

# Avon Longitudinal Study of Parents and Children: Exposure to Injury Risk in the Road Environment and Reported Road Traffic Injuries in 16-year-olds

## Abstract

This project investigated the relationship between reported road traffic injuries and risk taking in adolescents aged 16 years. Of the 4,815 respondents, 6.3% reported a road accident in the previous year: as a passenger in a motor vehicle (61.7%); as a cyclist (15.3%); as a driver of a moped or motorcycle (10.7%); or as a pedestrian (7%). Forty-two per cent of accidents resulted in injury and 75% of these needed medical attention. Accidents were more common in young people with high hyperactivity and sensation-seeking scores. Cycle and moped/motorcycle accidents were strongly associated with males, poorer parental supervision and the use of cigarettes, alcohol and cannabis.

## Main findings

In 2008–09, a sample of 4,815 young people aged 16 years from the Avon Longitudinal Study of Parents and Children (ALSPAC) completed a questionnaire about their road use, accidents in the previous 12 months and any injuries sustained:

- 6.3% of respondents reported a road accident in the previous year, as a passenger in a motor vehicle (61.7%), as a cyclist (15.3%), as a driver of a moped or motorcycle (10.7%), or as a pedestrian (7%). While 2.3% of accidents occurred when driving a car.
- 42% of the reported road accidents resulted in injury. None were fatal, but 75% of these required medical attention – 31.2% went to see their GP, 38.4% went to an emergency department and 6.1% stayed in hospital overnight.
- Road accident involvement in the last 12 months at 16 years was associated with reported behavioural problems at 9 and 11 years, especially high hyperactivity scores and high sensation-seeking scores, and with parentally reported hearing difficulty at 13 years. No links were found with anxiety or depression.
- Stressful life events were significantly associated with reporting road accident involvement in the last 12 months at 16 years for girls, but not for boys. Accidents at this age were more frequent in those young people who reported lower levels of parental monitoring: this association was particularly strong for bicycle and moped/motorcycle riders.
- Accidents on a cycle, moped or motorcycle were associated with males, the lack of a father at home, regular cigarette smoking and use of alcohol and cannabis.
- Following a multivariate analysis, factors persistently linked to accidents at 16 years were risky and illegal driving behaviour (driving or being driven in a car without a licence), daily cigarette smoking (also as a marker for alcohol and drug use), impaired hearing reported by their parent at 13 years and high scores on sensation seeking.

## Background

Unintentional injury is a major cause of mortality and morbidity in young adults aged 15–19, and road traffic injuries are the leading cause of death in this age group, representing 72% of mortality in 2009 in England and Wales. 16–17-year-olds are especially vulnerable in the road environment, and often show overconfidence in their own ability and a sense of invulnerability. Peer influence is particularly important at this age, and can encourage risk-taking and thrill-seeking behaviours. Young people are inexperienced with the effects of alcohol and may experiment with other drugs, which further increase their risk of accident and injury.

This project has investigated the complex influences on road use at 16, and the risk factors associated with accidents and injuries, utilising the Avon Longitudinal Study of Parents and Children (ALSPAC), a large contemporary longitudinal birth cohort study, which started in 1991 in the former county of Avon in South West England.

This research follows on from a previous Department for Transport funded study: *ALSPAC: Exposure to Injury Risk in the Road Environment and Reported Road Traffic Injuries in 13–14-year-olds* (Road Safety Web Publication No. 20).

The aims of this research were as follows:

1. To describe reported road traffic accidents of a cohort of young people aged 16–17 years in England.
2. To explore the relationship between reported road traffic injuries and a range of personal, family and wider environmental risk factors.
3. To investigate the co-associations of risk taking in the road environment with other risk-taking behaviours.
4. To describe the relationship between risk of accident and injury in the road environment during adolescence with development, behaviour and psychological problems.

In 2008–09, a sample of 4,815 young people aged 16 years from ALSPAC completed a questionnaire about their road use, accidents in the previous 12 months and any injuries sustained.

## Research findings

The 4,815 questionnaires available for analysis represented 52% of the total cohort at 16 years.

Most respondents walked to school, college or work, followed by being a passenger in a car,

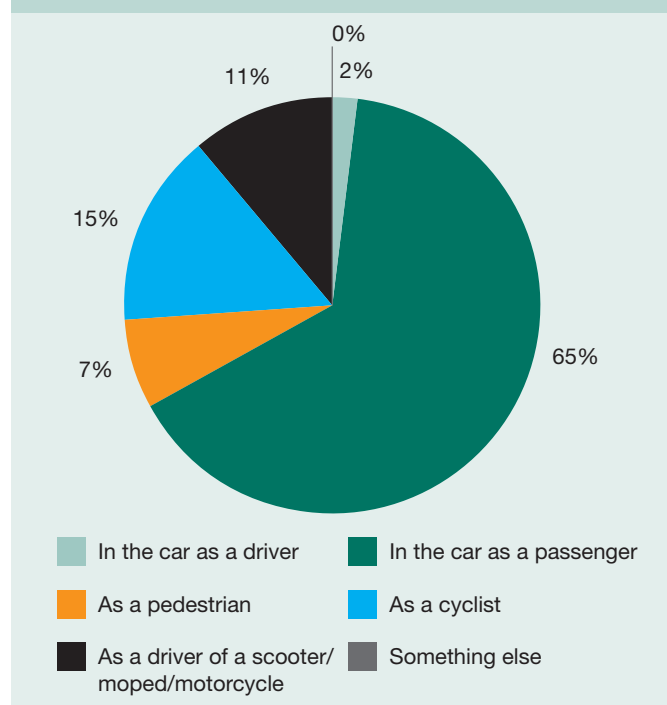
cycling and driving a moped/motorcycle. The most common journey time was 11–21 minutes. When compared with 13 years of age, there was less walking and being driven in a car, and more use of cycles, mopeds and motorcycles at 16 years. However, around 30% of 16-year-old young people were being driven in a car on a regular basis, and the most frequent accidents were as vehicle passengers. There was no relationship between journey time to work/school and accident risk.

Three-quarters of 16-year-olds said that they owned a bicycle, but the majority reported that the last time they used their bike was over a month ago. Less than 50% had a bicycle helmet and only 25% had used a helmet on their last ride. Not using a helmet, and other risky driving behaviours like driving a motorbike or car without a licence, were associated with alcohol and cannabis use and high sensation-seeking scores.

Young people who had an accident generally felt less safe to cross the road near to where they lived, when compared with young people who did not have an accident. However, there were no differences in young people's assessment of safety outside school, college or work.

Three hundred and three (6.3%) respondents reported being involved in an accident in the previous year – 42% (125/303) were hurt in the accident, and 75% of these sought medical attention from a GP or hospital A&E department, but only 4.8% stayed in hospital overnight.

Figure 1: Mode of travel and accidents



The most common accidents were sustained as a passenger in a car, as a cyclist and as a driver of a moped or motorcycle. Only 7% of accidents occurred to pedestrians. Pedestrians, cyclists and moped/motorcycle riders were classified as vulnerable road users.

There were few background factors associated with being a passenger in a vehicle, but being involved in an accident on a cycle, moped or motorcycle at 16 years was associated with males, the lack of a father at home, regular cigarette smoking and use of alcohol and cannabis. Respondents who had a road accident were more likely to live in a family of three or more siblings; however, overcrowding in the home was not correlated with accident risk. Adolescents living in areas of relative disadvantage were not at greater risk of injury in the road environment. However, the mothers of those children involved in road accidents were more likely to be dissatisfied with their neighbourhood.

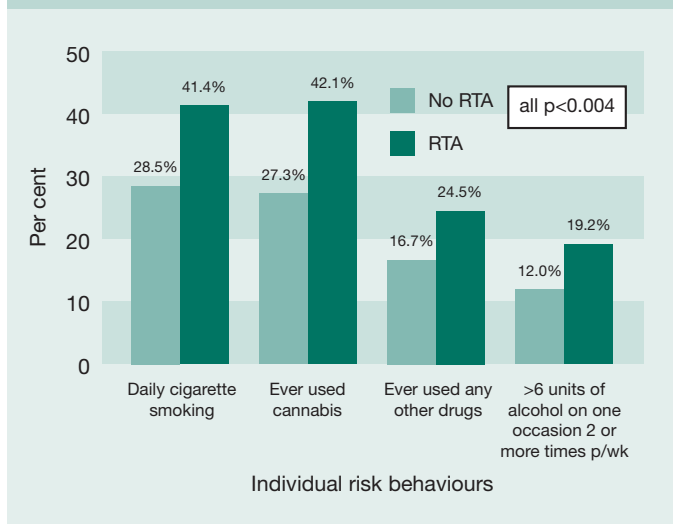
Those involved in accidents at 16 had similar cognitive, motor and sensory development in childhood, but, unlike the findings at 13, there was no excess of accidents or injuries among children with special educational needs. This may reflect less exposure to risk in the road environment because of enhanced parental supervision of learning disabled young people. Accident involvement at 16 years was associated with previously reported hearing loss (by their parent) at 13 years.

Those 16-year-olds who reported a road accident in the last 12 months were more likely to have been rated as having behavioural problems at 9 and 11 years, especially hyperactivity, and had higher scores on a sensation-seeking scale. The strongest associations between accidents and the individual's sensation-seeking profile were observed for motorcycle/moped riders, followed by cyclists and for the few cases of driving a car without a licence. No relationship was apparent with sensation seeking for pedestrians. No links were apparent with depression or other mood disorders.

Those involved in a road traffic accident had higher rates of cigarette, alcohol and drug use.

Stressful life events were significantly associated with reporting road accident involvement in the last 12 months at 16 years for girls, but not for boys. Accidents at this age were more frequent in those young people who reported lower levels of parental monitoring: this association was particularly strong for vulnerable road users.

Figure 2: Drug and alcohol use and road traffic accidents (RTA)



The young people who had accidents at 13 or 16 years were twice as likely to have had a previous road traffic injury before the age of 11. Most of these earlier events occurred during the primary school age period (5–11 years), with few accidents in the road environment prior to age five. Those young people involved in accidents in adolescence who had previously in childhood had an accident in the road environment showed a different profile, with no predominance of the male sex, and associations with conduct difficulties in childhood. Single parenthood (lack of a father at home) and family dissatisfaction with the neighbourhood were strongly associated with repeated road accidents in childhood and adolescence.

Following a multivariate analysis, factors persistently linked to accidents at 16 years were risky and illegal driving behaviour (driving or being driven in a car without a licence), daily cigarette smoking (also as a marker for alcohol and drug use), impaired hearing reported by their parent at 13 years, and high scores on sensation seeking.

## Conclusions

The risk factors for accident involvement at 16 years are a mixture of factors intrinsic to the young person (such as gender and behavioural profile), those related to family background (single parenthood, number of siblings and level of parental monitoring) and some related to the external social environment (stressful life events), but not to the external physical environment (indices of deprivation). Risk taking in the road environment in adolescence correlates strongly with sensation

seeking and other risky behaviours, such as alcohol and drug use.

The equalisation of accident risk in youth observed at 13 years was maintained at 16–17 years. With regard to accidents in the road environment, because young people from better-off backgrounds have more access to bicycles, mopeds and motorcycles, they are exposed to increased risk on the road, which counteracts against the lower risk from living in a better-off neighbourhood and having access to safe play areas.

### About the project

The large ALSPAC cohort has collected a wealth of data for a period of 20 years. When this cohort was initiated in 1991, it was representative of a whole community and covered a range of environments from inner-city to semi-rural in one geographical area in South West England. ALSPAC has also collected a diverse range of psychological and physical measures from both the children and their families.

Road use at 16 was self-reported by the young people, not by their parents, and all injuries resulting from accidents were reported by the young people, which avoided the biases intrinsic to collecting data from A&E and hospital records. The use of cigarettes, alcohol and other drugs was self-reported by the young people. The young person's

behavioural profile was reported by the parents using the Strengths and Difficulties Questionnaire, but the sensation-seeking score was self-reported by the young person in a research clinic.

The main limitation of this research is the missing data, with only 52% of eligible young people returning the questionnaire. Non-responders to the questionnaires, when compared with responders, were more likely to be male and from more deprived social backgrounds, with mothers with lower educational levels. The gender bias in the missing data will have led to an underestimation rather than an exaggeration of the number of accidents and the strength of the associations found. Also, no validation of accident data with other sources was possible, so limited information was available from the young people on the circumstances of the accident.

However, the available questionnaire results do capture the behaviour of young people in the road environment, and the extensive ALSPAC dataset provides a comprehensive set of variables to investigate family background and childhood factors associated with accident risk in adolescence.

Further data will be available on road use and accidents in the ALSPAC cohort at 18–19 years. Comparisons will then be possible of the same cohort at three different ages throughout adolescence.

### Further information

The full report, **Avon Longitudinal Study of Parents and Children: Exposure to Injury Risk in the Road Environment and Reported Road Traffic Injuries in 16-year-olds** by Alan Emond, Rita Doerner, Julie Mytton and Elizabeth Towner, is published by the Department for Transport (ISBN 978 1 84864127 9) as a free web download from [www.dft.gov.uk/topics/road-safety/research](http://www.dft.gov.uk/topics/road-safety/research)

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