

Chapter 3: Literature Review: Gambling and Indigenous Australians

3.1 Chapter overview

This chapter summarises literature specific to gambling by Australia's Indigenous population over the last 70 years. The review is separated into two sections. The first examines the literature prior to 1985, while the second section focuses on the period from 1985 to the present. This split broadly represents time before and after self-determination, which opened up new opportunities for Indigenous people through their ability to access the cash economy. The pre 1985 literature is set out chronologically and highlights the changing nature of unregulated gambling in the form of card games from the 1930s. Also included in Appendix 1 are three tables summarising all literature examined as part of the review:

1. Indigenous and gambling specific
2. Indigenous specific and mentions gambling, but not primarily about gambling (e.g. health or social research where gambling mentioned)
3. Gambling specific and includes Indigenous, but not indigenous specific.

3.2 Gambling and Indigenous Australians

Gambling can take on many forms along a continuum from games of skill to games of pure chance. As made clear by Chapter 2, the Indigenous population is by no means homogenous within Australia, and significant differences exist in demographic characteristics and socioeconomic status that reflect not only differences along the urban-rural-remote gradient, but also diversity within geographic regions. Given this heterogeneity, it is important to recognise that gambling is likely to have different meanings and differential impacts depending on where in Australia it occurs and also in relation to the type of gambling activity being played. It is difficult to pinpoint when and how gambling became a part of the social fabric of Indigenous Australians, although from most accounts it was either learned by men working on cattle stations, or from Asian immigrants during various gold rushes in Australia's history.

It is convenient to separate the discussion of 'Indigenous gambling' (i.e. unregulated gambling predominantly including card games) into two parts, with the first section dealing with literature on gambling from the 1940s through to 1985. This section follows a broadly chronological discussion based on the time the research was carried and reflects a period of significant change for Indigenous Australians. The second section discusses more recent research since the 1990s and includes literature on both remote and urban populations. This broad separation of the literature also reflects the significant changes in Australian law which involved the gaining by Indigenous Australians of full citizenship rights in the late 1960s and was followed by concurrent changes in policy approach from assimilation to self-determination. A full list of the literature reviewed is provided in Appendix 1.

3.3 Indigenous gambling: Card games pre 1985

There is limited research on gambling amongst Indigenous people in the first half of the 20th century, and in all the literature only one account by an Indigenous person of their experience with gambling throughout this time (Dodd and Vaughn, 1985). This is an important consideration as accounts by non-Indigenous people are invariably influenced by their own perceptions of both Aboriginal culture and gambling as an activity. The article

illustrates some of the complexities involved in understanding the need for Aboriginal people to gamble and the risks that Indigenous people were willing to take when gambling (i.e. playing cards). Reg Dodd was an Aboriginal man born in 1906 in Queensland who was interviewed in the 1980's with an article produced recounting his experiences (Dodd and Vaughn 1985). It is instructive to start with a quote from this anecdotal account given by Reg Dodd.

It is nonsense to suggest we [Aboriginal people] were gamblers. We didn't have to gamble to get something off another person. It was at the end of the 1930's that I first saw Aborigines gamble for twists of tobacco and half-pennies.

(Dodd & Vaughn, 1985, p 47).

According to Dodd, by the late 1930s, while in the mission settings, gamblers sat around for hours on blankets gambling the small amounts of money they had, with some card games going for hours with winners sharing money with losers to ensure the continuation of games, while catching up on gossip (Dodd and Vaughn, 1985). Card games played were 'Cut em' (like two up) and 'Coon-can'. A lot of the women and teenagers went to bingo, mostly for socialising, but Dodd wondered what it might do to the teenagers in terms of their future gambling. For most the risk of gambling seemed better than going without and being hungry. That is, the opportunity to turn \$4-5 into a couple hundred dollars that could be used to buy a fridge or television etc. for the family had great attraction. Dodd and Vaughn also discuss the neglect of children, but premises this with the breakdown of Aboriginal culture and respect for the Elder, and how the idea of electing someone doesn't work as it is not Aboriginal way. It allows outsiders to control and influence the people.

Many of our families are mess, especially young ones with children and all. The neglect is awful. Now we are exposed to all sorts of influences - gambling included.

(Dodd & Vaughn, 1985, p48).

It is clear that this old Aboriginal man views the balance of consequences from gambling more in the negative, though his memories from the times with little money (before self-determination) reflect community card games in a more positive light. It is important to note that this was when the Elders still had respect within communities and before alcohol became widely available to Aboriginal people.

Berndt and Berndt's (1946-47) description of card games in the Northern Territory during the 1940s suggests card games were largely ubiquitous in distribution, although they were less prevalent amongst central Australian Aborigines. The games were viewed primarily as a form of work and a means of making money. Money was seen by Indigenous people as a way to gain independence from "white enslavement" and gambling was the dream through which this could happen. Card games were interpreted as a form of agency which Indigenous people had incorporated from the dominant, more powerful culture. However, the games were concurrently viewed as detrimental to ongoing Indigenous cultural practices, particularly given the intensity in which games were played at the expense of other Indigenous activities (e.g. singing and dancing). Berndt and Berndt (1946-47) also observed that in many card games kinship avoidance relationships tended to take a backseat to the card games and that for example, brother-sister and mother-in-law taboos were ignored.

Tonkinson (1974), in an anthropological study of a central Western Australian community, noted that Aborigines learnt to play cards while (working) on cattle stations in the 1950s, although it was not until the late 1950s and early 1960s before cards became a major leisure-time activity. At this time money was available through the payment of wages to station workers, and later through social security benefits. Games mostly occurred on the return to the community of a station worker where money, clothing or other objects were usually gambled. The playing of the card games to some degree fulfilled obligations and responsibilities associated with kin, though money mostly ended up being spent in the mission store. By the mid 1960s, a small minority of people had adopted gambling as a major activity, and initiated men lamented that gambling would sometimes interfere with rituals and ceremony, an activity that was seen as “whitefella” business that had no place in the Dreamtime and was a threat to Aboriginal Law. When talking with Aboriginal men, Tonkinson (1974) found that many admitted to drinking and gambling when they went to town, but once back in their homeland, condemned such activities in retrospect as making people’s heads “no good” and causing them to neglect their family and Law.

David McKnight, an anthropologist, visited Mornington Island (located in the Gulf of Carpentaria around the Queensland - Northern Territory border) several times from the late 1950s through to 2000, and writes about the social disintegration caused by excessive alcohol consumption. Due to the ubiquitousness of gambling (cards), the book also includes a section on gambling. As with the central Western Australian community discussed above, Aboriginal men working as stockmen learnt how to play various card games (McKnight, 2002). Games were less conspicuous prior to the 1970s which saw the introduction of the canteen and money through welfare payments. The card games were games of chance, although more savvy players tended to be the regular winners. He gives no definitive reason for the games popularity, although he suggests that they may have given individuals the opportunity to gain money if they did not have the inclination or the skills to gain employment, or when faced with the demands of relatives for money, individuals may have decided that it was too difficult to hold onto their money and it was easier to gamble with relatives in order to disperse money. Winnings were nearly always spent at the canteen on beer (if the games were not being played for beer). Additionally, distribution of money (or beer) this way meant that relatives could not demand the money back at a later date. This would have led to a cycle whereby people lost money, were not able to ask for it back, and therefore would have to gamble again to try and win back the money at a later date.

Card games (or card schools as they were known) generally occurred in the mornings, and finished once the canteen opened in the afternoon. Most games were played amongst close relatives (kin), with men, women and children all participating, although children only played in low stakes games. In understanding people’s motivations for gambling McKnight notes that the games accord “with the optimism of hunter-gatherers”, in that people expect to be successful when hunting or gathering bush food, and they expect the same when gambling. The demand sharing nature of Aboriginal customs also meant that just as a successful hunter is expected to be generous with the bounty, so is the successful gambler. Of particular significance, McKnight notes that the giving and sharing of hunter-gatherers (i.e. food and some labour such as collecting firewood etc.) raised the standard of living of the whole community, particularly so when people lived in small camps with close kin. However, within a larger community and now living in a money economy, where hunting and gathering food is secondary to drinking and gambling, indiscriminate sharing lowers

the overall living standard. There was much ill-feeling between gamblers (and drinkers) and non-gamblers (and non-drinkers) of the same kin, particularly when demands for money were refused by the non-gamblers. Lastly, McKnight reported that the community was becoming two-tiered with the “squanderers” on one side and the “savers” on the other, which was also affecting kin relations. That is, savers (the minority) would borrow from other savers in times of need and squanderers could only demand of squanderers when they had had a win in gambling. It should be noted that this example of the negative effects of gambling was seriously exacerbated by excessive alcohol use. Negative social consequences associated with gambling identified by McKnight are listed in Box 1.

Box 1 Negative consequences of card playing on Mornington Island (McKnight, 2002)

- The significant amount of time spent playing cards diverts people away from more creative productive activities (e.g. painting, dancing, carving, caring for country)
- Child neglect – e.g. young Mothers shutting their small children in houses while they went gambling; and when young children did accompany their parents to the card schools, all they learnt was how to gamble
- Money lost playing cards meant that children were not being fed adequately (based on visual observations and reports by health centre staff)
- Winnings nearly always were spent at the canteen on beer
- When a single person had a large win, it meant there were a larger number of families that lost, leaving them little or no money for food and household expenses for a week or more
- If the same household lost week after week, then tensions arose between and within households
- Gamblers often ‘humbugged’ non-gamblers for money and when refused, this caused ill-feelings due to the demand sharing nature of Aboriginal culture

Altman (1985) presented a case study of gambling in an Arnhem Land Aboriginal outstation with a primary focus on economic interpretations of why people gamble and the ramifications of these activities. Two card games dominated. *Buta* was a game of chance (an adding game that is fast and exciting). Another card game, *Kunt* (like Rummy), is slower and skill plays a significant part. *Kunt* was usually played when less money was available or for leisure. Altman identified two types of gambling; as ‘leisure’ where small amounts of coins are gambled, and ‘business’ where much larger amounts of money are gambled. Money was nearly always gambled from unemployment benefits and not from the sale of arts and crafts. The role of gambling magic was also noted, as when individuals or alliances win consistently it is attributed to *Lambalk* (a good luck charm). While regarded as unfair, all gamblers were on the look out for such lucky charms. Large wins are nearly always attributed to lucky charms whether true or imagined.

Altman described the strong anti-surplus ideology amongst the people at the outstation which meant that excess money was often shared or pooled through gambling. Since 1979, when unemployment benefits were introduced, gambling had become more popular (because of the excess cash not previously available). At this time social security payments were bestowed inequitably across members living on the outstation due to the ongoing roll-out of payments to the Indigenous population. Gambling therefore performed a functional role in redistribution of income.

Altman’s analysis examined the relationships between cards and the productive subsistence economy and a vibrant ceremonial system. All people (approximately 30) living at the outstation were related through the Aboriginal kinship system. Older people never gambled on this outstation and disapproved of it, stating that it interfered with hunting and gathering, could lead to disputes and violence, and undermined secular authority. That is, cards disrupted traditional aspects of demand sharing through kin lines, although new kin

lines were being established for the purpose of gambling. Altman did not find a correlation between gambling and subsistence, although more disputes were involved with sharing of cash associated with gambling and these could lead to violence if drinking bouts were occurring concurrently with gambling, which was rare in the outstation setting.

Altman also noted that gambling could undermine the authority of Elders. However, he concluded, in what seems contradictory, that gambling did not erode ritualistic functions and contributed to the maintenance of local cultural practices. Two further points contextualise the conclusions by Altman. First, the study was conducted at a time when social security benefits were just being introduced across the Indigenous population. For people living in remote areas this distribution was staggered and unequal, so gambling therefore allowed for some redistribution of this cash. Second, the time of study was 1979-1980 and in subsequent visits in 1981, 1982 and 1983, gambling had declined in popularity. Altman provides three possible reasons for the subsequent decline in gambling: (1) full roll-out of social security to people leading to a more equal distribution of money, (2) increases in market commodity prices means less surplus money and a decline in money from arts and crafts, and (3) the affect of the fundamentalist Christian movement that swept Arnhem land in late 1981.

In a study published shorter after, Goodale (1987) presents an account of the role of card gambling in the Tiwi Islands north of Darwin (based on a study conducted in 1980/81). Two types of card games were observed, not in the card game played, but the way they were played. One was serious, while the other was less formal and was about sharing winning and continuing to play even though the amounts of money gambled may have been the same. Women were the more serious and regular gamblers and were more likely to perceive gambling as a form of work as evidenced by the quote from a young mother in the opening paragraph of the article.

Oh my, card playing is HARD [as it appears in the text] work! When I play, I don't hear my children cry for food. I don't hear and I don't see them. I think only about the cards!

(Goodale, 1987, p6)

Men generally only participated in the big stakes games (along with women) and rarely participated in the leisure or play games (though these were still for money). Card games were sometimes played by people to raise money for the purchase of their daily beer allotment from the canteen. In fact, a game known as *pirup* (Beer up) was only ever played with cans of beer. Gender distinction in Indigenous gambling existed in other Indigenous communities across Australia at the same time. Martin (1993) also found that men living in the north Queensland Aboriginal community of Arukun were also much more likely to spend the winnings from card games on alcohol or plane trips to Weipa to buy alcohol or occasionally material items such as fridges or fishing equipment. More card games were observed at times when money came to the community either through income tax returns, family allowance and welfare payments or incomes from paid work (at this time 30% of 20-60 year-olds were employed). The most intense and longest games occurred when income tax returns were received with games having pots of between \$12 and \$600, a considerable amount of money in 1980. The games did allow of the redistribution of money across age groups, as the children as young as 12 years also participated in games with the adults. In a follow-up study in 1987, Goodale was informed that Aboriginal people from the Tiwi Islands rarely went to the Darwin casino, as they had their own card

games in Darwin where they could gamble. This is an important point as a later study discussed in the section below notes significant attendance by Aboriginal people in the Darwin casino in the mid 1990s and that this may reflect a transition in the way Indigenous people gamble (Foote, 1996).

Hunter (1993) and Hunter and Spargo (1988) worked extensively in the Kimberley region of Western Australia in the 1980s (a similar time to the studies by Altman (1985) and Goodale (1987) in the Northern Territory). They identified three different card games, of which two were chance based while the third game was similar to Rummy and was a mixture of skill and chance. Stakes in the card games are typically larger closer to pay periods and in most games drinking was not permitted, as drunken players would often cause disruptions. Men tended to play only high stakes games, though women were the more constant gamblers or, in the words of Hunter and Spargo, the more “constant investors” (Hunter and Spargo, 1988, p 669). Players, especially men, sometimes used a lucky charm known as *jirri* across the Kimberley (a word of unknown etymology), though this practice was frowned upon and seen as cheating or gaining an unfair advantage. At the time of the study, like the Altman study, pension monies were the most reliable (and generally larger than social security payments) infusion of money into the community and this placed pensioners at risk. However, in one community Hunter noted that pensioners were only allowed to play among themselves which afforded them some protection from other community members taking the winnings away from these vulnerable people.

Hunter and Spargo (1988) identify three forms of negative consequences arising from gambling; physical, psychological and social. Physical consequences mainly related to poor nutrition which was viewed as an inevitable consequence of the greater living costs in remote areas. This was exacerbated by the fact that less nutritional fast-foods are often cheaper than healthier alternatives in these areas. Hunter and Spargo noted that even though card games circulated money within the community to some degree, larger winnings were usually spent on capital or luxury items or on alcohol and not on essential foods for daily living. In addition, the physical hygiene of houses was also affected in households where gambling was common due to essential services such as power and water being cut-off.

Psychological consequences of gambling mostly related to increased anxiety levels among gamblers compared with non-gamblers which was considered a result of the pestering (or humbug) associated with losers requesting money from other gamblers to continue gambling. However, children also suffered when their immediate care-givers gambled excessively through a lack of nutrition and emotional nurturing. While there usually was an extended family of care-givers available to Aboriginal children to buffer this, these additional care-givers are in nearly all instances over-extended, and gambling further concentrates the burden on these people. They also noted that children of heavy gamblers often did not attend school and this was attributed to a lack of sleep caused by the noise of games going throughout the night. In addition, if the child attended school they often lacked the money to buy lunch. In the words of Hunter and Spargo:

Thus, children of regular gamblers often are neglected physically and emotionally for variable periods. Wins on the part of their parents become linked to the sudden appearance of luxury items, food and indulgence. From long before the age that children can gamble, the game itself is associated

powerfully with temporary (and frequently lavish) relief from deprivation, which acts in turn as a powerful reinforcer of gambling itself.
(Hunter and Spargo, 1988, p671)

Observations made by Martin (1993) provide some support for these findings in the context of Arukun, north Queensland, where amounts of between \$100 and \$200 from women's gambling were in some instances given to children. Furthermore, Martin (1993) noted that gambling houses were often forced to shut games down after the occupants became "tired of the incessant noise and disputations" (Martin, 1993, p130). Martin (1993) also found that the card games most often operated separately from kin systems. For example, avoidance relations were more often than not ignored and with one player commenting that "ways are changing". Martin also analysed the distributive aspects of card games more thoroughly than Altman (1985) and Goodale (1987) and found that that distribution of cash through gambling in the big games was on the average from women to men and from non-drinkers to drinkers. The main reason for this was that men rarely distributed winnings back to women and most of the men's winnings were spent on alcohol or the process of obtaining it (e.g. charter flights or long taxi rides). As with the Northern Territory studies of cards in the 1980s, Martin notes that women (and men to a lesser extent) expressed notions that they were gambling to get food for subsistence or to raise money for something. However, Martin goes on to critically assess this assertion and notes "that Wik men and women did use gambling as a means for raising relatively large sums of money for specific projects, but a considerable amount of my field data shows that whatever rationales people may have offered for their gambling, playing cards for money with its excitement, sociability and stimulation was an end in itself for many players" (Martin, 1993, p137). In terms of causes, Martin (1993) associates the increase of gambling with an increase in the population living in the community. He contended that increased population increases the stresses between kin groups and individuals, and that card games allow for the relaxation of avoidance rules and kinship obligation for the duration of the game.

From the literature just reviewed it is clear that a mix of effects are being produced out of the card games that occurred throughout this time; some beneficial (e.g. social time together for families and relieving boredom, raising larger amounts of money when access to resources was limited) and others detrimental (e.g. increased family and community tensions, emotional and physical neglect of children, weakening of Indigenous kinship relationships). It is clear from the literature reviewed thus far that card games do not exist independently of broader social and community contexts, and that some broader community contexts are more important than others in how they may mediate the effect of gambling. The most clear example of this is where a community was experiencing significant alcohol related problems then gambling related problems were exacerbated (e.g. Hunter and Spargo, 1988; McKnight, 2001, Martin, 1993). It is also clear that Indigenous gambling has gone through considerable change throughout the first three-quarters of the 20th century and that significant policy changes in the latter part of the century are likely to contribute to how Indigenous people interact with gambling as an activity in the last 20-30 years. Specifically, changes that are likely to impact on Indigenous people's experience of gambling are the policy of self-determination that gave Indigenous people access to greater sums of money and allowed freedom of choice in how they spent that money, and the significant expansion of the gambling industry through both the opening up of casinos in all capital cities and the spread of PubTAB and EGMs into community venues across

Australia. The second part of this review turns its attention to these more recent trends, and to the burgeoning number of studies on Aboriginal people and gambling.

3.4 Indigenous gambling and regulated gambling: The last 20 years

As with the previous section, there have been a several studies that have looked specifically at gambling within the Indigenous population. Since the 1990s, gambling-specific studies have been carried out in NSW (Aboriginal Health & Medical Research Council of NSW, 2007; Dickerson et al., 1996), Victoria (Cultural Perspectives Pty Ltd, 2005), Queensland (Australian Institute of Gambling Research, 1996; Holden et al., 1996), and the Northern Territory (Foote, 1996; McDonald & Wombo, 2006; McMillen & Togni, 2000; Young et al., 2007; Young, Morris, Barnes, Stevens, & Paterson, 2006). For the other states and territories there is some published information on gambling by the Indigenous population and this will be referred to where appropriate. The general picture emerging from these studies is that Indigenous people are more likely to be regular gamblers than their non-Indigenous counterparts and also have a preference for electronic gaming machines (EGMs) or pokies, and that gambling does cause significant problems for individuals, families and communities (Aboriginal Health & Medical Research Council of NSW, 2007; Young et al., 2007; Dickerson et al., 1996). The remainder of this section outlines the key findings of the most significant of these studies conducted in different geographic contexts throughout Australia (i.e. NSW, Vic, Qld and the NT) with an emphasis on the social outcomes associated with gambling.

3.4.1 NSW

Table 3.1 summarises the differences between the Indigenous and non-Indigenous samples of the 1995 NSW study carried out by Dickerson et al. (1996). While the Dickerson et al. study was not a random sample of Indigenous people, the sample was considered broadly representative, and adequate for an exploratory study into Indigenous gambling patterns. Comparisons of the Indigenous and non-Indigenous sample indicate Indigenous people were 1.5 times more likely to be regular gamblers (1.4 and 1.9 times for males and females respectively), more likely to have a preference for EGM play, 1.5 times more likely to have a family member with an excessive gambling problem (4.5 times for males and 10 times for females), more likely to be classified as a probable pathological gambler by the South Oaks Gambling Screen (SOGS), and spent more than 10 times the amount of money per week on gambling compared with the non-Indigenous sample.

Table 3.1 Indigenous and non-Indigenous comparison of gambling indicators for 1995 NSW study

Gambling indicator	Indigenous	Non-Indigenous	Rate ratio¹
Regular (weekly) gambler – %	57	38	1.5
Preferred EGMs			
Males – %	27	19	1.4
Females – %	33	17	1.9
Family member excessive gambling			
Life time – %	32	20	1.6
Last 6 months – %	55	38	1.5
SOGS score ²			
Males			
5 to 9 – %	50	11	4.5
10 to 15 – %	29	3	9.7
Females			
5 to 9 – %	40	4	10.0

Gambling indicator	Non-Indigenous		Rate ratio ¹
	Indigenous	Indigenous	
10 to 15 – %	16	2	8.0
Weekly spending per week			
Males – mean (SD)	\$406 (608)	\$39 (130)	10.4
Females – mean (SD)	\$193 (277)	\$15 (87)	12.9

¹ Rate ratio for Indigenous to non-Indigenous (Indigenous:non-Indigenous)

² SOGS – South Oaks Gambling Screen. Scores of 5 or more on the SOGS indicate probable pathological gambler

Source: *Dickerson et al. (1996)*

In 2007 the Aboriginal Health and Medical Research Council of NSW conducted a review of gambling and its impacts on Aboriginal communities in NSW (AH & MRC of NSW, 2007). The review also reported on availability and appropriateness of existing treatment services with the aim to inform future directions in policy development and treatment provision for problem gambling. The report identified gambling as a significant issue for many Aboriginal people with the most common problems cited as financial hardship, the needs of children being overlooked, family discord, and contact with the criminal justice system. Gambling problems were often a cause of ‘shame’ for Aboriginal people and were therefore not always discussed openly. Future directions included raising public awareness amongst Aboriginal people about gambling and related problems lessening the ‘shame’, the development of alternatives for entertainment, particularly in remote areas (e.g. sporting facilities), and to raise awareness in Aboriginal community organisations on the availability of funding opportunities through local clubs.

3.4.2 Victoria

McMillen and Marshall (2004) captured a sample of Indigenous respondents in the *Victorian Longitudinal Community Attitudes Survey*. Amongst regular gamblers, Indigenous people were less likely to be classified as a problem gambler (10%), compared with non-Indigenous respondents (15%). However, more Indigenous females than males were classified as problem gamblers. Indigenous respondents were more likely to gamble and were over-represented in the problem gamblers group making up 1.5% of problem gamblers, yet constituting just 0.5% of the Victorian population. Due to the small sample of Indigenous respondents, no further empirical conclusions could be drawn from this survey, but the authors recommended that further research be carried out to ascertain help seeking behaviour for Indigenous respondents.

Cultural Perspectives Pty Ltd (2005) carried out a small qualitative study examining approaches to health promotion and service delivery to Indigenous people in Victoria. Interviews were conducted with problem gamblers and their family and friends, professionals within the Gamblers Help network, and representatives from Indigenous community organisations. EGMs were the most common gambling activity for the problems gamblers for both men and women. The main issues Indigenous problem gamblers identified were impacts on finances, family relationships and personal emotional well-being. Most interviewed people felt that Indigenous people in the general community knew about availability of services and this information was usually conveyed through ‘talk’ with family and friends. With regards to services, on the one hand most people indicated that they thought the current services were inadequate, but on the other hand, they also said the found the current services to be helpful. The main barriers to services were embarrassment (or ‘shame’) on the part of the problem gambler and an unwillingness to trust the counselling service (i.e. confidentiality). Suggestions to improve access to services included better public awareness on issues of confidentiality and the building up

of awareness amongst the Indigenous community of the potential problems gambling can cause to help alleviate shame associated with having a problem.

3.4.3 Queensland

Holden et al., (1996), in a study of 128 Indigenous regular (i.e. weekly) gamblers living in Cairns, Queensland, found that most preferred EGMs (78% of respondents), with the average weekly EGM expenditure of \$30. Total gambling expenditure on gaming and wagering (excluding card games) was \$60 (\$10-\$340) per week, which constituted 20% of the average income of the sample. Also as part of this study an evaluation of the impact of a PubTAB in a DOGIT (Deed of Grant in Trust) community located in north Queensland was carried out and involved conducting interviews with 17 PubTAB players and other community members. These interviews revealed that 80% of the adults in the community were heavy or weekly gamblers (more than five times that found in general population surveys in all jurisdictions across Australia). On average the 17 PubTAB players interviewed spent more than 25% (\$140 out of \$423) of their fortnightly income gambling on PubTAB. The interviews also revealed a marked reduction in canteen sales of alcohol and police arrest data indicated a decline in alcohol related community violence, which could be attributed to people allocating money to gambling rather than for alcohol consumption. So while an unintended benefit of the introduction of PubTAB was a reduction in alcohol related violence, it had a negative impact on council revenues, which were substantially reduced as less profit margins were received from the PubTAB compared with the sale of alcohol (note that as of 2009 councils in QLD will no longer be able to hold alcohol licenses).

Phillips (2003), researching a north Queensland community in the mid 1990s, explored the reasons for, and consequences of, drinking alcohol, smoking marijuana and gambling (predominantly card games). Ten reasons for people using (alcohol, marijuana and gambling) were provided, and these echoed the earlier work of Martin (1993). Centralisation and geographic dislocation was suggested as a primary cause of increased stress and tensions. Gambling, being a form of social interaction, helped to alleviate boredom and distract people from the pressures of everyday life. Family history was also an important factor, with children learning to play at a very early age (3-5 years). As with most other studies, there were significant differences in gambling patterns between men and women, with women being the more regular gamblers. According to interviews Phillips conducted with local women, they gambled to win money to buy food for the household. Gambling was seen as a way to alleviate poverty, particularly in household where the husband spent a large proportion of his pay on alcohol and marijuana. The community had a number of outstations and these were used as refuges and allowed people to connect with their ancestral lands. However, these were not always alcohol-, marijuana- and gambling-free zones and use was dependent on the outstation manager. In an example cited, one outstation had virtually no alcohol consumption, marijuana smoking or gambling. It was only when the Elder passed away and the outstation became managed by a non-Indigenous person that restriction of these activities lapsed.

3.4.4 Northern Territory

The Northern Territory carried out a gambling prevalence survey in 2005 with the aim to measure levels of problem gambling and to identify participation across a range of activities. The survey used a telephone methodology and as a consequence did not capture

a representative sample of the Indigenous population in the Northern Territory. Specifically, the Indigenous respondents were more socioeconomically advantaged compared with the total Northern Territory Indigenous population (Young et al., 2006). An analysis including the Indigenous sample indicated that Indigenous respondents were more likely (2.2% compared with 0.9%) to be classified as SOGS problem gamblers, although when using a different problem gambling screen (CPGI) this association was not evident. In a subsequent analysis Young et al., (2007) found that Indigenous people were more likely to be monthly EGM players than non-Indigenous people (23% *cf.* 16%). Because of the issues with the Indigenous sample, a qualitative study was also carried out consisting of 64 interviews with representatives from a range of organisations located across the Northern Territory (McDonald and Wombo, 2006). While the view of the services providers reflects their charter, the general perception was that unregulated gambling was very common and that the impacts of the activity were broadly negative. Another theme drawn from the interviews was that the increased money flows into communities over the last couple of decades (e.g. royalties, steady government benefits and CDEP, the sale of artworks) correlates with increased time and money spent gambling. Furthermore, comments indicated that professional card sharks were touring communities, cleaning up card games and taking winnings out of the community, when previously the money was more likely to remain in the community with some of the winning distributed amongst losers. Comments also indicated that Indigenous people were increasingly playing EGMs and that in some instances winning from community card games were spent in EGM venues. The increased participation in regulated gambling was attributed to the inclusive nature of these venues (i.e. the two casinos, pubs and clubs).

Comments on increasing patronage of regulated gambling venues elicited from the McDonald and Wombo (2006) interviews are consistent with earlier research in the Northern Territory (McMillen and Togni, 2000; Foote, 1996). Foote (1996) conducted an observational study of patrons in the Darwin casino and found on average there were 50 Indigenous people in the casino on a daily basis, of which 67% were female and 76% were located around EGMs. Foote (1996) commented that the increasing patronage of Indigenous people in the casino supported the hypothesis that gambling by Indigenous people gamble is going through a transitory phase as more forms of gambling become available and social barriers to participation are lifted. McMillen and Togni (2000), in a 1996/97 study looking at the impact of the introduction of EGMs into the Northern Territory conducted interviews with representatives from peak Aboriginal organisations in regional centres and Aboriginal people in these regions and from one remote community. Aboriginal people from central Australia and the top end reported that when they visited town they also visited the casino and mostly played EGMs. Aboriginal people living in Darwin commented that the casino was a popular place for Indigenous people to gamble and as a social meeting place when relatives came to town. Similar comments were made regarding the Alice Springs casino. In regional centres Aboriginal men had a preference for TAB betting and did not play EGMs in the community venues much, and said they preferred to play EGMs when they visited the casino. Some of those interviewed said they were concerned with the level of betting at the TAB in relation to the drain on resources and the fact that losses were leaving the community. A significant and consistent finding across the Northern Territory in all interviews was that EGMs should not be allowed in remote community venues, with one respondent commenting “if we had poker machines in the club it would ... stop our culture” (McMillen and Togni, 2000, p364).

The McMillen and Togni study also noted the ubiquitous nature of card games across the Northern Territory and found that by and large the card games appeared unproblematic, except in some instances with games played in Darwin parks where litter was sometimes left behind. Most, but not all, comments on card games viewed them in a positive light, especially because the children could be around, unlike when playing EGMs in other venues. The card games provided people in remote communities with something to do, if they were not in paid employment. Negative aspects of card games mentioned in interviews included people sitting for long periods and not eating properly, children being tired at school (or not attending) because of overnight card games disrupting sleep, and the drain on financial resources.

3.5 Summary

3.5.1 Summary: Indigenous gambling: Card games pre 1985

The early literature strongly suggests that gambling was not an activity that Indigenous people participated in traditionally. From all accounts sourced, Indigenous Elders (i.e. initiated men or men of high degree) saw gambling (and alcohol) as a danger to Indigenous Law. As early as the 1950s in central Australia, gambling was beginning to displace Indigenous ceremony and ritual as a community activity (Tonkinson, 1974, Berndt and Berndt, 1946-47). The testimony from Regg Dodd (Dodd and Vaughn, 1985) supported this conclusion. According to this source, prior to 1920 Aboriginal did not gamble and it was not until the end of the 1930s that Aboriginal men started gambling for twists of tobacco and halfpennies. Prior to this people simply asked if they wanted something. The card games prior to self-determination, by and large, given by the account in Dodd and Vaughn (1985), indicates that gambling was an activity played by families or when relatives visited and was an enjoyable social interaction, where winners redistributed money back to losers to stay in the game. However, Dodd and Vaughn also mention the hunger endured throughout this time and noted that if someone had only \$4-\$5 that little could be bought with this anyway and the risk of losing this money was worth the gain if they won one or two hundred dollars. Specific causes for increased gambling and other social ills such as alcohol abuse mentioned in Dodd and Vaughn (1985) include the break down in authority of Elders and the move towards elected representatives which were more often non-Aboriginal people.

Anthropological research conducted during the 1980s tended to emphasise the positive aspects of gambling by Indigenous people. Specifically, gambling was viewed as a form of hunting and gathering with men playing higher stakes games and women playing smaller stake games (though more regularly) respectively (Goodale, 1987; Altman, 1985). The redistributive function of gambling was highlighted by these studies. However, the studies by Goodale and Altman also noted negative aspects of gambling though these were not emphasised. Martin (1993), researching in a north Queensland Aboriginal community in the mid 1980s, conducted a more nuanced and critical analysis of gambling and noted that nearly all winnings from male gamblers was used to buy alcohol or to travel to a town to buy alcohol. The redistributive function emphasised by Goodale and Altman was made with little quantitative/empirical evidence, while Martin's conclusions, based on an analysis of inflows and outflows of money to the community, showed a redistribution of money from the women (who were primarily responsible for feeding and nurturing of children), to men, and from non-drinkers to drinkers. Similarly, Hunter (1993), McKnight (2001), and Hunter and Spargo (1988) contextualised gambling within the broader

community context where alcohol was a significant problem in the communities where their research was carried out.

3.5.2 Summary: Indigenous gambling post 1985: Regulated and unregulated gambling

Research in the 1990s in NSW, Victoria, Queensland, and the Northern Territory indicated that Indigenous people were engaging in regulated forms of gambling more heavily, mostly on horse race betting (TAB) and EGMs (Phillips, 2003; Brady, 1998; McMillen and Togni, 1998; Foote, 1996; Holden et al., 1996; Dickerson et al., 1996). These studies are not always directly comparable due to methodological differences, and this is likely to affect estimates of problem gambling derived using problem gambling screens developed for use in non-Indigenous (western) populations. However, the research suggests that regulated forms of gambling were a cause for concern for Indigenous people, particularly EGMs. Where regulated gambling was accessible to people in remote settings, many people were regular gamblers with one study finding people spent on average 20% of their income on EGMs. Given the low socioeconomic position of many Indigenous households the consequences of this type of gambling are likely to be significant. The hypothesis put forward by Foote (1996) that Indigenous people are going through a transition from participating in unregulated gambling (i.e. card games) to greater participation in regulated forms of gambling would appear to be still in process. Studies in north Queensland also found that Aboriginal gambling patterns by regular gamblers in Cairns were consistent with the NSW and Northern Territory studies; with EGMs the most preferred activity (Young et al., 2007; McDonald and Wombo, 2006; Holden et al., 1996; Dickerson et al., 1994). This association is likely to have significant social impacts given the association between EGM play and problem gambling found in prevalence studies across Australia (Young et al., 2007; Dickerson et al., 1996).

Unregulated gambling (card games) are still largely perceived as being less problematic than regulated gambling among Aboriginal people (McMillen and Togni, 1998), although there is evidence that the games are not performing the redistributive function they may have once performed (McDonald and Wombo; 2006; Phillips, 2003; Martin, 1993). The main function that card games play on communities is to relieve boredom and to provide a form of entertainment, and as a means to accumulate large sums of money. However, there is some evidence to suggest that large winnings from card games are being spent outside the community (not necessarily for food and essentials) and in some instances nearly all larger winnings are spent by men on alcohol (Martin, 1993; McDonald and Wombo; 2006; Phillips 2003).

Based on the most recent available research there is no doubt that gambling is causing significantly more problems in the Indigenous population compared with the non-Indigenous population. Problems include lack of money for essentials, children not being cared for adequately (i.e. physically through poor nutrition and emotionally through lack of nurturing), increased family and community tensions (particularly between gamblers and non-gamblers), and indirectly through the opportunity cost of less engagement in more productive pursuits within the broader community. Assertions made in previous research (e.g. Altman, 1985 and Goodale, 1987) that gambling was being used to express aboriginal kinship obligations and in redistribution of incomes are questionable, particularly given the changing socioeconomic circumstances of Indigenous people since self-determination. Analysis by other researchers in other Aboriginal communities conflicts with some of the conclusions of the influential papers of Altman and Goodale. Specifically, there is

evidence to suggest that card games act more to make income more unevenly distributed, particularly given the evidence that Indigenous people are engaging much more frequently with regulated gambling or more specifically, EGM gambling (Martin, 2003; Holden et al., 1996). However, as pointed out at the beginning of this Chapter, gambling and its effects vary dramatically between communities, and generalisations based on discrete studies in different geographic contexts are often tenuous. The next Chapter presents the first empirical analysis of the correlates of gambling-related problems for the entire country, stratified by jurisdiction and remoteness. The intent of the analysis is to start to provide an overall description of the correlates of gambling problems and in this way add to the understanding of gambling and its impacts that have been gained from the anthropological and prevalence studies to date.

Chapter 4: Correlates of Gambling Related Problems for the Indigenous and Total Population

4.1 Chapter Overview

The analyses presented in this chapter use data on gambling-related problems that are representative of the Australian Indigenous population. The analyses will provide estimates of the levels of gambling-related problems experienced by the Indigenous population presented according to jurisdiction and remoteness for Australia. The analyses will also identify the correlates, or characteristics, of households and individuals that are significantly (in a statistical sense) associated with reported gambling problems.

In order to contextualise the results, a comparison is also conducted between the Indigenous population and the entire Australian population. Analyses of the total Australian population is based on the 2002 and 2006 General Social Survey (GSS), a dataset that is broadly comparable with the data collected by the 2002 and the 2004/5 National Aboriginal and Torres Strait Islander Health Survey (NATSIHS).

In terms of structure, the Chapter:

- outlines the aims of the analyses
- describes the dependent variable (reported gambling problems) as contained in the *Negative Life Events Scale* used in all surveys
- describes the data sources used and the survey design used to collect the data
- set outs and explains the outcome and explanatory variables
- describes the statistical analyses used for the multivariate modelling
- presents the inter-relationships between the various NLES items
- presents estimates of reported gambling problems for the Indigenous population by jurisdiction and remoteness
- presents five multivariate logistic regression models for reported gambling problems based on the NATSISS (2002, remote and non-remote separately), NATSIHS (2004/5, non-remote only), and GSS (2002 and 2006, non-remote only).

4.2 Methods

4.2.1 Aims of the analyses

1. To present estimates for individual NLES items (including gambling problems) and determine the relationships between gambling problems and other negative life events, or 'stressors', both for the general population and the Indigenous population.
2. To present estimates of reported gambling problems by remoteness for each jurisdiction of Australia.
3. To identify significant regional, socio-demographic and socioeconomic correlates of gambling related problems experienced by the Indigenous and the general population stratified by remoteness.

4.2.2. Measuring gambling problems using the *Negative Life Events Scale*

The Negative Life Events Scale (NLES) is a regular survey module used by the ABS in social and health surveys, one that aims to measure the emotional and social wellbeing

of a person. It was developed in consultation with peak Aboriginal and Torres Strait Islander bodies with the aim of being able to be used as a comparable measure of social and emotional wellbeing between the Indigenous and non-Indigenous populations of Australia (Australian Bureau of Statistics, 2004b). The NLES asks respondents “*have any of these things [list of “stressors” or “negative life events”] been a problem for you or your family or friends during the last year?*” Respondents then answer yes or no to a list of up to 16 “stressors” or negative life events listed in Table 4.1. There were some small differences in the way some NLES items were worded between surveys, as well as differences in the items used for remote and non-remote samples in the surveys. For example, the item, serious and illness or disability, is listed as two separate items in the GSS (delineating between acute and chronic illness), while alcohol and drug related problems are listed as two separate items in the NATSISS and NATSIHS. Four items included in the Indigenous surveys were not included in the general population surveys due to the same items having less relevance in the general population or because they were specific to Indigenous people (e.g. discrimination/racism, pressure to fulfil cultural responsibilities and overcrowding).

Table 4.1 Negative Life Events items for each ABS survey

NLES item	NLES item inclusions				
	2002 NATSISS		2004/5 NATSIHS	2002 GSS	2006 GSS
	Remote	Non-remote	Non-remote	Non-remote	Non-remote
Gambling problem	✓	✓	✓	✓	✓
Divorce or separation	✓	✓	✓	✓	✓
Death of family member or close friend	✓	✓	✓	✓	✓
Serious illness or disability ¹	✓	✓	✓	✓	✓
Serious accident	✓	✓	✓	✓	✓
Alcohol or drug related problems ²	✓	✓	✓	✓	✓
Not able to get a job	✓	✓	✓	✓	✓
Lost job, made redundant, sacked	✓	✓	✓	✓	✓
Witness to violence	✓	✓	✓	✓	✓
Abuse or violent crime	✓	✓	✓	✓	✓
Trouble with the police	✓	✓	✓	✓	✓
Mental illness	✗	✓	✓	✓	✓
Member of family sent to jail/currently in jail	✓	✓	✓	✗	✗
Overcrowding at home	✓	✓	✓	✗	✗
Pressure to fulfil cultural responsibilities	✗	✓	✓	✗	✗
Discrimination/Racism	✓	✓	✓	✗	✗

1 Separate items for serious illness and serious disability in the 2002 and 2006 GSS

2 Separate items for alcohol related problems and drug related problems in the 2002 NATSISS

The NLES is asked in two blocks or modules. The first module lists five stressors in which there are slight differences between the remote and non-remote samples for ABS surveys. The second module contains between eight and ten stressors depending on remote and non-remote samples. It is in this second module that “gambling problem” is a listed stressor (copies of Australian Bureau of Statistics surveys are available at www.abs.gov.au). It is apparent from the wording of the question that it is not a prevalence estimate for problem gamblers. It asks respondents if gambling has “...*been a problem for you, your family or close friends during the last year*”. Therefore, the NLES gambling problem item measures the reach or impact of gambling problems on peoples’ social and family networks. This is not a strictly individual measure of gambling problems. It is a measure of the family or social-network level impact of gambling problems. This broader conception of gambling-related harm is consistent with the Australian definition of problem gambling which states

“Problem gambling is characterised by difficulties in limiting money and/or time spent on gambling which leads to adverse consequences for the gambler, others, or for the community.” (Neal et al., 2005).

The reliability of the NLES when used in a non-Australian Bureau of Statistics survey has been previously reported on (Kowall, Gunthorpe, & Bailie, 2007). Kowal et. al. (2007) assessed psychometric properties of the NLES in a sample of Indigenous carers and householders from ten remote Aboriginal communities across the Northern Territory (from the top end to central Australia). The study used a modified version of the NLES that asked respondents *“have any of these things [list of stressors] been a worry for you or anyone else living in this house during the last year?”*. That is, the item was presented in such a way that the estimates of gambling problems related to individual households as opposed to the ABS method of examining effects on social and family networks. Based on the difference in wording, it may be expected that the estimates collected as part of this study would be lower than those collected in the ABS Indigenous surveys for remote regions as a household is a smaller unit than a social network. However, in this study, 36% of carers and 41% of household heads reported a gambling related problem in year preceding the survey, a figure somewhat higher than the estimate reported by the ABS for remote regions of the NT (i.e. 31.5%) (Australian Bureau of Statistics, 2004c; Kowall et al., 2007). Kowal et. al. (2007) found the NLES performed well psychometrically with respect to item endorsement, discrimination and internal and external reliability. However, four items, not being able to get a job, losing a job, divorce and separation and overcrowding performed less well psychometrically. The NLES item of “gambling problem” showed good discriminatory characteristics in relation to the overall scale and other listed items. Therefore, we are able to utilise the NLES with some confidence.

However, as made clear in Chapter 2, the Indigenous population displays marked heterogeneity with respect to a range of demographic, social, and economic characteristics across jurisdictions and by degree of remoteness. Consequently these characteristics need to be accounted for when interpreting the estimates derived from the NLES items. For example, Indigenous people living in remote areas tend to have larger extended families because of the traditional Indigenous kinship systems which plays a prominent part in the life of many remote Indigenous people (Austin-Broos, 2003). The implication of this kinship system on estimates for remote regions, where a larger proportion of Indigenous people live in small communities (Australian Bureau of Statistics, 2002, 2007b), is that larger estimates may be expected because the more extensive social networks. While this potential overestimation needs to be considered when drawing direct comparison of estimates of reported gambling-related problems, it does not limit any analyses identifying significant correlations between NLES items and other demographic and socioeconomic variables collected in the surveys, as these correlations are based on patterns of association rather than absolute estimates.

Another limitation of the NLES item on gambling problems is that no definition of gambling problems is provided. From this point of view, the NLES is a very subjective scale with respondents deciding what is and is not problematic with regards to gambling (and other NLES items such as alcohol and drug problems). Some people may have different attitudes towards gambling and this will influence how they view gambling and its associated problems. This is of importance for the NLES where the meaning of gambling problems *per se* in the context of many remote Indigenous communities across

Australia varies according to current social practices and significant historical influence (see Chapter 3).

However, while there are limitations of using the NLES to report estimates of gambling-related problems, it nonetheless provides the only available measure of reported gambling problems that is collected consistently both spatially and temporally in national surveys for the general population and the Indigenous population of Australia.

4.2.3 ABS data sources and survey design

Four ABS data sets are used to analyse gambling-related problems. They are the 2002 NATSISS, the 2004/5 NATSIHS, and the 2002 and 2006 GSS's. These social and health surveys are designed to collect a range of information across geographic, demographic, social, cultural, health status and health behaviour domains. In addition, all the surveys contained a data item identifying whether the respondent, their family or a close friend had experienced gambling problems over the 12 months preceding the survey. Explanatory variables from all these domains will be used in the analyses and data items will be matched as closely as possible across the different surveys.

While full details of sample design, collection methods, and data quality for these surveys have been reported elsewhere (see user and technical guides (Australian Bureau of Statistics, 2003a, 2003b, 2004d, 2007a), a summary is provided here. The 2002 and 2006 GSS employed a stratified multistage area sample, with a scope of all people aged 15 years and over in non-remote areas of Australia. This survey is a general population survey and forms part of the ABS social survey program. Both Indigenous social and health surveys employed a very similar survey design, which included a “community” and non-community sample. The community sample included a selection of discrete Indigenous communities from Queensland, the Northern Territory, South Australia and Western Australia. The community sample was obtained by taking a random selection of discrete Indigenous communities selected from a specially developed Indigenous Community Frame, which was constructed from information obtained in the *2001 Census* and the *2001 Community Housing and Infrastructure Needs Survey*. Within the selected communities dwellings were randomly selected. The sample also included dwellings in other areas of these states and territories not covered in the community sample. Dwellings in non-community areas were selected using a stratified multistage area sample, with the likelihood of a collection district being selected being based on the number of dwellings containing Indigenous persons in that collection district. Within each household (for community and non-community samples) a random sub-sample of usual residents was selected for inclusion in the survey. All interviews were face-to-face and carried out by specially trained interviewers. The scope and sample size for each survey used for analyses is presented in Table 4.2.

Table 4.2 Data sources, sample size and scope for analyses

Name of survey	Year	Sample size (n) ¹	Geographic scope for analysis
National Aboriginal and Torres Strait Islander Social Survey ²	2002	8,523	Non-remote & remote
National Aboriginal and Torres Strait Islander Health Survey ³	2004/5	3,398	Non-remote
General Social Survey (GSS)	2002	15,510	Non-remote
General Social Survey (GSS)	2006	13,375	Non-remote

(1) 18 years and over, (2) NATSISS, (3) NATSIHS

The 2002 NATSISS included respondents 15 years and over, while the 2004/05 NATSIHS included persons of all ages. Persons 18 years and over were interviewed personally, while 15-17 years olds were interviewed with the consent of a parent or guardian. For people aged less than 15 years, information was collected from the person responsible for the child. Computer assisted interviewing (CIA) was used for most of the non-community sample, while paper-based survey instruments were used for the community sample. Additionally, some data items were either not collected in the community sample or were collected differently, with approximately 80% of data items collected for both samples.

Due to these differences in scope and in the questions administered between the two Indigenous surveys the analyses for the 2002 NATSISS will be stratified by remoteness (remote and non-remote), while for the 2002 and 2006 GSS, and the 2004/05 NATSIHS, analyses will be conducted only the non-remote sample. All analyses are restricted to respondents aged 18 years and over.

4.2.4 Statistical analyses

To allow comparability between the three surveys all analyses using the 2002 NATSISS are conducted separately for remote and non-remote sample. This stratification by remoteness also has the advantage of account for some variation within Australia's Indigenous population (e.g. people who live in remote areas have less access to regulated gambling activities; have a much higher percentage of Indigenous language speakers; have different socioeconomic circumstances etc.).

4.2.4.1 Inter-relationship between NLES items

Estimates for the eleven NLES items are presented for each survey stratified by remoteness for the 2002 NATSISS. Factor analysis (principle component factor method) was used to identify inter-relationships between the eleven NLES items. The decision on the number of factors to retain included a combination of interpretability, observing scree plots and generally retaining factors with Eigen-values greater than one (Everitt & Dunn, 2001). An orthogonal rotation was applied to the retained factors and rotated factor structures presented for comparison and contrast between the different population groups (i.e. Indigenous and the general population). While a tetrachoric correlation matrix would have been preferred to a standard correlation matrix for use in the factor analyses, the former was not possible due to the weighting system used by the ABS and limitations of the statistical package used by the ABS Remote Access Laboratory (RADL). All factor analyses were carried out using weighted data. Estimates for the NLES items included in the factor analyses are also presented.

4.2.4.2 Estimates of reported gambling problems

Estimates of reported gambling problems are presented from the three ABS surveys and, where the sample allowed, these are reported by remoteness. Estimates were obtained from published ABS data and through the purchase of additional customised data tables. All estimates are reported with the standard error. The standard error represents the upper (added to estimate) and lower (subtracted from estimate) bounds of the estimate and indicate that there is an approximate 67% chance that the true estimate falls within the upper and lower bound. These can be converted to 95% confidence intervals by multiplying the standard error by 1.96, and the upper and lower bounds would then

indicate that there is a 95% chance the true estimate falls within the upper and lower bounds.

4.2.4.3 Multivariable modelling of reported gambling problems

Estimates of reported gambling problems are presented for the three surveys by jurisdiction and remoteness. The following analytical strategy was carried out separately for each data set and by remoteness for the 2002 NATSISS. First, unadjusted associations between explanatory variables and reported gambling problems were assessed using logistic regression. Explanatory variables showing a significant ($p \leq 0.05$) association with gambling problems were then assessed for collinearity to ensure the assumptions associated with logistic regression modelling were maintained. Where two or more explanatory variables were significantly correlated then these were first entered into a model (for reported gambling problems) and variables remaining significant were retained for the next stage of the analytic strategy. Next, the significant explanatory variables were entered simultaneously into a multivariable logistic regression and backward elimination carried out with removal of variables set at $p > 0.05$. Final models are presented for the 2002 NATSISS by remoteness, the 2004/5 NATSIHS (non-remote), and the 2002 and 2006 GSS (non-remote). All explanatory variables contained in the final models represent those variables that showing independent association with reported gambling problems. Or in other words, each variable exerts an independent effect on reported gambling problems.

All analyses were carried out using Stata v8.2© with data accessed via the ABS RADL web portal (Australian Bureau of Statistics, 2006a). The suite of SVR (survey replicate methods) commands were used to analyse data and confidence intervals were calculated using the Jack Knife (jk1) method (Winter, 2008).

4.3 Results

4.3.1 Inter-relationships between reported gambling problems and other NLES items

Results from the factor analyses (FA) are presented in Tables 4.3 to 4.7. All NLES items are ordered in the same way for ease of interpretation. Tables also contain estimates for each NLES item and the standard error. The initial factor analysis for the remote 2002 NATSISS had just two Eigen-values greater than one (see Table 4.3). However, after completing the factor analyses for the non-remote and other data sets, a 3-factor rotated solution was also produced. The 3-factor solution explained just over 52% of the variation between the NLES items while the 2-factor solution explained just under 44% of the variation. The same six items relating to social transgression, with the exception of not being able to get a job, had loadings greater than 0.40 on the first factor for both the 2- and 3-factor solutions. Gambling problems loaded on the first factor for both solutions. Three items relating health and well-being (death of a family member, serious accident, and serious illness or disability) loaded independently of the other factors on factor 2 for both solutions.

Table 4.3 Rotated factor analysis of 11 NLES items for 2002 NATSISS remote sample

Variable	Estimates	3-factor solution			2-factor solution	
	% (SE)	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2
Witness to violence	29.6 (3.5)	0.79	0.11	0.06	0.75	0.15
Abuse or violent crime	17.3 (3.2)	0.75	0.00	0.17	0.76	0.02
Alcohol or drug related problems	36.7 (3.2)	0.74	0.24	0.03	0.69	0.27
Trouble with the police	21.7 (2.7)	0.65	0.13	0.13	0.65	0.16

Variable	Estimates	3-factor solution			2-factor solution	
	% (SE)	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2
Gambling problem	26.5 (3.0)	0.65	0.25	0.12	0.64	0.28
Not able to get a job	24.4 (1.8)	0.42	0.05	0.52	0.59	0.05
Lost job, made redundant, sacked	5.0 (0.6)	0.06	0.05	0.91	0.40	0.02
Divorce or separation	12.9 (2.3)	0.32	0.30	0.25	0.39	0.31
Serious illness or disability family	35.1 (1.6)	0.09	0.70	0.05	0.09	0.70
Serious accident someone close	18.5 (1.7)	0.17	0.71	0.01	0.14	0.71
Death family member/close friend	55.8 (2.0)	0.19	0.59	0.16	0.22	0.59
Rotated Eigen-value	-	2.95	1.58	1.25	3.17	1.64
% variance	-	26.8%	14.3%	11.4%	28.9%	14.9%
Cumulative % variance	-	26.8%	41.1%	52.5%	28.9%	43.7%

NOTE: Weighted data N= 69,337 (18 years and over remote)
Unweighted data n=3,796

The factor analysis of the non-remote 2002 NATSISS had three Eigen-values greater than one and the rotated solution provided a clearly interpretable factor structure explaining just under 45% of the variation in NLES items (Table 4.4). Factor 1 again contained items relating to social transgression including witness to violence, seeing abuse or violent crime, alcohol and drug problems, trouble with the police and gambling problems. Factor 2 contained three items, not being able to get a job, losing a job and divorce or separation. The third factor included the same three items related to health and well-being that loaded separately as in the remote factor analysis.

Table 4.4 Rotated factor analysis of 11 NLES items for 2002 NATSISS non-remote sample

Variable	% (SE)	Factor 1	Factor 2	Factor 3
Witness to violence	9.7 (0.7)	0.68	0.06	0.19
Abuse or violent crime	9.1 (0.8)	0.68	-0.01	0.13
Alcohol or drug related problems	20.6 (1.0)	0.70	0.17	0.08
Trouble with the police	16.4 (1.2)	0.68	0.10	0.04
Gambling problem	11.0 (0.8)	0.52	0.27	-0.04
Not able to get a job	27.8 (1.5)	0.16	0.66	0.11
Lost job, made redundant, sacked	10.2 (0.8)	0.04	0.76	0.04
Divorce or separation	16.3 (1.2)	0.24	0.42	0.05
Serious illness or disability family	30.3 (1.4)	0.10	0.21	0.63
Serious accident someone close	8.7 (0.7)	0.19	-0.08	0.61
Death of family member/close friend	43.1 (1.3)	0.06	0.08	0.65
Rotated Eigen-value	-	2.28	1.36	1.28
% variance	-	20.7%	12.3%	11.6%
Cumulative % variance	-	20.7%	33.1%	44.7%

NOTE: Weighted data N= 182,060 (18 years and over non-remote)
Unweighted data n=4,727

Table 4.5 shows the rotated factor structures for the 2- and 3-factor solutions for non-remote areas using the 2004/5 NATSIHS. The 3-factor solution was generated for comparability with other 3-factor solutions, although the initial factor analysis only yielded two Eigen-values greater than one, though with moderate explanatory power (38.4% of variance explained). The 3-factor solution explained just under 48% of the variation in NLES items. The first factor for the 2- and 3-factor solutions contained the same five NLES items relating to social transgression (as per previous table) and also included not being able to get a job, although this item also loaded on factor 2 in the 3-factor solution. Serious illness and serious accident loaded separately to all other NLES items for the 2- and 3-factor solutions, while death of a family member had a moderate loading across all factors.

Table 4.5 Rotated factor analysis of 11 NLES items for the 2004/5 NATSIHS non-remote sample

Variable	Estimates % (SE)	3-factor solution			2-factor solution	
		Factor 1	Factor 2	Factor 3	Factor 1	Factor 2
Witness to violence	10.6 (1.0)	0.67	0.16	0.18	0.68	0.19
Abuse or violent crime	10.6 (1.0)	0.69	0.11	0.03	0.69	0.03
Alcohol or drug related problems	24.2 (1.2)	0.69	0.09	0.10	0.68	0.09
Trouble with the police	15.3 (1.0)	0.74	0.05	0.07	0.72	0.05
Gambling problem	11.2 (0.8)	0.61	0.16	0.07	0.63	0.09
Not able to get a job	17.8 (1.0)	0.44	0.45	0.08	0.54	0.20
Lost job, made redundant, sacked	8.9 (0.8)	0.06	0.77	0.11	0.26	0.36
Divorce or separation	12.5 (0.9)	0.17	0.63	0.01	0.33	0.21
Serious illness or disability family	28.3 (1.3)	0.08	0.11	0.71	0.07	0.70
Serious accident someone close	8.3 (0.7)	0.10	0.06	0.75	0.08	0.72
Death of family member/close friend	40.7 (1.3)	0.34	-0.11	0.34	0.28	0.27
Rotated Eigen-value	-	2.67	1.30	1.25	2.88	1.35
% variance	-	24.2%	11.8%	11.4%	26.2%	12.3%
Cumulative % variance	-	24.2%	36.1%	47.5%	26.2%	38.4%

NOTE: Weighted data N= 185,510 (18 years and over non-remote)

Unweighted data n=3,398

Tables 4.6 and 4.7 show the rotated 3-factor solutions for the 2002 and 2006 GSS's respectively (for people living in non-remote areas). For the 2002 GSS (Table 4.6), the rotated 3-factor solution provided a readily interpretable factor structure explaining 41% of the variation in the NLES items. Factor 1 contained four items pertaining to social transgression, and factor 3 contained the items pertaining to health and well-being. Items related to getting or losing a job loaded highly on factor 2 and divorce or separation loaded moderately on factors 1 and 2.

Table 4.6 Rotated factor analysis of 11 NLES items for the 2002 GSS non-remote sample

Variable	% (SE)	Factor 1	Factor 2	Factor 3
Abuse or violent crime	3.2 (0.2)	0.71	-0.02	0.03
Witness to violence	2.7 (0.2)	0.70	0.00	0.09
Alcohol or drug related problems	7.5 (0.3)	0.54	0.34	0.01
Trouble with the police	3.2 (0.2)	0.63	0.12	-0.01
Gambling problem	3.5 (0.2)	0.33	0.20	0.18
Lost job, made redundant, sacked	6.2 (0.2)	0.00	0.75	0.03
Not able to get a job	14.4 (0.3)	0.08	0.73	0.04
Divorce or separation	11.4 (0.4)	0.28	0.33	0.17
Serious illness or disability family	23.5 (0.5)	0.00	0.15	0.61
Serious accident someone close	4.7 (0.2)	0.11	-0.07	0.59
Death of family member/close friend	20.0 (0.5)	0.03	0.05	0.63
Rotated Eigen-value	-	1.89	1.40	1.19
% variance	-	17.2%	12.7%	10.8%
Cumulative % variance	-	17.2%	29.9%	40.8%

NOTE: Weighted data N= 14,503,000 (18 years and over non-remote)

Unweighted data n=15,510

The rotated 3-factor solution for the 2006 GSS was similar to that obtained for 2002 and explained 42% of the variation in the NLES items (Table 4.7). Factor 1 contained the five items pertaining to social transgression (i.e. abuse or violent crime, witness to violence, trouble with the police, alcohol and drug problems, trouble with the police and gambling problems). Factor 2 again included the items relating to work and divorce or separation also had a moderate loading on this factor. Factor 3 again contained the three NLES items pertaining to health and well-being.

Table 4.7 Rotated factor analysis of 11 NLES items for 2006 GSS non-remote sample

Variable	% (SE)	Factor 1	Factor 2	Factor 3
Abuse or violent crime	3.3 (0.2)	0.71	-0.06	0.10
Witness to violence	2.9 (0.2)	0.67	0.07	0.14
Alcohol or drug related problems	8.6 (0.4)	0.60	0.30	0.00
Trouble with the police	3.9 (0.3)	0.64	0.11	-0.06
Gambling problem	3.2 (0.2)	0.44	0.26	-0.15
Lost job, made redundant, sacked	5.5 (0.3)	0.03	0.77	0.07
Not able to get a job	13.0 (0.4)	0.12	0.74	0.04
Divorce or separation	11.4 (0.4)	0.28	0.27	0.16
Serious illness or disability family	26.7 (0.7)	0.02	0.13	0.60
Serious accident someone close	5.2 (0.3)	0.18	0.02	0.49
Death of family member/close friend	21.1 (0.6)	0.03	0.04	0.68
Rotated Eigen-value	-	2.05	1.41	1.15
% variance	-	18.7%	12.8%	10.5%
Cumulative % variance	-	18.7%	31.5%	42.0%

NOTE: Weighted data N= 15,307,000 (18 years and over non-remote)

Unweighted data n=13,375

In summary all rotated factor solutions provided interpretable solutions with remarkable similarity between surveys of the Indigenous and general population (largely representative of the non-Indigenous population) and between remote and non-remote areas for the 2002 NATSISS. The NLES items clustered in three distinct groups that separated items relating to (i) social transgression, (ii) social and economic loss, and (iii) health and well-being. NLES items falling into the three groups are listed in Table 4.8.

Table 4.8 Summary of factor analyses of NLES items

Social transgression	Economic and social loss	Health and well-being
Abuse or violent crime	Lost job, made redundant	Serious illness or disability family
Witness to violence	Not able to get a job	Serious accident someone close
Alcohol or drug related problems	Divorce or separation	Death of family member/close friend
Trouble with the police		
Gambling problem		

4.3.2 Estimates of reported gambling problems by jurisdiction and remoteness

Estimates for reported gambling problems are presented for the Indigenous population and the general population in Tables 4.9 and 4.10 respectively. In addition, Figures 4.1 and 4.2 present reported gambling problems using choropleth maps, with darker shading representing higher estimates and lighter shading representing lower estimates. Reported gambling problems for the Indigenous population in 2002 were lowest in ACT/Tasmania and Western Australia and highest in the Northern Territory and Queensland. There was significant variation between remote and non-remote estimates for most states and territories with remote areas reporting higher estimates of reported gambling problems for all states except New South Wales. In 2004/5, ACT/Tasmania and Victoria had the lowest estimates for reported gambling problems and the highest were reported in the Northern Territory and South Australia.

Table 4.9 Estimates of reported gambling problems by jurisdiction for the Indigenous population

	2002 NATSISS ¹			2004/5 NATSIHS ²		
	Remote % (SE)	Non-remote % (SE)	Total % (SE)	Remote % (SE)	Non-remote % (SE)	Total % (SE)
Western Australia	13.2 (2.9)	3.6 (1.2)	8.1 (1.5)	10.1 (2.1)	12.3 (3.5)	11.1 (2.0)
New South Wales	8.7 (2.3)	10.3 (1.3)	10.2 (1.2)	6.0 (1.0)	11.1 (1.6)	10.8 (1.5)
Victoria	-	13.3 (1.6)	13.3 (1.6)	-	8.3 (1.5)	8.3 (1.5)
Queensland	37.1 (10.7)	10.7 (1.6)	17.4 (2.9)	18.7 (3.1)	12.3 (1.7)	14.0 (1.5)
South Australia	19.3 (5.4)	16.5 (2.3)	17.2 (2.2)	21.3 (3.5)	14.1 (2.1)	15.8 (1.8)
Northern Territory	31.9 (4.1)	11.4 (2.9)	28.4 (1.4)	27.5 (3.1)	8.3 (2.5)	24.5 (2.6)
ACT/Tasmania ¹	-	7.9 (1.1)	7.9 (1.1)	-	-	8.4 (1.4)
Australia	26.4 (3.2)	10.2 (0.7)	14.6 (1.0)	19.4 (1.6)	11.2 (0.8)	13.5 (0.7)

1 NATSISS estimates sourced from Australian Bureau of Statistics publications (data cubes), except for ACT/Tasmania which were derived from the NATSISS CURF accessed via the ABS RADL.

2 NATSIHS estimates obtained from a customised Australian Bureau of Statistics tables

Estimates of reported gambling problems for the general population living in non-remote area of Australia are presented in Table 4.10. In the 2002 GSS, the lowest estimate for reported gambling problems was in WA (under half the estimates from other states and territories) while the highest estimate was in NSW. Estimates remained relatively stable between 2002 and 2006, with WA again having the lowest estimate of reported gambling problems. There was little difference between all states and territories in 2006 estimates except the Northern Territory, which reported 4.7%, while all other states were around 3%, except for SA which was 3.8%. There were no significant differences between the 2002 and 2006 estimates as 95% confidence intervals (1.96 times the standard error) overlap for all estimates.

Table 4.10 Estimates of reported gambling problems by jurisdiction for the general population

	2002 GSS ¹	2006 GSS ¹
	Non-remote % (SE)	Non-remote % (SE)
Western Australia	1.3 (0.2)	1.6 (0.4)
New South Wales	4.1 (0.4)	3.3 (0.6)
Victoria	3.7 (0.4)	3.1 (0.4)
Queensland	3.2 (0.4)	3.7 (0.5)
South Australia	3.7 (0.5)	3.8 (0.5)
Northern Territory	3.0 (0.6)	4.7 (0.9)
ACT/Tasmania ¹	3.2 (0.3)	3.1 (0.3)
Australia	3.5 (0.2)	3.2 (0.2)

1 GSS (2002 and 2006) estimates obtained from customised Australian Bureau of Statistics tables

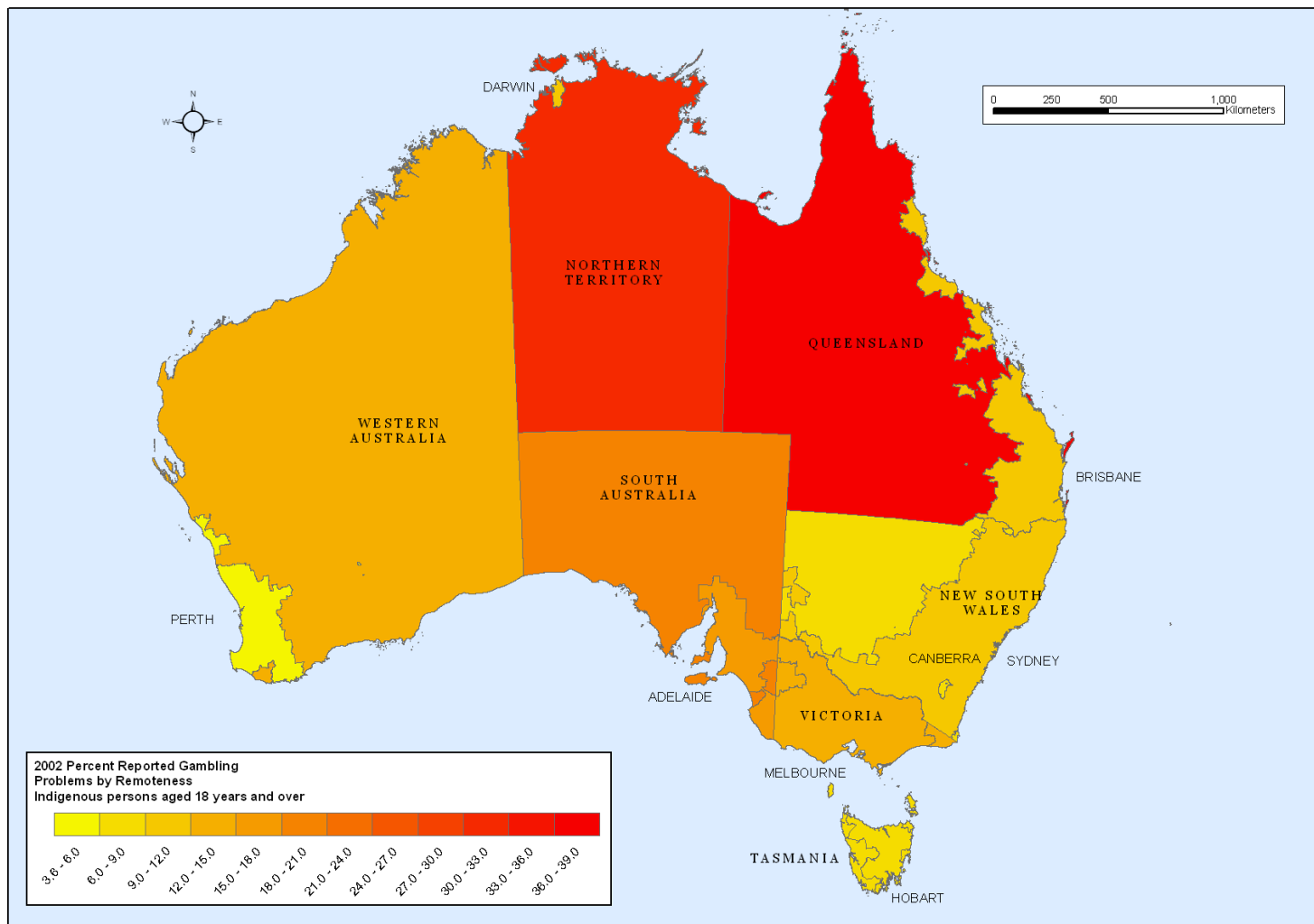


Figure 4.1 Reported gambling problems 2002 for the Indigenous population by jurisdiction and remoteness

Source: Australian Bureau of Statistics customised table - map prepared by Charles Darwin University, Institute for Advanced Studies, School for Social and Policy Research

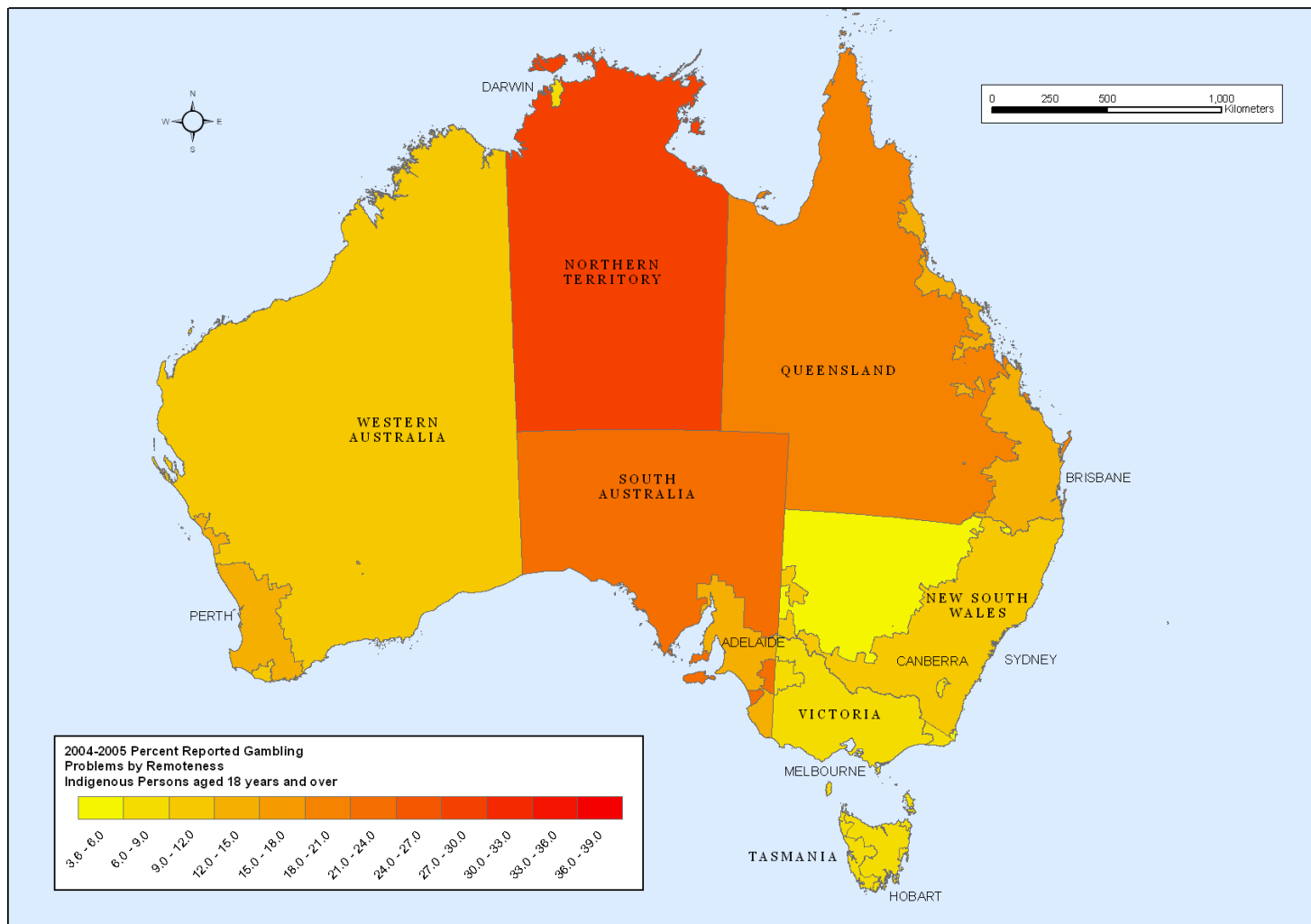


Figure 4.2 Reported gambling problems 2004/5 for the Indigenous population by jurisdiction and remoteness

Source: Australian Bureau of Statistics customised table - map prepared by Charles Darwin University, Institute for Advanced Studies, School for Social and Policy Research

4.3.3 Multivariable logistic regression models for reported gambling problems

Results for multivariable logistic regression models are presented in three sections:

- 4.3.3.1 - 2002 NATSISS non-remote sample and remote sample,
- 4.3.3.2 - 2004/5 NATSIHS non-remote sample, and
- 4.3.3.3 - 2002 and 2006 GSS non-remote sample. All variables in the final models are significant at $p \leq 0.05$.

Separate tables are presented for each multivariable model. The first column contains the explanatory variable remaining in the final models (i.e. that showed independent association with reported gambling problems). The second column contains odds ratios (and 95% confidence interval) for categories of the explanatory variables. Odds ratios greater than one that do not have 95% confidence intervals that include one are significantly different from the base category, which is given by one. Conversely, odds ratios below one that do not have 95% confidence intervals overlapping one are also significant. However, to assist interpretation of the odds ratios, percentage estimates and standard errors for each category of the explanatory variable are also included. This will help the reader gauge the magnitude of the differences between categories of the explanatory variables. The final column in these tables contains the explanatory variables distribution in the population and will add to 100% for each explanatory variable.

4.3.3.1 NATSISS (2002)

The final multivariable model for the 2002 NATSISS remote sample included eleven variables from a broad range of social and demographic domains (Table 4.11). There were differences in reported gambling problems between states and territories, with Queensland and the Northern Territory reporting significantly higher estimates of reported gambling problems compared with all other states. Household family structure was significantly associated with reported gambling problems, with Indigenous people living in three-or-more family households reporting significantly higher problems than one-family and sole person households (odds ratio and 95% confidence interval 2.14 (1.27-3.62)). Indigenous people who had access to a landline telephone were less likely to report gambling problems than those without a landline telephone (0.69 (0.49-0.98)). Five variables relating to social and community factors were significantly associated with reported gambling problems. Respondents who attended or were involved social and cultural activities reported more gambling related problems than those who did not attend such events. Specifically, Indigenous people who were participated in (1.33 (1.06-1.68)) or attending (1.50 (1.10-2.04)) a sporting event, involved in community special interest activities (1.64 (1.19-2.25)) and attending a funeral (1.82 (1.21-2.72)) were significantly more likely to report gambling related problems. People who perceived their communities to be having youth gang problems (1.49 (1.15-1.94)), alcohol problems (2.21 (1.39-3.53)), and physical assault problems (2.42 (1.83-3.19)) were significantly more likely to report gambling related problems than those not reporting community problems. Respondents who were a victim of threatened or physical violence (1.81 (1.36-2.40)) also reported higher levels of gambling problems. Lastly, self-reported health had a significant association with reported gambling problems, with people reporting their health as very good (1.77 (1.10-2.86)) and poor (1.89 (1.02-3.48)) more likely to report gambling related problems compared with those who reported their health as excellent.

Table 4.11 Multivariate models for reported gambling problems: Indigenous population living in remote and very remote regions (2002 NATSISS)

	Model REM1 OR (95% CI)²	Gambling Problems¹ % (SE)	Population distribution % (SE)
Australia	-	26.4 (3.2)	100.0
<i>Regional</i>			
State/Territory			
Western Australia	1.00	14.8 (3.2)	24.0 (0.7)
New South Wales	1.49 (0.79-2.82)	12.6 (2.6)	7.0 (0.3)
Victoria	-	-	0.0 (0.0)
Queensland	2.29 (1.15-4.57)	35.7 (10.1)	24.8 (0.6)
South Australia	0.88 (0.36-2.19)	19.6 (4.2)	4.8 (0.1)
Northern Territory	2.38 (1.32-4.30)	31.4 (3.9)	39.3 (0.4)
ACT/Tasmania	-	-	0.0 (0.0)
<i>Demographic</i>			
Household type			
One family	1.00	22.5 (2.4)	55.0 (2.5)
Two families	1.24 (0.86-1.78)	33.6 (5.8)	19.8 (1.7)
Three families	2.14 (1.27-3.62)	38.1 (6.3)	15.4 (2.2)
Mixed	1.01 (0.34-3.01)	23.2 (8.2)	3.6 (0.9)
Group	1.14 (0.29-4.40)	27.4 (11.8)	0.8 (0.2)
Lone person	0.53 (0.27-1.03)	11.8 (2.8)	5.4 (0.8)
<i>Socioeconomic/communication</i>			
Telephone access (landline)			
No access	1.00	30.7 (3.7)	56.9 (2.6)
Has landline access	0.69 (0.49-0.98)	21.1 (2.5)	43.1 (2.6)
<i>Social and cultural networks</i>			
Type of social/cultural activity - last 3 months			
Community interest activities			
Not involved	1.00	20.0 (2.3)	69.8 (2.2)
Involved in community activities	1.64 (1.19-2.25)	41.7 (4.9)	30.2 (2.2)
Sports/physical participation			
Did not participate	1.00	19.6 (1.8)	59.6 (3.2)
Participated in sports/physical activity	1.33 (1.06-1.68)	36.9 (4.8)	40.4 (3.2)
Sporting carnival attendance			
Did not attend	1.00	17.4 (1.8)	48.2 (2.6)
Attended sports carnival	1.50 (1.10-2.04)	35.1 (4.3)	51.8 (2.6)
Funeral attendance			
Did not attend	1.00	14.1 (2.0)	25.0 (1.6)
Attended funeral	1.82 (1.21-2.72)	30.7 (3.6)	75.0 (1.6)
Other clan members in community			
No	1.00	14.1 (3.6)	21.6 (2.2)
Yes - have other clan members	1.38 (0.83-2.31)	30.0 (2.9)	77.1 (2.4)
Don't know	2.45 (1.20-4.99)	28.1 (9.4)	1.3 (0.4)
<i>Social and community safety</i>			
Types of community problems			
Community youth gang problems	1.49 (1.15-1.94)	40.0 (3.9)	48.0 (4.1)
Community alcohol problems	2.21 (1.39-3.53)	39.0 (3.9)	54.2 (3.5)
Community physical assault problems	2.42 (1.83-3.19)	46.1 (3.8)	41.5 (4.8)
Victim of physical/threatened violence			
Not a victim	1.00	22.5 (2.7)	77.0 (1.3)
Has been victim	1.81 (1.36-2.40)	40.4 (5.0)	23.0 (1.3)
<i>Health and health behaviours</i>			
Self-assessed health status			
Excellent	1.00	22.7 (4.0)	15.4 (1.3)
Very good	1.77 (1.10-2.86)	32.1 (3.9)	27.1 (1.6)
Good	1.22 (0.75-1.98)	24.0 (2.7)	35.8 (1.9)
Fair	1.55 (0.85-2.84)	26.9 (3.4)	15.0 (0.9)
Poor	1.89 (1.02-3.48)	26.6 (6.5)	6.6 (0.8)

1 Estimates from RADL may differ from published Australian Bureau of Statistics estimates and those in Table 4.8 due to perturbation of the data by the Australian Bureau of Statistics to ensure confidentiality

2 OR = odds ratio, 95% CI = 95% confidence interval for odds ratio

NOTE: Weighted data $N_{\text{remote}} = 68,672$ (18 years and over non-remote)

Unweighted data $n_{\text{remote}} = 3,753$

Population distribution for each variable may not sum to 100 due to rounding

The final multivariable model for the non-remote sample of the 2002 NATSISS is presented in Table 4.12. There was significant variation between the states and territories with all jurisdictions reporting more gambling related problems compared with Western Australia. Female respondents and those living in houses with all Indigenous residents were more likely to report gambling problems (ORs of 1.59 (1.16-2.17), and 1.68 (1.11-2.53) respectively). One socioeconomic variable, personal income, remained in the model with respondents in the highest personal income category (2.45 (1.52-3.95)) reporting higher levels of gambling problems than people in the lowest income category. Two variables reflecting social, work and family networks, attending a sporting event and being involved in an Indigenous organisations were positively associated with reporting my gambling related problems (ORs of 1.61 (1.12-2.32) and 1.76 (1.19-2.62) respectively). Indigenous respondents who reported community problems with break-ins and theft (1.71 (1.21-2.41)), and family violence were significantly more likely to report gambling related problems. Respondents' self-reported health was associated with reported gambling problems, and this relationship was non-linear.

Table 4.12 Multivariate models for reported gambling problems: Indigenous population living in non-remote regions (major cities, inner and outer regional areas) (2002 NATSISS)

	Model NR1 OR (95% CI)	Gambling Problems ¹ % (SE)	Population distribution % (SE)
Australia	-	10.2 (0.7)	100.0
<i>Regional</i>			
<i>State/Territory</i>			
Western Australia	1.00	4.4 (1.4)	10.2 (0.3)
New South Wales	2.83 (1.31-6.13)	11.1 (1.4)	38.4 (0.6)
Victoria	4.02 (1.83-8.86)	14.4 (1.8)	8.6 (0.2)
Queensland	2.85 (1.45-5.62)	11.0 (1.6)	27.5 (0.6)
South Australia	5.16 (2.27-11.7)	17.9 (2.5)	5.9 (0.1)
Northern Territory	6.06 (1.67-21.9)	17.3 (5.9)	3.1 (0.3)
Australian Capital Territory/Tasmania	2.43 (1.07-5.55)	7.9 (1.1)	6.3 (0.2)
<i>Demographic</i>			
<i>Gender of respondent</i>			
Male	1.00	8.4 (1.0)	47.2 (0.3)
Female	1.59 (1.16-2.17)	13.4 (1.2)	52.8 (0.3)
<i>Household composition</i>			
Mixed Indigenous and non-Indigenous	1.00	8.5 (1.1)	45.2 (1.7)
All Indigenous	1.68 (1.11-2.53)	13.2 (1.2)	54.8 (1.7)
<i>Socioeconomic status</i>			
<i>Personal income (gross per week)</i>			
\$0-185 [1 st - 3 rd decile]	1.00	8.8 (1.3)	29.6 (1.3)
\$186-230 [4 th - 5 th decile]	1.02 (0.59-1.76)	9.7 (1.9)	15.7 (0.9)
\$231-380 [6 th - 7 th decile]	1.13 (0.71-1.79)	11.6 (1.6)	20.3 (1.0)
\$381-690 [8 th - 9 th decile]	1.05 (0.68-1.63)	9.8 (1.4)	21.1 (1.1)
\$691+ [10 th decile]	2.45 (1.52-3.95)	17.9 (3.0)	13.3 (1.1)
<i>Social and cultural networks</i>			
<i>Sporting carnival attendance</i>			
Did not attend	1.00		78.9 (1.3)
Attended sports carnival	1.61 (1.12-2.32)	18.5 (1.8)	21.1 (1.3)
<i>Involved in Indigenous organisation:</i>			
Was not involved	1.00	8.3 (0.8)	72.5 (1.4)

	Model NR1	Gambling Problems¹	Population distribution
	OR (95% CI)	% (SE)	% (SE)
Involved in Indigenous organisation	1.76 (1.19-2.62)	18.1 (1.9)	27.5 (1.4)
<i>Community problems</i>			
Community problems identified			
No theft or break-ins	1.00	7.9 (0.8)	55.8 (1.5)
Theft and break-ins	1.71 (1.21-2.41)	15.0 (1.4)	44.2 (1.5)
Community problems identified			
No family violence	1.00	9.7 (0.8)	86.3 (1.1)
Family violence	1.68 (1.17-2.41)	19.7 (2.4)	13.7 (1.1)
<i>Health and behaviour</i>			
Self-assessed health status			
Excellent	1.00	8.2 (2.0)	16.3 (1.1)
Very good	0.99 (0.49-2.03)	9.5 (1.3)	25.5 (1.2)
Good	1.75 (0.87-3.53)	13.3 (1.7)	31.7 (1.3)
Fair	1.79 (0.91-3.54)	13.2 (2.0)	18.9 (1.0)
Poor	0.98 (0.46-2.06)	8.0 (1.5)	7.7 (0.6)

¹ Estimates from RADL may differ from published Australian Bureau of Statistics estimates and those in Table 4.8 due to perturbation of the data by the Australian Bureau of Statistics to ensure confidentiality

NOTE: Weighted data $n_{\text{non-remote}} = 176,008$ (18 years and over non-remote)

Unweighted data $n_{\text{non-remote}} = 4,613$

Population distribution for each variable may not sum to 100 due to rounding

4.3.3.2 NATSIHS (2004/5) results (non-remote)

The final multivariable model for the non-remote sample of the 2004/5 NATSIHS is presented in Table 4.13. Variables relating to community problems and participation in social/cultural activities that remained in the 2002 NATSISS multivariable models were not available for analysis in the 2004/5 NATSIHS. Indigenous female respondents (1.64 (1.17-2.29)) were more likely to report gambling related problems compared with male respondents. Three socioeconomic variables were significantly associated with reported gambling problems. Indigenous people who were renting (3.01 (1.36-6.62)) or purchasing (2.36 (1.01-5.56)) their homes reported significantly more gambling problems than those who owned their own homes. Household equivalised income had a non-linear association with reported gambling problems, with respondents in the highest income quintile (2.68 (1.35-5.35)) and those in the 2nd income quintile (1.67 (1.04-2.68)) reporting at higher levels than those in the lowest household income quintile. Indigenous respondents who ran out money in the two weeks prior to the survey (1.58 (1.07-2.33)) were more likely to report gambling related problems. Respondents who had other clan members living in their community (2.21 (1.55-3.16)) were significantly more likely to report gambling problems, and people who were removed from their families (1.99 (1.40-2.81)) also reported significantly more gambling related problems.

Table 4.13 Multivariate models for reported gambling problems: Indigenous population living in non-remote regions (major cities, inner and outer regional areas) (2004/5 NATSIHS)

Explanatory variable	Model NR2	Gambling Problems¹	Population distribution
	OR (95% CI)	% (SE)	% (SE)
Australia	-	11.2 (0.8)	100.0
<i>Demographic</i>			
Gender			
Male	1.00	8.8 (1.1)	46.7 (0.8)
Female	1.64 (1.17-2.29)	13.3 (1.1)	53.3 (0.8)
<i>Socioeconomic status</i>			
Tenure type			
Owner: no mortgage	1.00	3.4 (1.1)	9.4 (1.0)

Explanatory variable	Model NR2	Gambling Problems ¹	Population distribution
	OR (95% CI)	% (SE)	% (SE)
Owner: mortgage	2.36 (1.01-5.56)	9.6 (1.9)	22.1 (1.4)
Renter	3.01 (1.36-6.62)	12.8 (1.0)	68.5 (1.7)
Household equivalised income quintiles			
Lowest quintile	1.00	10.2 (1.2)	33.3 (1.4)
2 nd quintile	1.67 (1.04-2.68)	13.9 (2.3)	20.0 (1.2)
3 rd quintile	1.09 (0.60-1.99)	8.5 (1.9)	16.2 (1.2)
4 th quintile	1.56 (0.87-2.80)	11.2 (2.5)	10.6 (1.1)
Highest quintile	2.68 (1.35-5.35)	19.7 (4.8)	5.8 (0.8)
Household income unknown	1.07 (0.57-2.04)	9.2 (2.2)	14.2 (1.1)
Money stress last 2 weeks			
Did not run out of money	1.00	9.6 (0.9)	75.4 (1.1)
Ran out of money	1.58 (1.07-2.33)	15.9 (1.9)	24.6 (1.1)
<i>Social networks and culture</i>			
Other clan members in community			
No	1.00	6.4 (0.9)	50.3 (1.7)
Yes - have other clan members	2.21 (1.55-3.16)	16.2 (1.4)	45.7 (1.6)
Don't know	2.04 (0.70-6.01)	14.2 (6.0)	3.9 (1.0)
Member of stolen generation			
Was not removed	1.00	7.2 (0.9)	41.9 (1.7)
Removed from family	1.99 (1.40-2.81)	17.5 (1.6)	39.3 (1.4)
Refused to answer	0.85 (0.49-1.49)	6.8 (1.3)	18.8 (1.2)

¹ Estimates from RADL may differ from published Australian Bureau of Statistics estimates and those in Table 4.8 due to perturbation of the data by the Australian Bureau of Statistics to ensure confidentiality

NOTE: Weighted data $n_{\text{non-remote}} = 184,404$ (18 years and over non-remote)

Unweighted data $n_{\text{non-remote}} = 3,373$

Population distribution for each variable may not sum to 100 due to rounding

4.3.3.3 GSS (2002 and 2006)

The final multivariable model for the 2002 GSS (for non-remote regions) is presented in Table 4.14. Compared with Western Australia, all other states had significantly higher reported gambling problems. Respondent age was associated with reporting gambling problems, with reported levels peaking in the 25-34 year-old category then decreasing as people aged. Variables pertaining to socioeconomic status remaining in the multivariable model included tenure type, household equivalised income, highest educational attainment, and experience of cash flow problems. Respondents who were renters (1.94 (1.18-3.18)) reported more gambling related problems compared with those who own their house. Household equivalised income had a non-linear association with reported gambling problems with respondents in the 3rd (1.99 (1.23-3.23)) and highest (1.64 (1.10-2.45)) quintile significantly more likely to report gambling problems than those in the lowest income quintile. Compared with respondents who had a diploma or higher, those with a certificate I-IV (1.55 (1.02-2.36)) and year 12 level (1.51 (1.02-2.22)) education were significantly more likely to report gambling problems. Respondents who experienced two or more cash flow problems in the last 12 months to the survey (2.22 (1.46-3.38)) reported significantly more gambling problems than those who experienced no cash flow problems. Participation in sports/physical activity (1.32 (1.00-1.74)) and being a victim of physical or threatened violence (2.02 (1.46-2.79)) both showed a significant positive association with reported gambling problems. Lastly, self-reported health showed a significant association with reported gambling problems, with respondents with good or less health reporting higher levels than those reporting their health as excellent.

Table 4.14 Multivariate models for gambling problems: Total population living in non-remote regions (major cities, inner and outer regional areas) (2002 GSS)

	Model NR3 OR (95% CI)	Gambling Problems¹ % (SE)	Population distribution % (SE)
Australia	-	3.5 (0.2)	100.0
<i>Regional</i>			
State/Territory			
Western Australia	1.00	1.4 (0.2)	9.8 (0.0)
New South Wales	3.48 (2.33-5.20)	4.1 (0.4)	33.8 (0.0)
Victoria	3.10 (2.03-4.73)	3.7 (0.4)	25.2 (0.0)
Queensland	2.97 (1.94-4.53)	3.5 (0.5)	7.8 (0.0)
South Australia	2.11 (1.32-3.37)	3.1 (0.4)	18.6 (0.0)
Northern Territory	1.91 (1.18-3.09)	3.2 (0.6)	0.7 (0.0)
Australian Capital Territory/Tasmania	2.47 (1.73-3.53)	3.1 (0.3)	4.0 (0.0)
<i>Demographic</i>			
Age (years)			
18-24	1.00	4.0 (0.6)	13.1 (0.0)
25-34	1.56 (1.04-2.32)	5.6 (0.5)	20.0 (0.0)
35-44	1.18 (0.78-1.78)	4.1 (0.5)	20.2 (0.0)
45-54	0.90 (0.55-1.50)	3.0 (0.4)	18.2 (0.0)
55 or more	0.65 (0.31-1.36)	1.5 (0.3)	28.4 (0.0)
<i>Socioeconomic status</i>			
Tenure type			
Owner: no mortgage	1.00	1.7 (0.3)	38.2 (0.5)
Owner: mortgage	1.64 (0.94-2.87)	4.0 (0.4)	34.5 (0.6)
Renter	1.94 (1.18-3.18)	5.3 (0.4)	27.3 (0.6)
Household equivalised income quintiles			
Lowest quintile	1.00	3.0 (0.4)	19.6 (0.6)
2 nd quintile	0.94 (0.63-1.40)	2.7 (0.3)	18.7 (0.5)
3 rd quintile	1.99 (1.23-3.23)	5.0 (0.8)	18.9 (0.4)
4 th quintile	1.43 (0.99-2.06)	3.6 (0.4)	19.8 (0.5)
Highest quintile	1.64 (1.10-2.45)	3.6 (0.3)	22.9 (0.6)
Highest educational attainment			
Diploma /degree / postgraduate	1.00	2.8 (0.4)	24.6 (0.6)
Certificate 1-4	1.55 (1.02-2.36)	4.0 (0.6)	17.4 (0.5)
Year 12	1.51 (1.02-2.22)	4.1 (0.5)	18.4 (0.4)
Year 11	1.46 (0.85-2.50)	4.1 (0.7)	6.7 (0.3)
Year 10 or below	1.51 (0.97-2.35)	3.2 (0.3)	32.9 (0.5)
Cash flow problems in last 12 months			
None	1.00	2.7 (0.2)	79.9 (0.4)
One	1.35 (0.93-1.96)	4.4 (0.6)	9.0 (0.3)
Two or more	2.22 (1.46-3.38)	8.7 (1.1)	11.1 (0.4)
<i>Social factors</i>			
Participation in social/sports activities			
Did not participate	1.00	3.0 (0.3)	36.0 (0.6)
Participated in sports	1.32 (1.00-1.74)	3.7 (0.2)	64.0 (0.6)
Victim of threatened/physical violence			
No threatened/physical violence	1.00	3.0 (0.2)	91.0 (0.3)
Victim of threatened/physical violence	2.02 (1.46-2.79)	8.1 (0.9)	9.0 (0.3)
<i>Health</i>			
Self-reported health			
Excellent	1.00	2.6 (0.4)	25.6 (0.5)
Very good	1.45 (0.97-2.18)	3.7 (0.3)	33.6 (0.6)
Good	1.86 (1.17-2.93)	3.8 (0.5)	24.9 (0.5)
Fair	1.82 (1.05-3.15)	3.1 (0.5)	11.3 (0.3)
Poor	3.95 (2.00-7.80)	5.5 (1.2)	4.6 (0.2)

¹ Estimates from RADL may differ from published Australian Bureau of Statistics estimates and those in Table 4.8 due to perturbation of the data by the Australian Bureau of Statistics to ensure confidentiality

NOTE: Weighted data $N_{\text{non-remote}} = 13,025,549$ (18 years and over non-remote)

Unweighted data $n_{\text{non-remote}} = 14,271$

Population distribution for each variable may not sum to 100 due to rounding

The final multivariable model for the 2006 GSS (for non-remote regions) is presented in Table 4.15. Consistent with the 2002 GSS model, compared with Western Australia, all jurisdictions reported levels of gambling problems 2-3 times higher. Respondents aged 18-45 reported significantly higher levels of gambling problems than older respondents (55 or more years), peaking in the 25-34 year-olds (2.77 (1.69-4.53)). The only socioeconomic variable in the model was cash flow problems and as with the 2002 model, people experiencing two or more cash flow problems (2.43 (1.63-3.61)) more likely to report gambling problems than those reporting no cash flow problems.

Table 4.15 Multivariate models for gambling problems: Total population living in non-remote regions (major cities, inner and outer regional areas) (2006 GSS)

	Model NR4 OR (95% CI)	Gambling Problems¹ % (SE)	Population distribution¹ % (SE)
Australia		3.2 (0.2)	
<i>Regional</i>			
State/Territory			
Western Australia	1.00	1.5 (0.4)	9.7 (0.0)
New South Wales	2.39 (1.26-4.53)	3.3 (0.5)	33.5 (0.1)
Victoria	2.40 (1.30-4.41)	3.2 (0.5)	25.1 (0.1)
Queensland	2.35 (1.35-4.12)	3.6 (0.5)	7.7 (0.0)
South Australia	2.59 (1.47-4.55)	3.6 (0.5)	19.3 (0.1)
Northern Territory	2.58 (1.57-4.25)	4.5 (0.6)	0.7 (0.0)
Australian Capital Territory/Tasmania	2.36 (1.32-4.23)	3.2 (0.3)	4.0 (0.0)
<i>Demographic</i>			
Age (years)			
18-24	1.86 (1.13-3.06)	4.0 (0.9)	12.7 (0.0)
25-34	2.77 (1.69-4.53)	4.3 (0.6)	18.4 (0.1)
35-44	2.67 (1.63-4.36)	4.0 (0.4)	19.5 (0.0)
45-54	2.56 (1.41-4.65)	3.7 (0.7)	18.3 (0.1)
55 or more	1.00	1.3 (0.2)	31.1 (0.0)
<i>Socioeconomic status</i>			
Cash flow problems in last 12 months			
None	1.00	2.3 (0.2)	82.2 (0.5)
One	1.64 (0.99-2.73)	4.8 (1.0)	7.9 (0.3)
Two or more	2.43 (1.63-3.61)	8.6 (1.0)	9.9 (0.4)
<i>Social factors</i>			
Participation in social/sports activities			
Did not participate	1.00	2.7 (0.2)	65.8 (0.6)
Participated in sports/recreational	1.41 (1.08-1.82)	4.0 (0.4)	34.2 (0.6)
Participation in social/sports activities			
Did not attend	1.00	2.9 (0.3)	85.0 (0.4)
Attended arts heritage or craft group	1.55 (1.04-2.30)	4.5 (0.7)	15.0 (0.4)
Victim of threatened/physical violence			
No threatened/physical violence	1.00	2.4 (0.2)	89.2 (0.4)
Victim of threatened/physical violence	2.97 (2.16-4.07)	9.8 (1.0)	10.8 (0.4)
<i>Health</i>			
Self-reported health			
Excellent	1.00	2.5 (0.5)	23.3 (0.5)
Very good	1.12 (0.67-1.86)	2.7 (0.3)	34.3 (0.5)
Good	1.62 (1.02-2.58)	4.0 (0.5)	26.6 (0.6)
Fair	1.69 (0.88-3.26)	3.5 (0.8)	11.2 (0.4)
Poor	1.92 (0.91-4.03)	4.1 (1.1)	4.6 (0.3)

1 Estimates from RADL may differ from published Australian Bureau of Statistics estimates and those in Table 4.8 due to perturbation of the data by the Australian Bureau of Statistics to ensure confidentiality

NOTE: Weighted data $N_{\text{non-remote}} = 15,307,066$ (18 years and over non-remote)

Unweighted data $n_{\text{non-remote}} = 13,375$

Population distribution for each variable may not sum to 100 due to rounding

4.4. Summary

1. The factor analyses of the NLES showed that gambling problems situate with other items relating to the social transgression factor. These included: witness to violence, abuse and violent crime, alcohol and drug related problems, and having trouble with the police. Significantly, the same pattern of associations occurred for the general population as the Indigenous population, so gambling problems sit within this domain (social transgressions) for the entire population and is not specific to Indigenous or non-Indigenous people.

2. There is great variation in reported gambling problems by jurisdiction and remoteness for the indigenous population. The NT, Qld and SA have highest reported gambling problems. Significantly, respondents living in remote regions in all jurisdictions except NSW reported more gambling problems than people living in non-remote regions. Estimates of reported gambling problems were also significantly higher (three to four times) amongst the Indigenous population living in non-remote regions, compared with the general population.

3. The significant correlates for the Indigenous population fall under the domains of regional, demographic, socioeconomic, social networks, social and community safety, and health. Socioeconomic factors were less important in remote regions compared with non-remote regions. For example, individual income and household income were independently associated with gambling problems in non-remote regions for the 2002 and 2004/5 surveys respectively, but not for the remote analysis. Participation in social and cultural activities was more important for remote areas with participation in these activities independently associated with higher levels of reported gambling problems.

4. Socioeconomic variables were more important in the analyses of the general population with the variables of income, educational attainment and tenure type (home ownership) all having independent associations with reported gambling problems. The variables showing an independent association with reported gambling problems remained relatively consistent between the 2002 and 2006 analyses. Participation in social and cultural events were also significant factors for the general population as with the Indigenous population, highlighting the social nature of gambling as an activity or form of entertainment.

These findings will be discussed in more detail in Chapter 5.

Chapter 5: Discussion and Conclusions

5.1 Scope of discussion

The results of three groups of analyses were presented in Chapter 4. These included:

1. Estimates of reported gambling problems for each state and territory by remoteness for both the Indigenous (2002 and 2004/5) and general population (2002 and 2006).
2. A factor analysis to identify associations between gambling problems and other negative life events items for both the Indigenous (2002 and 2004/5) and general population (2002 and 2006).
3. Logistic regression to identify independent correlates of reported gambling problems for both the Indigenous (2002 and 2004/5) and general population (2002 and 2006).

This discussion examines each of these analyses in separate sections below. This is followed by respective sections on the limitations of the analysis, policy challenges, and further research. The six sections are as follows:

Section 5.2 Estimates of reported gambling problems

Section 5.3 Situating gambling problems with other negative life events

Section 5.4 Independent correlates of reported gambling problems

Section 5.5 Limitations to the analyses

Section 5.6 Reducing gambling-related harm

Section 5.7 Further research

5.2 Estimates of reported gambling problems

Estimates of reported gambling problems were available for 2002 and 2004/5 for the Indigenous population and for 2002 and 2006 for the general population. It is important to note that absolute estimates are not strictly comparable between the 2002 NATSISS and the 2004/5 NATSIHS due to the differing survey content, which may have influenced how respondents answered the NLES. Comparable longitudinal estimates will be available after the next NATSISS in 2008 and the next NATSIHS in 2010. That said, there existed significant variation in reported gambling problems between the states and territories for all surveys, and was most notable for the surveys of the Indigenous population. Repeated for convenience, Table 5.1 shows the estimates of reported gambling problems by jurisdiction and remoteness for the Indigenous population (see also Table 4.9).

The NT, SA, and Qld had the highest levels of reported gambling problems in both 2002 and 2004/05, and significantly the Indigenous population of these three jurisdictions comprises approximately 45% of the total Indigenous population. The reasons these jurisdictions are so high relates to the extremely high levels of reported gambling problems amongst the remote population. Indeed, estimates for 2004/05 showed generally similar patterns to those observed in 2002, with Qld, SA and the NT reporting significantly higher estimates in remote regions compared with non-remote regions.

Table 5.1 Estimates of reported gambling problems by jurisdiction for the Indigenous population

	2002 NATSISS ¹			2004/5 NATSIHS ²		
	Remote % (SE)	Non-remote % (SE)	Total % (SE)	Remote % (SE)	Non-remote % (SE)	Total % (SE)
Western Australia	13.2 (2.9)	3.6 (1.2)	8.1 (1.5)	10.1 (2.1)	12.3 (3.5)	11.1 (2.0)
New South Wales	8.7 (2.3)	10.3 (1.3)	10.2 (1.2)	6.0 (1.0)	11.1 (1.6)	10.8 (1.5)
Victoria	-	13.3 (1.6)	13.3 (1.6)	-	8.3 (1.5)	8.3 (1.5)
Queensland	37.1 (10.7)	10.7 (1.6)	17.4 (2.9)	18.7 (3.1)	12.3 (1.7)	14.0 (1.5)
South Australia	19.3 (5.4)	16.5 (2.3)	17.2 (2.2)	21.3 (3.5)	14.1 (2.1)	15.8 (1.8)
Northern Territory	31.9 (4.1)	11.4 (2.9)	28.4 (1.4)	27.5 (3.1)	8.3 (2.5)	24.5 (2.6)
ACT/Tasmania ¹	-	7.9 (1.1)	7.9 (1.1)	-	8.4 (1.4)	8.4 (1.4)
Australia	26.4 (3.2)	10.2 (0.7)	14.6 (1.0)	19.4 (1.6)	11.2 (0.8)	13.5 (0.7)

¹ NATSISS estimates sourced from Australian Bureau of Statistics publications (data cubes), except for ACT/Tasmania which were derived from the NATSISS CURF accessed via the ABS RADL.

² NATSIHS estimates obtained from a customised Australian Bureau of Statistics tables

Reported levels of gambling problems in remote regions were consistently and markedly higher than reported in the non-remote regions. The only exception was NSW, which in 2004/5 reported significantly higher estimates in non-remote regions compared with remote regions and was the only jurisdiction where this was the case for both the 2002 and 2004/5 survey. However, absolute estimates for NSW tended to be lower than most other states and territories. Even so, reported gambling problems among the non-remote Indigenous population for all jurisdictions is still considerably higher than for their non-Indigenous counterparts. This raises two key questions. First, why are reported gambling problems higher among the Indigenous population compared with the general population? Second, why are reported gambling problems higher in remote compared with non-remote regions?

In terms of the first question, Chapter 2 of this report has already painted a picture of the inferior living condition and life chances that Indigenous people experience in Australia. This gross level of social and economic disadvantage is directly associated with high levels of social problems. This issue will be discussed further in the context of the results of the factor analysis of the NLES and the correlated of gambling-related problems, both of which identify associations between gambling problems and the general living conditions and opportunities available to Indigenous people in Australia.

In terms of the second question, it is clear (Chapter 2) the Indigenous disadvantage is most severe in remote regions where service delivery is challenged and employment opportunities are most limited. A higher level of a range of social problems may be expected in remote areas. However, in the gambling context, there are a number of possible reasons why people from remote regions reported high levels of gambling-related problems. First, in a methodological sense, it may be that the surveys overestimate reported gambling problems in remote areas. Many Indigenous people living in remote regions of Australia live in small communities (i.e. <500 people) and it is not known whether respondents from these communities are simply talking about the same person when answering the NLES. This point is even more significant when considering the interconnectedness between Indigenous people because of the kinship system that still operates in most remote regions of Australia (Austin-Broos, 2003). However, given the diversity of living arrangements that Indigenous people live in and the random sampling strategies employed by the Australian Bureau of Statistics, the estimates should be relatively robust. Additionally, it is important to note that whilst the figures may be inflated, this should not distract from the fact that problems were identified. Second, the level of reported gambling problems may relate to the type of gambling engaged in. In remote areas, card games are the dominant form, while regulated gambling, particularly

EGM play, is more available in the urban centres. We could speculate that, based on these results, cards are more problematic. However, WA, which has no EGMs outside the Burswood casino, still has relatively lower levels of remote gambling problems, suggesting regulated opportunities (i.e. EGMs, TABS, Keno) are influential in affecting levels of gambling problems, particularly given the very high levels of Indigenous intrastate mobility. Indigenous people living in remote communities travel regularly to larger urban centres for a myriad of reasons including gambling (Memmot et al., 2004). Therefore, reported problems could refer to card games or regulated gambling in urban centres, or a combination of these. There is some evidence from the NT to suggest that some people from remote communities get stranded in town when they run out of money, which is often spent on gambling and alcohol (Paterson, 2008). Similarly in north Queensland, research has shown that people often travel to larger urban centres to purchase alcohol and gamble (McKnight, 2001; Martin, 1993). Speculation aside, we will only really know why reported gambling problems are higher in remote areas through further research which explores Indigenous gambling patterns and outcomes in these areas, which in themselves are highly diverse.

5.3 Situating gambling problems with other negative life events

The factor analyses revealed a consistent pattern between NLES items for the Indigenous and non-Indigenous population for all surveys (i.e. 2002 NATSISS remote and non-remote, 2004/5 NATSIHS and the 2002 and 2006 GSS). Three domains were clearly distinguishable and included items relating to (1) social transgression and breakdown, (2) social/economic loss and alienation, and (3) health and wellbeing. Gambling problems were clearly situated with indicators of social breakdown and transgression including witness to violence, abuse or violent crime, alcohol or drug related problems and trouble with the police. While these indicators were significantly higher for the Indigenous population, the patterning of their relationships was consistent between remote and non-remote regions, and for Indigenous and non-Indigenous population. This finding is significant because it suggests that harm associated with gambling could be lessened through initiatives that improve social functioning and wellbeing, not only for Indigenous people who experience the affects most acutely, but throughout the entire population.

5.4 Independent correlates of reported gambling problems

The multivariable adjusted analyses revealed reported gambling problems to be significantly associated with state/territory of reporting, demographic, socioeconomic, social connectedness, and social/community safety variables for both the Indigenous and non-Indigenous population and remote and non-remote analyses, with minor variations in variable representation.

5.4.1 Jurisdiction effects

In all analyses (Indigenous and general population) except the non-remote analysis of the 2004/5 NATSIHS, there was significant multivariable adjusted variation between states and territories. The most notable difference was that nearly all states and territories reported significantly higher multivariable adjusted estimates of gambling problems compared with WA. This may be due to the fact that WA does not have EGMs located outside of the casino (i.e. no community EGM venues), EGMs being the form of gambling most associated with problem gambling (McMillen & Doran, 2006; Petry, 2003; Productivity Commission, 1999; Young & Stevens, 2009; Young, Stevens, & Morris, 2008).

5.4.2 Household structure and crowding

The 2002 NATSISS remote analysis identified household structure as an important independent correlate of reported gambling problems, with three-family households reporting more problems, a finding attributable to overcrowding in these houses. The background information given in Chapter 2 supports this finding in that Indigenous people living in remote and very remote areas experience considerably higher levels of crowding compared with Indigenous (and non-Indigenous) people living in non-remote areas. Overcrowding has been a near endemic feature of remote Indigenous communities for decades (Jones, 1994, 1999; Neutze, Sanders, & Jones, 2000), and this has implications for both mental (Evans, 1992; Gove, 1979) and physical health (Bailie et al., 2005). The non-remote analysis for the Indigenous population also identified a variable relating to household structure (i.e. whether the residents of the household were all Indigenous or mixed Indigenous and non-Indigenous). This variable may reflect Indigenous multi-family households and higher levels of crowding associated with these households, although further analysis would be required to identify if all Indigenous households were more crowded than mixed households. Household structure was not a significant independent correlate of gambling problems in the analyses of the 2002 and 2006 GSS.

5.4.3 Gender and age

Gender was a significant independent correlate of gambling problems in one model only (i.e. the 2004/5 NATSIHS non-remote analysis), with females reporting more gambling related problems. Reasons why Indigenous females living in non-remote areas reported more gambling problems may reflect gender-based differences in access to, or participation in, gambling activities. While this is speculative, the evidence from the literature in Chapter 2 indicates that Indigenous females are more likely to participate in gambling than males and spend a significant amount of time doing so (Aboriginal Health & Medical Research Council of NSW, 2007; Holden et al., 1996; McKnight, 2002; Paterson, 2006; Young et al., 2007; Young et al., 2006). While EGMs may be suggested anecdotally as the cause of problems, we need more information on the sorts of gambling issues encountered by Indigenous urban women. Age was not significantly associated with reported gambling problems in any of the analyses of the Indigenous population, but showed a significant independent association for both the 2002 and 2006 GSS, with reported gambling problems less common amongst people over 55 years of age.

5.4.4 Socioeconomic status

Socioeconomic variables were more prominent in the non-remote analyses for both the Indigenous and general population. Personal and household income was associated with reported gambling problems in non-remote regions for the 2002 and 2004/5 Indigenous surveys respectively, but not in remote regions. Indigenous people living in houses in the highest income quintile reported more problems than those in lower income households. The association for the general population (2002 GSS) indicated that people in the highest income quintile and those in the third income quintile reporting more problems than those in the lowest income quintile. The non-significant association between income and gambling problems in remote locations is most likely attributable to the lack of income variation amongst Indigenous people living in these regions of Australia (i.e. the majority of Indigenous people living in remote locations are on some type of government benefit - see Chapter 2). Conversely, it reflects greater variation in income distribution of Indigenous people living in non-remote parts of Australia. Having a land line telephone has been shown

to be associated with socioeconomic advantage amongst Indigenous households (Young et al., 2007; Young, Morris, Barnes, Stevens, & Paterson, 2006), and may represent a broader social status not measured by income alone. In remote regions (2002 NATSISS analysis) the variable indicating whether the household had a land line telephone did show a significant independent association with gambling problems, and this association indicated that these houses reported less gambling problems than those without a telephone.

Two socioeconomic variables (i.e. tenure type and cash flow problems in the previous 12 months) had independent associations with gambling problems for Indigenous people living in non-remote areas but not in remote areas. This again reflects the differing socioeconomic circumstances for Indigenous people living in remote and non-remote regions. There was more overlap in socioeconomic variables between the general population and Indigenous population in non-remote areas. Specifically, personal/household income, tenure type and having cash flow problems all showed independent association with gambling problems for the Indigenous population (2002 and 2004/5 non-remote analyses) and the general population (2002 and 2006 non-remote analyses). Higher income households tended to report more gambling problems than lower income households, people renting or purchasing their own home reported more problems compared with owner occupiers who had no mortgage, and people who experienced cash flow problems also were more likely to report gambling related problems. This finding may reflect crowding as houses with more people living in them tend to locate in the upper housing income quintile and rather than the income being important *per se*, it may be the greater numbers of the people in the house increasing a persons likelihood of being affected by a gambling problem.

The association between personal income and gambling problems present in the 2004/5 non-remote analysis for the Indigenous population indicated that people in the highest income decile (\$691 or more per week) were more likely to report gambling problems than all other income groups. This finding is unusual as reported gambling problems using another measure of socioeconomic status of owning a home had the lowest estimates of gambling problems compared with renters and people still paying off their homes. Confounding these findings is that we can not be sure that the people themselves are experiencing the problems or whether they are being affected by someone else's gambling. Additionally, Indigenous people (mostly in remote locations) gain status by giving to others and it may be that people with higher incomes are imposed upon more regularly by relatives (Austin-Broos, 2003); though no firm explanation can be made as we do not know the nature of the gambling problem being reported. Respondent's level of education showed an independent association with reported gambling problems in the 2002 GSS analysis only, with people with less than a diploma level more likely to report gambling related problems. Education did not show an independent association with reported gambling problems in any of the analyses of the Indigenous surveys.

5.4.5 Social connectedness

People who were more socially connected (measured by attendance/participation in sports, community special interest groups, funeral attendance, Indigenous organisation, and having other clan members in community) reported more gambling problems. This was consistent for the Indigenous and non-Indigenous population analyses. There are a number of possible reasons for this. First, people who attend special events may have more opportunity to gamble and therefore more likely to experience gambling problems. Second, people attending these events may have larger social networks and are thus more likely to know someone with

gambling problems. Unfortunately, there is no way of further explaining this result, though the finding does suggest that places where people meet (e.g. sporting and community events) may be good places to promote gambling awareness and educational campaigns. Furthermore, we do not know what types of gambling or types of problems people are experiencing. For example, if the problems relate to children not being adequately cared for (Hunter, 1993) then improved support services (e.g. child minding facilities, safe houses) for families may go some way to alleviating harm associated with gambling. This has particular relevance to Indigenous people living in remote locations where availability of services is often limited or non-existent (Bailie et al, 2002).

5.4.6. Community problems

The association between community problems (theft, family violence, youth gangs, assault, alcohol) and being a victim of threatened or physical violence with gambling problems is consistent with the findings from the factor analyses of the NLES items, linking gambling problems with social breakdown and transgressions (see section 5.3). This finding was consistent in remote and non-remote settings and between Indigenous and non-Indigenous people. A causal explanation can not be made regarding the association until further research is carried out assessing the relationship between violence and gambling. Additionally, the relationship between violence and gambling is likely to be mediated by a number of community-level factors. For example, Altman's (1985) study found gambling caused few problems, findings contrasted with Hunter and Spargo's (1988) work in communities in north-west WA which identified a range of social and mental health problems directly and indirectly caused by gambling. Similarly, McKnight (2002) found that gambling problems were exacerbated by chronic alcohol abuse in a community located in the Gulf of Carpentaria in Queensland. These studies highlight the variations in gambling outcomes between individual communities with different attributes (e.g. size and location). These factors were not measured or measured rather coarsely by the ABS surveys and may be confounding factors reflected in the significant associations with community problems. In short, there are a range of community problems that are expressed to different degrees in different contexts, and these are likely to form a complex pattern of associations that to date we understand poorly, particularly in so far as relationships to gambling problems are involved.

5.4.7. Health

Self-reported health was significant associated with gambling problems in all the analyses except the 2004/5 analysis for Indigenous people living in non-remote locations. A possible reason why the non-significance of self-reported health for the 2004/5 survey is that this survey is a health specific survey and the different content in the survey may have influenced (in an unknown way) how people answered the NLES items or the self-reported health item. Generally, people who reported excellent health reported significantly lower gambling related problems, although the association showed no clear linear trend. For example, in the 2002 remote Indigenous analysis, people reporting very good health were more likely to report gambling problems, as were people with poor health, but not people with good or fair health. Conversely, the 2002 non-remote Indigenous analysis showed that people with good and fair health to be reporting the highest levels of gambling problems. In addition to the differences between remote and non-remote for indigenous people, the association between health and gambling problems was inconsistent between the 2002 and 2006 GSS's. The use of the self-reported health item in Indigenous surveys has been questioned and the authors in an analysis of the 1994 NATSIS cautioned on the reliability of this item (Sibthorpe, Anderson, &

Cunningham, 2001), which may go some way to explaining the inconsistent relationships seen between it and gambling problems.

5.5 Limitations to the analyses

While some of the caveats to the analyses have been discussed in the previous section they are given full treatment here. First, the NATSISS (2002) and GSS (2002 and 2006) differ in survey scope in that the GSS does not sample people outside of non-remote areas (major cities, inner and outer regional). However, we were able to stratify the Indigenous analyses by remoteness which does allow for comparison across the same survey scope. Second, while the 2004/5 NATSIHS samples both remote and non-remote regions, the analyses using this data were only carried out on the non-remote sample due to data limitations. That is, the Australian Bureau of Statistics had concerns about differing methodology and accuracy of data once data had been formatted for use in the RADL (Australian Bureau of Statistics 2006). However, estimates for remote regions were able to be presented as these were sourced from ABS customised tables. It is important to note that these estimates were significantly higher in remote areas across Australia compared with non-remote regions. Therefore, even though we could provide estimates of reported gambling problems, our analysis of the 2004/5 NATSIHS was unable to unpack potential differences in correlates for remote areas for this survey.

Third, the Indigenous population exhibits significant heterogeneity by remoteness and this also differs between the states and territories, and correlates may also differ for different communities. Because of this, while the stratified analysis conducted for the 2002 NATSISS enabled the identification of different correlates for remote and non-remote areas, there exists the possibility of confounding through unmeasured variables. The most likely source of confounding in the stratified analyses, particularly for remote areas, is in community variation. For example, MacDonald and Wombo (2007) noted that the significance of gambling varied considerably by community. While the ABS goes to great effort in obtaining random samples, this is extremely difficult when sampling a minority population, and choices inevitably need to be made about which communities to include or exclude and these decisions could affect the accuracy of survey results, particularly when comparing two different surveys or the same survey over time. For example, the NT and WA have what are referred to as town camps, which are discrete Indigenous communities located within larger urban centres. Residents living in these communities have significantly different characteristics to other Indigenous people living in urban environments outside of the town camps. For example, the housing in town camps is of inferior quality and more likely to be crowded compared with housing located in urban suburbs outside of town camps (Bailie & Runcie, 2001; Bailie et al., 2002; Stevens & Bailie, 2002; Stevens, Stewart, Ulamari, & Bailie, 2002).

Fourth, measurement error occurs when respondents answer survey questions differently based on differing perceptions of the meaning of the survey questions. For example, a person living in a community that has an entrenched or 'normalised' social problem such as community violence may not perceive this to be out of the ordinary and therefore may not answer that their community is experiencing such problems. That is, the social norms existing in a community may influence a person's response. This type of measurement error in the example given would therefore deflate estimates associated with community violence. The significantly higher estimates of reported gambling problems for the Indigenous population compared with the general population may also reflect to some degree measurement error. As

discussed previously, many Indigenous people, particularly those living in discrete Indigenous communities, have strong kinship ties which interconnect people both socially and geographically (Austin-Broos, 2003). A question asking people if they know a family member with a (gambling) problem would, because of their interconnectedness, be more likely to draw an affirmative response. However, given the large differences observed in reported gambling problems between the Indigenous and general population, it is unlikely that all of this difference is due to the interconnectedness between Indigenous people. Furthermore, as outlined in Chapter 2, the socioeconomic position of Indigenous people living in remote areas of Australia is considerably lower than the Indigenous population living in non-remote areas and it is therefore likely due to the lower incomes that people are more likely to experience problems related to gambling (e.g. running out of money for essentials).

Fifth, we do not know what type of gambling is causing the problems. This is significant as unregulated (card games) gambling is ubiquitous amongst the Indigenous population across Australia (see Chapter 3). The research covered in the literature review was mixed in that some research suggests that card games are a relatively benign activity, while other research highlighted the negative impacts it may have (for example see Hunter and Spargo, 1988 and McKnight, 2002). Additionally, the NLES item provides no information on the types of problems people were experiencing related to gambling. Problems identified through the literature review included shortages of money for essentials, increased family and community tensions (particularly between gamblers and non-gamblers), physical and emotional neglect of children, lower rates of school attendance by children, and an eroding of Indigenous culture and ritual with the weakening of kinship systems (Phillips, 2003; McKnight, 2001, Hunter, 1993; Martin, 1993, Altman, 1985; Berndt and Berndt, 1946-7).

5.6 Reducing gambling-related harm

The multivariable analyses revealed that gambling related problems are associated with geographic, demographic, socioeconomic factors, as well as social connectedness, community problems and self-reported health. Additionally, the factor analyses clearly situated gambling problems as co-occurring with issues relating to social breakdown and transgression. These findings illustrate that gambling is closely tied to a range of social and environmental domains that need to be considered when formulating harm-reduction strategies. In other words, simply construing gambling as an isolated phenomenon that is causal of social problems is somewhat limited and inaccurate. Gambling is produced by and produces social issues; it is part of a complex of social relationships and processes. Harm reduction strategies, to be effective, may need to include these broader contexts. For example, the finding that crowded households experienced more gambling-related problems suggests that a reduction in crowding may in turn lead to a reduction in gambling problems. In this context, the injection of around \$680 million into Indigenous housing in the NT may indirectly reduce gambling problems along with a range of other crowding-related issues, although this will only be effective in reducing gambling harm if levels of crowding are substantially reduced (Bailie et al. 2005). In addition, the association between gambling problems and social breakdown/transgression suggest that gambling-related harm could be reduced through initiatives aimed at promoting community cohesion and wellbeing. The expansion of police services to remote communities and alcohol bans that were introduced as part of the Northern Territory Emergency Response may provide evidence about the mitigating effects of these interventions on gambling outcomes over short to medium term.

The association between gambling problems and attending or participating in community events would suggest that places where people meet socially may be good places to promote awareness about the harms associated with gambling. Additionally, there appears to be a need to create more public education surrounding gambling problems which would help to alleviate any stigma associated with acknowledging personal gambling problems. For example, the literature review identified ‘shame’ (i.e. embarrassment and guilt) as being a problem for Indigenous people in Victoria and NSW (Aboriginal Health & Medical Research Council of NSW 2007; Cultural Perspectives Pty Ltd 2005).

Table 5.2 summarises variables that showed a significant independent association with reported gambling problems and strategies that need to be considered when developing policy aimed at reducing harm associated with gambling.

Table 5.2 Correlates of gambling problems and policy implications for reducing gambling related harm

Significant independent correlates	Policy implications
Multi-family households	Crowded housing increases the chance of someone being affected by another persons gambling. High levels of overcrowding in remote communities may undermine other efforts to reduce gambling related harm.
Income	Improving employment and educational outcomes will increase disposable income, lessen time available for gambling, and improve individual ability to make an informed choice. Differences in the association between income and gambling problems in remote and non-remote areas may require different policy approaches for public health messages.
Social connectedness (participation and attendance at social/cultural events)	Places where people gather provide good exposure for information and posters on gambling related harm and availability of counselling services, and also raise awareness about harm associated with gambling.
Community problems and victim of physical or threatened violence	Community cohesion and wellbeing programs and improved policing of communities, while improving safety may also increase the community’s capacity to manage problems associated with gambling.

5.7 Further research

The analyses conducted as part of this report constitutes the first empirical analysis of reported gambling problems across Australia for the Indigenous population. However, while we have identified the distribution of problems and their correlates, we do not know what types of problems people are experiencing and more importantly, what types of activities are associated with gambling problems. For example, reported gambling problems in remote regions were typically higher than non-remote regions for Indigenous people, though it is not known whether it is unregulated gambling (i.e. card games on communities) or regulated gambling (i.e. casino and community venues) when people travel to larger regional centres or cities). This is particularly pressing given the ubiquitous nature of card games in Indigenous communities across Australia. While card games might not pose significant monetary problems due to small bets and the redistribution of money from winners to the losers, the time away from other social obligations may be problematic. In other words, the time spent gambling presents an opportunity cost lost from another activity, whether in education and training, fulfilling social obligations, caring for country or simply spending time with family. Our lack of knowledge is significant in this regard. Indeed, much more could be written about what we do not know about the causes and consequences of gambling in the Indigenous population.

The following list presents some pressing knowledge gaps that, if filled, will go some way to understanding the inter-relationships between people (Indigenous and non-Indigenous), gambling, and the social and environmental contexts in which they are embedded:

- What do “gambling-related problems” specifically consist of?
- In which contexts is gambling a benign or beneficial activity?
- What is the geographic distribution of gambling outcomes (i.e. community to community variation)?
- Which social groups within communities are most at risk from problematic gambling?
- What sort of gambling (i.e. cards or EGMs) are most problematic in different places and why?
- What are the relationships between unregulated and regulated forms of gambling?
- What are the links between alcohol, violence and gambling?
- What are the causal relationships between gambling outcomes and other social variables, such as mobility, social connectedness, income, crowding/housing, and health?
- What would be the most successful policy approach to harm minimisation?
- What are the independent correlates of reported gambling problems for remote and non-remote regions from the 2008 NATSISS (available in 2009)?
- Do items from the NLES as collected in the 2008 NATSISS cluster in the same way as they did in the 2002 NATSISS and 2004/5 NATSIHS?

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Appendix: Summary of literature reviewed

Table A1 Literature search: Indigenous specific gambling

Authors (year)	Location	Research (type) ³	Outcome variables	Results/Findings
Aimies (1999)	Australia	Policy	Gambling regulation, harm minimisation	<ul style="list-style-type: none"> • Harm minimisation • Assessment of current intervention strategies • Help seeking behaviour • Internet gambling
AH & MRC of NSW (2007)	NSW	Issues paper	Problem gambling, treatment services	<ul style="list-style-type: none"> • Significant problem in many communities • Association between PG and other life stressors • Need alternative entertainment • Aboriginal specific gambling treatment services
Bicego (2002)	NSW	Health Review (counselling)	Problem gambling; pokies	<ul style="list-style-type: none"> • Understand gender differences in treatment • PG as social problem
Brady (2004)	Australia, SA	Review	Gambling and problem gambling	<ul style="list-style-type: none"> • Downplay by anthropologists of the problematic (negative) consequences of gambling (including cards) - problem deflation • No gaming (EGM) licence for Nundroo • clear distinctions between in-community and out-of-community gambling
Brady (1998)	SA - Yalata and Maralinga	Report / submission to gaming licensee	Gambling - EGMs	<ul style="list-style-type: none"> • License for EGMs was not given • Brought to attention the potential damage the EGM gaming could have on Indigenous communities
Cultural Perspectives P/L (2005)	Victoria	Policy (grey)	CALD and Indigenous gambling	<ul style="list-style-type: none"> • Poker machines most common gambling • Negative impact on finances, relationships and emotional well-being • Referral to service usually through family • Preventive care mode: community development → education
Dickerson et. al. (1996)	Queensland & Yarrabah	Social impact assessment of EGMs	Impact of gambling (PubTAB)	<ul style="list-style-type: none"> • Problem gambling up to 15 times higher for Indigenous • 20%-25% of income on gambling in regular gamblers • 30% of EGM players did not gamble before the introduction of machines • PubTAB/EGMs in canteens associated with reduction in revenues
Dodd (1985)	Queensland	Interview about gambling	Gambling practices	<ul style="list-style-type: none"> • Originally not an Aboriginal practice • Was played for fun in the 1930's (tobacco, sometimes food)
Ellis (2000)	Australia	Indigenous gambling conference: PC gambling report	Public health paradigm	<ul style="list-style-type: none"> • Consumer protection, harm minimisation, and accountability • Problem gambling related to accessibility, particularly EGMs
Foote (1996)	Darwin	Visual observation of Indigenous casino patrons	Attendance in various parts of casino - EGMs	<ul style="list-style-type: none"> • High percentage of Indigenous people making up casino patronage • More females than males in casino • Peaks on pension weeks
Gab (2001)	Australia	Review	Cultural differences in gambling	<ul style="list-style-type: none"> • Clash between cultural beliefs to do with luck and chance and treatment that seeks to explain chance may be ineffective
Gibson & Pearson (1987)	Queensland, Hopevale	Anthropology and tradition: A modern perspective	Social problems - gambling and alcohol.	<ul style="list-style-type: none"> • Reciprocity - The Myth. It was only relatively recently that demand sharing began to include money for alcohol (1980's) • Sharp differences between closely located communities with regard to drinking and gambling culture
Goodale (1987)	Northern Territory - Tiwi Is.	Anthropology - gender	Card games - social mechanism	<ul style="list-style-type: none"> • Redistribution of money in small within family group games • Social status in the community improves with skill of card player • Gender - men in bigger stakes games & use winnings to buy personal things of status or go to town (where money often spent drinking) - women buy food for immediate need for household • Magic & luck used sometimes (but seen as bad if caught using magic)
Holden (1995)	Queensland (North)	Issues paper (grey)	EGMs, PubTAB, economic impact	<ul style="list-style-type: none"> • Low income but large expenditure on EGMs (especially <i>cf.</i> with non-Indigenous)

Authors (year)	Location	Research (type ²)	Outcome variables	Results/Findings
Hunter (1993)	NW Western Australia	Book (Chapter)	Card games, social impact	<ul style="list-style-type: none"> • Reduction in alcohol sales • No gambling for some people prior to EGMs • EGMs → flow of money out of community previously stayed in with card games • Card gambling affects child nutrition → gambling is a direct competitor for sustenance resources • Big money won often spent on luxury goods or alcohol rather than food • Higher anxiety amongst male gamblers compared with non-gamblers • Time spent gambling competes with other social activities (e.g. ritual and ceremony)
Hunter & Spargo (1988)	NW Australia	Comment and issues	Nutrition & hygiene, mental health, child health/education	<ul style="list-style-type: none"> • Gambling is a major drain on resources further contributing to dependency → opportunity costs • Gambling potency lies in its ability to undermine economic means of advancement, but also of subsistence • Much larger impact given the low incomes • Should not be medicalised, as result of social and economic situation
Kinsella & Carrig (1997)	SA/Australia	Review & context	Models of intervention	<ul style="list-style-type: none"> • Community development using workshops to identify gambling related problems • Education and training - need for counsellors to have cultural awareness training
Martin (1993)	Cape York	PhD Thesis	Ethnography	<ul style="list-style-type: none"> • Women more likely to gamble than men • Card game winnings often went from women to men and from non-drinkers to drinkers • Alcohol was an important defining community context in which gambling became problematic
McKnight (2002)	Mornington Island	Book (chapter)-40 years visiting	Ethnography	<ul style="list-style-type: none"> • Main focus on drinking - small section on gambling • Stockman learnt games on mainland (and had money to gamble) • Is redistributive (though money usually spent on grog) and accords with optimism of hunting & gathering (i.e. expect to win/catch/gather food) • Gambling common from 1975 onwards • Negative - takes people away from more creative pursuits; neglect of children (either locked in house) or if taken then only thing for kids to learn is gambling; complaints of lost money mean food money not around & children go hungry; winnings of a few hundred dollars usually spent on grog (large wins taken to Mt Isa for booze up & less often used for luxury item); large wins by individual often mean large number of people have lost all money → no food; people who do not gamble suffer from those that do - causes tensions • In past sharing food was of positive benefit to all in group when living in small groups of kin, but now hunting & gathering is subsidiary to drinking and gambling, then indiscriminate giving & sharing lowers standard of living → now have dual system of "savers" & "squanderers" - savers demand share from other savers and refuse to squanderers.
Nunkuwarnin Yunti (2005)	South Australia	Treatment services & policy	Program effectiveness	<ul style="list-style-type: none"> • Gambling program uses comprehensive primary health care model. Individual, family, community and institution
NT Government (2007)	Northern Territory	Policy (grey)	Reduce overall disadvantage	<ul style="list-style-type: none"> • Financial counselling, focus in disadvantaged areas • \$1.25 million for pornography and gambling program over 5 years • Investigate introduction (extension) of gambling counselling to communities • Research on: gambling and child safety; adequacy & enforcement of current regulatory laws; and potential for effective gambling counselling
Paterson (2006)	Northern Territory	Research	Ethnology - cards in discrete community	<ul style="list-style-type: none"> • Internal regulation • Little drinking when card games played
Paterson (2008)	Northern Territory	Research	Gambling venue attendance	<ul style="list-style-type: none"> • Many remote residents identified in urban venue • Sometimes run out of money - stuck in town
Steane et. al.	Northern	Research	Phenomenology &	<ul style="list-style-type: none"> • Qualitative research methods more suited to cross-

Authors (year)	Location	Research (type²)	Outcome variables	Results/Findings
(1998)	Territory communities	methods	positivism	cultural research <ul style="list-style-type: none"> • Dyadic (Indigenous) verse non-dyadic (non-Indigenous) • Impacts on time and money • Changes in social interactions and crime dispute resolution

Table A2 Literature search: Public health policy and treatment services with mention of Indigenous and gambling but not Indigenous and/or gambling specific

Authors (year)	Location	Research (type²)	Outcome variables	Results/Findings
Blaszczynski et. al. (1997)	Australia	Position paper - policy	Problem gambling; harm minimisation	<ul style="list-style-type: none"> • Harm minimisation • Promote psychologist • Education programs • Information on odds in advertisements • More signage in gambling establishments of the dangers of excessive gambling
Borrell (2004)	Australia	Gambling - social context	Problem gambling	<ul style="list-style-type: none"> • Needs to take a cultural perspective to ensure minimise stigmatizations associated with problem gambling • Social context important
Queensland Govern. (2005)	Queensland	General population survey	Problem gambling	<ul style="list-style-type: none"> • Indigenous (includes South Sea Islanders) had significantly higher CPGI scores at all levels of risk • Indigenous had higher PG prevalence (14%) than non-Indigenous (8%) and general population (0.5%) • “card games” in communities led to low recreational gambling prevalence (25%), but high moderate risk gambling (33%) in remote communities • Note need different policy formulation because of the social aspects of card games
Queensland Govern.(2005)	Queensland	Prisons & community corrections	Problem gambling	
DHS (2001)	South Australia	Interviews, telling stories	Youth problems	<ul style="list-style-type: none"> • Some teenagers went with out food and clothes because guardian (female) playing EGMs
Gabb (2002)	Australia	Gambling - social context	Problem gambling	<ul style="list-style-type: none"> • Need to encourage more people from ethnic and Indigenous population in to treatment providing
Hordacre (2007)	Rural Australia	Health context, child abuse	Improving Indigenous access to health services	<ul style="list-style-type: none"> • Better networks between Indigenous and non-Indigenous controlled health services • Long term collaboration
Hoy et. al. (1997)	NT Top End	Community screen	Health, nutrition, LBW babies	<ul style="list-style-type: none"> • Social problems including gambling associated with poor nutrition • High food pricing an issue, along with poor education and employment outcomes
Hunter (2006)	Australia	Policy	Mental health, social justice, welfare dependency	<ul style="list-style-type: none"> • Interventions must ensure not to reduce agency in Indigenous people and ultimately cause harm • Community control of services • Evidence-based programmes and policy
Williams and Kakakios (2001)	New South Wales	Policy (grey)	Aboriginal men’s health implementation plan	<ul style="list-style-type: none"> • Increase male employment in health sector • Increase male participation in primary health care • Improve access and availability of services • Increase the number of support groups for Aboriginal men • Increase the number of outreach services for Aboriginal men • MOU between health system and AMS’s concerning sharing resources and better promotion or services • Increase use of Isolated Patients Travel and Accommodation Assistance Scheme (IPTAAS)

Table A3 Literature review: Indigenous specific and mentions gambling

Authors (year)	Location	Research (type ²)	Outcome variables	Results/Findings
Altman & Johnson (2000)	Northern Territory - Maningrida	Evaluation	CDEP	<ul style="list-style-type: none"> Notes that while CDEP will allow for sociability some forms such as “endless” gambling are destructive
Austin-Broos (2003)	Central Australia (western Arrente)	Anthropology	Kin-based and market-based societies	<ul style="list-style-type: none"> Kinship now more about goods and commodities (i.e. \$\$), rather than detailed knowledge and experience about country Need to consider welfare and economics at same time as kinship
Blaszczynski et. al. (1997)	Australia	Position paper - policy	Problem gambling; harm minimisation	<ul style="list-style-type: none"> Harm minimisation Promote psychologist Education programs Information on odds in advertisements More signage in gambling establishments of the dangers of excessive gambling
Borrell (2004)	Australia	Gambling - social context	Problem gambling	<ul style="list-style-type: none"> Needs to take a cultural perspective to ensure minimise stigmatizations associated with problem gambling Social context important
Hordacre (2007)	Australia	Primary health care	Access to primary care	<ul style="list-style-type: none"> Poor health, alcohol and drug abuse were seen as contributing child sex abuse problem, along with social issues such as unemployment, limited education, poor housing, gambling, and loss of identity and control. Rural had better engagement between Indigenous and non-Indigenous health care providers
Hoy et. al. (1997)	Northern Territory community	Health survey - baseline	Overall health with focus in Type II diabetes	<ul style="list-style-type: none"> high rates of smoking and excessive drinking, of preventable infections and their sequelae, and of hypertension, insulin resistance, diabetes and renal disease Most morbidities were strongly associated with identifiable risk factors, such as overweight, smoking, excessive drinking, skin sores and scabies, all of which are amenable to modification
Hunter (2006)	Australia	Policy	Mental health, social justice, welfare dependency	<ul style="list-style-type: none"> Interventions must ensure not to reduce agency in Indigenous people and ultimately cause harm Community control of services Evidence-based programmes and policy
Hunter (2007)	Australia	Policy	Indigenous affairs	<ul style="list-style-type: none"> Changing policy and concepts Ambiguity in key concepts has led to bureaucratic inertia Awareness of Indigenous agency and the potential for policy to undermine
Kowal et. al. (2007)	Northern Territory	Psychosocial, mental health	Evaluation of NLES scale	<ul style="list-style-type: none"> Found the Negative Life Events Scale to be reliable and valid for use in Indigenous communities Includes gambling problems as a stressor
Schmidt et. al. (1998)	Remote Australia community	Mental health - physiological response	Stress measured by Urinary epinephrine and cortisol hormone	<ul style="list-style-type: none"> Higher stress later in week during more intense gambling periods High stress hormone output could mediate poor health
Sutton (2001)	Australia	Anthropology commentary on policy	Indigenous disadvantage	<ul style="list-style-type: none"> Economic improvement most likely to lead change in culture Cultural redevelopment needed. For example, there has always been violence and patriarchy Different context means cultural practices must change if to see improvement
Taylor (2003)	Northern Territory	Analysis of census data 96-01	Economic, socio-demographic	<ul style="list-style-type: none"> Northern Territory has a serious economic development problem. Approx. 25% of Northern Territory adult population structurally detached from the labour market
Tonkinson (1974)	Central WA	Ethnography (1960's)	Life and Law	<ul style="list-style-type: none"> Initiated men did not participate in gambling and discouraged it, particularly when it people gambled instead of performing rituals associated with Law Perceived as a threat to Law - whitefella business and no place in Dreamtime While men participate in drinking and gambling in town, they condemn it in retrospect once returning to camp - make people heads “no good” & cause to neglect family & Law Aboriginal men moving out of community life is no alternative to Law & only the certainty of a

Authors (year)	Location	Research (type²)	Outcome variables	Results/Findings
Williams and Kakakios (2001)	New South Wales	Policy (grey)	Aboriginal men's health implementation plan	<p>numbing preoccupation with drinking, fighting & gambling in whitefella world</p> <ul style="list-style-type: none"> • Increase male employment in health sector • Increase male participation in primary health care • Improve access and availability of services • Increase the number of support groups for Aboriginal men • Increase the number of outreach services for Aboriginal men • MOU between health system and AMS's concerning sharing resources and better promotion or services • Increase use of Isolated Patients Travel and Accommodation Assistance Scheme (IPTAAS)