

Adolescent injury

Supplementary materials

September 2021

MEASURES

Injury

Injury items were developed for LSAC.

At age 16-17 (Wave 7; 2016), the LSAC K cohort study adolescents were asked to respond 'Yes' or 'No' to:

In the last two years, have you missed more than two full days of school or work because of an injury?

Those injured were further asked:

- How many times has this happened? (Number recorded)
- Thinking of the most serious injury you had in the last two years, how many days off work or school did you have? (Number recorded)
- What caused the injury?
Adolescents indicated 'Yes' or 'No' to each of the following options: Car accident, Motorbike accident, Quad bike accident, Bicycle accident, Pedestrian accident, Other transport accident, Playing sport, Fall, Animal contact, Near drowning, Suffocation, Fire, heat and hot substances, Exposure to chemicals and poisons (including alcohol and other drugs), Firearm, Sharp object, Machinery or electricity, Struck by or collision with a person (e.g. Hit or punched), Struck by or collision with an object (not including a motor vehicle), Other.
- Where did this injury occur?
Response options were: Home, School, Work, Someone else's place, Outside public place other than a road, Inside public place, Public road, Other.
- Who treated this injury?
Adolescents indicated 'Yes' or 'No' to each of the following options: You treated yourself, Your parent, Friend, Coach or teacher, Ambulance paramedic, Doctor or nurse at GP clinic, Doctor or nurse at hospital, Medical specialist (e.g. physiotherapist or dentist), Other.
- What type of injury was it?
Adolescents indicated 'Yes' or 'No' to each of the following options: Broken or fractured bone, Burn or scald, Dislocation, Sprain, strain or tear, Cut or scrape, Bruises or swelling, Animal bites or bee stings, Concussion or internal head injury, Internal injury (not head), Dental injury, Poisoning, Other.

When LSAC K cohort adolescents were aged 12–13 (Wave 5; 2012), 14–15 (Wave 6; 2014) and 16–17 (Wave 7; 2016), a parent or guardian was asked:

In the last 12 months, how many times did the child need medical attention from a doctor or hospital because he/she was hurt or injured? (This includes hospital casualty emergency wards or outpatients clinics and, in more remote areas, includes care given by a visiting nurse or health centre nurse and excludes medical attention because child was unwell or had an illness (e.g. fever, asthma)).

Prior injury

A binary variable for prior injury was derived from responses to the above question when children were aged 12–13 (Wave 5) and 14–15 years (Wave 6) and coded 0 ('No' in Wave 5 and Wave 6) or 1 ('Yes' in Wave 5 and/or Wave 6). The percentage of adolescents who had experienced prior injury (injured at age 12–13, 14–15 or both) was 32.5%.

Unintentional injury

When LSAC K cohort adolescents were aged 16–17, parents who responded that their child had had an injury in the past 12 months were asked:

Thinking about the most serious injury in the last 12 months, how did this injury occur? Response options were: It was an accident (unintentional), someone else did it to him/her deliberately (intentional), he/she did it to himself/herself deliberately (self-inflicted).

Remoteness area of residence

The remoteness area indicator used was the Australian Statistical Geography Standard (ASGS) remoteness structure that divides Australia into five classes of remoteness on the basis of a measure of relative access to services. Categories for outer regional, remote and very remote were combined into a single category 'outer regional/remote'.

The percentage of adolescents (Wave 7; 2016) in each of the areas was: major city (65.4%); inner regional (22.3%) and outer regional/remote (12.4%).

SEIFA

The SEIFA indicator used was the Index of Economic Resources (IER). This indicator is created by the Australian Bureau of Statistics from social and economic census information. It ranks geographic areas across Australia in terms of their relative socio-economic disadvantage. Index scores (Wave 7; 2016) were classified into low advantage (lowest 25% of the distribution), middle (middle 50%) and high advantage (top 25%).

Equivalised parent income

Equivalised parent income was calculated by dividing post-imputation total parent income by an equivalence factor that accounts for the different size and composition of families. Scores (Wave 7; 2016) were classified into low (lowest 25% of the distribution), middle (middle 50%) and high (top 25%).

Parent education

In Wave 7, both parents or guardians reported on the highest qualification they had completed. Parent education was coded 0 (one or both parents has a bachelor degree/graduate diploma/certificate/postgrad degree) or 1 (neither parent has a bachelor degree/graduate diploma/certificate/postgrad degree). The percentage of adolescents whose parents did not have a degree was 59.7%.

School sector

When LSAC K cohort adolescents were 16–17 (Wave 7; 2016), a parent or guardian indicated if their child attended a government school; a Catholic school; an independent or private school; or was not in school.

The percentage of adolescents in each category was: government (47.9%), Catholic (21.6%), independent (22.0%) and not in school (8.5%).

Lifetime alcohol use

At age 14–15 (Wave 6; 2014), LSAC K cohort study adolescents were asked: Have you ever had even part of an alcoholic drink?

Lifetime alcohol use was coded 0 if the response was either 'No' or 'Yes, just a few sips' and 1 if the response was either 'Yes, I have had fewer than 10 alcoholic drinks in my life' or 'Yes, I have had 10 or more alcoholic drinks in my life'. The percentage of adolescents who had ever drunk more than a few sips of alcohol was 14.1%.

Risky driving

At age 16–17 (Wave 7; 2016), LSAC K cohort study adolescents (regardless of licence status) were asked: Try to remember the last 10 times you drove a car or other vehicle. On how many occasions have you done any of the following?

- Drove up to 10km/h over the limit
- Drove between 10 and 25 km/h over the limit
- Drove more than 25 km/h over the limit
- Drove when probably affected by alcohol
- Did not wear a seatbelt at all (or helmet if riding a motorbike)
- Did not wear your seatbelt for part of the trip (or helmet if riding a motorbike)
- Drove when very tired
- Drove when probably affected by an illegal drug.

Items were taken from the Australian Temperament Project.¹ An adolescent was seen as having engaged in risky driving if they reported any of these behaviours on at least one of their last 10 driving trips. The percentage of adolescents who had engaged in risky driving was 48.7%.

Sports participation

When LSAC K cohort adolescents were aged 16–17 (Wave 7; 2016), they were asked: In the last 12 months, since current month last year, did you regularly participate in any of the following organised activities outside of school hours?

- team sport (e.g. football, cricket or netball)
- individual sport, coaching or lessons (e.g. swimming, tennis, karate or gymnastics)
- fitness activity (e.g. going for a run, to the gym, or doing a group fitness class).

The percentage of adolescents who participated in a team sport was 44.1% and the percentage who participated in an individual sport was 20.8%. The percentage of adolescents who participated in fitness activities was 45.0%.

Employment

Employment status at age 16–17 was classified as: 1 Employed full-time (30+ hours/week); 2 Employed part-time (or unknown hours); 3 Looking for work; 4 Currently not in the labour force. Adolescents were classified as employed if they were in full-time or part-time employment. The percentage of adolescents who were employed was 48.0%.

Parental monitoring

When LSAC K cohort adolescents were 14–15 (Wave 6; 2014), a parent or guardian was asked:

- How many of child's close friends do you know by sight and by their first and last names?
- How many of child's close friends' parents do you know by sight and by their first and last names?
Response options were: 1 None of them; 2 Only a few; 3 About half; 4 Most of them; 5 All of them.
- How strongly do you agree or disagree that? 'It is important that parents know where their child is and what they are doing all the time.'

¹ Vassallo, S., Smart, D., Sanson, A., Harrison, W., Harris, A., Cockfield, S., & McIntyre, A. (2007). Risky driving among young Australian drivers: Trends, precursors and correlates. *Accident Analysis and Prevention*, 39, 444–458.

- How strongly do you agree or disagree with the following statement? 'It is difficult to know where child is and what he/she is doing now that he/she is getting older.' (reversed)
Response options were: 1 Strongly disagree; 2 Disagree; 3 Neither agree nor disagree; 4 Agree; 5 Strongly agree.
- In the course of a day, how often do you know where child is? (reversed)
- How often do you know who child is with when he/she is away from home? (reversed)
Response options were: 1 Always; 2 Almost always; 3 About half the time; 4 Almost never; 5 Never.

The standardised sum score of the six items was calculated and parental monitoring was classified as low (lowest 25% of the distribution), middle (middle 50%) or high (top 25%).

Big five personality traits

Personality traits were measured in the LSAC K cohort at age 16–17 (Wave 7; 2016) using the 10-item Big Five Personality Inventory (BFI-10).² Adolescents were asked to rate how well the following statements described their personality on a five-point scale from '1 = Disagree Strongly' to '5 = Agree Strongly':

1. Extraversion

- I see myself as someone who is reserved; keeps thoughts and feelings to self. (reversed)
- I see myself as someone who is outgoing, sociable.

2. Agreeableness

- I see myself as someone who is generally trusting.
- I see myself as someone who tends to find fault with others. (reversed)

3. Conscientiousness

- I see myself as someone who tends to be lazy. (reversed)
- I see myself as someone who does things carefully and completely.

4. Neuroticism

- I see myself as someone who is relaxed, handles stress well. (reversed)
- I see myself as someone who gets nervous easily.

5. Openness

- I see myself as someone who doesn't like artistic things (plays, music). (reversed)
- I see myself as someone who has an active imagination.

For each of the five personality traits, the average of the two items formed a scale ranging from 1 to 5. Each of the personality traits was then coded 1 (High, top 25%) or 0 (Moderate/low, bottom 75%).

² Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the big five inventory in English and German. *Journal of Research in Personality, 41*(1), 203–212.

FULL RESULTS

Table S1: Proportion of Australian adolescents aged 16–17 who reported injury in the previous two years, 2016

	Female		Male		Total	
	%	Population estimate	%	Population estimate	%	Population estimate
Number of injuries ^a in past 2 years						
0	81.1*	95,676	74.7	92,165	77.9	187,841
1	9.3	11,456	12.0	15,453	10.7	26,909
2	3.9	4,686	5.7	7,018	4.8	11,704
3	1.9	2,446	3.1	3,936	2.5	6,382
4	0.8	795	1.5	1,752	1.2	2,547
5 or more	3.0	3,079	3.0	2,891	3.0	5,970
One or more injuries ^a in past 2 years	18.9	22,463	25.3*	31,049	22.1	53,512
Total, n	1,451	118,140	1,498	123,214	2,949	241,354
Total, %	100.0		100.0		100.0	

Notes: ^a Injury causing at least two days absence from school or work. Asterisks indicate statistically significant differences in proportions between males and females, from non-overlapping 95% confidence intervals.

Source: LSAC K cohort, Wave 7, weighted

Table S2: Cause of most serious injury in past two years reported by Australian 16–17 year olds

Cause	Percentage of injuries		
	Female	Male	Total
Playing sport	50.6	60.8*	56.5
Other (unspecified)	23.9	16.3	19.5
Fall	14.7	9.7	11.8
Any transport injury	4.4 ^a	8.1	6.5
Car accident	0.2 ^a	0.4 ^a	0.3 ^a
Motorbike accident	2.5 ^a	2.5 ^a	2.5 ^a
Quad bike accident	0 ^a	0.4 ^a	0.2 ^a
Bicycle accident	0.4 ^a	3.8 ^{**a}	2.4 ^a
Pedestrian accident	0.4 ^a	0.3 ^a	3.3 ^a
Other transport accident	1.1 ^a	0.9 ^a	1.0 ^a
Struck by or collision with a person (e.g. hit or punched)	0.8 ^a	4.3 ^{*a}	2.8 ^a
Struck by or collision with an object (not including a motor vehicle)	2.1	3.0	2.6 ^a
Sharp object	1.4 ^a	2.7 ^a	2.2 ^a
Animal contact	4.3 ^{**a}	0.5 ^a	2.1 ^a
Fire, heat and hot substances	0.9 ^a	0.9 ^a	0.9 ^a
Near drowning	0 ^a	0.3 ^a	0.2 ^a
Suffocation	0 ^a	0.2 ^a	0.1 ^a
Machinery or electricity	0 ^a	0.1 ^a	0.1 ^a
Exposure to chemicals and poisons (including alcohol and other drugs)	0 ^a	0 ^a	0 ^a
Firearm	0 ^a	0 ^a	0 ^a
Total, n	266	383	649

Notes: ^a Estimate unreliable (cell count <20). Asterisks indicate statistically significant differences in proportions between boys and girls, from chi-square tests: * $p < .05$, ** $p < .01$. Any transport injury indicates any of car, motorbike, quad bike, bicycle, pedestrian, other transport. Totals do not round to 100.0% because 4% ($n = 23$) adolescents indicated more than one cause of injury.

Source: LSAC K Cohort, Wave 7, weighted

Table S3: Type of injury

	Percentage of sports injuries			Percentage of non-sports injuries		
	Female	Male	Total	Female	Male	Total
Sprain or strain	63.2*	45.1	51.8	37.6**	19.4	28.1
Broken or fractured bone	12.4	32.9**	25.2	13.4 ^a	26.9*	20.5
Bruises or swelling	12.6 ^a	11.7	12.0	10.1 ^a	20.7*	15.6
Cut or scrape	1.7 ^a	2.7 ^a	2.3 ^a	9.4 ^a	19.4	14.6
Dislocation	11.4 ^a	6.5	8.3	10.2* ^a	2.4 ^a	6.1 ^a
Concussion	5.1 ^a	5.8 ^a	5.5	2.9 ^a	4.4 ^a	3.7 ^a
Internal injury	4.7 ^a	2.7 ^a	3.5 ^a	4.8 ^a	6.4 ^a	5.7 ^a
Other	5.6 ^a	8.3	7.3	22.2	22.1	22.1
Total, n	140	247	387	126	136	262

Notes: ^a Estimate unreliable (cell count <20). Asterisks indicate statistically significant differences in proportions between males and females, from chi-square tests: * $p < .05$, ** $p < .01$. Respondents were asked to consider their most serious injury in the past two years. Totals do not round to 100.0% because respondents may have indicated more than one injury type. Burns/scalds, accidental poisoning, dental injuries and animal bites or bee stings are not shown as fewer than 20 respondents in total indicated each of these types. 'Other' injury types were unspecified.

Source: LSAC K cohort, Wave 7, weighted

Table S4: Where injury happened

	Percentage of sports injuries			Percentage of non-sports injuries		
	Female %	Male %	Total %	Female %	Male %	Total %
Home	0.3	0.3	0.3 ^a	39.7	22.5	30.7
School	21.0	32.8	28.4	12.9	23.1	18.3
Work	0.8	0.0	0.3 ^a	7.7	7.3	7.5 ^a
Another's home	0.4	0.3	0.3 ^a	11.5	4.2	7.7 ^a
Outside public place	57.0	55.0	55.8	10.8	24.0	17.7
Inside public place	19.4	11.1	14.2	4.5	0.8	2.6 ^a
Public road	0.0	0.0	0.0	3.2	9.3	6.4 ^a
Other	1.1	0.5	0.7 ^a	9.7	8.8	9.2
Total, n	140	247	387	126	136	262
Total, %	100.0	100.0	100.0	100.0	100.0	100.0

Notes: ^a Estimate unreliable (cell count <20). Respondents were asked to consider their most serious injury in the past two years. 'Other' injury locations were unspecified.

Source: LSAC K cohort, Wave 7, weighted

Table S5: Person treating injury

	Percentage of sports injuries			Percentage of non-sports injuries		
	Female	Male	Total	Female	Male	Total
Self	16.9	14.0	15.1	15.1 ^a	13.7	14.4
Your parent	21.7	17.8	19.2	20.0	15.1	17.5
Friend	0.8 ^a	2.5 ^a	1.9 ^a	1.0 ^a	5.3 ^{**a}	3.3 ^a
Coach or teacher	16.6	19.7	18.5	6.6 ^a	4.1 ^a	5.2 ^a
Ambulance Paramedic	2.2 ^a	11.3 ^{**}	7.9	3.0 ^a	8.7 ^{*a}	6.0 ^a
Doctor or nurse at GP clinic	26.8	28.9	28.1	34.9	35.2	35.0
Doctor or nurse at hospital	27.9	32.8	31.0	33.6	41.1	37.5
Medical specialist (e.g. physiotherapist or dentist)	35.6	30.1	32.1	23.3	16.3	19.6
Other	3.6 ^a	2.4 ^a	2.8 ^a	3.1 ^a	3.8 ^a	3.5 ^a
Total, <i>n</i>	140	247	387	126	136	262

Notes: ^a Estimate unreliable (cell count <20). Asterisks indicate statistically significant differences in proportions between males and females, from chi-square tests: * $p < .05$, ** $p < .01$. 'Other' persons treating the injury were unspecified. Totals do not round to 100.0% because respondents may have indicated more than one person treating the injury. Respondents were asked to consider their most serious injury in the past two years.

Source: LSAC K Cohort, Wave 7, weighted

Table S6: Days of school/work lost due to most serious injury in past two years

	Sports injury			Non-sports injury		
	Female %	Male %	Total %	Female %	Male %	Total %
1 or 2 days	35.1	31.4	32.8	27.3	25.8	26.5
3 to 10 days	54.8	57.7	56.6	48.2	57.0	52.8
11 to 20 days	7.0 ^a	9.2	8.4	10.8	6.9 ^a	8.7
More than 21 days	3.0 ^a	1.7 ^a	2.2 ^a	13.7	10.3 ^a	11.9
Median [IQR], in days	3 [2-6]	3 [2-5]	3 [2-5]	5 [2-10]	4 [2-8]	4 [2-10]
Total, <i>n</i>	140	247	387	126	136	262
Total, %	100.1	100.0	100.1	100.0	100.0	99.9

Notes: Some totals do not add up to 100.0% exactly because of rounding. ^a Estimate unreliable (cell count <20). IQR = inter-quartile range (the value of the 25th and 75th percentiles of the distribution).

Source: LSAC K cohort, Wave 7, weighted

Table S7: Factors associated with sports and non-sports injury among adolescents aged 16-17 years

	Sports injury aOR	Non-sports injury aOR
Male sex	1.59**	1.11
Remoteness area of residence		
Major city (ref.)	1.00	1.00
Inner regional	0.82	1.19
Outer regional/remote	0.67	0.87
SEIFA index of relative socio-economic disadvantage		
Low advantage	1.21	1.01
Middle (ref.)	1.00	1.00
High advantage	1.44*	1.12
Parent income		
Low	1.24	1.69**
Middle (ref.)	1.00	1.00
High	0.96	0.99
Parent education		
Neither parent has degree	1.40*	1.48*
School sector		
Government (ref.)	1.00	1.00
Catholic	0.80	0.72
Independent	0.90	0.98
Not in school	0.77	1.84*
Lifetime alcohol use	1.19	1.07
Risky driving (age 16-17)	1.24	1.33
Individual sport participation (age 16-17)	1.22	1.16
Team sport participation (age 16-17)	2.85***	0.55*
Fitness activity participation	1.37*	1.13
Prior injury ^a	1.83***	2.06***
Employment	0.94	1.49*
Low parental monitoring	0.75	1.46*
Personality		
High on extraversion	1.25	0.97
High on agreeableness	0.56*	1.16
High on conscientiousness	1.04	0.57**
High on neuroticism	0.99	1.61*
High on openness	0.97	1.61**
Total, n	2,096	2,022

Notes: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. aOR = adjusted odds ratio (adjusted for all other factors in table); multivariable logistic regression model for sports injury versus no injury; multivariable logistic regression model for non-sports injury versus no injury.

^a Any injury in past year at ages 12-13 and/or 14-15 years (reported by parent).

Source: LSAC K cohort, Waves 5-7, unweighted

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