

Review of the harmful use of alcohol among Aboriginal and Torres Strait Islander people

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Introduction

The focus of this review is not simply on the use of alcohol. *Most Aboriginal and Torres Strait Islander and non-Indigenous people alike consume alcohol in a manner that does not cause harm.* We are concerned with the *harmful* use of alcohol, and why levels of harmful use are higher among Aboriginal and Torres Strait Islander people than among non-Indigenous people. This goes beyond the issue of consumption by dependent drinkers (so-called 'alcoholics'). We are also concerned about those who drink regularly and those who engage in heavy episodic drinking (so-called 'binge drinkers') because their pattern of drinking contributes significantly to the level of harm to themselves and to others.

Although the focus of this review is specifically on alcohol, some drinkers also use other psychoactive drugs. Most commonly, this is confined to smoking tobacco but smaller numbers also use cannabis and, to a lesser extent, other illicit drugs, such as amphetamine-type stimulants (including crystal methamphetamine or 'ice'). Particularly in the case of alcohol and tobacco, the interactive effect of these drugs results in higher levels of health-related harm. Furthermore, as common factors play a causal role in the use of all drugs, many strategies to address them are also common.

In this review, we explore the harmful effects of alcohol use in the Aboriginal and Torres Strait Islander context examining: patterns of use; health impacts; underlying causal factors; policies and interventions to address these impacts; and ways to further reduce harm.

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About this review

This review draws mostly on journal publications, government reports, national data collections and national surveys, the majority of which can be accessed through the *HealthInfoNet*'s Bibliography.

Edith Cowan University prefers to use the term 'Aboriginal and Torres Strait Islander' rather than 'Indigenous Australian' for its publications. However, when referencing information from other sources, our authors are ethically bound to utilise the terms from the original source unless they can obtain clarification from the report authors/copyright holders. As a result, readers may see these terms used interchangeably with the term 'Indigenous' in some instances. If they have any concerns they are advised to contact the *HealthInfoNet* for further information.

Acknowledgements

Parts of this paper draw on reviews that we and our colleagues have undertaken for the National Indigenous Drug and Alcohol Committee [1], the Queensland Aboriginal and Islander Health Council [2], the Kimberley Aboriginal Medical Services Council [3], the Australian Government Department of Health and Ageing [4], and a book edited by the late Neil Thomson from the Australian Indigenous *HealthInfoNet* [5, 6]. The National Drug Research Institute at Curtin University is supported by funding from the Australian Government under the Substance Misuse Prevention and Service Improvement Grants Fund.

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Key facts

The Australian context

- Harmful use of alcohol is a problem for the Australian community as a whole. It is estimated that in 2011, alcohol caused 5.1% of the total burden of disease in Australia.
- The social cost of all drug use in Australia in 2004–05 was estimated at \$55.2 billion (\$79.9 billion in 2016 dollars), with alcohol alone contributing 27.3%, and alcohol combined with illicit drugs adding a further 1.9%.

Extent of alcohol use among Aboriginal and Torres Strait Islander people

- Alcohol use among Aboriginal and Torres Strait Islander people needs to be understood within the social and historical context of colonisation, dispossession of land and culture, and economic exclusion.
- Aboriginal and Torres Strait Islander people are about 1.3 times more likely to abstain from alcohol than non-Indigenous people.
- Aboriginal and Torres Strait Islander people are at least 1.2 and 1.3 times more likely to consume alcohol at levels that pose risks to their health over their lifetimes and on single drinking occasions than non-Indigenous people.
- Aboriginal and Torres Strait Islander men are more than twice as likely as Aboriginal and Torres Strait Islander women to consume alcohol at risky levels.

Health impacts of alcohol use among Aboriginal and Torres Strait Islander people

- Excessive alcohol consumption poses a range of health risks – both on single drinking occasions and over a person's lifetime, including alcoholic liver disease, behavioural disorders, assault, suicide and transport accidents.
- In NSW, Qld, WA, SA and the NT from 2010–2014 Aboriginal and Torres Strait Islander males and females died from conditions solely caused by alcohol more frequently than non-Indigenous males and females (4.7 and 6.1 times respectively).
- The overall rate of suicide among Aboriginal and Torres Strait Islander people in 2015 was 2.1 times higher than among non-Indigenous people. For the period 2011–2015, 40% of male suicides and 30% of female suicides were attributable to alcohol use.
- There is strong qualitative evidence linking alcohol and other drug (AOD) use and poor mental health among Aboriginal and Torres Strait Islander people.
- Age standardised rates of hospitalisation for Aboriginal and Torres Strait Islander people in the years 2012–13, 2013–14 and 2014–15 were 2.7, 2.3 and 2.4 times those of non-Indigenous people.
- In 2011, alcohol accounted for an estimated 8.3% of the overall burden of disease among Aboriginal and Torres Strait Islander Australians; a rate 2.3 times higher than among non-Indigenous people.
- In addition to harms to health, high levels of alcohol use can contribute to a range of social harms, including child neglect and abuse, interpersonal violence, homicide, and other crimes.

Policies and strategies

- Initial responses to the concerns about harmful alcohol use among Aboriginal and Torres Strait Islander people in the 1970s were driven not by governments but by Aboriginal and Torres Strait Islander people themselves who recognised that non-Indigenous mainstream responses were non-existent or largely culturally inappropriate.
- The level of harm caused by alcohol in any community is a function of complex inter-relationships between the availability of alcohol, and levels of individual wellbeing and social conditions that either protect against or predispose people or groups to harmful levels of consumption.
- As well as addressing the consequences of harmful levels of alcohol consumption, policies and intervention strategies must also address the underlying causal relationships. In the case of Aboriginal and Torres Strait Islander people this means addressing social inequality.
- As part of the current Australian Government's *Indigenous advancement strategy* (IAS), a number of programs are in place that aim to address social inequality and the broad social determinants of harmful alcohol use.
- Government policy documents most directly relevant to the minimisation of alcohol-related harm among Aboriginal and Torres Strait Islander people are the *National drug strategy 2017–2026* (NDS) and the *National Aboriginal and Torres Strait Islander peoples' drug strategy 2014–2019* (NATSIPDS).
- The *National drug strategy 2017–2026* provides a tripartite approach to reducing the demand for and supply of alcohol, and the immediate harms its causes.
- There is a strong evidence base for the effectiveness of a range of interventions including: alternative activities, brief interventions, treatment and ongoing care; taxation and price controls and other restrictions on availability; and community patrols and sobering-up shelters.
- Government programs to address Aboriginal and Torres Strait Islander inequality have been in place since the 1970s - what is now the *National drug strategy* was introduced in 1985. While there have been some improvements, as evidenced by various Government reports, progress has been slow and while there have been increases in funding these have not been sufficient to meet need.

- There is evidence that – provided with adequate resourcing – the culturally safe services provided by community-controlled organisations result in better outcomes. Aboriginal and Torres Strait Islander people should be key players in the design and implementation of interventions to address harmful alcohol use in their own communities, with capacity building within Aboriginal community-controlled organisations a central focus.
- The way forward is for Australian Governments to honour the commitments made in the NATSIPDS to work with Aboriginal and Torres Strait Islander people and to resource interventions on the basis of need.

Context of alcohol use among Aboriginal and Torres Strait Islander people

The broader Australian context

Alcohol is the most widely used psychoactive drug in Australia. At the national level, data on production, taxation and imports collected by the Australian Bureau of Statistics (ABS) give a fairly accurate measure of total alcohol consumption and provide a basis for calculating per capita levels. The ABS estimated that in 2014 annual average per capita consumption of pure alcohol by persons aged 15 years and older was 9.71 litres, an average of about two standard drinks per person per day (a standard drink is one containing 12ml or 10g of pure alcohol) – a decline from 10.49 litres per person in 2005 [7]. Data on wholesale sales of alcohol that are required to be reported to liquor licensing authorities in Western Australia (WA), the Northern Territory (NT), Queensland (Qld) and the Australian Capital Territory (ACT) also provide reasonably accurate information for the calculation of per capita consumption and have been used to report sales at regional and local levels [8].

Neither the ABS nor liquor licensing data tell us about the way in which alcohol is consumed by individuals or about variations in patterns of use among population sub-groups, such as women or Aboriginal and Torres Strait Islander people [9-11]. To overcome the limitations inherent in these data, we rely upon surveys that ask people about how often and how much alcohol they consume, and the World Health Organization (WHO) has developed a set of guidelines for conducting these surveys [12, 13]. It should be noted, however, that when the results of such surveys are extrapolated to broader populations, they all significantly under-estimate alcohol consumption as measured by sales data [13].

Since the introduction of the *National campaign against drug abuse* (now known as the *National drug strategy*) in 1985, the *National drug strategy household survey* (NDSHS) has been conducted every three years [14-18]. The NDSHS are considered the best survey data source for estimating risky consumption among individuals aged 14 years and older. Compliant with WHO guidelines, the surveys include a comprehensive set of questions that participants complete themselves and seal before returning to an interviewer [19]. Self-completion of the questionnaire facilitates both confidentiality and encourages more truthful reporting. The 2013 NDSHS estimated that 78.3% of Australians aged 14 years and older consumed alcohol in the preceding 12 months, and that 13.8% reported never having consumed a standard drink [18]. This survey also found that, in terms of the *2009 Australian alcohol guidelines* (see Appendix 1) 18.2% of Australians (26% of males and 10% of females) consumed alcohol in a manner that placed them at risk of alcohol-related harm over their lifetimes (on average more than two standard drinks per day); and 9.9% (14.1% of males and 5.7% of females) consumed alcohol at levels that placed them at risk of injury on a single drinking occasion (i.e. more than four standard drinks per occasion) at least weekly [18, 20].

It has been estimated that, in 2011, alcohol accounted for 5.1% of the total burden of disease in the Australian population and that in 2010, 4.7% of male and 3.0% of female deaths and 2.5% of male and 1.2% of female hospitalisations were attributable to alcohol [21, 22]. As well as impacting on physical and mental health, harmful levels of alcohol use contribute to a range of social harms, including child neglect and abuse, interpersonal violence, homicide, and other crime. The cost of this is significant. It has been estimated that in 2004–05, the social cost of all drug use in Australia was \$55.2 billion (\$79.9 billion in 2016 dollars), with alcohol alone contributing 27.3%, and alcohol combined with illicit drugs adding a further 1.9% [23]. Although, it did not arrive at a total cost, a later study found that in addition to these costs, there are substantial other costs that are borne by people other than drinkers themselves [24].

The historical context

From the time the first British colony was established in 1788 – except in some isolated locations – Aboriginal and Torres Strait Islander people were gradually dispossessed of the lands they had occupied for at least 60,000 years. As a result of introduced disease and violence their numbers fell dramatically and, dispossessed of their one capital resource – the land – they were reduced to working in low-paid menial jobs, living in shanties on the fringe of towns and subject to racism and discrimination [25].

In the 19th Century, on the assumption that the Aboriginal and Torres Strait Islander population was dying out, colonial and, later, state and territory governments adopted policies of ‘protecting’ the ‘remnant’ populations – including removing some to religious missions and government settlements where they lost all autonomy [26, 27]. However, increases in the Aboriginal and Torres Strait Islander population led, in the mid-20th Century, to a policy of assimilating Aboriginal and Torres Strait Islander people into the non-Indigenous population – whether they wished it or not [26, 28]. This included the removal of children of mixed descent from their Aboriginal and Torres Strait Islander families and placing them in institutions or fostering them out to non-Indigenous families. This had a devastating impact on those removed (the ‘Stolen Generations’), their families and their traditions. The effects of these policies continue to reverberate inter-generationally and include: absence of parenting models resulting, for some, in unacceptably high levels of child neglect and abuse; high levels of mental health problems; and harmful AOD use [29, 30].

In the 1970s, there was a significant change in Australian Government Aboriginal and Torres Strait Islander affairs policy. The *Assimilation policy* was a manifest failure, Aboriginal and Torres Strait Islander people clung tenaciously to their cultures, their enduring poor health and social conditions were an international embarrassment, and there was an increasing determination among them to control their own destinies. Enabled by the 1967 Referendum that empowered the Commonwealth Government to legislate on Aboriginal and Torres Strait Islander issues, the Whitlam Labor Government introduced the *Self-determination policy*. Under this, significant levels of funding were provided to address Aboriginal and Torres Strait Islander disadvantage and to resource community-controlled service organisations. Since that time, Australian Government policy has undergone various iterations depending upon the political party in power. These include *Self-management*, *Mutual obligation*, ‘*Closing the gap*’ and the ‘*Indigenous advancement strategy*’ [31]. Over the past two decades, successive governments have backed away from the notion of self-determination but the common goal of these policies has been to reduce the disadvantage faced by Aboriginal and Torres Strait Islander people – even though there is disagreement on the means by which this is to be achieved.

These various government policies have had some gradual positive impact. Among other outcomes, there have been significant reductions in infant mortality, improvements in housing and education levels, and increases in workforce participation. Nevertheless, as successive reports of the Steering Committee for the Review of Government Service Provision (SCRGSP) demonstrate, the gap between the living standards of Aboriginal and Torres Strait Islander and non-Indigenous people remains significant and Aboriginal and Torres Strait Islander disadvantage remains entrenched [32, 33]. As the prominent Wiradjuri journalist and author Stan Grant has said, this legacy is not something Aboriginal and Torres Strait Islander people can simply 'just get over' [34].

Alcohol is intertwined with the history of Aboriginal and Torres Strait Islander and non-Indigenous relations. Alcohol quickly became a cornerstone of early colonial life [35]. It was used by some colonists as a means of exchange with Aboriginal and Torres Strait Islander people for sex or labour [36], and many Aboriginal and Torres Strait Islanders increasingly began to use alcohol as a means of escape, as a solace and as one of the few forms of enjoyment available to them – with devastating consequences [5, 37-39].

To reduce the effects of heavy Aboriginal and Torres Strait Islander consumption and to protect non-Indigenous people from the threat perceived to arise from it, from 1838 to 1929 laws prohibiting the sale of alcohol to, or purchase of alcohol by, Aboriginal and Torres Strait Islander people were introduced in all jurisdictions [37]. These prohibitions carried over into the 'assimilation' era, with exemptions being granted to those who were able to demonstrate that they were sufficiently assimilated into the wider society – often at the expense of denying their Aboriginal and Torres Strait Islander identities and social relationships [40]. These restrictions were of limited effectiveness in circumventing Aboriginal and Torres Strait Islander access to or desire for alcohol, and some non-Indigenous people profited by illegally selling alcohol to them [39, 41, 42].

The effects of prohibition on Aboriginal and Torres Strait Islander people were harsh. As a population, they were under strict surveillance and excluded from social spaces such as hotels, which were important centres of social activity; and the fear of being caught with alcohol resulted in riskier drinking patterns such as consumption of high alcohol content beverages quickly and excessively (a pattern of consumption that some see as shaping current drinking patterns) [39]. Given the culturally and racially-based nature of the restrictions, alcohol predictably became a civil rights issue; with the laws being seen by Aboriginal and Torres Strait Islander people to embody inequity, discrimination and exclusion [40, 41].

As part of the agenda to assimilate Aboriginal and Torres Strait Islander people, in the 1960s the various state and territory prohibitions were progressively repealed [43]. Unsurprisingly, however, given the social conditions in which they lived, the repeal of prohibitions led to a significant increase in harmful levels of consumption [44, 45]. Since the late 1970s, various inquiries have highlighted the link between Aboriginal and Torres Strait Islander social disadvantage, poor health and high levels of alcohol use as a legacy of past policies [46-49]. While colonialism and dispossession are not the cause of all harmful alcohol use among Aboriginal and Torres Strait Islander people, observed drinking patterns are a response both to this history and the current social conditions that have arisen from it, as they are among Indigenous peoples elsewhere [37, 50].

Alcohol and alcohol use disorders

Alcohol is a psychoactive substance – a drug. Alcoholic beverages are produced by processes including brewing, fermentation and distillation to make beers, wines and spirits. The percentage of alcohol in a beverage determines its potency. Alcohol is a toxin – a poison – and, despite any pleasurable effects, to become intoxicated is to be poisoned. The effects of alcohol are dependent upon the amount consumed, both on single occasions and over time. Mild intoxication can be pleasurable, disinhibiting effects may facilitate social interaction and it is clearly valued among a large percentage of the Australian population. Increasing levels of consumption lead to psychomotor impairment with the potential for accidents and injury, and tissue and organ damage, as well as harms to others. Furthermore, alcohol consumed by women during pregnancy can cross the placenta and lead to a range of harmful effects to the fetus.

Several instruments are available to screen for problematic alcohol use. The most commonly used is the ten question Alcohol Use Disorders Identification Test (AUDIT) [51] and its shortened, three question version AUDIT-C [52]. These and a single question version, AUDIT-3, have been used in Aboriginal and Torres Strait Islander primary health care settings and have been found to be effective [53, 54]. Use of both AUDIT and AUDIT-C are recommended in the *Alcohol treatment guidelines for Indigenous Australians* [55] as is the *Indigenous risk impact screen* (IRIS) [56]. The latter is an Aboriginal and Torres Strait Islander-specific instrument that also screens for associated mental health risks [55]. It is important to note that these instruments are not diagnostic tools, rather they identify risky patterns of alcohol consumption that warrant further follow-up, investigation and perhaps treatment.

While terms such as 'alcoholism' and 'addiction' are in common use, more precise definitions are used to diagnose alcohol-related conditions in clinical settings.

The most widely used are those from the World Health Organization’s (WHO) *International classification of diseases* (ICD-10). Under the broad category, ‘Mental and behavioural disorders due to alcohol,’ ICD-10 identifies a range of clinical conditions related to alcohol use along with associated diagnostic criteria. These conditions include: acute intoxication, harmful use, dependence syndrome, withdrawal state, withdrawal state with delirium, psychotic disorder, amnesic syndrome, other unspecified mental and behavioural disorders [57]. ICD-10 is used to record hospital admissions and deaths attributable to alcohol in statistical and epidemiological data collections such as those used in following sections of this review.

Another commonly used classification is the *Diagnostic and statistical manual of mental disorders* (DSM-5) [58]. DSM-5 identifies a single ‘alcohol use disorder’ (combining ‘alcohol abuse’ and ‘alcohol dependence’ separately classified in the older DSM-IV) characterised by three states, ‘mild’, ‘moderate’, or ‘severe’ that are based on the presence of 2 to 3, 4 to 5, or 6 or more of 11 criteria.

Table 1. List of abbreviations

AATSIHS	Australian Aboriginal Torres Strait Islander Health Survey
ABS	Australian Bureau of Statistics
AIHW	Australian Institute of Health and Welfare
AOD	Alcohol and other drugs
AUDIT	Alcohol Use Disorders Identification Test
CAP	National Drug Strategy Aboriginal and Torres Strait Islander Peoples Complementary Action Plan
DALY	Disability adjusted life years
FASD	Fetal alcohol spectrum disorder
ICD-10	International Classification of Diseases 10
IRIS	Indigenous Risk Impact Screen
KRA	Key result area
NATSIHS	National Aboriginal and Torres Strait Islander Health Survey
NATSIPDS	National Aboriginal and Torres Strait Islander Peoples Drug Strategy
NATSISS	National Aboriginal and Torres Strait Islander Social Survey
NDS	National Drug Strategy
NDSHS	National Drug Strategy Household Survey
NHMRC	National Health and Medical Research Council
NIDAC	National Indigenous Drug and Alcohol Committee
PAP	Population attributable fraction
PAAP	Population attributable aetiologic fraction
RCIADC	Royal Commission into Aboriginal Deaths in Custody
RR	Rate ratio – the rate in one population group divided by that in another
SCRGSP	Steering Committee for the Review of Government Services Provision
YLD	Years lived with disability
YLL	Years of life lost

The DSM-5 classification recognises that an alcohol use disorder covers a range of problems and is not simply a dichotomous state as implied by the term ‘alcoholism’ (i.e. a person is either an ‘alcoholic’ or is not). Classificatory differences between DSM-5 and ICD-10 are discussed by Hoffman and Kopak [59].

Extent of alcohol use among Aboriginal and Torres Strait Islander people

Alcohol use among Aboriginal and Torres Strait Islander people

Aboriginal and Torres Strait Islander people constitute 3.0% of Australia’s population [60]. However, they experience health and social problems resulting from alcohol use at rates significantly greater than non-Indigenous people. In 2011, alcohol accounted for an estimated 8.3% of the overall burden of disease among Aboriginal and Torres Strait Islanders; a rate 2.3 times that among non-Indigenous people [61].

As indicated above, to obtain information on levels or patterns of alcohol use, we rely upon surveys that ask respondents about frequency and amounts of consumption. The validity and reliability of such surveys are dependent upon sampling methods, the extent to which linguistic and cultural understandings are shared between interviewers and participants, the questions asked, literacy levels and the way in which the results are interpreted [11, 62]. All of these factors need to be considered when conducting and assessing the results of alcohol use surveys among Aboriginal and Torres Strait Islanders.

Three national surveys provide information on alcohol use by Aboriginal and Torres Strait Islander people: the NDSHS discussed above, the *National Aboriginal and Torres Strait Islander social survey* (NATSISS), and the *Australian Aboriginal and Torres Strait Islander health survey* (AATSIHS) (previously the *National Aboriginal and Torres Strait Islander health survey* (NATSIHS)). Of these surveys, the most methodologically sound is the NDSHS. One limitation of the NDSHS, however is that the number of Aboriginal and Torres Strait Islander people included in the samples (about 450) is too small to provide reliable information on regional and local level variation in consumption. Another limitation is that they exclude (as do the NATSISS and AATSIHS/NATSIHS) homeless and itinerant people and those who are in institutions such as hospitals, prisons or police lock-ups at the time the surveys are conducted. Such people are likely to include some of the heaviest drinkers and this contributes to under-estimates of consumption levels. Despite these limitations, the NDSHS results are closest to actual consumption and comparisons can be made between them and consumption patterns among non-Indigenous people.

The NATSISS [63-65], and the AATSIHS [66,67] collect detailed survey information on the socio-economic and health circumstances of Aboriginal and Torres Strait Islander people and although they report on alcohol consumption, they were not designed specifically for this purpose and are not compliant with WHO guidelines. They ask participants to recall consumption over different time periods and obtain data from different age groups (15 years and older for the NATSISS and AATSIHS, 18 years and older for the NATSIHS, and 14 years and older for the NDSHS). While they have the advantage of much larger sample sizes, the methods for collecting data on alcohol consumption are less rigorous than those used for the NDSHS and their results are not comparable to the NDSHS results for either Aboriginal and Torres Strait Islander or non-Indigenous people.

Risky alcohol consumption

As indicated in our Introduction, this review is concerned about levels of alcohol consumption that pose 'risk' to people's health – that is, the probability of a person developing an adverse health outcome in a specified time period. This has long been of concern and, in 1987, the National Health and Medical Research Council (NHMRC) developed a set of guidelines setting out the health risks associated with alcohol consumption [68]. The guidelines were based on a rigorous review of the national and international evidence on the relationship between different levels of consumption and a range of health problems. In light of new evidence, the guidelines have since been revised twice and simplified [20, 69]. The most recent guidelines distinguish between risk of harm 'over a lifetime' and 'risk of injury on a single drinking occasion of drinking'. For healthy men and women aged 18 years and older, they state:

- drinking no more than four standard drinks on a single occasion reduces the risk of alcohol-related injury arising from that occasion
- drinking no more than two standard drinks on any day reduces the lifetime risk of harm from alcohol-related disease or injury [20].

It is important to note that none of the three national surveys report on amounts of alcohol consumed. Rather they report on the frequency of consumption that poses risks to health as defined by the NHMRC guidelines. However, the guidelines define risks so broadly that they group together people who may be consuming in a harmful manner but who are doing so at widely varying levels.

Due to changes in the NHMRC guidelines [20] used to categorise research results, it is not possible to compare survey results from earlier time periods with more recent surveys using the 2009 guidelines (except in the case of the 2002 NATSISS which the ABS has re-analysed using the 2009 guidelines). The national results of the 2010 and 2013 NDSHS, the 2012–13 AATSIHS, and the 2002, 2008 and 2014–15 NATSISS are presented in Table 2. The NDSHS results include comparison of Aboriginal and Torres Strait Islander and non-Indigenous findings. Such comparison is not available for the AATSIHS and NATSISS, but, unlike the NDSHS, results of these two surveys are broken down by gender.

The 2010 and 2013 NDSHS results suggest that the number of Aboriginal and Torres Strait Islander participants who reported being abstinent (not having consumed alcohol in the previous 12 months) increased from 25.4% in 2010 to 27.9% in 2013. Among non-Indigenous participants there was also a small increase in this group (which includes those who had never been drinkers and those who had previously been drinkers but who had given up), however Aboriginal and Torres Strait Islander people were about 1.3 times more likely to be abstainers than non-Indigenous people. The percentage of Aboriginal and Torres Strait Islander people reporting being abstinent in the NDSHS surveys was broadly consistent with the results of the 2012–13 AATSIHS but substantially lower than the levels reported in the three NATSISS surveys – 38.0%, 35.1% and 38.4%.

As well as suggesting an increase in the percentage of Aboriginal and Torres Strait Islander people reporting they were abstinent, conversely, the NDSHS data suggest that there were declines in the percentages of those reporting both lifetime and single occasion risky drinking. At the same time, there were self-reported declines in both types of risky drinking among non-Indigenous participants. Nevertheless, Aboriginal and Torres Strait Islander people were 1.6 times and 1.2 times more likely to report lifetime risky consumption in 2010 and 2013 and 1.3 times more likely to report single occasion risky consumption in both years.

Table 2. Self-reported alcohol consumption by risk level (percentage), national survey results, Australia

Level of risk	2010 NDSHS ^a		2013 NDSHS ^b		2012–13 AATSIHS ^c			2002 NATSISS ^{d*}			2008 NATSISS ^e			2014–15 NATSISS ^f		
	Aboriginal and Torres Strait Islander	Non-Indigenous	Aboriginal and Torres Strait Islander	Non-Indigenous	M ¹	F ²	T ³	M	F	T	M	F	T	M	F	T
Not consumed in the last 12 months	25.4	19.3	27.9	21.7	23.0	32.0	28.0	29.5	45.9	38.0	26.5	43.0	35.1	29.2	47.0	38.4
Lifetime risk																
Low risk (consumed ≤2 day)	42.6	60.4	49.4	60.2	51.0	58.0	54.0	44.3	43.9	44.1	42.4	46.1	44.3	43.9	42.5	43.2
Risky (consumed >2day)	32.1	20.3	22.7	18.2	26.0	10.0	18.0	25.5	9.5	17.2	29.1	10.1	19.2	22.0	7.9	14.7
Single occasion risk																
Low risk (consumed ≤4 drinks)	20.9	40.2	22.4	40.6				9.3	13.1	11.3	11.1	12.4	11.8	Not reported		
Risky (consumed >4 drinks)	53.7	40.5	49.6	37.7				47.2	23.8	35.0	50.0	26.9	37.9	Not reported		

1. Males

2. Females

3. Total population

* The ABS re-analysed the 2002 data using the 2009 Alcohol guidelines and used those guidelines in analysis of the 2008 data.

Sources: a. AIHW, 2011 [17]; b. AIHW, 2014 [18]; c. ABS, 2013 [67]; d. ABS, 2013 [65]; e. ABS, 2013 [65]; f. ABS, 2016 [70]

While the NATSISS data showed no change in the percentage of people reporting being abstinent, they do show what is reported to be a statistically significant decline in the percentage reporting lifetime risky consumption, from 17.2% in 2002 to 14.7% in 2014–15. This probably reflects a real decline because there were reported declines in all states and territories over that period. However, the magnitude of the decline is open to question because in Vic and SA the proportions of people reporting decreased risky lifetime consumption fell by an improbable 41% and 56% respectively [70]. For risky single occasion consumption, the 2002 and 2008 NATSISS surveys report similar percentages (35.0% and 37.9% respectively). The 2014–15 NATSISS did not report on risky single occasion consumption.

The results of the 2002, 2008 and 2014–15 NATSISS show that Aboriginal and Torres Strait Islander males were at least 2.8 times more likely than females to consume alcohol at levels that posed lifetime risk to their health. The 2002 and 2008 NATSISS also show that at the time of interview, males were about twice as likely as females to consume on occasions that posed risk of injury. These results are consistent with data reported by the 2012–13 AATSIHS when comparing patterns of consumption between males and females.

Together, the three NATSISS surveys show that most Aboriginal and Torres Strait Islander people either did not consume alcohol or did not consume it at a level that posed risks to their health over their lifetimes. This was also true of women on single drinking occasions, but men were slightly more likely than women not to consume alcohol at risky levels on such occasions. All three surveys indicated

that Aboriginal and Torres Strait Islanders were 1.3 times more likely to be abstainers than non-Indigenous people. They were also at least 1.2 and 1.3 times more likely to consume alcohol at levels that pose risks to their health over their lifetimes and on single drinking occasions, than non-Indigenous Australians. The surveys also indicate that Aboriginal and Torres Strait Islander men were more than twice as likely as Aboriginal and Torres Strait Islander women to consume alcohol at risky levels. Importantly the surveys show that there was a decline in risky drinking among Aboriginal and Torres Strait Islander people. However, given the inherent limitation of these surveys, the reported levels of consumption should be regarded as under-estimates. In addition, given the uncertainty of the estimates of risky consumption, we cannot be certain of the magnitude of the reported decline. That these are under-estimates is indicated by the significantly higher levels of alcohol-related deaths and hospitalisations among Aboriginal and Torres Strait Islander people than among non-Indigenous people, as discussed in the following sections of this review [11, 71].

The ability of policy makers, practitioners and the broader public to respond appropriately in reducing the harms caused by alcohol depends in large part on our understanding of the extent of the problem. As indicated above, limitations of existing surveys make such an understanding difficult to achieve and we need to subject those surveys to high levels of scrutiny. These limitations have long been pointed out and we urgently need to develop better and more culturally sensitive methods of better ascertaining data on Aboriginal and Torres Strait Islander patterns of alcohol consumption [62, 72].

Health impacts of alcohol use among Aboriginal and Torres Strait Islander people

Alcohol-related harms to health

In addition to the ICD-10 'Mental and behavioural disorders due to alcohol' discussed in the Introduction, excessive alcohol consumption poses a range of other health risks – both on single drinking occasions and over a person's lifetime. The most comprehensive sources of information on these risks come from two main sources: the National Causes of Death Database and the National Hospital Morbidity Database, both of which are collated from state and territory data and maintained by the ABS and the Australian Institute of Health and Welfare (AIHW). These data are commonly referred to as mortality (death) data and morbidity data (technically called 'hospital separations' as the records are prepared when patients are discharged or transferred). Information contained in these records represents 'the tip of the iceberg'. While there is some data on those whose problems are managed by specialist treatment services, there is no comprehensive source of data on the much larger number of people treated for alcohol-related problems in primary health care settings, nor for those whose problems are untreated.

In the mortality and morbidity data, the alcohol-related conditions that can most easily be identified are the eleven ICD-10 diagnostic categories that are wholly caused by alcohol. Such conditions are said to have a population attributable fraction (PAF) or a population attributable aetiologic (etiologic) fraction (PAAF) of 1.0. Apart from these, however, alcohol is known to contribute to a range of other conditions. Identification of these latter cases directly from death or hospital records requires that the primary diagnosis (e.g. accidental drowning or haemorrhagic stroke) is supplemented by an additional code indicating whether or not alcohol was a causal factor. Unfortunately, such information is not always recorded, hence the frequency of such cases is significantly underestimated. To overcome this limitation, an indirect method, the PAAF, was developed to estimate the contribution of alcohol to these other conditions. Based on comprehensive studies of the contribution of different levels of alcohol consumption to specific conditions among males and females in different age groups, a population measure of the proportion of cases attributable to alcohol can be calculated. This proportion is the partial PAAF. For example, as 12.5% of cases of liver cancer among Australian males aged 60–64 who consume alcohol in a hazardous manner are attributable to alcohol, the PAAF is 0.125. There are 29 such conditions with PAAFs ranging from 0.02 for psoriasis to 0.82 for chronic pancreatitis in the general Australian population [73]. Reflecting higher levels

of alcohol consumption among them, PAAFs have also been developed specifically for the Aboriginal and Torres Strait Islander population [74].

Mortality

The most comprehensive time series of Australian mortality data is published in annual reports prepared by the ABS. These include tables on Aboriginal and Torres Strait Islander deaths for NSW, Qld, SA and WA – the jurisdictions for which the data are most reliable. The underlying causes of death are categorised by ICD-10 summary groupings of particular conditions (i.e. particular diseases or injuries). Among these are several categories that include conditions to which alcohol makes a significant contribution: intentional self-harm (suicide); land transport accidents; cirrhosis and other diseases of the liver; and assault (homicide) (Table 3). With the exception of intentional self-harm, however, from these data it is not possible to single out particular conditions within these categories and the role of alcohol in these deaths. Nevertheless, Table 3 puts these deaths in context.

The biennial reports of the SCRGSP provide information on deaths from conditions that are attributable solely to alcohol (i.e. those with a PAAF of 1.0). Data for NSW, Qld, WA, SA and the NT for the years 2010–2014 are summarised in Table 4. Overall, these conditions occurred 4.7 times more frequently among Aboriginal and Torres Strait Islander males than among non-Indigenous males and 6.1 times more frequently among Aboriginal and Torres Strait Islander females than among non-Indigenous females. The most common of these conditions – alcoholic liver disease (alcoholic cirrhosis of the liver) and mental and behavioural disorders due to alcohol use – are chronic conditions resulting from long periods of heavy alcohol consumption. The former accounted for 61% of the 286 male deaths and 78% of the 139 female deaths and the latter for 20% of male and 12% of female deaths in these four categories.

Several of the categories of disease and injury in Table 3, group together conditions that are either wholly or partially attributable to alcohol use (and for which PAAFs are available) with those that are not; and from the published data it is not possible to disaggregate them. This is true for land transport accidents, cerebrovascular diseases, cirrhosis and other diseases of the liver and accidental poisoning. For example, the category cirrhosis and other diseases of the liver includes eight conditions only one of which, alcoholic liver disease (alcoholic liver cirrhosis), is attributable to alcohol use. It is, however, possible to apply PAAFs to two of the categories; intentional self-harm (suicide) and assault (homicide).

Table 3. Selected causes of death (age-standardised rate per 100,000 persons) by Aboriginal and Torres Strait Islander status and sex, NSW, Qld, SA, WA and NT, 2011–2015

Cause of death and ICD-10 code	2011			2012			2013			2014			2015			Total	
	No.	Rate	RR	No.	Rate	RR	No.	Rate	RR	No.	Rate	RR	No.	Rate	RR	No.	%
Males																	
All causes	1,312	1,340.2	2.0	1,351	1,308.5	2.0	1,433	1,095.6	1.7	1,473	1,062.7	1.7	1,591	1,114.7	1.7	7,160	100
Intentional self-harm	92	36.6	2.5	81	32.4	1.9	99	35.2	2.1	102	34.1	1.9	110	39.2	2.1	484	6.8
Land transport accidents	63	25.2	3.0	51	24.6	2.8	39	13.1	1.5	69	26.9	3.7	54	21.0	2.7	276	3.9
Cerebrovascular diseases	46	81.7	1.9	43	64.0	1.6	52	61.8	1.6	43	45.3	1.2	41	41.4	1.1	225	3.1
Cirrhosis & other diseases of liver	45	31.0	3.4	39	27.3	3.5				62	32.7	3.7	58	32.0	3.5	204	2.8
Accidental poisoning	23	10.3	1.7	31	15.3	5.5	35	15.8	2.6	36	14.8	2.2	38	14.8	2.2	163	2.3
Assault (X85-Y09)	18	n.p.	n.p.	26	11.4	7.6	20	7.0	6.1	18	n.p.	n.p.	27	8.1	6.4	109	1.5
# of deaths in above categories	287			271			245			330			328			1,461	
Percentage of male deaths	21.9			20.1			17.1			22.4			20.6				20.4
Females																	
All causes	1,075	954.6	1.9	1,118	982.5	1.9	1,208	904.1	1.8	1,257	905.7	1.8	1,591	1,114.7	1.7	6,249	100
Intentional self-harm	36	15.1	3.4	36	12.8	2.3	39	12.9	2.4	41	12.1	2.1	110	39.2	2.1	262	3.7
Land transport accidents	21	7.6	2.4	37	16.1	5.6	33	13.4	4.8	18	n.p.	n.p.	54	21.0	2.7	163	2.3
Cerebrovascular diseases	51	64.9	1.3	65	69.4	1.5	70	70.6	1.6	66	62.2	1.4	41	41.4	1.1	293	4.1
Cirrhosis & other diseases of liver	46	27.7	8.3	33	20.0	5.6	46	21.8	5.1	32	14.0	4.1	58	32.0	3.5	215	3.0
Accidental poisoning				15	n.p.	n.p.	24	11.0	4.1	26	11.2	3.6	38	14.8	2.2	103	1.4
Assault (X85-Y09)				17	n.p.	n.p.							27	8.1	1.3	44	0.6
# of deaths in above categories	154			203			212			183			328			1,080	
Percentage of female deaths	14.3			18.2			17.5			14.6			20.6				17.3

n.p. = not publishable because of small numbers, confidentiality or other concerns about the quality of the data.

RR = Rate Ratio – in this case the rate among Aboriginal and Torres Strait Islander Australians divided by the non-Indigenous rate.

Sources: ABS, 2013 [75]; ABS, 2014 [76]; ABS, 2015 [77]; ABS, 2016 [78-79]

In 2015, in NSW, Qld, SA, WA and NT, suicide was the second most frequent cause of death among Aboriginal and Torres Strait Islander males and the eighth most common cause of death among Aboriginal and Torres Strait Islander females. The overall rate of suicide among Aboriginal and Torres Strait Islander people was 2.1 times that among non-Indigenous people [79]. As Table 5 shows, in those jurisdictions, for the period 2011–2015, it is estimated that 196 (40%) of the 484 male suicides and 79 (30%) of the 262 female suicides were attributable to alcohol use – a finding discussed in more detail for the NT by Kuipers and colleagues [80]. Similarly, in the same period, it is estimated that 50 (46%) of the 109 homicides among males and 20 (46%) of the 44 female homicides were attributable to alcohol use.

It is clear from these data that, given the role of alcohol, there is considerable room to reduce the toll that suicide and homicide, and any secondary impacts, have on the Aboriginal and Torres Strait Islander population. (It is worth noting here that if the non-Indigenous PAAFs are applied to Aboriginal and Torres Strait Islander deaths as has been done in some studies [81], the contribution of alcohol is significantly under-estimated [82] – by 17% in relation to Aboriginal and Torres Strait Islander suicides (Table 5).

Table 4. Wholly alcohol attributable deaths (age-standardised rate per 100,000) by Aboriginal and Torres Strait Islander status and sex NSW, Qld, WA, SA & NT, 2010–2014

	Aboriginal and Torres Strait Islander		Non-Indigenous		
	Number	Rate *	Number	Rate	Rate Ratio
Males					
Alcoholic liver disease (K70)	175	18.9	1,988	4.7	4.1
Mental & behavioural disorders due to alcohol use (F10)	58	8.2	622	1.5	5.5
Poisoning by alcohol (X45, X65, Y15)	24	2.3	170	0.4	5.3
Other (E24.4, G31.2, G62.1, G72.1)	29	3.6	190	0.4	8.2
Total deaths related to alcohol use	286	33.0	2,970	7.0	4.7
Females					
Alcoholic liver disease (K70)	108	9.9	614	1.4	7.0
Mental & behavioural disorders due to alcohol use (F10)	17	n.p.	190	0.4	n.p.
Poisoning by alcohol (X45, X65, Y15)	9	n.p.	70	0.2	n.p.
Other (E24.4, G31.2, G62.1, G72.1)	5	n.p.	31	0.1	n.p.
Total deaths related to alcohol use	139	12.7	905	2.1	6.1
Persons					
Alcoholic liver disease (K70)	283	14.2	2,602	3.0	4.7
Mental & behavioural disorders due to alcohol use (F10)	75	4.5	812	0.9	4.9
Poisoning by alcohol (X45, X65, Y15)	33	1.5	240	0.3	4.9
Other (E24.4, G31.2, G62.1, G72.1)	34	1.9	221	0.2	7.7
Total deaths related to alcohol use	425	22.1	3,875	4.5	4.9

* Confidence intervals for rates are included in the source document.

n.p. = not publishable because of small numbers, confidentiality or other concerns about the quality of the data.

Rate Ratio - is the rate among Aboriginal and Torres Strait Islander people divided by the non-Indigenous rate.

Source: Based on SCRGSP, 2016 [33]

Table 5. Estimated contribution of alcohol to Aboriginal and Torres Strait Islander suicides and homicides by sex, NSW, Qld, SA, WA and NT, 2011–2015

	Aboriginal and Torres Strait Islander			Non-Indigenous		
	Number	PAAF	Alc attrib.	Number	PAAF	Alc attrib.
Males						
All causes	7160			267,162		
Intentional self-harm	484	0.4041	196	6,812	0.3102	2,113
Assault (X85-Y09)	109	0.4609	50	467	0.4409	206
Females						
All causes	6249			252,682		
Intentional self-harm	262	0.3008	79	2,226	0.2903	646
Assault (X85-Y09)	44	0.4609	20	*		
Persons						
All causes	13,409			519,844		
Intentional self-harm	746	0.3678	274	9,038	0.3053	2,759
Assault (X85-Y09)	153	0.4609	71			

* Not reported

Sources: ABS, 2013 [75]; ABS, 2014 [76]; ABS, 2015 [77]; ABS, 2016 [78-79]; Aboriginal and Torres Strait Islander PAAFs based on Pascal et. al., 2009 [82]; Non-Indigenous PAAFs based on Ridolfo and Stevenson, 2001 [73]

In NSW, Qld, WA, SA and the NT, deaths of Aboriginal and Torres Strait Islander people from all causes declined from 1,149.8 per 100,000 persons in 2000 to 982 per 100,000 in 2014. It is not possible to separate alcohol-caused deaths within the published data for this period, however in these same jurisdictions and over the same time period rates of death from external causes remained at similar levels – 84.8 per 100,000 in 2000 and 84.8 in 2014. There were also significant variations in the rates of death per 100,000 persons from external causes by jurisdiction in the period 2010–2014; being highest in the NT (119.7), followed by WA (114.6) and SA (83.1), and lowest in NSW (60.2) and Qld (64.6). This variability by state partly reflects the findings of an earlier study that found considerable variability in crude rates of alcohol-related deaths in the former Aboriginal and Torres Strait Islander Commission (ATSIC) zones for the period 2000–2004 [81].

Hospitalisation

The National Hospital Morbidity Database includes comprehensive data on hospitalisations (separations) of the Australian population in both public and private hospitals, including the hospitalisation of Aboriginal and Torres Strait Islander people. Annual reports on these, including Aboriginal and Torres Strait Islander data are published by the AIHW [83–85]. These data provide a broad overview of hospitalisation but more detailed data are reported by the SCRGSP [33].

These data are important, but their limitations need to be recognised. First, unlike the mortality records, the morbidity records are not records of individuals but records of cases of hospitalisation. Thus, for example, one person with a serious chronic disease and having multiple admissions will have multiple records of hospitalisation. Second, the AIHW acknowledges that Aboriginal and Torres Strait Islander people may be under-identified in the data by a factor of 1.09 and therefore the overall Aboriginal and Torres Strait Islander to non-Indigenous separation rate ratio for 2014–15 may have been 2.6, rather than the 2.4 reported for that period [85].

Table 6. Hospitalisations of Aboriginal and Torres Strait Islander people by principal diagnosis, number and percentage, Australia, 2012–13, 2013–14, 2014–15

Principal diagnosis	2012–13		2013–14		2014–15			
	No.	%	No.	%	No.	%	Rate	RR
Factors influencing health status and contact with health services	185,289	48.2	201,177	49.3	223,264	49.8	552.1	5.1
Injury, poisoning, and certain other consequences of external causes	27,653	7.2	28,402	7.0	29,237	6.5	47.0	1.8
Pregnancy, childbirth and the puerperium	22,342	5.8	23,368	5.7	28,831	6.4	29.7	1.4
Diseases of the respiratory system	20,944	5.4	20,702	5.1	22,960	5.1	41.1	2.3
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	18,616	4.8	19,502	4.8	21,644	4.8	42.4	1.4
Diseases of the digestive system	19,315	5.0	20,020	4.9	21,441	4.8	39.2	1.0
Mental and behavioural disorders	16,393	4.3	16,070	3.9	16,941	3.8	28.3	1.7
Other	74,086	19.3	78,924	19.3	83,779	18.7		
Total	384,638	100.0	408,165	100.0	443,097	100.0	946.0	2.4

RR = Rate Ratio - is the rate among Aboriginal and Torres Strait Islander people divided by the non-Indigenous rate.

Source: AIHW, 2014 [83]; AIHW 2015 [84]; AIHW, 2016 [85]

As with the mortality data, there are further issues for those seeking to identify the contribution of alcohol to hospitalisations. While information on hospitalisation for conditions with a PAAF of 1.0 are reported separately, most conditions with a partial PAAF are grouped together with conditions that are not alcohol-related, making it difficult to better estimate the contribution of alcohol.

Age-standardised hospitalisation rates among Aboriginal and Torres Strait Islander people were more than two times those among non-Indigenous people in 2012–13 (2.7 or 384,638 occasions), 2013–14 (2.3 or 408,165 occasions) and 2014–15 (2.4 or 443,097 occasions). The reasons for these hospitalisations are listed in Table 6. The most frequent of these diagnostic categories was 'Factors influencing health status and contact with health services'. This includes multiple hospitalisations of individuals for cancer treatment, rehabilitation and palliative care but the most common service was kidney dialysis. In each of the three years this constituted just under 50% of hospitalisations for Aboriginal and Torres Strait Islander people who, in 2014–15, were hospitalised for this reason at a rate 5.1 times that of non-Indigenous people. The diagnostic categories to which alcohol makes a significant contribution are injury and poisoning and other external causes and mental and behavioural disorders, which were ranked second and seventh in order of frequency.

For conditions wholly related to alcohol use (those with a PAAF of 1.0), hospitalisations for Aboriginal and Torres Strait Islander people were 5,579 (or 1.5%) in 2012–13, 5,240 (or 1.3%) in 2013–14 and 5,250 (or 1.2%) in 2014–15. Table 7 summarises the age-standardised hospitalisation rates per 100,000 people for those conditions for both Aboriginal and Torres Strait Islander and non-Indigenous people as well as the rate ratios. Whereas the rate ratios for all hospitalisations were 2.7, 2.3 and 2.4, the rate ratios for all conditions related to alcohol use were considerably higher – 4.2, 3.8 and 3.7.

Age-standardised rates of hospitalisation for these conditions among Aboriginal and Torres Strait Islander males were about 1.5 times greater than among females. Rates were also significantly higher among those residing in remote and very remote regions compared to those in major cities and inner and outer regional areas, and this is reflected in higher rates in WA, SA and the NT [33].

Table 7. Hospitalisations of Aboriginal and Torres Strait Islander people related to alcohol use, number, age-standardised rates (per 100,000 persons) and rate ratios, Australia, 2012–13, 2013–14, 2014–15

Principal diagnosis	No.	Rate	Rate Ratio
2012–13			
Mental/behavioural disorders (F10.0–F10.9)	4,453	834.2	4.4
Acute intoxication (F10.0)	2,967	574.2	12.2
Harmful use (F10.1)	184	35.8	5.5
Dependence syndrome (F10.2)	703	140.6	1.1
Other (F10.3–F10.9)	689	142.5	6.3
Alcoholic liver disease (K70)	609	126.4	5.7
Other inflammatory liver disease (K75)	39	8.7	1.4
Toxic effect of alcohol (T51)	58	8.9	3.1
Accidental poisoning by and exposure to alcohol (X45)	70	11.2	3.0
Intentional self-poisoning by and exposure to alcohol (X65)	270	46.3	2.2
Poisoning by and exposure to alcohol, undetermined intent (Y15)	49	8.2	3.0
Total of causes related to alcohol use	5,579	1,034.5	4.2
2013–14			
Mental/behavioural disorders (F10.0–F10.9)	4,262	773.7	3.8
Acute intoxication (F10.0)	2,804	498	11.0
Harmful use (F10.1)	177	31.5	4.4
Dependence syndrome (F10.2)	631	121.8	1.0
Other (F10.3–F10.9)	650	121.8	5.0
Alcoholic liver disease (K70)	515	106.0	5.8
Other inflammatory liver disease (K75)	63	12.7	1.9
Toxic effect of alcohol (T51)	41	6.9	2.9
Accidental poisoning by and exposure to alcohol (X45)	76	11.8	3.4
Intentional self-poisoning by and exposure to alcohol (X65)	268	45.0	2.2
Poisoning by and exposure to alcohol, undetermined intent (Y15)	57	10.2	3.9
Total of causes related to alcohol use	5,240	959.2	3.8
2014–15			
Mental/behavioural disorders (F10.0–F10.9)	4,287	773.5	3.8
Acute intoxication (F10.0)	2,966	565.7	11.3
Harmful use (F10.1)	164	30.4	3.7
Dependence syndrome (F10.2)	573	112.8	0.8
Other (F10.3–F10.9)	584	119.3	5.1
Alcoholic liver disease (K70)	512	99.9	5.6
Other inflammatory liver disease (K75)	70	14.9	2.2
Toxic effect of alcohol (T51)	52	8.6	4.0
Accidental poisoning by and exposure to alcohol (X45)	67	11.7	3.5
Intentional self-poisoning by and exposure to alcohol (X65)	266	42.3	2.0
Poisoning by and exposure to alcohol, undetermined intent (Y15)	51	7.8	3.0
Total of causes related to alcohol use	5,250	949.4	3.7

RR = Rate Ratio - is the rate among Aboriginal and Torres Strait Islander people divided by the non-Indigenous rate.

Source: Based on SCRGSP, 2016, Tables 11A.1.8 and 11A.1.9 [33]

Of those conditions with a PAAF of 1.0, acute intoxication was the most common for which Aboriginal and Torres Strait Islander Australians were hospitalised. This condition – which reflects higher levels of single occasion risky consumption among Aboriginal and Torres Strait Islander people – accounted for at least 53% of hospitalisations related to alcohol use nationally in each of the three years 2012–13, 2013–14 to 2014–15. The Aboriginal and Torres Strait Islander to non-Indigenous rate ratios were 12.2, 11.0 and 11.3 respectively. Furthermore, analyses of data between 2004–05 and 2014–15 show that the rate ratio of Aboriginal and Torres Strait Islander to non-Indigenous hospitalisations for acute intoxication increased from 5.7 to 11.4 for NSW, Vic, Qld, WA, SA and the NT combined. [33]. Two other conditions that made a large contribution to hospitalisations for Australia as a whole reflect high levels of risky lifetime consumption of alcohol. These were dependence syndrome and alcoholic liver disease. However, while rates of the former were similar to those among non-Indigenous Australians over the three years, those of the latter were significantly greater (rate ratios of 5.7, 5.8 and 5.6 respectively).

As indicated in Table 6, the second most frequent reason for hospitalisation among Aboriginal and Torres Strait Islander people is injury and poisoning and other external causes. Aboriginal and

Torres Strait Islander people were hospitalised for these causes at rates per 100,000 persons of 4,700 in 2012–13, 4,695 in 2013–14 and 4,605 in 2014–15, rates 1.8 times those among non-Indigenous people [33]. Rates of hospitalisation for all external causes were twice as high among Aboriginal and Torres Strait Islander people residing in remote and very remote regions than among those in major cities [33].

Published reports do not provide estimates of the contribution of alcohol to hospitalisations from external causes however, in Table 8, we have calculated estimates for four categories of conditions for which we have partial PAAFs: transport accidents; falls; intentional self-harm; and assault. These estimates are based on numbers of hospitalisations, differences in male and female hospitalisation rates, the proportions of non-pedestrian and pedestrian accidents (in the case of transport accidents), and PAAFs for the Aboriginal and Torres Strait Islander and non-Indigenous populations [73, 82-86]. Table 8 includes the total number of hospitalisations for each category, the estimated number of hospitalisations that were caused by alcohol and the percentage that those categories contribute to the total number of hospitalisations due to external causes for the years 2012–13, 2013–14 and 2014–15.

Table 8. Number of separations and estimations of alcohol caused separations, by external cause in ICD-10 (Australian Modification) groupings and Aboriginal and Torres Strait Islander status, all hospitals, Australia, 2012–13, 2013–14, 2014–15

Principal diagnosis	Aboriginal and Torres Strait Islander			Non-Indigenous		
	No.	Est. alcohol caused	% alcohol caused*	No.	Est. alcohol caused	% alcohol caused*
2012–13						
V00–V99 Transport accidents	2,811	480	1.2	69,151	17,026	1.6
W00–W19 Falls	7,028	1,190	2.9	291,681	47,258	4.4
X60–X84 Intentional self-harm	2,547	879	2.1	31,918	14,018	1.3
X85–Y09 Assault	7,296	3,363	8.1	18,650	8,301	0.8
Other external causes	24,725			733,387		
Total separations by external causes	41,596			1,075,636		
2013–14						
V00–V99 Transport accidents	2,970	508	1.2	71,388	17,577	1.6
W00–W19 Falls	7,519	1,267	2.9	305,630	49,518	4.4
X60–X84 Intentional self-harm	2,619	901	2.1	31,192	13,700	1.2
X85–Y09 Assault	7,031	3,241	7.5	17,682	7,870	0.7
Other external causes	26,100			773,616		
Total separations by external causes	43,269			1,128,120		
2014–15						
V00–V99 Transport accidents	2,604	445	1.1	61,234	15,077	1.4
W00–W19 Falls	5,735	966	3.3	211,606	34,284	5.5
X60–X84 Intentional self-harm	2,215	756	2.6	27,380	12,025	1.9
X85–Y09 Assault	5,601	2,556	8.7	14,488	6,449	1.0
Other external causes	15,686			367,919		
Total separations by external causes	29,237			621,393		

* Percentage of total separations by external causes estimated to be caused by alcohol. Source: Based on AIHW, 2014 [83]; AIHW 2015 [84]; AIHW, 2016 [85]

Within the broad category of hospitalisations for external causes, those for assault made the largest contribution. The 5,601 hospitalisations of Aboriginal and Torres Strait Islander people for assault in 2014–15 (Table 8) represents a rate of 854 per 100,000 persons – a rate 13.5 times that among non-Indigenous people. In the years 2012–13, 2013–14 and 2014–15, 37.8%, 36.5% and 46.0% of hospitalisations for assault were related to family violence [33]. In this period, Aboriginal and Torres Strait Islander men were hospitalised 217 times per 100,000 persons for family violence related assaults, at a rate 29.2 times greater than non-Indigenous men. Aboriginal and Torres Strait Islander women were hospitalised 633 times per 100,000 persons at a rate 37.0 times that among non-Indigenous women. Rates of hospitalisation from family violence in remote and very remote regions were twice those in major cities, and were highest in WA, SA and the NT. An estimated 45% of these hospitalisations were attributable to alcohol and these accounted for 8.1%, 7.5% and 8.7% of all hospitalisations for external causes in the years 2012–13, 2013–14 to 2014–15.

While the total numbers of hospitalisations for falls was similar to those for assault, the PAAFs for both non-pedestrian and pedestrian accidents and for men and women are lower and hence the estimated number of falls attributable to alcohol is also lower. While hospitalisation for falls accounted for about 17% of those for all external causes, those attributable to alcohol accounted for 2.9% in 2012–13 and 2013–4 and 3.3% in 2014–15.

Hospitalisations for transport accidents and intentional self-harm (as a proportion of all hospitalisations for external causes) were similar in each of the three years 2012–13, 2013–14 and 2014–15; 6.8%, 6.9% and 8.9% for transport accidents and 6.1%, 6.1% and 7.6% for intentional self-harm. However hospitalisations for intentional self-harm contributed twice as much (35%) to total hospitalisations for external causes as transport accidents (17%). As well as being more likely to be hospitalised for assault Aboriginal and Torres Strait Islander women were at least 1.5 times more likely to be hospitalised for intentional self-harm than were males [33]. In 2014–15, while there was little difference in hospitalisations for self-harm rates of hospitalisation for assaults, transport accidents and falls were about 4.8, 1.7 and 1.6 times higher in remote and very remote regions than in major cities and inner and outer regional areas [33].

The estimated numbers of hospitalisations in these four diagnostic categories attributable to alcohol in 2012–13 and 2013–14 (5,912 and 5,917 respectively) were greater than for conditions wholly related to alcohol use. In 2014–15 the number of hospitalisations (4,723) was equal to 90% of hospitalisations for conditions wholly related to alcohol use (Table 7).

Of the four diagnostic categories, assaults estimated to be attributable to alcohol made the greatest contribution to hospitalisations for all external causes in each of the three years (8.1%, 7.5% and 8.7% respectively); a category estimated to have contributed 1% or less than 1% to non-Indigenous hospitalisations.

Fetal alcohol spectrum disorder (FASD)

Fetal alcohol spectrum disorder (FASD) among Indigenous peoples has long been a concern in North America and has become increasingly so in Australia. FASD is a diagnostic term used to describe the permanent, severe, neurodevelopmental impairments that may occur from the effects of maternal alcohol consumption on unborn children [87]. This spectrum of conditions encompasses fetal alcohol syndrome (FAS) at the most severe end, through partial FAS (pFAS), alcohol-related neurodevelopmental disorder (ARND) and alcohol-related birth defects (ARBD) [88]. FASD contributes to multiple harms throughout the life span. It is responsible for impaired cognitive functioning in babies, children and adults. Children with FASD often present with delayed learning and motor skills that affect their ability to process information, especially abstract concepts and higher-ordered cognitions, and their capacity to self-regulate emotions and behaviours [88, 89]. Such learning deficits can have lasting effects on children into the teenage years and adulthood and lead to school disruptions, unemployment, substance misuse and engagement with the criminal justice system [90].

Establishing FASD prevalence in Australia for the total population and for population subgroups remains a challenge. Reasons for this include: lack of clinical recognition of the full spectrum of fetal alcohol disorders; variations in diagnostic criteria employed by medical personnel; and voluntary reporting. In recent years, however, progress has been made to obtain expert consensus on FASD diagnostic criteria, with the recent publication of the *Australian guide to the diagnosis of FASD* [87]. However, as there is still no national data collection on FASD, most of our knowledge of FASD is based on reports of the prevalence of FAS. The only published national report on FAS is from a prospective study based on Australian Paediatric Surveillance Unit data. The study identified 92 cases of which 65% were Aboriginal and Torres Strait Islander, and reported an incidence rate for the population as a whole of 0.06 cases per 1000 live births for the period 2001–2004 (see Table 9) [91, 92].

With few exceptions, published FAS prevalence estimates come from state birth defect registries and are based on passive surveillance. These registries relied on voluntary reporting until 2011 at which time notifications became statutory across the states.

This means that prior to 2011, estimates derived from registry data are thought to underestimate actual population prevalence levels [93]. Comparisons of prevalence levels between Australia and other countries suggest that prevalence estimates for the non-Indigenous Australian population are unrealistically low [94]. In contrast, prevalence estimates for the Aboriginal and Torres Strait Islander population under voluntary reporting may be erroneously high due to the relatively large number of notifications reported in Aboriginal and Torres Strait Islander communities with particularly high rates of alcohol consumption [95].

Most of our knowledge about FASD prevalence among Aboriginal and Torres Strait Islander people is confined to notifications made in Western Australia, and on the basis of just two studies based on data from the Western Australia Birth Defects Registry and the Rural Paediatric Service [96], and from the Western Australia Registrar for Developmental Anomalies (or WARDA, formerly the WA Births Defects Registry) [95]. The former study reports estimates of FAS prevalence, whereas the latter study reports pooled estimates on FAS and FASD prevalence. Since only a minority of cases in the pooled estimates refer to FASD (16 of the 990 cases), it is possible to compare the estimates with the FAS estimates based on the WA Birth Defects Registry and Rural Paediatric Service (Table 9). The extent to which the estimates reflect true prevalence levels in the Aboriginal and Torres Strait Islander and non-Indigenous communities is not known.

The WA registry data suggest that FAS prevalence in the non-Indigenous population is low and stable with a relatively slight increase in levels from 1980 to 2010 (0.02 to 0.04 per 1000 live births). Prevalence rates for the Aboriginal and Torres Strait Islander population are markedly higher than for the non-Indigenous population (by at least 100-fold), and

appear to rise from 1980 to 2010, with a higher rate of increase from 2000 onwards (a rise that might be partly attributable to increased reporting).

Two additional studies report prevalence estimates by Aboriginal and Torres Strait Islander status that are based on data other than registry notifications. The first study reported FAS prevalence estimates for the Top End of the NT based on a review of medical records and outpatient letters from the Royal Darwin Hospital for the period 1990 to 2000. These estimates suggest higher FAS prevalence in the Top End than in Australia as a whole (0.68 compared to 0.06) and in the total Aboriginal and Torres Strait Islander population (1.87 compared to 0.146) [93]. The higher prevalence rate in the Top End than for the country as a whole is partly due to the higher rate of alcohol consumption in the NT.

The second study, The Lililwan Project, reported pooled estimates for pFAS and FAS per 1,000 children (as opposed to live births) in Fitzroy Crossing in WA based on interviews with mothers about their alcohol consumption during pregnancy. This approach broke from standard passive surveillance methods used in the past. The results suggest extremely high FAS and pFAS prevalence among children aged 7 to 9 years old (120 per 1000 children) with rates 20 times higher than shown from the 2010 WA registry data [97, 98]. While differences in data collection may account for some of the disparity in prevalence levels among Aboriginal and Torres Strait Islander people reported using WARDA notification data, two of the project investigators (Bower and Elliott) contributed substantively to the earlier studies on FAS prevalence in both the Aboriginal and Torres Strait Islander and non-Indigenous populations. This, and the fact that the study was initiated by the Fitzroy Aboriginal and Torres Strait Islander Elders lends high credibility to the Lililwan Project findings.

Table 9. Prevalence estimates of FAS (per 1000 live births) by jurisdiction

Jurisdiction	Source	Reference period	Total population	Aboriginal and Torres Strait Islander population	Non-Indigenous population
Australia	Australia Paediatric Survival Unit	2001–2004	0.06	0.146	0.004
Western Australia	WA Birth Defects Registry and the Rural Paediatric Service	1980–1997	0.18	2.76	0.02
		1980–2010	0.26	4.08	0.03
	WA Registrar for Developmental Anomalies*	2000–2010	0.41	6.12	0.04
Fitzroy Crossing, WA	Lililwan Project**	Apr 2010–Nov 2011	n.p.	120.0	n.p.
Northern Territory Top End	Paediatric Dept., Royal Darwin Hospital	Jul. 1990–Jul. 2000	0.68	1.87	0

* Reported cases of FAS (n=194) and FASD (n=16).

** Reported cases of FAS or pFAS (n=13).

n.p. Not publishable because of small numbers, confidentiality or other concerns about the quality of data.

Sources: Elliot et al., 2008 [92], Bower et al., 2007 [99], Mutch et al., 2015 [95], Fitzpatrick et al., 2015 [97], Harris and Bucens, 2001 [93]

Mental health and social and emotional wellbeing

Comorbidity between substance use and mental health disorders is common in the general population. Data from the 2007 *National survey of mental health and wellbeing* indicate that 17.6% of persons with an affective disorder (e.g. schizophrenia, mood disorder, personality disorder) and 11.9% of persons with an anxiety disorder (e.g. stress-related disorders, neurosis) also have a substance use disorder (comprising 6.2% and 14.4% of the total population respectively) [100]. There are no comparable data for Aboriginal and Torres Strait Islander people. Nevertheless, there is strong qualitative evidence linking substance use and poor mental health among Aboriginal and Torres Strait Islanders and it is likely that a significant proportion of Aboriginal and Torres Strait Islander people who are diagnosed with an anxiety or affective disorder also meet the ICD-10 criteria for a substance use disorder.

The few published statistics on the impact of alcohol use on the mental health of Aboriginal and Torres Strait Islander people suggest improvements between 2012–13 and 2014–15 especially among males (see Table 7). Data from this period indicate that age-standardised rates for alcohol-related mental and behavioural disorders [ICD-10 category F10] declined 7.8% from 834 to 773 per 100,000 among Aboriginal and Torres Strait Islander people and increased by 6.7% from 190 to 203 per 100,000 among non-Indigenous Australians [33]. This led to a drop in the rate ratio from 4.4 to 3.8. Although the age-standardised hospitalisation rates for mental disorders due to alcohol among Aboriginal and Torres Strait Islander women are approximately two-thirds lower than among Aboriginal and Torres Strait Islander men, most of the decline occurred within the male population.

Mental and behavioural disorders due to psychoactive substance use, including alcohol, represents just under one-half of mental health related hospitalisations among Aboriginal and Torres Strait Islander men (43.4%) and just under one-third among Aboriginal and Torres Strait Islander women (Table 10). It is notable that for the periods for which data are available, 2005–06, 2008–10, and 2011–13, for Aboriginal and Torres Strait Islander men, the Aboriginal and Torres Strait Islander to non-Indigenous rate ratio fell from 4.5 to 4.0, but increased slightly for Aboriginal and Torres Strait Islander women from 3.3 to 3.5. Aboriginal and Torres Strait Islander men had higher rates of hospitalisation for alcohol-related mental illness and schizophrenia than Aboriginal and Torres Strait Islander women, whereas Aboriginal and Torres Strait Islander women were hospitalised at a higher rate than Aboriginal and Torres Strait Islander men for mood disorders and neurosis [101, 102].

In recent years Aboriginal and Torres Strait Islander researchers have sought to clarify what social and emotional wellbeing (SEWB) means for Aboriginal and Torres Strait Islander people using their own concepts and definitions. Conventional biomedical concepts of SEWB focus on the state of a person's mental health as measured by an ICD-10 diagnosis of an affective, substance abuse or anxiety disorder. To Aboriginal and Torres Strait Islander people, mental health is just one dimension of social and emotional well-being (albeit an important one). In the Aboriginal and Torres Strait Islander context, SEWB encompasses the total environment affecting life quality, including the quality and strength of social relationships, connections to land, family, community, ancestry and spirituality [104, 105]. Both the NATSISS and the AATSIHS include self-reported data on aspects of individual SEWB.

Table 10. Hospitalisations of Aboriginal and Torres Strait Islander people for mental health related conditions, number and age-standardised rate per 100,000 and Aboriginal and Torres Strait Islander to non-Indigenous rate ratios, 2013–2015

Principal diagnosis	Males				Females			
	No.	%	Rate	RR	No.	%	Rate	RR
Mental & behavioural disorders due to psychoactive substance use (F10-F19)	7,538	43.4	13.2	3.7	5,366	32.2	8.7	3.5
Schizophrenia, schizotypal & delusional disorders (F20-F29)	4,374	25.2	7.0	3.0	2,989	17.9	4.9	2.9
Mood disorders (F30-F39)	1,764	10.1	3.1	0.9	3,135	18.8	5.7	0.8
Neurotic, stress-related disorders (F40-F49)	2,078	12.0	3.4	1.4	2,925	17.5	4.5	1.3
Disorders of adult personality and behaviour (F60-F69)	347	2.0	0.5	2.2	800	4.8	1.1	1.2
Behavioural and emotional disorders (F90-F98)	424	2.4	0.4	2.3	164	1.0	0.2	1.9
Organic, including symptomatic, mental disorders (F00-F09)	284	1.6	1.1	2.2	297	1.8	1.1	1.6
Other	579	3.4	n.p.	n.p.	994	5.9	n.p.	n.p.
Total	17,388	100.0	29.5	2.1	16,670	100.0	27.6	1.5

RR = Rate Ratio - is the rate among Aboriginal and Torres Strait Islander people divided by the non-Indigenous rate.
Source: AIHW, 2017 [103]

One measure of SEWB is the level of psychological distress experienced by individuals. In 2014–15, the majority of Aboriginal and Torres Strait Islander people aged 18 years and over self-reported low to moderate distress levels in the previous 12 months. However, 32.5% reported experiencing high to very high distress levels, 2.6 times greater than in the non-Indigenous population [103]. Similarly, a recent study using data from the *Longitudinal study of Aboriginal and Torres Strait Islander children* found that, while the majority of children reported positive relationships across multiple dimensions associated with favourable mental health, 23% were at high risk of emotional and behavioural difficulties [106].

The relationships between alcohol and mental health and SEWB are complex and difficult. On the one hand harmful levels of alcohol use can cause mental health and SEWB problems and on the other hand problems of mental health and social and emotional wellbeing can result in harmful levels of AOD use. They can also interact to mutually exacerbate each other. There are little data on these interactions among Aboriginal and Torres Strait Islander people. However, the Australian Health Ministers’ Advisory Council reported that 9% of Aboriginal and Torres Strait Islander people aged ≥18 years identified alcohol problems as a source of stress [107].

The burden of disease and injury

Mortality data report the number of deaths due to, and morbidity data report the number of hospitalisations for, particular conditions. An alternative approach seeks to measure the *impact* of such deaths and hospitalisations – the burden of disease [22].

Table 11. Burden of disease (number and percentage of linked disease) attributable to alcohol use, Aboriginal and Torres Strait Islander people, 2011

Linked disease	Disability adjusted life years	
	Number	Percent
Alcohol use disorders	8,037	100.0
Suicide and self-inflicted injuries	1,701	20.0
Road traffic injuries—motor vehicle occupants	1,119	23.6
Chronic liver disease	1,001	24.0
Coronary heart disease	634	4.6
Homicide and violence	626	18.5
Poisoning	541	17.4
Other road traffic injuries	327	24.0
Liver cancer	289	23.2
Falls	264	11.2
All other diseases and injuries	1,311	..
Total	15,850	8.3

Source: AIHW, 2016 [61]

The burden of disease approach uses the concept of Disability adjusted life years or DALYs. A DALY is a measure of a year of life lost due to disability and consists of two components; the fatal burden of a condition (years of life lost or YLL) and the non-fatal burden (years lived with disability or YLD). This approach has been taken by the AIHW in a study of the impact of disease and injury among Aboriginal and Torres Strait Islander people. The study included estimates of the contribution of alcohol and 19 other risk factors to the burden of disease. Data on the prevalence of disease and injury were derived from the National Mortality Database. Data on the non-fatal burden were derived from administrative data sources (e.g. disease registers, hospitalisations), surveys and epidemiological studies. Estimates of population distribution of exposure to risk factors such as alcohol were primarily derived from the 2012–13 AATSIHS [61].

As with ABS reports of the causes of death, the burden of disease study reports on broad categories of conditions rather than on specific conditions. Furthermore, as the estimates of exposure to alcohol are based on the AATSIHS (which, as discussed previously, are likely to be underestimates), the estimates of the contribution of alcohol to these conditions are likely to be underestimates. Nevertheless, the findings of the report provide a broad picture of the disproportionate contribution of alcohol to Aboriginal and Torres Strait Islander ill-health. Overall, it was estimated that 8.3% of the total burden of disease was attributable to alcohol (Table 11). This represents a DALY age-standardised rate of 29.1 per 1000 persons compared to a rate of 9.4 among non-Indigenous people – a rate 3.1 times greater. The only alcohol-specific condition reported on was alcohol use disorders and, as shown in Table 12, there was a decline of 7.3% in the age-standardised DALY rate from 14.6 to 13.5 per 1000 persons. This decline from 2003 to 2011 likely reflects the decline in risky drinking observed in the NDSHS.

Table 12. Alcohol use disorders age-standardised YLD, YLL and DALY rates (per 1,000 people) among Aboriginal and Torres Strait Islander people, 2003 and 2011

Burden of disease	2003	2011	Rate difference	Rate difference %
Non-fatal burden (YLD)	11.7	11.4	-0.3	-2.9
Fatal burden (YLL)	2.9	2.2	-0.7	n.p.
Total burden (DALY)	14.6	13.5	-1.1	-7.3

YLD - Year lived with disability

YLL - Years of life lost

DALY - Disability adjusted life year

n.p. = not publishable because of small numbers, confidentiality or other concerns about the quality of the data.

Source: AIHW, 2016 [61]

The impact of alcohol does not equally affect all Aboriginal and Torres Strait Islander people. As shown in Table 13, the impact is significantly less among Aboriginal and Torres Strait Islander females, and older age groups (for both males and females it is greatest in the 15–24 and 25–34 year age groups and declines with age). A key factor in this is the contribution of alcohol to higher rates of self-harm and road traffic accidents among younger people, especially males. The study also reported significant regional variation in the burden of disease. Overall, age-standardised DALY rates were lowest in major cities (379 per 1000 persons) and highest in remote (524 per 1000 persons) and very remote (440 per 1000 persons) regions. However, YLD were highest in major cities and lowest in very remote regions (160 per 1000 persons), while YLL were lowest in major cities and highest in remote and very remote regions (327 per 1000 persons and 280 per 1000 persons respectively). While the impact of alcohol was not reported, the higher rates of YLL in remote and very remote regions are likely to reflect the higher frequency of alcohol-related suicide, assaults and road traffic injuries.

Factors contributing to alcohol use among Aboriginal and Torres Strait Islander people

It is important to recognise that the effects of alcohol on individuals are not simply a product of the substance itself. The amounts of alcohol consumed, the way in which it is consumed and the ways in which people behave under its influence are conditioned by: the characteristics of alcoholic beverages themselves and their availability; individual characteristics of drinkers and their life experiences and SEWB; and wider sociocultural settings, including what are known as the social determinants of health [108-110].

Table 13. Contribution of alcohol to the total burden of disease (DALYs) among Aboriginal and Torres Strait Islander people by age and sex, 2011

Age group	Male %	Female %
15–24 years	20.9	9.3
25–34 years	21.2	7.1
35–44 years	17.6	5.6
45–54 years	10.7	5.5
55–64 years	5.3	3.2
65+ years	3.3	n.a.

Source: AIHW, 2016 [61]

Alcohol and availability

In previous sections, we have identified some of the harms that risky levels of alcohol consumption have caused to the health of a substantial proportion of the Aboriginal and Torres Strait Islander population. The harms caused by alcohol to individuals and communities are proportional to the amount consumed – as consumption at the population level goes up or down so do indicators of health-related harm. However, while risky levels of consumption are partly a function of demand they are also a function of the supply, the availability, price and marketing, of alcohol [108].

A wide variety of groups has been established to meet the demand for and supply of alcoholic beverages. Collectively referred to as the ‘alcohol industry’, these groups include beverage producers, wholesalers, retailers, related industries such as tourism, and their various industry representative bodies and lobby groups [111-113]. The industry generates employment, taxation revenue, and substantial profits. It is politically powerful and influential and strongly resists efforts to control sales. Both nationally and internationally, the alcohol industry has been criticised for maximising its profits by ‘externalising’ the costs associated with alcohol-related harm by transferring them to governments, communities and individuals.

Risky alcohol consumption among some sections of the Aboriginal and Torres Strait Islander population does not take place in isolation. It occurs in the wider Australian context in which supply of alcohol contributes to that harm and for most Aboriginal and Torres Strait Islander people availability, price and industry strategies to promote consumption are determined in the wider political and economic arena. Nevertheless, state and territory liquor licensing laws do provide some avenues for Aboriginal and Torres Strait Islander people to take action to reduce harm.

Individual characteristics

Alcohol is a psychoactive drug and when it is consumed it interacts with neurotransmitters in the brain to produce feelings of pleasure. These feelings of pleasure can positively reinforce the desire to consume more, whether on a single drinking occasion or over time. Furthermore, alcohol consumption can be a negative reinforcer of behaviour. That is, it can interact with the nervous system in ways that enable the drinker to avoid or alleviate negative stimuli – including the symptoms of mental illness, threats to SEWB or stressors in the broader social environment [108, 114].

Chronic consumption of alcohol leads to changes in neural pathways which can result in 'sensitisation' in which the desire for alcohol becomes a craving and to the development of tolerance in which increasing amounts of alcohol are needed to produce the desired pleasurable effects. In addition, those seeking to abstain may suffer negative withdrawal symptoms that can motivate them to resume consumption [108, 114]. Such chronic consumption results in the 'mental and behavioural disorders due to alcohol' or 'alcohol use disorder' summarised in a previous section of this review.

It is important to note that the response of individuals or groups to alcohol is not only a function of the neurobiological processes described above. There are also genetic differences between individuals that increase their risk of dependent use. While there is considerable variability in how such differences are expressed [115], there is no evidence from Australia or elsewhere that population level genetic differences between Aboriginal and Torres Strait Islander and other indigenous peoples on the one hand and non-Indigenous people on the other account for differences in patterns of risky alcohol use or dependence [37]. More important than, and over-riding genetic differences is the fact that people's consumption patterns and behaviour in response to alcohol consumption are learned and conditioned by their expectation of the effect that alcohol will have upon them as well as cultural differences in expectations of such behaviour [116].

Individual life-style choices are sometimes invoked to explain differences in the prevalence of health risk factors, such as alcohol consumption, in the Aboriginal and Torres Strait Islander and non-Indigenous populations. While these may play some role they are not sufficient to explain the broad observed differences either within or between Aboriginal and Torres Strait Islander and non-Indigenous populations. Rather, the evidence clearly demonstrates that both health status in general and AOD use in particular are the result of the different levels of SEWB among individuals and the differential distribution of a range of social factors – largely beyond the control of individuals – which can protect against or cause ill-health and which exert their influence at all stages of the lifecycle from birth to death [110, 117-119].

Social determinants of harmful alcohol use

Individuals do not live in a social vacuum. To a large degree, the personal characteristics that either protect or dispose individuals towards harmful alcohol consumption are shaped by factors in people's social environments – they are socially determined [120, 121]. Much of the evidence for the impact of these factors on alcohol use and health more broadly comes from international studies but before going on to discuss them, it is important to recognise that people's social environments are not simply a given or a natural state of affairs. They are historically determined and cannot be fully understood apart from the historical context from which they have emerged.

The social gradient

The now famous Whitehall Study, which investigated the health of British male civil servants, showed a direct relationship between seniority and health; men at the bottom of the bureaucratic ladder suffered mortality rates four times higher than those at the top [122]. The higher a person's social position, the better health they experienced, meaning that it was not simply poverty but relative inequality that was contributing to differential health outcomes. Material and psychosocial factors are implicated at each stage of the life cycle, from poverty and emotional neglect in childhood, to poor housing, unemployment and stressful racial intolerance in adulthood. This social gradient in health has been confirmed across the world, including in Australia [120, 123, 124]. Some would claim that universal access to social security payments means that Aboriginal and Torres Strait Islander people are not living in poverty, in the same way as those in the developing world. And it is true that stark indices like infant mortality which reflect absolute poverty, are much worse in countries like Sierra Leone (117 per 1,000 live births compared to 9.6 per 1,000 live births among Aboriginal and Torres Strait Islander people) [125]. However, the illnesses which contribute to the existing gap in life expectancy (10.6 years for males and 9.6 years for females) [126] are those demonstrating a clear social gradient – heart disease, diabetes, respiratory disease, cancer, accidents and violence.

Each of the factors implicated in this social gradient of health: stress, early life experiences, social exclusion, work, social support, food and transport, and addiction [110] disproportionately effects the daily lives of Aboriginal and Torres Strait Islander people. Crucially, each can be addressed by proven policy interventions [124].

Stress

People continually experiencing anxiety, insecurity and a lack of autonomy in their everyday lives are more likely to suffer poor health, including mental illness and premature death. These psychosocial factors influence physical health through the body's hormonal and nervous system's 'fight or flight' responses to immediate physical threats. Attending to these threats means those resources crucial for health maintenance are diverted, with resulting impacts on the cardiovascular and immune systems [110]. While these so-called stress-related illnesses are popularly associated with high-income, high-responsibility employment, research has clearly implicated low-income, and low-autonomy as contributing factors [120].

Many Aboriginal and Torres Strait Islander people have demonstrably stressful lives: grief about the loss of country, language and culture [127]; the bitter experiences of everyday life (such as encounters with police, casual racism, unemployment, overcrowded housing); and the impact of premature and unexpected deaths [128]. One observer in central Australia noted that almost a third of her time and that of her Warlpiri co-residents was spent in 'sorry', the cultural response to death [129]. Aboriginal and Torres Strait Islander people frequently lose close family members to premature and sometimes violent death, leading many to excessive alcohol use, which exacerbates their poor health and community wellbeing [130].

Aboriginal and Torres Strait Islander people are less likely than other Australians to feel in control of their lives [131]. Research among First Nation communities in Canada indicates that those with most control over their country, governance, social services and cultural facilities experience lower rates of suicide than other afflicted communities [132]. Policies aimed at reducing stress among Aboriginal and Torres Strait Islander people should support community activities that promote pride in country, language and community-controlled services, such as the Ranger Caring for Country programs recently threatened with de-funding [133].

Early life experience

Disadvantage can begin even before an infant is born. Poor maternal nutrition and exposure to cigarette smoke and alcohol can have life-long impacts on a child, and Aboriginal and Torres Strait Islander women are more likely than other Australian women to be exposed to these risks [67, 110]. In Australia the impact of FASD is being belatedly acknowledged, many years after high prevalence of FASD was identified among Indigenous peoples elsewhere [134].

The malleability of infant biology means that early childhood experiences can have a profound impact on brain, emotional and social development [120]. A child with an insecure attachment to its mother, and subject to inconsistent parenting and poor nutrition, is likely to be less ready for school, with resulting life-long deficits in education and employment and high rates of harmful alcohol use. Importantly, policy interventions such as home visiting in pregnancy and early childhood care and education can be transformative for both women and their children [135].

In Australia there has been bipartisan recognition of the importance of the early years, with child mortality and early childhood education being key *Closing the gap* targets [126]. The target of halving the gap in mortality rates for Aboriginal and Torres Strait Islander children under five within a decade is on track, but as yet the target of access for 95% of all Aboriginal and Torres Strait Islander four-year-olds in remote communities to early childhood education has not been met. Despite this, there have been encouraging developments with increasing numbers of Aboriginal and Torres Strait Islander children receiving quality early care and education, and increased learning opportunities for mothers and other workers relating to the needs of developing children in their communities [136].

Social exclusion and racism

Social exclusion due to poverty, discrimination and racism contributes to poor health and premature death [120]. While many studies have illustrated the material deprivations of Aboriginal and Torres Strait Islander people [137], it is only relatively recently that researchers have turned their attention to the impact of historical and contemporary racism on health and health behaviours, such as smoking and drinking [138, 139]. A systematic review of empirical studies on self-reported racism and health found a particularly strong association between the experience of racism and poor mental health, and a significant relationship between racism and poor health behaviours [139].

The pathways through which these social factors impact on health are becoming better known. More Australians are now aware of the history of Aboriginal and Torres Strait Islander dispossession, and of the subsequent discriminatory legislation which regulated every aspect of Aboriginal and Torres Strait Islander life [140]. However, for many Aboriginal and Torres Strait Islander people, it is not just memories of past injustices that affect their health. When surveyed, 27% of Aboriginal and Torres Strait Islander people reported discrimination of some type over a twelve-month period, and institutional racism is experienced by many in housing, education, employment, health, and the justice system [139].

Policies that have attempted to counteract the impact of social exclusion include legislation such as the *Racial discrimination act 1975* (which makes it illegal to discriminate on the basis of race), and official apologies for past injustice, such as Prime Minister Rudd's 'Sorry' address to the Australian Parliament in 2008 [141]. The effects of such attempts to symbolically atone for the past are, however, contested. Currently public debate in Australia has been dominated by calls to amend the *Racial discrimination act*, in order to allow more 'robust' public speech, despite the damage this speech may do to vulnerable people [142].

Work

Meaningful, reliable work is a potent protector against poor health [110, 120]; unemployment is a significant health risk, particularly when widespread in an area [110]. A six-year study of health, alcohol and psychosocial factors in post-communist Eastern Europe, showed that men and women who were unemployed had more than double the risk of dying than those with jobs [120]. Contributing to this higher risk were increased rates of smoking and drinking among the unemployed, as well as poorer nutrition.

This international research has important implications for Aboriginal and Torres Strait Islander people among whom unemployment remains stubbornly high. Between 2008 and 2012–13 the percentage of non-Indigenous Australians in paid employment rose from 75% to 75.6%. In the same period, however, the proportion of employed Aboriginal and Torres Strait Islander people fell from 53.8% to 47.5% [126]. The *Closing the gap* target to halve the gap in employment between Aboriginal and Torres Strait Islander and non-Indigenous people by 2018 is currently reported as 'no progress' [143].

One significant contributor to poor employment prospects is relatively poor education. Despite some improvements, such as a narrowing gap in Year 12 or equivalent attainment, there have been no overall improvements in Aboriginal and Torres Strait Islander reading and numeracy since 2008 [126].

Policy interventions need to address the reasons for poor school attendance and achievement, as well as access to post-school training and meaningful employment [143].

Social support

Social support at an individual and community level, particularly at critical transitions of the life cycle, can contribute to better health and reduced substance misuse. Pregnancy, early childhood, the commencement of primary and secondary school, and entering post-school training and employment all represent critical opportunities for positive interventions [110, 120].

Government support to those in need can be conditional, such as cash for school attendance and health check-ups, or unconditional, such as the so-called cashless welfare that prohibits purchases of alcohol or gambling. The evidence is equivocal; a recent review of conditional and unconditional support schemes across the world showed more positive school enrolment when conditions were applied and monitored while another example showed no difference in the effects of conditional and unconditional schemes [120, 144]. Opinion is divided in the Aboriginal and Torres Strait Islander community about this issue, but all agree that with respect to both education and employment, it is not simply about forcing people to participate. The quality of education, training and employment offered needs to be addressed if children and adults are expected to attend [120, 143].

Food and transport

Good health is dependent upon access to affordable, adequate food and exercise [110, 120]. Aboriginal and Torres Strait Islander people, particularly those in remote areas, are more likely to experience food insecurity than other Australians, partly due to poverty and lack of transport [145]. A cultural and historical legacy of mission feeding regimes, which have resulted in unhealthy food preferences, and declining levels of physical activity among many Aboriginal and Torres Strait Islander people, has resulted in predictable health consequences [125]. Policy interventions, such as community kitchens where good food is communally produced and cooked, alongside practical advice for maintaining an adequate diet in challenging circumstances, have shown promise [145].

Dependence

In this review, we have been concerned primarily with the health effects of harmful alcohol use. However harmful use of, and dependence on, alcohol, tobacco and/or other drugs, are closely associated with social and economic disadvantage more broadly [120]. In this regard, they are a double-edged sword. Harmful use and dependence are both a response to social disadvantage and associated stresses, and can lead to further disadvantage [110].

Policies and strategies

What's being done?

Wilkes and Gray have written that [146], as harmful AOD use is a complex, multi-causal phenomenon, addressing it requires a comprehensive approach, including strategies to:

- address the underlying social determinants
- prevent or minimise the uptake of harmful use
- provide safe acute care for those who are intoxicated
- provide treatment for those who are dependent
- support those whose harmful AOD use has left them disabled or cognitively impaired
- support those whose lives are affected by others' harmful AOD use.

Below, we will discuss these strategies within the evidence-based demand, supply and harm reduction framework of the *National drug strategy* and the *National Aboriginal and Torres Strait Islander peoples' drug strategy*. Before doing so, however, we will situate them within the government policy framework and discuss some issues that pertain to all strategies to reduce alcohol-related harm.

It is important to recognise that when concerns about harmful alcohol use among Aboriginal and Torres Strait Islander people gained increasing attention in the 1970s, the initial response was driven not by governments but by Aboriginal and Torres Strait Islander people themselves who recognised that non-Indigenous mainstream responses were largely culturally inappropriate and who established services such as Benelong's Haven in New South Wales [147]. Since that time Aboriginal and Torres Strait Islander community groups (often led by women) have spearheaded local action to limit the supply of alcohol and to minimise harm in their communities [1, 148]. Government responses have grown out of both the problem itself and the Aboriginal and Torres Strait Islander response to it. Nevertheless, the policies of governments (national, state and territory) play a major role in providing the context in which responses are framed, especially through their roles as providers of funding. With regard to the latter, while there have been real increases in government expenditure over recent years [33], this funding remains insufficient to meet the need for services and the gaps in service provision [1, 149].

The Government policy documents most directly relevant to the minimisation of alcohol-related harm among Aboriginal and Torres Strait Islander people are the *National drug strategy 2017–2026* (NDS), the *National drug strategy Aboriginal and Torres Strait Islander peoples' complementary action plan 2006–2009* (the CAP) and the *National Aboriginal and Torres Strait Islander peoples' drug strategy*

2014–2019 (NATSIPDS)[150, 151]. The NDS was developed by the former Intergovernmental Committee on Drugs (IGCD), made up of representatives of Australian and state and territory government departments of health and law enforcement, and was endorsed by the responsible government ministers. Since its inception in the mid-1980s there have been various revisions of the NDS. All, however, have been based on: the premise that harmful AOD use is primarily a health problem; the overarching strategy of minimising AOD-related harm; and the three subsidiary strategies of demand, supply and harm reduction. The NDS is not prescriptive but provides an agreed upon strategy which various governments and their agencies use to guide their own responses and priorities. The NDS also provides the framework for the allocation of funding for intervention services, whether those services are provided by governments themselves or non-government organisations [152].

The CAP was first introduced for the period 2003–2006 and subsequently, without amendment, was extended to cover the period 2006–2009. It was developed in recognition that within the NDS there was a need for specific strategies to address the higher prevalence of AOD use among Aboriginal and Torres Strait Islander people. Like the NDS, the CAP was not prescriptive but intended to guide the strategies of the Australian and state and territory governments. It was based on extensive consultation and included six key result areas (KRAs). In summary these were: enhanced capacity for Aboriginal and Torres Strait Islander people to address harmful AOD use; whole of government commitment to implement, evaluate and improve interventions; improved access to services; provision of a full range of services; workforce enhancement; and sustainable partnerships between Aboriginal and Torres Strait Islander communities and the government and non-government sectors [151]. A review of the CAP was undertaken in 2009 and found that: the KRAs were too broad; it lacked performance measures; monitoring of outcomes was poor; and that it had not been used to its full potential, largely because it was not tied to a funding pool. Nevertheless, it concluded that the CAP should continue [153].

A 2010 report on organisations conducting Aboriginal and Torres Strait Islander-specific AOD services also found that several of the key result areas of the CAP were not being adequately met [1]. These included a move away from a government commitment to funding community-controlled organisations, compromising the capacity of Aboriginal and Torres Strait Islander people to address alcohol use issues within their own communities. The report highlighted a paucity of services for particular at-risk groups such as women, young people, and those experiencing mental health issues.

Access to organisations providing a comprehensive range of services from prevention through treatment to on-going care were limited. In addition, the capacity of Aboriginal and Torres Strait Islander community-controlled organisations to deliver services was severely constrained by staff shortages, lack of trained and qualified staff and very limited access to workforce development programs.

Similarly, a review of the Aboriginal and Torres Strait Islander AOD treatment sector found that the CAP lacked a clearly articulated and agreed upon framework through which it was to be implemented and thus provided a poor basis for service planning, as reflected in the maldistribution of AOD intervention services [1, 149]. The review reported that many service providers regarded the CAP as aspirational and poorly translated into service planning and resource allocation, and identified several issues in this regard. Among them were: funding is not commensurate with need or not distributed in accordance with need; resource allocation is often historically rather than needs based; there is little understanding that local communities' needs can change, or that policy and community priorities can be different; and that some policy shifts ignore the evidence-base and best practice, resulting in unplanned service development and a lack of funding for the entire sector [149].

The CAP continued to guide Aboriginal and Torres Strait Islander AOD strategy until the belated release of the *National Aboriginal and Torres Strait Islander peoples' drug strategy 2014–19*. The goal of the NATSIPDS is:

'...to improve the health and wellbeing of Aboriginal and Torres Strait Islander people by preventing and reducing the harmful effects of alcohol and other drugs (AOD) on individuals, families, and their communities.' [154]

The NATSIPDS includes four principles in addition to those in the NDS. These are:

1. Aboriginal and Torres Strait Islander ownership of solutions
2. holistic approaches that are culturally safe, competent and respectful
3. whole-of-government effort and partnerships
4. resourcing on the basis of need (a principle included at the particular insistence of Aboriginal and Torres Strait Islander people).

Within this framework four priority areas were identified:

1. building the capacity of the AOD system
2. increased access to a full range of services
3. strengthening partnerships between Aboriginal and Torres Strait Islander, government and mainstream service providers
4. establishing systems to evaluate performance [154].

Like the CAP, no specific allocation of funds has yet been set aside for its implementation, rather funding is to be provided through various Australian and state and territory programs. Reflecting Australian Government policy, the NATSIPDS emphasises the role of mainstream providers to a greater extent than did the CAP. At the time of writing, no evaluation of the progress on implementation of the NATSIPDS has been undertaken and it remains to be seen whether it will be more effective than its predecessor.

Between 2005 and 2014, Aboriginal and Torres Strait Islander people had a policy advisory role through the National Indigenous Drug and Alcohol Committee (NIDAC) – a sub-committee of the Australian National Council on Drugs (ANCD). NIDAC had some notable successes including pressing for the introduction of low aromatic fuel to combat petrol sniffing, input into various government enquiries, publication of policy and information papers, hosting of biennial Aboriginal and Torres Strait Islander AOD conferences, and input into development of the NATSIPDS. However, NIDAC was abolished when the ANCD was replaced by the Australian National Advisory Committee on Alcohol and Drugs (ANACAD), which includes only two Aboriginal and Torres Strait Islander members.

It is important to recognise that the NDS and the NATSIPDS do not provide the sole policy response to harmful alcohol use, either in Aboriginal and Torres Strait Islander or non-Indigenous contexts. Australian Government taxation policy and regulations influence the price of alcoholic beverages and their consumption [155]. The availability of alcoholic beverages is also affected by state and territory liquor licensing legislation and although this legislation includes harm minimisation objectives, to varying degrees, they are balanced against the interests of the liquor industry [156]. Furthermore, while the underlying premise of the NDS and the NATSIPDS is that harmful alcohol use is a health problem, laws and/or their application in some jurisdictions are applied with a focus on social order and punitively applied against Aboriginal and Torres Strait Islander people [157-159]. These issues are not new and Brady provides an historical overview of them [45]. It is also the case that other government policy priorities may be at odds with those of alcohol-specific policy. Thus, for example, AOD policy aimed at improved service provision may be undermined by government budgetary policy aimed at constraining or reducing expenditure.

Community control

Just as important as AOD intervention services themselves are the ways in which those services are provided. AOD services provided by non-Indigenous (mainstream) government and non-government organisations are intended to be available to all Australians, including Aboriginal and Torres Strait Islander people. Some Aboriginal and Torres Strait Islanders prefer to use these services for reasons including convenience, the anonymity they provide, and because of the 'shame' factor associated with alcohol dependence in their own communities. Many Aboriginal and Torres Strait Islanders, however, regard mainstream services as inappropriate to their needs and racist, and express a preference for using Aboriginal and Torres Strait Islander community-controlled organisations where they are available [149, 160]. It was for these reasons among others that a wide range of Aboriginal and Torres Strait Islander community controlled organisations have emerged, including primary health care and AOD service providers, and why most AOD services for Aboriginal and Torres Strait Islander people are provided by Aboriginal and Torres Strait Islander community-controlled organisations. There is evidence that – provided with adequate resourcing – the culturally safe services provided by community-controlled organisations result in better outcomes [149, 161]. This is recognised in both the NATSIPDS and the *National Aboriginal and Torres Strait Islander health plan 2013–2023* [154, 162]. However, there is concern among some observers that the commitment to community control is being undermined by the increasing award of tenders to non-Indigenous non-government organisations to provide services to Aboriginal and Torres Strait Islander people [1, 149]. Aboriginal and Torres Strait Islander people should be key players in the design and implementation of interventions to address harmful alcohol use in their own communities, with capacity building within Aboriginal community-controlled organisations a central focus.

Harm minimisation

Demand reduction

Demand reduction is based on evidence demonstrating that the less alcohol consumed by individuals and populations the less physical and social harm will be experienced [108]. As stated in the NDS, demand reduction aims to: prevent uptake and delay onset of AOD use; reduce use of drugs in the community; support people to recover from dependence and reconnect with the community; and support efforts to promote social inclusion and resilient individuals, families and communities [163].

Addressing the social determinants

To effectively reduce demand for alcohol and related harm, it is essential that interventions address the underlying social determinants of that demand. Without this, alcohol-specific interventions will be limited in their overall effectiveness. Aboriginal and Torres Strait Islander people have long been working to address the social and economic disadvantages they and their communities face and there is a wide range of Australian and state and territory government programs to support them in areas such as housing, education, employment and enterprise development. At the Australian Government level, many of these fall under the umbrella of the Department of the Prime Minister and Cabinet's *Indigenous advancement strategy* which has five broad program areas:

1. Jobs, Land and Economy
2. Children and Schooling
3. Safety and Wellbeing
4. Culture and Capability
5. Remote Australia Strategies [164].

It is beyond the scope of this paper to review these strategies but the SCRGSP [33], the Prime Minister [165], and the Close the Gap Campaign Steering Committee [166] each provide regular reports on progress in this area. Suffice it to say, however that social and economic disadvantage remain considerable.

Alternatives to alcohol and other drug use

One of the more common demand reduction interventions, generally targeted towards young people, is providing alternative activities to AOD use [1]. Alternative activities include sporting, recreational, employment, education retention, and culturally focused activities. They have the wider focus of strengthening well known protective factors, such as improving school engagement and retention, fostering positive family relationships, developing young people's self-esteem, wellbeing, self-worth and cultural connectedness [1, 167].

Education and persuasion

Education and health promotion interventions take many forms, including school-based AOD programs, and include health promotion programs that focus on raising awareness of safe consumption levels and alcohol-related harms, and provide support and advice for those attempting to reduce or abstain from use [3]. While widely popular (in part due to their relatively low cost), with the exception of some particular school-based programs [168], the evidence for the effectiveness of education and persuasion strategies remains equivocal among both non-Indigenous and Aboriginal and Torres Strait Islander populations [108, 169].

What this suggests is, that while the information provided in such programs may be necessary for individuals and communities to act, it is not sufficient and that education and persuasion programs should be part of a wider suite of intervention strategies [3].

Screening and brief interventions

Screening for potentially harmful use of alcohol is part of the Aboriginal and Torres Strait Islander health check funded through Medicare to encourage early detection, diagnosis and intervention for common and treatable conditions in primary health care settings [170]. Generally, patients are screened using AUDIT-C or one of the other instruments described in an earlier section of this review. Depending upon their score on the assessment, patients may be referred or followed-up for treatment or offered a brief intervention consisting of advice on safe levels of drinking, information and education [55]. Among non-Indigenous populations, for those who are not alcohol dependent, brief interventions have been shown to be cost effective [171]. While some barriers to integration of brief interventions in Aboriginal and Torres Strait Islander primary health care settings have been identified [172, 173], if delivered in a culturally sensitive, respectful, and non-judgemental manner clinicians have found them to be effective [3, 171].

Treatment

Treatment aims to reduce the demand by individuals for alcohol and hence to minimise further harm. Treatment for alcohol dependence among the general population has a number of positive outcomes including reduced AOD use, improved physical and psychological health and reductions in criminal behaviour [169]. Furthermore, regardless of type, any exposure to treatment is associated with significant reductions in consumption and related harm [108]. A range of treatment options is available all of which are utilised by Aboriginal and Torres Strait Islander clients. The range of treatments includes: withdrawal management (detoxification); pharmacotherapies, including those to assist in withdrawal and alcohol aversion drugs; and psychosocial therapies, including cognitive behavioural therapy, motivational therapy and narrative therapy [55, 174, 175]. Importantly, given the high levels of social and emotional distress and comorbid mental health conditions that drive risky levels of consumption and dependence, it is important that these be addressed concurrently otherwise treatment is less than optimally effective and the risk of relapse remains high [149, 176].

Treatment is provided by a range of organisations including primary health care services and AOD specialist services, and in a range of settings including health care clinics, communities, residential services and in some cases hospitals [1].

In non-Indigenous settings, treatment provided in non-residential settings is as effective as that provided in residential settings [108, 171]. An exception to this, however, has been found where patients:

- are highly resistant to treatment
- have few financial resources
- come from environments that are not conducive to recovery
- have more serious, coexisting medical or psychiatric conditions [108].

Given the disadvantages they face, this finding is clearly applicable to Aboriginal and Torres Strait Islander people seeking treatment for a chronic relapsing condition. It is also clear that total abstinence following treatment is the exception rather than the rule [108, 177]. Thus, while abstinence might be a desirable goal for some, a more realistic expectation is that treatment will result in reduced consumption, longer periods between relapse, improved health and social engagement, and reduced harm.

A number of factors have been identified that enable or create barriers to access and provision of effective treatment for Aboriginal and Torres Strait Islander people. These include: inadequate resourcing; a lack of specialist services in some regions; and the hidden costs associated with entering treatment programs (especially for women) [149, 178]. Resourcing is a particularly acute issue. Previous research has shown that there has been a lack of funding for specialist Aboriginal and Torres Strait Islander services in some regions [1], and given the complexity of the problems they face it has been estimated that on average it costs between two and three times more to provide adequate levels of treatment to Aboriginal and Torres Strait Islander than to non-Indigenous clients [179].

The role of culture and cultural differences cannot be underestimated as a facilitator or barrier to effective treatment [178-181]. The way in which treatment services are delivered to non-Indigenous people cannot simply be applied to Aboriginal and Torres Strait Islander clients. Service providers need an understanding of the cultures and social circumstances of their clients and they and the organisations in which they operate must provide a culturally safe environment for Aboriginal and Torres Strait Islander people [182]. These conditions are most effectively met by Aboriginal and Torres Strait Islander community-controlled organisations and it was estimated in 2014 that the additional cost to mainstream organisations to meet those conditions was approximately \$60,500 per organisation per year [179].

On-going care

As indicated above, alcohol dependence is a chronic relapsing condition and even with the most effective treatment the likelihood of relapse is high. For this reason, on-going care (after-care, follow-up care) is essential to obtain the optimal benefits of treatment and the resources that are invested in it [146, 149, 183]. The need for such care varies but can be provided through individual counselling and support, support groups, transitional housing and employment support. An increased recognition of the need for such services has resulted in governments directing increased funding toward them.

Supply reduction

The evidence shows that there is a clear link between overall levels of alcohol consumption, levels of risky consumption and levels of alcohol-related harm. The evidence also shows that the most effective means of reducing alcohol-related harm is to reduce alcohol consumption [108]. In the NDS, supply reduction for alcohol is targeted towards the regulation of legitimate supply [163], but the NATSIPDS explicitly states 'Supply reduction strategies aim to reduce the availability of alcohol ... and control ... (it's) use' [154]. While these statements are contradictory, the point is moot because governments have been reluctant to implement broad supply control measures – and in some jurisdictions there has been a relaxation of them. There are several reasons for this: alcohol is a legal substance; large numbers of the population enjoy access to it; and the alcohol industry is a significant component of the Australian economy and its constituent segments are able to exert considerable political power to ensure that their profitability is not curtailed. For these reasons, efforts to reduce the supply of alcohol have been largely implemented at the local level where they have been both (implicitly or explicitly) targeted at and/or initiated by Aboriginal and Torres Strait Islander people.

Alcohol taxation

The most effective means of reducing the supply of alcohol is by increasing price – a strategy that is open to the Australian Government by increasing taxes on alcoholic beverages. While it did this successfully with regard to pre-mixed drinks in 2009, the Government has been generally reluctant to use this power – despite evidence that the cost of alcohol-related harm outweighs the revenue raised from alcohol taxation [23]. This reluctance appears to stem from the short-term budgetary benefits of alcohol taxation revenue (\$6.0 billion in 2014–15)[184], pressure from the alcohol industry and fear of an electoral backlash.

There have been calls – including by Aboriginal and Torres Strait Islander organisations such as the Aboriginal Drug and Alcohol Council (SA) – for the Australian Government to introduce a tiered volumetric tax on alcohol under which all beverages would be taxed on their alcohol content, with higher taxes being levied on higher alcohol content drinks [185]. Advocates of this approach argue that: due to the price elasticity of demand for alcohol, consumption would be reduced; potentially more taxation revenue would be available to fund other harm minimisation measures; and both Aboriginal and Torres Strait Islander and non-Indigenous people would be affected equally. However, calls for such a measure have been rejected by both Liberal-National and Labor Governments.

In the 1990s, the NT introduced a small levy; first on the sale of all alcoholic beverages and later an additional levy on the sale of cask wine. The levies were aimed at raising funds for demand reduction measures under the Living with Alcohol Program. However, it also had the effect of raising price and reducing consumption, with reductions in alcohol-related deaths and hospitalisations among both Aboriginal and Torres Strait Islander and non-Indigenous Territorians [186, 187]. Subsequently, a decision of the High Court ruled that the levy was in fact an excise duty (which under the Australian Constitution only the Commonwealth Government can impose) and it was discontinued.

Alcohol restrictions

As indicated previously, at the state and territory level liquor licensing acts impose restrictions on the supply and sale of alcohol – restrictions that are enforced through policing [156, 188]. While the states and territories generally have been reluctant to use such acts to effect widespread supply reduction, these pieces of legislation contain provisions under which variations can be made to regulations pertaining to particular licensed premises or localities.

Either of their own volition or at the request of Aboriginal and Torres Strait Islander communities or other key stakeholders – such as the police or government health agencies – liquor licensing authorities have used their powers under these acts to impose additional restrictions in particular towns. These localities include Alice Springs and Tennant Creek in the NT and Halls Creek and Fitzroy Crossing in WA. The restrictions have been generally imposed as packages of whole-of-community restrictions, usually including restrictions on the sale of particular beverage types or on trading hours. There is international and national evidence, as well as from some of these localities, for the effectiveness of these restrictions in reducing alcohol consumption and related harm [8, 156, 188-190]. However, there is also evidence that – in the absence of complementary demand reduction measures – over time there may be a reduction in the impact of these restrictions [188].

Indirect price control

Banning the sale of low-priced high-alcohol content beverages such as cask, table and fortified wines has been particularly effective at the local level. This is an indirect price control intervention that increases the average price per standard drink; meaning that consumers can purchase less alcohol for a given amount of money and – as alcohol has a relatively high elasticity value – overall consumption is reduced [8, 191]. A study from Central Australia centred on Alice Springs, showed that when sales of table wine in casks of more than two litres and fortified wine in casks of more than one litre were prohibited as part of a package of restrictions in 2006, the wholesale price per litre of pure alcohol rose from an average of \$69.75 in the preceding 13 quarters to \$90.60 in the following 16 quarters and consumption fell from an average per quarter of 3.9 litres to 3.4 litres per person aged 15 years and over. This was associated with a levelling of hospitalisations for alcohol attributable conditions and a rate of hospitalisations that was significantly less than expected based on previous trends [8]. Similar reductions in consumption and alcohol-related hospitalisations were observed in an earlier study from Tennant Creek [189]; and another study from Tennant Creek demonstrated that money was not diverted from the purchase of foodstuffs to the purchase of alcohol [192].

Community-wide alcohol bans

All state and territory liquor licensing laws contain provisions for the prohibition of the possession or consumption of alcoholic beverages in particular areas. Aboriginal and Torres Strait Islander lands acts in some jurisdictions also provide for controls to be applied specifically to Aboriginal and Torres Strait Islander lands. Evaluation of the impact of such measures has been limited but d'Abbs found that while not eliminating alcohol-related harm they are effective in reducing it [193]. He also identified three criteria that must be met to achieve some control over alcohol: (1) community council commitment; (2) genuine community support; and (3) agreement on enforcement [193]. Aboriginal and Torres Strait Islander people themselves have availed themselves of such legislation, for example by 2005 79% of remote Aboriginal and Torres Strait Islander communities in the NT had declared themselves 'dry' under provisions of the *NT liquor act* [194, 195]. Despite this and with no consultation with affected Aboriginal and Torres Strait Islander communities, in 2007 the Howard Government's *Northern Territory national emergency response act* [196] applied prohibitions on the provision, possession and consumption of alcohol on all Aboriginal land with an administrative proviso that these could be modified subject to implementation of approved *Alcohol management plans* (AMPs). Importantly, this act was exempt from provisions of the *Racial discrimination act* [197] – an issue of particular concern to Aboriginal and Torres Strait Islander communities.

The prohibitions were maintained under the Gillard Labor Government's *Stronger futures in the Northern Territory act* [198] but with the provision that they were no longer exempt from the application of the *Racial discrimination act*. A review of the *Northern Territory emergency response* (NTER) found that there had been a reduction in alcohol consumption and related harm; however, this was likely to have been due to an increased police presence and enforcement of the restrictions rather than the new bans themselves [195].

Local dry area alcohol bans

Another form of alcohol bans are 'local dry area alcohol bans' [188]. Such bans usually prohibit the consumption of alcohol in specific public areas within cities or towns – as in Adelaide and Port Augusta in SA. However, they have also been applied more widely such as in the case of the still current 'Two kilometre law' in the NT which prohibits consumption of alcoholic beverages within two kilometres of licensed premises, and the Northern Territory Licensing Commission decision which has declared all of Alice Springs a restricted area [8, 199, 200]. While ostensibly having application to all citizens, these bans have implicitly targeted Aboriginal and Torres Strait Islander people in their application and enforcement. As well as being discriminatory, the available evidence indicates that these are ineffective and simply move public drinking to adjacent areas – often where the risk of harm is greater [188, 200, 201].

Alcohol management plans (AMPs)

With some variation, *Alcohol management plans* (AMPs) have been introduced in several jurisdictions and have been reviewed by Smith and others [202]. Although they have been implemented in regional towns such as Alice Springs and Port Augusta, they have been most commonly applied in Aboriginal and Torres Strait Islander communities. In principle, the purpose of AMPs is to enable particular communities to develop broad-based local approaches to the minimisation of alcohol-related harm. In practice, however, they have focused on supply, to the neglect of demand reduction strategies. This focus has been contentious, especially when AMPs have been driven by governments and where such measures are perceived to be discriminatory. Nevertheless, there is some limited evidence for the effectiveness of AMPs:

'... it has been found that where AMPs are locally driven and owned, there are stronger and more sustainable outcomes.' [202]

The effectiveness of controls on supply

There are two commonly raised objections to the introduction of tighter alcohol supply controls. The first is that they are commonly circumvented. This is no doubt the case, but the real question is to what extent do such circumventions undermine the impact of the restrictions or have unintended negative consequences? The evidence with regard to the former shows that, generally, attempts to circumvent restrictions have limited impact in comparison to that of the restrictions [8, 188, 189]. Negative unintended consequences are likely to vary from community to community and to be dependent upon factors such as the level of community support.

The second objection to tighter alcohol supply controls is that they lead to increased use of other drugs as a substitute for alcohol. The international evidence indicates that – while some substitution might take place – substitution of one drug for another is variable and complex, and not a simple one-to-one phenomenon [203]. It has been reported that in Aboriginal and Torres Strait Islander communities where alcohol bans or restrictions have been imposed there have been increased levels of cannabis use. While some of this use might be attributable to substitution, it is important to note that increases in cannabis use have not been confined to communities with alcohol restrictions but have also occurred in communities in which there have been no additional restrictions [204–206]. More recently, it has been claimed that alcohol bans have led to increased methamphetamine use. Again, however, while we do not have good quantitative data on the prevalence of methamphetamine use, if such use has increased, concerns about it have been raised broadly and not confined to communities with additional controls on the supply of alcohol.

The evidence at an international, national and Aboriginal and Torres Strait Islander community level, clearly demonstrates that additional controls on the supply of alcohol can be effective in reducing alcohol-related harm. However, the literature makes clear that to be effective such measures need to be led and supported by local Aboriginal and Torres Strait Islander communities and should not be discriminatory [159, 207, 208]. Where these conditions are met, there is strong Aboriginal and Torres Strait Islander support for additional restrictions [209]; otherwise there is resistance to them.

Harm reduction

The overall objectives of the NDS and the NATSIPDS 2014–2019 are to minimise harmful consumption of alcohol and other drugs. Both, however, also include the recognition that at the same time there is a need to reduce the harms directly arising from AOD consumption. Most harm reduction strategies target the wider community and include a broad range of interventions, such as community policing, family violence programs, drink driving

prevention programs, responsible service of alcohol, removal of glass drinking containers from licensed premises or sporting facilities, and support services such as women's, and youth shelters for those experiencing the harms of their own or someone else's alcohol use [150, 210]. It is beyond the scope of this paper to review this broad range of harm reduction strategies and for some there is no specific evidence relating to Aboriginal and Torres Strait Islanders. Rather, we will review two key harm reduction strategies that have grown out of Aboriginal and Torres Strait Islander communities – community patrols and sobering-up shelters.

Community patrols

Community patrols – also known as warden patrols, night patrols, day patrols, foot patrols and youth patrols – operate in remote, regional, and urban centres and vary considerably in their operational structures and roles. The first community patrols were established in the NT in the late 1980s and their role was highlighted by the Royal Commission into Aboriginal Deaths in Custody (RCIADC) [211]. They provide assistance and transportation to a place of safety for intoxicated persons, to prevent them from harming themselves and/or others. Patrols were identified as a means of keeping people out of police custody and following the Royal Commission they spread rapidly both within the NT and to other jurisdictions [212].

While a large component of their work deals with the consequences of intoxication, the role of patrols often extends more broadly to issues of community safety (including but not limited to crime prevention) and they provide culturally safe, non-coercive alternatives to police involvement [213, 214]. Due to both the variety of patrols and the activities they perform, there is little quantitative data on the outcomes they have achieved [213]. Nevertheless, they generally enjoy community support, there is a range of qualitative reports attesting to their effectiveness, and several have won awards in recognition of their work [213, 214]. Factors which have been identified as contributing to their success include community support and trust, and effective links with other services and agencies [214, 215].

Sobering-up shelters

The first sobering-up shelter was established in Tennant Creek in 1983 [215, 216]. The RCIADC highlighted the role and importance of sobering-up shelters in reducing incarceration and the risk of death in custody, and recommended the establishment of more shelters [211, 217, 218]. In response shelters have since been established in all jurisdiction except Tasmania and the ACT [1].

The purpose of sobering-up shelters is to reduce the harms from alcohol use for both intoxicated persons and others. Working closely with community patrols and the police, sobering-up shelters provide intoxicated people with a safe alternative to police custody, a bed, and when the person is sober, a place to shower, breakfast, and in some cases laundry facilities. Clients are also generally offered brief AOD interventions and/or referrals to withdrawal management, treatment or other services [215, 219].

Sobering-up shelters are sometimes criticised by both Aboriginal and Torres Strait Islander and non-Indigenous people for not providing treatment and for enabling their clients to continue drinking. However, this view fails to recognise the purpose of the shelters. While entry into treatment might be desirable for some clients, many are resistant and unwilling or unable to reduce their consumption and the purpose of the shelters is to prevent those clients from unnecessary harm – something that sobering-up shelters are effective in doing [215].

Future directions

The evidence shows that most Aboriginal and Torres Strait Islander people either do not consume alcohol at levels that pose risks to their health and wellbeing or do not consume it at all. Others however, consume it at levels that cause considerable harm and at levels significantly greater than among the non-Indigenous population. There is also good evidence that the causes of these higher levels of consumption lie in: the legacy of history; the current inequalities and continuing racism that are rooted in that history; and the higher levels of social and emotional distress and mental illness arising from those inequalities that in turn drives higher levels of alcohol use and its consequences. There is also evidence that this sets up a vicious circle in which higher levels of alcohol use and dependence contribute further to inequality and distress.

Evidence suggests that to minimise the harms arising from alcohol use we require a two-pronged strategy: firstly to address the underlying social determinants namely the social inequalities that underlie social and emotional distress; and secondly to directly address the problem of harmful use and its consequences. Evidence-based strategies can address these harms, and the factors that can facilitate or impede implementation of them. With regard to the provision of AOD services we have the tools to calculate the cost of providing services of an 'adequate' level and we have estimates of the additional costs required to provide services to Aboriginal and Torres Strait Islander people that address their special needs.

Aboriginal and Torres Strait Islander people who experience alcohol-related harms in their communities generally have a good understanding of what is needed in those communities and what will and will not work and have been at the forefront of addressing those needs. There is also good evidence that solutions that are externally imposed on Aboriginal and Torres Strait Islander communities are less likely to be effective and more likely to be resisted. It was on this basis that past policies of self-determination and self-management were adopted and this underpins the principle of Aboriginal and Torres Strait Islander community control of services.

While some individuals may do well, as a population Aboriginal and Torres Strait Islander people cannot overcome the disadvantages they face without government support. Reflecting the evidence, Australian governments have introduced a range of policies, strategies and programs to provide that support. These include the IAS to address the social determinants, the CAP and now the NATSIPDS specifically to minimise AOD related harm.

The reports of the SCRGSP and other organisations show that we have made only slow progress in addressing alcohol-related harm and its causes. What then is the way forward? In our view, the way forward is not new but has already been charted in numerous reports and evidence-based policy documents. What is needed is a commitment to act more vigorously on the evidence we already have – particularly to address the social determinants of alcohol-related harm.

With regard to the provision of AOD services, there is a need to provide greater access to a holistic range of services. This includes better integrating alcohol treatment services with primary health care and SEWB services, providing AOD service in areas that are currently under-served and providing services for Aboriginal and Torres Strait Islander sub-groups such as women and young people. There is a need to ensure that organisations providing those have both the organisational and workforce capacity to deliver them. Recognising that mainstream services are available for those Aboriginal and Torres Strait Islander people who choose to use them, there is a need for all levels of government to recommit in practice, to the principle of Aboriginal and Torres Strait Islander community-control of services for Aboriginal and Torres Strait Islander people.

All of the points raised thus far are impacted upon by a much larger issue that is resourcing. The statement that 'No Australian Government has committed the resources needed to alleviate Aboriginal disadvantage' remains as true today as it was over twenty-five years ago [220]. Australia is one of the richest countries in the world but a many of its Aboriginal and Torres Strait Islander population live in extreme disadvantage.

Australia has the resources to alleviate this and to do so is an investment in the country's future, but to do so requires a commitment to equity and justice for all Australians. This also requires leadership from politicians. To plead budgetary constraints is to place the interests of the wealthiest members of society over those of the most disadvantaged.

In broad terms, we know what works to minimise alcohol-related harm among Aboriginal and Torres Strait Islander people. 'What is needed is the commitment to do it – with and not for Aboriginal and Torres Strait Islander people' [146].

Concluding comments

While individuals can make healthy decisions about their alcohol use, their choices are framed by the social conditions of their lives. This is particularly true for many Aboriginal and Torres Strait Islander people, whose everyday lives constrain their ability to make healthy lifestyle choices. The better news is that healthy public policies, which address the early years, education, employment and social support, as well as specific interventions around substance misuse, can make a significant difference. The challenge for political leaders is to persuade citizens that such interventions are in the interests of everyone, not simply the disadvantaged, because of future costs to the health, welfare and justice systems when inequity is not addressed.

Appendix 1

Australian guidelines to reduce health risks from drinking alcohol (2009)

<p>Guideline 1: Reducing the risk of alcohol-related harm over a lifetime</p>	<p>The lifetime risk of harm from drinking alcohol increases with the amount consumed</p> <p>For healthy men and women, drinking no more than two standard drinks on any day reduces the lifetime risk of harm from alcohol-related disease or injury.</p>
<p>Guideline 2: Reducing the risk of injury on a single occasion of drinking</p>	<p>On a single occasion of drinking, the risk of alcohol-related injury increases with the amount consumed</p> <p>For healthy men and women, drinking no more than four standard drinks on a single occasion reduces the risk of alcohol related injury arising from that occasion.</p>
<p>Guideline 3: Children and young people under 18 years of age</p>	<p>For children and young people under 18 years of age, not drinking alcohol is the safest option</p> <p>Parents and carers should be advised that children under 15 years of age are at the greatest risk of harm from drinking and that for this age group, not drinking alcohol is especially important.</p> <p>For young people aged 15–17 years the safest option is to delay the initiation of drinking for as long as possible.</p>
<p>Guideline 4: Pregnancy and breastfeeding</p>	<p>Maternal alcohol consumption can harm the developing fetus or breastfeeding baby</p> <p>For women who are pregnant or planning a pregnancy, not drinking is the safest option.</p> <p>For women who are breastfeeding, not drink.</p>

Source: Adapted from National Health and Medical Research Council, 2009 [20]

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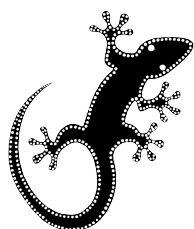
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Australian Indigenous HealthInfoNet

The Australian Indigenous HealthInfoNet's mission is to contribute to improvements in Aboriginal and Torres Strait Islander health by making relevant, high quality knowledge and information easily accessible to policy makers, health service providers, program managers, clinicians, researchers and the general community. We are helping to 'close the gap' by providing the evidence base to inform practice and policy in Aboriginal and Torres Strait Islander health.

The HealthInfoNet addresses this mission by undertaking research into various aspects of Aboriginal and Torres Strait Islander health and disseminates the results (and other relevant knowledge and information) mainly via its Internet site (www.healthinonet.ecu.edu.au). The HealthInfoNet's research mainly involves analysis and synthesis of data and other information obtained from academic, professional, government and other sources, but it also undertakes some primary data collection and analysis.

The HealthInfoNet is a leader in knowledge transfer, the area of research which aims at transferring the results of pure and applied research into practice. In this research, the HealthInfoNet addresses the knowledge needs of a wide range of potential users. These include policy makers, health service providers, program managers, clinicians and other health professionals (including Aboriginal and Torres Strait Islander health workers), and researchers. The HealthInfoNet also provides easy-to-read and summarised material for students and the general community.

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(Water Dreaming)**

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