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## Road user behaviour, attitudes and crashes: A survey of Aboriginal and Torres Strait Islander people in Australia

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### Abstract

**Objective:** This study aimed to describe road user behaviour, attitudes and crashes in Aboriginal and Torres Strait Islander people in four urban, regional and remote communities located in New South Wales (NSW) and South Australia (SA).

**Methods:** Face-to-face surveys were administered to clients (n=625) in Aboriginal Community Controlled Health Services (ACCHS). All Aboriginal and Torres Strait Islander clients attending the ACCHS for any reason were approached to participate over a 2-week period. Surveys included questions on sociodemographic factors, crash involvement, road behaviours and road safety attitudes drawn from tools used in national surveys.

**Results:** The participation rate was high (69%-75%). Seat belt wearing rates were very high, particularly in the front of a car, although rear seat belt wearing rates in SA (77%) were substantially lower than in NSW (93%). Among drivers, 11% reported always or mostly driving 10 km/hour over the speed limit, and this was higher among drivers in SA (13.4%). Drivers aged 55 years and over and/or women were more likely to report that they do not drink at any time or restricted what they drank when driving. These results enable comparison with the Community Attitude to Road Safety survey conducted Australia-wide in 2013.

**Conclusions:** This study confirms that Aboriginal and Torres Strait Islander people are inclined to report attitudes or road safety behaviours similar to the rest of the population; however, rear restraint use was lower and self-reported speeding was higher. These issues are likely attributable to transport options and geography in remote communities, which can contribute to overcrowding and unsafe driving practices.

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**ROAD USER BEHAVIOUR, ATTITUDES AND CRASHES: A SURVEY OF ABORIGINAL  
AND TORRES STRAIT ISLANDER PEOPLE IN AUSTRALIA**

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## **ABSTRACT**

**Objective:** This study aimed to describe road user behaviour, attitudes and crashes in Aboriginal and Torres Strait Islander people in four urban, regional and remote communities located in New South Wales (NSW) and South Australia (SA).

**Methods:** Face to face surveys were administered to clients (n=625) in Aboriginal Community Controlled Health Services (ACCHS). All Aboriginal and Torres Strait Islander clients attending the ACCHS for any reason were approached to participate over a two week period. Surveys included questions on socio-demographic factors, crash involvement, road behaviours and road safety attitudes drawn from tools used in national surveys.

**Results:** The participation rate was high (69-75%). Seatbelt wearing rates were very high, particularly in the front of a car, although rear seat belt wearing rates in SA (77%) were substantially lower than NSW (93%). Among drivers, 11% reported always or mostly driving 10 km/h over the speed limit, and this was higher among drivers in SA (13.4%). Drivers aged 55 years and over and/or women were more likely to report that they do not drink at any time or restricted what they drank when driving. These results enable comparison with the Community Attitude to Road Safety survey conducted Australia-wide in 2013.

**Conclusions:** This study confirms that Aboriginal and Torres Strait Islander people are inclined to report attitudes or road safety behaviours similar to the rest of the population; however rear restraint use was lower and self-reported speeding was higher. These issues are likely attributable to transport options and geography in remote communities, which can contribute to overcrowding and unsafe driving practices.

**KEY MESSAGES**

What is already known on this subject:

- Aboriginal and Torres Strait Islander people are over-represented in road crashes
- There is limited insight into the underlying context of road crashes or contributing factors to road crashes involving Aboriginal and Torres Strait Islander people, inhibiting development of targeted programs.

What this study adds:

- The results of this survey point to underlying transport issues in Aboriginal and Torres Strait Islander communities particularly around access to alternative transport options and remoteness
- Systems level programs that are culturally and gender appropriate are needed to support people to safely access transport and comply with road safety laws

## **BACKGROUND**

Prevention of road deaths has been a success story in high income countries globally.(World Health Organisation, 2015) Despite steady rises in motorisation, there have been steady declines in national road crash fatality rates in Australia, the US and Canada, for example.(Haagsma et al., 2016) This is attributed to decades of research and investment in systems wide programs including safer roads and vehicles, reduction of exposure for vulnerable road users, and introduction and enforcement of legislation including around drink driving, speed and stricter licensing laws for novice drivers.

However, not all population groups have benefited. In most countries, including Australia, fatality rates remain far higher for those in regional or rural areas, where drivers often travel further in older cars on poor quality roads with less police enforcement, and less access to rapid emergency care.(Siskind, Steinhardt, Sheehan, O'Connor, & Hanks, 2011) Younger drivers have persistently higher fatality and serious injury rates, as do very elderly drivers.(Chen et al., 2010; Meuleners, Harding, Lee, & Legge, 2006) Aboriginal and Torres Strait Islander people in Australia experience fatal road crashes at 2-3 times the rate of the rest of the community and sustain serious injuries at a rate about 20% higher reflecting similar trends in First Nations populations in the US and Canada.(Fines, Bougie, Oliver, & Kohen, 2013; Henley & Harrison, 2013; Murphy et al., 2014) In general, crash rates increase with remoteness of residence, and as a higher proportion of Aboriginal and Torres Strait Islander people live in more remote settings, are involved in more fatal road crashes. Nonetheless, once the effect of place of residence is taken into account, there remains a substantial burden of injury left unaccounted for.(Falster et al., 2013a) Furthermore, Aboriginal and Torres Strait Islander people are also over involved as vulnerable road users, for example as pedestrians, and as passengers in cars.(Henley & Harrison, 2013)

While mortality and hospitalisation data indicate rates of fatal and serious injury crashes, these data do not account for other crashes, nor do they allow for in depth examination of various road related factors and crash types. Alternatively, analysis of police crash data, may allow understanding of context and hence more appropriate development of targeted preventative programs. However, in most states in Australia, Aboriginal and Torres Strait Islander identification is not collected in licensing or crash data, meaning that Aboriginal and Torres Strait Islander status of those involved in

crashes cannot be readily determined, even among drivers. In some states, police collect information on Aboriginal and Torres Strait Islander status of the people involved in a crash at the scene, which is probably therefore greatly under-reported.(Rebecca Ivers, Clapham, Senserrick, & Harrison, 2012)

Only one state, New South Wales, requests drivers to identify as Aboriginal and Torres Strait Islander, which is done on a voluntary basis at the registry office when applying for or renewing a driver licence. There are therefore little available state or national data that can be used to determine road crash risk factors for Aboriginal and Torres Strait Islander people.

While there are multiple examples of successful Aboriginal and Torres Strait Islander community led prevention programs, the absence of data on contributing factors means that there has been little investment in specific road crash prevention programs focused on or led by Aboriginal and Torres Strait Islander people.(Clapham K, 2004; K Clapham, Senserrick, Ivers, Lyford, & Stevenson, 2008)

There have been some notable exceptions; for example restrictions on riding in open load spaces in Western Australia, which led to decreases in fatal crashes,(Hawkes, 2005) and an alcohol management program in the Northern Territory, which reduced road related deaths.(Stockwell T, 2001) Otherwise, there are few evaluated programs addressing road injury for Aboriginal and Torres Strait Islander people in Australia.(Senserrick T, Ivers R, Boufous S, Martiniuk A, & Clapham K., 2010)

Given the absence of information on factors associated with road crashes for Aboriginal and Torres Strait Islander people, there is an urgent need to better understand the context and contributing factors to crash involvement of to facilitate development of more appropriately targeted road safety initiatives. This study aimed to explore history of crash involvement, and road safety behaviours and attitudes in a sample of Aboriginal and Torres Strait Islander people attending Aboriginal Community Controlled Health Services (ACCHS) in New South Wales (NSW) and South Australia (SA).

## **METHODS**

We conducted a cross-sectional survey of clients (n=625) attending four ACCHS in two Australian states with a geographic spread across urban, regional and remote locations: Redfern (urban) and Griffith (regional) in NSW; Port Lincoln (remote) and Ceduna (very remote) in SA. This survey

formed part of a larger mixed methods study for which detailed methods have been reported previously.(Kathleen Clapham et al., 2017; Rebecca Ivers et al., 2016). The study was overseen by a steering committee, comprising the investigators, representatives from the Aboriginal Health and Medical Research Council of NSW (AH&MRC), The Aboriginal Health Council of South Australia (AHCSA), representatives from ACCHS Aboriginal and Torres Strait Islander policy officers from the transport authorities in each state. This committee met quarterly and reviewed study methods, conduct, interpretation and dissemination of results.

The survey was administered by trained research assistants at each site, most of whom were Aboriginal and Torres Strait Islander people (25/27). The survey aimed to be representative of people attending ACCHS and was conducted face-to-face between December 2012 and February 2013. All Aboriginal and Torres Strait Islander clients attending the participating ACCHS for any reason over the two week period were approached by research assistants while they were entering the service or waiting for appointments and asked to participate. Consenting clients completed the survey administered by a research assistant using iPads, or on identical paper questionnaires.

Survey responses were collected and managed using REDCap (Research Electronic Data Capture) electronic data capture tools hosted at The George Institute for Global Health. (Harris PA, 2009) Where possible, survey questions were adapted from previous licensing studies, (Helps et al., 2008; R Ivers et al., 2011) census questionnaires and other relevant tools including from the Community Attitudes to Road Safety Survey (Petroulias, 2009, 2014); questions included socio-demographic factors, crash involvement, road related behaviours and attitudes to road safety. The surveys were developed with close oversight from the steering committee to ensure that the wording of questions was clear and that multiple-choice options were appropriate and relevant to the partnering communities. In addition, representatives of the participating ACCHs were given the opportunity to work through the survey question by question with the investigators, make changes to the wording and suggest additional questions according to their perception of their community's needs and priorities. Descriptive analyses were conducted using SAS version 5.1. Analyses of driver behaviour



(speeding and alcohol) were limited to those participants who reported driving any sort of motor vehicle on a public road in the last 12 months.

Ethics approval for the study was granted by the Ethics Committee of the AH&MRC of NSW and the Aboriginal Health Research Ethics Committee of the AHCSA and Flinders University.

## **RESULTS**

Of those approached at each study site, the proportion who consented and undertook an interview ranged from 69% to 75%. No data were collected from those who chose not to participate. In total, 625 people participated in the survey, 292 in Redfern, 83 in Griffith, 92 in Ceduna and 158 in Port Lincoln. Table 1 shows demographic characteristics of participants. Overall, 41% of participants were male; 6% of participants in NSW spoke a language other than English at home and 12% in SA; mainly Aboriginal languages. The largest proportion of participants were those in the age category of 40-54 years (34%); followed by those aged 25-39 years (28%).

**Table 1 Sociodemographic characteristics of participants**

	NSW (n = 375)	SA (n = 250)	TOTAL (n = 625)
Gender (Women)	214 (57.2%)	152 (61.5%)	366 (58.9%)
Age categories (years)			
16-24	66 (17.8%)	57 (23.9%)	123 (20.2%)
25-39	100 (27.0%)	69 (29.0%)	169 (27.8%)
40-54	127 (34.3%)	78 (32.8%)	205 (33.7%)
55+	77 (20.8%)	34 (14.3%)	111 (18.3%)
Speaks language other than English at home (Yes)	23 (6.3%)	27 (11.7%)	50 (8.4%)
Employment			
Full time	138 (37.5%)	85 (34.6%)	223 (36.3%)
Part-time	28 (7.6%)	19 (7.7%)	47 (7.7%)
Casual	27 (7.3%)	12 (4.9%)	39 (6.4%)
Not employed	175 (47.6%)	130 (52.8%)	305 (49.7%)
Age (years) when finished school Mean (SD)	15.8 (1.74)	16.0 (1.30)	15.9 (1.59)
Post school qualifications <sup>A</sup>			
None	139 (39.2%)	101 (43.0%)	240 (40.7%)
Bachelors	45 (12.7%)	9 (3.8%)	54 (9.2%)
Trade or certificate	171 (48.2%)	125 (53.2%)	296 (50.2%)

<sup>A</sup>There were a further 18 participants that were still at school (NSW n=8 and SA n=10)

### Crash history

Of the 625 total participants interviewed, a total of 44 (7%) reported having been involved in a car crash within the last 12 months, 33 (9% of all NSW participants) from NSW and 11 (5% of SA participants) from SA. Of these crashes, six (14%) participants reported mild injuries and three (7%) reported injuries requiring hospitalisation. At the time of the reported crashes, 30 (68%) in total (21

from NSW and 9 from SA) reported being the driver, and four of the drivers involved (13%) reported that they had no licence at the time of the crash.

Participants were also asked if their family or friends had ever been involved in a car crash. Out of the 585 who responded, a total of 197 (34%) reported previous crash involvement; 146 (42% of participants) from NSW and 51 (22%) from SA.

### **Seatbelt use**

Self-reported seatbelt wearing rates were very high, particularly for when riding in the front of a car. Of the total front seat seatbelt use respondents, 98% reported 'always' wearing a seatbelt when riding as a passenger or driver (Table 2). Of the total respondents on rear seat seatbelt use, 86% reported 'always' wearing a seatbelt, although rates in SA were substantially lower at 77% compared to 93% reported in NSW.

Rear seatbelt wearing rates were similar by gender but varied by age. Lower proportions of participants reported always wearing rear seatbelts among those aged 16-24 years (80%) and 25-39 years (81%), compared with those aged 40-54 years (91%) and those aged 55 years and older (92%).

### **Speed**

Among drivers, 11% reported always, nearly always or mostly driving at 10 km/h over the speed limit, and this was higher among drivers in SA (Table 2). There were little differences by gender with slightly more males reporting 'always, nearly always or mostly driving at 10 km/h over the speed limit' and 'being booked for speeding in the last 6 months'. Speeding behaviour varied slightly by age with those aged 40-54 years most likely to report always, nearly always or mostly driving at 10 km/h over the speed limit (13%) while those aged 55 years and older least likely to report this behaviour (9%). Despite less than 10% of respondents aged 16-24 years reporting always, nearly always or mostly driving at 10 km/h over the speed limit, these respondents were most likely to report being booked for speeding in that last 6 months (12%).

### **Alcohol**

There was high agreement, with minimal variation by age, gender or state, that being legally over the alcohol limit would affect the ability to act safely as a pedestrian and as a driver (Table 2). Among respondents who were drivers, those aged 55 years and over were more likely to report that they don't drink at any time or restricted what they drank if they were driving. Furthermore, there were more respondents from NSW (40%) than SA (28%) that reported not drinking at all, however there were more respondents in SA (61%) than NSW (50%) that reported not drinking.

A high proportion of driver respondents (96%) reported that it was unlikely that they had driven with a blood alcohol limit above 0.05 in the last 12 months with minimal variation by age, gender or state.

Table 2 Reported road user behaviour and perceptions (seatbelt use, speeding and alcohol use) by age, gender and state

	Gender		State		Age categories (years)				Total <sup>A</sup>
	Men	Women	NSW	SA	<25	25-39	40-54	55+	
Always wear seatbelt in front seat	237/ 243 (97.5%)	340/ 348 (97.7%)	338/ 348 (97.1%)	242/ 246 (98.4%)	114/ 116 (98.3%)	154/ 160 (96.3%)	192/ 196 (98.0%)	104/ 106 (98.1%)	564/ 578 (97.6%)
Always wear seatbelt in rear seat	210/ 246 (85.4%)	300/ 347 (86.5%)	323/ 349 (92.6%)	189/ 247 (76.5%)	93/ 116 (80.2%)	130/ 161 (80.7%)	179/ 197 (90.9%)	97/ 106 (91.5%)	499/ 580 (86.0%)
Always, nearly always or mostly drive 10km over the limit*	21/ 166 (12.7%)	25/ 240 (10.4%)	22/ 229 (9.6%)	24/ 179 (13.4%)	7/ 72 (9.7%)	13/ 119 (10.9%)	18/ 138 (13.0%)	6/ 69 (8.7%)	44/ 398 (11.1%)
Booked for speeding in last 6 months*	18/ 166 (10.8%)	17/ 241 (7.1%)	22/ 227 (9.7%)	14/ 182 (7.7%)	9/ 73 (12.3%)	8/ 117 (6.8%)	12/ 139 (8.6%)	5/ 70 (7.1%)	34/ 399 (8.5%)
Would being over the limit affect your safety as a pedestrian (Yes)	204/ 237 (86.1%)	312/ 340 (91.8%)	306/ 342 (89.5%)	213/ 238 (89.5%)	100/ 112 (89.3%)	139/ 157 (88.5%)	174/ 193 (90.2%)	91/ 103 (88.3%)	504/ 565 (89.2%)
Would being over the limit affect your safety as a driver (Yes)	228/ 239 (95.4%)	326/ 338 (96.4%)	322/ 339 (95.0%)	235/ 241 (97.5%)	108/ 113 (95.6%)	151/ 155 (97.4%)	185/ 194 (95.4%)	97/ 102 (95.1%)	541/ 564 (95.9%)
Do you agree with RBTs (Agree strongly)	193/ 243 (79.4%)	303/ 343 (88.3%)	297/ 346 (85.8%)	202/ 243 (83.1%)	92/ 114 (80.7%)	128/ 160 (80.0%)	175/ 196 (89.3%)	90/ 103 (87.4%)	485/ 573 (84.6%)

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 Which best describes your behaviour about drinking and driving\*

I don't drink at any time	48/ 159 (30.2%)	89/ 236 (37.7%)	89/ 224 (39.7%)	49/ 173 (28.3%)	16/ 69 (23.2%)	30/ 117 (25.6%)	52/ 134 (38.8%)	35/ 68 (51.5%)	133/ 388 (34.3%)
If I am driving, I don't drink	90/ 159 (56.6%)	127/ 236 (53.8%)	112/ 224 (50.0%)	105/ 173 (60.7%)	47/ 69 (68.1%)	69/ 117 (59.0%)	66/ 134 (49.3%)	31/ 68 (45.6%)	213/ 388 (54.9%)
If I am driving, I restrict what I drink	21/ 159 (13.2%)	19/ 236 (8.1%)	22/ 224 (9.8%)	19/ 173 (11.0%)	6/ 69 (8.7%)	17/ 117 (14.5%)	16/ 134 (11.9%)	2/ 68 (2.9%)	41/ 388 (10.6%)
If I am driving, I do not restrict what I drink	0/ 159 (0.0%)	1/ 236 (0.4%)	1/ 224 (0.4%)	0/ 173 (0.0%)	0/ 69 (0.0%)	1/ 117 (0.9%)	0/ 134 (0.0%)	0/ 68 (0.0%)	1/ 388 (0.3%)

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 In last 12 months how likely you have driven over 0.05\*

Likely (Fairly/Very likely)	9/ 162 (5.6%)	6/ 236 (2.5%)	7/ 223 (3.1%)	8/ 177 (4.5%)	2/ 72 (2.8%)	5/ 115 (4.3%)	7/ 134 (5.2%)	1/ 70 (1.4%)	15/ 391 (3.8%)
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<sup>A</sup> Denominators reflect available data      \*Drivers only

## DISCUSSION

This study explored self-reported crash history, road user behaviours and perceptions in a study sample with a high participation rate from Aboriginal and Torres Strait Islander people attending health services in four urban and regional/remote sites across NSW and SA. We found that more than one third of our sample had been exposed to crashes, with a higher proportion reported in NSW (9% vs 5%), this is likely a result of the NSW sites being located in more urban/regional areas while the SA sites were remote. Of those reported having been involved in a crash, 7% said they had been directly involved in a crash in the previous 12 months, of which two thirds were the driver or 4% of the total sample. There are few reports with which to compare these results; however the Community Attitude to Road Safety (CARS) survey conducted Australia-wide in 2013 found 17% of drivers reported crash involvement in the past 3 years, which suggests our results for 12 months are likely lower than for the general population.(Petroulias, 2014) This likely relates to the proportion of our sample that identified as drivers; as previously reported by Rebecca Ivers et al. (2016), almost one third of participants reported that they did not have a licence and between 10-34% of participants across the sites reported not having driven at all in the previous 12 months. Furthermore, this is consistent with the 2009-10 rates of serious or fatally injured Aboriginal and Torres Strait Islander car occupants, of which considerably more were passengers than drivers.(Henley & Harrison, 2013) By contrast, among other Australian car occupants seriously or fatally injured, there were twice as many drivers as passengers, which suggests that there are a higher number of passengers per vehicle among Aboriginal and Torres Strait Islander people seriously or fatally injured occupants compared with other Australians.(Henley & Harrison, 2013)

The higher proportion of Aboriginal and Torres Strait Islander people injured as passengers emphasises the importance of appropriate restraint use in both the front and rear seats. We found that seat belt wearing rates in the front seat were high for both NSW and SA; results were in line with what is reported in the CARS surveys nationally.(Petroulias, 2014) However, in SA in CARS 2013, rear seat belt use was 93%; in our current survey only 77% use a rear seatbelt, with 10% of respondents reporting they only wore a seatbelt while in the rear seat sometimes. Given the two locations participating in SA were remote areas, this suggests that restraint programs have not

adequately addressed restraint use issues in such settings, and also suggests overloading of vehicles which results in insufficient restraints being available; this represents an important opportunity for targeted culturally informed restraint initiatives.

In terms of speed, the CARS survey reported that the percentage of drivers nationally travelling at 10 km/h always, nearly always or mostly over the speed limit decreased from 15% in 1993 to 5% in 2013. This was higher in our sample, with twice as many respondents (11%) reporting always, nearly always or mostly driving 10km/h over the speed limit. While both genders in our sample reported higher rates than the CARS survey, the proportion of women in our sample (10%) was more than three times the national sample in which 3% of women reported driving 10km/h over the speed limit, while the men in our sample (13%) exceeded but more closely approximated the CARS survey (8%). By state, CARS reported in 2009 that 6% of drivers in NSW and 4% in SA reported always, nearly always or mostly driving at 10 km/h over the speed limit, and in 2013 CARS reported 8% for NSW and 1% for SA. While our sample in NSW (10%) was similar to the 2013 CARS survey, 13% of our participants in SA reported driving at 10 km/h always, nearly always or mostly over the speed limit. This difference between the CARS SA results and our SA results, likely reflects the remote location of our study sites in SA as speeding higher in areas outside of capital cities.(Falster et al., 2013b; Zwerling et al., 2005). Furthermore, it is well documented that speed is a factor in higher crash rates on regional and remote roads, which disproportionately impacts Aboriginal and Torres Strait Islander people whom are more likely than other Australians to reside in rural and remote locations.(Falster et al., 2013a) The link between crash rates and geography is attributed to exposure to longer travel times on poorly maintained roads at higher speeds among regional and remote drivers(Falster et al., 2013a; Zwerling et al., 2005). The high rates of reported speeding in our SA sample and among female drivers in our sample suggest that speeding campaigns are not adequately targeting Aboriginal and Torres Strait Islander drivers who are female and/or live in remote areas.

The reported incidence of being booked for speeding in the last 6 months has remained between 5-8% nationally in the general population since 1993 to 2013, according to the CARS survey. Our study found higher results for both NSW (10%) and SA (8%) participants, respectively, compared to 5% for NSW and 4% for SA in the 2013 CARS survey. While this likely reflects the higher proportion of our



sample that reports speeding behaviour, it may also be indicative of increased enforcement in Aboriginal and Torres Strait Islander communities, for example among those aged 55 and over in our sample, 7% reported being booked for speeding in the past six months, which was more than twice the rate of those aged 60 and over in the CARS sample (3%). Conversely, there was no such discrepancy in enforcement rates among those aged 25 and under, with our sample (12%) closely approximating the CARS sample that reported being booked for speeding in the past six months (12%).

We reported far higher proportion of Aboriginal and Torres Strait Islander respondents that reported not drinking and driving or not drinking at all in our sample (34%) compared to the CARS sample (23%). This could in part explain the considerable difference between self-reports of restricting drinking if driving between the CARS survey and our study: in the CARS survey, the NSW rate was 34% and 39% for SA while our results showed only 10% for NSW and 11% for SA. Further, more respondents in our sample reported that they had likely driven over the blood alcohol limit in the past 12 months than the NSW and SA CARS samples in which only 1% of NSW and 0% of SA respondents endorsed this compared with 3% and 5% in NSW and SA respectively in our sample. This discrepancy between attitudes toward drink driving and behaviour in our sample may reflect specific cultural and geographic needs for transport within Aboriginal and Torres Strait Islander communities that can contribute to patterns of drink driving behaviour. This includes the lack of alternative transport in regional and remote communities and low rates of licensed drivers in Aboriginal and Torres Strait Islander communities, which can put pressure on licensed drivers to provide transport that may involve over-crowding of vehicles or drink driving.(Cullen, Clapham, Hunter, Treacy, & Ivers, 2016; Elliot and Shananhan Research, 2008; Transport for NSW, 2014) Alternatively, lack of access to public or private transport can increase the likelihood that people will drive unlicensed, which can be a risk factor for injury as unlicensed driving is associated with more severe crashes and other risky behaviours including speeding and drink driving.(Hanna, Laflamme, Elling, & Möller, 2013; Hanna, Taylor, Sheppard, & Laflamme, 2006; Watson, 2004; Watson, Armstrong, Watson, Wilson, & Livingstone, 2011) Furthermore, Aboriginal and Torres Strait Islander peoples require transport to meet specific cultural needs, including transporting family members to events and locations of cultural or kinship significance; however in transport disadvantaged

communities this can also contribute to unsafe driving practices including vehicle over-crowding, insufficient restraint use and drink driving.(Cullen, Clapham, Hunter, Porykali, & Ivers, 2017; Helps et al., 2008)

This study has confirmed that in general, Aboriginal and Torres Strait Islander people do not report less safe attitudes than the rest of the population, however there are specific geographic and cultural factors that may be impacting on higher rates of injury due to crash, particularly among Aboriginal and Torres Strait Islander passengers in Australia. This highlights that there are both strengths and challenges for communities and road authorities to work together on. In particular, very low use of rear restraints in SA is concerning and requires urgent systems level collaboration between communities and policy makers. We also found that more participants reported speeding, although this likely reflects the geography of our sample and represents opportunity for targeted campaigns and road safety interventions that are culturally and gender informed. Furthermore, the results of this survey point to underlying transport access issues in Aboriginal and Torres Strait Islander communities due to low rates of licensed drivers, which can be addressed through comprehensive licensing support programs and alternative transport schemes. Supporting Aboriginal and Torres Strait Islander people to safely and legally access affordable transport will reduce overcrowding and unsafe driving practices that stem from transport disadvantage and contribute to over-representation of Aboriginal and Torres Strait Islander people in road injury and incarceration.

There are some limitations. As with all such interview surveys, there is the potential for social desirability bias resulting in possible under-reporting of crash risk, however in our study, as Research Assistants were Aboriginal and Torres Strait Islander people it is also possible that participants felt more comfortable and able to fully disclose crash history and driver behaviours.

This study has several strengths: we obtained a good participation rate from people attending ACCHS and gained insight into both road safety perceptions and self-reported behaviours; however the sample does not represent all Aboriginal and Torres Strait Islander people, and may represent those with poorer health profiles, given they were recruited from medical services. It is possible, therefore that their health may have prevented participants from driving and increase their reliance on alternative modes of transport. They are also older than the general population. Targeted surveys such as this one

are more useful ways to learn about knowledge, attitudes and self-reported behaviour and exposures of Aboriginal and Torres Strait Islander people. Main alternatives to targeted approaches such as this are large population sample surveys, which are much more expensive to conduct. Small surveys such as this one are appropriate for studying fairly high-prevalence phenomena than lower prevalence ones (e.g. recent crash involvement). To study the latter with good precision through cross-sectional surveys one would need a larger sample, and a methodologically stronger alternative would be a cohort, ideally followed for several years, or a nationally representative study. Indeed, given the burden of road injury, we strongly suggest that Aboriginal and Torres Strait Islander identification is accurately captured in state licensing databases, and transport and road safety questions are added to the National Aboriginal and Torres Strait Islander Health Survey. Having a common core question set is important as it enables better comparison of findings between investigations. Further, in addition to addressing transport access, we recommend road safety campaigns consider these findings and focus on such issues as seat belt use among young Aboriginal and Torres Strait Islander people; travelling at safe speeds targeting middle aged people (those aged 40-54 years); and alcohol use particularly in rural settings where transport options are particularly limited.

This work highlights the importance of conducting special studies to examine specific issues not identified by routinely collected data. In addition to significant issues around licensing previously reported, we have uncovered some substantial unresolved challenges to road safety. In particular, targeted community-led programs around restraint use are still urgently needed, particularly in rural and remote areas. It is likely that overloading and lack of restraint use are major contributors to the over-representation of Aboriginal and Torres Strait Islander people in road deaths and this requires urgent, targeted attention. Similarly speed remains a significant issue. Given that these are well known risk factors, it is imperative that initiatives aimed at addressing behaviours are targeted; however, such initiatives should not involve over policing. While enforcement is a very effective lever to change behaviour in general, it must be accompanied by appropriately targeted community based education or marketing programs (Castillo-Manzano & Castro-Nuno, 2012). For restraints it is likely that low restraint use is due as much to lack of availability of cars with restraints and therefore opportunities to address then and/or alternative safe transport options must be considered. Given the

high number of Aboriginal and Torres Strait Islander people incarcerated for regulatory road related offences it seems likely that traditional enforcement based initiatives are likely to result in increased numbers of people with prohibitive fines, potentially leading to great inequality in incarceration (NSW Auditor General, 2013). Alternative approaches should therefore be considered, potentially including community owned and led transport, licensing and restraint programs (Kathleen Clapham et al., 2017; Cullen, Chevalier, Hunter, Gadsden, & Ivers, 2017; Cullen, Clapham, Lo, et al., 2017). Co-design and development of programs that involve and engage Aboriginal and Torres Strait Islander people to address risk factors and community priorities are vital to sustainable and effective programs.

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