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**Driver licensing: descriptive epidemiology of a social determinant of  
Aboriginal and Torres Strait Islander health**

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### Abstract

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**Methods:** Interviewer-administered surveys were conducted with 625 people 16 years or older in four Aboriginal Community Controlled Health Services in New South Wales and South Australia over a two-week period in 2012-2013.

**Results:** Licensing rates varied from 51% to 77% by site. Compared to not having a licence, having a driver licence was significantly associated with higher odds of full-time employment (adjusted OR 4.0, 95%CI 2.5-6.3) and educational attainment (adjusted OR 1.9, 95%CI 1.2-2.8 for trade or certificate; adjusted OR 4.0, 95%CI 1.6-9.5 for degree qualification).

**Conclusions:** Variation in driver licensing rates suggests different yet pervasive barriers to access. There is a strong association between driver licensing, education and employment.

**Implications:** Licensing inequality has far-reaching impacts on the broader health and wellbeing of Aboriginal and Torres Strait Islander people, reinforcing the need for appropriate and accessible pathways to achieving and maintaining driver licensing.

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# Driver licensing: descriptive epidemiology of a social determinant of Aboriginal and Torres Strait Islander health

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The urban and regional development of Australia has resulted in densely populated city areas and the necessary use of a private car for transport in regional and outer urban areas. The ability to acquire a driver licence is an important contributor to one's independence, mobility – and very often – employment.<sup>1</sup>

According to the 2011 Census of Population and Housing, almost three-quarters of people who travelled to work used a car (74%) and the proportion was even higher in regional and remote areas (87%).<sup>1</sup> While public transport is a viable alternative for some people, it is largely restricted to major urban centres. A higher proportion of Aboriginal and Torres Strait Islander people than other Australians reside in regional or remote areas,<sup>2</sup> suggesting that this part of the population is likely to be particularly dependent on cars and similar vehicles for transport. In 2008, nearly three-quarters (71%) of Aboriginal and Torres Strait Islander adults living in remote areas had no access to public transport and 15% were unable to reach places when needed.<sup>3</sup>

However, driving and travelling in cars also confers risks of crash and injury. Persisting high crash and fatality rates for young people prompted the introduction of graduated licensing laws for novice drivers. These have been successful in reducing injury,<sup>4,5</sup> but there are clear trade-offs between safety and mobility.<sup>6</sup> While improving safety, these laws also increased the duration, cost and complexity of the steps to obtaining a licence, which include multiple testing points

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**Key words:** Aboriginal health, road safety, driver licensing

over several years and up to 120 hours of supervised driving practice during the learner driver phase.<sup>5</sup>

Further, the introduction of licence suspension for unpaid fines, minimum disqualification periods and Habitual Traffic Offender declarations in NSW pose new barriers to maintaining licensure.<sup>1</sup> State debt recovery processes in several states in Australia, including NSW and SA, require that if fines are not paid (including those unrelated to driving) the State may take actions including driver licence suspension until the debt is repaid or action is taken towards

repayment. For those who have incurred large fines this may result in numerous years without a driver licence. Prolonged suspensions of licences may have a significant impact on an individual's ability to get to work and places of education, especially in regional areas. Non-payment of fines can also result in imprisonment, especially if the person has few assets. Licensing regulation can, in this way, increase criminalisation of already marginalised groups.<sup>7</sup>

The rate of driver licence suspensions for fine defaults in Aboriginal and Torres Strait Islander populations is more than three

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times that of non-Indigenous people.<sup>1</sup> Up to 40% of the Aboriginal community in NSW, for example, have reported having an outstanding debt with the agency that administers the NSW fine enforcement system, the State Debt Recovery Office (SDRO), with unpaid fines (31%) and SDRO debt (28%) the most common causes for suspension or loss of licence.<sup>8</sup>

Several previous studies have explored driver licensing in Aboriginal and Torres Strait Islander people. Both the 2008 Elliot and Shanahan Report and the 2010 Tanami Driver Licensing Project highlighted low rates of driver licensing in the Aboriginal and Torres Strait Islander population (46% and 47.3%, respectively).<sup>8,9</sup> A population-based survey in South Australia in 2012 found that 62.5% (95%CI 57.5–67.3) of Aboriginal people aged 17 years and older held a full or provisional driver licence.<sup>10</sup> The estimated prevalence of license holding was highest in metropolitan areas (68%), lower in regional areas (58%) and lowest in remote areas (53%), although this survey did not include the very remote Anangu Pitjantjatjara Yankunytjatjara region of SA, for logistical reasons.

These studies also report a high prevalence of unlicensed driving for Aboriginal and Torres Strait Islander people. Elliot and Shanahan found that 29% of those never licensed and 46% of past licence holders had driven within the past year.<sup>8</sup> Taylor et al. found that 35.6% (95%CI 23.0–49.8) of respondents aged 17 and older without a full or provisional licence and with access to a motor vehicle had driven without a licence in the year before survey, most more than once.<sup>10</sup>

Earlier research in South Australia found that a lack of access to safe travel interacts with the health and cultural needs of Aboriginal people.<sup>11</sup> For health and transport systems to work effectively, they must reflect and incorporate the known connectedness of the health and cultural needs of the population. As highlighted by Marmot, the circumstances in which people live are critical as social determinants of health. Access to education and opportunities for skills development and employment therefore contribute significantly to the health of Aboriginal and Torres Strait Islander peoples.<sup>12</sup> Holding a driver licence, and retaining it, with the concomitant access to services and independence it provides, can be seen as a critical enabler or barrier to health.

With the exception of Taylor et al,<sup>10</sup> previous studies exploring licensing for Aboriginal and Torres Strait Islander people are limited to small or non-representative samples. Apart from NSW, which began collecting voluntary information on Indigenous status in licensing data in 2009, no states or territories in Australia currently collect information about Indigenous status in driver licensing data. The consequent lack of data inhibits the development of appropriate, targeted policy solutions to address this important issue. This study therefore aimed to examine licensing rates and predictors of licensing 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, face-to-face survey administered to clients attending four ACCHS in NSW and SA. The study was overseen by a steering committee comprising the investigators; representatives from the Aboriginal Health and Medical Research Council of NSW and The Aboriginal Health Council of South Australia; representatives from ACCHS; and Aboriginal policy officers from the transport authorities in each state, Transport for NSW and Main Roads SA. This committee met quarterly and reviewed study methods, conduct, interpretation and dissemination of results.

The survey was conducted between December 2012 and February 2013 in four services: Redfern and Griffith in NSW, and Ceduna and Port Lincoln in South Australia. Sites were selected based on interest from the service and capacity to engage in the project.

The survey was administered by trained research assistants at each site, most of whom were Aboriginal (25/27). All Aboriginal or Torres Strait Islander clients attending the participating ACCHS and related services for any reason over the two-week period were asked to participate in the study. Research assistants approached clients while they were entering the service or waiting for appointments, and asked that they complete the consent form. Consenting clients completed an anonymous interviewer-administered survey; responses were collected using iPads (SA) or on identical paper questionnaires (NSW). Of those approached at each site, the proportion that consented and undertook an interview ranged from 69% to

75%. No data were collected from those who chose not to participate.

Data were collected and managed using REDCap electronic data capture tools hosted at The George Institute for Global Health.<sup>13</sup>

Where possible, survey questions were adapted from previous licensing studies,<sup>11</sup> Census questionnaires and other relevant tools including from the Community Attitudes to Road Safety Study.<sup>14</sup> Participants were asked if they currently had a driver licence and if they knew the expiry date. Data were not collected on whether or not the interviewer had sighted the driver licence. If the licence was out of date, the participant was informed of their legal obligations to hold a current licence while driving.

Ethics approval for the study was granted by the Ethics Committee of the Aboriginal Health and Medical Research Council of NSW and the Aboriginal Health Research Ethics Committee of the Aboriginal Health Council of South Australia and Flinders University.

## Statistical analysis

Descriptive statistics were calculated for variables of interest. Previous research guided the selection of variables considered to be potential predictors of driver licence-holding status. Each of these variables was made the subject of univariate analysis using logistic regression then entered into a multivariable model. The dependent variable was driver licence status at the date of interview, comparing those who reported no licence with those who reported having any type of licence. Records with missing values for the variables included in models were omitted.

All analyses used SAS version 9.4 (Cary, USA).

## Results

### Study population

The 625 interviews included 292 (46.7%) in Redfern, 83 (13.3%) in Griffith, 92 (14.7%) in Ceduna and 158 (25.3%) in Port Lincoln. Table 1 presents basic socio-demographic characteristics. In all sites there were more female respondents than male, with the highest proportion of women participating in Griffith (63.9%) and Port Lincoln (65.8%).

The proportion of people reporting speaking a language other than English at home varied from none in Griffith to 20.9% (19/91) in Ceduna. Aboriginal and Torres Strait Islander languages were the most prevalent other languages with Kriol and Torres Strait Islander

languages the most common in Redfern (combined, 3% of the Redfern participants), Pitjantjatjara (3% of the Ceduna/Koonibah participants) and Aboriginal English and Pitjantjatjara in Port Lincoln (combined, 8% of those participants). The proportion in full-time employment ranged from 27.1% in Port Lincoln to 48.8% in Griffith; the proportion of people reporting a bachelor's degree ranged from 3.5% in Ceduna to 13.4% in Redfern.

Most participants (n=504/606; 83.2%) reported having ever tried to acquire a driver licence of any kind, with most – 470/503 (93.4%) – reporting having succeeded. The proportion of people holding a licence enabling them to drive independently (a full or provisional licence) was 51.4% in Redfern, 52.5% in Port Lincoln, 66.3% in Ceduna and 77.2% in Griffith (Table 2). Of those with a licence to drive independently, four had an expired licence.

In total, 577/610 (94.6%) participants reported ever having driven a motor vehicle and across sites between 28% and 64% reported driving every day in the past year

(Table 3). Of respondents, 40% indicated that they currently use a vehicle (car/4WD/truck) to get to work (31.7% as drivers and 8.3% as passengers). By site, the proportion who used a private vehicle (car/4WD/truck) to get to work was 22.3% in Redfern (20.6% as drivers, 1.7% as passengers); 62.7% in Griffith (53.0% as drivers, 9.6% as passengers); 81.5% in Ceduna (53.3% as drivers, 28.3% as passengers) and 36.7% in Port Lincoln (28.5% as drivers, 8.2% as passengers). Most participants said driving was important or very important for independence, to support community needs and meeting work and other obligations (Table 3).

### Learn to drive experiences

The respondents with a current licence were asked about their experiences of learning to drive. Almost one-quarter (24.9%; 92/370) indicated that they sometimes could not find a licensed driver to teach them, or that the licensed driver didn't have time available to help (95/368, 25.8% combined); the proportions varied by site (Table 3). More than

one-quarter (97/374, 25.9%) reported that sometimes they were unable to afford the cost of petrol to drive as a learner. Roughly 17% indicated that they had difficulty attaining the requisite number of driving hours for their log book, although fewer reported difficulty at sites in SA compared to NSW. In NSW, 36.7% (73/199) and in SA 36.5% (50/137) people reported having professional driving lessons. In Ceduna (the most remote site) only 7% reported having had professional lessons.

### Factors associated with licensing

Factors significantly associated with having a current licence included full-time employment, older age and education (Table 4). Of employed people, 64% reported holding a licence compared to only 36% of those who were unemployed ( $p < 0.05$ ). In multivariable models, those in full-time employment had significantly greater odds (adjusted OR 4.0; 95%CI 2.5–6.3) of reporting having a current licence than those in part-time or casual employment or not currently employed. Compared to those with no educational

**Table 1: Socio-demographic characteristics of sites and study population.**

	Redfern 292 (77.9%)	Griffith 83 (22.1%)	NSW (n = 375)	Ceduna/Koonibah 92 (36.8%)	Port Lincoln 158 (63.2%)	SA (n = 250)	TOTAL (n = 625) <sup>a</sup>
<b>Study sites</b>							
Site population (proportion Indigenous)	18,265 (1.3%) <sup>b</sup>	18,780 (4.1%)		3625 (24.9%)	14,574 (5.6%)		
Remoteness	Major city	Outer regional		Very remote	Remote		
<b>Participant characteristics</b>							
<b>Aboriginal or Torres Strait Islander status</b>							
Yes Aboriginal	273 (93.5%)	80 (96.4%)	353 (94.1%)	91 (98.9%)	158 (100%)	249 (99.6%)	602 (96.3%)
Yes Torres Strait Islander	10 (3.4%)	2 (2.4%)	12 (3.2%)	1 (1.1%)	0 (0.0%)	1 (0.4%)	13 (2.1%)
Both Aboriginal and Torres Strait Islander	9 (3.1%)	1 (1.2%)	10 (2.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	10 (1.6%)
<b>Gender</b>							
Male	130 (44.7%)	30 (36.1%)	160 (42.8%)	42 (45.7%)	53 (34.2%)	95 (38.5%)	255 (41.1%)
Female	161 (55.3%)	53 (63.9%)	214 (57.2%)	50 (54.4%)	102 (65.8%)	152 (61.5%)	366 (58.9%)
<b>Age categories (years)</b>							
16-24	55 (18.8%)	11 (14.1%)	66 (17.8%)	21 (24.7%)	36 (23.5%)	57 (24.0%)	123 (20.2%)
25-39	81 (27.7%)	19 (24.4%)	100 (27.0%)	25 (29.4%)	44 (28.8%)	69 (29.0%)	169 (27.8%)
40-54	95 (32.5%)	32 (41.0%)	127 (34.3%)	29 (34.1%)	49 (32.0%)	78 (32.8%)	205 (33.7%)
55+	61 (20.9%)	16 (20.5%)	77 (20.8%)	10 (11.8%)	24 (15.7%)	34 (14.3%)	111 (18.3%)
Speaks a language other than English at home	27 (9.4%)	0 (0.0%)	27 (7.3%)	19 (20.9%)	17 (12.1%)	36 (15.6%)	63 (10.5%)
<b>Employment</b>							
Full time	99 (34.4%)	39 (48.8%)	138 (37.5%)	43 (47.3%)	42 (27.1%)	85 (34.6%)	223 (36.3%)
Part-time	22 (7.6%)	6 (7.5%)	28 (7.6%)	13 (14.3%)	6 (3.9%)	19 (7.7%)	47 (7.7%)
Casual	19 (6.6%)	8 (10.0%)	27 (7.3%)	6 (6.6%)	6 (3.9%)	12 (4.9%)	39 (6.4%)
Not employed	148 (51.4%)	27 (33.8%)	175 (47.6%)	29 (31.9%)	101 (65.2%)	130 (52.8%)	305 (49.7%)
<b>Schooling</b>							
Still at school	8 (2.8%)	0 (0.0%)	8 (2.2%)	5 (5.8%)	5 (3.3%)	10 (4.2%)	18 (3.0%)
Have never attended school (no formal education)	2 (0.7%)	0 (0.0%)	2 (0.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (0.3%)
Age when finished school (years)							
Mean (SD)	15.8 (1.76)	15.9 (1.70)	15.8 (1.74)	15.9 (1.19)	16.0 (1.37)	16.0 (1.30)	15.9 (1.59)
<b>Post-school qualifications</b>							
None	104 (37.7%)	35 (44.3%)	139 (39.2%)	33 (38.4%)	68 (45.6%)	101 (43.0%)	240 (40.7%)
Bachelor's degree	37 (13.4%)	8 (10.1%)	45 (12.7%)	3 (3.5%)	6 (4.0%)	9 (3.8%)	54 (9.2%)
Trade or certificate	135 (48.9%)	36 (45.6%)	171 (48.2%)	50 (58.1%)	75 (50.3%)	125 (53.2%)	296 (50.2%)

a: Missing data excluded for each variable

b: Indigenous population for central Sydney



**Table 2: Licensing status of study population.**

Licensing status	Redfern	Griffith	NSW	Ceduna	Port Lincoln	SA	Total
None	100 (34.2%)	10 (12.0%)	110 (29.3%)	19 (20.7%)	56 (35.4%)	75 (30.0%)	185 (29.6%)
Full (including heavy vehicle)	129 (44.2%)	53 (63.9%)	182 (48.5%)	54 (58.7%)	76 (48.1%)	130 (52.0%)	312 (49.9%)
Provisional (P1 or P2)	21 (7.2%)	11 (13.3%)	32 (8.5%)	7 (7.6%)	7 (4.4%)	14 (5.6%)	46 (7.4%)
Learner permit	14 (4.8%)	4 (4.8%)	18 (4.8%)	3 (3.3%)	6 (3.8%)	9 (3.6%)	27 (4.3%)
Motorcycle only (no car licence)	1 (0.3%)	0 (0.0%)	1 (0.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.2%)
Other	1 (0.3%)	0 (0.0%)	1 (0.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.2%)
Have previously tried to get a licence, but no data if currently have a licence	12 (4.1%)	3 (3.6%)	15 (4.0%)	6 (6.5%)	13 (8.2%)	19 (7.6%)	34 (5.4%)
No data if have ever tried to get a licence or if currently have a licence	13 (4.5%)	2 (2.4%)	15 (4.0%)	3 (3.3%)	0 (0.0%)	3 (1.2%)	18 (2.9%)
Currently hold licence but didn't say what type	1 (0.3%)	0 (0.0%)	1 (0.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.2%)
Total	292	83	375	92	158	250	625

qualifications, those reporting having a trade certificate or a bachelor's degree had significantly higher odds of reporting holding a current driver licence (adjusted OR 1.9; 95%CI 1.2-2.8 and 4.0; 95%CI 1.6-9.5, respectively).

## Discussion

This study has systematically assessed licensing rates, barriers to licensing and factors associated with licensing in a sample of Aboriginal people attending ACCHS in Australia. The study found licensing rates varied substantially across sites. Licensing rates for independent driving (full or

provisional licence) were lowest in Redfern and in Port Lincoln at just over 50%, but substantially higher in Griffith (77%) and Ceduna (66%).

There is limited published data on driver licensing rates, either in the general or Aboriginal population. A licensing rate of 83% for the general population in NSW aged over 16 years has been reported;<sup>15</sup> analysis of NSW licensing data suggests that Aboriginal people represent only 0.4% of all driver licence holders, but 1.9% of the eligible driver population in NSW in 2011.<sup>1</sup> The South Australian Aboriginal Health Survey reported lower licensing rates in the most remote

regions of that state (53%), with higher rates in regional (58%) and urban settings (68%).<sup>10</sup>

Our results in NSW suggest that while the licensing rate in the outer regional town of Griffith (77%) approaches general population licensing rates, the rates in the urban setting of Redfern (just over 50%) are substantially lower. It is possible that licensing may be a lower priority in Redfern due to greater availability of public transport but it is notable, however, that – even in Redfern – a high proportion of respondents indicated the importance of driver licensing for work and independence. Greater difficulty in attaining log book hours in NSW compared to SA likely reflects different graduated licensing laws, with NSW requiring 50 mandatory log book hours in 2002 for learner drivers increasing to 120 hours in 2007, while SA required 50 mandatory minimum hours from 2005 increasing to 75 hours in 2010. It should be noted that barriers to driver licensing were not intended to be a major focus of this paper and will be addressed in subsequent publications utilising qualitative data from the study.

Our results in SA were similar to those of Taylor<sup>10</sup> with a 53% licensing rate in Port Lincoln, a large remote town, but we found higher rates in Ceduna (66%), a smaller, very remote community with a high proportion of Aboriginal people. The higher rate in Ceduna may reflect different characteristics of people attending the ACCHS, or those choosing to participate in our survey; although may also reflect access to local licensing programs.

While the small number of study sites limits the conclusions that can be made, it is notable that – as in NSW – those in larger more urban settings may also face substantial challenges to driver licensing. Each of the services included in this study are relatively isolated or disadvantaged areas. Griffith, Ceduna and Port Lincoln all fall into decile 3 on the SEIFA index of education and occupation, and Ceduna and Port Lincoln 3 and Griffith 5 on the SEIFA scale relative index of socioeconomic advantage and disadvantage.<sup>16</sup> Redfern falls into the Sydney local government area which is classed as deciles 9 and 10,<sup>16</sup> respectively, on the two indices, but this is unlikely to accurately represent the majority of clients attending the ACCHO.<sup>17</sup> Our results suggest that licensing rates are variable, and indicate that there are likely to be substantial barriers for licensing, even in areas with a high apparent level of service provision. For low-skilled workers,

**Table 3: Licensing and driving experiences by site.**

	Redfern % (n/N)	Griffith % (n/N)	Ceduna % (n/N)	Port Lincoln % (n/N)
Driven every day of the week in the past year	28.2 (73/259)	48.1 (38/79)	64.0 (57/89)	45.3 (67/148)
Not driven at all in last 12 months	33.6 (87/259)	12.7 (10/79)	10.1 (9/89)	29.1 (43/148)
Driver licence 'important' or 'very important'* for:				
– independence	93.3 (235/252)	98.7 (74/75)	98.9 (86/87)	98.6 (138/140)
– to support community needs	86.9 (218/251)	94.7 (71/75)	64.7 (55/85)	92.4 (133/144)
– meeting work requirements and opportunities	88.6 (218/246)	88.9 (64/72)	95.2 (79/83)	96.5 (137/142)
Learn to drive experiences**				
Sometimes could not find a licensed driver to teach them	21.5 (35/163)	33.9 (21/62)	17.0 (10/59)	30.2 (26/86)
Licensed driver didn't have available time to help	26.1 (42/161)	43.1 (28/65)	17.0 (10/59)	18.1 (15/83)
Sometimes they were unable to afford the cost of petrol to drive as a learner	24.1 (39/162)	32.3 (21/65)	27.0 (17/63)	23.8 (20/84)
Had difficulty attaining the requisite number of driving hours for their log book	19.8 (32/162)	28.1 (18/64)	6.7 (4/60)	10.7 (9/84)
Driving lesson experience				
Had professional driving lessons**	40.1 (57/142)	28.1 (16/57)	7.0 (4/57)	57.5 (46/80)
Main reasons for not having lessons with professional driving instructor:				
– no professional instructor nearby	5.9 (5/85)	24.4 (10/41)	77.4 (41/53)	11.8 (4/34)
– cost	23.5 (20/85)	36.6 (15/41)	11.3 (6/53)	8.8 (3/34)

\* Compared to neutral, not important and not important at all.

\*\* Those with a driver licence were asked about their learn to drive experience (Redfern n=167; Griffith n=68; Ceduna/Koonibah n=64; Port Lincoln n=89); responses are yes compared to no/don't know.

a driver licence may provide an essential qualification for employment and access to workplaces which may not always be well served by public transport.

Importantly, however, this study has confirmed the very strong relationship between licensing, education and employment, with those who held a driver licence (provisional or full) having significantly higher odds of being in full-time employment or having higher levels of formal education. Given the cross-sectional nature of the study design, it is not possible to determine the direction of effect, although it is clear that driver licensing is linked to education and employment. Licensing could be a necessary pre-requisite for access to education and an essential skill for employment; conversely, it is possible that the financial advantage that comes with higher education and full-time employment is likely to make licensure more accessible. This association is likely to be a complex web of cause and effect, with improved licensing an important step in creating better education and employment outcomes.<sup>18</sup>

The World Health Organization has defined social determinants of health as structural determinants and conditions of daily life that affect health status and are responsible for a major part of health inequities. This definition includes the accessibility of schools and education as well as employment,<sup>19</sup> which have been raised as important social determinants for Aboriginal health.<sup>12</sup> Considering the relationship found between licensing and education and employment, it is highly likely that low licensing rates for Aboriginal populations, as a social determinant of health, are adversely affecting health status.

### Study strengths and weaknesses

A strength of this study is the high response rate across the four participating ACCHS (70% overall; 69–75). While clients of Aboriginal and Torres Strait Islander health services are not necessarily representative of the broader community, against an estimated national population of 517,000, ACCHS delivered patient care to about 257,000 Aboriginal and Torres Strait Islander people.<sup>20</sup> This indicates that a significant proportion of Aboriginal and Torres Strait Islander people access such services and, as such, they are a recognisable subset of the Aboriginal and Torres Strait Islander population. Furthermore, it has been argued that these services better target those who are 'hard to reach' as they have more clients with complex disease than do private general practices.<sup>21</sup>

Participants in this study (median age = 41) were, however, older than the general Aboriginal and Torres Strait Islander population, of which the median age in 2011 for those over 16 years was 34 years.<sup>22</sup> The differing ages of participants is to be expected, as those aged 65 years and over are more likely to visit their general practitioner than younger people.<sup>23</sup> It is possible that the under-representation of Aboriginal and Torres Strait Islander people in licensing may therefore be even greater than the results indicate, as our study found those who were aged 25–54 years were more likely to be licensed than those aged under 25 years in univariate analyses. However, as most ACCHS provide transport services to clients<sup>18</sup> it is also possible that the licensing rate is lower among clients who attend ACCHS than the general Aboriginal and Torres Strait Islander

population. Further work is required to better understand this.

In common with all analyses based on cross-sectional data from surveys, this study provides a relatively weak basis for drawing conclusions on causation, particularly the direction of causation. Caution must therefore be used in interpretation of the results.

### Implications

Issues of personal, family and community empowerment to control life events, and being able to live lives of value, are fundamental to social determinants of Aboriginal and Torres Strait Islander health.<sup>19</sup> The under-representation of Aboriginal and Torres Strait Islander people holding driver licences also affects education and employment outcomes. Aboriginal and Torres Strait Islander Australians have lower rates of post-school educational attainment and participation in the labour force. In 2008, about 40% of Aboriginal and Torres Strait Islander people aged 25–64 years held a non-school qualification compared to 61% of the non-Indigenous population of equivalent age. Only 6.5% of Aboriginal and Torres Strait Islander Australians held a bachelor degree or higher, compared with one quarter (25%) of non-Indigenous people, with the rate even lower for those in remote areas (3.6%).<sup>3</sup> In 2008, less than two-thirds (65%) of working-age Aboriginal and Torres Strait Islander people were in the labour force compared with 79% of the non-Indigenous population.<sup>3</sup> Programs that ensure individuals have more control over the things in their lives that are important to them, including education and employment, are critical to increasing the health status of Aboriginal and Torres Strait Islander people.<sup>19</sup> As such, driver licensing support programs that aim to increase licensure, including learner driver mentor programs, may provide significant opportunities to close the gap.<sup>7</sup> However, such programs are limited in scope and there is not yet significant public funding to support these, despite the recent NSW Government Audit Report recommending further investment.<sup>1</sup> It should also be noted that other population groups; for example, from culturally and linguistically diverse communities, also face similar barriers to licensing.<sup>24</sup>

The results of this study also have implications for other issues having a negative impact on the health of Aboriginal and Torres Strait

**Table 4: Univariate and multivariable associations with having a current licence.**

Variables	Factor	Univariate estimates			Adjusted estimates <sup>a</sup>	
		N available/ N missing	OR (95% CI)	p-value	OR (95% CI)	p-value
Gender	Male vs. female	603 / 22	0.9 (0.7-1.3)	0.6123	0.9 (0.6-1.3)	0.4171
Full-time employment	Yes vs. No	602 / 23	4.6 (3.0-6.9)	<0.0001	4.0 (2.5-6.3)	<0.0001
Language other than English	Yes vs. No	583 / 42	0.9 (0.5-1.6)	0.8051	0.8 (0.4-1.5)	0.5022
Age category	25-39 vs. <25	590 / 35	1.6 (1.0-2.7)	0.0468	1.0 (0.6-1.8)	0.9579
	40-54 vs. <25		1.7 (1.0-2.7)	0.0338	1.2 (0.7-2.1)	0.5661
	55+ vs. <25		1.1 (0.6-1.8)	0.7574	1.0 (0.6-1.9)	0.9784
Level of education	Bachelor vs. None	576 / 49	5.9 (2.6-13.6)	<0.0001	3.9 (1.6-9.5)	0.0025
	Trade or certificate vs. None		2.2 (1.6-3.2)	<0.0001	1.9 (1.2-2.8)	0.0023
Urban residence	Major cities & regional vs. Remote & very remote	606 / 19	1.1 (0.8-1.6)	0.5051	1.0 (0.6-1.4)	0.8442
Driving under suspension <sup>b</sup>	Yes vs. No	176 / 449	0.6 (0.3-1.2)	0.1553		
Age when driving regularly <sup>b</sup>		517 / 108	1.0 (0.99-1.1)	0.1126		

a: Adjusted model includes available sample of 540 (85 missing)

b: Variable is not included in the multivariate model due to the high proportion of missing data

Islander people, notably, incarceration. Aboriginal and Torres Strait people represent nearly one-third of the total prisoner population in Australia in 2014.<sup>25</sup> Similarly, Aboriginal and Torres Strait Islander people were over-represented in traffic offending figures in NSW in 2011, and accounted for 6.4% of all traffic offenders despite making up less than 3% of the population.<sup>1</sup> In 2011, 12% of Aboriginal and Torres Strait Islander people found guilty of a 'driver licence' offence were imprisoned, compared to only 5% of the non-Indigenous population.<sup>1</sup> The low rates of licensing found in this study in some settings, and high rates of reported driving without a licence, may help to explain high rates of incarceration of Aboriginal people due to licensing offences in Australia.<sup>7</sup> There is considerable human and social cost to the over-representation of Aboriginal people in traffic-related offences and imprisonment. Incarceration has enormous and often hidden financial and human costs for the individual and the health and wellbeing of Aboriginal communities.

Low licensing rates and poor access to transport options for Aboriginal and Torres Strait Islander people can be seen as both a cause and consequence of broader socioeconomic disadvantage, and pose a significant public health challenge for Australia. The National Aboriginal Health Strategy 1989 defines Aboriginal health as not merely the physical wellbeing of an individual but also the social, emotional and cultural wellbeing of the whole community.<sup>26</sup> Evident from this understanding of the broader societal definition of health, improved access to licensing is a fundamental prerequisite for increasing good health in Aboriginal and Torres Strait Islander people.

## Conclusion

This study confirms the challenges in attaining a driver licence for Aboriginal and Torres Strait Islander people in Australia and, most importantly, the central and strong relationship between licensing, education and employment. While intuitively the link may appear obvious, no previous research has demonstrated this association.

These results reinforce the need for sustained and coordinated investment in licensing support programs for Aboriginal and Torres Strait Islander people in an effort to increase good health. It is important that a holistic approach is pursued to minimise barriers and

create support systems that assist in both obtaining and maintaining licensing.

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## References

1. Audit Office of New South Wales. New South Wales Auditor-General's Report Performance Audit. Improving Legal and Safe Driving Among Aboriginal People [Internet]. Sydney (AUST): AONSW; 2013 [cited 2014 Jul]. Available from: <http://www.audit.nsw.gov.au/publications/performance-audit-reports/2013-reports/improving-legal-and-safe-driving-among-aboriginal-people>
2. Australian Bureau of Statistics. 4714.0 - National Aboriginal and Torres Strait Islander Social Survey [Internet]. Canberra (AUST): ABS; 2008 [cited 2014 Aug]. Available from: <http://www.abs.gov.au/AUSSTATS/abs@nsf/Latestproducts/4714.0>
3. Australian Institute of Health and Welfare. *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander People: An Overview* [Internet]. Canberra (AUST): AIHW; 2011 [cited 2014 Aug]. Available from: <http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=10737418955>
4. Masten SV, Foss RD, Marshall SW. Graduated driver licensing program component calibrations and their association with fatal crash involvement. *Accid Anal Prev*. 2013;57:105-13.
5. Roads and Traffic Authority of New South Wales. *Improving Road Safety: Young Drivers* [Internet]. Sydney (AUST): The Audit Office of NSW; 2011 [cited 2014 Aug]. Available from: [http://www.audit.nsw.gov.au/ArticleDocuments/143/Improving\\_Road\\_Safety\\_Young\\_Drivers.pdf.aspx?Embed=YPerformance Audit](http://www.audit.nsw.gov.au/ArticleDocuments/143/Improving_Road_Safety_Young_Drivers.pdf.aspx?Embed=YPerformance Audit)

6. Bates L, Watson B, King M. Mobility and safety are conflicting goals for transport policy makers when making decisions about graduated driver licensing. *Int J Health Promot Educ*. 2010;48:46-51.
7. Naylor B. L-plates, logbooks and losing out. Regulating for safety - or creating new criminals? *Altern Law J*. 2010;32:94.
8. Elliott and Shanahan Research. *Investigation of Aboriginal Driver Licensing Issues*. Sydney (AUST): Roads and Traffic Authority (NSW); 2008.
9. Ivers R, Boufous S, Hinchcliff R, Senserrick T, Elkington J, Ali M. *Tanami Driver Licensing Study*. Darwin (AUST): Northern Territory Department of Lands and Planning; 2010.
10. Taylor AW, Marin T, Avery J, Dal Grande E. *South Australian Aboriginal Health Survey*. Adelaide (AUST): Population Research and Outcome Studies; 2012.
11. Helps Y, Moller J, Kowanko I, Harrison JE, O'Donnell K, de Crespigny C. *Aboriginal People Travelling Well: Issues of Safety, Transport and Health*. Canberra (AUST): Department of Infrastructure, Transport, Regional Development and Local Government; 2008.
12. Marmot M. Social determinants and the health of Indigenous Australians. *Med J Aust*. 2011;194:512.
13. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap) - A metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform*. 2009;42:377-81.
14. Petroulias T. *Community Attitudes to Road Safety - 2009 Survey Report* [Internet]. Canberra (AUST): Australian Government Department of Infrastructure, Transport, Regional Development and Local Government; 2009 [cited 2014 Aug]. Available from: [https://infrastructure.gov.au/roads/safety/publications/2010/pdf/community\\_att\\_09.pdf](https://infrastructure.gov.au/roads/safety/publications/2010/pdf/community_att_09.pdf)
15. Raimond T, Milthorpe F. Why are Young People Driving Less? Trends in Licence-holding and Travel Behaviour [Internet]. *Proceedings of the Australasian Transport Research Forum*; 2010 Aug] Sep 29 - Oct 1; Canberra, Australia. Available from: [http://www.atrf.info/papers/2010/2010\\_Raimond\\_Milthorpe.pdf](http://www.atrf.info/papers/2010/2010_Raimond_Milthorpe.pdf)
16. Australian Bureau of Statistics. 2033.0.55.001 - *Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA), Australia, 2011* [Internet]. Canberra (AUST): ABS; 2013 [cited 2014 Sep]. Available from: <http://www.abs.gov.au/ausstats/abs@nsf/mf/2033.0.55.001/>
17. Marles E, Frame C, Royce M. The Aboriginal Medical Service Redfern: Improving access to primary care for over 40 years. *Aust Fam Physician*. 2012;41(6):433-6.
18. Clapham K, Senserrick T, Ivers R, Lyford M, Stevenson M. Understanding the extent and impact of Indigenous road trauma. *Injury*. 2008;39:519-523.
19. May J, Carey TA, Curry R. Social determinants of health: Whose responsibility? *Aust J Rural Health*. 2013;21:139-40.
20. National Aboriginal Community Controlled Health Organisation. *Investing in Aboriginal Community Controlled Health Makes Economic Sense* [Internet]. Canberra (AUST): NACCHO; 2014 [cited 2015 Jul]. Available from: [http://www.naccho.org.au/download/naccho\\_health\\_futures/Full%20Report%20-%20Economic%20Value%20of%20Final%20Report.pdf](http://www.naccho.org.au/download/naccho_health_futures/Full%20Report%20-%20Economic%20Value%20of%20Final%20Report.pdf)
21. Couzos S, Thiele D. Closing the gap depends on ACCHSs (letter). *Med J Aust*. 2009;190(10):541.
22. Australian Bureau of Statistics. 2075.0 - *Census of Population and Housing - Counts of Aboriginal and Torres Strait Islander Australians, 2011*. Canberra (AUST): ABS; 2012.
23. Australian Bureau of Statistics. 4102.0 - *Australian Social Trends. Health Services: Use and Patient Experience*. Canberra (AUST): ABS; 2011.
24. Department of Transport. *Aboriginal People and Ethnic Minority Groups Accessing our Driver Licensing Services: Substantive Equality Framework Assessment* [Internet]. Perth (AUST): DOT; 2012 [cited 2015 Nov]. Available from: [http://www.transport.wa.gov.au/mediaFiles/about-us/DOT\\_P\\_SubstantiveEqualityAccessingServices.pdf](http://www.transport.wa.gov.au/mediaFiles/about-us/DOT_P_SubstantiveEqualityAccessingServices.pdf)
25. Australian Bureau of Statistics. 4517.0 - *Prisoners in Australia, 2014*. Canberra (AUST): ABS; 2014.
26. National Aboriginal Health Strategy Working Party. *National Aboriginal Health Strategy*. Canberra (AUST): NAHSWP; 1989.