

South Australian Primary Schools Bicycle Helmet Usage Survey

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ABSTRACT

This was a school-based survey that was conducted in 2003 to assess bicycle helmet compliance rates amongst South Australian primary school students riding to school. 32% of South Australian primary schools chose to participate in the survey. The total number of students attending the participating schools accounted for approximately 42% of all primary school children. A sample of non-participating schools was independently surveyed to estimate the differences between participating and non-participating schools. The data were disaggregated to examine any differences discernible between schooling sectors, school location and schools with a high indigenous population. Furthermore, the relationship between socio-economic disadvantage and helmet wearing rates was explored. It was estimated that 4% of primary school children ride their bicycle to school. Of the students riding a bicycle to school, 92% wore a helmet. The highest rate of helmet-compliance was reported in Catholic and independent primary schools (100%). Geographically, the lowest rate was reported in the metropolitan Adelaide region (89%). Programs to improve helmet wearing rates might target those from a background of disadvantage and include indigenous children.

BACKGROUND

In July 1991 legislation was passed in South Australia requiring bicyclists to wear helmets. Because of the new legislation, and an enforcement campaign by police, compliance with the legislation appeared initially to be high. However, in recent years anecdotal reports have suggested that the compliance with bicycle-helmet legislation is waning.

Previous studies in Australia have reported bicycle helmet rates among primary school children to be between 85% (RACQ, 2001) and 97% (Ratcliffe, 1993). Primary school children are one of the most compliant groups in wearing a helmet whilst bicycling. High school children and adults (particularly during casual, recreational cycling) have been shown to have a much lower level of helmet compliance. The previous study that found helmet-compliance among primary students to be 97%, found that adult and secondary student helmet-compliance were 88% and 75% (Ratcliffe, 1993).

The South Australian Department for Transport and Urban Planning (DTUP – now the Department for Transport Energy and Infrastructure) expressed an interest in the issue of compliance with bicycle-helmet legislation. DTUP requested the Centre for Automotive Safety Research to include in their research program, a school-based survey to assess bicycle helmet compliance. CASR commissioned the South Australian Department of Health to undertake the survey.

METHODS

In October 2003 every primary school in South Australia received a letter of invitation to participate in the South Australian Primary Schools Bicycle Helmet Usage Survey. The survey was conducted both in metropolitan and country South Australia, and across all public, Catholic and independent primary schools.

The survey was conducted from the 3rd -7th November 2003. Participation in the survey involved each school nominating an observer who spent one hour, on one designated morning of the survey week, standing at the school's bicycle racks recording whether students that arrived to school by bicycle were wearing a helmet. The study population was primary school students from Reception to Year 7 (R-7) aged approximately from 5 to 12 years. A short survey form and complete instructions were provided to each school with a reply paid self-addressed envelope for returning the survey results.

Schools were requested, in the survey instructions, not to forewarn students of the upcoming survey, so that the survey results would be representative of regular helmet wearing activity.

The survey form was designed primarily to establish counts of students riding to school with and without a helmet worn. Some additional information was requested: school location (metro or rural); education system (public, Catholic, independent); school type (Aboriginal school, area school, junior primary school, primary school, rural school, primary/secondary school); any recent participation in bicycle education programs; the survey date, day, and time; and weather conditions on the day.

Participation in the bicycle helmet survey did not require any other action to be taken, other than completing and returning the brief survey form. However, schools were given the opportunity to inform students about bicycle safety (after the survey) through a free educational kit that was made available to participating schools. The educational kit provided a useful method of encouraging school participation through the provision of resources for teachers.

Two weeks after the Bicycle Helmet Survey had concluded, an appointed study-observer visited a random sample of all public, Catholic and independent primary schools in the metropolitan Adelaide area that chose not to participate in the survey to conduct site observations and obtain extra survey data. This second part of the study was conducted to determine whether helmet wearing among responding primary schools was the same as that for non-responding primary schools. The latter observations could only be conducted in non-participating schools, and only in the metropolitan Adelaide area, due to the financial constraints of the study. In these site observations of non-respondent schools, the survey data were obtained by the study-observer standing at the school's entrance gate and recording whether students that arrived to school by bicycle were wearing a helmet. This different technique was used to collect the data because the study-observer was not authorised to enter the school grounds.

Estimates of the total enrolment of students were obtained from the Department of Education, Training and Employment Services (DETE), the Catholic Education Office, and the Association of Independent Schools of SA. In a small number of cases, enrolment information was sought directly from the schools themselves.

RESULTS

Survey response

There were 683 invitations sent to schools, with 217 (31.8%) agreeing to participate. Of the 217 schools that participated 34 (15.7%) completed the survey outside the designated survey week. These responses were considered to be representative of those conducted during the survey week and were included as survey results.

The 217 participating schools have a total enrolment of 48,347 primary school students. Although the overall response rate for the survey was 31.8%, the responding schools accounted for approximately 42.3% of all primary school students in years R-7 (48,347/114,287) in South Australia (based on 2001 mid-year enrolments; DETE, 2001).

The response rate varied across educational sectors: public schools had the highest response rate of 37.0% (187/505) followed by Catholic schools 26.9% (25/93). Independent schools had a very low response rate of 5.9% (5/85). Table 1 shows the response rates by educational sector and school type.

Table 1. Response rates for the South Australian Bicycle Helmet Usage Survey, 2003

	Schools invited	Schools responding	Response rate
Public schools			
Aboriginal schools	18	5	27.8%
Area schools	51	23	45.1%
Junior primary schools	35	3	8.6%
Primary schools	386	151	39.1%
Primary/secondary schools	13	3	23.1%
Rural schools	2	2	100.0%
Public schools total	505	187	37.0%
Catholic schools			
Primary schools	74	23	31.1%
Primary/secondary schools	19	2	10.5%
Catholic schools total	93	25	26.9%
Independent schools			
Primary schools	47	3	6.4%
Primary/secondary schools	38	2	5.3%
Independent schools total	85	5	5.9%
All Primary Schools Total	683	217	31.8%
All Primary Students Total	114,287	48,347	42.3%

Survey results

The proportion of primary school students riding a bicycle to school was 4.1% (1,984/48,347). Of the students riding a bicycle to school, 92.3% (1,832/1,984) were wearing a helmet. Table 2 shows the survey results by educational sector and school location.

Table 2. Survey results for the South Australian Bicycle Helmet Usage Survey, 2003

	Total school s	Total enrolment s	Number students observed	Number of students wearing helmet	Proportion of students riding to school	Helmet wearing rate
All Primary Schools Total	217	48,347	1,984	1,832	4.1%	92.3%
Educational Sector						
Public schools	187	40,980	1,830	1,678	4.5%	91.7%
Catholic schools	25	6,601	136	136	2.1%	100.0%
Independent schools	5	766	18	18	2.3%	100.0%
School location						
Country schools	115	17,427	1,029	980	5.9%	95.2%
Metropolitan schools	102	30,920	955	852	3.1%	89.2%
Other schools						
Non- respondent schools	40	11,285	133	111	1.2%	83.5%
Aboriginal schools	5	292	18	0	6.2%	0.0%

Public Schools

A total of 187 public schools participated in the survey, with a total enrolment of 40,980 primary school students. The rate of bicycle riding to school was slightly higher than for all schools at 4.5% (1,830/40,980). Of the students riding a bicycle to school, 91.7% were observed wearing a helmet (1,678/1,830). Although this rate of helmet wearing for public schools was quite high, it was slightly below the rate of helmet wearing for all schools.

Catholic schools

A total of 25 Catholic schools participated in the survey, with a total enrolment of 6,601 primary school students. The rate of bicycle riding to school among Catholic school students was much lower in comparison with all schools at 2.1% (136/6,601). Of the students riding a bicycle to school, all were recorded as wearing a helmet (136/136), a reported compliance of 100%. The reliability of this rate of compliance is unknown, as the validation exercise was not conducted for participating schools.

Independent schools

A total of 5 independent schools participated in the survey, with a total enrolment of 766 primary school students. The rate of bicycle riding to school among independent school students was again much lower in comparison with all schools at 2.3% (18/766). Of the students riding a bicycle to school, all were recorded as wearing a helmet (18/18), with a reported 100.0% compliance. Again, the reliability of this reported 100% compliance is unknown, as validation of participating schools was not conducted.

Country schools

A total of 115 country schools participated in the survey, with a total enrolment of 17,427 primary school students. The rate of bicycle riding to school among country school students was higher in comparison with all schools at 5.9% (1,029/17,427). Of the students riding a bicycle to school, 95.2% were wearing a helmet (980/1,029), which was above the rate of helmet wearing for all schools.

Metropolitan schools

A total of 102 metropolitan schools participated in the survey, with a total enrolment of 30,920 primary school students. The rate of bicycle riding to school among metropolitan school students was lower in comparison with all schools at 3.1% (955/30,920). Of the students riding a bicycle to school, 89.2% were wearing a helmet (852/955), which was below the rate of helmet wearing for all schools.

Non-respondent Schools

With the permission of the DETE, the second part of the study was to conduct site observations and obtain the survey data for a random sample of metropolitan primary schools that chose not to participate in the survey. One in every seven non-responding schools was selected, resulting in a total of 40 validation observations (25 public, 8 independent and 7 Catholic) being conducted at schools with a total enrolment of 11,285 primary school students.

The results showed that non-respondent schools were different to responding schools with only 1.2% of students riding a bicycle to school (133/11,285), and only 83.5% of bicycle riders wearing a helmet (111/133). This rate of compliance with bicycle helmets was lower than the rate for all schools, and these differences were statistically significant ($p < 0.001$ for both measures). Counts at non-respondent Catholic and independent schools were too small to examine whether there were any trends across educational sectors.

Aboriginal Schools

A total of 5 Aboriginal schools participated in the survey, with a total of 292 primary school students. While the proportion of students riding a bicycle to school was higher in comparison with all schools (6.2%, 18/292) no students were observed wearing a helmet. All participating Aboriginal schools were outside the Metropolitan area.

Schools with Bicycle Education Programs

In the survey questionnaire, schools were asked whether in the last 6 months they had been involved in any bicycle education programs (e.g. BikeEd; DTEI, 2006). Of the respondents, 32 schools had been involved in a bicycle safety education program. Comparison of these schools with primary schools who *did not* recently have a bicycle education program showed little difference in bicycle riding (4.4% versus 4.0%) and a slightly lower rate of helmet wearing (90.0% versus 92.8%).

Socio-economic disadvantage

An analysis was conducted to determine the helmet-compliance rates among primary school students riding to school, by level of socio-economic disadvantage. The Socio-Economic Indexes for Areas (SEIFA) are four summary measures derived from the Australian Bureau of Statistics Census of Population and Housing to measure different aspects of socio-economic conditions by geographic area. For this analysis, geographic area was defined by the postcode of the school. Note that while each school was allocated one SEIFA score according to postcode, that does not mean that all students at their normal place of residence would necessarily have the same score.

The SEIFA index selected was the *Index of Disadvantage* (ABS, 2001). The SEIFA *Index of Disadvantage* allocates each postcode a score of disadvantage that is derived from levels of income, educational attainment and unemployment within that postcode. For ease of analysis the index of disadvantage was categorised into the following four groups:

- Very high level of disadvantage
- High level of disadvantage
- Low level of disadvantage
- Very low level of disadvantage

The break-points between each category correspond to the 10th, 25th and 75th percentile values of the index in South Australia (ABS, 2001) Although the rate of helmet-compliance was quite high, there were statistically significant differences across the four groups ($p < 0.001$). Schools located in postcodes of very high disadvantage had the lowest rates of helmet-compliance, and schools located in postcodes of very low disadvantage had the highest rates of helmet compliance. Therefore, the trend was for increased helmet-compliance with decreasing levels of disadvantage, as outlined in Table 3.

Table 3. Helmet-compliance rates by level of socio-economic disadvantage, South Australian Bicycle Helmet Usage Survey, 2003

Level of Disadvantage	Number of schools	Number of Bicyclists Wearing Helmet	Total Number of Bicyclists	Helmet-Compliance Rate
Very high level of disadvantage	27	169	204	82.8%
High level of disadvantage	57	344	379	90.8%
Low level of disadvantage	80	780	831	93.9%
Very low level of disadvantage	53	539	570	94.6%

Other results

Schools were asked in the survey questionnaire about the weather conditions when the survey was conducted. A total of 99.1% (215/217) of schools reported that the survey was conducted in dry weather. Therefore, weather conditions would not have influenced the survey results, and particularly the number of children that rode to school.

Of the schools that participated in the survey, 81.1% (176/217) requested the bicycle safety educational kit that was offered.

DISCUSSION

Generally helmet compliance among primary school children riding to school was high. The survey results showed the highest rates of compliance among Catholic and independent primary schools. Geographically, the lowest rate was reported in the metropolitan Adelaide region. The reported compliance among Catholic and independent primary school children was 100%. One possible explanation for this complete compliance could be a well implemented ‘no helmet – no ride’ school policy. As mentioned previously, the validation exercise was not conducted for participating schools, so the reliability of the 100% reported compliance is unknown.

Given that the response rate for the survey was low (31.8%) calculations were made to determine what affect the non-responding schools (68.2%), with a lower rate of helmet-compliance, would have on an estimate of helmet compliance among all primary school students in South Australia. For the responding schools, the compliance rate is known (92.3%). Assuming that all non-responding schools were similar to those observed in the study follow-up (compliance rate 83.5%) the estimate for helmet compliance for all primary school students in South Australia would be 89.0%, which is in concordance with other surveys conducted in Australia. Alternatively we must consider the possibility that the figures reported by the schools were inflated. While we requested that no advance warning be given to the students, we cannot verify the extent to which this request was followed.

The rate of bicycle riding as well as the rate of helmet wearing appeared to lower in non-respondent schools. This finding might suggest that the non-respondent schools were less likely to participate in the bicycle helmet study because the proportion of their students involved in bicycle riding is lower. The different collection method used to collect data from non-respondent schools might have introduced a bias into the reported lower rate of bicycle riding, because there might have been more than one entrance gate to the school through which bicyclists could enter, and the study-observer collected data at the main entrance gate only. However, it is unlikely that this difference in collection method biased the rate of helmet wearing found among non-respondent schools, as the cyclists entering through the main gate should be representative of all cyclists arriving at the school.

Given that the survey relied on school staff conducting observations it was not considered feasible to collect information on the appropriate fit, type or size of the helmet, because such judgments would require a sufficient level of training. Therefore, observers were instructed only to record whether or not the helmet was being worn. In addition, comment cannot be made on whether the helmet was worn for the entire duration of the journey to school.

It was not our intention to evaluate the effect of school policies such as a 'no helmet – no ride' policy on wearing rates. We feel that self-reports of such policies might be misleading, as it would be impossible to know how strictly such policies were being enforced. However, this variable might be considered for inclusion in future surveys.

This survey was conducted with the assistance of DETE. Throughout the project, contact with the schools was made particularly easy by using existing channels of communication that DETE already has established. Contacting schools through DETE was found to be very cost-effective and timely. Similar methods of communication should be considered for future work in road safety, where collaborative projects with DETE, and school communities are feasible. However, some independent verification of the results of such projects, such as a observations at a representative sample of responding schools is may be necessary for validation.

CONCLUSIONS AND RECOMMENDATIONS

Generally, reported helmet wearing among primary school students was high. The rate for respondent schools was 92%, but the lower rate we observed in non-respondent schools (84%) may indicate that the reported rate from responding schools was inflated. Independent observations of participating schools would have helped to clarify the meaning of the different rates of helmet wearing between the two groups. Nevertheless, the indication that the true rate of wearing may in fact be lower than was reported by the schools reinforces the need for current education programs and initiatives to receive continued funding and development so that the current level of compliance is maintained, or increased.

Due to the very low rate of helmet wearing among Aboriginal school students it may be appropriate for some action be taken to raise compliance in this group.

In addition, there is a need for future studies to address not only the level of compliance but also the appropriateness of helmet wearing, such as correct fitting and size. Such a study would require personnel trained in this area.

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