sometimes supply additional information to registrars of death that may lead to additional cases being identified as Aboriginal or Torres Strait Islander on the death certificate. The death certificate provides the information used by ABS to code Aboriginality. Queensland has only required this information on death certificates from January 1996, thus it has been impossible to determine the Aboriginal and Torres Strait Islander injury death rate in that state.

Benham has shown that New South Wales and Victoria stand out as having substantial under-enumeration of deaths of indigenous persons (7). The extent to which this applies to injury is unknown, but it is likely that coronial investigation of injury cases reduces the proportion of cases where Aboriginality is not identified.

Hospitalisations

Aboriginality is identified during hospital admission procedures. Generally the information is gained by self report from the patient or relatives during the collection of personal information by clerical staff. Little is known about the uniformity of these procedures. It is not known, for example, what proportion of patients or families are asked whether the patient is of Aboriginal or Torres Strait Islander descent. The practices almost certainly vary from hospital to hospital and from one geographic region to another. One example (8) shows that under-identification of Aboriginal and Torres Strait Islander peoples in Victoria is considerable:

"For the first year of mandatory reporting of Aboriginality of hospital patients there was a significant increase in the number of Koori admissions. There were 2683 Koori admissions to public hospitals reported in 1992-93. This increased to 4212 Koori admissions in public hospitals for 1993-94."

Table 2: Percentages by which the 1991 Census counts of the Aboriginal and Torres Strait Islander population are less than the more accurate experimental estimates published by ABS in 1994

Age group	Males	Females	Persons
0-4	4.5	4.2	4.3
5-9	4.5	4.2	4.4
10-14	3.3	3	3.2
15-19	8.1	6.3	7.2
20-24	13.6	5.2	9.5
25-29	14.3	5.8	10.1
30-34	10.1	3.6	6.8
35-39	11.2	3.9	7.5
40-44	4.9	2.5	3.7
45-49	4.2	5.2	4.7
50-54	3.9	1.8	2.8
55-59	4.3	6.1	5.2
60-64	5.3	2.7	3.9
65+	2.4	4	3.3
Total	7.4	4.4	5.9

This represents a 57 per cent increase which suggests probable substantial under-identification in the 1991/92 Victorian data. Even if other states do not experience such a large discrepancy, it is likely that the level of underestimation is high and therefore comparative rate ratios between Aboriginal and Torres Strait Islander peoples and non-Aboriginal people will underestimate the real difference in risk levels.

Populations

Aboriginality is determined by self-reporting at the Census. Detailed studies by ABS have shown that the proportion of people who indicate that they are of Aboriginal or Torres Strait Islander descent at the Census is an underestimate. The Census employs collectors who check forms and use consistent procedures to ensure that data items are as complete as possible. The method is therefore more rigorously controlled than those that operate in relation to deaths and hospitalisations data collections.

The impact of differential identification

It is clear that the process of determination of Aboriginality in routine data collections is not straightforward. The willingness to identify oneself as of Aboriginal or Torres Strait Islander descent varies from setting to setting. The opportunity to obtain information also varies. It is clear that each of the data sets used for describing injury patterns in the Aboriginal and Torres Strait Islander peoples are, at best, estimates that contain errors associated with the way in which information is gained. Furthermore, it is clear that death, hospitalisation and population estimates are all underestimates of actual Aboriginal and Torres Strait Islander numbers. It seems most likely that the underestimation is highest in hospitalisations data, less of a concern in deaths data and best understood in the population estimates.

Issues of injury classification

Limitations of E-codes

Injury deaths and hospitalisations are classified according to the International Classification of Diseases external causes codes, commonly known as E-codes (3). These have a limited capacity for describing the injury event and are useful for broad epidemiological study. The level of detail of causes varies from broad category to broad category, with the greatest detail occurring in the on-road transport and poisoning by pharmaceuticals categories. E-codes are most suitable for assessing injury patterns in western industrialised countries. Many Aboriginal and Torres Strait Islander peoples' injuries fall into categories where there is little detail (e.g. falls). The overall size of a problem can be assessed, but a detailed understanding of the causes cannot be obtained.

Differential identification of causes

In addition to the difficulties with E-codes, it is apparent that culture affects the way in which information about an event is presented to investigators or clinicians and the way this is interpreted through coding.

Injury by violence is known to be severely under-reported in hospitalisation data for non-Aboriginal women. These women are reluctant to report the true nature of the cause, and medical staff are often reluctant to record details of assault in medical records (9). Violence is recognised by Aboriginal and Torres Strait Islander peoples as a key concern. In this milieu, violence in domestic settings, in particular, is less likely to be hidden. It is likely, therefore, that the reluctance to report violence is less among Aboriginal and Torres Strait Islander women. The reported rate is therefore likely to be closer to the experienced rate.

The rate of reported violence resulting in hospitalisation among Aboriginal and Torres Strait Islander women is much higher than that of non-Aboriginal women, resulting in a very high rate ratio (Table 4). It is possible that a substantial component of this ratio is due to systematic differences in reporting and coding practices. The size of this bias is not known and will be difficult to determine. This type of reporting bias is less likely to occur for deaths due to the more detailed investigations undertaken as part of the coronial process. The overall age-standardised rate ratio for interpersonal violence related deaths is 10.8 (Table 3). This suggests that, while the hospitalisation rate ratio may be inflated by under reporting in the non-Aboriginal community, the level of interpersonal violence experienced by Aboriginal and Torres Strait Islander men and women is comparatively high and is worthy of particular attention.

Table 3: Overview of injury-related deaths in Aboriginal and non-Aboriginal populations, average number of deaths and rate ratios 1990-1992 and number of deaths 1994 (Australia excluding Queensland)

Type of injury death	1990-1992					1994			
	Aboriginal and Torres Strait Islander peoples		Non-Aboriginals		Ratio of age-adjusted rates: A&TSI vs non-A&TSI rates:	Aboriginal and Torres Strait Islander peoples		Non-Aboriginals	
	Average number of deaths	% of all injury deaths	Average number of deaths	% of all injury deaths		Number deaths	% of all injury deaths	Number of deaths	% of all injury deaths
Transport	75	41	1983	34	3.4	54	31	1668	31
Drowning	11	6	207	4	4.8	15	9	181	3
Poison: medications, etc	5	3	152	3	2.2	6	3	247	5
Poison: other substances	9	5	32	1	17.5	2	1	20	0
Falls	5	3	788	14	1.2	8	5	782	14
Fires, burns, scalds	7	4	112	2	10.5	8	5	104	2
Other unintentional	16	9	453	8	3.4	13	7	394	7
Self harm	22	12	1818	31	0.9	31	18	1769	33
Interpersonal violence	34	18	252	4	10.8	37	21	245	5
Total	184	100%	5797	100%	2.8	174	100%	5410	100%

Interpretation of cultural practices

Aboriginal and Torres Strait Islander peoples have raised the question of how certain classes of events are coded in both deaths and hospitalisations data. Traditional punishment may result in injury requiring hospitalisation and, occasionally, in death. External causes codes could identify this as violence related or as injury during legal intervention. It is uncertain which category is used, although the low numbers of injuries classed as injury during legal intervention, suggests that these cases may be coded as violence. Alternatively, Aboriginal and Torres Strait Islander peoples may be unwilling to identify traditional punishment to non-Aboriginal people and may provide information that would result in these events being

classed as accidents. Clearly, it is important to understand such issues better and to develop ways of obtaining information and coding it to reflect the cause accurately.

The importance of injury in Aboriginal and Torres Strait Islander peoples

Tables 3 and 4 show a consistent pattern of higher injury rates among Aboriginal and Torres Strait Islander peoples compared with non-Aboriginal people. While the size of the differences should be treated with caution, due to the difficulties with the data, there is little doubt that injury is an important public health issue for Aboriginal and Torres Strait Islander peoples.

Overview of injury hospitalisation data

Table 4: Overview of external causes related hospital separations among Aboriginal and Torres Strait Islander peoples and non-Aboriginal populations, number of cases and rates (per 100,000 population), Australia (except NT), 1991/92.

Cause of injury†	Aboriginal and Torres Strait Islander peoples		Non-Aboriginal		Aboriginal and Torres Strait Islander peoples: Non-Aboriginal standardised rate ratio‡	Excess hospital separations
	Count	Age-adjusted rate	Count	Age-adjusted rate		
Male						
Transportation	661	614	30170	356	1.7	221
Drowning and submersion	7	4	481	6	0.7	-3
Pharmaceutical poisoning	159	119	5766	68	1.7	67
Non-pharmaceutical poisoning	89	53	2232	26	2.0	52
Falls	1013	1160	42643	518	2.2	448
Fires, burns, scalds	234	218	3588	42	5.1	172
Other unintentional	2132	2075	69863	824	2.5	1169
Self harm	159	146	5451	64	2.3	92
Interpersonal violence	1402	1433	11146	131	10.9	1250
Undetermined intent	70	70	742	9	8.0	60
Total	5926	5891	172082	2046	2.9	3529
Female						
Transportation	329	284	15499	183	1.6	106
Drowning and submersion	8	4	198	2	1.9	4
Pharmaceutical poisoning	223	182	7292	87	2.1	110
Non-pharmaceutical poisoning	52	36	1428	17	2.1	27
Falls	736	916	49973	548	1.7	333
Fires, burns, scalds	128	104	1854	22	4.7	95
Other unintentional	1264	1247	27022	318	3.9	898
Self harm	213	186	6731	80	2.3	121
Interpersonal violence	1478	1353	2463	29	**	1443
Undetermined intent	31	29	416	5	5.9	26
Total	4460	4341	112876	1292	3.4	3162
Persons						
Transportation	988	443	45669	271	1.6	322
Drowning and submersion	15	4	679	4	1.0	0
Pharmaceutical poisoning	382	152	13058	77	2.0	178
Non-pharmaceutical poisoning	141	44	3660	22	2.0	78
Falls	1749	1036	92616	547	1.9	776
Fires, burns, scalds	362	158	5442	32	4.9	266
Other unintentional	3396	1650	96885	574	2.9	2049
Self harm	372	166	12182	72	2.3	213
Interpersonal violence	2880	1388	13609	81	17.2	2689
Undetermined intent	101	49	1158	7	7.1	86
Total	10386	5091	284958	1686	3.0	6657

† Cause of injury is based on standard aggregations of the ICD9 external cause (E-code) classification. See data issues panel for details.

‡ Rate ratios are ratios of all-ages rates of Aboriginal and Torres Strait Islander peoples and non-Aboriginal rates. Age adjustment of rates was made by direct standardisation, taking the Australian population in 1991 (excluding the Northern Territory population) as the standard.

* Excess Aboriginal and Torres Strait Islander hospital separations is the difference between the observed number of Aboriginal and Torres Strait Islander separations

and the expected number if the Aboriginal and Torres Strait Islander populations experienced the injury rates observed in the non-Aboriginal population. The sum of male and female excess hospital separations may not equal the excess hospital separations in the persons category due to the effect of rounding.

** Note: Interpersonal violence against non-Aboriginal women is known to be under-reported. Comparison of rates between Aboriginal and Torres Strait Islander and non-Aboriginal women should be treated with great caution. The rate ratio in this cell is 46.0 but this may be severely elevated due to the very low non-Aboriginal rate.

Limitations of the data that need addressing

Completeness

Data on Aboriginal and Torres Strait Islander injury is incomplete. Queensland has only introduced Aboriginality on death registrations for 1996 and it may take some time for this to reach full reliability. It is evident that many health service collections do not reliably identify Aboriginality. Accurate identification of Aboriginal and Torres Strait Islander peoples in major health data and the death data is essential. There is a need to explore biases in the reporting of interpersonal violence and in particular the extent of differential identification of both violence and Aboriginality among women receiving hospital treatment.

Geographic specificity

At present it is not possible to analyse national hospitalisation data by geographic region. While all states and territories collect data about place of usual residence, the coding of geographic location varies, making it difficult to uniformly assign cases to classifications such as the Rural and Remote Area Classification system. Several states do not provide finely detailed geographic classification to the national data pool due to legislation requiring the absolute anonymity of unit record level data in the states. It is therefore not possible to present national data for urban, rural and remote dwelling Aboriginal and Torres Strait Islander peoples. If states were prepared to introduce recoding to the Rural and Remote Area Classification system and attach this to unit records, this problem would be overcome.

In addition, it is only possible to obtain population data at detailed geographic level from the Census which, as pointed out above, is a biased estimator of some age and sex groups of the Aboriginal and Torres Strait Islander population.

The data presented on Aboriginal and Torres Strait Islander injury at state and national level is an aggregation of non-homogeneous populations. It is almost certain that the injury patterns among urban dwelling Aboriginal and Torres Strait Islander peoples are different to those in rural areas and different again from those living traditional lifestyles in more remote areas. Setting priorities for prevention requires a better understanding of the injury patterns of Aboriginal and Torres Strait Islander peoples living different lifestyles.

Timeliness

National data collections have become more timely in recent years but considerable delays are still experienced, especially with larger systems such as those dealing with hospitalisations. As timeliness of these systems improves, the issue of having current year detailed population estimates will become more critical, as it

is difficult to make sense of the information without adequate population denominators.

Level of detail of descriptions of injury causes

The level of detail of information available is not adequate to permit a thorough identification of causes and the setting of specific prevention priorities. While this should improve for deaths data if the National Coronial Information System is put in place, it is difficult to rapidly make changes of the kind necessary to the hospitalisations data collections. The number of contributing hospitals and the commitment to implementing changes through the National Health Information Agreement increases quality but does not provide a basis for rapid changes to be made. Alternative ways of obtaining more detail and greater reliability of information need to be considered if better information on Aboriginal and Torres Strait Islander injury patterns are to be produced in the short term.

Given the size of the Aboriginal and Torres Strait Islander populations and (despite the high rate of injury) the relatively small number of injury cases, it will be necessary to supplement existing data. This could be done in a number of ways. The development of surveillance techniques for small communities, that encompass both prospective and retrospective quantitative and qualitative material, is required, and a project to develop new methods for small communities is under way in Cairns. In addition, cause-specific studies are needed to move beyond broad descriptive epidemiology to more detailed understanding of injury causes and possible prevention strategies.

Conclusion

Data concerning injury among Aboriginal and Torres Strait Islander peoples lack the precision and coverage that is desirable. Nevertheless, there is sufficient evidence to show that injury rates are significantly higher among Aboriginal and Torres Strait Islander peoples than their non-Aboriginal counterparts. In the short term, existing data can be used to start setting prevention priorities, but improvement in hospitalisation, death and population data is needed to provide a more definitive picture of injury patterns.

New methods of injury surveillance that take into account the different lifestyles of Aboriginal and Torres Strait Islander peoples are required to better understand how to reduce the injury burden. Injury cause classifications that are more culturally applicable are needed and attention is required to lessen the possibility that data reported by health services contain hidden biases.

Data Issues

External Causes Group Definition

Cause of injury	ICD9 E-Codes
Transportation	800-848
Drowning	910
Poisoning by pharmaceuticals, etc	850-858
Poisoning by other substances	860-869
Falls	880-888
Fires/burns/scalds	890-899, 924/.0, .8, .9
Other unintentional	900-909, 911-923, 924/.1, 925-929
Intentional, self inflicted	950-959
Intentional, inflicted by another	960-978, 990-999
Undetermined intent.	980-989
Medical misadventure, etc.	870-879, 930-949

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